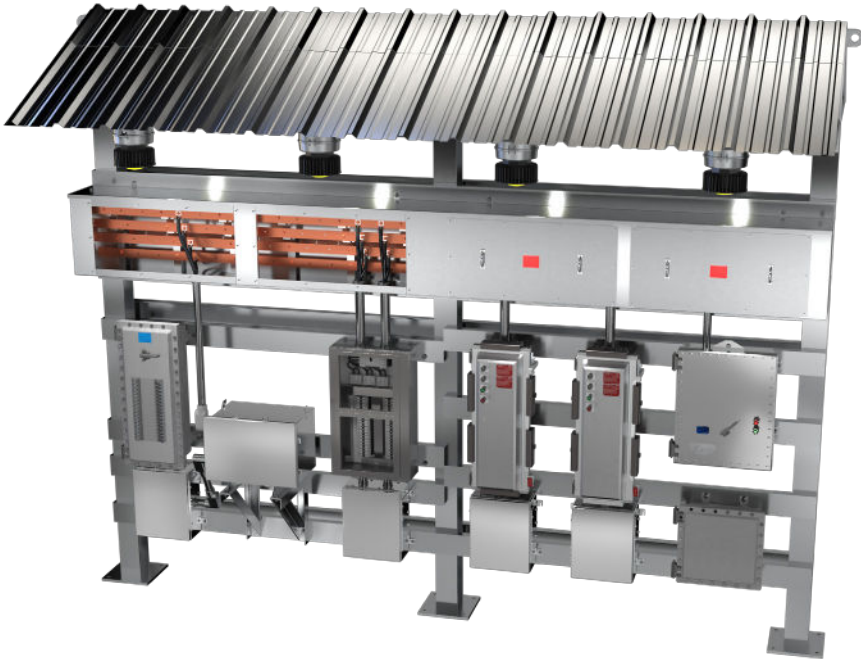




Electrical Switch Racks



Applications:

Free-Standing Switch Rack Assemblies Are Used:

- To provide a complete motor control center in one integrated package
- Outdoors and indoors
- In damp, wet or corrosive locations such as sewage treatment plants, lumber mills, marine installations, and food preparation areas
- In areas made hazardous due to the presence of flammable vapors or gases, such as petroleum refineries, chemical and petrochemical plants, gas gathering plants, pipeline compressor stations, and drilling rigs, both onshore and offshore
- In areas where hazardous dusts are present, such as coal handling facilities, grain processing and handling plants, and certain food process industries

Features:

- Complete factory assembled and wired switch racks
- Pre-drilled bus boxes allow for quick and easy changing or adding of components
- Complete assembly covered under one order, eliminating engineering costs, additional costs of placing separate orders with several vendors for various components, and assembly and scheduling problems at job site
- Wiring is simple. After switch rack is in place, feeders are connected to the main bus and connections made from starters motors. No other field wiring is necessary

- Maintenance time and costs are reduced by having controls grouped. Work is performed in one location instead of moving from one control to another in various locations
- Major components are standard EBMX, EBM, SN4, SN4X, SN4XEBPB, SN7, EXCP, D2PB, EXD, D2D, EPL, and D2L enclosures featuring ready access to starters and breakers for inspection and maintenance
- Custom built racks to meet your exact requirements are an Spike Electric Controls specialty. Complete quotations will be supplied for any job, large or small.

Standard Finishes:

Rack frame – hot dip galvanized steel, stainless steel, or natural aluminum
Components – see sections A & C for finishes

Standard Materials:

Rack frames – channel members, bolted and welded

Certifications and Compliances:

NEC:

Class I, Divisions 1 & 2, Groups C, D (Group B optional)

Class II, Division 1, Groups E, F, G Class II, Division 2, Groups F, G Class III

NEMA: 3, 4X (optional), 7B (optional) CD, 9EFG, 12

Options:

Rack frame finish – corrosion resistant primer with air dry epoxy

Options listed for individual components can be incorporated in complete switch racks

Construction:

General:

- All construction to be in accordance with current National Electrical Code® (NEC), National Electrical Manufacturers' Association (NEMA), state and local standards as designated by the purchaser.
- All hazardous area enclosures for motor starters, combination motor starters, circuit breakers, motor circuit protectors, instrument enclosures, panelboards, main bus, fittings, receptacles, and lighting fixtures shall be made and supplied by the manufacturer.
- All explosion-proof threaded enclosures for combination starters, circuit breakers, motor circuit protectors, and starters shall be UL classified.
- All other standard hazardous area enclosures shall be UL listed or UL classified.
- Manufacturer shall retain permanent records of all motor control racks and shall have the capability of duplicating, or replacing, any fully-assembled rack or rack component.

Manufacturer to assume responsibility for construction, purchase/manufacturer of components, complete circuit continuity testing, and testing of mechanical functions of components.





