Southern Oregon University Design and Construct a Rooftop Solar PV System for the Theater Building RFP 2025-30 June 13, 2025

Addendum #1

This Addendum together with RFP 2025-30 (including 7 attachments) form the Contract Documents. The following clarifications, changes, additions and deletions hereby become part of the Contract Documents. The original solicitation documents remain in full effect unless specifically modified by this Addendum.

1. Proposal Due Date Change

Proposal deadline is extended one (1) day. Proposals are due on June 20 at 3:00pm.

2. <u>Completion Date Extended</u>

The date for substantial completion is extended to September 20, 2025. All the conduit, wiring and PV equipment should be installed by that date. PV system programming, testing and commissioning can extend until October 15, 2025.

3. Existing Conduit to Roof

The existing spare conduit from Mechanical Room 281 through the roof can be used for this project. The conduit is a 2-inch EMT.

4. Alternate Conduit Path from Mechanical Room 281 to Prop Shop 264

A new PV conduit will be permitted above the upper lobby ceiling. The Contractor is allowed to install an access panel through the upper wall of the prop shop if needed for conduit installation.

5. Confirm Basement Conduit Size

The existing spare conduit from the Basement Electrical Room to the Fist Floor Costume Storage Room is a 1 1/4-inch EMT.

6. Confirm Roof Area

The roof area available for solar is approximately 81 ft. x 40 ft.

7. Confirm Structural Adequacy of Existing Roof

The existing structure has been evaluated and deemed adequate to accommodate the added dead load from PV panels. Any documentation required by the permitting authority will be SOU's responsibility.

8. <u>Mandatory Pre-Proposal Meeting Sign-in Sheet</u> Attached.

9. MDP Submittal

The 2018 submittal for the MDP expansion is attached.

10. Confirm Wall Construction Details at the Auditorium Metal Roof

The 1981 roof plan with wall details is attached for reference.

Attachments:

Attachment A: Mandatory Pre-proposal sign-in Sheet (1 page) Attachment B: 2018 Switchboard Submittal (25 pages) Attachment C: Roof Plan and Details - Original 1981 Construction (1 page)

End of Addendum #1

Addendum #1 - RFP 2025-30 Attachment A

Southern Oregon University (RFP 2025-30) New Rooftop Solar PV System for Theater Building Mandatory Pre-Proposal Meeting Sign-In June 9, 2025 – 9:00 AM

COMPANY	CONTACT PERSON	MAILING ADDRESS	TELEPHONE	EMAIL
True South Solar	Jamie	125 Clea Creek dr Ashland OR 97520	Ph541.941.4279	
INFINITY ELECTICICAL CONTRACTORS	CARLY SHELDON	4778 ANTWAY DR CENTRAL POINT, OR 97502	^{Ph} 541 - 876 - 7430	
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			Ph	-
			Ph	
			Ph	
			Ph	

Addendum #1 - RFP 2025-30 Attachment B (25 pages)



SOU JPR Theatre

SUBMITTED UNDER SECTION <u>26 24 13</u>

Switchboards







Detail Bill of Material

Project Name: SOU Theater General Order No:

Negotiation No:PO140712X6K2Alternate No:0007

tem No.	Qty	Product		Description
	1 Switchboards Designation			Pow-R-Line CSwitchboard, Front Access/ Front and Rear Align, Type 1, 208Y/120V 3-Phase 4-Wire, 1200 Copper, Minimum Interrupting Rating: 65kA, Bus Bracing Rating: 65kA
				n
		Qty	List of Materia	als
		1	Pow-R-Line C	
	1 Seismic Freestanding			tanding Label (IBC/CBC Seismic Qualified)
		1	1200 Amp CU	Distribution Structure
		1	Main Lugs	Trip Ctandard
		4		TIP - Standard Scool France Trip 600 A. Thermal Mag. (2) #2 500 kemil
		I	Mechanical	: 000A Framej, mp 600 A, memai way, (2) #2-300 kcmii,
	1 225A 3P [ED 225A F Mechanical		225A 3P [ED 2 Mechanical	225A Frame], Trip 225 A, Thermal Mag, (1) #4-4/0,
	2 125A 3P [ED 225A Mechanical		125A 3P [ED 2 Mechanical	225A Frame], Trip 125 A, Thermal Mag, (1) #4-4/0,
		1	3P [EDB 225A	A Frame] Provision

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction there of for the time the shipment is delayed.



