

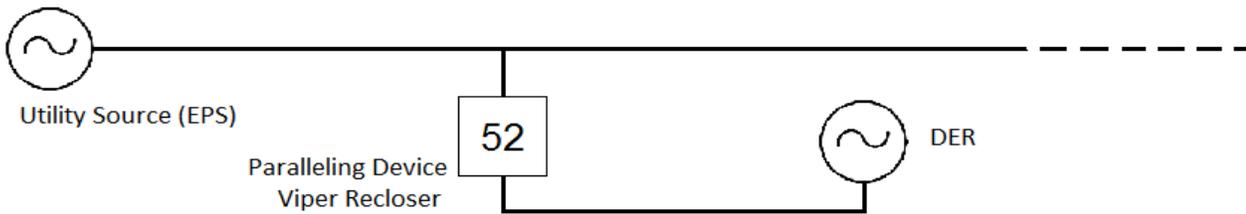
## Paralleling devices between DER and EPS

### Using Viper Reclosers or Trident Switches for interconnection between Distributed Generation and Utility System

#### Introduction

A paralleling device interties a Distributed Energy Resource (DER) with the utility's Electric Power System (EPS) as defined per the IEEE 1547 standard. The paralleling device is open when isolating the DER from the grid and closed when integrating the DER into the grid.

When the DER is isolated from the EPS, the paralleling device must be able to withstand an 180° out-of-phase condition across the open gap for an indefinite duration. The IEEE 1547 standard requires a 110% over-voltage withstand from each source. This corresponds to a 220% line-to-ground voltage across open contacts of the paralleling device. In a 38kV system, this 220% line-to-ground voltage equates to 48kV. (See below)



#### Viper Validation

G&W Electric, in partnership with a major utility, performed and successfully passed a 24 hour out-of-phase 48kV withstand voltage on a 38kV Viper-ST in the open position at a recognized US laboratory. The Vipers are the first reclosers of its kind to pass and publish validation for such paralleling applications.

G&W switchgear can be used in paralleling applications only in steady states where the device must remain open while the two sources are not synchronized. Per standard, reclosers and fault interrupters are not designed to make and break out-of-phase fault conditions. The IEEE 1547 also calls for a second isolation point to provide a lockable visible break. This second open point is recommended during generator starting sequences.

#### Summary

Over the years G&W switchgear has become a top choice for many utilities' intertie applications. Paralleling schemes can also be implemented using our Trident switches for underground applications as they share the same solid dielectric technology. For padmount and vault applications, the Trident with SafeVu provides the visible break required by the IEEE 1547 standard. G&W Viper reclosers and Trident switches keep adding value to customers as they are now validated to complement DER strategies in paralleling applications.

# Overhead Automatic Transfer with Overcurrent Protection

### Features

- High speed automatic transfer switching with overcurrent protection
- Distance between preferred and alternate sources is limited only by communication link selected.
- Communication can be via cable, fiber optic or wireless.
- Directional overcurrent protection
- Battery backup and sophisticated battery monitoring
- SCADA inputs/outputs
- DNP 3.0 available
- Total restoration time (using an Open before Close transition) in as little as 8 cycles\*
- Verification of switch status before operation eliminates the possibility of paralleling sources
- User selection of transition sequence
- Complete events recorder with time/date stamp
- Delay timers for initial and return transfer
- Option for dead-line operation

\* Communication devices and transfer delay timers will affect the total restoration time.

### Ratings

Maximum Design Voltage, kV.....	15.5.....	29.2 .....	38
Impulse Level (BIL) kV.....	110.....	125.....	150
Continuous and Load break Current, A .....	800 .....	800 .....	800
8 Hour Overload, A .....	960.....	960 .....	960
Interrupting Current, kA rms sym. ....	12.5 .....	12.5.....	12.5
Making Current, rms asym. kA .....	20.....	20.....	20
Peak, asym. kA.....	32.....	32.....	32
Mechanical Endurance, Operations.....	10,000 .....	10,000 .....	10,000

For more information:  
Contact your local G&W Electric representative or visit us at [www.gwelec.com](http://www.gwelec.com).

### Conclusion

If an overcurrent is detected on the load side of the system, the 351-R control will engage its overcurrent protection logic and override the automatic transfer sequence. This gives the user the benefits of both recloser overcurrent protection and high speed automatic source transfer in one package.

This solution simplifies the number and variety of distribution system components as well as providing a significant cost savings. It is one example of G&W's pre-engineered LaZer™ family of automation solutions.