

281°F ETL® • Electro Thermal Link®

The **Electro Thermal Link [ETL®]** is a multi-purpose, *dual* response fusible link / release device. The fusible link portion functions identically to an *ordinary* fusible link - *ambient* temperature nearing the *rated* temperature causes the low temperature alloy to melt, allowing the link halves to separate. The ETL® can also be actuated by an *electrical* impulse. A 0.2 ampere *minimum* trip current applied for a 50 millisecond *minimum* duration starts an *irreversible* chemical reaction that melts the fusible alloy and causes link separation in 6 to 10 seconds at standard temperature. The ETL® was designed to substantially improve life safety and minimize property damage by providing both *ordinary fusible link response in the event of fire* along with the capacity to *instantaneously* respond to *any* type of fire, smoke, infrared, light detector (etc.) capable of supplying a short duration current impulse. The design allows for ETL® substitution or retrofitting of ordinary fusible links and other actuators or release devices installed in: dampers; doors; roof hatches; towers; extinguishing systems, and inert chemical or gas release systems. An inherent major advantage of the ETL® over other products is the *dually redundant* dormancy – it draws no current and stays inertly in place until actuated, then functions and separates in seconds. The ETL® is designed and intended FOR INDOOR (or sheltered) DRY USE ONLY. The ETL® is a device manufactured to exacting space age standards.

Technical Description

The 281°F ETL® is a fusible link / release device with a 281°F (138°C) nominal temperature rating and a **40 pound (18 KG) maximum continuous – 7 pound (2.268 KG) minimum continuous** tensile End pull weight rating at standard temperature. *Additionally*, it contains a bridge wire initiated pyrotechnic heating element requiring a fifty (50) millisecond minimum duration all fire current of 200 millamperes (0.2 ampere) within a voltage range of 6-30 VAC/DC (NEC Class 2, low voltage). The fusible link portion is a nominal 1" (25.4 mm) X 3 1/8 (79.4 mm) X 1/2" (12.7 mm) envelope with 1/2" (12.7mm) square reinforced openings at the ends to allow attachment of "S" hooks, straps, or other attachments. An 11/16" (17.3 mm) diameter x 1 1/4" (31.7 mm) protruding cylinder containing the pyrotechnic heating element and attachment wires (UL® 1018 Wire Class 1) and provides a means to attach a standard EMT conduit connector adapter to any combination 1/2" (12.7 mm) EMT; or 3/8" (9.5 mm) or 1/2" (12.7 mm) flexible conduit, thereby meeting any requirements such as National Electric Code specifications for 'Wiring in Ducts, Plenums, and Other Air Handling Spaces.' The ETL® has a forty (40) pound maximum continuous tensile strength at standard temperature, which can only be achieved in installations where the link is subject to equal linear tension from both ends.

Electrical Characteristics

The ETL® contains a bridge wire initiated pyrotechnic heating element. The 14u bridge wire has a nominal resistance of **10 to 30 Ohms**. The bridge wire is multi-purpose, serving as the ignition source for the chemical heater core and providing a method for non destructive testing. The design of the bridge wire has been optimized, requiring minimal energy to function while remaining safe to handle, transport and install.

Care should be exercised in handling and installing the ETL® with particular attention to the following electrical characteristics: Avoid proximity to electrostatic discharge or heavy induction fields. Keep the lead wires twisted or otherwise shunted unless performing resistance checks or until making final connection. Keep the ETL® inside the packaging box when not in use, protect it from unwanted accidental exposure to stray current such as radio transmission fields; electric motor induction fields; electrical coils, and static discharge.

The ETL® should be wired in parallel to normal open circuit contacts, which keeps both lead wires disconnected from the intended actuation energy source. While it is *possible* to continuously monitor the bridge wire, it is not recommended. Even minimal continuous input current through the bridge wire will cause long term "baking" of the internal chemical core, and allow ingress for undesired current at levels sufficient to cause unwanted actuation of the device. Monitoring even at extremely low levels defeats Faraday shield protection and allows the possibility of unwanted input currents in the event of ground loop surges, electrical spikes, or proximate lightning discharges. If it is *absolutely* necessary to monitor the ETL®, input current must be limited to <1 milliampere continuous current with all possibility of current surge (including ground

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loops) isolated or eliminated. Some possibilities might include using <1 milliampere test input current on a timed interval check basis or use of optical isolation circuitry. ETL®'s subjected to continuous monitoring or extremely harsh environment may have a decreased shelf life and should be replaced at some predetermined maintenance interval.

The ETL® may be safely resistance checked using any commercial Ohmmeter or bridge tester using an input current of ≤10 milliamperes total input current into the sample within the resistance range of **10 to 30 Ohms**. Resistance should be checked between the individual ETL® yellow lead wires (or at the normally open contacts after *assuring* that the ETL® is disconnected from all circuits). There should be an open circuit between either lead wire and ground. Insulation resistance is >2 Megohms @ 600 VAC.