Switchboard General Information						
Pow-R-Line C - Specifications						
Quantity: 1						
Alignment: Front Access/ Front and Rear Align						
Service: 208Y/120V 3-Phase 4-Wire	Minimum Interrupt Rating: 65 kA					
Bus Specifications						
Bus Amps: 1200	Bus Bracing Rating: 65kA					
Neutral Amps: 1200						
Bus Material: Copper	Heat Test					
Ground Bus Material: Copper .25 X 1.5 Ground Bus Bolted To Frame (1) #6-350 kcmil Ground Lug						
Incoming Information						
Terminals, Mechanical, Top, (4) #4-500 kcmil						
Incoming Entry: Top	Incoming Location: Left					
Incoming Qty & Size: Terminals, Mechanical, Top, (4) #4-500 kcmil						
Structure Specifications						
Non Service Entrance						
Enclosure Type: Type 1						
Seismic Label (IBC/CBC Seismic Qualified) - Freestanding						
Refer to seismic installation data sheet TD01508002E						
and drawing 1A32496 for details.						
Enclosure properties						
Struct #	Description/Modifications					
1	Top incoming main lugs on 50x chassis (Incoming Main Device/MLO Section)					

The information on this document is	PREPARED BY DATE					
created by Eaton Corporation. It is	DAVE SANDERSON	3/16/2017	Eaton SumterSC		SumterSC	
be used for the purpose in which it is	APPROVED BY	DATE	JOB NAME S	B NAME SOU Theater		
supplied.			DESIGNATION			
	VERS	SION	TYPE		DRAWING TYPE	
	8.0.7	17.0	Switchboards		CustAppr	
NEG-ALT Number	REVISION	DWG SIZE	G.O.		ITEM	SHEET
PO140712X6K2-0007	0	DwgA				1 of 3



SHEET

2 of 3

Switchboard Units Information								
Str#	Unit	Description/Mo	difications				Nameplate	
1	1	Main Lugs -Inco	ming					
	2	Feeder Breaker Terminals, Mech Neutral Termina	- Chassis Mtd-12 hanical, (1) #4-4/0 I, (1) #6-350 kcmi	5A 3P [ED 225A Frai I	ne], Trip 125A., Th	ermal Mag		
	3	Feeder Breaker Neutral Termina	- Chassis Mtd-3P I, (1) #6-350 kcmi	[EDB 225A Frame]	Provision			
	4	Feeder Breaker Terminals, Mech Neutral Termina	- Chassis Mtd-22 nanical, (1) #4-4/0 I, (1) #6-350 kcmi	5A 3P [ED 225A Frai I	ne], Trip 225A., Th	ermal Mag		
	5	Feeder Breaker Terminals, Mech Neutral Termina	- Chassis Mtd-12 nanical, (1) #4-4/0 I, (1) #6-350 kcmi	5A 3P [ED 225A Frai	ne], Trip 125A., Th	ermal Mag		
	6	Feeder Breaker Terminals, Mech Neutral Termina	- Chassis Mtd-60 nanical, (2) #2-500 I, (2) #4-500 kcmi	0A 3P [LGE 600A Fr) kcmil I	ame], Trip 600A., T	hermal Mag		
informa ted by I	ation on th Eaton Corp	is document is poration. It is	PREPARED BY DAVE SANDERSON	DATE 3/16/2017	Eaton		SumterSC	
used for plied.	the purpo	se in which it is	APPROVED BY	DATE	JOB NAME DESIGNATION	SOU Theater		
			VE 8.1	0.17.0	Switchboards		CustAppr	
-ALT Numb	ber		REVISION	DWG SIZE	G.O.		ITEM	SHEE
JU712X6K2	2-0007			DWGA				3 01





September 2011 Sheet 21009

Switchboards—Low Voltage Pow-R-Line C Switchboards

General Description—Pow-R-Line C, Front- or Rear-Access, Group-Mounted Feeders

Pow-R-Line C Switchboards

Meets NEMA Standard PB-2 and UL 891.

