

Engineering Change Order: Chiller Glycol Manifold Pressure Relief Valve Upgrade

ECO Tracking Identifier: ECO-2024-031

Target Platform: Gigavolt Megapack X-7000 (Model: X-7000)

Effective Manufacturing Date: November 15, 2024

Impacted Subsystem: Thermal Management Loop — Hydraulic Manifold

Originating Engineer: Devante Brooks, Lead Thermal Systems Engineer

Root Cause & Field Failure Justification

Analysis of 18 field warranty service dispatches across desert solar installations in Arizona and West Texas revealed recurring low coolant flow alarms (ERR_COOL_302). In 7 instances, field technicians discovered brass pressure relief valves (Part Number: PRV-GLY-300) had suffered internal spring corrosion and seat sticking due to galvanic incompatibility with ethylene glycol additives. When fluid temperatures reached 48 °C during peak daytime charging, over-pressurization forced coolant through secondary o-ring seals, resulting in fluid loss, pump cavitation, and nuisance thermal trips.

Modification Specifications

- Superseded Part:** Brass Pressure Relief Valve PRV-GLY-300 (Rated crack pressure: 3.2 bar).
- Authorized Replacement:** 316 Stainless Steel Pressure Relief Valve PRV-GLY-350-SS (Gigavolt P/N: PRV-GLY-350-SS, crack pressure: 3.8 bar ± 0.1 bar, PTFE seat seals).
- O-Ring Material Mandate:** All manifold joint O-rings must be replaced with Fluorocarbon (FKM / Viton-A) seals (Part Number: GSK-ORG-FKM-01). Nitrile (NBR) seals are strictly prohibited.

Retrofit & Labor Instructions

- Service Kit:** Field Retrofit Kit RET-X7-031 containing valve PRV-GLY-350-SS, three FKM O-rings, and two gallons of pre-mixed premade inhibited glycol.

- **Estimated Labor Time:** 1.75 technician hours.
- **Drain and Refill:** System must be completely depressurized to 0.0 bar before loosening hydraulic union nuts. Drain spent fluid into approved chemical collection drums.