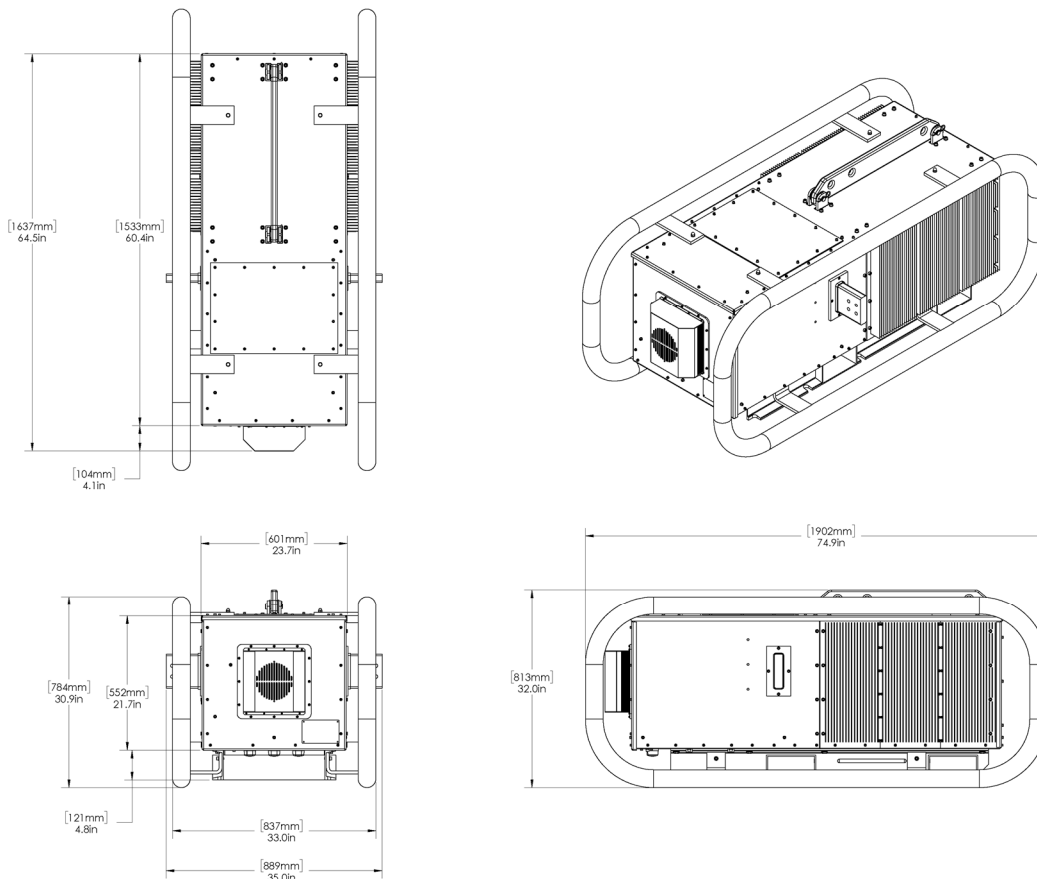


The Power Guardian™ 390 builds upon the proven success of its predecessor, the PowerLine Guardian®. The Power Guardian 390 injects a reactance in series with the line to increase the line’s total reactance. A fleet of deployed units provides a nearly continuous range of reactance from zero up to the collective rating of the fleet, enabling real-time control of power flow. This product provides immense value to electric utilities pursuing a dynamic high-voltage grid. **The Power Guardian 390 enables utilities to get more from their existing grid by:**

- Addressing short duration and emergency needs with rapidly deployable and easily re-deployable solutions
- Accommodating changes in generation and load by deploying a fleet of units in weeks rather than years
- Routing power away from overloaded transmission facilities and onto facilities with spare capacity to provide reliable delivery of low-cost, low-carbon generation
- Avoiding the use of precious substation space
- Providing high uptime via a modular, redundant solution

Each Power Guardian 390 model has a 390 kVAr reactive power rating. The Power Guardian 390 model ratings are differentiated by their continuous current rating. For example, a Model 390-1300 has a reactive power rating of 390 kVAr and a maximum continuous current of 1300 A RMS. Units provide a corresponding minimum reactance for each current rating per the Table below. The Power Guardian 390 is mounted horizontally and is primarily intended to be installed in SmartBanks™ or SmartTowers™, which collectively provide options to install within the right-of-way, in the substation or in a dedicated parcel.