Construction Details

- 6000A main bus maximum
- Front accessible—main sections front- and/or side-access
- Front- and rear-access; main sections front- and/or side-access
- Feeder devices group-mounted
- Sections rear-aligned or front- and rear-aligned

Main Devices, Individually Mounted

- Molded-case circuit breakers, 400–2500A, fixed-mounted
- Insulated-case circuit breakers, Magnum SB, 800–5000A, fixed and drawout
- Air power circuit breakers, Magnum[™] DS, 800–5000A, fixed or drawout
- Air power circuit breakers with current limiting fuses, Magnum DSL, 800–5000A
- Bolted pressure switches, 800–5000A, fixed
- Fusible switches, 400–1200A, fixed

Feeder Devices, Group-Mounted

- Molded-case circuit breakers, 15–1200A
- Fusible switches, 30–1200A

Feeder Devices, Individually Mounted

- Molded-case circuit breakers, 800–2500A, fixed
- Insulated-case circuit breakers, Magnum SB, 800–5000A, fixed and drawout
- Air power circuit breakers, DS and Magnum DS, 800–4000A, fixed and drawout
- Bolted pressure switches, 800–1600A, fixed

Selective Coordination

Selectively coordinated systems dictated by code and customer mandates may be achieved with Eaton switchboards to either 0.1 or 0.01 seconds as mandated by codes and/or customers. Refer to **Tab 1**, **Section 1.4** for additional details.

Note: For selection and layout guidelines, please reference **Page 21.1-1**.



Pow-R-Line C Switchboard

For a complete product specification in CSI format, see Eaton's Product Specification Guide Section 16429

21.0-9

E 'T•N

General Description—Pow-R-Line C, Front-Access, Group-Mounted Feeders

Features

- Eaton's circuit breaker ratings up to 200 kAIC
- Trip units that integrate Eaton's Arcflash Reduction Maintenance System[™] reduces potential arc flash available
- Integral ground fault protection available in electronic trip units from 15–5000A
- Electronic trip units that integrate zone selective interlocking capabilities available in moldedcase, insulated-case and air power circuit breaker
- Available with circuit breakers and fusible switches on the same chassis



The Single Chassis Design Provides Device Flexibility

- UL listed and labeled. Meets NEC and NEMA standards
- Eaton microprocessor-based metering devices are standard when metering is specified. Conventional metering is available. IQ and Power Xpert devices can provide a communications capability. See Tab 3
- Optional integral surge protective device (SPD) is available in Pow-R-Line C switchboards, when specified. See Tab 34
- Aluminum, copper or silver-plated copper bus
- A full range of device modifications is available
- Available in NEMA Type 1 and 3R enclosures, UL listed

Modifications

- Ground fault protection on mains and distribution devices
- Coordination with other Eaton divisions for busway and transformer connections



Type 1 Pow-R-Line C Features

(1) Customer metering.

(2) Utility metering compartment.

③ Surge protective device.

Table 21.0-1. Pow-R-Line C Group-Mounted Switchboards Voltage: 240–480–600 Vac, 250 Vdc Mains: 400–6000A

Main Device Type	Amperes	Short-Circuit Symmetrical Rating (kA)
Molded-case circuit breakers Insulated-case circuit breakers, Magnum SB Air power circuit breakers, Magnum DS Air power circuit breakers with CL fuses DSL	400–2500 800–5000	14–200 30–100 200
Bolted pressure switches	800-5000 1	200
Main lugs only	400-6000	Rating determined by overcurrent protective device

Feeder Device Type	Amperes	Short-Circuit Rating (kA)
Molded-case circuit breakers	15–1200	10–200
Fusible switches	30–1200	200
Stacked—main with branch devices	400–2500	18–200
Magnum SB up to two high	800–2000	30–100
Magnum DS up to two high ^②	800–2000	30–100

① 5000A bolted pressure switches are not UL listed.

