Technical catalog | February 2017

Tmax Link OEM Solutions
Low voltage switchboards and panelboards UL/CSA

Table of contents

Tmax Link overview

ABB's Tmax Link enables OEMs to build UL/CSA distribution switchboards and panelboards (dead-front) by fabricating bus, chassis', enclosures, and breaker mounting straps to group mount ABB molded case circuit breakers (MCCB) into an electrical distribution assembly with a UL/CSA label. Tmax Link allows OEMs to manufacture basic components under an extension of the ABB UL/CSA certification while using the OEM's own logo. The Tmax Link distribution switchboard and panelboard design incorporates features that meet application requirements for high short circuit systems while retaining flexibility, safety, and convenience. With Tmax Link, the OEM has increased production capabilities, value-add and ownership of the supply chain to offer the shortest possible lead-times.

Benefits

- Easy to manufacture mounting straps (no castings, special molded components or special processes are required).
- Commonly available standoff insulators
- Universal strap kits for both switchboards and panelboards
- No limitation in the use of 100% rated breakers
- Switchboard:
  - Designed for the Tmax, Tmax XT and Formula families of ABB circuit breakers
  - 1.25" and 1.38" hole spacing designs available for vertical bus
  - 100A—1200A frame breakers available in 28", 32" or 38" wide sections
- Panelboard:
  - Designed for the Tmax, Tmax XT and Formula families of ABB circuit breakers
  - 1.38" hole spacing design for vertical bus
  - Up to 800A frame breaker in 28" wide section
  - Up to 1200A frame breaker in 32" wide section

Tmax Link overview

Standards

Tmax Link panelboard is designed, test and constructed in accordance with the following industry standards:

National electrical manufacturer association:	NEMA 1 enclosure
Underwriters laboratories (UL®):	UL67, File # E475757
Canadian standards association (CSA®):	CSA C22.2 No. 29

Tmax Link switchboard is designed, test and constructed in accordance with the following industry standards:

National electrical manufacturer association:	NEMA 1 enclosure
Underwriters laboratories (UL®):	UL891, File # E466042
Canadian standards association (CSA®):	CSA C22.2 No. 244 (MC # 262686)

UL/CSA File extension process overview

Step 1
ABB has designed and tested switchboard and panelboard solutions in accordance to the above UL Files utilizing the ABB SACE molded case circuit breaker families Tmax, Tmax XT, and Formula.

Step 2
OEM to submit a file extension request to UL/CSA[1] referencing the appropriate.
UL File from the above tables.
[1]The CSA file extension process may have some minor differences from the described UL process.

Step 3
ABB to review and approve file extension request with UL/CSA.

Step 4
ABB will provide the extension package which will include:
- Drawings of strap kits
- Drawings for circuit breaker support plates
- Drawings for interior structures
- Assembly instructions with torque values
- Bills of materials

Step 5
The OEM has the option to build or purchase circuit breaker strap kits that include bus bar straps, circuit breaker support plate, circuit breaker cover plates and hardware for installation.

Switchboard technical data

Horizontal/Main bus

Current ratings		800A	1200A	1600A	2000A	2500A	3000A	3600A	4000A	5000A
Copper bus	1 layer 0.25" x 3.00"	X	-	-	-	-	-	-	-	-
	1 layer 0.25" x 5.00"	X	X	X	-	-	-	-	-	-
	2 layer 0.25" x 4.00"	X	X	X	X	-	-	-	-	-
	2 layer 0.25" x 5.00"	X	X	X	X	X	-	-	-	-
	3 layer 0.25" x 5.00"	X	X	X	X	X	X	X	-	-
	4 layer 0.25" x 5.00"	X	X	X	X	X	X	X	X	-
	6 layer 0.25" x 5.00"	X	X	X	X	X	X	X	X	X
Aluminum horizontal bus	2 layer 0.25" x 3.00"	X	-	-	-	-	-	-	-	-
	2 layer 0.25" x 4.00"	X	X	X	-	-	-	-	-	-
	3 layer 0.25" x 3.00"	X	X	X	-	-	-	-	-	-
	3 layer 0.25" x 4.00"	X	X	X	X	-	-	-	-	-

Vertical bus

Current ratings		400A	600A	800A	1000A	1200A	1600A	2000A
Copper bus Per UL 891 standard table 23 and 25	1 layer 0.25" x 3.00"	X	X	X	-	-	-	-
	2 layer 0.25" x 3.00"	X	X	X	X	X	-	-
	3 layer 0.25" x 3.00"	X	X	X	X	X	X	X
Aluminum bus Per UL 891 standard	1 layer 0.25" x 3.00"	X	-	-	-	-	-	-
	2 layer 0.25" x 3.00"	X	X	X	X	-	-	-
	3 layer 0.25" x 3.00"	X	X	X	X	X	X	-

Rated voltage (+/-10%):		240VAC	480VAC	600VAC
Maximum short circuit ratings: MLO = main lugs only MCB = main circuit breaker Rated frequency (+/- 2%): 50/60Hz	65kA	MLO	MLO	MLO
	100kA	MCB	MCB	MCB
	150kA	MCB	MCB	-
	200kA	MCB	MCB	-

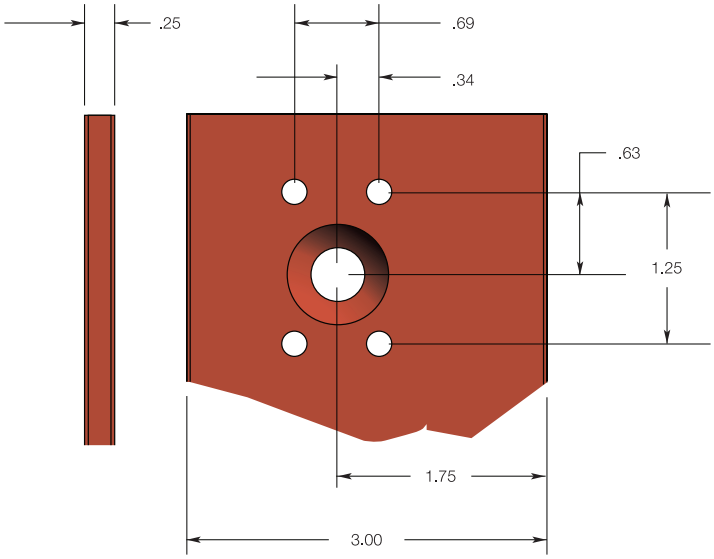
Vertical distribution bus

Tmax Link will offer two vertical bus designs, one based on a 1.25" vertical hole spacing and one based on a 1.38" vertical hole spacing (reference Figures 1.25" Design and 1.38" Design). The OEM has the ability to produce these vertical bus bars with either hole pattern. The Tmax Link switchboard design uses standardized bus bar sizes and commonly available standoff insulators throughout the product range; thereby, minimizing the inventory level of raw materials required by the OEM. The switchboard design accommodates several bus materials including tin-plated aluminum bus, silver-plated copper bus, or tin-plated copper bus. Vertical bus meets UL, CSA and NEMA standards for temperature rise.

