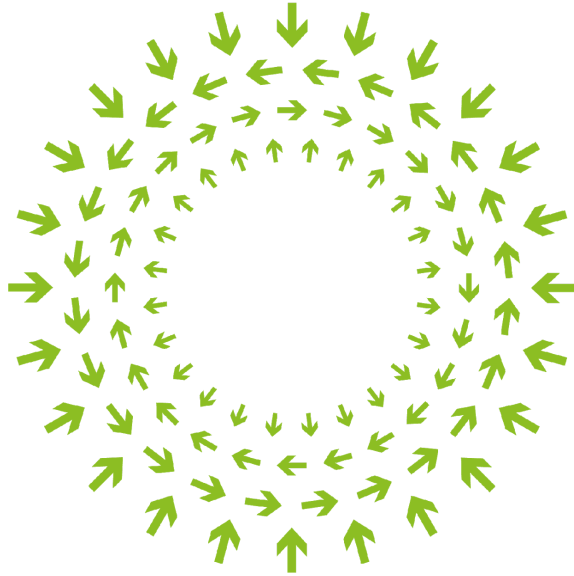




OPEN
Compute Project

Open Rack V3 HPR 2000A DC Power Output Connector Design Specification

Rev: 1.0.0

06/23/2026

Author

Mohammed Alisa Mechanical Engineer, Meta

1. License

THE UPDATED DEFAULT CONTRIBUTOR LICENSE AGREEMENT (CLA) IS [OWFa 0.9](#). PLEASE VERIFY THE CORRECT CLA/FSA IS USED AND EXECUTED FOR THIS CONTRIBUTION.

1.1 Open Web Foundation (OWF) CLA

Contributions to this Specification are made under the terms and conditions set forth in **Modified Open Web Foundation Agreement 0.9 (OWFa 0.9)**. (As of October 16, 2024) ("Contribution License") by:

META Platforms

Usage of this Specification is governed by the terms and conditions set forth in **Modified OWFa 0.9 Final Specification Agreement (FSA)** (As of October 16, 2024) ("**Specification License**").

You can review the applicable Specification License(s) referenced above by the contributors to this Specification on the OCP website at <https://www.opencompute.org/contributions/templates-agreements>.

Notes:

The above license does not apply to the Appendix or Appendices. The information in the Appendix or Appendices is for reference only and non-normative in nature.

NOTWITHSTANDING THE FOREGOING LICENSES, THIS SPECIFICATION IS PROVIDED BY OCP "AS IS" AND OCP EXPRESSLY DISCLAIMS ANY WARRANTIES (EXPRESS, IMPLIED, OR OTHERWISE), INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, OR TITLE, RELATED TO THE SPECIFICATION. NOTICE IS HEREBY GIVEN, THAT OTHER RIGHTS NOT GRANTED AS SET FORTH ABOVE, INCLUDING WITHOUT LIMITATION, RIGHTS OF THIRD PARTIES WHO DID NOT EXECUTE THE ABOVE LICENSES, MAY BE IMPLICATED BY THE IMPLEMENTATION OF OR COMPLIANCE WITH THIS SPECIFICATION. OCP IS NOT RESPONSIBLE FOR IDENTIFYING RIGHTS FOR WHICH A LICENSE MAY BE REQUIRED IN ORDER TO IMPLEMENT THIS SPECIFICATION. THE ENTIRE RISK AS TO IMPLEMENTING OR OTHERWISE USING THE SPECIFICATION IS ASSUMED BY YOU. IN NO EVENT WILL OCP BE LIABLE TO YOU FOR ANY MONETARY DAMAGES WITH RESPECT TO ANY CLAIMS RELATED TO, OR ARISING OUT OF YOUR USE OF THIS Open Compute Project • <3 Layer Specification Title> Date: XXXX, 2XXXX Page X SPECIFICATION, INCLUDING BUT NOT LIMITED TO ANY LIABILITY FOR LOST PROFITS OR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY CHARACTER FROM ANY CAUSES OF ACTION OF ANY KIND WITH RESPECT TO THIS SPECIFICATION, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), OR OTHERWISE, AND EVEN IF OCP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

