

[Manuals.plus](#) /

› [Square D](#) /

› Square D B4.15 Thermal Overload Element Instruction Manual

Square D B4.15

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INSTRUCTION MANUAL

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of the Square D B4.15 Thermal Overload Element. This component is designed for use with Square D Motor Starters to provide thermal protection for electric motors, preventing damage due to sustained overcurrent conditions.

Adherence to these instructions is crucial for ensuring the safety of personnel and the longevity of the equipment.

2. Product Overview



Figure 1: The Square D B4.15 Thermal Overload Element. This image displays the metallic and brass components of the thermal unit, including the adjustment knob and the connection terminals, designed for integration into a motor starter.

The B4.15 Thermal Overload Element is a critical safety device that monitors the current drawn by a motor. If the current exceeds a safe limit for an extended period, indicating an overload, the element will trip, disconnecting power to the motor and preventing overheating and potential damage. It is specifically designed to comply with NEC Article 430 Part C requirements for motor protection.

3. Setup and Installation

The B4.15 Thermal Overload Element is intended for use with Square D Motor Starters of NEMA Sizes 00, 0, 1, and 1P. Proper selection and installation are paramount for effective motor protection.

3.1 Selection Guidelines

Follow these guidelines for selecting the correct thermal unit amperage:

1. **Motor Full Load Amps (FLA) and Service Factor (SF):** The thermal unit amp rating must be selected based on the motor's FLA and service factor.
2. **Motor and Starter in Same Ambient Temperature:** If the motor and starter are located in the same ambient temperature environment, the thermal unit amp rating should be equal to the motor's FLA divided by 1.0 SF.
3. **Motor Service Factor (1.15 to 1.25 SF):** For motors with a service factor between 1.15 and 1.25, the thermal unit amp rating should be equal to the motor's FLA divided by 1.0 SF.
4. **Motor Ambient Temperature 18°F Higher than Starter:** If the motor's ambient temperature is 18°F (10°C) higher than the starter's ambient temperature, the thermal unit amp rating should be equal to 90% of the motor's FLA. This represents a 10% derate from the standard selection.
5. **Motor Ambient Temperature 18°F Lower than Starter:** If the motor's ambient temperature is 18°F (10°C) lower than the starter's ambient temperature, the thermal unit amp rating should be increased by 5% of the motor's FLA.

Important: Always ensure that the selected thermal unit amp rating does not exceed the maximum rating of the motor starter itself.

3.2 Installation Procedure

Refer to the specific installation instructions provided with your Square D Motor Starter for detailed steps on how to properly insert and secure the B4.15 Thermal Overload Element. Ensure all electrical connections are tight and secure, and that the element is correctly seated within its designated slot.

4. Operation

Once installed, the B4.15 Thermal Overload Element operates automatically to protect the motor. When the motor draws excessive current for a duration that could cause overheating, the thermal element heats up. Upon reaching a critical temperature, it will trip the motor starter, interrupting the power supply to the motor.

After a trip, allow the thermal element to cool down before attempting to reset the motor starter. Repeated tripping indicates an underlying issue that must be investigated and resolved before resuming operation.

5. Maintenance

The B4.15 Thermal Overload Element is designed for reliable operation with minimal maintenance. However, periodic inspection is recommended as part of a comprehensive motor control system maintenance program.

- **Visual Inspection:** Regularly inspect the thermal element and its connections for any signs of physical damage,

corrosion, or loose wiring.

- **Cleanliness:** Ensure the area around the thermal element is free from dust, dirt, and debris, which could affect its thermal characteristics.
- **Functionality Check:** If possible and safe to do so, periodically test the trip function of the motor starter and thermal element according to the motor starter's manufacturer guidelines.

Always disconnect power before performing any inspection or maintenance tasks.

6. Troubleshooting

If the motor starter trips frequently, or if the motor is overheating without the thermal element tripping, consider the following:

- **Frequent Tripping:**
 - Verify the motor's FLA and service factor against the thermal unit's rating. Ensure correct selection based on Section 3.1.
 - Check for mechanical overload on the motor (e.g., jammed machinery, excessive load).
 - Inspect motor windings for damage or short circuits.
 - Ensure proper ventilation for both the motor and the motor starter enclosure.
- **Motor Overheating, No Trip:**
 - Confirm the thermal element is correctly installed and making proper electrical contact.
 - Verify the thermal element's rating is not too high for the motor.
 - Check for ambient temperature discrepancies between the motor and starter, and adjust the thermal unit selection accordingly (refer to Section 3.1).
 - Inspect the thermal element for damage or signs of malfunction. Replace if necessary.

If issues persist, consult a qualified electrician or contact Square D technical support.

7. Specifications

Attribute	Detail
Model	B4.15 Thermal Unit
Compatibility	Square D Motor Starters (NEMA Size 00, 0, 1, 1P)
Compliance	NEC Article 430 Part C
Product Dimensions	6 x 4 x 5 inches
Manufacturer	Schneider Electric / Square D
ASIN	B07H2JQ6V2

8. Safety Information

Working with electrical components carries inherent risks. Always observe the following safety precautions:

- **Disconnect Power:** Always ensure that all power to the motor starter and associated circuits is disconnected and locked out before performing any installation, inspection, or maintenance.

- **Qualified Personnel:** Installation and servicing should only be performed by qualified and authorized electrical personnel.
- **Local Codes:** Adhere to all local and national electrical codes and regulations.
- **Proper Tools:** Use appropriate insulated tools for electrical work.

9. Warranty and Support

Specific warranty information for the B4.15 Thermal Overload Element is not provided within this document. For warranty details, technical support, or further assistance, please refer to the official Square D or Schneider Electric website, or contact their customer service directly.

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