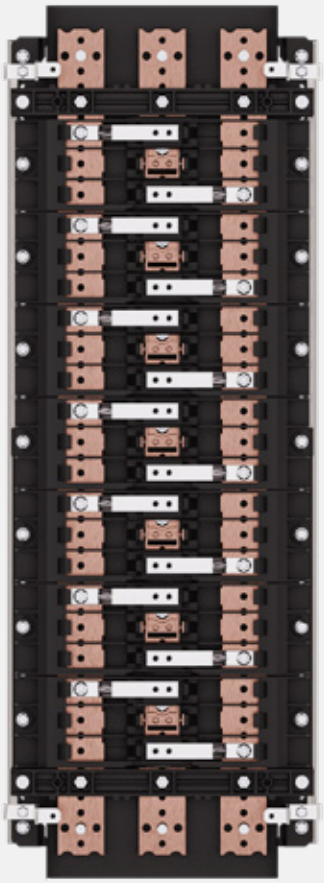
APPLICATION GUIDE

ReliaGear® OEM lighting panelboards

Building smart, reliable and flexible solutions together



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Offering overview

Offering overview

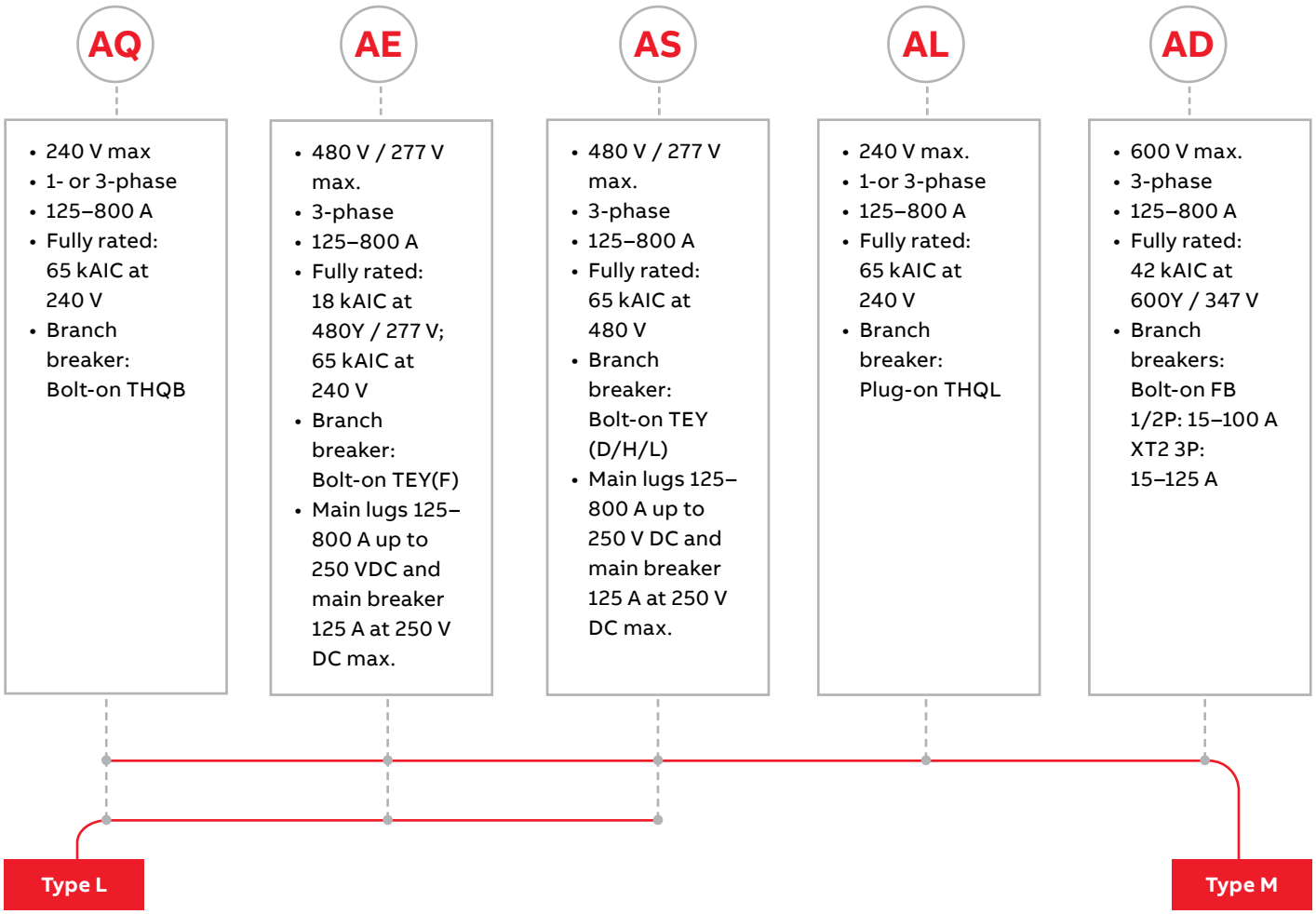
Offering overview

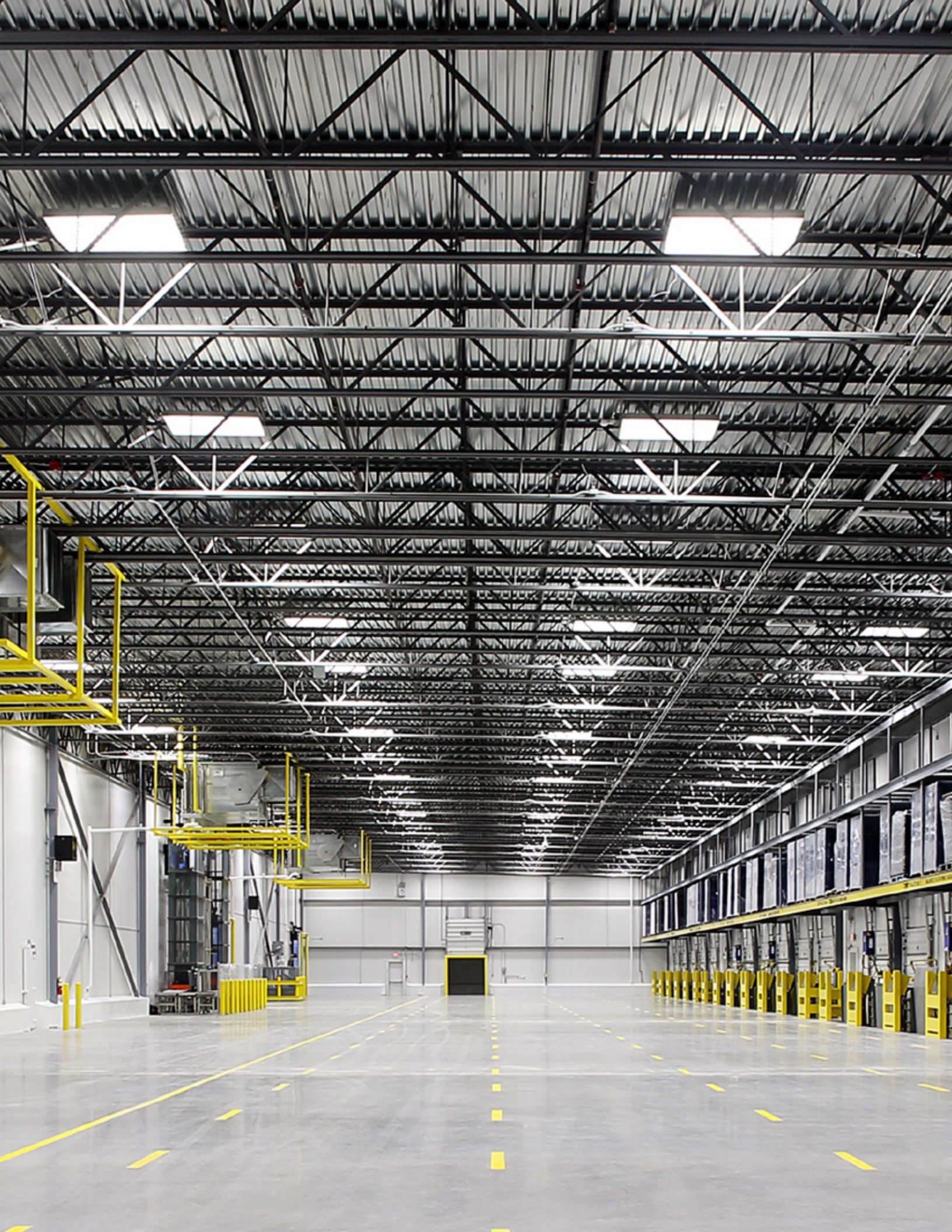
ReliaGear® OEM lighting panelboards are assembled on rigid steel frames and equipped with circuit breakers from 15 A to 100 A — with main breaker or main lug up to 600 A. Maximum short circuit rating is equal to 65 kA at 480 V AC with applicable series rating, up to 100 kA at 240 V with the AS panel.

ReliaGear® OEM Type L panelboards provide the interior construction only without pre-installed breakers and without the shield. This is offered for AQ, AE and AS panel types.

OEM Type L is a UL recognized component.

ReliaGear® OEM Type M panelboards provide the interior construction only with pre-installed breakers and with the shield. This will be offered for all panel types.





02

High level specifications

High level specifications

High level specifications

2.1. Application

The following classifications and limitations of panelboards have been established by Underwriters Laboratories (UL) and the National Electrical Code (NEC). Note — “an overcurrent protective device is a circuit breaker pole or single fuse.” Panelboards have no fire wall ratings. All are 50/60 Hz rated. There is no limitation as to the number and rating of branch circuits, except as determined by available enclosures.
In addition, the ReliaGear® OEM lighting panelboard Type L is UL Recognized.

2.1.1. Interrupting ratings — circuit breakers

Panelboards have integrated short circuit ratings. When fully rated, the rating is that of the lowest rated device in the panelboard. When series-connected rated, the rating is that of the main device in the panelboard (or remote line-side protected device) and branch-tested/UL Listed combination.

2.1.2. Selective coordination

NFPA 70, the National Electrical Code (NEC), requires overcurrent devices to be selectively coordinated when applied in emergency standby systems (Article 700), legally required standby systems (Article 701), Critical Power Systems (Article 708) and when supplying multiple elevator circuits (620.62). The NEC defines the performance standard of selective coordination in Article 