² Third-party witness tested at 30 cycles.

④ Main breaker (Magnum SB).⑤ Cable pull and termination space.

Application Considerations and Definitions

Eaton's Pow-R-Line[®] family of distribution switchboards incorporates new design concepts that fit the ever-increasing need for applications on high short circuit systems, while retaining maximum flexibility, safety and convenience throughout the line.

Front Access

Front-access switchboards align at the rear, enabling them to be placed against a wall (Type Pow-R-Line CTM front accessible). If the main section is deeper than others, due to physical size of the main device, the necessary offset in lineup will occur in front, and the main section will be accessible from the side as well as from the front. Eaton also offers front accessible switchboards that align at the front and rear.

Rear Access

Rear-access switchboards align at the front and the rear. Bus maintenance and cable entry and exit require rear access. There are two types of rear accessible switchboards. Both types use the same incoming utility and/or main structures. The first type uses group-mounted feeder devices with panel construction (Type Pow-R-Line C rear accessible). The second type uses individually compartmentalized feeder devices with load side insulated bus bar extensions (Type Pow-R-Line *i*).

Individually Mounted

Larger overcurrent protective devices (OCPD) may be individually mounted. In most cases, this means that the OCPD is mounted vertically in the switchboard and is connected via bus bar. All insulated case circuit breakers, power air circuit breakers and bolted pressure contact switches are individually mounted. Moldedcase circuit breakers 600A and above may be individually mounted when used as a main or as a feeder device feeding other OCPD within a section or adjacent sections.

Compartmentalized Feeder and Branch Devices

Compartmentalized molded-case circuit breakers and fusible switches provide additional isolation. Individually mounted molded-case circuit breakers and fusible switches through 1200A are available in a compartmentalized, rear-access, rear-connected switchboard. See Pow-R-Line *i* switchboards in this section for details.

Standard Switchboard Height

Standard Pow-R-Line switchboard height is 90.00 inches (2286.0 mm). Contact Eaton for special heights.

Group Mounting

Group-mounted circuit protective devices are an assembly of units mounted on a panelboard type chassis. Units may be moldedcase breakers, fusible switches, customer metering and surge protective devices.

A main molded-case breaker or main fusible switch, within the sizes listed for panelboard design, can be included in the panel-mounted assembly in lieu of a separate, individually mounted unit.

Space Only for Future Devices Group-Mounted Construction

Where space only for future circuit protective devices is required, the proper space and a blank filler plate will be supplied. Connections and mounting hardware are not included.

Provision for Future Devices

Where provisions for future circuit protective devices are required, space for the device, corresponding vertical bus, device connectors and the necessary mounting hardware will be supplied.

Bus Bar System

Standard bus in the switchboards is tin-plated aluminum. Copper, silver-plated copper or tin-plated copper are also available.

Main bus and sub-main buses meet UL[®] and NEMA[®] standards for temperature rise on all Pow-R-Line switchboards. Special density rated bus is available.

Overcurrent Devices

To properly select and size overcurrent devices for use in a switchboard, the allowable temperature rise must be taken into account as to its effect on the tripping characteristics of the devices in question per UL 891.

Accordingly, the NEC[®] requires overcurrent devices to be rated not less than 125% of the continuous load they are protecting. To comply with this, an 80% derating factor must be used with all overcurrent devices such as molded-case breakers and FDPW fusible switches unless they are tested and listed for application at 100% of the rating. All Magnum type breakers and bolted pressure switches are 100% rated.

