

## PROCUREMENT SPECIFICATION

# Visible Blade Disconnect Switches Bulletin 1494U, 1494V and 1494C

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SECTION XX XX XX

**VISIBLE BLADE DISCONNECT SWITCHES**

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes fusible and non-fusible disconnect switches with visible blade design that readily shows ON/OFF status.

1.02 QUALIFICATIONS

A. Manufacturer

- 1. The manufacturer shall have a minimum of 25 years of experience in the manufacture of visible blade disconnect switches.
- 2. The approved manufacturers are:
  - a) Rockwell Automation Allen-Bradley
  - b) Substitutions: None permitted

B. Certification

- 1. 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.
- 2. Third-party manufacturers and brand labeling shall not be allowed.

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 \_\_\_\_\_

1.04 REFERENCES

- A. The visible blade disconnect switches shall be:
  - 1. UL Listed
  - 2. CSA Certified
  - 3. CE Marked
  - 4. NFPA 79 Compliant
- B. The following standards shall be met:
  - 1. UL 98
  - 2. CSA C22.2-4

#### 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 visible blade disconnect switch.
  - 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 visible blade disconnect switches 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 disconnect switch of dimensioned plans, elevations, sections and details, along with clearances and service-space requirements. The drawings shall show tabulations of installed devices, including –
    - a) Current, voltage, horsepower and short-circuit ratings.
    - b) Fuse type, if applicable.
    - c) Mechanism type and accessories.
    - d) Identification of equipment served.
  - 2. Diagrams to show power, signal and control wiring.
- D. Maintenance data shall include:
  - 1. Manufacturer's visible blade disconnect switch maintenance instructions.
  - 2. Name and phone number of a local distributor for the spare parts.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Allen-Bradley / Rockwell Automation – Visible Blade Disconnect Switches, Bulletin 1494U, 1494V and 1494C (No substitutions)

## 2.02 VISIBLE BLADE DISCONNECT SWITCHES

- A. The visible blade disconnect switches shall include: **[include applicable devices]**
1. Universal Disconnect Switches (Bulletin 1494U), which can be connected for rod or cable operation in the field for use in flange-constructed enclosures up to 24 inches (610 mm) deep.
  2. Variable Depth Disconnect Switches (Bulletin 1994V), which are rod-operated for use in flange-constructed enclosures up to 24 inches (610 mm) deep.
  3. Cable-Operated Disconnect Switches (Bulletin 1494C), which allow separate mounting of the handle for use in flange-constructed enclosures up to 24 inches (610 mm) deep.
- B. The visible blade disconnect switches shall be interoperable with standard electrical equipment.

## 2.03 UNIVERSAL DISCONNECT SWITCHES (BULLETIN 1494U)

### A. RATINGS

1. The universal disconnect switches shall have both UL/CSA/NEMA and IEC ratings in 30, 60 and 100A sizes, with power/voltage as indicated on the drawings.
2. The universal disconnect switches shall have (UL) IEC-rated insulation voltage,  $U_i$ , of (600) 1000V.
3. The universal disconnect switches shall be rated for an ambient temperature of –
  - a) Open: -20 to +60°C (-4 to +140°F).
  - b) Enclosed: -20 to +40°C (-4 to +104°F).
  - c) Storage: -40 to +65°C (-40 to +149°F).
4. The universal disconnect switches shall have:
  - a) Mechanical life of 20,000 operations / 300 ops/hour maximum.
  - b) Electrical life of 10,000 operations at rated current.
5. The universal disconnect switches shall have a short-circuit withstand capability of 10,000A (unfused or Class H fuses) or 200,000A (Class J or Class R fuses).
6. With the operating mechanism and handle connected to the switch at all times, universal disconnect switches are in compliance with NFPA 79.

### B. CONSTRUCTION

1. Each fusible or non-fusible version of the universal disconnect switch shall have a small footprint and shall be modularly constructed, as indicated on the drawings, of:
  - a) A universal switch mechanism.
  - b) A threaded-rod/handle or cable/handle mechanism.
  - c) Snap-on accessories.

