

## SOLARLOK PV4 Connector

### 1. Reference Documents

- EN 50521: Connectors for photovoltaic systems - Safety requirements and tests
- EN 60512-12: Connectors for electronic equipment -- Test and measurements
- EN 60529: Degrees of Protection Provided by Enclosures (IP Code)
- EN 60664-1: Insulation coordination for equipment within low-voltage systems (Part 1)
- EN 60695: Fire hazard testing (Part 2-10, Part 11-10,)
- Safety class II

### 2. Test Requirements and Procedures Summary

Group A-Mechanical test (are for themselves separate tests)				
No.	Designation	Specimen	Test conditions / Specimens	Requirements
A.1	Durability of marking	1 Pair Connector include label, sticker (or similar)	Visual examination with the naked eye Per 5.2 of EN 50521	a) Manufacture name, trademark or mark of origin; l) Symbol "Do not disconnect under load"; m) Polarity of connector, if applicable The marking shall be indelible and easily legible.
			For the test piston, size 1 shall be used and the test liquid shall be water. A force of 5N shall be applied for a duration of 10 cycles according to IEC 60068-2-70 Per 6.3.2 of EN 50521	Marking shall be still readable
A.2	Terminations and connection methods	1 Pair Contact with crimping cable	Pull out force test of crimped connections Per 5.5 of EN 50521	The Min. values of the pull out force shall be 310N for 4mm <sup>2</sup> and 360N for 6mm <sup>2</sup> See Table 1 of EN60352-2
A.3	Contact retention force in insert	1 Pair Connector	Shall withstand for a force of 125N for 1 min applied in any direction permitted by the construction, either directly or through any wire or cable Per 5.15.2 of EN 50521	No axial Displacement is allowed to the contact likely to impair normal operation
A.4	Cable clamp (pull)	1 Pair Connector	Tensile force 60N see table 1 Per 5.14 of EN50521	3mm displacement permissible
A.5	Cable clamp (torsion)	1Pair Connector	Torque 0.10Nm see table 1 Per 5.14 of EN50521	±30° angle permissible
A.6	Mechanical strength impact	1Pair Connector	Dropping height: - 750mm for specimens of mass ≤ 250g - 500mm for specimens of mass > 250g	Parts used for protection against electric shock shall not be damaged. A reduction of clearance and creepage distance is not allowed.

			Dropping cycles:8 positions in 45° step, one cycles per position	
A.7	Mechanical strength at lower temperature	1 Pair mated connector	Four impact on the specimen, an energy of 1 joule after being cooled and maintained for 5h at a temperature of minus 40.0°C on a steel plate of 20mm thickness Per 6.3.10 of EN 50521	No damage likely to impair the function of the connector Per 5.15 of EN50521
A.8	Insertion force (Mating force)	1 Pair connector	The specified force shall be applied in the direction of the insertion of the unmated pair with the rate of 50mm/min. Per 6.3.13 of EN 50521	The Max. values of insertion force shall be 70N Per 5.16 of EN50521
A.9	Withdrawal force (Un-mating force)	1 Pair Only for mated connector disengaged locking device or snap-in device	The specified force shall be applied in the direction of the separation of the mated pair with the rate of 50mm/min Per 6.3.13 of EN 50521	The Max. values of withdrawal force shall be 70N Per 5.16 of EN50521
A.10	Effectiveness of connector coupling device (Separation force)	1 Pair Only for mated connector with locking device or snap-in device.	The specified force shall be applied in the direction of the separation of the mated pair with the rate of 10 N/sec. Per 6.3.14 of EN50521	Connector with locking device or with snap-in device shall withstand a load of 80N at least Per 5.17 of EN 50521

Note Test group A consists of separate tests. There is no required test sequence.

