

TD-01-40-E
HUBBELL POWER SYSTEMS
SVN/PH4/PH3 SEISMIC EXECUTIVE SUMMARY
HIGH QUALIFICATION LEVEL OF IEEE 693-2005 (0.5 g ZPA)

The industry standard to which Hubbell Power Systems (Ohio Brass) qualifies the seismic capability of its surge arresters is IEEE 693-2005. This document certifies that Ohio Brass SVN, PH3 and PH4 series arresters, up to the size of the tested unit, meet the High Qualification Level as demonstrated by a shake table test on a test stand.

SVN444GA353 was tested May 29-30, 2013 at the University of Nevada, Reno, Large Scale Structures Laboratory. Testing was performed by trained Dynamic Certification Laboratories (DCL) staff and the instrumentation and data acquisition system were regulated under DCL's quality control program. DCL is accredited as complying with ISO/IEC Standard 17025 by the International Accreditation Service.

Seismic tests in accordance with IEEE 693 were performed on arrester model number SVN444GA353. The entire assembly had a mass of 600 pounds and a center of gravity of 88.2 inches. The measured mass includes 15 pounds added to simulate the line terminal per the standard. The arrester was mounted on a 97.5 inch test stand, which was mounted to the shake-table interface plate.

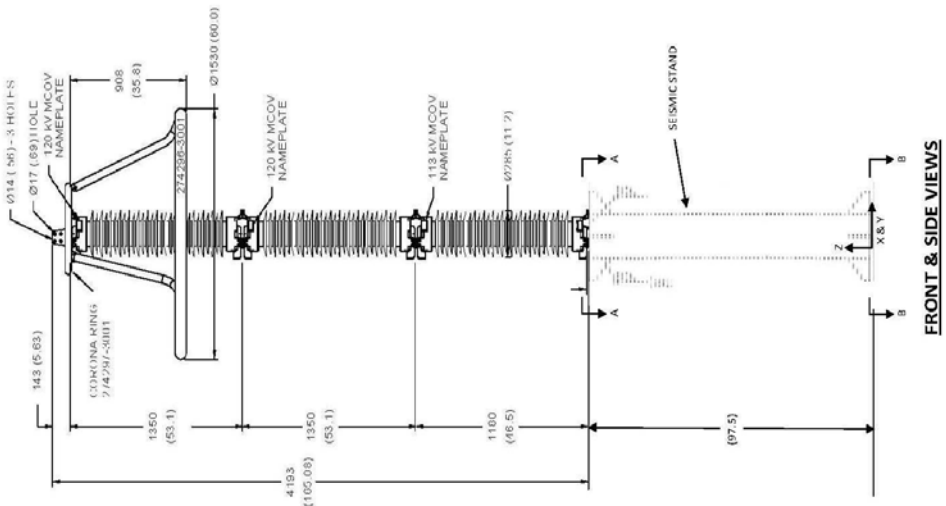
To be qualified to the High Seismic Qualification Level, IEEE 693-2005 requires that a surge arrester tested to the 0.5g ZPA level survives the shake table test with no structural damage, and that it remains functional, as demonstrated by successfully passing routine production tests after the shake table test. These tests consist of measurement of reference voltage, Watts-loss, discharge voltage and partial discharge, as well as performance of a shed seal test. All tests were performed with satisfactory results.

Surge arrester SVN444GA353 meets the requirements for the High Seismic Qualification Level (0.5 g ZPA).

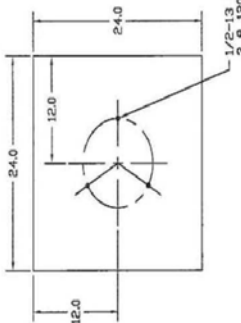
IEEE 693-2005 allows seismic qualification based on the concept of "qualifying equipment by group." This permits products of different voltage ratings, but similar physical structure, to be combined into groups for qualification purposes, with the most seismically vulnerable piece of equipment of each group being analyzed or tested. All Hubbell Power Systems - Ohio Brass SVN, PH3 and PH4 arresters use the same general composite profile and the same type of end fittings. For seismic analysis purposes, according to the provisions of IEEE 693-2005, they can all be considered to be part of a group. The most seismically vulnerable member of the group would then be that arrester having the greatest mass, greatest total height and highest center of gravity.

Those SVN, PH3 and PH4 arresters which do not exceed the listed mass and center of gravity of arrester model SVN444GA353 are also qualified to the High Seismic Qualification Level of IEEE 693-2005.

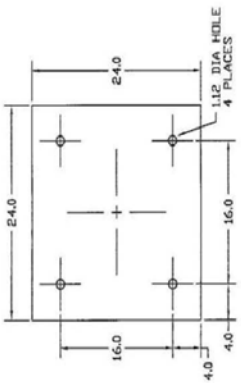
A detailed shake table test report is available upon request. Please contact your Hubbell representative.



FRONT & SIDE VIEWS



SECTION A-A
SEISMIC STAND TOP PLATE DETAIL



SECTION B-B
SEISMIC STAND FOUNDATION ANCHOR BOLT PLAN

DATA:

TOTAL WEIGHT

CG OF EQUIPMENT ONLY

X - 0

Y - 0

Z - 88.2" Above top of seismic stand

NATURAL FREQUENCIES W/ DAMPING:

- 1.5 Hz @ 1.67% DAMPING (PRE-TEST, X-AXIS)
- 1.5 Hz @ 1.18% DAMPING (PRE-TEST, Y-AXIS)
- 1.4 Hz @ 2.29% DAMPING (POST-TEST, X-AXIS)
- 1.1 Hz @ 2.93% DAMPING (POST-TEST, Y-AXIS)
- 12.0 INCHES AT CONDUCTOR ATTACHMENT POINT

600 LB (1,340 LB with seismic stand)

MAXIMUM DEFLECTION:

QUALIFIED BY:

MAX MEASURED LOAD PER BOLT AT BASE:

MANUFACTURER:

DATE TESTED:

29, 292 LB
HUBBELL POWER SYSTEMS
MAY 29-30, 2013

SEISMIC OUTLINE DRAWING

TYPE OF EQUIPMENT: SYN COMPOSITE SURGE ARRESTER

EQUIPMENT VOLTAGE: Rated Voltage = 444 KVrms, MCOV=353 KVrms

APPROVED BY: Kelly Laplace, DCL Quality Manager

DCL REPORT NUMBER: 45022-1301b-1

QUALIFIED BY: IEEE 693 - 2005, LEVEL HIGH QUALIFICATION

DRAWING NUMBER

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