Connectivity Solutions LC4®
System LC4®

- with integrated locking
- alternatively to be unlocked either manually or only with a tool, according to NEC 2008 NFPA 70
- connectors, cables and junction boxes

- industrially pre-assembled, overmolded and tested
- field-attachable versions also available
Succeed together

production and service

service
Junction boxes for thin film modules

- einpolige Anschlussdosen, für durch die Modulrückwand geführte Bändchen

- zweipolige Anschlussdosen, für durch die Modulrückwand geführte Bändchen, optional mit Diode

Junction boxes for crystalline modules

- with spring clamps

Connectors

- System LC4®
  - with integrated locking
  - alternatively to be unlocked manually or acc. to NEC 2008 NFPA 70, only with a tool

Cables

- standard cables
- cables according to specific markets’ needs, i.e. for America, Europe, Asia, or multistandard

- 2.5 mm² AWG 14
- 4.0 mm² AWG 12
- 6.0 mm² AWG 10

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Module junction technology

Features

- special direct contacting inside the junction boxes,
- very flat junction box designs
- for crystalline or thin-film modules
- single-pole and two-pole versions
- with self-adhesive pad or for gluing
- sealing by means of potting
- with LC4® connectors with integrated locking
- overmolded connectors: outstanding environmental seals, excellent strain relief, unsurpassed ruggedness and durability

Benefits

- fast, easy to automate and secure connecting processes inside the junction boxes
- minimized contact resistance
- minimized cable lengths with single-pole junction boxes
- contracted dimensions of the junction boxes allow for high packaging density of the modules
- permanently reliable system operation
- minimized attendance and servicing expenditure
- the best solution available for each module type
- all from one source, available worldwide
- system meets international requirements, including NEC 2008 NFPA 70
- customized solutions at any time
Interface from outside

Receptacles of system LC4®
- with integrated locking
- alternatively to be unlocked manually or only with a tool, acc. to NEC 2008 NFPA 70

manual crimp tools
cables: standard or customized

crimp machines for cost-effective production of higher volumes

protective caps

Internal wiring

- screw terminal blocks
- connectors with insulation displacement technology (IDT)
- connectors with screw clamp technology
- connectors with crimp technology
- indirect, two-part connectors
- direct connectors for the circuit board edge
- for discrete stranded wires or flat cables
- pitches from 1.27 mm (.050") up to 10.0 mm (.394")
- for load currents up to 15 A/630 V AC
- I/O interfaces including RJ45 and USB
- circular connectors up to IP 68

For the internal wiring of the components, Lumberg offers a wide range of solutions, all from one source.

for
- inverters
- power optimizers
- auxiliary components

Detailed information about these connector systems can be found in additional Lumberg catalogs and on the Internet.
Features

- photovoltaic receptacles as the interface
- highest protection degree IP 68
- rugged and durable
- LC4® system with integrated locking
- protective caps for transport and spare receptacles
- connector systems and terminal blocks for the internal wiring
- proven a billionfold in various industries

Benefits

- permanently reliable system operation
- fast and easy to assemble
- proven connector systems from one source: into the housing and within the housing
- many systems designed for automated processing
- available worldwide
- customized solutions

From the field into the housing – and within...
Wiring of solar power plants:
industrially pre-assembled, overmolded, tested

Photovoltaic array harnesses LC4®
• ready-to-plug: industrially pre-assembled
• industrially tested
• with LC4® connectors
• with integrated locking, alternatively to be unlocked manually or only with a tool, acc. to NEC 2008 NFPA 70

Components and auxiliaries for on-site assembly

Field-attachable connectors from system LC4®
• with integrated locking
• alternatively to be unlocked manually or only with a tool, acc. to NEC 2008 NFPA 70

In-line fuses
In-line diodes

cables: standard or customized

2.5 mm²
AWG 14

4.0 mm²
AWG 12

6.0 mm²
AWG 10

crimp tool: only one tool for all wire sections
Some of the world’s largest solar power plants are wired with Lumberg components. These plants (right) combine 700,000 resp. 550,000 thin-film modules.

Wire faster and more effectively

**Features**

- photovoltaic array harnesses: everything is pre-assembled and ready-to-plug
- harnesses 100% tested
- overmolded connectors: outstanding environmental seals, excellent strain relief, unsurpassed ruggedness and durability
- extremely sturdy: overmolded connector often even stronger than the cable
- with LC4® connectors with integrated locking
- highest protection degree IP 68
- halogen-free
- UV and ozone-resistant

**Benefits**

- up to 30% shorter installation time
- permanently reliable system operation
- minimized attendance and servicing expenditure
- no lengthy crimping on-site when using pre-assembled and overmolded harnesses
- ideal wiring strategy for every application: overmolded solution is pre-assembled and tested, field-attachable solution available for home run cables
- system meets international requirements, including NEC 2008 NFPA 70
- all from one source, available worldwide
- standard and customized solutions
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<td>Connecting cables LC4®, with connectors at both ends</td>
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Connectivity solutions for photovoltaic power systems
Overview system LC4®