100, Definitions. Beginning with the definition in effect with the 2014 NEC, the combinations of circuit breakers that can comply with this standard are limited. Those limitations include the number of circuit breaker poles, current ratings of either the line-side or load-side circuit breaker and the maximum interrupting current that selective operation extends to. These limitations can affect the selection of circuit breakers used in a panelboard. ABB has documented selective pairs of its molded case circuit breakers in publication 1SDC210066D0201. This publication should be consulted when applying panelboards in the applications noted above.

High level specifications

2.2. Standard product features

Product requirements	Features	OEM LP Type L	OEM LP Type M
Sub-system offering	Interior with shortened rails — no shield	√	
	Interior with shortened rails and shield		√
	Pre-installer breakers		√
	Box-mounted neutral (option)	√	√
Panel type	AQ	√	√
	AL		√
	AE	√	√
	AS	√	√
	AD		√
Supported phases	1-phase	√	√
	3-phase	√	√
Bus amperage	125	√	√
	225	√	√
	400	√	√
	600	√	√
	800		√
Bus material	Aluminum heat-rated	√	√
	Aluminum density-rated		√
	Silver-plated copper density-rated	√	√
	Tin-plated copper density-rated		√
	Bare copper heat-rated	√	√
Supported kits	Main breaker	√	√
	Main lugs	√	√
	Feed-through lugs	√	√
	Sub-feed breakers		√
	Neutrals	√	√
	Grounds	√	√
Branch circuit count	12		√
	18		√
	24		√
	30	√	√
	36		√
	42	√	√
	48		√
	54		√
	60		√
	66		√
	72		√
	78		√
	84		√

Product requirements	Features	OEM LP Type L	OEM LP Type M
Supported main breakers	THQB/THHQB		√
	A2	√	√
	TEY		√
	XT1	√	√
	XT4	√	√
	XT5	√	√
Branch strap offering	200 A straps		√
	Normal straps	√	√
Sub-feed / feed-through offering	Feed-through lugs	√	√
	1 sub-feed breaker assembly		√
	1 sub-feed breaker + feed-through lugs		√
	2 sub-feed breakers		√
Advanced features	Surge protection devices		√
	Veris/Socomec branch circuit monitoring		√
Ordering process	empower Flow — SKU-based	√	
	empower Quote — SKU-based		√

Note: Not all possible configurations are available

03

Product details

Product details

Product details

3.1. Type L sizing and assembly

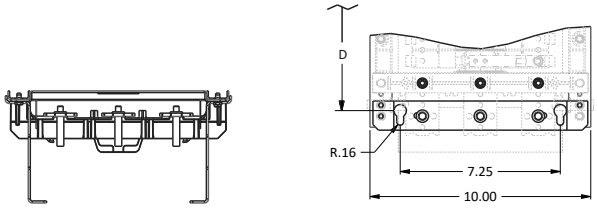
In terms of sizing, the main drivers of the overall length are ampacity, branch circuit count and the line and load spacing of the interior. The 2D drawings on the following pages showcase the following dimensions in inches.