Electrical Switch Racks

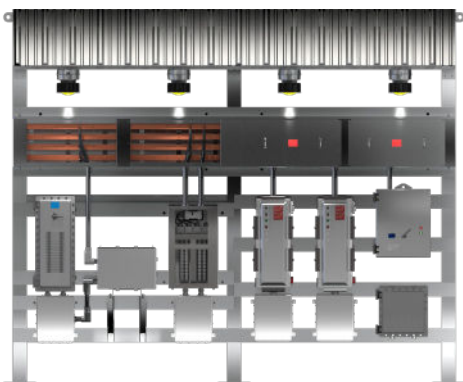


Rack Frame Design Structure

- Switch rack, either single or double face as required, shall be rigid, free-standing structures. Racks shall be factory welded, assembled and fabricated from standard rolled structural steel or aluminum shapes.
- Vertical risers will be 6" I-beam and horizontal members shall be 6-inch channel.
- Mounting feet shall be 6-inch channel. Width of such feet for single-sided racks shall be 41 inches.
- End mounting feet will be braced (welded) to the upright with 6" T member.
- Mounting feet shall be anchored at the job site with 1-inch diameter bolts. Anchor bolts and mounting pads will be the responsibility of the user.
- Maximum horizontal spacing between mounting legs shall not exceed 6 feet. (Specific dimensions to be determined by the manufacturer.)
- Racks longer than 20 feet will be supplied as bolt-together sections. (Specific section dimensions to be determined by the manufacturer.)

Fittings:

All fittings shall be made and provided by the manufacturer. Seals and unions will be provided for each incoming and outgoing conduit as required. All interconnections between components shall be done by the manufacturer with galvanized rigid conduit, and conduit fittings as required to meet the hazardous classification. Interconnecting conduits to be provided with conduit seals as required. All incoming and outgoing rack conduit entrances shall include conduit seals as required by the hazardous location specified. Such seals will be provided by the manufacturer and will not be filled where field wiring is to be introduced.



Grounding:

A pressure-type grounding lug with appropriate wire capacity will be provided at each end of frame.

Finish:

Rack frame shall be hot-dip galvanized after fabrication or natural aluminum.

Bus Duct in Lieu of Canopy

(Optional):

Single - or double - pitched canopy shall have minimum 15-degree pitch with a minimum 7'6" ground clearance, and 2-foot overhang. Roofing material shall be corrugated aluminum. Canopy roof trusses, cross channels, roof material, and mounting hardware shall be shipped unassembled for quick assembly at the job site. All holes in structure shall be provided except for roof mounting holes which will be drilled in the field.

Motor Control Components:

All Circuit Breakers & Disconnects:

- Handles shall be pad lockable in either the "OFF" or "ON" position, and shall be trip-free of the circuit breaker itself. An attached indicating plate shall give clear, visual confirmation of the circuit breaker status.
- Motor starter overload reset operating mechanisms shall be field adjustable.
- All Nema 7 enclosures shall be cast of a corrosion-resistant copper-free aluminum alloy (less than 0.4% copper) and shall be of a three section design. Multiple-start straight buttress threads between the covers and the body shall ensure quick access to the interior in less than two full turns of the covers. A system of stops shall prevent over tightening and thread seizing. A system of locks shall prevent covers from loosening due to external vibration.
- Female threads on the top cover with male threads on the bottom cover shall ensure inherent water and rain shedding.
- The external circuit breaker operating handle affixed to a stainless steel shaft, shall be pad lockable in either the "ON" or "OFF" position. Circuit breaker mechanisms shall be trip-free of the circuit breaker itself to allow the circuit breaker to open under overload conditions even if it is locked in the "ON" position.
- The mounting bracket shall provide a three-point suspension system for quick installation and adjustment.

- Conduit entrances shall have integral wire pulling bushings and conduit stops. These openings shall be arranged two at the top and two at the bottom and shall be sized for power and control requirements.

General

- Position, and shall be trip-free of the circuit breaker itself. An attached indicating plate shall give clear, visual confirmation of the circuit breaker status.

Lighting Panelboards

Class I, Division 1:

Class 1, Division 1 & 2

Panel boards shall be Eaton's Crouse-Hinds type, factory and Non-factory sealed SN7 series.

NEMA 4X Option:

- All bus boxes, control enclosures and lighting panelboards will be made of KRYDON® material to meet NEMA 4X requirements.

Conduit Boxes, Outlet Boxes & Device Boxes:

Conduit boxes, outlet boxes, and device boxes shall be Eaton's Crouse-Hinds Conduit® fittings.

Seals:

Seals will be standard Eaton's Crouse-Hinds type Conduit EYS. (Eaton's Crouse-Hinds Conduit EYD drains to be specified as required.)

Unions:

Unions will be Eaton's Crouse-Hinds UNY.

Breathers and Drains:

Breathers and drains shall be Eaton's Crouse-Hinds ECD.

Wiring:

- Standard wire shall be copper only, 600 volt, 75°C minimum rating, UL listed.
- No power wire less than 12AWG shall be used.
- Control wire shall be 14AWG minimum, 7 strands, THW minimum.
- Wiring shall be sized in accordance with the NEC requirements.

Drawings:

Standard drawings supplied for customer approval shall include complete rack wiring diagram, component data, nominal weight of the rack, and overall rack dimensions.