LC4-CP
CP = Connector Parts
Chassis receptacles LC4®, for front mounting, with crimp contacts

LC4-CP
CP = Connector Parts
Branch connectors LC4®

LC4-CP
CP = Connector Parts
In-line fuses LC4®
In-line diodes LC4®

LC4-CX
CX = Connector auxiliaries
Protective caps LC4®

LC4-CX
CX = Connector auxiliaries
Unlocking tool LC4®
Processing tools and machines LC4®

Features
- LC4® with integrated locking according to NEC 2008 NFPA 70
- highest protection degree IP 68
- halogen-free, UV and ozone-resistant
- two options: pre-assembled, overmolded and tested or field-attachable
- standard product range and customized solutions

Benefits
- permanently reliable system operation
- minimized attendance and servicing expenditure
- no lengthy crimping on-site when using pre-assembled and overmolded harnesses
- ideal wiring strategy for every application: overmolded solution is industrially pre-assembled and tested, field-attachable solution available complimentarily
- system meets international requirements, including NEC 2008 NFPA 70

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Connectivity solutions for photovoltaic power systems
LC4®-JC – Junction boxes for Crystalline modules

**LC4-JC**

Photovoltaic junction box for crystalline modules\(^1\), with connecting cables and LC4\(^\circ\) connectors, with 2–4 spring clamps and 0–3 diodes, for ribbons fed through the back plane of the module, mounting with self-adhesive pad\(^2\) or by means of glue

1. **Temperature range**
   -40 °C/+85 °C (IEC)
   -40 °C/+90 °C (UL)
   (+125 °C upper limit temperature)

2. **Materials**
   - Housing/cover: m-PPE, V0 according to UL 94
   - Contact: CuNiSi, tin-plated
   - Pressure contact spring: CrNi
   - Cap nut: m-PC, V0 according to UL 94
   - Sealings: silicone
   - Pressure compensation seal: PTFE
   - Adhesive pad: upon request

3. **Mechanical data**
   - Mating with: photovoltaic connectors LC4
   - Further data: see LC4-CP 3.../LC4-AM
   - Protection degree (junction box)\(^3\): IP 65
   - Connectable contact ribbons:
     - Width: ≤ 10.0 mm
     - Thickness: ≤ 0.1 mm
   - Other dimensions upon request
   - Connected conductor:
     - Photovoltaic cable, double-insulated, technical Data upon request
     - Section alternatively: 2.5 mm\(^2\) (AWG 14), TÜV/UL-approved
     - 4.0 mm\(^2\) (AWG 12), TÜV/UL-approved
     - 6.0 mm\(^2\) (AWG 10), TÜV/UL-approved

4. **Electrical data** (at \(T_{amb} = 20 °C\))
   - Contact resistance: ≤ 1 mΩ
   - Rated current (IEC): various diodes available, value depending on type of diode and diode bypass test, details upon request
   - Rated current (UL): 15 A DC (AWG 14), 20 A DC (AWG 12, AWG 10)
   - Rated voltage\(^4\): 1000 V DC (IEC)/600 V DC (UL)
   - Modul working voltage: 100 V DC
   - Overvoltage category\(^4\): III (8 kV)
   - Material group\(^4\): IIIa (IEC)/2 (UL) (CTI ≥ 250)
   - Creepage distance/clearance between all other live parts: 12.7 mm/9.5 mm
   - live parts and touchable surfaces: 20.0 mm
   - Pollution degree\(^4\): 3
   - Protective class: II
   - Insulation resistance: > 10 GΩ

---

\(^1\) according to application class A of IEC 61730-1/UL 1703
\(^2\) appropriate materials upon request
\(^3\) according to IEC 60529/DIN EN 60529
\(^4\) according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

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**Crystalline modules:**

**Wiring diagram**

Two-pole junction boxes, for ribbons fed through the back plane of the module

**Designation**

LC4-JC details upon request

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*Lumberg - passion for connections

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01/2014
Thinfilm modules:
Wiring diagram
Single pole junction boxes, for ribbons fed through the back plane of the module
Designation
LC4-JT – Junction boxes for Thinfilm modules

1. Temperature range
-40 °C/+85 °C (IEC)
-40 °C/+90 °C (UL)
(+155 °C upper limit temperature)

2. Materials
UV-resistant
Housing/cover: m-PET GF, 5VA according to UL 94
Contact: XCrNi, tin-plated
Crimp bushing: Cu, tin-plated
Adhesive pad: upon request