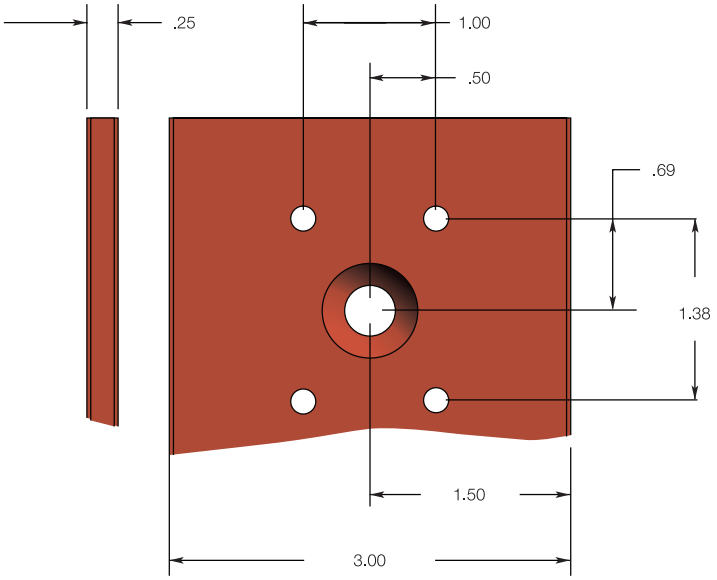
Switchboard technical data

Bus bracing system

The Tmax Link bus bracing design has a standard short circuit withstand rating of 65kA RMS at 240VAC, 480VAC, and 600VAC. It has the ability to increase the short circuit rating up to: 200kA @ 240VAC, 200kA @ 480VAC, or 100kA @ 600VAC with the use of an ABB Tmax or Tmax XT as a main circuit breaker.



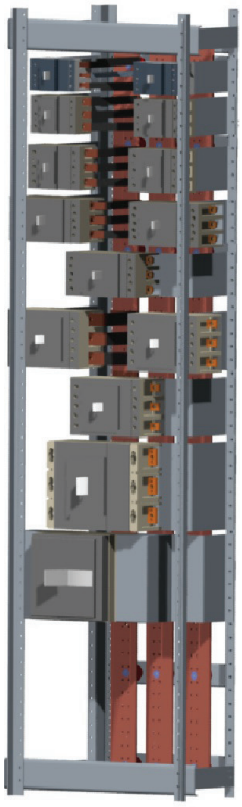
1.25" design



1.38" design

Circuit breaker arrangement

Group mounted circuit protective devices are an assembly of circuit breakers mounted on a panelboard type chassis. A main molded case circuit breaker within the sizes listed for the switchboard design can be included in the panel mounted assembly in lieu of a separate, individually mounted main circuit breaker.



Switchboard technical data

Group mounted molded case circuit breaker layout and space requirements

Group mounted layout				Breaker mounting configuration	Required space	Required space	Integral main breaker	Trip unit options
					1.25 design	1.38 design		
A1	100A	100A	A1	Dual	3.75"	4.12"	No	TMF
XT1	125A	125A	XT1	Dual	3.75"	4.12"	No	TMF
XT2	125A	125A	XT2	Dual	3.75"	4.12"	No	TMF, ELT
XT3	225A	225A	XT3	Dual	6.25"	6.87"	No	TMF
A2	250A	250A	A2	Dual	6.25"	6.87"	No	TMF
XT4	250A	250A	XT4	Dual	6.25"	6.87"	Yes	TMF, TMA, ELT
	250A		XT4	Single	6.25"	6.87"	Yes	TMF, TMA, ELT
T5	400A	400A	T5	Dual	6.25"	6.87"	Yes	TMA, ELT
	400A		T5	Single	6.25"	6.87"	Yes	TMA, ELT
	600A		T6	Single	8.75"	9.62"	Yes	TMA, ELT
	800A		T6	Single	8.75"	9.62"	Yes	TMA, ELT
	1200A		T7	Single	8.75"	9.62"	Yes	ELT

The maximum chassis height is 68.75". Refer to table to determine chassis heights with various main breakers.
TMF = Thermal Magnetic Fixed; TMA = Thermal Magnetic Adjustable; ELT = Electronic

Standard circuit breaker cable lugs

Frame	Ampere rating	Wire size	Catalog number (set of 3)
A1	80	14 AWG – 2	KA1080-3
	100	4 AWG – 1	KA1100-3
XT1	125	14 AWG – 1/0	KXT1CU-3PC[1]
XT2	125	14 AWG – 1/0	KXT2CU-3PC[1]
XT3	100	14 AWG – 1/0	KXT3CUAL1-3PC
	225	4 AWG – 300 kcmil	KXT3CUAL2-3PC
A2	225	1 AWG – 300 kcmil	KA2225-3
	250	300 – 350 kcmil	KA2250-3
XT4	100	14 AWG – 1/0	KXT4CUAL1-3PC
	225	4 AWG – 300 kcmil	KXT4CUAL2-3PC[2]
	250	250 – 350 kcmil	KXT4CUAL3-3PC[2]
	150	14 AWG – 1/0	KXT4XCU-3PC1[3]
	250	10 AWG – 250 kcmil	KXT4CU-3PC
T5	300	250 kcmil – 500 kcmil	KT5300-3
	400	(2) 3/0 – 250 kcmil	KT5400-3
T6	600	(2) 250 – 500 kcmil	K6TH
	800	(3) 2/0 – 400 kcmil	K6TJ
T7	1200	(4) 4/0 – 500 kcmil	KT7X1200-3

[1] FC Cu Terminals for copper cables only
[2] Not available for XT4X up to 150A

Switchboard technical data

Circuit breaker mounting strap kits

The circuit breaker mounting straps required for mounting MCCBs to the 1.25" and 1.38" hole patterns have been designed in a manner that allows the OEM to fabricate them at their own facility. Special care has been taken to ensure that no extraordinary forging, die casting process or specialized tooling is required to realize the ABB design for the mounting straps, thereby reducing the OEMs cost and lead-times. This also allows the OEM to have greater control of their supply chain. Additionally, ABB will offer the ability to purchase the mounting strap kits. The mounting kit will contain the bus straps, the circuit breaker support plate, the circuit breaker enclosure cover and the hardware for installation.

