



Expertise Applied | Answers Delivered

HVAC/R PRODUCT CAPABILITIES

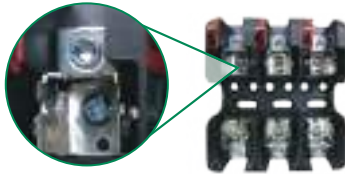


GOING BEYOND SUPPLIER TO BE YOUR SOLUTION PARTNER

Easy-to-Use Screw Head Type

Simplifying tightening process to help eliminate assembly errors

A major OEM approached Littelfuse indicating that they were having challenges with their installation tightening processes. Littelfuse designed a hex-screw head that would be better suited for their automated assembly, simplifying the tightening process and reducing assembly errors.



Custom Temperature Sensing

Enabling peak system efficiency

A rooftop unit manufacturer was able to significantly reduce wasted energy by using custom-designed temperature sensors on the refrigerant pipes to control the defrost cycle of a heat pump. The sensors provided fast thermal response and helped reduce energy consumption.



Customized Timing

Saving cost of potential lost inventory due to accidental manual override

Multiple large OEM companies requested a customized three-phase voltage monitor without a manual reset option from the manufacturer to protect what's inside their refrigeration racks. This forced a time-delayed restart by eliminating the possibility of the rack accidentally waiting on a manual reset.



Adaptive Fan Control

Helping to maximize energy efficiencies

A delay-on-break timer monitors the system run time and determines how long the delay-on-break time delay should be. The longer the system runs, the longer the fan runs. This custom solution maximizes the system's heating and cooling by pulling as much conditioned air out of the duct work as possible making the system more efficient and reducing energy costs.

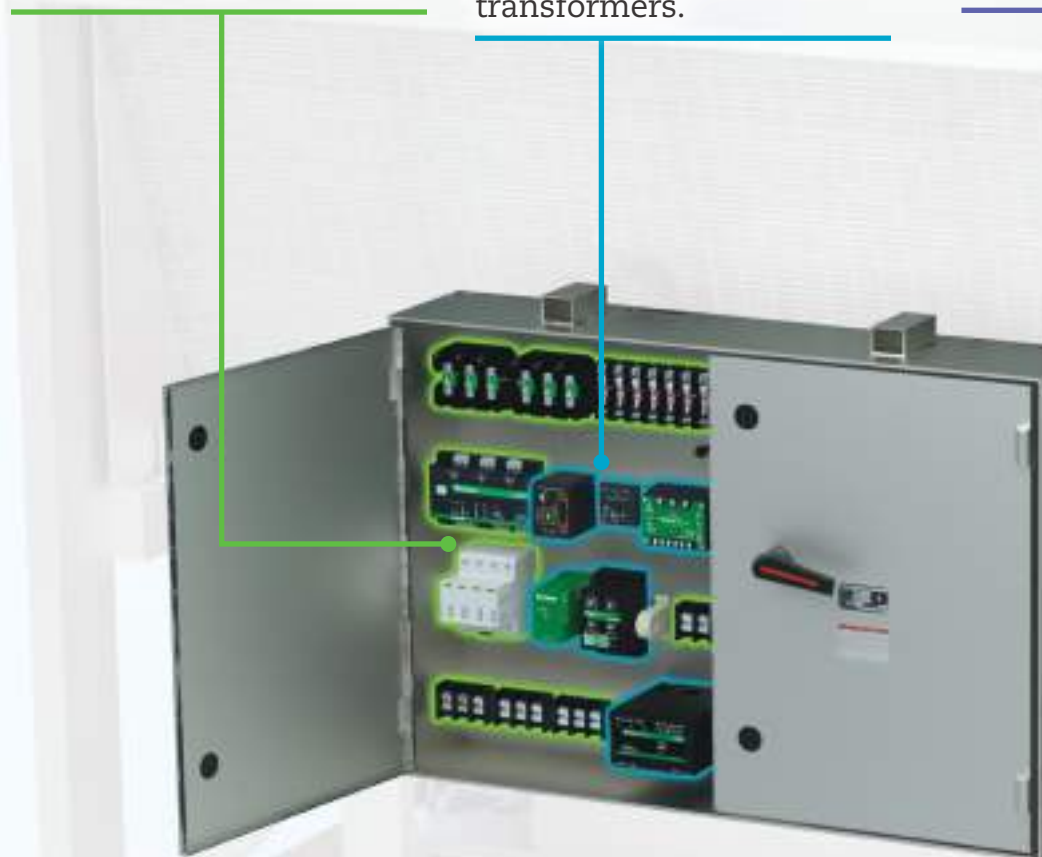


3 REASONS TO CHOOSE LITTELFUSE

PROTECT your brand reputation by including current-limiting fuses, arc-flash protection, motor protection relays, and surge protective devices.