3. Mechanical data
Mating with
Further data
see LC4-CP 3.../LC4-AM
Protection degree (junction box)
IP 65
Connectable contact ribbons
Width: ≤ 6.0 mm
Thickness: ≤ 0.1 mm
Other dimensions upon request
Connected conductor
Photovoltaic cable, double-insulated, technical Data upon request
Section alternatively 2.5 mm² (AWG 14) or 4.0 mm² (AWG 12)

4. Electrical data (at Tamb 20 °C)
Contact resistance: ≤ 1.5 mΩ
Rated current: 10 A at Tamb 85 °C
Rated voltage:
1000 V DC (IEC)/600 V DC (UL)
Modul working voltage: 100 V DC
Overvoltage category:
III (8 kV)
Material group:
IIIa (IEC)/2 (UL) (CTI ≥ 250)
Creepage distance/clearance between live parts and touchable surfaces: 21.8 mm
Pollution degree:
3
Protective class: II
Insulation resistance: > 10 GΩ
1 according to application class A of IEC 61730-1/UL 1703
2 appropriate materials upon request
3 according to IEC 60529/DIN EN 60529
4 according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

* a option with self-adhesive pad
* b spacer option for fixation by means of glue
* c potting hole
* d deaerator hole
* e connecting cables: section 2.5 mm² (AWG 14) or 4.0 mm² (AWG 12)
* f left connector: LC4-CP 3... or LC4-AM
* g right connector: LC4-CP 3... or LC4-AM
* h schematic diagram of bottom side with ribbon feed-through
* i opening of bottom side for ribbon feed-through
* j direction of cable departure
* k outline contour of junction box

Thinfilm modules:
Wiring diagram
Single pole junction boxes, for ribbons fed through the back plane of the module
Designation
LC4-JT – Junction boxes for Thinfilm modules

<table>
<thead>
<tr>
<th>Ø (mm²)</th>
<th>A (mm)</th>
<th>B (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>54.4</td>
<td>17.75</td>
</tr>
<tr>
<td>4.0</td>
<td>56.4</td>
<td>18.75</td>
</tr>
</tbody>
</table>

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Connectivity solutions for photovoltaic power systems

**LC4-JT**

Photovoltaic junction boxes for thin film modules¹, two-pole, with connecting cables and LC4® connectors, with or without diode, for ribbons fed through the back plane of the module, mounting with self-adhesive pad or by means of glue², for potting², cover for automatic assembly

1. **Temperature range**
   -40 °C/+85 °C (IEC)
   -40 °C/+90 °C (UL)
   (+155 °C upper limit temperature)

2. **Materials**
   - UV-resistant
   - Housing/cover: m-PET GF, 5VA according to UL 94
   - Contact: XCrNi, tin-plated
   - Crimp bushing: Cu, tin-plated
   - Adhesive pad: upon request

3. **Mechanical data**
   - Mating with: photovoltaik connectors LC4
   - Further data: see LC4-CP 3.../LC4-AM
   - Protection degree (junction box)²: IP 65
   - Connectable contact ribbons:
     - Width: ≤ 12.0 mm
     - Thickness: ≤ 0.1 mm
   - Other dimensions upon request:
     - **Connected conductor**
       - Photovoltaic cable, double-insulated, technical Data upon request
       - Section alternatively: 2.5 mm² (AWG 14) or 4.0 mm² (AWG 12)

4. **Electrical data** (at Tamb 20 °C)
   - Contact resistance: ≤ 1.5 mΩ
   - Rated current (IEC): various diodes available, value depending on type of diode and diode bypass test, details upon request
   - Rated current (UL): 10 A DC without diode, details upon request
   - Rated voltage⁴: 1000 V DC (IEC)/600 V DC (UL)
   - Modul working voltage: 100 V DC
   - Overvoltage category⁴: III (B kV)
   - Material group⁴: Illa (IEC)/2 (UL) (CTI ≥ 250)
   - Creepage distance/clearance between all other live parts: 16.5 mm
   - live parts and touchable surfaces: 21.8 mm
   - Pollution degree⁴: 3
   - Protective class: II
   - Insulation resistance: > 10 GΩ

¹ according to application class A of IEC 61730-1/UL 1703
² appropriate materials upon request
³ according to IEC 60529/DIN EN 60529
⁴ according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

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* a option with self-adhesive pad
* b spacer option for fixation by means of glue
* c potting holes
* d deaerator holes
* e connecting cables: section 2.5 mm² (AWG 14) oder 4.0 mm² (AWG 12)
* f left connector: LC4-CP 3... or LC4-AM
* g right connector: LC4-CP 3... or LC4-AM
* h schematic diagram of bottom side with ribbon feed-through
* i opening of bottom side for ribbon feed-through
* j direction of cable departure
* k outline contour of junction box
* l optional extra strain relief clip

---

**Thinfilm modules:**

**Wiring diagram**

Two-pole junction boxes, for ribbons fed through the back plane of the module

**Designation**

LC4-JT
details upon request

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**www.lumberg.com**

01/2014
Connectivity solutions for photovoltaic power systems
LC4®-AM – Cable Assemblies, Modular harnesses

