

Pad-Mounted Capacitor Stations

Typical Specifications

General

The primary capacitor station shall be 15kV class, 95kV BIL, with 200A continuous current, suitable for shunt connections on systems with a maximum design voltage of 8.3/14.4kV grounded wye. It shall be completely assembled and ready for connection to the utility system with load-break separable insulated connectors per ANSI/IEEE std. 386-1985 or latest revision. (Separable insulated connectors and load-break inserts shall be supplied by user). The capacitor station shall contain two isolated compartments separated by a metal barrier for access to the separable connectors or capacitors. The enclosure shall be constructed for application in outdoor environments.

Enclosure Construction

The enclosure shall meet ANSI standards C57.12.28-1988 or latest revision regarding tamperproofness and characteristics of the finish. For maximum strength, the unit shall be constructed of 12 ga. sheet steel, and the cover cross-kinked for water run-off and rigidity.

The enclosure shall have an open bottom with a "C" channel with a 2" lip for strength and ease of mounting to the pad.

Separate doors for the separable connector and capacitor compartments shall be provided with three-point latching and a non-ferrous captive penta- or hex-head bolt. The doors shall have 304 stainless steel hinges, fully welded, 3" in length, with 0.375" dia. hinge pins and a captive door holder.

The grounded metal barrier separating the compartments shall be painted Lt. Grey with polyester powder for long-life and high-contrast for safety.

The enclosure shall have the bonding of the finish coat enhanced by putting it through a 6-stage pretreatment system. The chemical balance shall be checked twice daily, to provide consistent high quality. The finish shall be electrostatically applied polyester powder with a Munsell color 7GY3.29 /1.5 with a minimum thickness of 2 mils. The system shall be checked for adhesion characteristics at least three times per week to maintain a high-quality finish. Grounding provisions and park stands shall be placed for ease of installation and operation.

Bushings

Bushings shall be 15kV class and from a nationally recognized manufacturer and meet all aspects of ANSI/IEEE 386-1985 or latest revision and shall be mounted at a height for ease of cable termination and operation.

Capacitors

NEMA standard outdoor single-phase 60hz 95kV BIL individual capacitors shall be supplied bolted in place in a manner that will allow replacement without affecting other components. The units shall utilize all-film insulation impregnated with non-PCB liquid dielectric fluid. The capacitors shall be rated through 400kVAR in available sizes and voltages through 7.96kV and connected grounded wye for use on four wire grounded wye systems. Internal discharge resistors shall be included in capacitors.

Switches

The switches shall be oil or vacuum, outdoor, single-phase, rated 14.4kV, 95kV BIL. They shall be mounted on rigid brackets and positioned to allow manual operation, visual positioning and easy removal if required. Five-pin receptacle and sockets are wired with 4-wire control cable for electrical operation. These cables shall be brought to an accessible terminal box and a single control cable taken to the control socket. All wiring shall be secured to insure ease of tracing and adequate clearance to the high voltage.

Fusing

The fusing shall be current limiting type clip-mounted with visual indication of a blown fuse. Where multiple capacitors are used, group or individual fusing shall be provided, rated for phase-to-phase voltage and sized, based on the manufacturers recommendations. Individual fusing is rated at phase-neutral voltage and sized to coordinate with tank rupture curves and allowable overvoltage.

Current Limiting Reactors

For application as a paralleled bank in proximity of the other bank, an appropriately sized current-limiting reactor shall be supplied.

Barriers

Phase and ground barriers shall be provided, to assure proper phase-to-phase and phase-to-ground clearances for the designed voltage class. These barriers shall allow entry to each phase individually, without disturbing the electrical clearances of the others. The barriers shall be glass-reinforced polyester NEMA GPO-3 class material, white in color to provide maximum visibility.

Meter Socket for Capacitor Control

The four- or six-terminal socket shall be mounted in the upper portion of the insulated connector compartment, isolated from the bushings by a metal barrier, visible and protected with a clear Lexan door that can only be operated when the compartment doors are open.

Power for the control and NR switches is supplied by the user, and is applied at the junction box. Wiring diagrams located at the control and junction box will identify proper connections.

Safety Decals

“Danger-High Voltage” and “Wait 5 Min. After Capacitors Are De-energized Before Entering” will be placed on door barriers of the capacitor compartment, and “Do Not Switch With Elbows” will be placed in the connector compartment.

NOTE: This typical specification is written for 15kV, 95kV BIL. Specs for 25kV or 35kV stations would be similar.