A. Total rail length: Top-to-bottom measurement of the panel interior
B. Branch section length: Branch section measurement
C. Line end length: Length measurement driven by the main device
D. Mounting length: Total length for wall mounting

Panel	Main device	Ampacity	Branch circuits	A (in.)	B (in.)	C (in.)	D (in.)
AQ, AE, AS	Main lug / main stud	125 A	30	20.26	16.00	2.00	19.50
			42	26.26	22.00	2.00	25.50
		225 A	30	20.26	16.00	2.00	19.50
			42	26.26	22.00	2.00	25.50
		400 A	30	20.26	16.00	2.00	19.50
			42	26.26	22.00	2.00	25.50
		600 A	30	20.26	16.00	2.00	19.50
			42	26.26	22.00	2.00	25.50
	XT1	125 A	30	27.26	16.00	8.50	26.50
			42	35.26	22.00	10.50	34.50
	A2 / XT4	225 A	30	29.26	16.00	11.00	28.50
			42	35.26	22.00	11.00	34.50
	XT5 400 A	400 A	30	35.26	16.00	17.00	34.50
			42	41.26	22.00	17.00	40.50
	XT5 600 A	600 A	30	35.26	16.00	17.00	34.50
			42	41.26	16.00	17.00	40.50

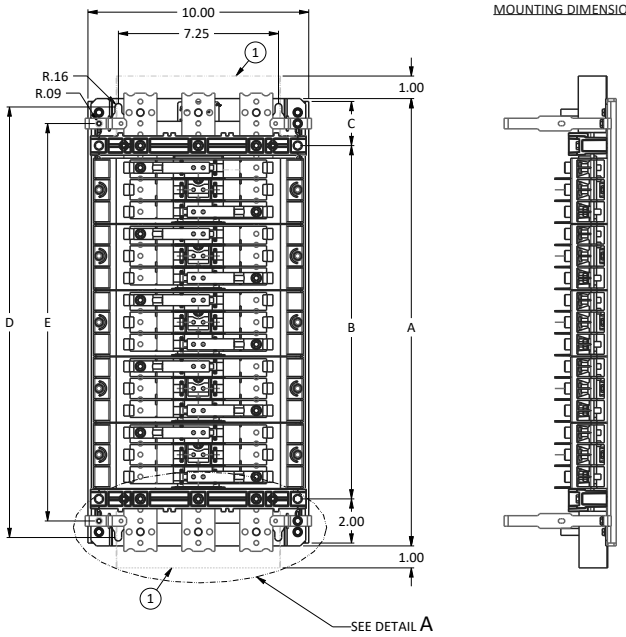
Product details

3.1.1. Main lugs / main stud interior



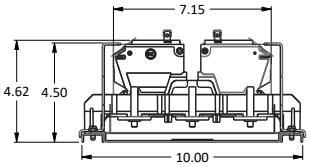
DETAIL A
SCALE 3:10

MOUNTING DIMENSIONS

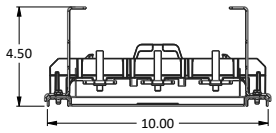


PANEL	SUB TYPES	PHASES	CKT	AMPS	BUS MATERIAL	MAIN TYPE	BRANCH BREAKER
AQ	L	3	30 & 42	1, 2, 4 & 6	A & C	N	THQB
AE	L	3	30 & 42	1, 2, 4 & 6	A & C	N	TEY/TEYF
AS	L	3	30 & 42	1, 2, 4 & 6	A & C	N	TEYD/H/L

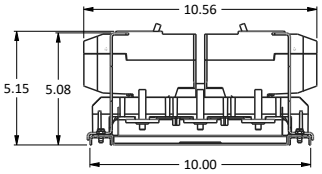
PANEL	AMPACITY	BRANCH CKTS	MAIN TYPE	A	B	C	D	E
AQ, AE & AS	125A	30	N	20.26	16	2	19.5	18
		42	N	26.26	22	2	25.5	24
	225A	30	N	20.26	16	2	19.5	18
		42	N	26.26	22	2	25.5	24
	400A	30	N	20.26	16	2	19.5	18
		42	N	26.26	22	2	25.5	24
	600A	30	N	20.26	16	2	19.5	18
		42	N	26.26	22	2	25.5	24



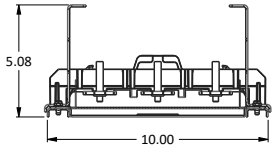
AQ PANEL
THQB



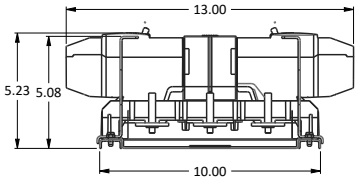
AQ PANEL



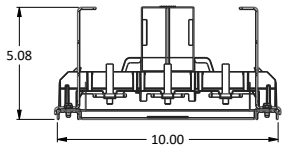
AE PANEL
TEY/TEYF



AE PANEL



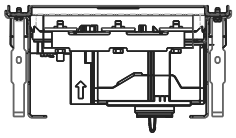
AS PANEL
TEYD/H/L



AS PANEL

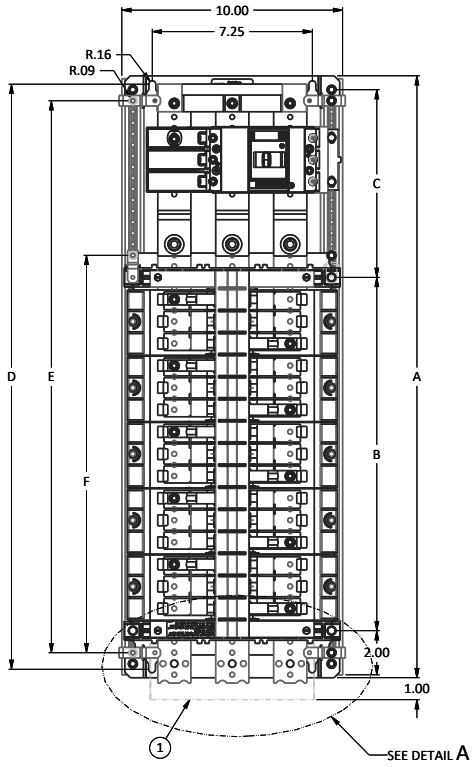
Product details

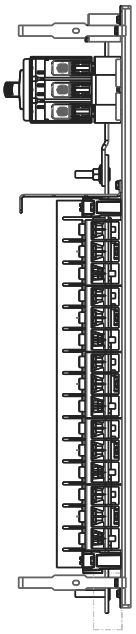
3.1.2. Main breaker: XT1 interior

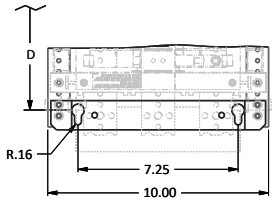


PANEL	SUB TYPES	PHASES	CKT	AMPS	BUS MATERIAL	MAIN TYPE	BRANCH BREAKER
AQ	L	3	30 & 42	1	A & C	R	THQB
AE	L	3	30 & 42	1	A & C	R	TEY/TEYF
AS	L	3	30 & 42	1	A & C	R	TEYD/H/L