LC4® photovoltaic connecting cables, with overmolded connectors, integrated locking and bend protection
LC4-AM 00: with plug and open end
LC4-AM 01: with socket and open end
LC4-AM 60: with two plugs
LC4-AM 61: with two sockets
LC4-AM 62: with plug and socket

1. Temperature range
   -40 °C/+85 °C (IEC)
   -40 °C/+90 °C (UL)
   (+125 °C upper limit temperature)

2. Materials
   Insulating body: m-PC, V1 according to UL 94
   Contact pin/bush: CuNiSi, tin-plated
   Sealing (sockets only): silicone

3. Mechanical data
   Insertion force: ≤ 20 N
   Withdrawal force: ≥ 10 N
   Retaining force of locking latches: ≥ 90 N
   Mating cycles: 50
   Mating with: photovoltaic connectors LC4
   Protection degree: IP 68

4. Electrical data (at Tamb 20 °C)
   Contact resistance: ≤ 1 mΩ
   Rated current (IEC): 22 A at Tamb, 85 °C, 2.5 mm² (AWG 14)
   30 A at Tamb, 85 °C, 4.0 mm² (AWG 12)
   30 A at Tamb, 85 °C, 6.0 mm² (AWG 10)
   Rated current (UL): 35 A at Tamb, 20 °C, 2.5/4/6.0 mm²
   Rated voltage: 1000 V DC (IEC)/600 V DC (UL)
   Overvoltage category: III (8 kV)
   Creepage distance/clearance between contact and touchable surfaces: 24.6 mm
   Contact and cable outlet: 35.8 mm
   Insulation resistance: > 10 GΩ

Designation
LC4-AM ...
details upon request

* a marking + on LC4-AM ...-1
marking – on LC4-AM ...-2

Designation
LC4-AM 00 IT
www.lumberg.com 01/2014
LC4® photovoltaic connecting cables, with assembled connectors and integrated locking
LC4-AM 30: with plug and open end
LC4-AM 31: with socket and open end

1. Temperature range
-40 °C/+85 °C (IEC)
-40 °C/+90 °C (UL)
(+115 °C upper limit temperature)

2. Materials
- Insulating body: m-PC, V1 according to UL 94
- Contact pin/bush: CuNiSi, tin-plated
- Sealing (sockets only): silicone

3. Mechanical data
- Insertion force1: ≤ 20 N
- Withdrawal force1: ≥ 10 N
- Retaining force of locking latches2: ≥ 90 N
- Mating cycles2: 50
- Mating with photovoltaic connectors LC4
- Protection degree3: IP 68

4. Connected conductor
- Photovoltaic cable, double-insulated, technical data on request
- Section alternatively: 2.5 mm² (AWG 14), 4.0 mm² (AWG 12), 6.0 mm² (AWG 10)

4. Electrical data (at Tamb 20 °C)
- Contact resistance2: ≤ 1 mΩ
- Rated current (IEC)2: 22 A at Tamb 85 °C, 2.5 mm² (AWG 14) 30 A at Tamb 85 °C, 4.0 mm² (AWG 12) 30 A at Tamb 85 °C, 6.0 mm² (AWG 10)
- Rated current (UL)2: 35 A at Tamb 20 °C, 2.5/4.0/6.0 mm²
- Rated voltage4: 1000 V DC (IEC)/600 V DC (UL)
- Overvoltage category4: III (8 kV)
- Material group4: IIIa (IEC)/3 (UL) (CTI ≥ 225)
- Creepage distance/clearance between contact and touchable surfaces: 24.6 mm
- Creepage distance/clearance between contact and cable outlet: 22.8 mm
- Insulation resistance: > 10 GΩ

1 measured with a polished steel gauge, nominal thickness 4.0 mm
2 measured with a proper counterpart
3 according to IEC 60529/DIN EN 60529 only in mated condition with a proper counterpart
4 according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

Designation
LC4-AM ... details upon request

*a marking + on LC4-AM ...-1
marking – on LC4-AM ...-2
Connectivity solutions for photovoltaic power systems

**LC4®-AT** – Cable Assemblies, T-type array harnesses

**LC4®** photovoltaic array harness, type T, with overmolded connector branches, with connectors with integrated locking, total length, number of branches and distance between branches (plugs or sockets) and cable end options according to customer’s specification.

