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宁波市杭州湾新区滨海四路（兴慈五路与兴慈六路中间）
浙江创源光伏科技有限公司
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Subject: **Procedure And/Or Report Material**

The following material resulting from the investigation under the above numbers is enclosed.

Issue

Date	Vol	Sec	Pages	Revised Date
2011/06/08	1	1	Revised Description Page(s) 2,4,5,6,7,8	2011/11/30
2011/06/08	1	1	New Test Record 2	2011/11/30

Inspections at your plant will be conducted under the supervision of LING JIANYI, UL INSPECTION CENTER HANGZHOU, CHINA NAT'L IMPORT & EXP COM INSP CORP, YAOJIANG DEVELOPING CENTER, 9TH FL, 305 HUANCHENG NORTH RD, HANGZHOU, ZHEJIANG, China, 310012., PHONE: 571-8578-6148, FAX: +86-571-8578-6199, EMAIL: HZULIC@ZGB.COM.CN

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

Please review this material and report any inaccuracies to UL's Customer Service Professionals. Contact information for all of UL's global offices can be found at http://www.ul.com/global/eng/pages/corporate/contactus.

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SUZ File

UL INSPECTION CENTER 325

RATINGS (Cont'd.):

Model No.	Type (M/F) (P/N)	Maximum Voltage (V dc)	Maximum Current (A dc)	Conductor (AWG, Cu, Stranding)	# of Strands / Dia. of conductor, mm	Outside Wire Insulation Diameter, mm
PV-CY01L	M/F	600	20	12	48/0.3	6.3 - 6.4
		1000	**20**	**12**	**48/0.3**	**7.1±0.2**

Current Rating – The ampacity rating of these devices are limited based on the wire size used per the National Electrical Code (NEC) requirements for Free Air applications considering the correction factor.

Mating Correlation -

Male Model No.	Mated with Female Model number
PV-CY01L	PV-CY01L

Operating Temperature – 85°C

Wire Strip length – 7.5 mm

Tooling –

Connector Model Number	Wire type and Range, mm2 (AWG)	Crimp tool identification			Number of crimps
		Manufacturer name (model)	Upper die number	Lower die number	
PV-CY01L	PV wire, 12 AWG	Shanghai Zhengang Machinery Co Ltd, model JB04-1	N/A	N/A	1

CONSTRUCTION DETAILS:

Spacings – Minimum acceptable spacings at wiring terminals is as follows:

Potential involved, V	Through air		Over surface	
	in.	(mm)	in.	(mm)
301 - 600	1/4	6.4	3/8	9.5
601 - 1000	**3/8**	**9.5**	**1/2**	**12.7**

MARKINGS:

The connector is marked in accordance to OOI 6703, Section 10. The connector body is marked as follows:

a) The Listee's name, trademark.
b) The model number.
c) The connector **may be** identified with the following marking statements:

"+"	and	"-" or

Other markings are included on the smallest unit container:

d) "Do Not Disconnect Under Load."
e) Rated voltage.
f) Rated current.

A permanent marking shall be molded, die-stamped, paint-stenciled, stamped, or etched metal that is permanently secured, or indelibly stamped on a pressure-sensitive label secured by adhesive that complies with the Standard for Marking and Labeling Systems, UL 969. Ordinary usage, handling, storage, and the like of the unit shall be considered in determining whether a marking is permanent.

MARKINGS (Cont'd.):

The Installation/Assembly Instructions - One manual provided with each carton (see ILL.1 for details). The installation instructions must contain the following markings in addition to the marking requirements above:

a) Rated Voltage.

b) Operating Temperature Range.

*

c) "Do Not Disconnect Under Load: PV plug connections must not be disconnected while under load. They can be placed in a no load state by switching off the DC/AC converter or breaking the AC circuit".

Male Connector Model No. – PV-CY01L
Fig. 1

General - The general design, shape, and arrangement shall be as illustrated except where variations are specifically described.

1. Overall dimensions – 46.8 mm L x 19.2 mm W outside diameter. See ILL-2 for further details.

*2. Connector Male Housing – R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black **(Rated** V-0, RTI **min=105°C).**

Cat. No.	Overall Height, mm	Overall Width, mm	Minimum Thickness (in contact with live parts), mm	Minimum Thickness, mm	ILL. No.
PV-CY01L	46.8	19.2	1	1	2

3. Pin Crimp Connector (Male) – Tin plated copper, max of 0.001% zinc. See illustration as tabulated below for dimensional details.

