EMProve ® - E1

Ultra-Fast Surge Arrester 6 kV Rating UFSA06E1-x

Product Description

The EMProve®-E1 Ultra-Fast Surge Arrester (UFSA06E1-x) is a medium-voltage protection device engineered to shunt fast-front transient currents—such as those produced by E1 HEMP events and switching disturbances—away from critical equipment. When tested at a Nationally Recognized Test Lab under MIL-STD-188-125 conditions, the UFSA shunted more than **97%** of the induced current to ground (Fig. 1).

The UFSA operates as a parallel, ultra-fast shunt device, reacting in under 6 ns and coordinating with conventional surge arresters to reduce residual voltage at the protected equipment. The device is suitable for indoor or outdoor installation in environments ranging from light to heavy pollution.

Electrical connections are made through two sets of NEMA-compliant threaded holes on each flange. Standard and custom adapters are available.

Specifications

- Med Voltage Intermediate class device
- Voltage class: 6 kV
- MCOV: 5.1 kV
- Energy class: H
- Standby current: <16 µA (60 Hz)
- Bypass current rating: 2.5 kA amps
- Housing BIL: 110 kV (IEEE C37.06 chopped wave)
- Reaction delay time: <6 nS
- Temperature range (storage/operating): -40 ^{O}F (-40 ^{O}C) to 150 ^{O}F (65 ^{O}C)
- Humidity: 5 % to 95 % (noncondensing)
- Length: 9 US inches (228.9 mm)
- Dia: 3.00 US inches (76.2 mm) Indoor
- Dia: 5.76 US inches (146.3 mm) Outdoor
- Weight: 5.5 US pounds (2.49 kg) Indoor
- Weight: 6.9 US pounds (3.13 kg) Outdoor

Installation Overview

The UFSA06E1 must be installed within 3.28 ft (1 m) of the protected equipment on all phase conductors and neutral. Performance depends on minimizing inductance in both the phase/neutral connection and the ground return path. Connections should be as short and direct as practical, following NEMA Surge Protection Institute guidance.

The device is not intended to serve as a structural support member and is not a lightning arrester; it is designed to operate in coordination with appropriately rated lightning arresters.

Maintenance

The UFSA is maintenance-free. AFS recommends periodic partial-discharge and insulation-resistance testing every 48 months to verify continued performance. The device is capable of handling **hundreds of E1 current surges** without degradation.

Product Family

Advanced Fusion Systems manufactures UFSA devices across multiple voltage classes and installation categories. Contact AFS or an

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authorized representative for information on additional ratings and configurations

Orderable Part Numbers

8106.00001 for UFSA06E1-A (Indoor) (Fig 2)

8106.00002 for UFSA06E1-B (Outdoor) (Fig 3) Medium-voltage, intermediate-class 6 kV outdoor device (Fig. 2), suitable for pollution degree levels from medium to heavy.

Warranty

AFS warrants the UFSA device against defects in materials and workmanship for **ten (10) years**, prorated from the date of purchase. AFS further warrants that the UFSA will perform to the specifications stated herein for up to **1,000 E1 current surges** when tested under NRTL conditions or equivalent environments. For complete warranty terms, refer to the purchase agreement.

Dual-Use / ITAR Notice

The UFSA incorporates dual-use technology subject to U.S. export control laws, including ITAR restrictions. Units may not be transferred, exported, opened, x-rayed, reverse-engineered, or otherwise examined without prior written authorization from AFS. Each device is permanently marked with a serial number, and AFS reserves the right to inspect units as required to ensure compliance and protect proprietary technology.

Application and Use Conditions

The UFSA06E1 is designed for use on **properly rated 6 kV medium-voltage systems** when installed in accordance with AFS instructions, applicable codes, and utility standards. Performance depends on correct system grounding, conductor geometry, and maintaining the recommended installation distance from the protected equipment.

Intended Function

The UFSA06E1 is engineered to **shunt fast-front transient currents**, including E1 HEMP-induced currents and switching-related overvoltages, away from downstream equipment. The device operates **in coordination with conventional surge arresters** and does not replace standard insulation coordination practices.

