

# Multilin 859

## Comprehensive, Compact Motor Protection & Management for Medium and Large Motors

The Multilin 859 relay is a member of the Multilin 8 Series protective relay platform, designed for the protection, control and management of medium and large power rating induction motors. It has been designed for space constrained applications, where a shallow depth is required, or as a direct replacement for existing Multilin 169, 269, 269Plus and 369 motor protection relays.

Utilizing the same field proven hardware and protection and control algorithms of the Multilin 8 Series, the 859 delivers advanced features including high-speed protection, customizable programmable logic, and advanced motor monitoring and diagnostics - all in a fixed mount, slim design.

With extensive communication capabilities the 859 easily integrates into new or existing process control systems, enabling operationally focused motor management and control.

### Key Benefits

- Utilizing GE's proven Thermal Model for reliable protection of AC induction motors
- With a depth of 3.5", the 859 is ideal for MCCs with shallow depths or space constraints
- Detachable display can be mounted up to 15 feet away from the device, allowing for greater installation flexibility
- Large graphical color LCD display for enhanced operability, with user-configurable single line diagrams for local control, system status and metering
- Integrated condition monitoring based on Electrical Signature Analysis to deliver detailed motor health monitoring and Predictive analytics to increase motor life
- CyberSentry™ Advanced Security including features such as AAA, Radius, RBAC, and Syslog, helping to enable NERC® CIP compliance
- Safe and reliable motor re-start on 'down hole' pump applications. Unique back spin detection feature detects flow reversal on a pump motor, enabling timely and safe motor restarting
- Single setup & configuration software, reducing training & commissioning time
- Customer Support available 24/7, available in multiple languages

### Applications

- Suitable for Medium to Large HP Induction Motors (typically; 500kW-1MW, 650-1300 HP) found in oil & gas, mining & metals, cement, and wastewater applications
- Medium to large two-speed, VFD-driven and cyclic loading motors
- For high inertia loads and reduced-voltage starting motors
- Retrofit solution as a direct replacement (same mechanical form factor) for Multilin 169, 269, 269Plus and 369 series relays



## Innovative Technology & Design

- Proactive motor health diagnostics with Electrical Signal Analysis for electrical, mechanical and thermal monitoring
- Advanced, flexible and embedded communications: IEC® 61850 Ed2, IEC 62439/PRP, Modbus® RTU & TCP/IP, DNP3.0, IEC 60870-5-104
- Designed with an IEC62443 4 1:2018 certified Secure Development Lifecycle Process

## Ease of Use

- Single setup and configuration software across the 8 Series platform
- Automated and simplified settings file conversion of legacy GE devices
- Installation flexibility - Remote display and remote RTD (RRTD) options

## Quality & Reliability

- IPC A-610-E Class 3 manufacturing standards to ensure device quality and reliability
- Environmental board level stress screening and full functional testing
- Standard harsh environmental coating for added reliability

## Uncompromising Service & Support

- Covered under GE's 10-year warranty



## Retrofit Solutions

The Multilin 859 has been designed as a direct replacement and upgrade, matching the height, width depth, to older Multilin 169, 269, 269Plus and 369 protection and control devices.

The 859 fits the same mechanical cutout and uses the same terminal blocks as existing 369 relays, eliminating the need to rewire the device. For other relays, one-to-one wire maps are provided to reduce installation and commission times.

The 859 eliminates the need to modify existing cut-outs or wiring, and does not require re-engineering or drawing changes. The unified 8 Series setup and configuration tool further simplifies the upgrade process with automated setting file conversion, minimizing system downtime and commissioning time.

### Easy 3-Step Process to Upgrade from 369 to 859, in as fast as 30 minutes



EnerVista 8 Series Setup Software provides automated setting file conversion. Once completed, the relay provides a graphical report to verify and call out any specific settings that might need attention

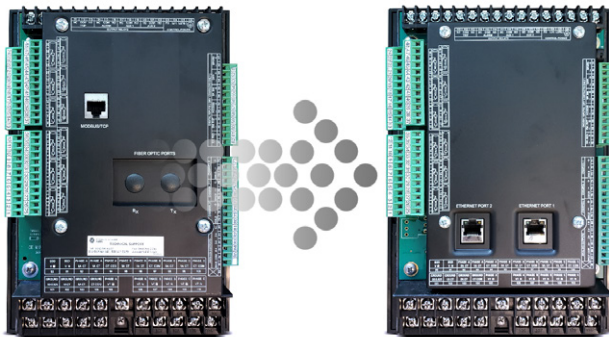
Simply unplug left and right terminal connectors and unscrew the upper and lower terminal wires to remove the 369 relay from the panel. No need to disconnect any of the field wiring\*

Mount the new 859 relay into the switchgear, plug in the old terminal blocks and reconnect the upper and lower terminal wires – there is no need to make any cut-outs modifications or push and pull old cables