1.2 Acknowledgements

The Contributors of this Specification would like to acknowledge the following for their feedback:

Jingjing Sun	Power Engineer, Meta
Wenying Zhang	Thermal Engineer, Meta
Dmitriy Shapiro	Mechanical Engineer, Meta
Ben Kim	Compliance Engineer, Meta
Chris Gieski	Lead Design Engineer, Amphenol

Revision History

Date	Version #	Author	Description
06/23/2026	1.0.0	Mohammed Alisa	Initial OCP Release

Table of Contents

1. License	2
1.1 Open Web Foundation (OWF) CLA	2
1.2 Acknowledgements	2
2. Scope	4
3. Overview	5
4. Electrical	5
5. Environmental	5
6. Mechanical	6
6.1. Geometry	6
6.2. Mating to the HPRv3 Busbar	7
7. Quality	10
8. Regulatory	11
9. Compliance with OCP Tenets	12
9.1. Openness	12
9.2. Efficiency	12
9.3. Impact	12
9.4. Scale	12
9.5. Sustainability	12

2. Scope

This document defines the technical specifications for an ORv3 HPR 2000A DC Power Output Connector used in the Open Compute Project.

3. Overview

This interconnection is the power interface between HPRv2 72kW/100kW power shelf and the HPRv3 vertical busbar.



Figure 1: 72kW Power Shelf with 2000A DC Output Connector

4. Electrical

- Nominal output voltage range (based on power shelf): 49V-50V
- Max current continuous in still air: 2000A
- Max current continuous in 390LFM @ 75°C airflow: 2000 A
- Max temperature rise: 25°C recommended (when connected to HPRv3 rack busbar)
- Max busbar +/- DC resistance is within 20uohm, i.e. max. 40mV voltage drop at 2000A current

5. Environmental

- Operating Ambient Temperature at connector location: 15°C to 85°C
- Long-term Storage: -40C to 50C and 5-95% RH
- Short-term Storage: -20C to 65C and 10-80% RH
- Operating Humidity: 20-90%, 5C dew point minimum
- Lifetime: 6 years

6. Mechanical

6.1. Geometry

- Connector can be a stand-alone part that is mounted onto the power shelf, or an extension of the power shelf.
- The connector shall fit within the maximum height of 1 Open Rack Unit (48.00mm)
- The connector shall support a panel thickness of 1.10 to 1.32 mm.
- The connector may use tools to attach to the power shelf.
- If applicable, torque range for fasteners installed to the rear of the power shelf shall be 0.7 - 0.9 NM.