Technical Specifications

Electrical

Maximum Continuous Current	Per Model Table Below
Maximum Emergency Current	Per Model Table below

Minimum Reactance in Injection	Per Model Table Below
Fault Current Rating	Per Model Table Below

Maximum Voltage (Corona-Free)	≤550 kV RMS line-to-line	Power	Powered by line current
Operating Frequency Range	47.5 Hz to 60.6 Hz		

Physical

Mass 3600 lbs (1633 kg)

Dimensions See Figure Above

Conductor Size Capacity Agnostic

Mounting⁽⁴⁾ Suspended from structure via insulator

Cooling Active with one sealed forced cooler

Communications

Communication Architecture EMS integration using PowerLine Gateway™ located at substation

Communication Security Features Multilevel ISM band wireless protocol optimized for fast telemetry. Protocol uses SHA-256 to ensure cryptographic integrity of all messages while supporting full observability by utility firewalls

Environmental

Operating Ambient Temperature Range -40°F to 122°F (-40°C to 50°C)

Storage Temperature Range -40°F to 122°F (-40°C to 50°C)

Condensing Operating Humidity Range 5% to 100%

Maximum Sustained Rain 4.0 in/hr (102 mm/hr)

Standards

Software and Firmware IEC 61508 Compliant

Electrical Connections ANSI C119.4

Intrusion Protection IEC 60529, IP 54

Sensor Accuracy

AC Line Current +/- 3%

Power Guardian 390 Models¹

Model	Max Continuous Current (A RMS)	Min Reactance @ 50 Hz (mΩ)	Min Reactance @ 60 Hz (mΩ)	Max Emergency Current (A RMS)	Max Emergency Current Duration (hours)	Max Fault Current and Duration (kA RMS, seconds)	Minimum Current for Monitoring Mode ² (A RMS)	Minimum Current for Injection Mode ³ (A RMS)
390-3200	3200	29	35	3840	2	63, 0.5 and 44, 1.0	480	960
390-2700	2700	41	49	3240	2	63, 0.5 and 44, 1.0	405	810
390-2300	2300	57	68	2760	2	63, 0.5 and 44, 1.0	345	690
390-2000	2000	75	90	2400	2	63, 0.5 and 44, 1.0	300	600
390-1800	1800	92	111	2160	2	63, 0.5 and 44, 1.0	270	540
390-1600	1600	117	140	1920	2	63, 0.5 and 44, 1.0	240	480
390-1300	1300	177	212	1560	2	63, 0.5 and 44, 1.0	195	390
390-1150	1150	226	271	1380	2	44, 0.5	173	345
390-1000	1000	299	359	1200	2	44, 0.5	150	300
390-850	850	414	497	1020	2	25, 1.0	128	255

¹ Models with different current ratings available upon request. Reactance will depend on current rating.

² In Monitoring Mode, the Power Guardian 390 is bypassed and does not inject reactance. Telemetry data is still transmitted.

³ In Injection Mode, the Power Guardian 390 injects the rated reactance in series with the line and telemetry data is transmitted.

⁴ Power Guardians are typically installed on dedicated transmission towers (SmartTowers™) or in banks in substations or parcels within/near the transmission right-of-way (SmartBanks™). Power Guardians can also be deployed on the Smart Wires mobile platform.

About Smart Wires

Based on the San Francisco Bay Area, with offices in the United States, the United Kingdom, Ireland and Australia, Smart Wires is the leader in grid optimization solutions that leverage its patented modular power flow control technology. Smart Wires solutions are quickly deployable, enabling utilities to react quickly and address emergency problems. This flexible technology is also easily re-deployable, providing a robust investment to solve short duration need windows and hedge against the uncertain nature of their systems' future needs. Driven by a world-class leadership team with extensive experience delivering innovative solutions, Smart Wires partners with utilities around the globe to address the unique challenges of the rapidly evolving electric system. Smart Wires' technology was developed by utilities for utilities, led by a consortium of large U.S. utilities at the National Electric Energy Testing Research and Applications Center (NEETRAC). This core group of utilities, which included Southern Company and Tennessee Valley Authority (TVA), defined the vision for the original modular power flow control solution. PG&E, EirGrid (Ireland), Minnesota Power, Central Hudson, and Western Power (Australia) are some of the other utilities leveraging Smart Wires power flow control solutions.

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