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ROCKWELL AUTOMATION

PROCUREMENT SPECIFICATION

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Molded Case Circuit Breakers Bulletin 140G

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SECTION XX XX XX

MOLDED CASE CIRCUIT BREAKERS

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes globally rated Molded Case Circuit Breakers used for feeder circuits, disconnects, and branch protection.

1.02 QUALIFICATIONS

A. Manufacturer

- 1. The manufacturer shall have a minimum of 25 years of experience in the manufacture of molded case circuit breakers.
- 2. The approved manufacturers are:
 - a) Rockwell Automation Allen-Bradley
 - b) Substitutions: None permitted

- B. Certification – To ensure all quality and corrective-action procedures are documented and implemented, all manufacturing locations shall be certified to the ISO-9001 Series of Quality Standards.

1.03 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract apply to this section.
- B. The following sections contain requirements that relate to this section:
 - 1. Section _____, Electrical: Basic Requirements
 - 2. Section _____, Acceptance Testing
 - 3. Section _____

1.04 REFERENCES

- A. The molded case circuit breakers shall be:
 - 1. UL Listed
 - 2. CSA Certified
 - 3. CE Marked
 - 4. CCC Certified
 - 5. RoHS Compliant

B. The following standards shall be met:

1. UL 489
2. CSA C22.2-5
3. EN 60947-2
4. CCC GB 14048.2

C. NFPA 79 compliance shall be available through the use of an internal rotary operating handle kit.

1.05 ENVIRONMENTAL REQUIREMENTS

A. The supplier shall confirm specified service conditions during and after installation of products.

B. The supplier shall maintain the area free of dirt and dust during and after installation of products.

1.06 PRE-MANUFACTURE SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00, Submittal Procedures.

B. Product data shall include:

1. Publications on each type of molded case circuit breaker.
2. Data sheets on options and accessories, when applicable.

C. Installation instructions shall include a copy of the manufacturer's installation instructions, including receiving, handling, and storage requirements.

1.07 FINAL SUBMITTALS

A. Supplier certification shall be provided that the molded case circuit breakers have been installed in accordance with the manufacturer's instructions.

B. Testing shall be performed per manufacturer's standard. A copy of the test reports, if available, shall be provided as part of the final documentation.

C. Final drawings shall include:

1. Drawings for each circuit breaker of dimensioned plans, elevations, sections, and details, along with clearances and service-space requirements. The drawings shall show tabulations of installed devices, including –
 - a) Enclosure details
 - b) Current and voltage ratings
 - c) Short-circuit ratings
 - d) Time-current curves with selectable ranges, as applicable

2. Diagrams to show power, signal, and control wiring.

D. Maintenance data shall include:

1. Molded case circuit breaker User Manual.
2. Name and phone number of a local distributor for the spare parts.

PART 2 PRODUCTS

2.01 RATINGS

- A. The molded case circuit breakers shall have current ranges as indicated on the drawings.
 - 1. G-Frame: 15A to 125A (160A, IEC only)
 - 2. H-Frame: 15A to 125A (160A, IEC only)
 - 3. I-Frame: 60A to 225A
 - 4. J-Frame: 25A to 250A
 - 5. K-Frame: 120A to 400A
 - 6. M-Frame: 240A to 800A
 - 7. N/NS-Frame: 480A to 1200A
 - 8. R-Frame: 800A to 3000A
- B. The molded case circuit breakers shall have IEC-rated insulation voltage, U_i , of:
 - 1. G-Frame and I-Frame: 800V
 - 2. H-Frame and J-Frame through R-Frame: 1000V
- C. All molded case circuit breakers shall be dual-rated EN/IEC 60947-2 and UL 489 in both 3- and 4-pole configurations.
- D. Protection shall be as indicated on the drawings:
 - 1. Thermal/Magnetic – 15A to 800A
 - 2. Electronic – 10A to 3000A
- E. Interrupting capacities shall be 25 kA to 150 kA, as indicated on the drawings.
- F. All molded case circuit breakers shall have short-circuit current rating (SCCR) coordination with Allen-Bradley contactors, overload relays, and motor starters.
- G. The molded case circuit breakers shall be:
 - 1. Rated for an operating environment of 40°C (104°F) without derating.
 - 2. Rated for storage at -40 to +80°C (-40 to +176°F).
- H. Molded case circuit breakers shall have a mechanical life of:
 - 1. G-Frame, H-Frame, I-Frame, J-Frame – 25,000 operations / 240 ops/hour
 - 2. K-Frame and M-Frame – 20,000 operations / 120 ops/hour
 - 3. N-Frame and NS-Frame – 10,000 operations / 60 ops/hour
 - 4. R-Frame – 15,000 operations / 60 ops/hour
- I. Molded case circuit breakers shall have an electrical life at 415 VAC of:
 - 1. G-Frame, H-Frame, I-Frame, J-Frame – 8000 operations / 120 ops/hour
 - 2. K-Frame – 7000 (400A) - 5000 (630A) operations / 60 ops/hour
 - 3. M-Frame – 7000 (630A) - 5000 (800A) - 4000 (1000A) operations / 60 ops/hour
 - 4. N-Frame and NS-Frame – 2000 operations / 60 ops/hour
 - 5. R-Frame – 4500 (2000A) - 4000 (2500A) - 3000 (3200A) operations / 60 ops/hour