PANEL	AMPACITY	BRANCH CKTS	MAIN TYPE	A	B	C	D	E	F
AQ, AE, & AS	125A	30	R	27.26	16	8.5	26.5	25	18
		42	R	35.26	22	10.5	34.5	33	24

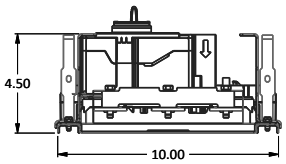




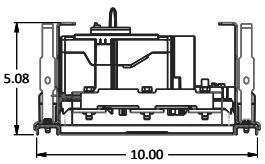


DETAIL A
SCALE 3:10

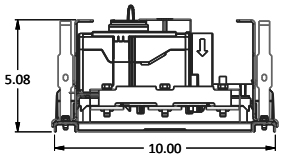
MOUNTING DIMENSIONS



AQ PANEL / XT1 BREAKER



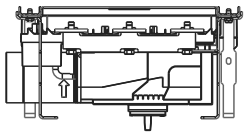
AE PANEL / XT1 BREAKER

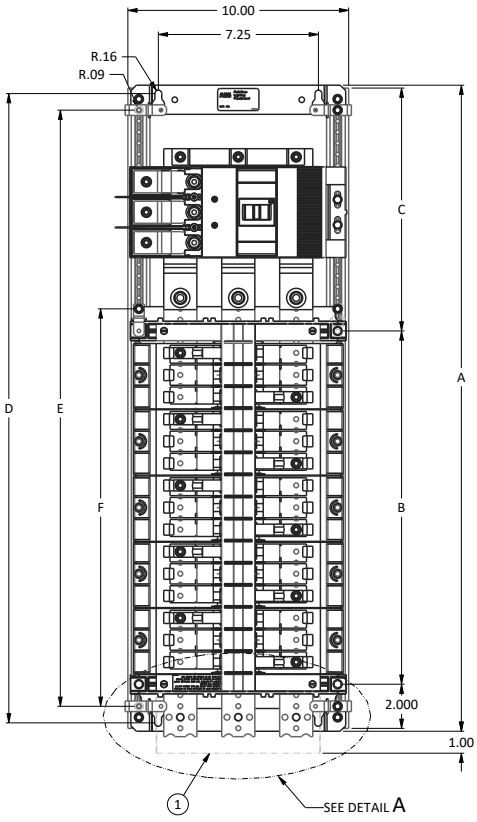


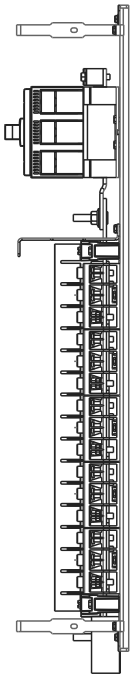
AS PANEL / XT1 BREAKER

Product details

3.1.3. Main breaker: A2 interior

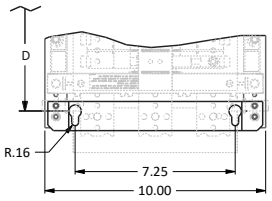






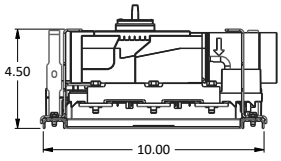
PANEL	SUB TYPES	PHASES	CKT	AMPS	BUS MATERIAL	MAIN TYPE	BRANCH BREAKER
AQ	L	3	30 & 42	2	A & C	R	THQB
AE	L	3	30 & 42	2	A & C	R	TEY/TEYF
AS	L	3	30 & 42	2	A & C	R	TEYD/H/L

PANEL	AMPACITY	BRANCH CKTS	MAIN TIPE	A	B	C	D	E	F
AQ, AE & AS	225A	30	R	29.26	16	11	28.5	27	18
		42	R	35.26	22	11	34.5	33	24

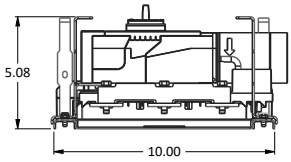


DETAIL A
SCALE 3:10

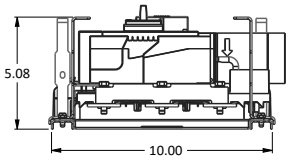
MOUNTING DIMENSIONS



AQ PANEL / A2 BREAKER



AE PANEL / A2 BREAKER

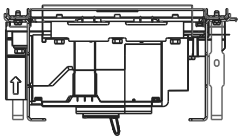


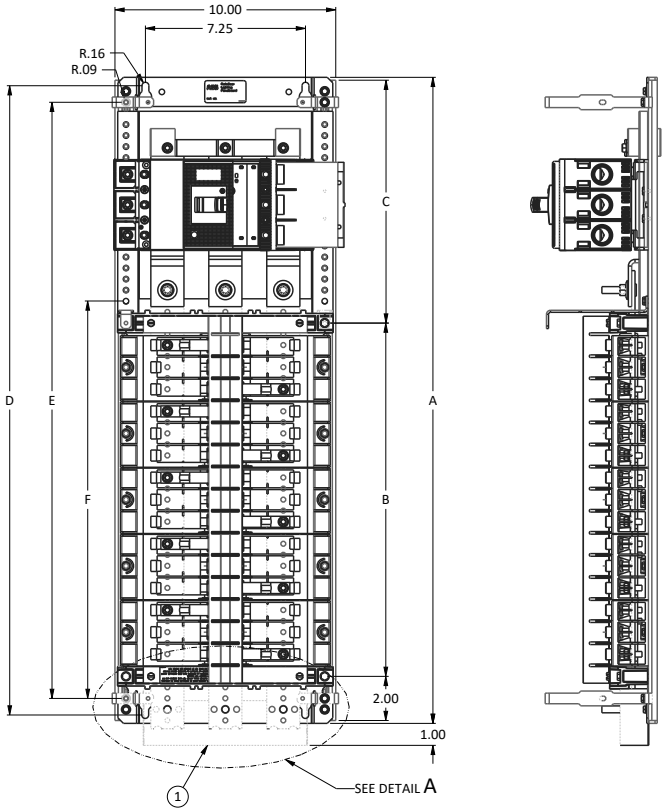
AS PANEL / A2 BREAKER

Note: A2 main breaker is not offered for AE and AS panels

Product details

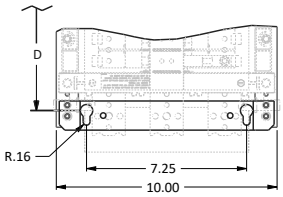
3.1.4. Main breaker: XT4 interior





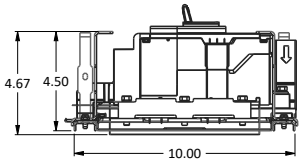
PANEL	SUB TYPES	PHASES	CKT	AMPS	BUS MATERIAL	MAIN TYPE	BRANCH BREAKER
AQ	L	3	30 & 42	2	A & C	R	THQB
AE	L	3	30 & 42	2	A & C	R	TEY/TEYF
AS	L	3	30 & 42	2	A & C	R	TEYD/H/L