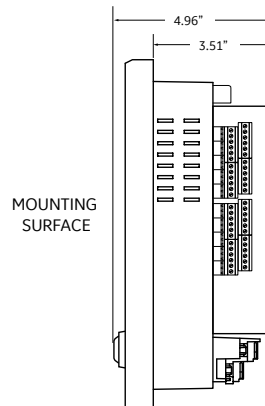
169, 269Plus and 369 relays

*\* The panel and all wiring must be deenergized and safety procedures followed*



369 Back view

859 Back view



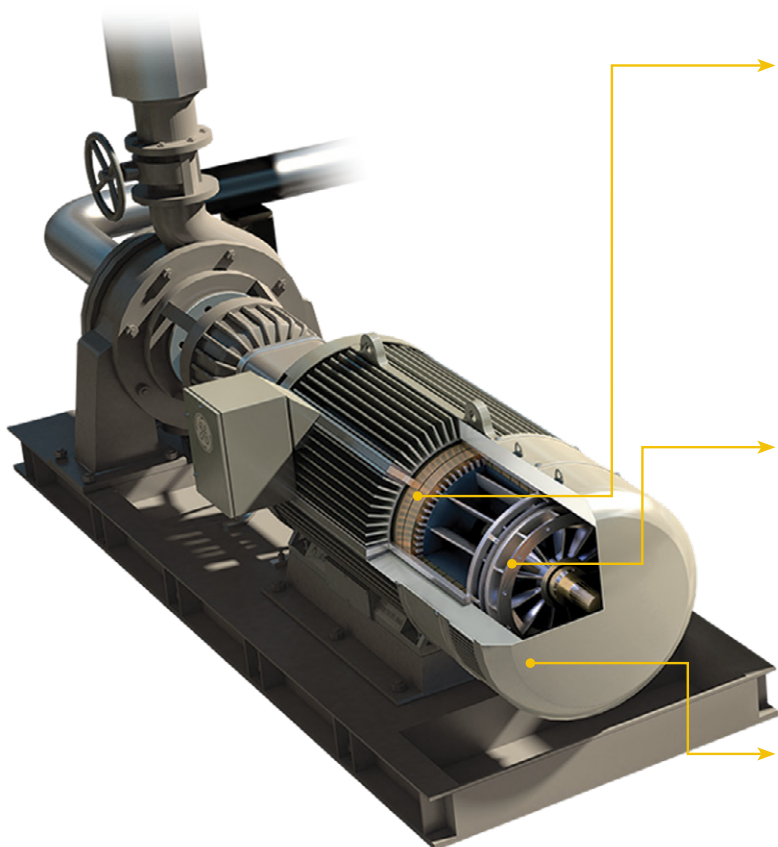
Dimensions of 859: same cutout as 169, 269Plus and 369.

## New Build Installations

The 859 is equally as powerful in new installations as it is for retrofits. The shallow depth behind the panel facilitates ease of mounting, plus the graphical HMI, control and annunciation capabilities serve to reduce the need for peripheral equipment mounted in the panel. The protection and control features carry the strong Multilin design heritage, reducing training requirements for personnel.

## Advanced Motor Monitoring & Diagnostics

Integrated, cost effective monitoring and diagnostic features that leverage existing relay data without the need for additional devices or sensors to detect electrical, thermal or mechanical abnormalities before they become critical motor failures.



### Electrical Abnormalities

If undetected, insulation failure can evolve into phase or ground faults, causing equipment damage or loss, and significant unplanned downtime. The 859's advanced motor monitoring and trending capabilities provide identification of critical electrical conditions including:

- Stator inter-turn insulation failure
- Phase-phase insulation failure
- Stator ground failure
- Loss of load/process
- Unbalance current
- Power factor
- Under/Over frequency

### Thermal Abnormalities

The 859 continuously and proactively monitors the motor for Thermal Capacity Used (TCU) to provide early warning of thermal stresses including:

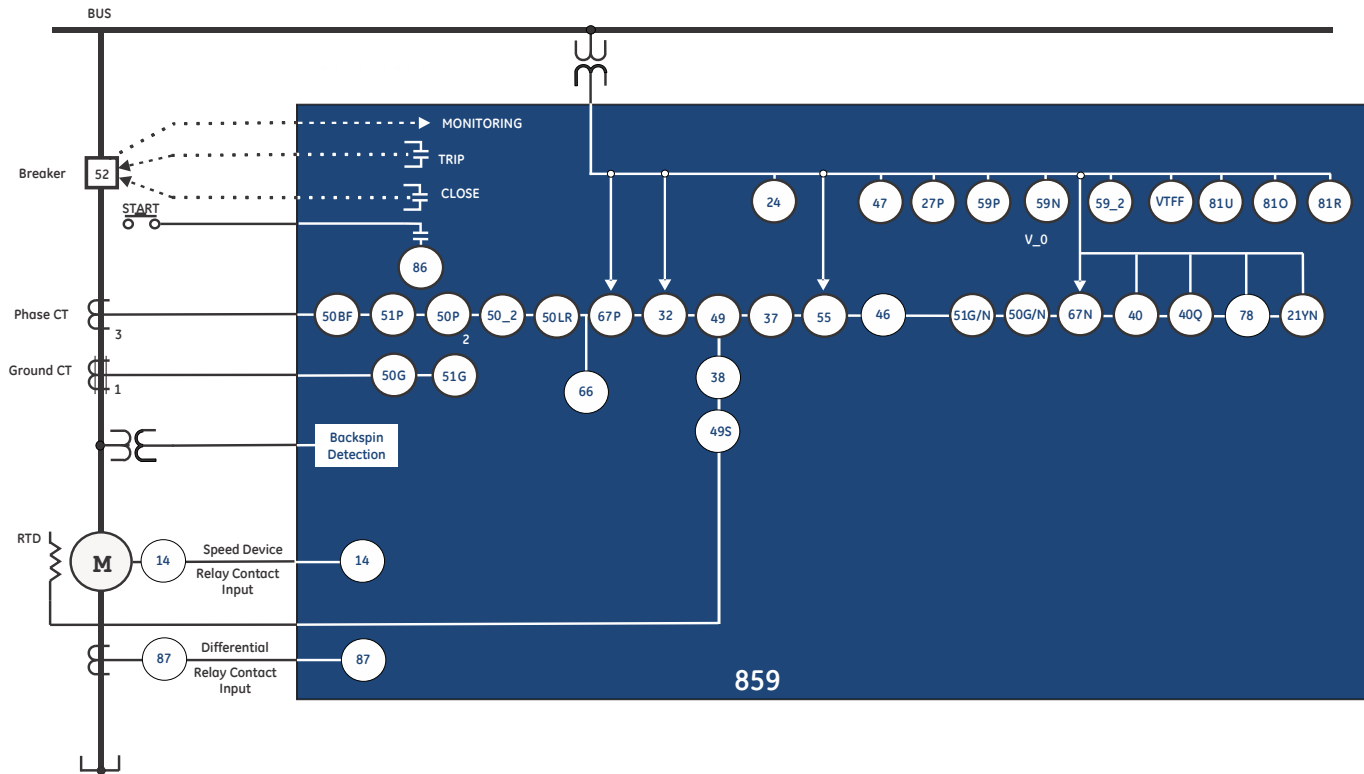
- Extreme starting conditions
- Ambient temperature
- Forced cooling stops
- Harmonics
- Single phasing
- Unbalance current
- Increase load
- Locked rotor

### Mechanical Abnormalities

Without the need for additional sensors or probes, the 859 utilizes GE's patented Electrical Signature Analysis (ESA) / Motor Current Signature Analysis (MCSA) to identify mechanical abnormalities in the motor including:

- Broken rotor bar
- Bearing failure
- Mechanical jam
- Static & dynamic eccentricity
- Foundation looseness
- Misalignments

# Functional Block Diagram



## ANSI® Device Numbers & Functions

ANSI DEVICE	DESCRIPTION
12/14	Over Speed Protection/ Under Speed Protection
21YN	Neutral Admittance
24	Volts per Hertz
27P	Phase Undervoltage
32	Directional Power
37	Undercurrent
37P	Underpower
38	Bearing RTD Temperature
40	Loss of Excitation
40Q	Reactive Power
46	Current Unbalance
47	Voltage Reversal
48	Incomplete Sequence
49	Thermal Model
49S	Stator RTD Temperature
50BF	Breaker Failure
50G	Ground Instantaneous Overcurrent
50SG	Ground Fault
50LR	Mechanical Jam

ANSI DEVICE	DESCRIPTION
50N	Neutral Instantaneous Overcurrent
50P	Phase Instantaneous Overcurrent
50_2	Negative Sequence Instantaneous Overcurrent
51G	Ground Time Overcurrent
51N	Neutral Time Overcurrent
51P	Phase Time Overcurrent
52	AC Circuit Breaker
55	Power Factor
59N	Neutral Overvoltage
59P	Phase Overvoltage
59X	Auxiliary Overvoltage
66	Maximum Starting Rate
67N	Neutral Directional Element
67P	Phase Directional Element
81O	Overfrequency
81U	Underfrequency
81R	Frequency Rate of Change
86	Start Inhibit
VTF	Voltage Transformer Fuse Failure

## Other Functions

OTHER
Backspin Detection
Undervoltage Restart
Autorestart
Advanced Electrical Signature Analysis
Stator Turn-Turn
Broken Rotor Bar
Breaker Arcing
Breaker Health Report
Speed Switch
Current Demand
kW Demand
kvar Demand
kVA Demand
Starter Failure
Motor Health Report
Motor Start Report
Digital Elements
Motor Learned Data
Data Logger
Harmonics
THD

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