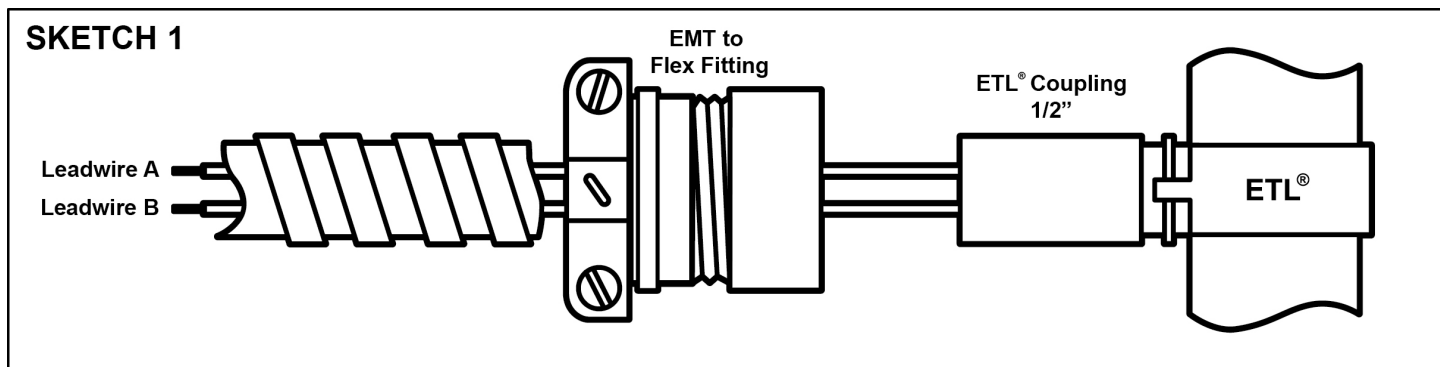
It is possible for the chemical heat core to leave a conductive path after functioning. Some residual resistance could cause the core to continue to draw a minimal current from a supply transformer or battery. If this is an installation consideration or problem it will be necessary to fuse the system upstream to accommodate it. Assure that any such fusing will not prevent any ETL® in the system from having less than the minimum trip current (0.2 ampere *minimum*) available.

Installation Instructions

The ETL® is typically mounted on dampers in ductwork; roof hatches; fire doors, and for other uses where retrofit or replacement of standard fusible links of forty pound rating (or less) is desired. It is typically attached mechanically by placing metal straps or “S” hooks through the square link half opening to provide a “floating” linear force tension of 7# minimum, 40# maximum continuous load. The ETL® has a forty (40) pound *maximum continuous* tensile strength end pull, at standard temperature (which can only be achieved in installation where the link is subject to *equal* linear tension). If side or “peel” forces are encountered (which is typical in most smoke damper installations) the weight may have to be reduced, or the tension vectors re-established. For this reason it is not permissible to bolt or fix one end of the ETL® in most installations. Even if the installation is gravity release (i.e. forty (40) pounds hanging straight down from the bottom of the link) it is recommended to allow the link to “float” using “S” hooks, straps or other attachments.

As the ETL® is designed to be mounted on dampers in ductwork, the wiring is subject to the National Electrical Code Para. 300-22 “Wiring in Ducts, Plenums, and other Air Handling Spaces,” which requires the use of metallic protection of all such wiring. Accordingly, the ETL® attachment end is the same diameter as ½” EMT tubing permitting standard UL listed 3/8” or ½” flex to ½” EMT connectors to be used together with the appropriate flexible metal conduit to completely encase the wires within the duct as illustrated in sketch 1. Note that the flexible conduit should run in a substantially level, straight line with a minimum length and slack, to either side of the duct, assuring it cannot be trapped under the damper blades upon closure. Always mount the junction box outside the duct on the top or either side at a point at or above the level of the ETL® when mounted on the damper.

The ETL® is typically wired by running the yellow lead wires (Lead wire A and Lead wire B sketch 1) from the ETL® to a pair of Normally Open [NO] terminal contacts (Lead wire A to [NO] contact 1 and Lead Wire B to [NO] contact 2). Polarity is irrelevant. Actuating supply current is typically provided by an NEC class 2 low voltage 6-30 VAC/DC (or other) source capable of delivering 0.2 ampere (200 milliamperes) *minimum* for 50 milliseconds *minimum* duration to each unit wired in parallel to the [NO] contacts.



ETL® Storage

The ETL® should be stored in indoor or sheltered dry areas where the ambient temperature should not exceed 150°F. The ETL® should remain in its box while in storage to prevent it from accidental actuation in extreme induction fields.

ETL® Inspection, Maintenance, and Replacement

The ETL® should be installed inspected and replaced in accordance with the applicable codes and authorities having jurisdiction. Since this multipurpose life safety device can be installed in many fire and life safety applications, the most stringent code requirement that governs the intended application must be in compliance. recommend that the ETL® links be inspected and examined at least once every year (or more often in extreme environments) for corrosion, soldered joint cracks, paint residue, chemical residue, or other foreign material that would impair the performance of the ETL® Link. In such cases, the ETL® should be replaced.

ETL® Warranty

GLOBE TECHNOLOGIES warrants that our products are free from defects as to workmanship and materials, when used in accordance with their approval listings and the restrictions and cautions that apply. Our obligation under this warranty shall be limited to replacing, at our plant, any parts thereof which shall, within one year after delivery to the ORIGINAL PURCHASER, be demonstrated to be defective. In order to accomplish the demonstration of defectiveness, the parts claimed to be defective must be sent by the original purchaser to Globe Technologies, 1109 W. Cedar, Standish, MI 48658. Globe shall not be liable under any terms of this warranty if the defective part is not submitted to Globe for inspection. This warranty does not extend to consequential damages of any nature. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES. EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS. No person, firm or corporation is authorized to assume for us any other liability in connection with the sale of our products.