2. The switch body shall be glass-filled thermoplastic with plated copper contacts. Switches, mechanisms and accessory kits shall be zinc-plated steel with RoHS compliant finish.
3. Aluminum lug/line kits shall be provided with each universal disconnect switch.
  - a) Single-port lugs shall be installed on the line side of the switch with extra lugs included for load-side terminations and shall accept copper or aluminum wire.
  - b) Multi-port lugs shall attach to the load side of the switch or to the fuse block and shall have 6 ports that accept copper or aluminum wire. This shall eliminate the need for a distribution block and shall allow direct connection to branch circuits.
4. Fuse blocks shall share a common base across all universal disconnect switch sizes.
  - a) Class J and Class R fuses shall be available.
  - b) Fuse barriers shall be included with each fuse block and shall be scored for different fuse lengths.

#### C. OPERATORS

1. Threaded-rod operators shall accommodate enclosures up to 19 inches (483 mm) deep.
2. Cable operators shall have 3-, 4-, 5- or 6-foot long cables with a low 6-inch bend diameter.
3. Handles shall be, as indicated on the drawings:
  - a) Non-metallic Type 1, 3R, 4, 4X, 12.
  - b) Painted metal Type 1, 3R, 4.
  - c) Stainless steel Type 4, 4X.

#### D. ACCESSORIES

1. Auxiliary contacts: standard switching with snap-on feature shall be rated –
  - a) NEMA/EEMAC: B600, Q600 (600 VAC).
  - b) IEC: AC 15, DC 13 to IEC/EN60947-5-1 and UL 508 (17V, 5 mA minimum).
2. Auxiliary contacts: low level (PLC) switching with snap-on feature shall be rated –
  - a) NEMA/EEMAC: C300, R150.
  - b) IEC: AC 15, DC 13 to IEC/EN60947-5-1 and UL 508 (15V, 1 mA minimum).
3. Protective cover: one-piece cover with back-of-hand safety for line and load protection shall fasten to switch and fuse block without tools.
4. Electrical interlock: standard 10A switching shall –
  - a) Function as an N.O.E.B contact. As disconnect handle moves from OFF to ON, interlock contacts shall change state before switch de-energizes.
  - b) Be ideal for removing power from a drive circuit.

## 2.04 VARIABLE DEPTH DISCONNECT SWITCHES (BULLETIN 1494V)

### A. RATINGS

1. The variable depth disconnect switches shall have UL/CSA/NEMA or IEC ratings in 30, 60, 100, 200, 400 and 600A sizes, with power/voltage as indicated on the drawings.
2. The variable depth disconnect switches shall have (UL) IEC-rated insulation voltage,  $U_i$ , of (600) 660V.
3. The variable depth disconnect switches shall be rated for an ambient temperature of –
  - a) Open: -20 to +60°C (-4 to +140°F).
  - b) Enclosed: -20 to +40°C (-4 to +104°F).
  - c) Storage: -40 to +65°C (-40 to +149°F).
4. The variable depth disconnect switches shall have:
  - a) Mechanical life of 20,000 operations / 300 ops/hour maximum (30 to 200A); 10,000 operations / 240 ops/hour maximum (400 and 600A).
  - b) Electrical life of 10,000 operations at rated current (30 to 200A); 6000 operations at rated current (400 to 600A).
5. The variable depth disconnect switches shall have a short-circuit withstand capability of 10,000A (unfused or Class H fuses) or 200,000A (Class J or Class R fuses).
6. With the handle connected to the switch at all times, variable depth disconnect switches are in compliance with NFPA 79.

### B. CONSTRUCTION

1. Each fusible or non-fusible version of the variable depth disconnect switch shall include the switch, a connecting rod, a handle and accessories as indicated on the drawings. Fusible versions shall also include a trailer fuse block and fuse clips.
2. The switch body shall be phenolic with plated copper contacts. Switches, mechanisms and accessory kits shall be zinc-plated steel with RoHS compliant finish.
3. Switches shall have right-hand or left-hand mechanisms as indicated on the drawings.
4. Line- and load-side wire-connecting copper lugs shall be standard-sized or oversized as indicated on the drawings.
5. Connecting rods, as indicated on the drawings, shall accommodate enclosure depths (from the top of the flange to the disconnect switch mounting surface) of 6-3/4 to 23 inches (172 to 584 mm).
6. Handles shall lock in the OFF and ON positions and shall be, as indicated on the drawings:
  - a) Non-metallic Type 1, 3R, 4, 4X, 12.
  - b) Painted metal Type 1, 3R, 4.
  - c) Stainless steel Type 4, 4X.
7. Fuse blocks shall accommodate Class H, Class J and Class R fuses.