Frame	Single/dual mount	1.25" design	1.38" design
A1	Dual	KA1D1.25	KA1D1.38
A2	Dual	KA2D1.25	KA2D1.38
XT1	Dual	KX1D1.25	KX1D1.38
XT2	Dual	KX2D1.25	KX2D1.38
XT3	Dual	KX3D1.25	KX3D1.38
XT4	Single	KX4S1.25	KX4S1.38
XT4	Dual	KX4D1.25	KX4D1.38
XT4	Dual		KX4D1.38-28
T5	Single	KT5S1.25	KT5S1.38
T6	Single	KT6S1.25	KT6S1.38
T6	Single		KT6S1.38-28
T7	Single	KT7S1.25	KT7S1.38

Enclosure details

The height and depth of the enclosure is to be determined by the OEM and the application the switchboard will operate in. ABB has established the minimum widths to be used in the Tmax Link design based on UL wire bending space requirements and arcing distance test results. The OEM will be able to include breaker ratings up to 1200AF within a 32" wide enclosure.

Minimum enclosure widths

Mounting configuration	Breaker frame		Width (inches)
Dual	100A – 250A	A1-A2 XT1-XT4	32"
	125A – 250A		
Dual	400A	T5	38"
Single	250A – 1200A	XT4 – T7	32"

Switchboard technical data

Required wire bending space

UL requires a minimum wire bending radius for various cable sizes. The table below provides the minimum horizontal space required for each circuit breaker frame size and the maximum cable size that can be utilized for load connections.

Frame	[A]	Maximum cable size	Required wire bending space (UL 891)	Enclosure width
A1 – Dual	100	#1 AWG	3.00"	28"
XT1, XT2 – Dual	125	#1/0	3.50"	28"
XT4 – Single	250	350 kcmil	5.00"	28"
A2, XT4 – Dual	250	350 kcmil	5.00"	28"
T5 – Single	400	(1) 500 kcmil	6.00"	28"
T5 – Single	400	(2) 250 kcmil	6.00"	28"
T5 – Dual	400	(1) 500 kcmil	6.00"	38"
T5 – Dual	400	(2) 250 kcmil	6.00"	38"
T6 – Single	600	(2) 500 kcmil	8.00"	28"
T6 – Single	800	(3) 400 kcmil	10.00"	28"
T7 – Single	1200	(4) 500kcmil	12.00"	32"

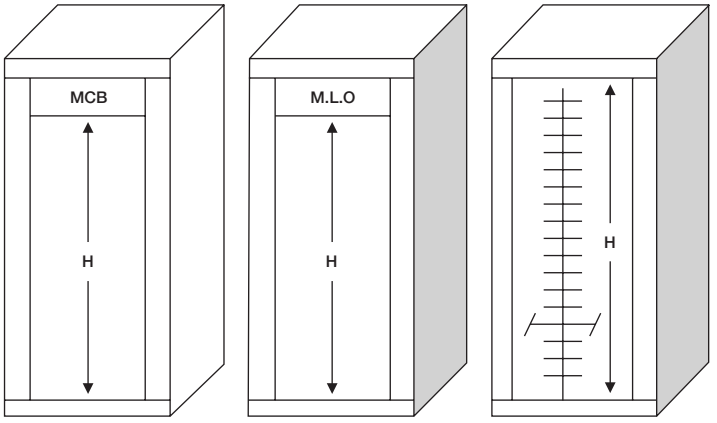
Switchboard technical data

Switchboard layout

The Tmax Link switchboard design includes several layouts to accommodate many applications. These layouts are as follows:

- An integral (chassis mounted) main circuit breaker with group mounted feeder circuit breakers in one structure
- A main lug only supply connection with group mounted feeder circuit breakers
- An individually mounted molded case circuit breaker with a separate group mounted feeder circuit breaker chassis in one structure
- A through-bus (horizontal/main bus) fed chassis with group mounted feeder circuit breakers

The maximum chassis circuit breaker mounting space for branch/feeder MCCBs is indicated below for each layout that has been incorporated in the Tmax Link switchboard design.



400-1200 A
Main breaker top entrance 1

Main lug only 1

Through-bus fed distribution section

1 Unit may be inverted for bottom-feed applications

Remaining chassis height "H"

250A – 1200A					
	Integral mounted main breaker				Main/through bus fed distribution section
Vertical bus rating	Tmax/Tmax XT		1.25 design	1.38 design	
400A	T4, XT4	250A	62.50"	64.61"	68.75"
400A	T5	400A	62.50"	61.85"	68.75"
600A	T6	600A	60.00"	59.09"	68.75"
800A	T6	800A	60.00"	59.09"	68.75"
1200A	T7	1200A	60.00"	59.09"	68.75"
1600A			-	-	68.75"
2000A			-	-	68.75"

Application note:

The UL standard requires that the vertical bus be sized based on the quantity of branch/feeder circuit protective devices in accordance with Table 26 of the UL891 standard. The table can be found below titled "Minimum ampacity of section or branch bus".

Panelboard technical data

Tmax Link panelboard electrical data

Vertical bus current ratings		400A	600A	800A	1000A	1200A
Copper bus	1 Layer 0.25" x 3.00"	X	X	X	X	X
Aluminum bus	1 Layer 0.25" x 3.00"	X	X	-	-	-
	2 Layer 0.25" x 3.00"	-	-	X	X	X

Ventilation requirements

Each opening for ventilation measures 0.12" H by 1.25" W (0.15 sq. in.), small enough to prevent a tool from being inserted through the openings. A barrier is placed behind the openings to provide an additional degree of protection from foreign object touching the live parts. The air inlet is located in the bottom front of the enclosure and has 2 groups of openings with each group or array containing 98 ventilation openings (14 rows by 7 columns) for a total of 196 openings with a total area of 29.4 sq. in. The air outlet is located in the top front of the enclosure and has an equal number of ventilation openings as the air inlet, 2 groups of openings with each group or array containing 98 ventilation openings (14 rows by 7 columns) for a total of 196 openings with a total area of 29.4 sq. in.