PANEL	AMPACITY	BRANCH CKTS	MAIN TIPE	A	B	C	D	E	F
AQ, AE & AS	225A	30	R	29.26	16	11	28.5	27	18
		42	R	35.26	22	11	34.5	33	24

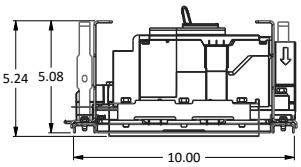


DETAIL A
SCALE 3:10

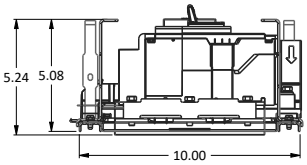
MOUNTING DIMENSIONS



AQ PANEL / XT4 BREAKER



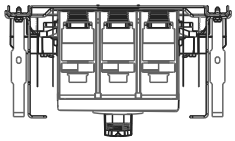
AE PANEL / XT4 BREAKER

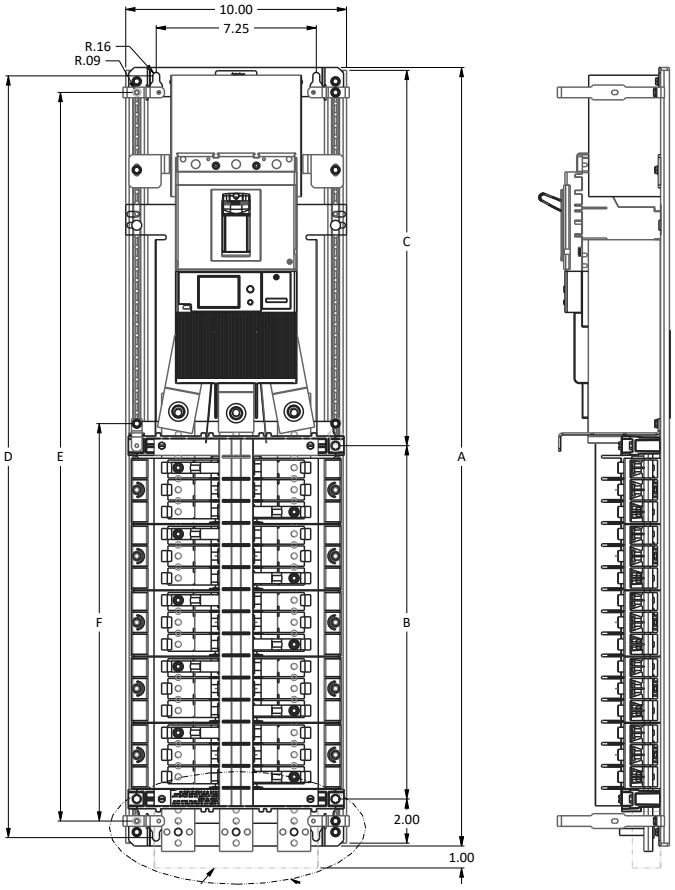


AS PANEL / XT4 BREAKER

Product details

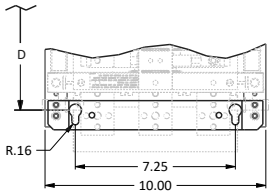
3.1.5. Main breaker XT5 400 A and XT5 600 A interior





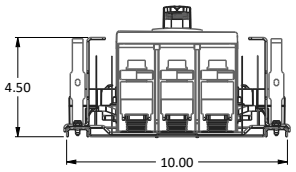
PANEL	SUB TYPES	PHASES	CKT	AMPS	BUS MATERIAL	MAIN TYPE	BRANCH BREAKER
AQ	L	3	30 & 42	1, 2, 4 & 6	A, C & S	R	THQB
AE	L	3	30 & 42	1, 2, 4 & 6	A, C & S	R	TEY/TEYF
AS	L	3	30 & 42	1, 2, 4 & 6	A, C & S	R	TEYD/H/L

PANEL	AMPACITY	BRANCH CKTS	MAIN TYPE	A	B	C	D	E	F
AQ, AE & AS	400A	30	R	35.26	16	17	34.5	33	18
		42	R	41.26	22	17	40.5	39	24
	600A	30	R	41.26	16	23	40.5	39	18
		42	R	47.26	22	23	46.5	45	24