Wire Size	Overall length, mm	Overall thickness, mm	Crimp Barrel Height, mm	Crimp Barrel width, mm	ILL. No.
12 AWG	30	0.4	5.85	4.7	3

4. Electrical Connector lock – Stainless steel. The lock is slid over the pin connector, item 3, to retain the Pin Crimp Connector, item 3, in the housing. See ILL. 4 for dimensional details.

5. Housing Locking Nut - R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black. Size M15, provided with ribs for gripping. Used with item 2 above to complete the housing assembly.

Wire Size	Conductor Opening, Diameter, mm	Overall Length, mm	Overall Width	Minimum Thickness (in contact with live parts)	Minimum Thickness, Elsewhere, mm	ILL. No.
12 AWG	7.3	19	19.3	Not in contact with live part	2	5

6. Pinch Ring – R/C (QMFZ2), type FR370, by ASAHI KASEI CHEMICALS CORP (E48285), color black. Used with item 7 below to provide the cable strain relief. Minimum 1 mm thick. See ILL. 6 for dimensional details.

7. Waterproof Ring (Seal Gland) – R/C (JMLU2), type E02-60 by Zhongshan Golden Rubber Seal Product Co Ltd (MH28674). Used with item 6 above as the cable weather seal and cable strain relief by sliding over the outer jacket of the cable See illustration as tabulated below for dimensional details.

Wire Size	Minimum Thickness, mm	Inner Diameter (ID), mm	ILL. No.
12 AWG	0.9	6.36	7

8. Wire – Listed, Type PV wire, sunlight resistant, rated minimum 90°C, 600 V. **See Ratings section for details.**

*

Female Connector Model No. – PV-CY01L
Fig. 2

General - The general design, shape, and arrangement shall be as illustrated except where variations are specifically described.

1. Overall dimensions – 43.3 mm L x 19.2 mm W outside diameter. See ILL-8 for further details.

*2. Connector female Housing – R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black **(Rated** V-0, RTI **min=105°C).**

Cat. No.	Overall Height, mm	Overall Width, mm	Minimum Thickness (in contact with live parts), mm	Minimum Thickness, mm	ILL. No.
PV-CY01L	43.3	19.2	0.8	0.8	8

3. Pin Crimp Connector (Female) – Tin plated copper, max of 0.001% zinc. See illustration as tabulated below for dimensional details.

Wire Size	Overall length, mm	Overall thickness, mm	Crimp Barrel Height, mm	Crimp Barrel width, mm	ILL. No.
12 AWG	35.7	0.4	5.85	6	9

4. Contact Pressure Spring – Silver plated copper. Used inside the female crimp connector, item 3 above, to enhance the electrical conductivity and to secure the mating connector in place. See Ill. 10 for dimensional details.

5. Electrical Connector lock – Same as Fig. 1, item 4 above.

6. Housing Locking Nut - Same as Fig. 1, item 5 above.

7. Pinch Ring – Same as Fig. 1, item 6 above.

8. Waterproof Ring (Seal Gland) – Same as Fig. 1, item 7 above.

9. O-Ring – R/C (JMLU2), type E02-60 by Zhongshan Golden Rubber Seal Product Co Ltd (MH28674), 1.7 mm thick, 9.8 mm OD. Used on female connector to weather seal the connector. See Ill. 11 for physical dimension.

10. Wire – Same as Fig. 1, item 8 above.

RATINGS (Cont'd.):

Model No.	Type (M/F) (P/N)	Maximum Voltage (V dc)	Maximum Current (A dc)	Conductor (AWG, Cu, Stranding)	# of Strands / Dia. of conductor, mm	Outside Wire Insulation Diameter, mm
PV-CY01L	M/F	600	20	12	48/0.3	6.3 - 6.4
		1000	**20**	**12**	**48/0.3**	**7.1±0.2**

Current Rating – The ampacity rating of these devices are limited based on the wire size used per the National Electrical Code (NEC) requirements for Free Air applications considering the correction factor.