Configurations

– 3 phase, 3 wire
– 3 phase, 4 wire (100% rated neutral)

Rated voltage (+/-10%):		240VAC	480VAC	600VAC
Maximum short circuit ratings[1]: **MLO = main lugs only** **MCB = main circuit breaker** **Rated frequency (+/- 2%): 50/60Hz**	65kA	MLO	MLO	MLO
	100kA	MCB	MCB	MCB
	150kA	MCB	MCB	-
	200kA	MCB	MCB	-

[1]On systems capable of producing up to 65,000A RMS symmetrical short circuit current at the incoming terminals, MLO connection, no main circuit breaker is required. To achieve bus short circuit ratings higher than 65kAIC, the ABB Tmax/Tmax XT circuit breaker must be used as an integrally mounted or remote mounted main device. The maximum short circuit rating of the bus is equivalent to the maximum short circuit rating of the main circuit breaker used.

Panelboard technical data

Service conditions

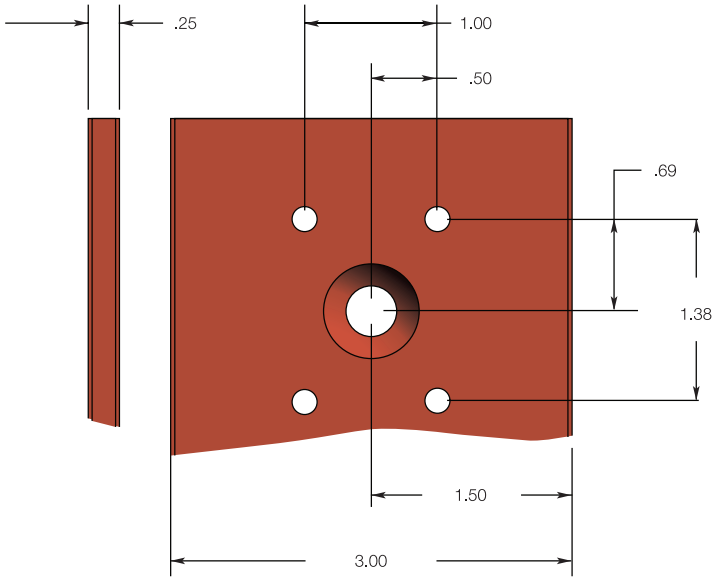
Ambient temperature: 40 ˚C (104 ˚F)
Altitude: 6,600 feet (2000 meters)
For other service conditions, refer to the Formula, Tmax or Tmax XT technical catalogs for appropriate de-rating tables.

Vertical distribution bus

Tmax Link has a vertical bus design based on 1.38" vertical hole spacing, reference figure below. The Tmax Link panelboard design uses standardized bus bar sizes and commonly available standoff insulators throughout the product range thereby minimizing the inventory level of raw materials required by the OEM. The panelboard design accommodates multiple bus materials and plating options including; tin-plated aluminum bus, silver-plated copper bus, or tinplated copper bus. The vertical bus meets UL®, CSA® and NEMA® standards for temperature rise and has optimized ratings based on thermal testing.

Bus bracing system

The Tmax Link bus bracing design has a standard short circuit withstand rating of 65kA RMS at 240VAC, 480VAC, and 600VAC, with the ability to increase the short circuit ratings up to: 200kA @ 240VAC, 200kA @ 480VAC, or 100kA @ 600VAC with the use of an ABB Tmax or Tmax XT circuit breakers as a remote or integrally mounted main overcurrent protective device.



1.38" design

Panelboard technical data

Circuit breaker arrangement

Group-mounted circuit breakers are an assembly of circuit protective devices mounted on a single chassis. A main molded-case circuit breaker within the sizes listed for the panelboard design can be included in the panel-mounted assembly in lieu of a separate, remote mounted main circuit breaker.

Group mounted molded case circuit breaker layout and space requirements

Group mounted layout				Breaker mounting configuration	Required space	Integral main breaker	Trip unit options
					1.38 design		
A1	100A	100A	A1	Dual	4.12"	No	TMF
XT1	125A	125A	XT1	Dual	4.12"	No	TMF
XT2	125A	125A	XT2	Dual	4.12"	No	TMF, ELT
XT3	225A	225A	XT3	Dual	6.87"	No	TMF
A2	250A	250A	A2	Dual	6.87"	No	TMF
XT4	250A	250A	XT4	Dual	6.87"	Yes	TMF, TMA, ELT
250A			XT4	Single	6.87"	Yes	TMF, TMA, ELT
400A			T5	Single	6.87"	Yes	TMA, ELT
600A			T6	Single	9.62"	Yes	TMA, ELT
800A			T6	Single	9.62"	Yes	TMA, ELT
1200A			T7	Single	9.62"	Yes	ELT

The minimum chassis height is 13.75" (10X); the maximum chassis height is 27.50" (20X).
TMF = Thermal Magnetic Fixed; TMA = Thermal Magnetic Adjustable; ELT = Electronic

Panelboard technical data

Enclosure details

The height of the enclosure is to be determined by the available circuit breaker mounting space and the type of incoming supply connection (MLO or MCB) the panelboard will have. ABB has established the minimum widths.

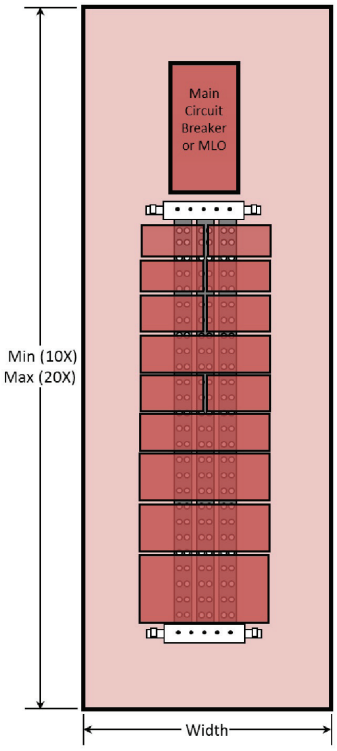
Required wire bending space UL requires a minimum wire bending radius for various cable sizes. The table below provides the minimum wire bending space required for each Formula, Tmax and Tmax XT circuit breaker frame size and the maximum cable size that can be utilized for field wiring connections.