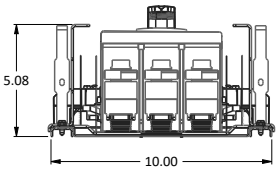


DETAIL A
SCALE 3:10

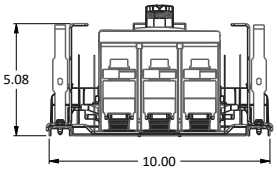
MOUNTING DIMENSIONS



AQ PANEL / XT5 BREAKER



AE PANEL / XT5 BREAKER

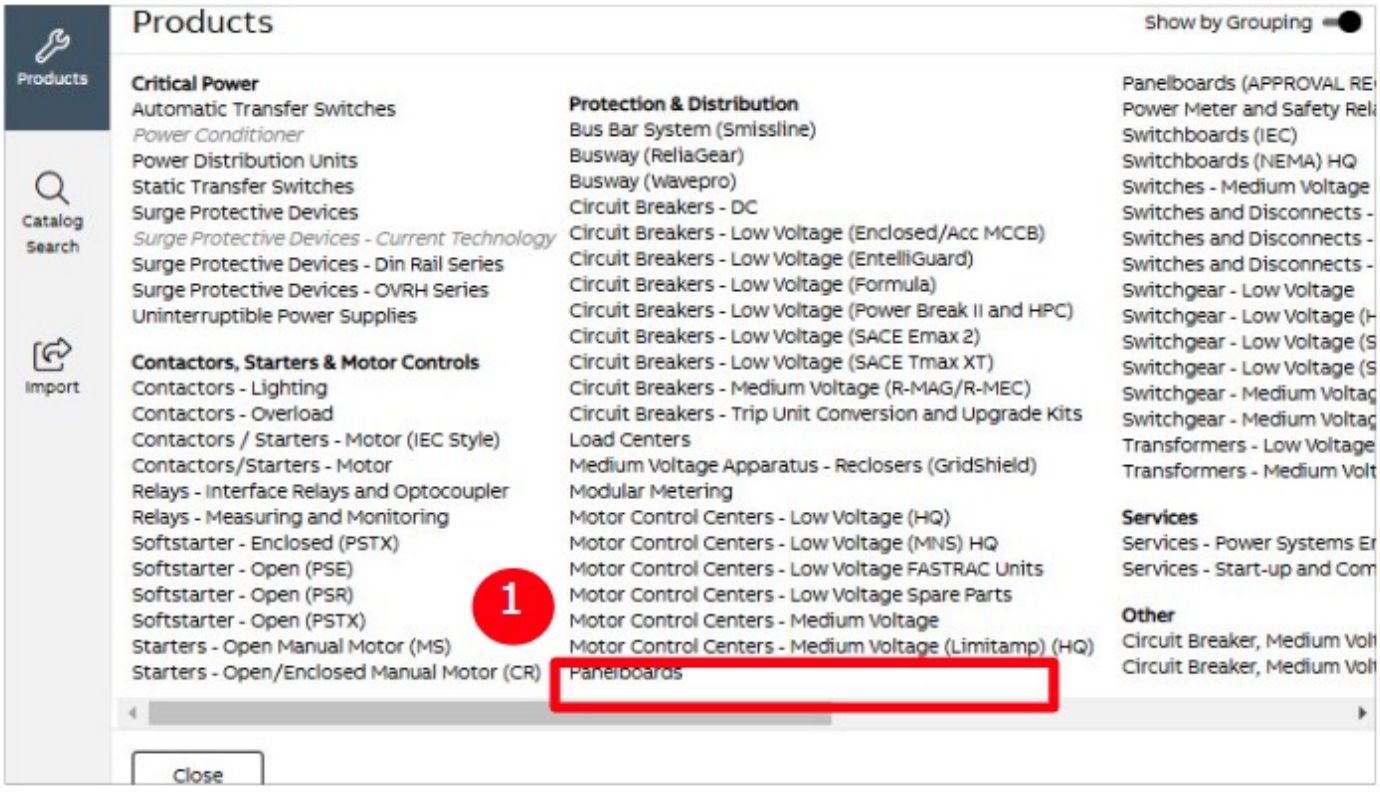


AS PANEL / XT5 BREAKER

Product details

3.2. Type M sizing and assembly
The Type M offering is a configurable product with varying options and sizes. To more appropriately define the sizing for the panel, it is recommended that customers access and use empower. Below are the steps to determine dimensions and download a PDF.

