



Case Study:

**Protecting Museum Water
Infrastructure from Surges**



View of the water court inside the Pavilions
Credit: Thomas Phifer & Partners
Courtesy: Glenstone Museum

ABOUT THE FACILITY

Glenstone is a modern and contemporary art museum located in Potomac, Maryland. It displays work by 20th and 21st century artists and provides a serene and contemplative environment for visitors to explore the art, architecture and landscape on a 230-acre former fox hunting estate.

In 2018, Glenstone will open an expansion project, the Pavilions, that will increase its exhibition space by nearly six-fold. Once the Pavilions opens, the museum will have the capacity to host 100,000 visitors annually.

On the Front Cover:
The Gallery, currently open
Also seen (left to right): Ellsworth Kelly, Untitled, 2005 Richard Serra; Sylvester, 2001
Photo: Scott Frances
Courtesy: Glenstone Museum

Background

Water bodies help define the museum's idyllic landscape and reflecting pools provide visual context for both the art exhibits and the facility's unique architecture. A sophisticated water supply system provides water to these locations. In addition, a reliable supply of water is needed for irrigation and potable uses.

The facility's water infrastructure is supplied by groundwater wells located throughout the grounds. After lightning activity damaged costly pumping equipment, Glenstone turned to ASCO Power Technologies to develop a surge protection solution.

Case Summary

Location: Washington DC Metro Area

Products/Services: ASCO 100, 200 and 400 SERIES Surge Protective Devices

Critical Need: Mitigation of surge-related risks to well pumps and controls that manage the facility's groundwater supplies and water infrastructure.

Results:

ASCO supplied more than 40 SPDs to shunt overvoltages away from pumps and control apparatus, and developed a solution for deploying SPDs inside groundwater wells.

The Situation

In order to supply water and control its distribution, submersible pumps withdraw groundwater from multiple wells throughout the site. Each well relies on a powerful electronically controlled pump for groundwater withdrawal. The system includes large underground cisterns for storing and transferring water. A sophisticated network of controls, pumps, transducers and piping delivers water and manages water levels throughout the exhibits and buildings, all connected by miles of power and control wiring.

Following lightning activity, costly pumping equipment became inoperable, requiring replacement. Glenstone turned to ASCO Power Technologies for a surge protection solution that would protect the facility’s water pumps and controls.

To avoid impacting landscape views, Glenstone required surge protection equipment to be installed inside the well casings. Consequently, the form factor of any solution had to fit inside the cylindrical wells. In addition, the solution had to provide for reliable operation across a wide range of temperatures and in humid or condensing conditions.

The Solution

ASCO Application Engineers recommended distinct solutions for equipment at the wells within Glenstone’s buildings. To protect electronic controls from transients entering along utility and distribution conductors, ASCO supplied Model 420 SPDs. ASCO also supplied Model 175 SPDs to protect transducers at water storage locations. Primary features of these devices are shown below.





While protecting the equipment in mechanical spaces was relatively straightforward, protecting the equipment in the wells presented technical challenges. Because the

equipment would reside in a down-hole environment, ASCO engineers worked to identify a solution that would protect its SPDs against extreme temperature variations and elevated humidity, yet still fit within the confines of each cylindrical well casing.

For each well pump, ASCO engineers recommended the ASCO Model 235, which is typically used to protect equipment in highway light poles from lightning-induced surges. To protect well pump controllers, ASCO specified the Model 425. ASCO engineers also identified watertight plastic housings from another manufacturer that could contain the SPDs, protect the units from moisture, and fit inside each well. Primary features of each SPD are shown below.

The Outcome

ASCO furnished a comprehensive surge protection solution to Glenstone’s electrical contractor, who installed the SPDs to protect the facility’s sophisticated water delivery infrastructure. Since then, thousands of visitors have enjoyed unimpeded views made possible by reliable water delivery enabled by robust ASCO SPDs.

Protection for Electronic Controls		Protection for Well Pumps & Pump Controllers	
ASCO Model 420	ASCO Model 175	ASCO Model 235	ASCO Model 425
			
<ul style="list-style-type: none"> • UL 1449 4th Edition Listed • 50kA 8 x 20µs • Includes all UL-required Overcurrent Protection and Safety Coordination features • 20kA Inominal • 200kA SCCR • Voltage-specific design performs better than 'one-size-fits-all' alternatives • UL 96A Lightning Protection compliant 	<ul style="list-style-type: none"> • UL 497B Certified • 10 kA 8 x 20 µs • Three-stage hybrid protection • Sneak/fault current protection • Resettable fuses – PTCs • Low capacitance option • Plug-in module 	<ul style="list-style-type: none"> • Fully encapsulated for water resistance • Submersion tested to satisfy waterproof requirements • Series connected surge protection • All modes of protection • 'Protected' status LED • Compact design 	<ul style="list-style-type: none"> • UL 1449 4th Edition Listed • 100kA per phase ratings • Includes all UL-required Overcurrent Protection and Safety Coordination features • 20kA Inominal • 200kA SCCRs • UL 96A Lightning Protection compliant • Voltage-specific design • All MOV suppression elements monitored • All Modes of Protection

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