Minimum enclosure widths—Table X

Mounting configuration	Breaker frame		Width (inches)
Dual	100A – 250A	A1-A2 XT1-XT4	28"
	125A – 250A		
Single	250A – 800A	XT4, T5 – T6	28"
Single	1200A	T7	32"

Frame	[A]	Maximum cable size	Required wire bending space (UL 67)	Enclosure width
A1 – Dual	100	#1 AWG	3.00"	28"
XT1 – Dual	125	#1/0	3.50"	28"
XT2 – Dual	125	#1/0	3.50"	28"
XT3 – Dual	225	300 kcmil	5.00"	28"
A2, XT4 – Dual	250	350 kcmil	5.00"	28"
XT4 – Single	250	350 kcmil	5.00"	28"
T5 – Single	400	(1) 500 kcmil	6.00"	28"
T5 – Single	400	(2) 250 kcmil	6.00"	28"
T6 – Single	600	(2) 500 kcmil	8.00"	28"
T6 – Single	800	(3) 400 kcmil	10.00"	28"
T7 – Single	1200	(4) 500kcmil	12.00"	32"

Panelboard technical data



Panelboard layout

The Tmax Link panelboard design includes several layouts to accommodate many applications. These layouts are as follows:

- An integral (vertical or horizontal mounted) main circuit breaker with group mounted branch circuit breakers
- A main lug only (MLO) supply connection with group mounted branch circuit breakers (No integral or remote main circuit breaker)

Note: This configuration may be used as service entrance equipment with up to six service disconnect circuit breakers installed up to the maximum 3 cycle bus withstand current rating of 65kA

- A main lug only (MLO) supply connection panelboard may be used with a remote mounted Tmax or Tmax XT molded case circuit breaker (MCCB) and applied at short circuit ratings up to the maximum interrupting rating of the remote main circuit breaker
- A panelboard may also be equipped with feed through or sub-feed lugs

The maximum chassis circuit breaker mounting space for branch/feeder MCCBs is indicated below for each layout that has been incorporated in the Tmax Link panelboard.

250A – 1200A

Vertical bus rating [A]	Tmax or Tmax XT		Enclosure height (Minimum) with 10X mounting space	Enclosure height (Minimum) with 20X mounting space	Enclosure width (Minimum)	Enclosure depth (Minimum)
400A	XT4	250A	34.25"	48.00"	28.00"	10.27"
400A	T5	400A	34.25"	48.00"	28.00"	10.27"
600A	T6	600A	39.50"	53.25"	28.00"	10.27"
800A	T6	800A	43.25"	57.00"	28.00"	10.27"
1200A	T7	1200A	48.00"	61.75"	32.00"	10.27"

Application note:

The Tmax Link panelboard design allows for all ABB Tmax and Tmax XT MCCBs that can physically fit onto the switchboard interior to be 100% rated (i.e. there is no limitation on the quantity of 100% rated circuit breakers that can be installed) therefore, careful consideration should be given to the busbar rating of the panelboard to meet the total loading requirements of all MCCBs connected to the vertical bus when multiple 100% rated circuit breakers are used.

Panelboard technical data

Standard circuit breaker cable lugs

Frame	Ampere rating	Wire size	Catalog number (set of 3)
A1	80	14 AWG – 2	KA1080-3
	100	4 AWG – 1	KA1100-3
XT1	125	14 AWG – 1/0	KXT1CU-3PC[1]
XT2	125	14 AWG – 1/0	KXT2CU-3PC[1]
XT3	100	14 AWG – 1/0	KXT3CUAL1-3PC
	225	4 AWG – 300 kcmil	KXT3CUAL2-3PC
A2	225	1 AWG – 300 kcmil	KA2225-3
	250	300 – 350 kcmil	KA2250-3
XT4	100	14 AWG – 1/0	KXT4CUAL1-3PC[2]
	225	4 AWG – 300 kcmil	KXT4CUAL2-3PC[2]
	250	250 – 350 kcmil	KXT4CUAL3-3PC[2]
	150	14 AWG – 1/0	KXT4XCU-3PC1[3]
	250	10 AWG – 250 kcmil	KXT4CU-3PC
T5	300	250 kcmil – 500 kcmil	KT5300-3
	400	10 AWG – 250 kcmil	KT5400-3
T6	600	250 kcmil – 500 kcmil	K6TH
	800	(3) 2/0 – 400 kcmil	K6TJ
T7	1200	(4) 4/0 – 500 kcmil	KT7X1200-3

[1]FC Cu Terminals for copper cables only
[2]Not available for XT4X up to 150A

Panelboard technical data

Circuit breaker mounting strap kits

The circuit breaker mounting straps required for mounting MCCBs have been designed in a manner that allows the OEM to fabricate them at their own facility. Special care has been taken to ensure that no extraordinary forging, die casting processes or specialized tooling is required to realize the ABB design for the mounting straps, thereby reducing the OEMs cost and lead-times. This also allows the OEM to have greater control of their supply chain.

Additionally, for those OEMs that do not wish to fabricate the straps, ABB will offer the option to purchase the mounting kits from ABB.

The mounting kit will contain the bus connecting straps, the circuit breaker mounting support, the circuit breaker cover plate, assembly hardware and the instruction sheet showing how to install these components.

Ordering codes

Frame size	Single/dual mount	Minimum enclosure width	Catalog number
A1–1P	Dual	28"	KA1D1.38-1AC
	Dual	28"	KA1D1.38-1B
A2–1P	Dual	28"	KA2D1.38-1AC
	Dual	28"	KA2D1.38-1B
A1–2P	Dual	28"	KA1D1.38-2AC
	Dual	28"	KA1D1.38-2AB-BC
	Dual	28"	KA1D1.38-2AC
A2–2P	Dual	28"	KA2D1.38-2AB-BC
	Dual	28"	KA2D1.38-2AC
A1–3P	Dual	28"	KA1D1.38
A2–3P	Dual	28"	KA2D1.38
XT1–3P	Dual	28"	KX1D1.38
XT2–3P	Dual	28"	KX2D1.38
XT3–3P	Dual	28"	KX3D1.38
XT4–3P	Single	28"	KX4S1.38
	Dual	28"	KX4D1.38-28
	Dual	32"	KX4D1.38
T5–3P	Single	28"	KT5S1.38
T6–3P	Single	28"	KT6S1.38-28
	Single	32"	KT6S1.38
T7–3P	Single	32"	KT7S1.38

Molded case circuit breakers

With Tmax Link, the OEM only needs to purchase the circuit breakers required for the switchboard or panelboard from ABB, all other components can be fabricated by the OEM. Tmax Link utilizes ABB's high performance molded case circuit breaker (MCCB) lines to provide high interrupting ratings, compact size and industry leading features. The Tmax Link designs have no limitation on the quantity of 100% rated breakers that can be installed. These MCCBs cover frame sizes from 100 to 1200 amps. The ABB Formula, Tmax and Tmax XT lines of MCCBs have several key features that go along with their very small physical size:

- Double insulation – this construction characteristic allows for field installation of UL/CSA Listed internal accessories without exposure to energized parts
- Complete range of electrical and mechanical accessories
- Positive operation – circuit breakers from ABB ensure that the toggle indicates the precise position of the moving contacts. This guarantees safe and reliable signaling by the device
- Installation – ABB molded case circuit breakers can be installed in either the horizontal or vertical planes without any de-rating of their performance characteristics
- Interrupting ratings up to 200kAIC
- Compact size
- 100% rated and 80% rated versions
- All ABB molded case circuit breakers are UL/CSA Listed and IEC rated for global application and acceptance
- All versions of the Formula, Tmax and Tmax XT families are suitable for reverse feed applications

ABB circuit breakers carry the following interrupting capacities

- **A** – Adequate interrupting rating
- **N** – Normal interrupting rating
- **S** – Standard interrupting rating
- **H** – High interrupting rating
- **L** – Extra high interrupting rating
- **V** – Very high interrupting rating
- **X** – Extremely high interrupting rating

Trip unit options

- Thermal magnetic, Fixed (TMF) and Adjustable (TMA)
- Electronic (LS/I, LSI, and LSIG)
- ABB Formula, Tmax and Tmax XT UL

Details

– UL File #E93565 (MCCBs and MCPs)
– UL File #E116596 (Accessories)

Molded case circuit breakers

Circuit breaker ratings				UL/CSA interrupting capacity (kA symmetrical amperes)			
				Volts AC			
Frame	Continuous ampere rating	Version	Poles	240V	480V	600V	600/347V
A1	100A	A	1	10kA	-	-	-
		A	2, 3	10kA	-	-	-
		N	1	18kA	-	-	-
		N	2, 3	25kA	-	-	-
XT1	125A	N	3	50kA	25kA	-	18kA
		S	3	65kA	35kA	-	22kA
		H	3	100kA	65kA	-	25kA
XT2	125A	N	3	65kA	25kA	18kA	
		S	3	100kA	35kA	22kA	-
		H	3	150kA	65kA	25kA	-
		L	3	200kA	100kA	35kA	-
		V	3	200kA	150kA	42kA	-
		X	3	200kA	200kA	42kA	-
XT3	225A	N	3	50kA	25kA	-	10kA
		S	3	65kA	35kA	-	10kA
A2	250A	A	1	10kA	-	-	-
		A	2, 3	10kA	-	-	-
		N	1	14kA	-	-	-
		N	2, 3	25kA	-	-	-
XT4	250A	N	3	65kA	25kA	18kA	-
		S	3	100kA	35kA	22kA	-
		H	3	150kA	65kA	25kA	-
		L	3	200kA	100kA	50kA	-
		V	3	200kA	150kA	65kA	-
		X	3	200kA	200kA	100/65kA[1]	-
T5	400A	N	3	65kA	25kA	18kA	-
		S	3	100kA	35kA	25kA	-
		H	3	150kA	65kA	35kA	-
		L	3	200kA	100kA	65kA	-
		V	3	200kA	150kA	100kA	-
T6	600A	N	3	65kA	35kA	20kA	-
		S	3	100kA	50kA	25kA	-
		H	3	200kA	65kA	35kA	-
		L	3	200kA	100kA	42kA	-
	800A	N	3	65kA	35kA	20kA	-
		S	3	100kA	50kA	25kA	-
		H	3	200kA	65kA	35kA	-
		L	3	200kA	100kA	42kA	-
T7	1200A	S	3	65kA	50kA	25kA	-
		H	3	100kA	65kA	50kA	-
		L	3	200kA	100kA	65kA	-

[1]100kA up to 150A, 65kA from 175-250A.
Tmax and Tmax XT circuit breakers available as 80% or 100% rated.
Formula circuit breakers available as 80% rated only.

Circuit breaker mounting strap kits

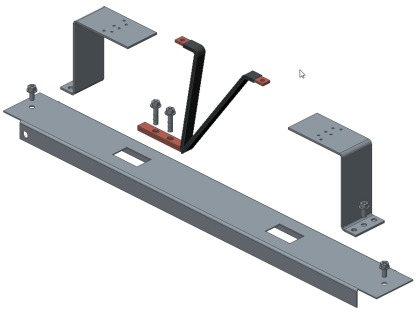
Catalog number explanation

K A 1 D 1.38 -2 AC -28

- **K** = Kit catalog number prefix
- **A** = Formula
  - T = Tmax
  - X = Tmax XT
  - A = Formula
- **1** = Breaker frame
  - 1 = XT1 – 125AF, A1-100AF
  - 2 = XT2 – 125AF, A2-250AF
  - 3 = XT3 – 225AF
  - 4 = XT4 – 250AF[3]
  - 5 = T5 – 400AF
  - 6 = T6 – 600AF and 800AF[3]
  - 7 = T7 – 1200AF
- **D** = Mounting
  - D = Dual mounted breaker[1]
  - S = Single mounted breaker[2]
- **1.38** = Strap kit design
  - 1.38 = Strap kit design
  - 1.25 = Strap kit design
- **-2** = Number of poles
  - -1 = Single pole (formula only)
  - -2 = Two pole (formula only)
- **AC** = Phase
  - AC = A and/or C phases
  - B = B phase only
  - BC = B and/or C phases
  - AB-BC = AB or BC phases
- **-28** = Width
  - 28 = 28" W version (XT4, T6)

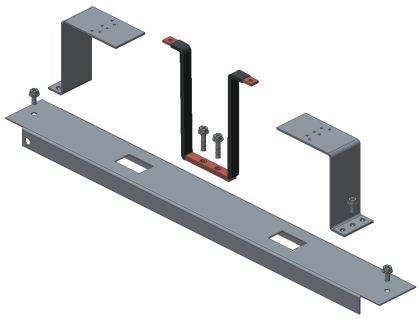
[1]Dual mounted breaker only available up to 250A XT4 breaker frame for 28" W panelboard and up to 400A T5 frame in switchboard design.
[2]Single mounted breaker available from 250A XT4 breaker frame up to 1200A T7 breaker.
[3]Kits available in 28" wide versions, to order add suffix code -28W to end of part number.
Note: All installation kits supplied by ABB come standard with tin plating.