Short-Circuit Rating

Standard bus and connectors on all switchboards are rated for use on systems capable of producing up to 65,000A rms symmetrical short-circuit current at the incoming terminals.

Increased bus short-circuit ratings equal to that of connected switchboard devices, up to 200,000A rms symmetrical, are available in most

Pow-R-Line C switchboards when approved main devices are installed. UL labeled switchboard sections are marked with their applicable short-circuit rating.

When air power circuit breakers are used as feeder devices in a switchboard, these devices may experience up to a 30-cycle (1/2 second) delay if the instantaneous setting is turned off. Eaton has qualified our low voltage switchboards when air power circuit breakers are used as feeders (and mains) to 30 cycles. This rating is not recognized under the UL 891 standard. However, Eaton has witness tested the structure bussing with a qualified National Recognized Testing Laboratory (NRTL) at 30 cycles (1/2 second) up to 100 kAIC symmetrical.

Provision for Busway Entrance and Exit

Busway connections to switchboard sections include cutout and drilling in the top of the switchboard with riser connections from the switchboard device or bus, up to the point where the bus duct enters the switchboard. No connections are furnished external to the switchboard.

In all transactions involving busway attached to switchboards, it is essential that information regarding orientation of the busway with respect to the front of the switchboard be supplied to the coordinating assembly plant.

On Pow-R-Line C switchboards, a solid bus bar is used to connect the bus duct to the individually mounted main device, main or sub-main switchboard bus, or vertical main bus of panelmounted circuit protective device panels. **Busway fed by group-mounted branch devices are cable connected**.

Aluminum riser connections are standard. Copper- or silver-plated copper is available as an option.





September 2011 Sheet 21003

Switchboards—Low Voltage

General Description

Transitions

Transition structures are required for connecting switchboards to the secondary of power center transformer (fluid filled), motor control centers, and for other special switchboard configurations such as "L" or "U" shaped lineups. In some applications, an extra structure complete with connections is required; in others, where switchboard depth and space permit, only the connection conductors are required. Refer to Eaton for these applications.

Auxiliary Structures

These are normally mounted adjacent to service structures or distribution structures, and used where incoming service or feeder conductors require additional space or facilities not included in the standard switchboard, such as:

- Mounted adjacent to a top connected service structure and used as a cable pull structure where service conductors are brought in underground. Auxiliary structures are the same depth and height as the service structure, and are wide enough to accommodate the incoming cables.
- Mounted adjacent to a service structure and used as a bus transition compartment for running riser bus from the loadside of the service structure up to top outgoing bus duct connection when distribution structures are not required. Auxiliary structures are the same depth and height as service structures.

In addition to the above applications, auxiliary structures may be mounted adjacent to a distribution structure and used as a structure for lighting panel or other device that may be cable-connected to a branch circuit device in the distribution structure. Dimensions are compatible with the arrangements required.

Switchboards Used as Service Equipment

Service equipment is the electrical equipment that constitutes the main control and means of power cutoff the electric service (normally Power Company supply) brought into the building.

Where switchboards are to be used as service equipment, certain NEC and UL requirements apply that necessitate modifications not normally supplied in switchboards.

The following is a summary of the requirements that are pertinent to the application of a switchboard for service equipment:

A. A switchboard with main lugs only (no main disconnect) must be designed so that all circuits in the switchboard can be disconnected from the supply source by the operation of no more than six operating handles (breaker or switch).

Switchboard equipped with main disconnect devices are not subject to the above six disconnect limitation, as the entire board can be de-energized with the main disconnect device.

Ground fault protection of equipment must be provided for solidly grounded wye electrical services of more than 150V to ground, but not exceeding 600V phase-to-phase for each service disconnecting means rated 1000A or more.