## Group B- Service life Test

No.	Designation	Specimen	Test conditions / Specimens	Requirements
B.1	Contact Resistance (initial)	3 Pair Mated Connector	Test current:1A Measure points <sup>a</sup> at the end of the termination	The Max. values shall be 0.5mΩ
B.2	Mechanical Operation (Durability)	Following B1	Shall be engaged and disengaged by means of A) a device simulating normal operating conditions, the speed of insertion and withdrawal shall be approximately 0.01m/s with a rest in the unmated position of approximately 30s B) manual mating/un-mating 300 Max. cycle per hour Per 6.3.5 of EN 50521	1) 100 operation cycles without load 2) No damage likely to impair function Per 5.11.1 of EN 50521

B.3	Contact Resistance (Final)	Following B2	Same condition as for test phase B.1	Deviation of the contact resistance shall be no more than 50% of the initial reference value (0.5 mΩ)
B.4	Bending Test (flexing)	Following B3 (Only non-rewirable connector)	The cable is loaded with a weight such that the force applied is 20N (in Figure 1) Per 6.3.6 of EN 50521	100 repeat bends Per 5.11.2 of EN 50521
<sup>a</sup> , Measure points: at the conductor as close as possible to the termination without Cable, if this is not possible, the conductor resistance shall be recalculated.				

Group C- Thermal Test (Mated test specimen)				
No.	Designation	Specimen	Test conditions / Specimens	Requirements
C.1	Contact Resistance (initial)	1 Pair Mated Connector	Test current:1A Measure points a at the end of the termination (Figure 1)	The Max. values shall be 0.5mΩ
C.2	Temperature Rise Test	Following C.1	- length of test cable = 500mm ± 50mm - test shall be carried out with rated current as specified at ambient temperature:85°C - the test shall be continued until a constant temperature is obtained Per test 5a of EN 60512 Per 6.3.4 of EN 50521	temperature rise(ΔT ) of a connector shall not exceed 30°C Per 5.13 of EN 50521
C.3	Contact Resistance (Final)	Following C.2	Test current:1A Measure points a at the end of the termination (Figure 1)	Deviation of the contact resistance shall be no more than 50% of the initial reference value (0.5 mΩ)
<sup>a</sup> , Measure points: at the conductor as close as possible to the termination without Cable, if this is not possible, the conductor resistance shall be recalculated.				

Group E- Degree of protection Test				
No.	Designation	Specimen	Test conditions	Requirements
E.1	Degree of protection	2 Pair Connector	Test finger IP20 at 10N Per 60529 Per 6.3.3.1 of EN 50521	no live parts shall be accessible by test finger Per 5.4.1 of EN 50521
E.2	Degree of protection IP code	From E.1	Test IP 68 (1m,24h) per IEC 60529 Per 6.3.3.2 of EN 50521	IP 68, No ingress of water or dust Per 5.9 of EN 50521

### Group F- Insulation Material Test

No.	Designation	Specimen	Test conditions	Requirements
F.1	Dielectric Voltage Withstand Test (Voltage Proof)	3 Pair Mated Connector	The test voltage shall be applied between all live parts and accessible surface, withstand voltage (50/60Hz) with a r.m.s value of 2000V plus (4 times rated voltage) for 1 min. Per 6.3.8b) of EN 50521	No flashover or breakdown of voltage Per 5.10 of EN 50521
F.2	Flammability (Enclosure)	Following F.1	Glow wire test with 650°C according to EN 60695-2-10 Per 5.20.1c) of EN 50521	No inflame Per 5.20.1c) of EN 50521
F.3	Flammability (support for live part)	Following F.2	Glow wire test with 750°C according to EN 60695-2-10 Per 5.20.2c) of EN 50521	No inflame Per 5.20.2c) of EN 50521

Annex

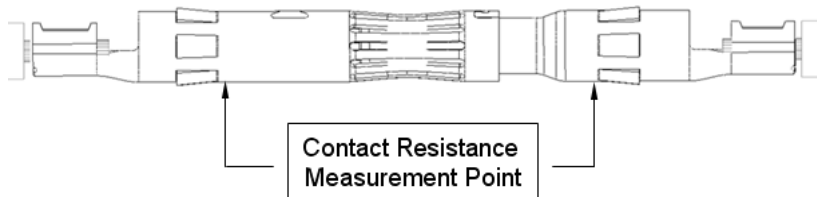


Figure 1  
Contact Resistance Measure Point illustration