Mating Correlation -

Male Model No.	Mated with Female Model number
PV-CY01L	PV-CY01L

Operating Temperature – 85°C

Wire Strip length – 7.5 mm

Tooling –

Connector Model Number	Wire type and Range, mm2 (AWG)	Crimp tool identification			Number of crimps
		Manufacturer name (model)	Upper die number	Lower die number	
PV-CY01L	PV wire, 12 AWG	Shanghai Zhengang Machinery Co Ltd, model JB04-1	N/A	N/A	1

CONSTRUCTION DETAILS:

Spacings – Minimum acceptable spacings at wiring terminals is as follows:

Potential involved, V	Through air		Over surface	
	in.	(mm)	in.	(mm)
301 - 600	1/4	6.4	3/8	9.5
601 - 1000	**3/8**	**9.5**	**1/2**	**12.7**

MARKINGS:

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a) The Listee's name, trademark.
b) The model number.
c) The connector **may be** identified with the following marking statements:

"+"	and	"-" or

Other markings are included on the smallest unit container:

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e) Rated voltage.
f) Rated current.

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MARKINGS (Cont'd.):

The Installation/Assembly Instructions - One manual provided with each carton (see ILL.1 for details). The installation instructions must contain the following markings in addition to the marking requirements above:

a) Rated Voltage.

b) Operating Temperature Range.

*

c) "Do Not Disconnect Under Load: PV plug connections must not be disconnected while under load. They can be placed in a no load state by switching off the DC/AC converter or breaking the AC circuit".

Male Connector Model No. – PV-CY01L
Fig. 1

General - The general design, shape, and arrangement shall be as illustrated except where variations are specifically described.

1. Overall dimensions – 46.8 mm L x 19.2 mm W outside diameter. See ILL-2 for further details.

*2. Connector Male Housing – R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black **(Rated** V-0, RTI **min=105°C).**

Cat. No.	Overall Height, mm	Overall Width, mm	Minimum Thickness (in contact with live parts), mm	Minimum Thickness, mm	ILL. No.
PV-CY01L	46.8	19.2	1	1	2

3. Pin Crimp Connector (Male) – Tin plated copper, max of 0.001% zinc. See illustration as tabulated below for dimensional details.

Wire Size	Overall length, mm	Overall thickness, mm	Crimp Barrel Height, mm	Crimp Barrel width, mm	ILL. No.
12 AWG	30	0.4	5.85	4.7	3

4. Electrical Connector lock – Stainless steel. The lock is slid over the pin connector, item 3, to retain the Pin Crimp Connector, item 3, in the housing. See ILL. 4 for dimensional details.

5. Housing Locking Nut - R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black. Size M15, provided with ribs for gripping. Used with item 2 above to complete the housing assembly.

Wire Size	Conductor Opening, Diameter, mm	Overall Length, mm	Overall Width	Minimum Thickness (in contact with live parts)	Minimum Thickness, Elsewhere, mm	ILL. No.
12 AWG	7.3	19	19.3	Not in contact with live part	2	5

6. Pinch Ring – R/C (QMFZ2), type FR370, by ASAHI KASEI CHEMICALS CORP (E48285), color black. Used with item 7 below to provide the cable strain relief. Minimum 1 mm thick. See ILL. 6 for dimensional details.

7. Waterproof Ring (Seal Gland) – R/C (JMLU2), type E02-60 by Zhongshan Golden Rubber Seal Product Co Ltd (MH28674). Used with item 6 above as the cable weather seal and cable strain relief by sliding over the outer jacket of the cable See illustration as tabulated below for dimensional details.

Wire Size	Minimum Thickness, mm	Inner Diameter (ID), mm	ILL. No.
12 AWG	0.9	6.36	7

8. Wire – Listed, Type PV wire, sunlight resistant, rated minimum 90°C, 600 V. **See Ratings section for details.**

*

Female Connector Model No. – PV-CY01L
Fig. 2

General - The general design, shape, and arrangement shall be as illustrated except where variations are specifically described.

1. Overall dimensions – 43.3 mm L x 19.2 mm W outside diameter. See ILL-8 for further details.

*2. Connector female Housing – R/C (QMFZ2), type 540Z (f1) by ASAHI KASEI CHEMICALS CORP XYRON POLYMER (E82268), color black **(Rated** V-0, RTI **min=105°C).**

Cat. No.	Overall Height, mm	Overall Width, mm	Minimum Thickness (in contact with live parts), mm	Minimum Thickness, mm	ILL. No.
PV-CY01L	43.3	19.2	0.8	0.8	8

3. Pin Crimp Connector (Female) – Tin plated copper, max of 0.001% zinc. See illustration as tabulated below for dimensional details.