B. For testing purposes, means are also required to disconnect the switchboard neutral bus from the grounded service neutral conductor (single-phase, three-wire; and threephase, four-wire systems). To comply with this requirement, a removable link (solid bar) is provided in the switchboard neutral bus. This link is generally located near the point where the main feeders enter the switchboard or in the area of the main disconnect device where one is provided. To further comply with NEC and UL requirements, a separate bonding strap is connected from the neutral bus to the switchboard frame. This bonding connection is located on the line side of the removable neutral link, maintaining a service ground to the switchboard frame when the test link is removed. See **Figure 21.0-1**.



Figure 21.0-1. Neutral Link

UL labeling will clearly indicate service equipment listed switchboards.

General Description

Underwriters Laboratories Requirements and Labeling

The basic requirement for obtaining a UL label on a switchboard, is that all the component devices (breakers, switches, and so on) in the switchboard assembly are UL listed. In addition, the switchboard must comply with all applicable provisions of UL 891.

Today's modern electrical systems require that switchboards offer a wide selection of electrical devices, many of which do not fall within the scope of UL listed devices. Therefore, the conditions under which a switchboard may be labeled are limited.

Listed below are several important guidelines for consideration when a UL label is specified:

- UL nameplates, where applicable, are supplied for each vertical structure rather than one common nameplate for the complete switchboard lineup. Where all of the component devices in the switchboard are UL listed and all applicable provisions of UL 891 are met, each of the switchboard sections may be labeled.
- Individual vertical structures of a switchboard may be labeled where they comply with UL requirements, although other vertical structures in the same switchboard lineup may not meet the UL standards, and will not be labeled.
- 3. All Pow-R-Line C switchboards are UL labeled when all mounted devices are UL listed.

Alternate Power Source Capabilities

Multiple solutions are available to accommodate alternate power sources available. Due to the large number of customer and system requirements, details are not provided in this guide. Eaton offers solutions that include main-main configuration and maintie-main configurations. Automatic transfer equipment, including UL 1008 listed transfer switches and other automatic transfer schemes, are available.

Automatic Transfer Equipment

For continuity of service, automatic transfer equipment between two incoming sources may be required. This equipment transfers the load upon failure of the normal (or preferred) source to the standby (or alternate) source. Upon restoration of the normal source, the load is automatically transferred back to it. To accomplish this, electrically operated main protective devices (and bus tie devices, if required) must be employed. Additional relays also are required to detect source voltage failure and to transfer control power, when required. A manual selector switch is usually provided to select the mode of operation-automatic or manual transfer.

Seismic Qualification



Refer to **Tab 1** for information on seismic qualification for this and other Eaton products.



Seismic qualified

MMM MMM

Eaton Corporation's equipment identified below was tested for seismic withstand capability and tested in accordance with the combined requirements specified in the International Building Code, the California Building Code, and the Uniform Building Code. As required by the codes, the equipment demonstrated its ability to function after the seismic tests. The seismic capability of the equipment exceeds the worst-case required levels, as illustrated in the figure below.



William V. Joerger, S.E. *ISAT*

TESTED BY *Wyle Laboratories* January, 2013–70461R12



3RD PARTY TEST ENGINEER IN CHARGE

For interpretation of testing data, refer to Eaton Publication SA12501SE



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27.4-22 Molded-Case Circuit Breakers & Enclosures Circuit Breaker Selection Data

E 1 • N

Series G Selection Data—LG-Frame

Series G, L-Frame Electronic RMS, 100–630 A* Thermal-Magnetic, 250–630 A* *UL Maximum is 600 A



L-Frame Breaker

Table 27.4-36. Dimensions in Inches (mm), Weight in Lbs (kg)

Number of Poles	Width	Height	Depth	Weight
3	5.48 (140)	10.13 (258)	4.09 (104)	16 (7.3)
4	7.22	10.13	4.09	20 (9.1)

Table 27.4-37. Thermal-Magnetic Trip Rating

Frame	Ratings
LG	250, 300, 350, 400, 500, 600
LG 1	320, 630

1 Not UL listed.

LG_400 LG_250

Table 27.4-38. Digitrip 310+ Electronic Trip Units

	•
Frame	Ratings
LG_630	250, 300, 315, 350, 400, 500, 600, 630
LG_600	250, 300, 315, 350, 400, 450, 500, 600

Note: 160, 315 and 630 are IEC ratings only. LG breaker is HACR rated.

