

## GE's Pole-mounted Voltage Regulator

The Pole-mount/platform mount Voltage Regulator (VR-PM) is GE's premium product for voltage control outside the substation and has established the benchmark in the industry for robust design and operational reliability.

The only voltage regulator on the market that is guaranteed to support 2 million switch operations and adheres to the latest IEEE C57.15-2009 and C57.131 standards of 40x rated short circuit current.

Why does this matter? Voltage stability is an increasing challenge to utilities. The economic benefits of voltage management are becoming better understood, especially given the adoption of technologies that can adjust the voltage profiles dynamically. Distributed generation, an increase of loads with variable speed and customer expectation of power quality all contribute towards voltage regulating devices needing to operate more often to keep the voltage in the targeted operational range.

The engineering design, material selection and strict manufacturing processes of the VR-PM Voltage Regulator allow it to be operated in this manner to best serve the operational and economic, interests for the utility.

Unlike other competitive products, the VR-PM Voltage Regulator does not have a required maintenance plan, resulting in one of the lowest total costs of ownership in the industry.

### Key Benefits of the VR-PM:

#### Robust design and low total cost of ownership

- Best in class Load Tap Changer (LTC) switch life, with up to two million operations resulting in up to 20 years of maintenance free usage.
- Superior internal arrester provides optimum surge protection against abnormal voltage surges by leveling the internal stresses in the winding during surge and fault events. Compared to externally mounted arresters, this results in higher reliability and a more stable design as it extends the service life of the unit.
- Forward and reverse power flow measurements for volt/var management on distributed generation feeders

#### Validated design against Industry standards

- Adheres to the latest IEEE.C57.15-2009 Standards (40x rated current). GE performs short circuit testing every year to validate performance.
- Newly designed control cabinet configurable for most control and communications options; meets NEMA 3R and UL50 requirements and testing.
- Seismic certified and can be installed in most applications around the world.
- Rural Utilities Service (RUS) certified.



GE's Pole Mount Voltage Regulator (VR-PM) installed on a platform in a distribution network



The Pole-mounted Voltage Regulator (VR-PM)



Maintenance Free Usage



Switch Operations



40x Rated Current

## Technical Specifications

	STANDARD OFFERING	OPTIONAL OFFERING
<b>Power Ratings</b>	38 - 333kVA (Single Phase Only)	Type A and B Designs
<b>Voltage Ratings</b>	Primary Voltages from 2.5kV through 19.9kV	
<b>BIL Ratings</b>	Primary BIL ratings 60kV to 150kV BIL	110kV BIL
<b>Thermal Rating</b>	Thermal rating of 55°C/65°C rise	
<b>Frequency</b>	60 Hz frequency	50 Hz frequency
<b>Special Ratings</b>		<ul style="list-style-type: none"> <li>• Designs for elevations higher than 3300 feet</li> <li>• Low loss designs available in all ratings</li> </ul>
<b>Insulating Fluid</b>	ANSI Type 2 Mineral Oil	
<b>Tank &amp; Features</b>	<ul style="list-style-type: none"> <li>• Steel construction per C57.15-2009, C57.12 &amp; C57.90</li> <li>• Round, sealed carbon steel tank with durable weather-resistant powdercoat-finish (ANSI No. 70 Gray)</li> <li>• Three cover bushings (S, L, SL) with ANSI clamp-type terminals</li> <li>• Two heavy duty lifting lugs on tank and cover</li> <li>• Black diagrammatic anodized aluminum nameplate on tank and control cabinet</li> <li>• Universal, waterproof, 3/8 inch lockable pad lock, and heavy duty constructed NEMA 3R carbon steel control cabinet with Handle</li> <li>• Control cabinet equipped with universal connector for accepting various control options without modifications</li> <li>• 18" to 36" GE designed creep procelain bushings</li> <li>• 15" radiator panels, 2 bank maximum</li> <li>• Removable, sealed hand-hole cover</li> <li>• One cabinet available control modules by all suppliers</li> <li>• Square base - unit can be used in sub station or on above platform mounting. Hanger Brackets included for pole mounting. Tank grounding (Qty 2 - diagonal opposite on all bases)</li> </ul>	<ul style="list-style-type: none"> <li>• Stainless</li> <li>• Zinc primer and epoxy topcoat finish for corrosive environments.</li> <li>• NEMA 2 or 4 hole spade, SEFCOR 2 or 4 hole, clamp type terminals, 1.00 threaded stud, &amp; H&amp;J vertical or horizontal terminals.</li> <li>• Laser-etched stainless steel namplate</li> <li>• Adjustable control cabinet heater for condensation removal. Bottom entry control cable.</li> <li>• Bird guard for bushings and lightning arresters</li> <li>• Ability to integrate most control modules within the Flex-Connect cabinet. (M6200A, GE 2011B, C, &amp; E, SEL and ICM)</li> <li>• Seismic certified galvanized adjustable sub-base; heights available from 15.5" to 42.5"</li> </ul>
<b>Internal Features</b>	<ul style="list-style-type: none"> <li>• Load Tap Changer (LTC) Switch with expected life of 2,000,000 operations</li> <li>• 65°C rated oven-bonded, patterned, epoxy-coated insulation paper for core and coil assembly</li> <li>• Superior short circuit withstand ability (40x rated current in accordance with latest ANSI C57.15-2009 requirements)</li> <li>• Center-tapped, internally mounted, zinc-oxide series winding bypass arrester with very low failure rate provides superior distribution of voltage stresses across the series winding and protects arrester from physical damage during transportation and service</li> </ul>	<ul style="list-style-type: none"> <li>• 668 Amperage Max</li> <li>• Reverse power flow measurement</li> </ul>
<b>Gauges &amp; Valves</b>	<ul style="list-style-type: none"> <li>• Liquid level sight gauge</li> <li>• 15 to 45 Degree Dial-type position indicator with drag hand and load bonus adjustment for additional current carrying ability</li> <li>• 1" brass oil drain valve, brass minimum oil sight gauge and upper filter press connection for cycling oil</li> <li>• Pressure relief valve (10 psig vent pressure)</li> </ul>	<ul style="list-style-type: none"> <li>• Stainless steel drain valves and oil sampling valves</li> <li>• Temperature gauge (0 to 160°C)</li> </ul>