CONTROL loads can increase system efficiency with time delay and current monitoring, mechanical and solid-state relays, contactors, capacitors, and transformers.

SENSE temperature more accurately and reduce cycle time with customized, easy-to-install NTC and RTD temperature sensors and reed sensors.



Backed with nearly 100 years of experience, leading brands rely on Littelfuse for their critical HVAC/R system needs. As a design partner, our dedicated team can help you select the right combination of solutions from our extensive product portfolio.

PROTECT

UL Class Fuses

Littelfuse UL Class fuses offer quality overcurrent protection for all kinds of HVAC load conditions. These fuses are chosen over circuit breakers due to their higher amperage in a smaller package, quicker response time, and no calibration requirements.

- Available in both indicating and non-indicating versions
- Best-in-Class current-limiting performance available in Class RK5
- High interrupting rating (up to 300 kA)



Littelfuse.com/IndustrialPowerFuses

Class CC and 10 x 38 mm Fuses

UL Listed CC/CD fuses offer extreme current-limitation in a space-saving design and are available up to 60 A. The 10 x 38 mm style fuses offer supplementary protection in a wide range of ampere ratings to meet the needs of a variety of applications.

- Saves 45 %-75 % space
- Fast-acting and time-delay performance
- High-interrupting rating



Littelfuse.com/IndustrialPowerFuses

High-Speed Fuses

QS series fuses reduce the energy let-through by up to 70 % over previous generation high-speed semiconductor fuses. Our experts have designed high-performance silver fuse elements that combine with a hardened silica filler to provide enhanced HVAC system protection.

- Less energy wasted during operation
- Laser-etched resistance values to eliminate labels that erode over time
- Universal mounting adapts to wide variety of configurations



Littelfuse.com/Power-Speed

Fuse Blocks and Holders

Enable easy fuse installation and replacement with our extensive line of fuse blocks, fuse holders, and fuse accessories.

- Compact design provides space savings
- Universal and DIN-rail mounting with optional DIN-clip covers
- Snap to release—no tools required



Littelfuse.com/FuseBlocks

Power Distribution Blocks

Integrated touch-safe covers provide protection against accidental shorting between poles caused by loose wires, tools, or other conductive material. They also safeguard personnel from accidentally contacting energized connectors.

- Meets UL standards
- Space-saving designs
- Mounts to DIN rail or panels



Littelfuse.com/FuseHolders

Voltage and Phase Monitors

Prevent motors from running with no load applied and provide protection due to blown fuses, broken wires, or worn contacts. The monitors help to prevent damaged machinery and injury of personnel.

- Protects against phase loss and reverse phase
- Low- and high-voltage trip
- Unbalanced voltage protection



Littelfuse.com/VoltageMonitoringRelays

Enhanced Overload Relays

Enhanced overload relays combine voltage and phase protection with underload and overload protection for motors. Protect motors from conditions resulting in motor windings overheating and burning insulation.

- Monitors over and under voltage and unbalanced voltage
- Real-time voltage and current readings and fault codes
- Optional communications allow connection to remote monitoring.



Littelfuse.com/MotorProtection

Surge Protective Devices (SPDs)

Surge protective devices (SPDs) provide equipment protection from transient overvoltage events lasting micro-seconds. By limiting the overvoltage to the equipment during these events, costly damage and downtime can be mitigated.

- Provides thermal protection to eliminate catastrophic failure
- Visual indicator quickly identifies service requirements to avoid loss of protection
- Compact footprint increases design flexibility



Littelfuse.com/SPD



CONTROL

Industrial Solid-State Relays

Get superior uptime, safe and reliable performance for frequent on/off switching.

- Overvoltage protection ensured with Littelfuse TVS Diodes
- Up to 3x more life stress cycles than competition

Littelfuse.com/SSR



Current Monitoring Relays

Littelfuse monitoring relays provide over and under current sensing with adjustable trip delays. These relays protect against single-phasing and current unbalance problems that can be caused by voltage supply problems, bad contactors, loose wiring, bad wires, or damaged motors.