Limitations of Protection

The UFSA06

E1 does not provide protection against:

- Direct lightning strikes
- Sustained overvoltage, system faults, or abnormal system operating conditions
- Events exceeding the device's published electrical ratings
- Improper installation, misapplication, or inadequate grounding
- Equipment failure unrelated to transient overvoltages

Residual voltage is dependent on system impedance, grounding, and conductor inductance.

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System Compatibility

The UFSA15E1 must be applied only on systems whose **voltage class, MCOV, BIL, and grounding configuration** match the published ratings. Use outside these conditions may result in reduced performance or equipment damage.

No Implied Performance Beyond Published Ratings

AFS makes no claim of performance beyond the device's published electrical ratings, test data, and application guidelines. References to E1/E3 or fast-front transient mitigation describe **measured behavior under controlled test conditions** and do not constitute a guarantee of performance under all field conditions.

Thermal and Energy Considerations

The UFSA06E1 is designed to handle **high-energy transient currents** within its published bypass rating. Events exceeding these limits may result in device degradation or failure. The UFSA06E1 is not intended to dissipate continuous or long-duration fault energy.

No Consequential Liability

AFS shall not be liable for indirect, incidental, or consequential damages arising from the use or inability to use the UFSA06E1, including but not limited to loss of service, equipment downtime, or system interruption.

Continuous Improvement

AFS reserves the right to change the design and specifications without notice.

Contact

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Figure 1: E1 PCI performance

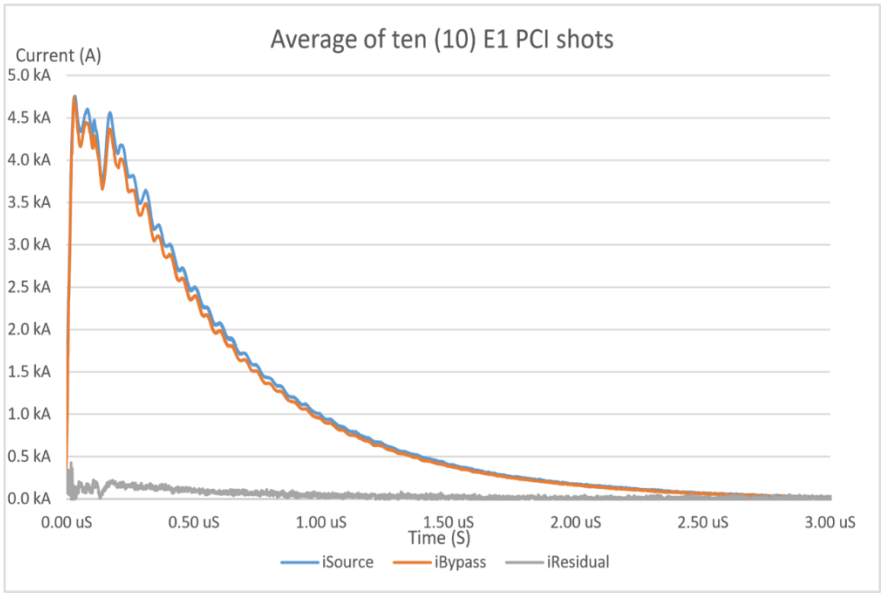

Figure 2: EMProve ® - E1 Indoor
Pollution degree very light to light

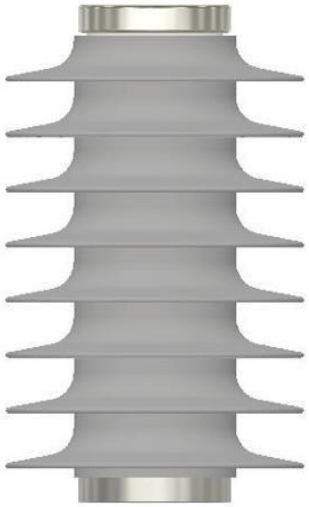

Figure 3: EMProve ® - E1 Outdoor
Pollution degree medium to heavy