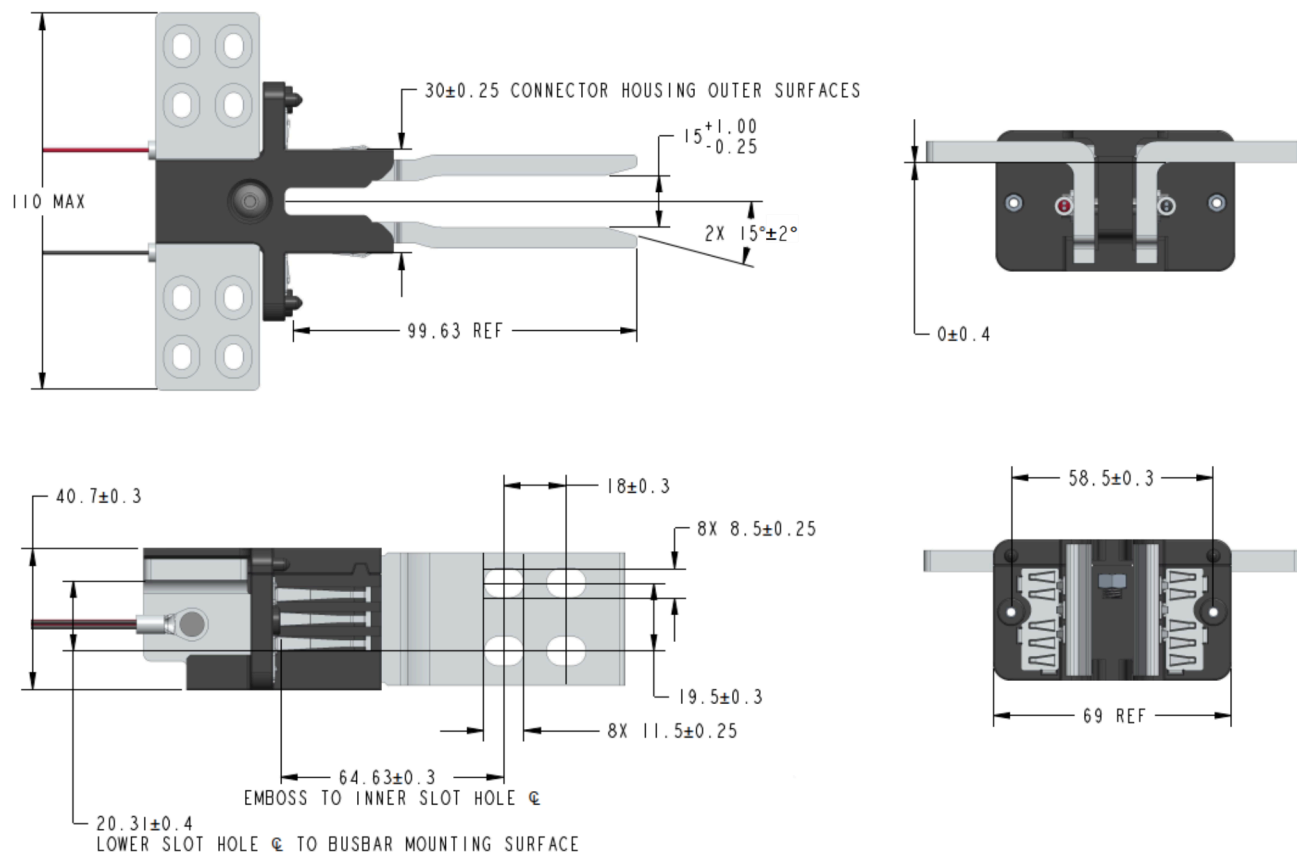


Figure 2: DC Output Connector Critical Dimensions

6.2. Mating to the HPRv3 Busbar

- Drawing below shows HPRv3 rack busbar critical dimensions for DC output connector mating.