### 1. Temperature range
-40 °C/+85 °C (IEC)
-40 °C/+90 °C (UL)
(+125 °C upper limit temperature)

### 2. Materials
- Halogen-free, UV-resistant
- Insulating body: m-PC, V1 according to UL 94
- Contact Sheet: CuNiSi, tin-plated
- Further data: see LC4-AM resp. LC4-CP

### 3. Mechanical data
- Mating with photovoltaic connectors LC4
- Protection degree:
  - Type 1: IP 68
- Further data: see LC4-AM resp. LC4-CP
- Connected conductor:
  - Photovoltaic cable, double-insulated, technical data on request
- Section alternatively:
  - 4.0 mm² (AWG 12) or
  - 6.0 mm² (AWG 10)

### 4. Electrical data (at T<sub>amb</sub> 20 °C)
- Contact resistance:
  - ≤ 1 mΩ
- Rated current:
  - 30 A
- Rated voltage:
  - 1000 V DC (IEC)/600 V DC (UL)
- Overvoltage category:
  - III (8 kV)
- Material group:
  - IIIa (IEC)/3 (UL) (CTI ≥ 225)
- Creepage distance/clearance between contact and touchable surfaces:
  - 22.6 mm
- Pollution degree:
  - 3
- Insulation resistance:
  - > 10 GΩ

1. only in mated condition with a proper counterpart
2. measured with a proper counterpart
3. according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

**Photovoltaic array harnesses: wiring diagram Typ T**

Interconnection of module tables with complete, pre-assembled harnesses – at the customer’s specification

* a socket LC4-AM 01
* b plug LC4-AM 00 IT
* c stripped cable end
* d socket LC4-CP 31
* e plug LC4-CP 30 IT
* f T-branch
* g array harness with male branch cables (configuration example)
* h array harness with female branch cables (configuration example)

**Designation**

LC4-AT ... details upon request

Optional: delivery on reel with up to 249 T-branches

Approvals under preparation
Connectivity solutions for photovoltaic power systems

**LC4®-CP – Connector Parts without cable**

**LC4® photovoltaic connector, field-attachable, with integrated locking and crimp contact**

**LC4-CP 30**: plug  
**LC4-CP 31**: socket

1. **Temperature range**  
   -40 °C/+85 °C (IEC)  
   -40 °C/+90 °C (UL)  
   (+115 °C upper limit temperature)

2. **Materials**  
   - Insulating body: m-PC, V1 according to UL 94  
   - Contact pin/bush: CuNiSi, tin-plated  
   - Sealing (sockets only): silicone  
   - Cap nut: PA GF, V0 according to UL 94

3. **Mechanical data**  
   - Insertion force\(^1\) ≤ 20 N  
   - Withdrawal force\(^1\) ≥ 10 N  
   - Retaining force of locking latches\(^2\) ≥ 90 N  
   - Matting cycles\(^2\) 50  
   - Tightening torque cap nut 1,4 ± 0,2 Nm  
   - Matting with photovoltaic connectors LC4

4. **Connectable conductors crimp terminal**  
   - Photovoltaic cable, double-insulated\(^4\)
     - Section LC4-CP 3... 2.5: 2.5 mm\(^2\) (AWG 14)  
     - Section LC4-CP 3... 4.0: 4.0 mm\(^2\) (AWG 12)  
     - Section LC4-CP 3... 6.0: 6.0 mm\(^2\) (AWG 10)

5. **Package unit option**  
   - Standard packaging: pre-assembled, contacts in bulk, sorted in plastic bags of 50 pieces, in a cardboard box

6. **Examples of recommended cables on the internet site www.lumberg.com**

**Composition of type designation**

- **Series**: LC4  
- **Type of product**: CP Connector Part  
- **Configuration**:  
  - 30 field-attachable plug  
  - 31 field-attachable socket  
- **Polarity**:  
  - -1 +  
  - -2 –  
- **Locking option**:  
  - IT Internal locking is only unlockable with a Tool, otherwise it can be unlocked manually  
- **Cable section**:  
  - 2.5: 2.5 mm\(^2\) (AWG 14)  
  - 4.0: 4.0 mm\(^2\) (AWG 12)  
  - 6.0: 6.0 mm\(^2\) (AWG 10)  
- **Package unit option**:  
  - VP7 500 pieces (pre-assembled, contacts in bulk)  
  - VP19 500 pieces (one plastic bag per connector, pre-assembled, contacts in bulk)

*\(^a\) marking + on LC4-CP 3...-1, - on LC4-CP 3...-2  
*\(^b\) hexagonal cap nut
Connectivity solutions for photovoltaic power systems

**LC4®-CP – Connector Parts without cable**

**LC4-CP 10**
- LC4 photovoltaic chassis receptacle, with integrated locking and crimp contact, for front mounting
- **LC4-CP 10:** plug
- **LC4-CP 11:** socket

1. **Temperature range**
   - LC4-CP 10: -40 °C/+85 °C (IEC)
   - LC4-CP 10: -40 °C/+90 °C (UL)
   - (+125 °C upper limit temperature)
   - Halogen-free, UV-resistant