Wire Size	Overall length, mm	Overall thickness, mm	Crimp Barrel Height, mm	Crimp Barrel width, mm	ILL. No.
12 AWG	35.7	0.4	5.85	6	9

4. Contact Pressure Spring – Silver plated copper. Used inside the female crimp connector, item 3 above, to enhance the electrical conductivity and to secure the mating connector in place. See Ill. 10 for dimensional details.

5. Electrical Connector lock – Same as Fig. 1, item 4 above.

6. Housing Locking Nut - Same as Fig. 1, item 5 above.

7. Pinch Ring – Same as Fig. 1, item 6 above.

8. Waterproof Ring (Seal Gland) – Same as Fig. 1, item 7 above.

9. O-Ring – R/C (JMLU2), type E02-60 by Zhongshan Golden Rubber Seal Product Co Ltd (MH28674), 1.7 mm thick, 9.8 mm OD. Used on female connector to weather seal the connector. See Ill. 11 for physical dimension.

10. Wire – Same as Fig. 1, item 8 above.

TEST RECORD NO. 2

SAMPLES:

Samples of the PV connector as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

Cat. No. PV-CY01L (male and female), rated 20A, 1000Vdc, for use with PV wire 12 AWG, Cu, with 48 strands and insulation OD of 6.9-7.3 mm.

GENERAL:

Test results relate only to the items tested.

Due to similarity of R/C (QIJQ2) Model PV-CY01L, rated 600 Vdc to these Recognized devices of this manufacturer, only the following tests were considered necessary. The only difference in construction is the assembly to a 12 AWG PV cable with a larger OD, rated 1000Vdc.

Since the measured minimum creepage spacing for this PV connector is larger than 16 mm, the Inclined Plane Tracking Test is not considered necessary.

Tests were considered covered as follows:

Test	File Reference	Report Date	Test Record No.
Static Heating Sequence	E342638	2011-06-08	1

The following tests were conducted.

Leakage Current Test – As Received:	UL1703 Sec. 21
Dielectric Voltage Withstand Test - As Received:	UL1703 Sec. 26
Wet Insulation Resistance Test – As Received:	UL1703 Sec. 27
Water Spray Test:	UL1703 Sec. 33
Dielectric Voltage Withstand Test - Following Water Spray Test:	UL1703 Sec. 26
Leakage Current Test - Following Water Spray Test:	UL1703 Sec. 21
Temperature Cycling Test:	UL1703 Sec. 35
Dielectric Voltage Withstand Test Following Temperature Cycling Test. Conducted At 50°C Or Higher:	UL1703 Sec. 26

Dielectric Voltage Withstand Test Following Temperature Cycling Test - Conducted At Room Temperature:	UL1703 Sec. 26
Leakage Current Test Following Temperature Cycling Test:	UL1703 Sec. 21
Wet Insulation Resistance Test Following Temperature Cycling Test:	UL1703 Sec. 27
Humidity Cycling Test:	UL1703 Sec. 36
Dielectric Voltage Withstand Test Following Humidity Cycling Test:	UL1703 Sec. 26
Leakage Current Test Following Humidity Cycling Test:	UL1703 Sec. 21
Wet Insulation Resistance Test Following Humidity Cycling Test:	UL1703 Sec. 27
Strain Relief Test:	UL1703 Sec. 22
Impact Test:	UL1703 Sec. 30
Low Temperature Impact Test:	UL1703 Sec. 30
Mold Stress-Relief Distortion Test:	UL 746C, Sec. 29
Crush Resistance Test:	UL 746C, Sec. 21
Dielectric Withstand Test:	UL 486A-486B, 7.5

TEST RECORD SUMMARY:

The results of this investigation, including the construction review and testing, indicate that the products evaluated comply with the applicable requirements in Subject 6703 Outline for Connectors for Use in Photovoltaic Systems, Issue No. 2, dated September 15,2011 and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Test Record by: Reviewed by:

Brian Yang Andrew Bonlender

Associated Project Engineer Project Engineer