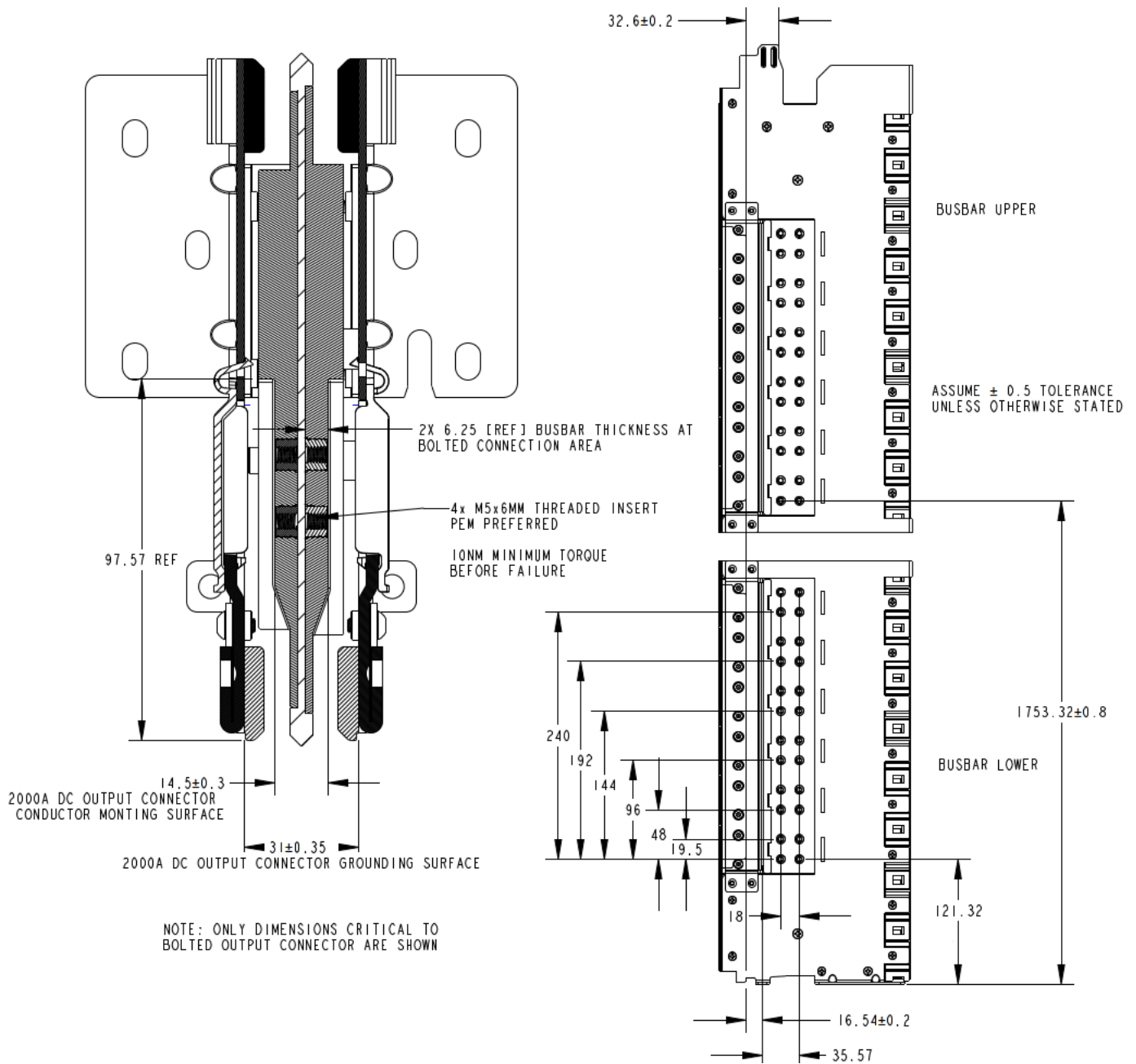


Figure 3: HPRv3 Busbar Dimensions



Figure 4: Connection to HPRv3 Busbar

- Connector shall enable a minimum of 4mm side-to-side gatherability (this should be done through chamfers on the conductor blades).
- The connector shall be installed to the HPRv3 busbar using 8 (4 per pole) bolts, each torqued to 5 +/- 0.25 Nm. Bolts specifications are listed below:
 - Diameter/Thread/Length: M5-0.8 x 14mm
 - Note: 14mm length includes captive hardware thickness - this is important to ensure that bolt tip does not clash into the vertical busbar insulator
 - Bolt head height: Max 3.65mm
 - Bolt grade: 8.8 or higher
 - Material: Nickel-plated, heat treated carbon steel
 - Hardness 32-38 HRC
 - Captive features: Belleville + plain washer
 - 15mm plain washer diameter is recommended
 - 1mm belleville washer thickness is recommended
 - 1.2mm plain washer thickness is recommended
 - Known bolt part numbers meeting the specified requirements are as follows (see Figure 5 for visual representation):
 - PENCOM: BO3310
 - PEM: G-119198-CN-04