2. **Materials**
   - Insulating body: m-PC, V1 according to UL 94
   - Contact pin/bush: CuNiSi, tin-plated
   - Sealing (sockets only): silicone
   - Hexagonal nut: PA GF, HB according to UL 94

3. **Mechanical data**
   - Insertion force: ≤ 20 N
   - Withdrawal force: ≥ 10 N
   - Retaining force of locking latches: ≥ 90 N
   - Mating cycles: 50
   - Tightening torque nut: 0.8–1.1 Nm
   - Mating with photovoltaic connectors LC4
   - Protection degree: IP 68

4. **Electrical data**
   - Contact resistance: ≤ 1 mΩ
   - Rated current (IEC): LC4-CP 1... 2.5 A at T<sub>amb</sub> 85 °C
   - LC4-CP 1... 4.0 and 6.0 A at T<sub>amb</sub> 85 °C
   - Rated current (UL): 35 A at T<sub>amb</sub> 20 °C, all sections
   - Overvoltage category: III (8 kV)
   - Rated voltage: 1000 V DC (IEC)/600 V DC (UL)
   - Creepage and clearance: 28.3 mm
   - Insulation resistance: > 10 GΩ

**Composition of type designation**

- **Series:** LC4
- **Type of product:** CP Connector Part
- **Configuration:** 10 chassis plug, 11 chassis socket
- **Polarity:** -1, -2
- **Locking option:** IT Internal locking is only unlockable with a Tool, otherwise, it can be unlocked manually
- **Cable section:** 2.5 mm² (AWG 14), 4.0 mm² (AWG 12), 6.0 mm² (AWG 10)
- **Package unit option:** 100 pieces (standard, individual parts in bulk), VP19 100 pieces (one plastic bag per connector, individual parts)

**Standard packaging:** individual parts in bulk, sorted in plastic bags of 100 pieces, in a cardboard box
## Connectivity solutions for photovoltaic power systems

**LC4®-CP – Connector Parts without cable**

### LC4-CP 222
**LC4® photovoltaic branch connector**
LC4-CP 222: socket-plug-plug

### LC4-CP 235
**LC4® photovoltaic branch connector**
LC4-CP 235: plug-socket-socket

### Temperature range
-40 °C/+85 °C (IEC)
-40 °C/+90 °C (UL)
(+125 °C upper limit temperature)

### Materials
- Insulating body: m-PC, V1 according to UL 94
- Contact pin/bush: CuNiSi, tin-plated
- Sealing (sockets only): silicone

### Mechanical data
1. **Insertion force** ≤ 20 N
2. **Withdrawal force** ≥ 10 N
3. **Retaining force of locking latches** ≥ 90 N
4. **Mating cycles** 50
5. **Mating with photovoltaic connectors LC4**
6. **Protection degree** IP 68

### Electrical data (at Tamb 20 °C)
1. **Contact resistance** ≤ 1 mΩ
2. **Rated current (IEC)** 30 A at T_{max} 85 °C
3. **Rated current (UL)** 35 A at T_{max} 20 °C
4. **Rated voltage** 1000 V DC (IEC); 600 V DC (UL)
5. **Overvoltage category** III (8 kV)
6. **Material group** IIIa (IEC)/3 (UL) (CTI ≥ 225)
7. **Creepage distance/clearance** between contact and touchable surface 22.3 mm
8. **Insulation resistance** > 10 GΩ

### Composition of type designation
- **Series**: LC4
- **Type of product**: CP Connector Part
- **Configuration**: 222 socket-plug-plug
- **235 plug-socket-socket
- **Polarity**: -1 +
- **-2 –
- **Locking**: IT Internal locking, only unlockable with a Tool
- **Number of ways**: W02 2

### Package unit: 100 pieces in a cardboard box

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*a marking + on LC4-CP 2...-1, - on LC4-CP 2...-2

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*a marking + on LC4-CP 2...-1, - on LC4-CP 2...-2
LC4®-CP – Connector Parts without cable

**LC4-CP 950**

LC4® in-line fuse connector assembly for photovoltaic installations¹, overmolded, plug-plug

1. **Temperature range**
   -40 °C/+85 °C
   (+110 °C upper limit temperature)

2. **Materials**
   - Insulating body/housing: m-PC, V1 according to UL 94
   - Housing: m-PC, V1 according to UL 94
   - Contact pin/bush: CuNiSi, tin-plated
   - Inner contacts: CuNiSi, tin-plated
   - Sealing (sockets only): silicone

3. **Mechanical data**
   - Insertion force² ≤ 20 N
   - Withdrawal force² ≥ 10 N
   - Retaining force of locking latches² ≥ 90 N
   - Mating cycles² 50
   - Mating with photovoltaic connectors LC4
   - Protection degree³ IP 68