- Self-powered for use as ac current proof relay
- Available with fast-on terminals for quick installation
- Monitors up to 200 A loads

Littelfuse.com/CurrentMonitoringRelays



Mechanical Relays

Ideal for HVAC applications, general-purpose relays are actuated with an electro-magnetic current, creating a closed circuit.

- Available in industry-standard sizes
- Environmentally friendly design is RoHS Compliant



Littelfuse.com/MechanicalRelays

Time Delay Relays

Protect HVAC/R equipment from damage caused by rapid cycling of compressors. The Littelfuse SSAC line of timers include delay-on-make, delay-on-break, dual function, multifunction, and lockout functions.

- Provides brownout protection and prevents low-voltage start ups
- Encapsulated to guard against shock, vibration, and humidity
- Replaces thousands of competitive models



Littelfuse.com/Timers

Contactors

Acting as an on/off switch controlled by thermostats, contactors are designed with consistent silver thickness for increased product life, making them ideal for the demands of commercial and residential HVAC applications A2L Compliant.

- Double E magnet assembly for optimal performance with reduced power use
- One piece terminal design meets NEMA standard for spacing without insulated terminals
- Auxiliary switch part numbers available that fits all Hartland Controls 3-pole contactors



Littelfuse.com/DefinitePurposeContactors

Capacitors

Engineered to boost the current or reduce the power factor to an electrical motor, run capacitors feature single and dual rated values, as well as round or oval case options.

- Aluminum case, oil-filled construction for motor run applications
- Hard start kits for compressor or refrigeration unit applications



Littelfuse.com/MotorRunCapacitors

Transformers

Engineered to change one ac voltage to another by magnetic induction, heavy-duty transformers are available with primary and secondary voltages between 20 to 500 VA.

- Application-specific designs are available
- Engineered to run more efficiently



Littelfuse.com/Transformers

SENSE

NTC Thermistor Pipe Sensors

Negative temperature coefficient (NTC) thermistor pipe sensors are ideal for measuring temperature on pipe surfaces, enabling better control of heating/cooling functions to drive energy efficiency.

- Moisture resistant
- Supplied with copper-plated mounting clips, with custom options available for dimension requirements
- 105 °C max operating temperature



Littelfuse.com/TempSensors

Temperature Sensors with Aluminum Housings

Littelfuse offers aluminum probe housings engineered for a wide range of HVAC temperature sensing applications. Customized solutions tailored for your needs are available by request.

- Suitable for a wide range of temperature sensing applications
- Temperature sensing element available that best fits your needs, along with other physical properties (lead wire type, termination, etc.)



Littelfuse.com/TempSensors

Water Immersion Temperature Sensors

Custom temperature sensors using NTC or resistance temperature detector (RTD) technology with threaded or sealed housings are ideal for measuring water temperature in tanks or a process flow.

- Available in a variety of housing types for potable water and other applications
- Temperature sensing element and other physical properties available to best fit your needs



Littelfuse.com/TempSensors

Reed Switch Position Sensors

Littelfuse offers a wide variety of reed sensors in both standard and custom packages for simplified mounting and connecting to detect position. Plus, these sensors are sealed from the outside environment for maximum robustness.

- Zero power consumption
- Contactless position sensing
- Sensing element available that best fits your needs, along with other physical properties (lead wire type, termination, etc.)



Littelfuse.com/TempSensors



What's the **Best Fit** For Your Application?

APPLICATIONS	PROTECT								CONTROL							SENSE		
	UL Class Fuses	Class CC & 10 x 38 mm Fuses	High-Speed Fuses	Fuse Blocks & Holders	Power Distribution Blocks	Voltage and Phase Monitors	Enhanced Overload Relays	Surge Protective Devices	Industrial Solid-State Relays	Current Monitoring Relays	Mechanical Relays	Time Delay Relays	Contactors	Capacitors	Transformers	NTC Sensors	RTD Sensors	Reed Sensors
Air Handling Units	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Rooftop Systems	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Screw/Scroll Compressors	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	
Chillers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Furnace Manufacturers	•	•		•	•		•		•	•	•	•	•	•	•	•		
Heat Pumps	•	•		•	•	•		•		•	•	•	•	•	•	•	•	
Walk-In Fridge/Freezers	•	•		•	•	•	•	•		•	•	•	•	•	•	•	•	•
Refrigeration Racks	•	•		•	•	•	•	•		•	•		•	•	•	•		•
Fixed Speed Compressors	•	•	•	•	•	•	•	•		•						•	•	
Vending Machines		•		•	•											•		•
Wall Thermostats																•		•
AC Condensing Units	•	•		•	•			•		•		•				•	•	•
Split Systems	•	•		•	•			•		•		•				•	•	
Boilers	•	•		•	•				•	•	•		•	•	•	•		
Water Heaters	•	•		•	•						•		•	•	•	•		
Tankless Water Heaters	•	•		•	•				•							•		
Air Ducts	•	•		•	•											•	•	