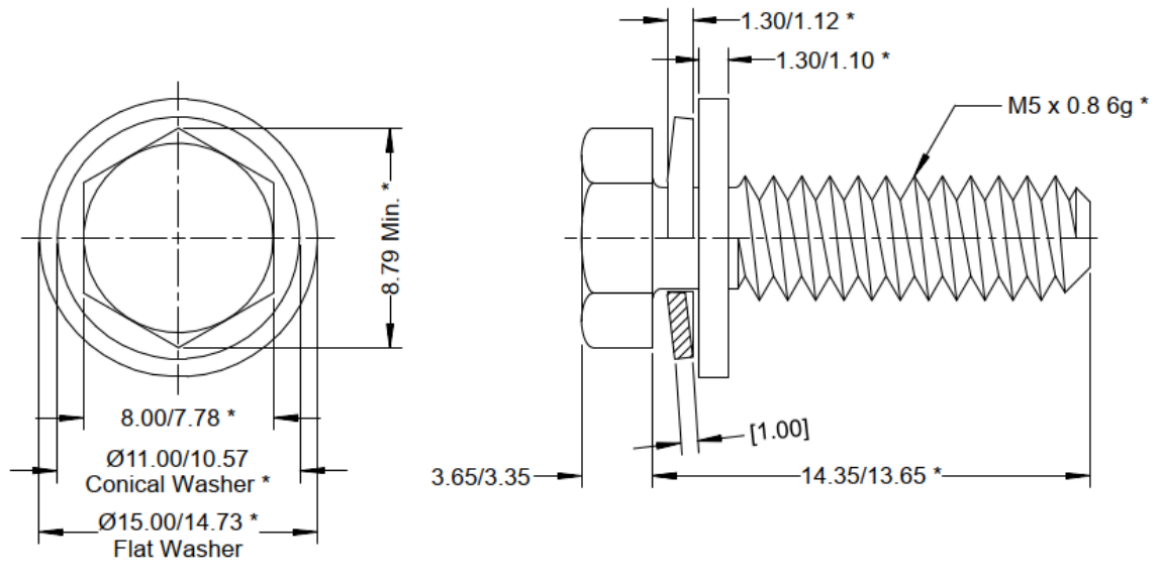


Figure 5: Recommended Power Shelf Bolt Dimensions

- Connector must feature tool-less grounding contacts. These contacts shall interface with the grounding bracket on the HPRv3 busbar.
- Connector assembly shall feature thermistors for temperature sensing, one for each conductor pole. Thermistors shall be mounted at the rear of the connector and support temperatures up to 150C (minimum). Known thermistor part numbers meeting the specified requirements are as follows:
 - JOYIN JAS103G398FB240001RH
 - Vishay NTCALUG54A
 - TDK EPCOS B57881S0123F000
 - THINKING TTC3A123G3742EY3
 - EXSENSE TS103F25C3977FB-NLXXXA
- The power shelf will ship within the rack while connected to the rack busbar. The connector solution shall prevent damage of the power shelf and the rack busbar during the following packaged, rack-level tests (ASTM 4169 details below) while meeting the voltage drop requirements per section 4 and show no exposed copper of either the power shelf connector or rack busbar under SEM analysis of the interfaces.
- The rack is tested in the shipping packaging for transportation Shock and Vibration per ASTM 4169-16 Schedule E - Vehicle Vibration for 2hrs on vertical axis only for 80 minutes low level, 30 minutes medium level and 10 minutes high level.

7. Quality

The following tests will be conducted with three samples each per Table 1.