1. Log in to empower using your customer account. After creating a new quote, add a Panelboard to the order (see below).

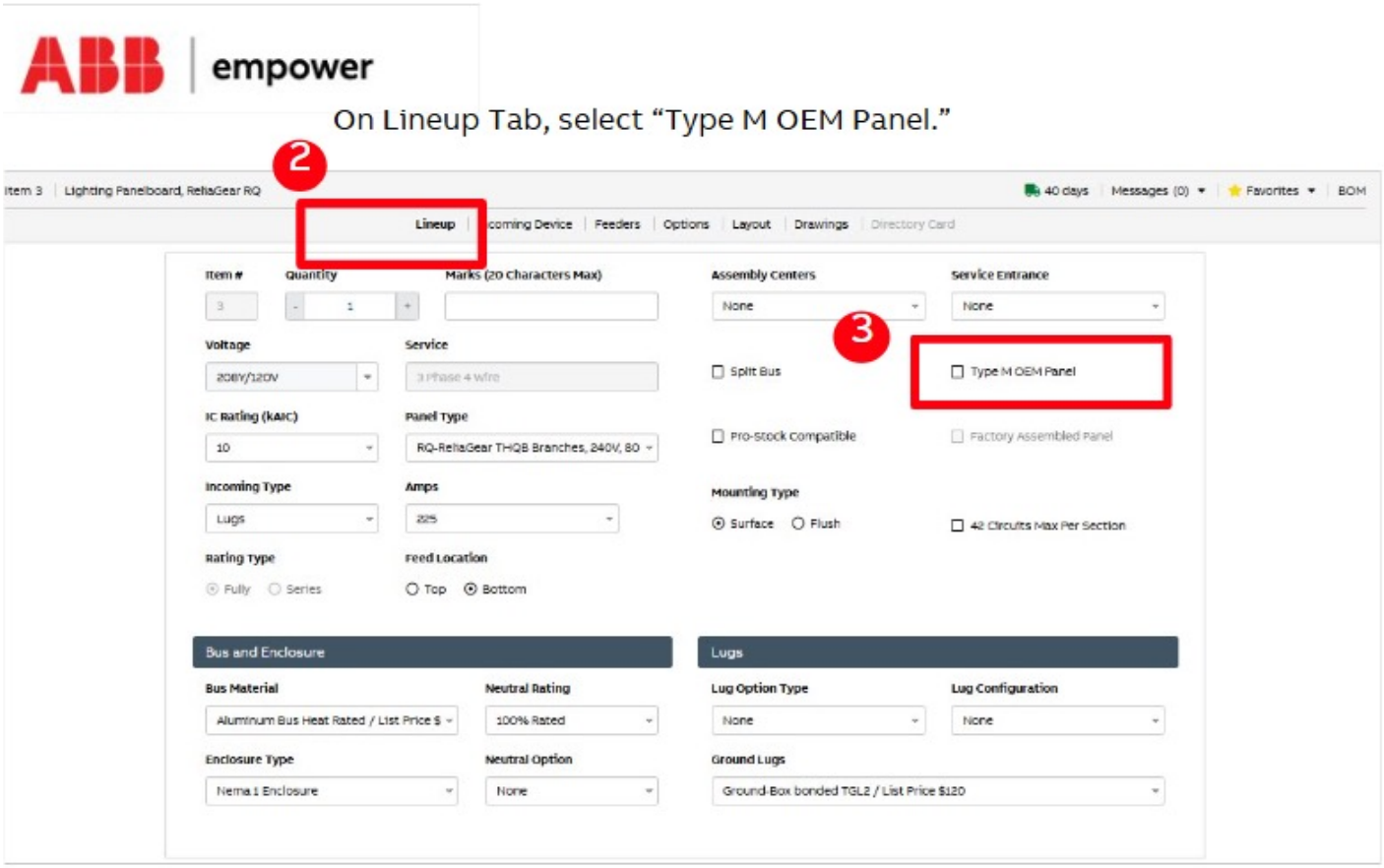


Product details

2. Once at the configurator, navigate to the Lineup tab.

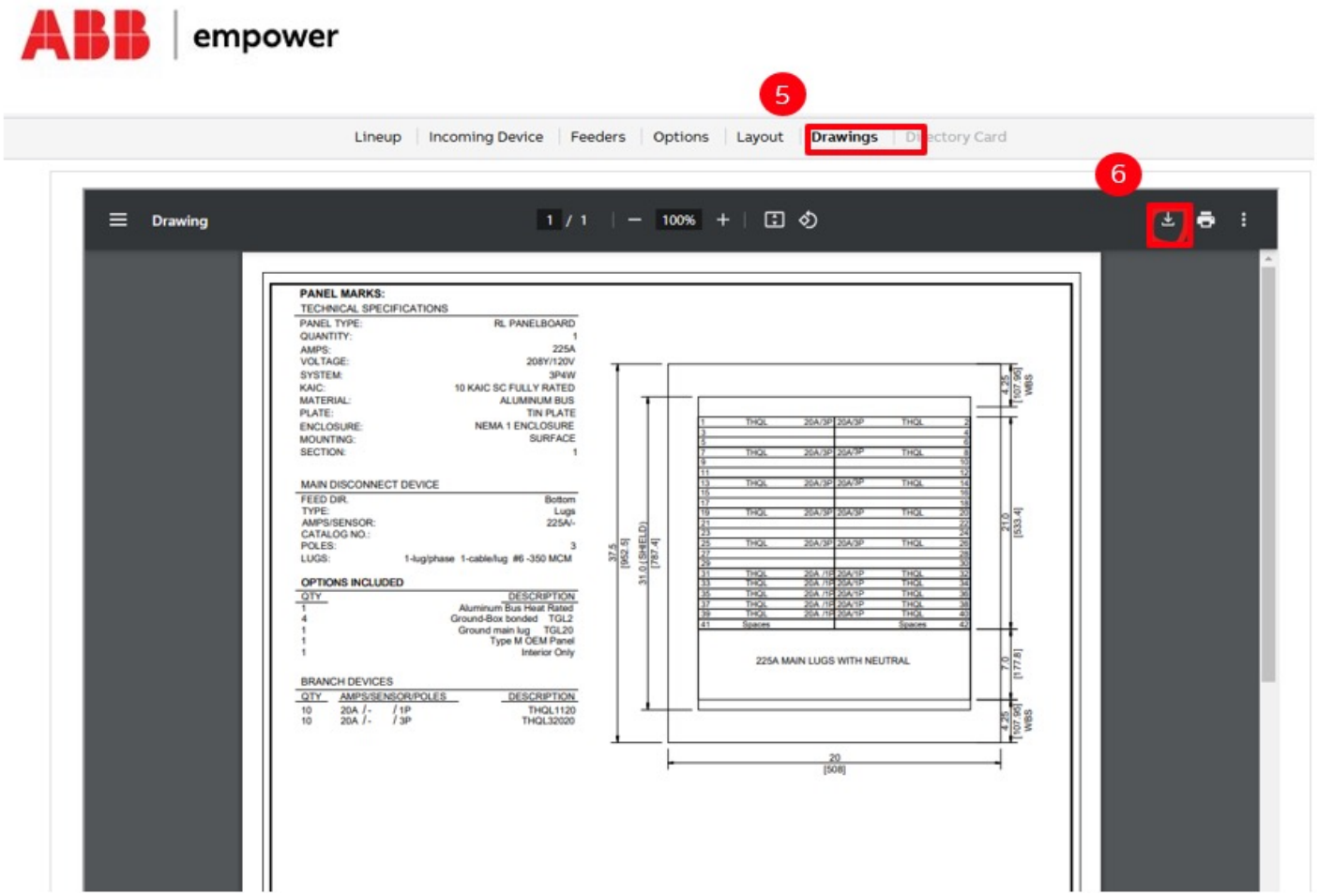
3. The Lineup tab has a checkbox option for “Type M OEM Panel.” Make sure this box is checked (see below).

4. Make all necessary selections on the Lineup tab, the Incoming device tab, the Feeders tab and the Options tab.



Product details

5. Select Drawings tab to see the front view and dimensions.
6. The drawing document can be downloaded directly from this screen (see below).



Product details

3.3. Wire bend space / minimum enclosure volume

Panel type	Config. type	Branch breakers
AQ	L, M	THQB/THHQB/TXQB bolt-on
AL	M	THQL/THHQL/TXQL plug-on
AE	L, M	TEY/TEYF bolt-on
AS	L, M	TEY/TEYF/TEYD/TEYH/TEYL bolt-on
AD	M	FB bolt-on

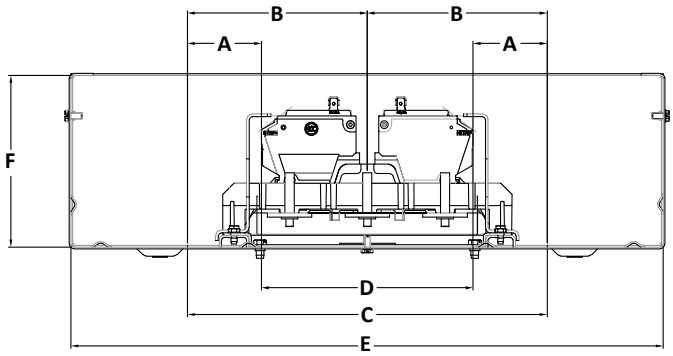
Minimum wiring space, from end of lug to box wall (inches)

	Main lugs only, to end wall				Main circuit breaker		
					Phase lug		
Main rating (amps)	Phase lug	Neutral lug	Frame type	Mounting	To side wall (20" wide box)	To end wall	Neutral lug
100 A main breaker, 125 A MLO	6	6	XT1	Horizontal	6	–	6
225 A	12	12	A2	Horizontal	6.5	–	12
225 A	12	12	XT4	Horizontal	7.8	–	11
400 A	15	11	XT5	Vertical	–	15	11
600 A	15	11	XTS	Vertical	–	16	–

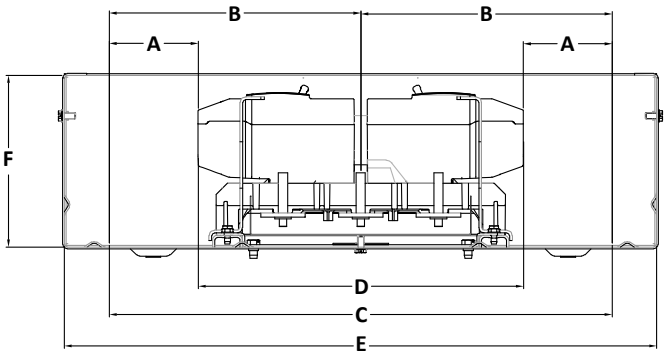
Product details

The dimensions below will help OEM customers design their product according to sizes of the ABB lighting panels. Wire bend spaces are defined by UL 67 and are driven by amperage and wire size. The minimum enclosure size defined by dimensions E and F below is required to maintain UL 67 certification per the ABB design. Should an enclosure be defined with a dimension in between D and E (and likewise F), the OEM will be required to complete a UL certification program to obtain a certification for their own design. Please see table below. Other certifications may have different requirements.