Circuit breaker mounting strap kits



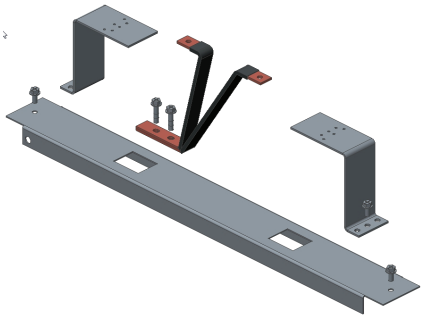
Dual–A1 1P frame A or C phase

Component	Qty.
Dual A1 1P strap 1 AC	1
Dual A1 1P strap 2 AC	1
Dual A1-A2 support bracket	2
Dual A1 1P cover	1
Screw, taptite, hex ¼-20 X .500	6
Screw, taptite, hex ¼-20 X 0.750	2
Screw, taptite, hex ¼-20 X 1.000	2



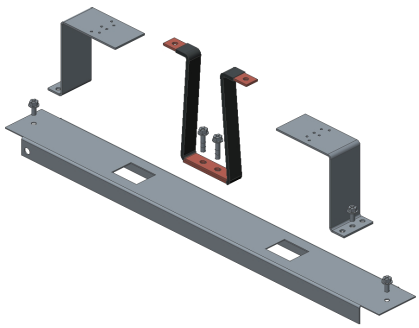
Dual–A1 1P frame B phase

Component	Qty.
Dual A1 3P strap 2 V	1
Dual A1 3P strap 3 B	1
Dual A1-A2 support bracket	2
Dual A1 1P cover	1
Screw, taptite, hex ¼-20 x .500	6
Screw, taptite, hex ¼-20 x 0.750	2
Screw, taptite, hex ¼-20 x 1.000	2



Dual–A2 1P frame A or C phase

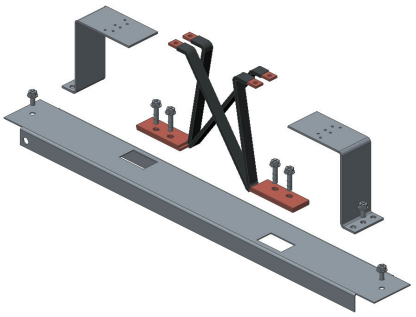
Component	Qty.
Dual A2 1P strap 1 AC	1
Dual A2 1P strap 4 AC	1
Dual A1-A2 support bracket	2
Dual A2 1P cover	1
Screw, taptite, hex ¼-20 x .500	6
Screw, taptite, hex ¼-20 x 0.750	2
Screw, taptite, hex ¼-20 x 1.000	2



Dual–A2 1P frame B phase

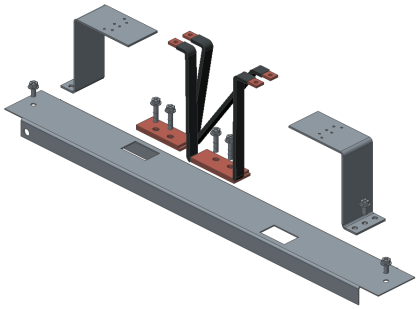
Component	Qty.
Dual A2 3P strap 2 B	2
Dual A2 3P strap 3 B	1
Dual A1-A2 sprt brkt	2
Dual A2 1P cover	1
Screw, taptite, hex ¼-20 x .500	6
Screw, taptite, hex ¼-20 x 0.750	2
Screw, taptite, hex ¼-20 x 1.000	2

Circuit breaker mounting strap kits



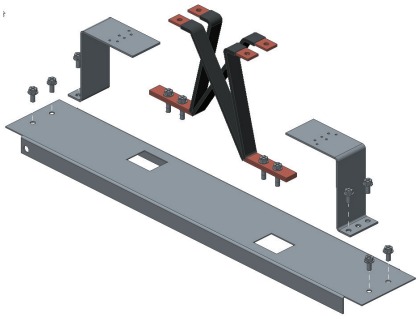
Dual–A1 2P frame A-C phases

Component	Qty.
Dual A1-A2 support bracket	2
Dual A1 2P cover	1
Dual A1 2P strap 1 AC	2
Dual A1 2P strap 4 AC	2
Screw, taptite, hex ¼-20 x .500	8
Screw, taptite, hex ¼-20 x 0.750	4
Screw, taptite, hex ¼-20 x 1.000	4



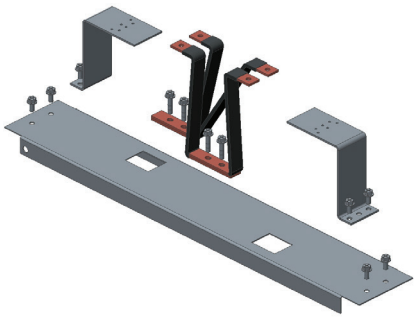
Dual–A1 2P frame A-B/B-C phases

Component	Qty.
Dual A1-A2 support bracket	2
Dual A1 2P cover	1
Dual A1 2P strap 1 AC	1
Dual A1 2P strap 2 B	1
Dual A1 2P strap 3 B	1
Dual A1 2P strap 4 AC	1
Screw, taptite, hex ¼-20 x .500	8
Screw, taptite, hex ¼-20 x 0.750	4
Screw, taptite, hex ¼-20 x 1.000	4



Dual–A2 2P frame A-C phases

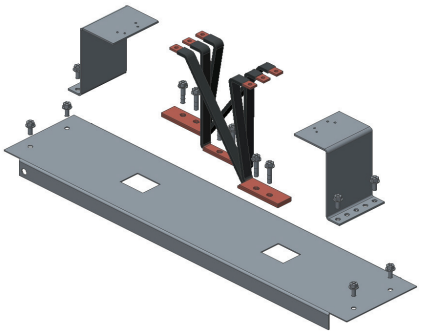
Component	Qty.
Dual A2-A2 support bracket	2
Dual A2 2P cover	1
Dual A2 2P strap 1 AC	2
Dual A2 2P strap 4 AC	2
Screw, taptite, hex ¼-20 x .500	12
Screw, taptite, hex ¼-20 x 0.750	4
Screw, taptite, hex ¼-20 x 1.000	4



