

# HID

## HIGH IMPEDANCE DIFFERENTIAL MODULE

Auxiliary resistors and varistors for high impedance differential schemes

### KEY BENEFITS

- Includes 2000-ohm resistors to provide security against the effects of CT saturation for through faults
- Provides metal oxide varistors (MOV) to clamp secondary peak voltage to less than 2 kV
- Use the HID in conjunction with an overcurrent relay for a separate phase, neutral, and negative-sequence overcurrent elements, including instantaneous, definite-time, and inverse time-overcurrent elements for backup overcurrent protection.

### APPLICATIONS

- Single-zone bus protection, reactor protection, or sensitive restricted earth fault protection on grounded, wye-connected power transformer windings
- High impedance differential protection for electrical machines such as generators or motors, including lockout logic.

### Overview

High Impedance Differential protection is a well-known principle where stabilization resistors provides immunity against CT saturation during external faults. The HID module provides resistors together with voltage limiters (MOV) to be used with high-speed overcurrent relay in order to get a high impedance differential protection scheme. External CT's are differentially connected exactly as for traditional high impedance differential protection relaying.

The overcurrent-relay unit connected in series with the resistors provides high-speed operation for bus faults involving high-magnitude currents. A voltage-limiting element is connected in parallel to avoid excessively high CT secondary voltages which can damage current inputs when bus faults occurred.

The procedure for determining the necessary adjustments and the resulting sensitivity to low-current bus faults is very simple and straightforward, requiring only knowledge of the CT secondary excitation characteristics and their secondary impedance.

All CTs must have the same rating, and should be a type, like a bushing CT with a distributed secondary winding, that has

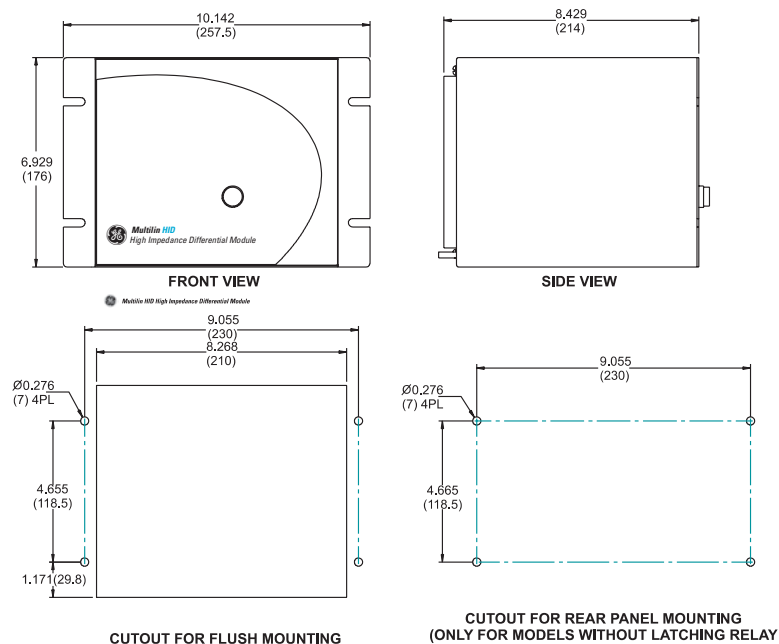
little or no secondary leakage reactance. A latching relay is incorporated, whose contacts are connected to short circuit the resistors once the associated relay has tripped, preventing damage to the associated MOVs.

The HID frontplate incorporates a Reset pushbutton to reset the latching relay once the fault has been cleared, in order to elimi-

nate the resistors short circuit.

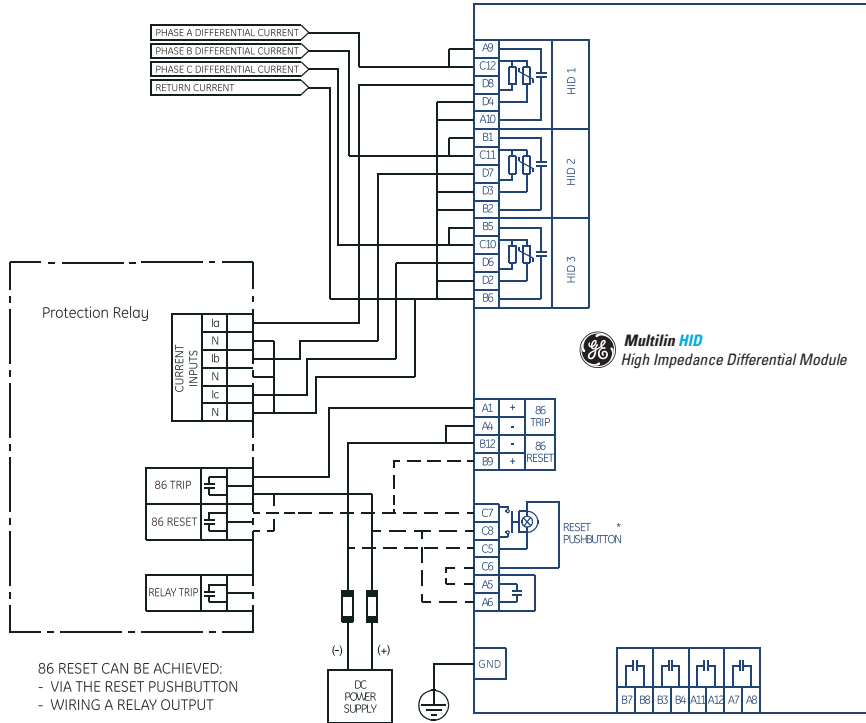
The combination of HID module with a high speed overcurrent relay can be applied for bus protection in most cases where CTs having negligible leakage reactance are used. This generally includes any kind of current transformers with a toroidal core if the windings (on the tap used) are completely distributed about the core.

### Dimensions



## Typical Wiring

Bus Protection



## Ordering

HID	*	*
Application	1	1 winding transformer REF - 1 resistor + 1 MOV
	2	2 winding transformer REF - 2 resistors + 2 MOV
	3	Busbar Applications 3 High impedance differential elements
Latching relay / Power supply	0	Without latching relay
	1	48 Vdc latching relay
	2	125 Vdc latching relay
	3	220 Vdc latching relay

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