Because we know quality matters when selecting products for your design, our engineers build our components to the highest industry standards. Littelfuse is committed to exceptional customer value through our relentless pursuit of zero defects and operational excellence in everything we do.

MROplus™ Material Reduction Opportunity Program

The Littelfuse exclusive MROplus program helps customers lower costs, increase plant safety, decrease downtime and reduce inventory. In this industrial fuse consolidation program, our Technical Support Group analyzes a fuse inventory list and generates detailed reports to ensure the best circuit protection is being used. This decreases the risk of electrical hazards within your facility and saves time and money by optimizing inventory. All you have to do is complete a request form with your current fuse inventory and the MROplus program creates a custom recommendation for you. Best of all...it is absolutely FREE!

What can MROplus do for you?

Lower Costs

MROplus helps you upgrade circuit protection, increase safety, reduce fuse inventory, decrease downtime and improve productivity. These improvements amount to money saved towards your bottom line.

Improve Safety

Identify inadequate fuses and upgrade them to current-limiting circuit protection to reduce Hazard Risk Categories (HRC) in any type of facility. In accordance to NFPA 70E, after reducing HRC, workers are permitted to wear less Personal Protective Equipment (PPE) allowing repairs to be made quickly which minimizes time spent in live panels.

Decrease Downtime

Improve productivity with MROplus by converting to indicating fuses and consolidating inventory. Indication takes the guesswork out of fuse replacement with fast, visible identification, resulting in time and money saved.

Reduce Inventory

Eliminate duplicate or obsolete products and maintain only the fuses necessary for operation. This reduces SKUs, gets rid of waste and ensures the best protection available. Refer to the Fuse Consolidation Guide below to see how this is done.

Learn more at Littelfuse.com/MROplus



FUSE CONSOLIDATION GUIDE

If you have **THIS** fuse...

CLASS RK1 (600 V)	CLASS RK5, H, K (600 V)	CLASS RK5, H, K (250 V)	CLASS J	CLASS CC (Time Delay)
Littelfuse LLSRK	Littelfuse FLSR	Littelfuse FLNR	Littelfuse JTD	Littelfuse FLM
Littelfuse KLSR*	Littelfuse NLS*	Littelfuse NLN*	Littelfuse JLS*	Littelfuse FLQ
Bussmann LPSRK	Littelfuse RLS*	Littelfuse RLN*	Bussmann LPJ	Bussmann LPCC
Bussmann KTS(R)*	Bussmann FRS	Littelfuse KLNK*	Bussmann JHC	Bussmann FNM
Mersen A6D(R)	Bussmann NOS*	Bussmann FRN(R)	Bussmann JKS*	Bussmann FNQ
Mersen A6K(R)*	Bussmann RES*	Bussmann NON*	Mersen AJT	Mersen EDCC
	Mersen TRS	Bussmann REN*	Mersen A4J*	Mersen MEN
	Mersen OTS*	Bussmann KTN(R)*		Mersen MEQ
	Mersen RFS*	Mersen TR		
		Mersen OT*		
		Mersen RF*		
		Mersen A2K(R)*		

