ABB ESB20-20/24

ABB ESB20-20/24 Contactor Instruction Manual

Model: ESB20-20/24

1. Introduction

This manual provides essential information for the safe and effective installation, operation, and maintenance of the ABB ESB20-20/24 Contactor. Please read this manual thoroughly before attempting any procedures to ensure proper handling and to prevent potential hazards.
The ABB ESB20-20/24 is a compact, single-pole contactor designed for switching electrical loads in various applications, particularly in control circuits and automation systems. It features a 24V coil voltage and is suitable for DIN rail mounting.

2. Safety Information

WARNING: Electrical shock hazard. Only qualified personnel should install, operate, or service this device. Disconnect all power before working on the equipment.

- Always ensure that the main power supply is disconnected and locked out before performing any installation, maintenance, or troubleshooting.
- Follow all local and national electrical codes and regulations.
- Use appropriate personal protective equipment (PPE) such as insulated gloves and safety glasses.
- Verify correct wiring connections and voltage ratings before applying power.
- Do not operate the contactor if it appears damaged or has been exposed to moisture.

3. Product Description

The ABB ESB20-20/24 contactor is an electromechanical switching device used for making and breaking electrical power circuits. It is specifically designed for applications requiring reliable switching of resistive or inductive loads. Its compact design allows for efficient use of space in control panels.

Figure 1: Front view of the ABB ESB20-20/24 Contactor. This image shows the compact design and terminal connections of the device.

Key features include:

- **Coil Voltage:** 24 Volts AC/DC (depending on specific variant, typically AC for this model).
- **Number of Poles:** 1 (main power contacts).
- **Mounting:** Standard DIN rail mounting for quick and secure installation.
- **Application:** Suitable for control circuits, lighting, heating, and small motor applications.

4. Installation

4.1 Mounting

1. Ensure the DIN rail is securely fastened within the control panel.
2. Align the contactor's mounting clips with the DIN rail.
3. Press the contactor firmly onto the rail until it clicks into place. Verify it is securely seated and does not wobble.

4.2 Wiring

Refer to the wiring diagram provided with the product packaging for specific connection details. General wiring steps are as follows:

1. **Power Circuit:** Connect the main power supply conductors to the power terminals (L1, T1 or similar markings) as indicated on the device. Ensure proper wire gauge for the intended load current.
2. **Control Circuit:** Connect the 24V control voltage to the coil terminals (A1, A2). Observe polarity if applicable (for DC coils) or ensure correct phase connection for AC coils.
3. **Auxiliary Contacts (if present):** Connect any auxiliary contacts according to your control circuit requirements.
4. Tighten all terminal screws to the recommended torque specifications to prevent loose connections and overheating.
5. Double-check all connections for correctness and security before applying power.

5. Operation

The ABB ESB20-20/24 contactor operates by energizing its coil. When the 24V control voltage is applied to the A1 and A2 terminals, the coil creates a magnetic field that pulls the armature, closing the main power contacts. This allows current to flow through the power circuit.
When the 24V control voltage is removed, the magnetic field collapses, and a spring mechanism opens the main power contacts, interrupting the power circuit.
No direct user interaction is typically required for the operation of the contactor itself, as it is controlled by an external control circuit (e.g., a switch, PLC, or thermostat).

6. Maintenance

WARNING: Disconnect all power before performing any maintenance.

- **Regular Inspection:** Periodically inspect the contactor for signs of wear, damage, or overheating (discoloration, melting). Check for loose connections.
- **Cleaning:** Keep the contactor free from dust, dirt, and moisture. Use a dry, soft cloth or compressed air for cleaning. Do not use solvents or abrasive cleaners.
- **Terminal Tightness:** Re-tighten terminal screws if necessary, especially after initial installation and during routine maintenance checks.
- **Contact Wear:** While internal contacts are generally not user-serviceable, excessive arcing or frequent switching of high inductive loads can accelerate wear. If the contactor fails to operate reliably, replacement may be necessary.

7. Troubleshooting

WARNING: Troubleshooting involves working with live electrical circuits. Only qualified personnel should perform these procedures.

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
Contactor does not engage when control voltage is applied.	• No control voltage (24V) present at A1/A2 terminals. • Incorrect control voltage. • Loose wiring connections to coil. • Damaged coil.	• Verify 24V supply to A1/A2. • Check control circuit wiring and power source. • Tighten terminal screws. • Test coil resistance (if possible); replace contactor if coil is open or shorted.
Contactor hums loudly or chatters.	• Low control voltage. • Mechanical obstruction. • Damaged shading coil (AC contactors).	• Verify stable 24V control voltage. • Inspect for foreign objects preventing full armature closure. • Replace contactor if shading coil is damaged.
Contactor contacts weld or stick.	• Overcurrent or short circuit. • Frequent switching of high inductive loads. • Contactor undersized for application.	• Investigate and correct overcurrent condition. • Consider adding surge suppression or using a contactor rated for higher inductive loads. • Replace contactor and ensure proper sizing for the load.

8. Specifications

Parameter	Value
Model Number	ESB20-20/24
Brand	ABB
Coil Voltage	24 Volts
Number of Poles	1
Mounting Type	DIN Rail Mount
Product Dimensions (L x W x H)	0.39 x 0.39 x 0.39 inches
Item Weight	4.2 ounces
Device Type	Contactor

9. Support

For technical assistance, warranty information, or further inquiries regarding the ABB ESB20-20/24 Contactor,

please contact your local ABB representative or visit the official ABB website. Ensure you have the model number (ESB20-20/24) available when seeking support.

ABB Official Website: www.abb.com