4. **Electrical data** (at Tamb 20 °C)
   - Contact resistance ≤ 5 mΩ
   - Rated current and voltage various fuses available, values depending on type of fuse, details upon request
   - Overvoltage categoryⅣ III (8 kV)
   - Material groupⅣ Illa (IEC)/3 (UL) (CTI ≥ 225)
   - Creepage distance/clearance² between contact and touchable surface 28.3 mm
   - Insulation resistance > 10 GΩ
   - according to application class A of IEC 61730-1/UL 1703
   - according to IEC 60529/DIN EN 60529
   - only in mated condition with a proper counterpart
   - IP-X8 requirements under agreement between manufacturer and user
   - according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

**Composition of type designation**

<table>
<thead>
<tr>
<th>Series:</th>
<th>LC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of product:</td>
<td>CP Connector Part</td>
</tr>
<tr>
<td>Configuration:</td>
<td>fuse with connectors 950 plug-plug</td>
</tr>
<tr>
<td>Locking:</td>
<td>Internal locking, only unlockable with a Tool</td>
</tr>
<tr>
<td>Specification of built-in fuse:</td>
<td></td>
</tr>
<tr>
<td>Rated current:</td>
<td></td>
</tr>
<tr>
<td>Rated voltage:</td>
<td></td>
</tr>
</tbody>
</table>

**Designation**

LC4-CP 950 IT FU01 2A 600V
LC4-CP 950 IT FU02 10A 900V

Package unit: 100 pieces in a cardboard box
Connectivity solutions for photovoltaic power systems
LC4®-CP – Connector Parts without cable

LC4®-CP 952
LC4® in-line fuse connector assembly for photovoltaic installations¹, overmolded, plug-socket

1. Temperature range
-40 °C/+85 °C
(+110 °C upper limit temperature)

2. Materials
- Insulating body/housing: m-PC, V1 according to UL 94
- Housing: m-PC, V1 according to UL 94
- Contact pin/bush: CuNiSi, tin-plated
- Inner contacts: CuNiSi, tin-plated
- Sealing (sockets only): silicone

3. Mechanical data
- Insertion force² ≤ 20 N
- Withdrawal force² ≥ 10 N
- Retaining force of locking latches² ≥ 90 N
- Matting cycles² 50
- Matting with photovoltaic connectors LC4
- Protection degree³ IP 68

4. Electrical data (at Tamb 20 °C)
- Contact resistance ≤ 5 mΩ
- Rated current and voltage various fuses available, values depending on type of fuse, details upon request
- Overvoltage category⁴ III (8 kV)
- Material group⁴ IIIa (IEC)/3 (UL) (CTI ≥ 225)
- Creepage distance/clearance² between contact and touchable surface 28.3 mm
- Insulation resistance > 10 GΩ

¹ according to application class A of IEC 61730-1/UL 1703
² measured with a proper counterpart
³ according to IEC 60529/DIN EN 60529 only in mated condition with a proper counterpart
⁴ according to DIN EN 60664/IEC 60664 resp. according to ANSI/UL 746A

Designation
LC4-CP 952 IT FU01 2A 600V
LC4-CP 952 IT FU02 10A 900V

Package unit: 100 pieces in a cardboard box

Composition of type designation

| Series: | LC4 |
| Type of product | CP Connector Part |
| Configuration | fuse with connectors |
| | 950 plug-plug |
| | 952 plug-socket |
| Locking | IT Internal locking, only unlockable with a Tool |
| Specification of built-in fuse | |
| Rated current | |
| Rated voltage | |
LC4-CP 970 IT

LC4® in-line diode connector assembly for photovoltaic installations, overmolded, plug-plug

1. Temperature range
   -40 °C/+85 °C
   (+110 °C upper limit temperature)

2. Materials
   - Insulating body/housing: m-PC, V1 according to UL 94
   - Housing: m-PC, V1 according to UL 94
   - Contact pin/bush: CuNiSi, tin-plated
   - Inner contacts: CuNiSi, tin-plated
   - Sealing (sockets only): silicone

3. Mechanical data
   - Insertion force: ≤ 20 N
   - Withdrawal force: ≥ 10 N
   - Retaining force of locking latches: ≥ 90 N
   - Mating cycles: 50
   - Mating with photovoltaic connectors LC4
   - Protection degree: IP 68

4. Electrical data (at Tamb 20 °C)
   - Contact resistance: ≤ 5 mΩ
   - Rated current and voltage: various diodes available, values depending on type of diode, details upon request
   - Overvoltage category: III (8 kV)
   - Material group: Illa (IEC/3 (UL) (CTI ≥ 225)
   - Creepage distance/clearance: 28.3 mm
   - Insulation resistance: > 10 GΩ

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**Composition of type designation**