Electrical Switch Racks



Customer: _____

Project: _____

Prepared By: _____

Quotation For: Estimate/Budget

Quotation Required By (Date) _____

Is a current copy of plant STDS/SPECS available

Engineering Firm: _____

Location: _____

Date: _____

Bid

Immediate Buy

Material Required By (Date) _____

Area Classification:

HAZARDOUS - Circle All That Apply

- Class I
Div. 1 or 2, Grps B,C & D
- Class II
Div. 1 or 2, Grps E,F & G
- Class III

NON-HAZARDOUS

- Ordinary Locations
- NEMA 3R, 4, 4X (Circle One)

Structural Frame:

MATERIAL

- Steel
- Aluminum
- Single Face
(Components on ONE side only)
- Double Face
(Components on BOTH sides)
- Other _____
- Percent Spare Space _____ %

FINISH

- Hot Dip Galvanized
- Painted

Roof Canopy:

- Yes No
- Corrugated Aluminum
- Corrugated Fiberglass

Enclosure Type:

- Bolted Threaded
- Krydon Epoxy Coated

Dimension Restrictions:

- Length _____ Height _____

Service System: (i.e. 480V, 3PH, 3W, 60HZ)

_____ VOLT _____ PH _____ W _____ HZ

Incoming Feeder Requirements:

- _____ # Conductors/Phase
- _____ # AWG/MCM
- _____ # Inch Conduit (Size)
- Top Entry Bottom Entry

Main Bus Enclosure:

MATERIALS

- Steel
- Aluminum
- Other (Specify)
- Bus Location - Top of Rack
- Bus Location Bottom of Rack
- Bus Bracing _____ (25 KAIC Standard)
- Bus Amps _____
- Other - Customer to Specify

FINISH

- Hot Dip Galv.
- Painted

MAIN BUS CHARACTERISTICS

- Copper Bars
- Bare (Standard) Power Distr. Block
- Insulated Ground Bus in Enclosure
- Silver Plated
- Tin Plated



Electrical Switch Racks



Main Breaker/Disconnect: (3C, N)

None Molded Case Breaker

AIC Rating _____

Amp Trip (AT)/ _____ Amp Frame (AF) _____

Disconnect Switch

_____ Amps

Fused Non-Fused

Feeder Circuit Breaker: (3C, N)

AIC Rating _____

Qty	(AT)	(Specify)
_____	_____	/100/150 AF
_____	_____	/100/150 AF
_____	_____	/225/250 AF
_____	_____	/400 AF
_____	_____	/800 AF
_____	_____	Other

Equipment Requirements:

COMBINATION MOTOR STARTERS (1C, N)

FVNR, Reversing, 2-Speed (circle one)
Qty.

_____ NEMA Size 0 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 1 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 2 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 3 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 4 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 5 With _____ AT/ _____ AF, _____ MCP
_____ NEMA Size 6 With _____ AT/ _____ AF, _____ MCP

Refer to Eaton's Crouse-Hinds catalog for suggested breaker or motor circuit protector sizing if not specified above, Eaton's Crouse-Hinds will size accordingly.

OPTIONS REQUIRED

*Unless specified differently *options furnished standard

	Yes	No
*Fused Control Transformer Suffix FTFS	_____	_____
Space Heaters Suffix R11, R22, R44	_____	_____
Start/Stop Pushbuttons Suffix PB23	_____	_____
Hand-Off Auto Selection Switch Suffix RR3	_____	_____
Red Indicating Light Suffix J1	_____	_____
Green Indicating Light Suffix J3	_____	_____
*Auxiliary Contacts: (2 N.O./2NC) Suffix S782	_____	_____
Control Relay Suffix S787	_____	_____
*Breather/Drain Suffix S198V/S756V	_____	_____
*12 Point Terminal Block Other - Specify Suffix S786	_____	_____

Component Preference:

Cutler-Hammer SQD A-B GE
(Cutler-Hammer will be used if no preference is indicated.)

Distribution Transformers:

_____ KVA _____ PH _____ Volt-Pri _____ / _____ Volt-Sec
_____ KVA _____ PH _____ Volt-Pri _____ / _____ Volt-Sec

Copper Windings Stainless Steel Enclosure

Panelboards: (1A, N)

Power (480V) (D2D EXD)

Single Phase Three Phase

Main Breaker _____ Pole _____ AT

Branch Circuits

Qty	AT	No. Poles (i.e. '2P'-2 = Pole)
_____	_____	_____
_____	_____	_____
_____	_____	_____

LIGHTING/HEAT TRACING

(240/120V) (D2L, EPL, D2PB)

Single Phase Three Phase

Main Breaker _____ Pole _____ AT

Branch Circuits

Qty	(AT)	No. Poles (i.e. '2P'=2 Pole)
_____	_____	_____
_____	_____	_____
_____	_____	_____

‡ GFI (5mA) _____ AMP Rating _____
(No. Req'd) _____

‡ EPD (30mA) _____ AMP Rating _____
(No. Req'd) _____