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# Voltage Sensing Bushings

G&W's Voltage Sensing Bushing (VSB) system is a temperature compensated, built-in, voltage measuring system that eliminates the need for PTs when three phase analog voltage monitoring is required. The VS bushing can be used on both G&W SF6 and solid dielectric (Trident) style switchgear on grounded wye systems through 38kV. Compared to potential transformers, the VS bushing system offers these benefits:

- Significant cost savings
- Cleaner, less cumbersome installation
- Less space required
- Fewer add-on components which could potentially fail
- Installed and tested prior to shipment
- Capable of field recalibration
- One digital output per way for threshold voltage detection

## OPERATION

The VS bushing system utilizes a capacitively coupled screen which is embedded within the epoxy bushing. The low energy output of the screen is amplified by integral circuitry, resulting in a 0-120 VAC analog output suitable for direct connection to any relay, IED or RTU. The circuitry incorporates built-in calibration and temperature compensation which improve accuracy.

## CONSTRUCTION

Bushings are designed to ANSI/IEEE 386 standards with standard apparatus interface accepting conventional 600A elbow style connectors (elbows must be ordered separately).

## APPLICATIONS

Voltage sensing bushings are ideal for applications requiring the sensing of presence (or loss) of voltage on one or all phases of a primary cable. Common applications include automatic transfer and automatic loop restoration schemes. The bushings



▲ Voltage sensing bushings mounted on a padmount SF6 switch.

▶ For solid dielectric switches, all voltage sensing components are built into the epoxy module.



are ideal for submersible vault applications. VS bushings provide a cleaner installation and significant savings compared to using PTs connected to all three phases.

## SPECIFICATIONS

### General Ratings

Use on: Grounded wye systems  
Operating temperature: -40°C to +65°C  
Storage temperature: -50°C to +65°C  
Humidity: 95%

### Input Ratings

Input voltage range (phase-to-phase):  
For SF6 switches: 10.7kV - 38kV  
For Trident switches: 3.7kV - 38kV  
Frequency range: 47Hz - 63Hz

### Output Ratings

Nominal output voltage: 120 VAC  
Number of analog voltage outputs: 3 or 6  
Number of digital outputs: 1 or 2  
Digital pick-up voltage: 90% of Vnom (on all phases)

Digital drop-off voltage: 75% of Vnom (on any phase)  
Maximum burden (per output): 0.06VA  
Voltage accuracy:  
For SF6 switches: +/- 2% from 0°C to 65°C and +/- 5% from -40°C to 0°C.  
For Trident switches: +/- 3% from -40°C to 65°C.  
Voltage signal delay: 1/2 cycle max

### Calibration

Communication port: RS 232  
Communication protocol:  
- Hyper Terminal  
- Windows XP