

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20190710-E349950  
**Report Reference** E349950-20120510  
**Issue Date** 2019-JULY-10

**Issued to:** TYCO Electronics Corp  
2901 Fulling Mill Rd  
Middletown PA 17057

**This certificate confirms that  
representative samples of**

Component - Electric Vehicle Plugs, Receptacles And  
Couplers

See Addendum Page

Have been investigated by UL in accordance with the  
component requirements in the Standard(s) indicated on  
this Certificate. UL Recognized components are incomplete  
in certain constructional features or restricted in  
performance capabilities and are intended for installation in  
complete equipment submitted for investigation to UL LLC.

**Standard(s) for Safety:**

UL 2251 and CSA C22.2 No. 282-13 Plugs, Receptacles  
and Couplers for Electric Vehicles

**Additional Information:**

See the UL Online Certifications Directory at  
<https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Recognized Component Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified  
and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

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contact a local UL Customer Service Representative at <http://ul.com/about/locations/>



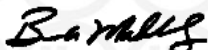
# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20190710-E349950  
**Report Reference** E349950-20120510  
**Issue Date** 2019-JULY-10

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

**Models:**

USR, CNR – Component Connector Assembly, Models 2202164-1, 2220001-1, 2220001-2, 2220001-3, 2220001-4, 2220002-1, 2220002-2, 2220002-3, 2220002-4, 2220003-1, 2220003-2, 2220003-3, 2220003-4, 2220004-1, 2220004-2, 2220004-3, 2220004-4, 2220005-1, 2220005-2, 2220005-3, 2220005-4, 2220006-1, 2220006-2, 2220006-3, 2220006-4, 2220014-1, 2220623-1, 2220623-2, 2220623-3, 2220623-4, 2220624-1, 2220624-2, 2220624-3, 2220624-4, 2220625-1, 2220625-2, 2220625-3, 2220625-4, 2220813-1, 2220813-2, 2220813-3, 2220813-4, 2220816-1, 2220816-2, 2220816-3, 2220816-4, 2220819-1, 2220820-1, 2218313-1, 2218313-2, 2220817-1, 2220817-2, 2220817-3, 2220817-4, 2220818-1, 2220818-2, 2220818-3, 2220818-4, 2220814-1, 2220814-2, 2220814-3, 2220814-4, 2220815-1, 2220815-2, 2220815-3, 2220815-4, 2220013-1, 2220017-1, 2220018-2, 2220964-2, 2220983-2, 2220984-2, 2220985-2, 2220985-3, 2220985-4, 2231120-3, 2231120-5, 2348997-X, 2355127-X, 2355128-X, 2355129-X, 2829096-1, 2267185-1, 2267185-2, 2267185-3, 2829186-1, 2829187-1, 2829188-1, 2829188-4, 2829189-1, 2829190-1, 2829191-1, 2829192-1, 2829193-1, 2829194-1, 2829195-2, 2829195-3, 2829195-4, 2829198-1, 2829199-1, 2829200-1, 2267220-1, 2267220-2, 2267220-3, 2267220-4, 2829188-2, 2267221-1, 2267221-2, 2267221-3, 2267221-4, 2829198-2, 2829198-3, 2829303-1, 2829302-1, 2267185-4, 2829458-2, 2829606-1, 2829673-1.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

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## DESCRIPTION

## PRODUCT COVERED:

USR, CNR - Component Connector Assembly, Models 2202164-1, 2220001-1, 2220001-2, 2220001-3, 2220001-4, 2220002-1, 2220002-2, 2220002-3, 2220002-4, 2220003-1, 2220003-2, 2220003-3, 2220003-4, 2220004-1, 2220004-2, 2220004-3, 2220004-4, 2220005-1, 2220005-2, 2220005-3, 2220005-4, 2220006-1, 2220006-2, 2220006-3, 2220006-4, 2220014-1, 2220623-1, 2220623-2, 2220623-3, 2220623-4, 2220624-1, 2220624-2, 2220624-3, 2220624-4, 2220625-1, 2220625-2, 2220625-3, 2220625-4, 2220813-1, 2220813-2, 2220813-3, 2220813-4, 2220816-1, 2220816-2, 2220816-3, 2220816-4, 2220819-1, 2220820-1, 2218313-1, 2218313-2, 2220817-1, 2220817-2, 2220817-3, 2220817-4, 2220818-1, 2220818-2, 2220818-3, 2220818-4, 2220814-1, 2220814-2, 2220814-3, 2220814-4, 2220815-1, 2220815-2, 2220815-3, 2220815-4, 2220013-1, 2220017-1, 2220018-2, 2220964-2, 2220983-2, 2220984-2, 2220985-2, 2220985-3, 2220985-4, 2231120-3, 2231120-5, **2348997-X**, **2355127-X**, **2355128-X**, **2355129-X**, 2829096-1, 2267185-1, 2267185-2, 2267185-3, 2829186-1, 2829187-1, 2829188-1, 2829188-4, 2829189-1, 2829190-1, 2829191-1, 2829192-1, 2829193-1, 2829194-1, 2829195-2, 2829195-3, 2829195-4, 2829198-1, 2829199-1, 2829200-1, 2267220-1, 2267220-2, 2267220-3, 2267220-4, 2829188-2, 2267221-1, 2267221-2, 2267221-3, 2267221-4, 2829198-2, 2829198-3, 2829303-1, 2829302-1, 2267185-4, 2829458-2, 2829606-1, 2829673-1.