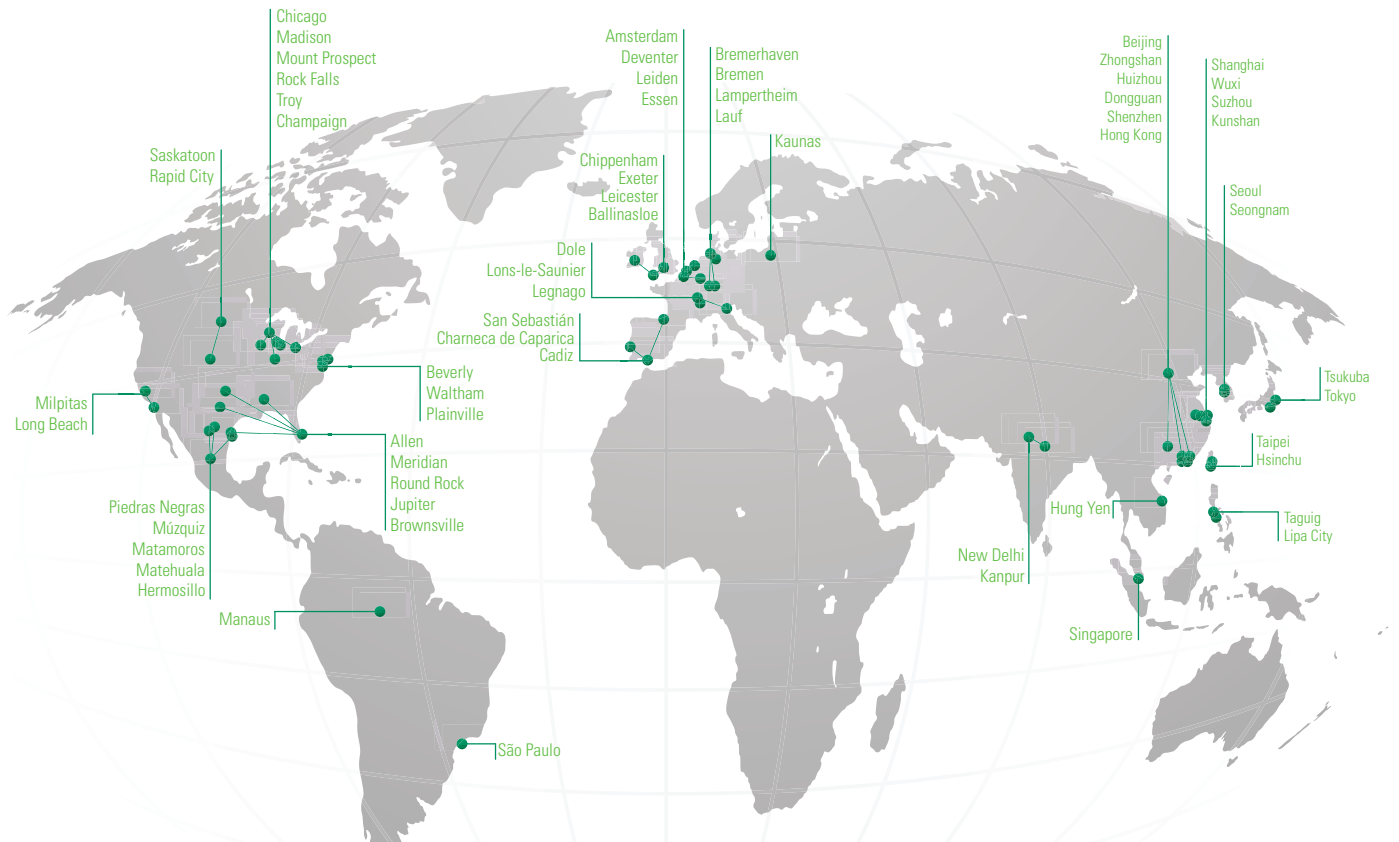
...consolidate with **THIS** fuse

LLSRK_ID	LLSRK_ID	LLNRK	JTD_ID	CCMR
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*Consult Article 430 of the NEC** when substituting for loads with motors, or call 1-800-TEC-FUSE.

** NEC is a trademark of its respective owner.

LOCAL RESOURCES FOR A **GLOBAL** MARKET



Littelfuse.com/HVAC

For a comprehensive library of resources including datasheets, product manuals, white papers, application guides, demos, online design tools, catalogs, and more, visit **Littelfuse.com/TechnicalResources**

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Littelfuse Startco
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(The Galleria Building)
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Tel: +1-306-373-5505

Hartland Controls now part of Littelfuse
807 Antec Road
Rock Falls, IL 61071, USA
Tel: +1-815-626-5170

Fuse and Relay

Technical Support:
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Littelfuse products are certified to many standards around the world. To check certifications on specific components, please refer to the specific product datasheet on Littelfuse.com.

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