Test	Test Standard	Test Condition/ Method	Pass/Fail Criteria	Additional Data to Collect for Review
Low level contact resistance (LLCR)	EIA-364-23	Subject mated specimens to 100 milliamperes maximum current and 20 millivolts maximum open circuit voltage	10 milliohms maximum (initial) 20 milliohms maximum (final)	We can leave these values but we believe that the connector will be much lower based on our previous BK products. 0.1milliohms for both initial and final, but we will need to verify with testing
Contact resistance at rated current (CRRC)	EIA-364-6	Resistance should be measured after the connector has reached thermal equilibrium, after carrying Rated load at 25°C ambient temperature	0.5 milliohms maximum (initial and final)	The requirement can likely be reduced to 0.05milliohms based on previous history, but will need verified by testing
Withstanding voltage	EIA-364-20, Condition I	1000 volts AC at sea level for power contacts. 1 minute duration. Test between adjacent contacts of specimens	No breakdown or flashover	use UL1977 section 17 requirement of 1000 volts + 2*rated voltage. Example: 48VDC rated will be 1096 VDC test voltage, 1 mA maximum leakage
Vibration	EIA-364-28 Test condition VII, Test condition E	15 minutes duration in each of the three mutually perpendicular directions	No discontinuities of 1 microsecond or longer duration No plastic deformation or contact dislodging In addition: LLCR before and after	post test contact wear optical examination, SEM/EDX optional
Shock	EIA-364-27, Method A	Subject mated specimens to 50G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks	No discontinuities of 1 microsecond or longer duration. No plastic deformation or contact dislodging. post test contact wear optical examination, SEM/EDX optional	post test contact wear optical examination, SEM/EDX optional
Temperature Life	EIA-364-17, Method A, Condition 5.	Subject mated specimens to 125°C for 500 hours	LLCR before and after	monitor contact voltage drop during test
Thermal Shock	EIA-364-32, Method A	Test condition VII: -55C to 85C for 10 cycles with 30 minute dwell time	LLCR before and after	N/A

Humidity	EIA-364-31, Class III	Subject mated specimens to 10 cycles (10days) between 25 and 65°C at 80 to 98% RH	LLCR before and after Dielectric withstand voltage before and after	N/A
Salt Spray	EIA-364-26C	Subject mated specimens to test for 48 hours, with a 5% solution salt spray, 35 +1/-2°C	LLCR before and after	N/A
Temperature rise vs. current	EIA-364-70, Method 3	Attach connector to a busbar 45mm in length and heated to 85C. Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C	Lower than 30°C	

Table 1: Testing Details

8. Regulatory

The connector shall comply with the following safety requirements:

Items	Reference std	Requirements
Safety NRTL certification	UL 1977 or other equivalent UL safety standard	RU- Recognized safety mark and certification should be available
Temperature rise	UL1977 and IEC61984 EIA364-70D,	T-rise without airflow shall not exceed 30degree C
ROHS	2011/65/EU (RoHS 2) and its latest revision	Must comply with EU ROHS substance restriction requirements
Flammability	UL94	Plastic material flammability must be UL94 V0 or above
Insulation or plastic material temperature	UL62368-1, Meta	Any plastic used for insulation purposes must have a temperature rating at least 40% higher than plastic max operating temperature when measured with absolute max current that connector can support. Vicat temp can be referenced for judgement
Ground impedance	EIA 364	Ground pin shall not have more than 10mohm contact resistance

Table 2: Regulatory Requirements

9. Compliance with OCP Tenets

9.1. Openness

The connector design is fully open to the community, with all mechanical interfaces, dimensions, fastener specifications, and busbar mating geometries disclosed herein to allow any qualified vendor to produce a compliant solution.

9.2. Efficiency

This single connector interface supports the total 2000A DC output for the 72kW/100kW power shelf, serving as a direct replacement for traditional multi-cable and lug-and-bolt configurations to minimize cable losses between the shelf and the rack busbar.

9.3. Impact

This interconnection is the power interface between HPRv2 72kW/100kW Power shelf and the HPRv3 vertical busbar architecture. Supporting a 2000A continuous DC output, this solution is foundational for achieving the >100kW rack densities necessitated by next-generation AI and ML compute platforms.

9.4. Scale

To facilitate high-volume deployment for hyperscalers and large enterprise clients, multiple qualified part numbers are provided for all critical ancillary components—including fasteners and thermistors—enabling integrators to choose between approved sources without necessitating further re-qualification.

9.5. Sustainability

The connector must comply with EU ROHS substance restriction requirements per 2011/65/EU (RoHS 2) and its latest revision. This solution is specified for a 6-year service lifetime, with all plastic material flammability rated at UL94 V0 or above.