## GENERAL

These devices are electric vehicle assemblies, consisting of an EV connector, a length of UL Listed Cable, and a socket contact on the infrastructure side. The EV connector is SAE J1772 compliant, multi-pole grounding type devices employing crimp-type contacts for power, control pilot and communications (optional) circuits. They are intended to supply AC power to an electric vehicle for the purpose of charging the vehicle batteries.

The connectors are provided with enclosures rated Type 3R in the mated position and may be used either indoors or outdoors.

## RATINGS:

Assembly	Housing Assembly Color (for info. only)	Current and Voltage Rating		Control Pilot Contact Rating	Cable Sizes	Cable Length (ft)
2202164-1, 2220014-1	Black or White	32A	240VAC	2A, 30VDC	3/10 + 2/20 AWG Type EVE	20
2829186-1	White					20
2829187-1						26
2829189-1	Blue					26
2220001-1	Gray	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220001-2						15
2220001-3						20
2220001-4						25
2220002-1	Black	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220002-2						15
2220002-3						20
2220002-4, 2220013-1, 2220017-1, 2220018-2, 2220964-2, 2220983-2, 2220984-2, 2220985-2, 2220985-3, 2220985-4, 2231120-3, 2231120-5, 2829096-1						25
2829188-1						21
<b>2829188-4</b>						<b>19</b>
2829190-1						22
2829121-1						26
2829192-1						25
2829193-1						25
2829194-1						25
2829195-2						25
2829195-3						21
2829195-4						19
2829198-1						20
2829458-2						
2829673-1						25
2829606-1	Orange					
2829199-1	Gray					22
2829200-1						16

**Continued:**

Assembly	Housing Assembly Color (for info. only)	Current and Voltage Rating		Control Pilot Contact Rating	Cable Sizes	Cable Length (ft)
2267220-1	Gray	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2267220-						15
2267220-						20
2267220-						25
2829188-2						33
2267221-1	Black	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2267221-2						15
2267221-3						20
2267221-4						25
2829198-2						21
2829198-3						25
2829303-1						25
2829302-1						15
2220003-1	White	*32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220003-2						15
2220003-3						20
2220003-4						25

Continued:

Assembly	Housing Assembly Color (for info. only)	Current and Voltage Rating		Control Pilot Contact Rating	Cable Sizes	Cable Length (ft)
2220004-1	Gray	*32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220004-2						15
2220004-3						20
2220004-4						25
2220005-1	Black	*32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220005-2						15
2220005-3						20
2220005-4						25
2220006-1	White	*32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220006-2						15
2220006-3						20
2220006-4						25
2220623-1	Gray	*20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220623-2						15
2220623-3						20
2220623-4						25
2220624-1	Black	*20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220624-2						15
2220624-3						20
2220624-4						25
2220625-1	White	*20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220625-2						15
2220625-3						20
2220625-4						25
2220813-1	Gray	*20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220813-2						15
2220813-3						20
2220813-4						25
2220814-1	Black	*20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220814-2						15
2220814-3						20
2220814-4						25

Continued:

Assembly	Housing Assembly Color (for info. only)	Current And Voltage Rating		Control Pilot Contact Rating	Cable Sizes	Cable Length (ft)
2220815-1	White	20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	10
2220815-2						15
2220815-3						20
2220815-4						25
2220816-1	Gray	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220816-2						15
2220816-3						20
2220816-4						25
2267185-2						15
2220817-1	Black	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220817-2						15
2220817-3						20
2220817-4						25
2267185-1						15
2220818-1	White	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	10
2220818-2						15
2220818-3						20
2220818-4						25
2267185-3						15
2267185-4						25
2218313-1	White Gray	20A	240VAC	2A, 30VDC	3/14 + 1/20 AWG Type EVJE	18.7
2218313-2						3/14 + 1/18 AWG Type EVJE
2220819-1	White	32A	240VAC	2A, 30VDC	3/10 + 1/20 AWG Type EVE	20
2220820-1	Blue					
<b>2348997-X</b>	<b>Black</b>	<b>40A</b>	<b>240VAC</b>	<b>2A,30VDC</b>	<b>3/10 + 1/20 AWG type EVE</b>	<b>6 ft to 36 ft</b>
<b>2355127-X</b>	<b>Gray</b>					
<b>2355128-X</b>	<b>White</b>					
<b>2355129-X</b>	<b>LT Gray</b>					

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE USE):

Use - For use only with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

USR indicates investigation to United States Standards, UL 2251.

CNR- Indicates the devices were tested to the requirements of CSA C22.2 No. 282-13, Plugs, Receptacles and Couplers for Electric Vehicles.

Conditions of Acceptability - In order to be judged acceptable as a component of electric vehicle charging equipment, the following conditions should be met.

1. Interruption of Current - This device has not been tested for interrupting the flow of current by connecting or disconnecting the mating connector. If the device will be routinely connected or disconnected under load in the end-use application, tests to evaluate the device's ability to withstand the resulting electrical arc should be considered. The number of make-and-break cycles, the supply voltage and power factor, and the current carried by each pole of the device in the test are to be developed based upon the conditions that will be presenting in the end-use. This device should be used where the power contacts will not interrupt current.
2. Pilot Contacts - This device has been tested for 110 percent make and break cycles of interrupting a current of 30 A at 33 V dc by connecting and disconnecting the mating connector in accordance with the Overload and Endurance test sequence, for Heavy duty rating, Codes A and N, as specified in UL 508, Standard for Industrial Control Equipment. The devices should be used with equipment employing a control pilot circuit, having a current interrupting rating not less than the vehicle inlet or vehicle connector rating. The control pilot circuit shall function to insure that the interrupting device opens the power circuit before the power contacts break.
3. Insulating Materials - The insulating materials used in this device has been investigated for their Relative Thermal Index (Electrical and Mechanical with Impact), Flame Rating, Hot Wire Ignition, High Current Arc Resistance to Ignition and Comparative Tracking Index, and comply with the requirements for direct support of live parts in UL 746C, "Polymeric Materials - Use in Electrical Equipment Evaluations." The maximum operating temperature for any connector shall not exceed the rated operating temperature that is based on the Relative Thermal Index of the material, 120°C. Materials used for the enclosure of a device comply with the requirements for exposure to outdoor weather conditions (ultraviolet light exposure, water exposure and immersion) in UL 746C.



4. Terminations - The wiring terminations of the vehicle connector employ crimp-type terminations that have been subjected to the Conductor Secureness and Pullout tests from UL 2251, using crimp tool HTS - Basis Hand Tool P/N 1-1105850-8. The Die used for power and grounding contacts is P/N 2-1105870-8 HTS. The Die used for the signal contact is P/N 1-1105852-8 HTS. Refer to Ills. 30-32 for additional tooling. Tooling No. 400BHD using die 41DA-10N by Pico used for alternate constructed contact PNs 2120507 and 2120508 shown in Ill. 7A is as shown in Ill. 40. The use of any other tool shall be an end-product consideration.
5. Configuration and Mating - This connector employs polarized contact slots but the terminals are not identified.
6. Outdoor Use - The connector mated with SAEJ1772 inlet has been evaluated for an enclosure rating of Type 3R in accordance with UL 2251.
- \*7. **The following models have been evaluated for Short Circuit Test at 5000A with the following overcurrent protection. If used with another type of protection in the end product, testing should be repeated with the specific protection device used in the end product.**

Model (s)	Non-Time-Delay Fuse	Branch Circuit Breaker Rating
2348997-X, 2348997-X, 2355127-X, 2355128-X, 2355129-X	50A	--

8. The connector has been evaluated to the Vehicle Driveover Test in accordance with IEC 62196-1 Edition 2.
9. The suitability of the connectors employed on the cable free end of the connector Models 2220013-1, 2220017-1, 2220018-2, 2220964-2, 2220983-2, 2220984-2, 2220985-2, 2220985-3, 2220985-4, 2231120-3, 2231120-5, 2829096-1, 2829458-2, 2829606-1, 2829673-1, 2218313-1 and 2218313-2 shall be determined in the end product.