

Application of NEMA 3R Low Voltage Motor Control Centers with AC Drives and Soft Starts

Class 8998

Retain for future use.

INTRODUCTION

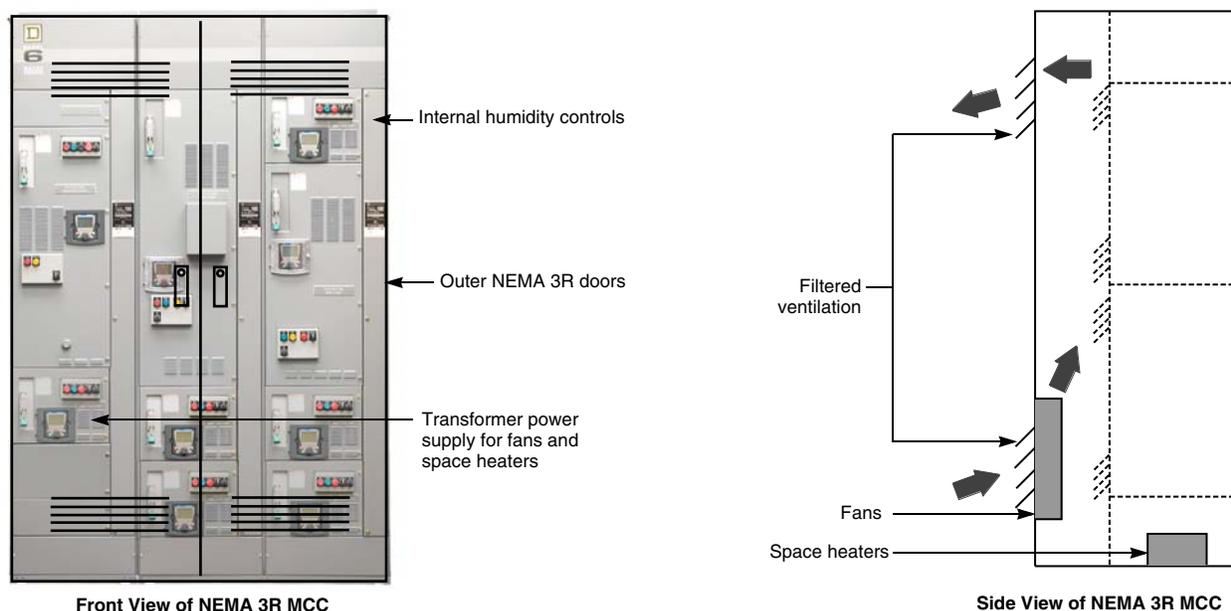
Square D[®] Motor Control Centers (MCCs), designed and manufactured by Schneider Electric, provide a convenient, versatile package that can be used in various environments. MCCs are frequently used in NEMA 3R applications to provide a free-standing, rainproof enclosure for municipal pumping and industrial processes. NEMA 3R MCCs may contain AC drives and soft starts, which require additional provisions to ensure they operate reliably in an outdoor environment. Until now, outdoor MCC packages containing drives and soft starts were designed as specially-engineered solutions that included air conditioners or other cooling systems.

Schneider Electric now provides a pre-engineered, force-ventilated NEMA 3R MCC with AC drives and soft starts. A specified range of these drives and soft starts can be shipped from the factory for outdoor applications (see "Ratings" on page 3). Due to its force-ventilated design and humidity control, the NEMA 3R MCC package can continuously operate within the range of ambient conditions specified in this bulletin.

PRODUCT DESCRIPTION

NEMA 3R MCCs are non-walk-in enclosures with a design based on the standard NEMA 1 MCC. Additional housing and gasketing provide protection from rain, sleet, and ice. The NEMA 3R MCC for AC drives and soft starts features louvered and filtered openings on the front doors, along with humidity controls inside the enclosure (see Figure 1). The MCC enclosure is further modified to include fan-forced ventilation while continuing to meet NEMA 3R enclosure requirements and the UL 845 MCC standard.

Figure 1: Square D[®] Ventilated NEMA 3R Low Voltage Motor Control Center



ENVIRONMENTAL CONTROL

The ventilated NEMA 3R MCC manages the internal MCC environment to maintain the required temperature and humidity levels for the drive and soft start controls in outside environments from -10 to 40 °C (14 to 104 °F). The following features are included:

Dual Door Fans

Dual door fans force fresh air into the enclosure and move air out of the enclosure. The centrifugal impeller fans use highly reliable ball bearing rotors. A factory-preset thermostat controls the fans, based on the MCC's internal temperature. Door interlock switches turn the fans off when the outer NEMA 3R door is opened.

Positive Pressure Ventilation

The intake fans, mounted at the lower vents, blow air into the cabinet. This air increases the cabinet's internal air pressure relative to the air pressure outside the cabinet. The "positive" air pressure created inside the cabinet helps force out dirt and contaminants. This positive pressure ventilation method is common practice for industrial atmospheres. It provides a cleaner environment for drive and soft start electronics than one that would be created by exhaust fans mounted at the upper vents.

Space Heaters

Space heaters add heat to prevent condensation during cooler periods, overnight, and in winter weather.

NOTE: Space heaters do not allow application of the MCC in temperatures below -10 °C (14 °F).

Humidity Controls

It is crucial to maintain a level of dryness in or around the electronic controls for drives and soft starts. Condensation must be avoided. The space heaters will supply the MCC with heat when necessary to reduce condensation. A factory-preset thermostat and humidistat monitor humidity levels and turn on the space heaters to dry the internal MCC ambient air.

Self-Contained Power Supply

The fused control transformer(s) supplied in each MCC line-up provide power for space heaters and fans. There is no need for external power once the main 3-phase power is connected. The power supply is pre-wired at the factory to fans, space heaters, and environmental controls through protected wiring provisions. Each transformer is able to supply power to three sections and should be mounted at the bottom of the MCC section.

Filtered Louvers

Each NEMA 3R MCC door contains top and bottom louvers for ventilation. Behind each louver is a coarse rubber filter that helps protect against debris entering the MCC.

NOTE: All drives and soft starts include internal thermal protection switches to shut down the drive or soft start unit before damage occurs.

RATINGS

- -10 to 40 °C (14 to 104 °F)
NOTE: In hotter climates, Schneider Electric suggests installing a shed for shading the MCC as a best practice, since high temperatures are not always consistent.
- Up to 2000 A horizontal bus
- Up to 600 A vertical bus
- Outdoor, rainproof, sleet-resistant enclosure (NEMA 3R)
- UL 845 Listed
- 0–600 Vac, 3-phase, 3-wire or 4-wire
- Non-walk-in
- The following table shows the drive and soft start units available for mounting in a NEMA 3R MCC.

Table 1: Drive and Soft Start Units Available for NEMA 3R MCC

Device	Horsepower
Altistart® soft starters	1–200 hp, 208 V
	1–200 hp, 240 V
	1–500 hp, 480 V
	1–600 hp, 600 V
Altivar® AC drives ¹ (constant torque) ²	1–40 hp, 480 V
	1–15 hp, 208/230 V

¹ A maximum of four Altivar drives are allowed in a single section. Mount drive units starting at the top of the section.

² Use constant torque ratings for variable torque applications. For information on drive space requirements, refer to Square D document no. 8998CT9701__.

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