<table>
<thead>
<tr>
<th>Series</th>
<th>LC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of product</td>
<td>CP Connector Part</td>
</tr>
<tr>
<td>Configuration</td>
<td>diode with connectors</td>
</tr>
<tr>
<td></td>
<td>970 plug-plug</td>
</tr>
<tr>
<td>Locking</td>
<td>IT Internal locking, only unlockable with a Tool</td>
</tr>
<tr>
<td>Specification of built-in diode</td>
<td></td>
</tr>
<tr>
<td>Rated current</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td></td>
</tr>
</tbody>
</table>

**Packaging**

- **LC4-CP 970 IT D02 4A 1000V**
- Package unit: 100 pieces in a cardboard box

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*a embossment identifying the cathode side

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Connectivity solutions for photovoltaic power systems

LC4®-CP – Connector Parts without cable

LC4® in-line diode connector assembly for photovoltaic installations

1. Temperature range
   -40 °C/+85 °C
   (+110 °C upper limit temperature)

2. Materials
   - Insulating body/housing: m-PC, V1 according to UL 94
   - Housing: m-PC, V1 according to UL 94
   - Contact pin/bush: CuNiSi, tin-plated
   - Inner contacts: CuNiSi, tin-plated
   - Sealing (sockets only): silicone

3. Mechanical data
   - Insertion force: ≤ 20 N
   - Withdrawal force: ≥ 10 N
   - Retaining force of locking latches: ≥ 90 N
   - Matting cycles: 50
   - Matting with photovoltaic connectors LC4
   - Protection degree: IP 68

4. Electrical data (at Tamb 20 °C)
   - Contact resistance: ≤ 5 mΩ
   - Rated current and voltage: various diodes available, values depending on type of diode, details upon request
   - Overvoltage category: III (8 kV)
   - Material group: Illa (IEC)/3 (UL) (CTI ≥ 225)
   - Creepage distance/clearance: between contact and touchable surface 28.3 mm
   - Insulation resistance: > 10 GΩ

Designation

LC4-CP 972 IT D02 4A 1000V

Package unit: 100 pieces in a cardboard box

Composition of type designation

Series: LC4
Type of product: CP Connector Part
Configuration: diode with connectors
970 plug-plug
972 plug-socket
Locking: IT Internal locking, only unlockable with a Tool
Specification of built-in diode
Rated current
Rated voltage

LC4-CP 972 IT Dxx xxA xxxxxV

*a embossment identifying the cathode side
Connectivity solutions for photovoltaic power systems

**LC4®-CX – Connector auxiliaries**

**LC4-CX 91**
Protective cap for LC4® photovoltaic connectors
LC4-CX 91: for sockets
LC4-CX 92: for plugs

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC4-CX 91</td>
<td>for sockets</td>
</tr>
<tr>
<td>LC4-CX 92</td>
<td>for plugs</td>
</tr>
</tbody>
</table>

Package unit: 100 pieces in a cardboard box

**LC4-CX 93**
Unlocking tool for LC4® photovoltaic connectors IT, also wrench for field-attachable connectors and chassis receptacles LC4-CP

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC4-CX 93</td>
<td>unlocking tool, wrench</td>
</tr>
</tbody>
</table>

**LC4-CX CZK48**
Manual crimp tool for termination of LC4® photovoltaic connectors with crimp contacts, with contact positioner

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC4-CX CZK48</td>
<td>crimp tool</td>
</tr>
</tbody>
</table>

1. **Materials**
   - Cap: PPE/PS
   - Sealing: silicone

2. **Designation Description**
   - LC4-CX 91: for sockets
   - LC4-CX 92: for plugs
   - LC4-CX 93: unlocking tool, wrench

3. **Range of applications**
   - Photovoltaic connectors: LC4-CP 1..., LC4-CP 3...
   - Connectable conductors: crimp terminal
   - Photovoltaic cable, double-insulated
   - Section: 2.5 mm² (AWG 14), 4.0 mm² (AWG 12), 6.0 mm² (AWG 10)

4. **Features**
   - Application: low-volume production, installation, repair
   - Stroke capacity: ca. 240/h

5. **Dimensions**
   - Dimensions (H x W x D): 50 mm x 95 mm x 205 mm
   - Weight: ca. 0.7 kg

6. **Notes**
   - Wire construction preferably according to IEC 60228 class 5, otherwise crimp connection must be tested
Important notice

Lumberg products can be used according to the characteristics specified in the data sheet. Beyond that, all applicable regulations, standards and directives for the use of these products and for the intended application must be obeyed by the user. It is the user’s responsibility to ensure the appropriateness of a chosen Lumberg product for the intended application.

Connector systems with crimp connection and high protection degrees require suitable cables and accurate processing. In order to assure safe function of the connectors they must be processed with Lumberg harnessing equipment according to Lumberg harnessing instructions, using cables approved by Lumberg. On the Internet (www.lumberg.com) a choice of “Approved cables” is available for every type of connector.

Due to continuous development of Lumberg products, serving technical progress, the descriptions and data provided hereafter are for information only and subject to change without notice.

We will be pleased to discuss detailed requirements.