160, 200, 225, 250, 300, 315, 350, 400

100, 125, 150, 160, 175, 200, 225, 250

Table 27.4-39. UL 489/IEC 60947-2 Interrupting Capacity Ratings

					3		J -				
Circuit	Number	Interrupting Capacity (kA rms Symmetrical Amperes) (kA)									
Breaker	of Poles Volts AC (50/60 Hz)								Volts DC 2		
туре		240-24	240–240		380-415		600	690		250 3	
		I _{cu}	I _{cs}	I _{cu}	I _{cs}			I _{cu}	I _{cs}	I _{cu}	I _{cs}
LGE630 LGS630 LGH630	3, 4 3, 4 3, 4	65 85 100	65 85 100	35 50 70	35 50 70	35 50 65	18 25 35	12 20 25	6 10 13	22 22 42	22 22 42
LGC630 LGU630 LGX630	3, 4 3, 4 3, 4	200 200 200 ④	200 200 200	100 150 200	100 150 200	100 150 200	50 65 65	30 35 35	15 18 18	42 50 50	42 50 50

⁽²⁾ DC rating applies to substantially non-inductive circuits.

^③ Two-pole circuit breaker, or two poles of three-pole circuits.

④ IEC rating is 300 kA at 240 Vac.

Table 27.4-40. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/Number of Conductors	Metric Wire Range mm ²	Number of Terminals Included	Catalog Number
400	Aluminum	Cu/Al	500–750 (1)	240–380 (1)	3	3TA631LK 5
400	Aluminum	Cu/Al	500–750 (1)	240–380 (1)	4	4TA631LK 5
400	Copper	Cu	500–750 (1)	240–380 (1)	3	3T631LK 5
400	Copper	Cu	500–750 (1)	240–380 (1)	4	4T631LK 5
630	Aluminum	Cu/Al	2–500 (2)	35–240 (2)	3	3TA632LK 66
630	Aluminum	Cu/Al	2–500 (2)	35–240 (2)	4	4TA632LK 66
630 630	Copper Copper	Cu Cu	2–500 (2) 2–500 (2)	35–240 (2) 35–240 (2)	3 4	3T632LK 4T632LK 5
400	Aluminum	Cu/Al	2–500 (1)	35–240 (1)	1	TA350LK ®
400	Copper	Cu	2–500 (1)	35–240 (1)	1	T350LK

^⑤ Includes LTS3K (three-pole) or LTS4K (four-pole) terminal covers.

⁶ Standard terminal included with complete breaker.





Series G

L-Frame

Figure 6. Thermal-Magnetic LGE, LGS, LGH, LGC, LGU, and LGX Circuit Breakers-Curve Number TC01208002E, January 2010



Figure 7. Thermal-Magnetic LHH High Instantaneous Circuit Breaker – Curve Number TC01206004E, September 2009



Molded-Case Circuit Breakers & Enclosures 27.4-26 **Circuit Breaker Selection Data**

Series C, F-Frame Thermal-Magnetic 10-225 A Electronic RMS 15–225 A



F-Frame Breaker

Table 27.4-55. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
1	1.38 (34.8)	6.00 (152.4)	3.38 (85.7)
2	2.75 (69.9)	6.00 (152.4)	3.38 (85.7)
3	4.13 (104.8)	6.00 (152.4)	3.38 (85.7)
4	5.50 (139.7)	6.00 (152.4)	3.38 (85.7)

Table 27.4-56. Thermal-Magnetic Trip Ratings

Frame	Ratings
ED, EDH, EDC	100, 125, 150, 175, 200, 225
EHD, FDB, FD, HFD, FDC, HFDDC	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150
FD, HFD, FDC	175, 200, 225