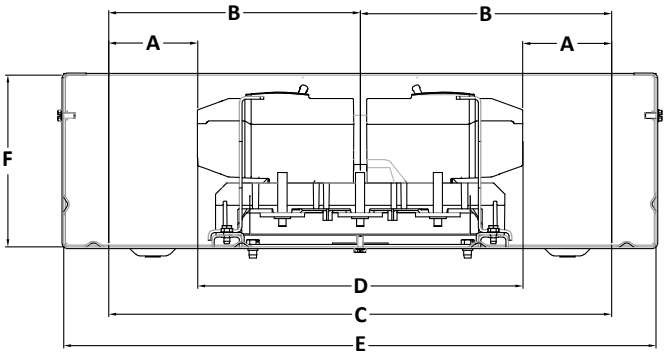
AQ/AL PANEL DIMENSIONS



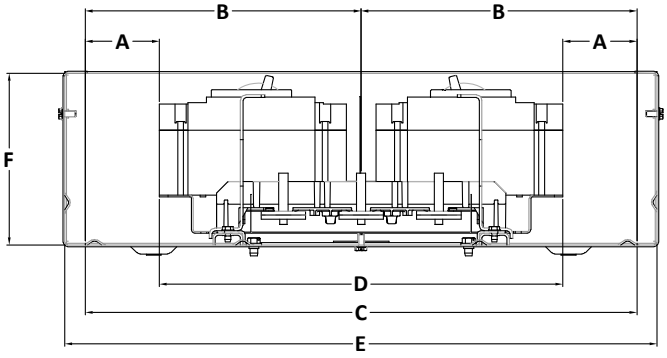
AE PANEL DIMENSIONS



AE PANEL DIMENSIONS



AD PANEL DIMENSIONS



Product details

Dimensions summary table[1]

Panel	Breaker	Breaker amp	Wlre size	Wire bend space (in. per UL 67)	Center to WBS (in.)	WBS to WBS (in.)	Breaker to breaker load-load (in.)	Minimum enclosure width[1] (in.)	Minimum enclosure depth[1] (in.)
Type	Type	Range	Min.–max.	A	B	C	D	E	F
AQ	THQB	15–30	14–4	2.00	5.57	11.15	7.15		
		35–100	14–10	Not specified per UL 67 table 17.2					
	THHQB	15–30	14–4	2.00					
		35–100	14–10	Not specified per UL 67 table 17.2					
	TXQB	15–30	14–4	2.00					
AL	THQL	15–30	14–4	2.00	5.57	11.15	7.15		
		35–100	14–10	Not specified per UL 67 table 17.2					
	THHQL	15–30	14–4	2.00					
		35–100	14–10	Not specified per UL 67 table 17.2					
	TXQL	15–30	14–4	2.00					
AE	TEY	15–20	14–12	Not specified per UL 67 table 17.2	6.58	13.56	10.56	20.00	5.81
		25–60	10–6	1.50					
		65–100	4–1/0	3.00	8.08	16.56			
	TEYF	65–110	4–1/0	3.50	8.58	17.56			
		115–125	4–2/0						
AS	TEY	15–20	14–12	Not specified per UL 67 table 17.2	7.80	15.60	12.60		
		25–60	10–6	1.50					
		65–100	4–1/0	3.00	9.30	18.60			
	TEYF	65–110	4–1/0	3.50	9.80	19.60			
		115–125	4–2/0						
	TEYD	115–125	4–2/0	3.50	10.00	20.03	13.03		
	TEYH								
	TEYL								
AD	FBV, FBN, FBH, FBL	15–20	14–10	Not specified per UL 67 table 17.2	8.81	17.63	13.63		
		25–60	10–4	2.00					
		70–100	4–1/0	3.00	9.81	19.63			

[1] The minimum enclosure size is defined by dimensions E and F in the table. These dimensions are required to maintain UL certification per the ABB design. Use of an enclosure that reduces these dimensions will require a UL qualification program to obtain the UL certification for that new design.

Product details

3.4. Technical details

3.4.1. Wiring guidelines (Cu or Al)

- Use 60 °C or 75 °C ampacity sized wire on line and neutral and equipment ground terminals.
- Standard wire sizes listed in this publication may be changed by using alternate terminal kits.
- Refer to circuit breakers for allowable wire temperature rating, wire size and tightening torque.
- Neutral rated for 200% panelboard phase current option.
- Suitable for nonlinear loads, 200% rated neutral, additional “Y” lugs provided for 200% neutral.

3.4.2. Torque requirements

Tightening torque
Applies to line, neutral and equipment ground terminal

Slotted screw		
AWG wire size		lb-in.
	Min.	Max.
14–10	32	35
8	36	40
6–4	41	45
3–2/0	45	50

Internal hex		
Hex size		lb-in.
	Min.	Max.
3/16	108	120
1/4	180	200
5/16	240	275
3/8	330	375
1/2	450	500

Torque values for hardware

Screw size	Torque (lb-in.)
#4 Steel	16
#10 Plastic	16
#8 Cu/Al/steel	24
#10–32 Cu/Al/steel	32
1/4–20 Al/<0.150 thick Cu	44
1/4–20 0.150 thick Cu	60
5/16–18 Cu/Al/steel	110
3/8–16 Cu/Al/steel	220
1/2–13 Cu/Al/steel	22

3.4.3. Reference documents

Publication	Description
1SQC173002C0201	ReliaGear® OEM lighting panelboards
1VAL0001-DTA	Certification of seismic compliance
DET-008	Series and selectivity rating table
1SQC173024M0201	Neutral kit installation
1TQC213000E0022	XT1 2-Pole strap kit installation
1TQC213000E0022	XT1 3-Pole strap kit installation
1TQC213000E0021	A2 2-Pole strap kit installation
1TQC213000E0021	A2 3-Pole strap kit installation
1TQC213000E0024	XT5 2-Pole strap kit installation
1TQC213000E0024	XT5 3-Pole strap kit installation
1SQC173018M0201	XT5 600A 2-Pole strap kit installation
1SQC173018M0201	XT5 600A 3-Pole strap kit installation
1SQC900006K0201	OEM drawing selector instructions

US
ABB Inc.
305 Gregson Drive
Cary, NC 27511

electrification.us.abb.com

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