2.02 CONSTRUCTION

- A. Each molded case circuit breaker shall be an assembled unit in a supporting case and shall consist of:
 - 1. Circuit breaker
 - 2. Operator
 - 3. Internal accessories (optional)
 - 4. External accessories (optional)
- B. In addition to short-circuit protection, molded case circuit breakers shall provide thermal overcurrent protection through mechanical means with heater elements or by using electronics. Protection methods include:
 - 1. Fixed Thermal/Magnetic
 - 2. Adjustable Electronic
 - 3. Adjustable Thermal/Adjustable Magnetic

Adjustment ranges shall be as indicated on drawings.
- C. The molded case circuit breakers shall be panel-mounted, DIN rail-mounted, or bus bar-mounted as indicated on the drawings. **[DIN rail- and bus bar-mounting are options]**

2.03 CIRCUIT BREAKERS

- A. The molded case circuit breakers shall be in 3- and 4-pole configurations, as indicated on the drawings.
- B. The molded case circuit breakers shall have clearly-marked ON (I), OFF (O), and tripped positions, and a test button for initiating an alarm trip.
- C. The molded case circuit breakers shall have a removable front cover to accept installation of internal accessories.

2.04 OPERATORS

- A. Operators shall be wired with 600V (UL/CSA) insulated wire. No voltage derating shall be required.
- B. Variable depth rotary operators shall enable the external control of breakers that are installed inside industrial control panels, through the use of a handle with rotary motion.
- C. Flex cable operators shall enable the external control of breakers that are installed inside flanged enclosures or industrial control panels, through the use of flex cables, rather than operating rods.
- D. Motor operators shall enable remote opening, closing, and resetting of breakers with provisions for local control.
- E. Direct rotary operators shall mount with direct handle operation of the breaker and shall be lockable.
- F. NFPA internal operating handles shall enable turning an energized panel off with the door open and shall satisfy NFPA requirements.

2.05 INTERNAL ACCESSORIES

- A. Internal accessories shall be installed by removing the front cover.
- B. Shunt trips and undervoltage releases shall fit into left-side slots inside the circuit breakers and shall be wired with 600V (UL/CSA) insulated wire. No voltage derating shall be required.
 - 1. Shunt trips shall allow the breaker to be opened via electric command.
 - 2. Shunt closes shall allow remote closing when the spring motor is charged (NS- and R-Frame).
 - 3. Undervoltage releases shall allow the breaker to be opened via a change in the voltage of its power supply.
 - 4. Residual current release modules (IEC only) shall be available to protect against low levels of earth-fault currents.
- C. Auxiliary and alarm contacts shall have snap-in mounting provisions to fit into right-side pockets inside the circuit breakers and shall be changeover contacts (Form C).
 - 1. Auxiliary contacts shall indicate ON/OFF status of the molded case circuit breakers.
 - 2. Alarm contact shall indicate trip status:
 - a) due to pressing the test button
 - b) due to overcurrent or short-circuit
 - c) due to residual current, shunt, or undervoltage release signal, as equipped
 - 3. Thermal trip contacts shall indicate trip status due to overcurrent, short-circuit, or undervoltage release only (H-, J-, N-, NS-, and R-Frame).

2.06 EXTERNAL ACCESSORIES

- A. In addition to the standard end cap, termination options, including lugs, extended terminals, multitap lugs, rear terminals, and spreader terminals, shall be provided as indicated on the drawings.
- B. Phase barriers and terminal covers shall be provided as shown on the drawings.
- C. Padlock attachments shall be supplied as indicated on the drawings to enable locking the breakers in the off position.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. The supplier shall coordinate the shipping of equipment.
- B. The supplier shall store the equipment in a clean and dry space.
- C. The supplier shall protect the units from dirt, water, construction debris, and traffic.

3.02 INSTALLATION

- A. The supplier shall verify all trip settings have been properly adjusted prior to energizing.
- B. The supplier shall ensure accessibility to operator. These components shall be free from obstruction at all times.

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3.03 SPARE MATERIALS

- A. Provide one (1) spare molded case circuit breaker of each size utilized, including options.

3.04 WARRANTY

- A. The manufacturer shall provide their standard parts warranty for eighteen (18) months from the date of shipment or twelve (12) months from the date of being energized, whichever occurs first.
- B. The manufacturer shall confirm this warranty as part of the submittal.

END OF SECTION

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