Table 27.4-57. Digitrip 310+ Electronic Trip Units

Types Frame Ratings

FDE, HFDE, FDCE	225	100, 110, 125, 150, 160, 175, 200, 225
	160	60, 70, 80, 90, 100, 125, 150, 160
	80	15, 20, 30, 40, 50, 60, 70, 80

Table 27 4-58 UI 489 Interrupting Canacity Ratings

Circuit	Number of Poles	Trip Type 1	Interrupting Capacity (Symmetrical Amperes)					
Breaker			Volts AC (50/60 Hz)				Volts DC	
туре			240	277	480	600	125	250 23
EDB EDS	2, 3 2, 3	N.I.T.	22,000 42,000			_	10,000 10,000	_
ED EDH EDC ④	2, 3 2, 3 2, 3	N.I.T.	65,000 100,000 200,000	_ _ _	_ _ _	_ _ _	10,000 10,000 10,000	- - -
EHD	1 2, 3	N.I.T.	— 18,000	14,000 —	— 14,000	-	10,000 —	— 10,000
FDB	2, 3, 4	N.I.T.	18,000	-	14,000	14,000	-	10,000
FD FD FDE ⁽⁵⁾	1 2, 3, 4 2, 3, 4	N.I.T.	— 65,000 65,000	35,000 -	— 35,000 35,000	 18,000	10,000 — —	 10,000
HFD HFD HFDE (5)	1 2, 3, 4 2, 3, 4	N.I.T.	— 100,000 100,000	65,000 — —	— 65,000 65,000	 25,000	10,000 — —	 22,000
FDC ④ FDCE ⑤	2, 3, 4	N.I.T.	200,000	-	100,000	35,000 25,000	-	22,000
HFDDC 6	3	N.I.T.	_	-	—	—	-	42,000 7

① N.I.T. is non-interchangeable trip unit.

⁽²⁾ Two-pole circuit breaker, or two poles of three-pole circuit breaker.

^③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

④ Current limiting.

 $\ensuremath{^{\textcircled{5}}}$ Electronics available on three-pole only.

⁶ HFDDC is UL only and is not tested to other standards.

^⑦ Interrupting rating is 35,000 A at 600 Vdc with three poles in series, for ungrounded systems only.

Table 27.4-59. Line and Load Terminals

Maximum Terminal		Wire	AWG Wire	Metric Wire	Catalog Number	
Breaker Amperes	Body Material ®	Туре	Range	Range (mm ²)	Package of 3 Terminals	
Standard Pres	sure Type Terminals			·		
20 (EHD) 100 150 225	Steel Steel Aluminum Aluminum	Cu/Al Cu/Al Cu/Al Cu/Al	(1) #14#10 (1) #141/0 (1) #44/0 (1) #44/0	2.5–4 2.5–50 25–95 25–95	3T20FB (9) 3T100FB 3TA150FB 3TA225FD	
Optional Pres	sure Terminals					
50 100 150	Aluminum Aluminum Stainless Steel	Cu/Al Cu/Al Cu	(1) #14–#4 (1) #14–1/0 (1) #4–4/0	2.5–16 2.5–50 25–95	3TA50FB ® 3TA100FD 3T150FB	

225 Aluminum Cu/Al (1) #6-300 kcmil 16-150 [®] UL listed for use with copper or aluminum conductors as noted.

9 Not for use with ED, EDH, EDC breakers.

3TA225FDK



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Figure 32. Types ED, EHD, FDB, FD, and HFD 35A-Curve Number SC-4138-87B



Broome Oringdulph, O'Toole, Rudolf & Associates p.C. Architects and Planners AIA 733 Northwest 20th Portland, Ore, 97209 Phone: 503 226 1575 TAPE CONT **M** Ω \bigcirc (5)**U** Ш \bigcirc œ (5 S \cup Revision log Drawn by Title ROOF PLAN # DETAILS Sheet numper 4.8 Date 25 MARCH 80