### C. ACCESSORIES

1. Auxiliary contacts: standard switching shall be rated –
  - a) NEMA/EEMAC: B600, Q600 (600 VAC).
2. Auxiliary contacts: low level (PLC) switching shall be rated –
  - a) NEMA/EEMAC: C300, R150 (240 VAC) (5 mA at 12 VDC).
3. Protective cover: one-piece cover with door and back-of-hand safety for load-side protection shall fasten to switch without tools.
4. Electrical interlock: standard 10A switching shall –
  - a) Function as an N.O.E.B contact. As disconnect handle moves from OFF to ON, interlock contacts shall change state before switch de-energizes.
  - b) Be ideal for removing power from a drive circuit.

## 2.05 CABLE-OPERATED DISCONNECT SWITCHES (BULLETIN 1494C)

### A. RATINGS

1. The cable-operated disconnect switches shall have UL/CSA/NEMA or IEC ratings and 30, 60, 100, 200, 400 and 600A sizes, with power/voltage as indicated on the drawings.
2. The cable-operated disconnect switches shall have (UL) IEC-rated insulation voltage,  $U_i$ , of (600) 660V.
3. The cable-operated disconnect switches shall be rated for an ambient temperature of –
  - a) Open: -20 to +60°C (-4 to +140°F).
  - b) Enclosed: -20 to +40°C (-4 to +104°F).
  - c) Storage: -40 to +65°C (-40 to +149°F).
4. The cable-operated disconnect switches shall have:
  - a) Mechanical life of 20,000 operations / 300 ops/hour maximum (30 to 200A); 10,000 operations / 240 ops/hour maximum (400 and 600A).
  - b) Electrical life of 10,000 operations at rated current (30 to 200A); 6000 operations at rated current (400 to 600A).
5. The cable-operated switches shall have a short-circuit withstand capability of 10,000A (unfused or Class H fuses) or 200,000A (Class J or Class R fuses).
6. With the handle connected to the switch at all times, cable-operated disconnect switches are in compliance with NFPA 79.

### B. CONSTRUCTION

1. Each fusible or non-fusible version of the cable-operated disconnect switch shall include the switch, cable mechanism, handle and accessories as indicated on the drawings. Fusible versions shall also include a trailer fuse block and fuse clips.



2. The switch body shall be phenolic with plated copper contacts. Switches, mechanisms and accessory kits shall be zinc-plated steel with RoHS compliant finish.
3. Switches shall have right-hand or left-hand mechanisms as indicated on the drawings.
4. Line- and load-side wire-connecting lugs shall be standard-sized or oversized as indicated on the drawings.
5. Cable mechanisms shall have 3-, 4-, 5-, 6- or 10-foot long cables as indicated on the drawings.
6. Handles shall lock in the OFF and ON positions and shall be, as indicated on the drawings:
  - a) Non-metallic Type 1, 3R, 4, 4X, 12.
  - b) Painted metal Type 1, 3R, 4.
  - c) Stainless steel Type 4, 4X.
7. Fuse blocks shall accommodate Class H, Class J and Class R fuses.

#### C. ACCESSORIES

1. Auxiliary contacts: standard switching shall be rated –
  - a) NEMA/EEMAC: B600, Q600 (600 VAC).
2. Auxiliary contacts: low level (PLC) switching shall be rated –
  - a) NEMA/EEMAC: C300, R150 (240 VAC) (5 mA at 12 VDC).
3. Protective cover: one-piece cover with door and back-of-hand safety for load-side protection shall fasten to switch without tools.
4. Electrical interlock: standard 10A switching shall –
  - a) Function as an N.O.E.B contact. As disconnect handle moves from OFF to ON, interlock contacts shall change state before switch de-energizes.
  - b) Be ideal for removing power from a drive circuit.

### 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 device assembly.
- B. The supplier shall ensure accessibility to operator. These components shall be free from obstruction at all times.

### 3.03 SPARE MATERIALS

- A. The supplier shall provide one (1) spare visible blade disconnect switch 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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