Dual–A2 2P frame A-B/B-C phases

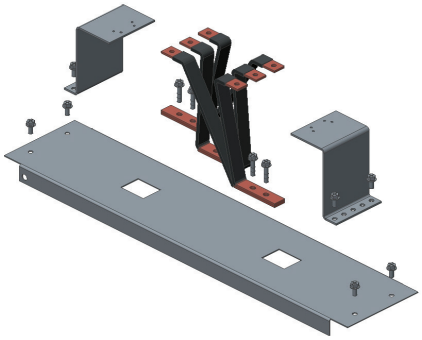
Component	Qty.
Dual A1-A2 3P support bracket	2
Dual A2 2P cover	1
Dual A2 2P strap 1 AC	1
Dual A2 2P strap 2 B	1
Dual A2 2P strap 3 B	1
Dual A2 2P strap 4 AC	1
Screw, taptite, hex ¼-20 x .500	12
Screw, taptite, hex ¼-20 x 0.750	4
Screw, taptite, hex ¼-20 x 1.000	4

Circuit breaker mounting strap kits



Dual–A1 3P frame

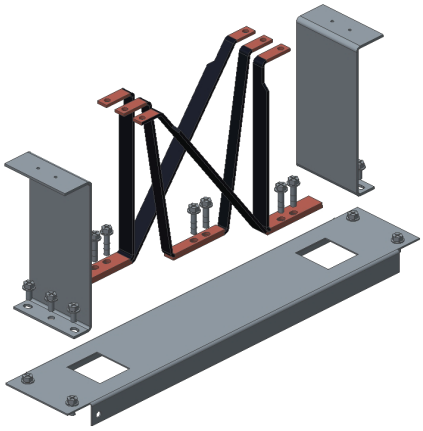
Component	Qty.
Dual A1-A2 3P support bracket	2
Dual A1 3P cover	1
Dual A1 3P strap 1 AC	2
Dual A1 3P strap 2 B	1
Dual A1 3P strap 3 B	1
Dual A1 3P strap 4 AC	2
Screw, taptite, hex ¼-20 x .500	14
Screw, taptite, hex ¼-20 x 0.750	6
Screw, taptite, hex ¼-20 x 1.000	6



Dual–A2 3P frame

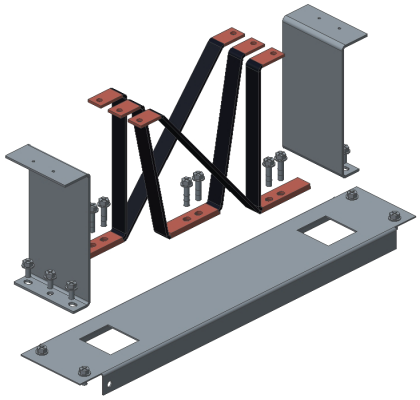
Component	Qty.
Dual XT2 strap 1 phase A and C	2
Dual XT2 strap 2 phase B	1
Dual XT2 strap 3 phase B	1
Dual XT2 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	16
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6

Circuit breaker mounting strap kits



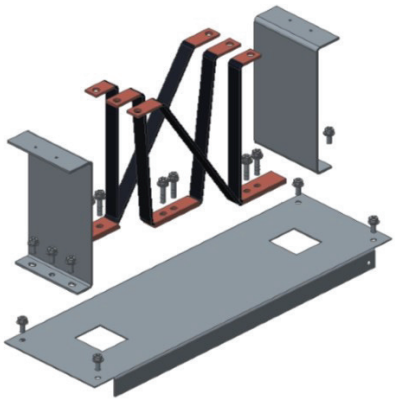
Dual–XT1 3P frame

Component	Qty.
Dual XT1 strap 1 phase A and C	2
Dual XT1 strap 2 phase B	1
Dual XT1 strap 3 phase B	1
Dual XT1 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	16
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6



Dual–XT2 3P frame

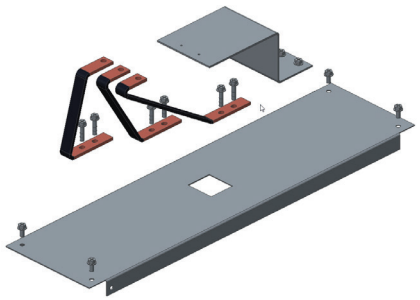
Component	Qty.
Dual XT2 strap 1 phase A and C	2
Dual XT2 strap 2 phase b	1
Dual XT2 strap 3 phase B	1
Dual XT2 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	16
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6



Dual–XT3 3P frame

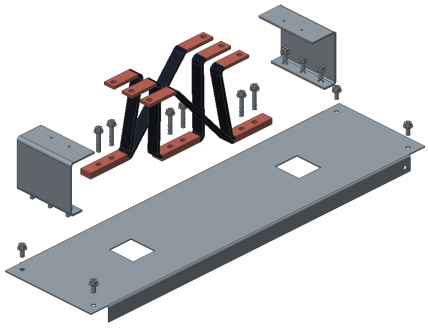
Component	Qty.
Dual XT3 strap 1 phase A and C	2
Dual XT3 strap 2 phase B	1
Dual XT3 strap 3 phase B	1
Dual XT3 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	16
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6

Circuit breaker mounting strap kits



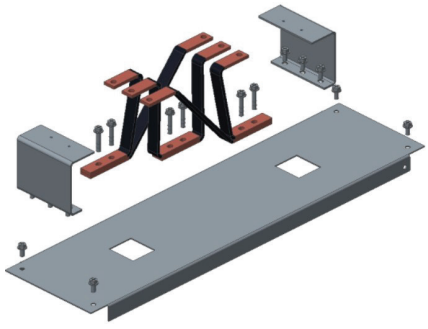
Single–XT4 3P frame

Component	Qty.
Single XT4 strap 1 phase A	1
Single XT4 strap 2 phase B	1
Single XT4 strap 3 phase C	1
Support	1
Front panel	1
Screw ¼-20 x 0.500	13
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6



Dual–XT4 3P frame (32" wide)

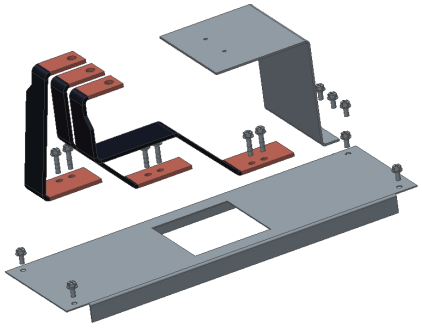
Component	Qty.
Dual XT4 strap 1 phase A and C	2
Dual XT4 strap 2 phase B	1
Dual XT4 strap 3 phase B	1
Dual XT4 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	10
Screw ¼-20 x 0.500	12
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6



Dual–XT4 3P frame (28" wide)

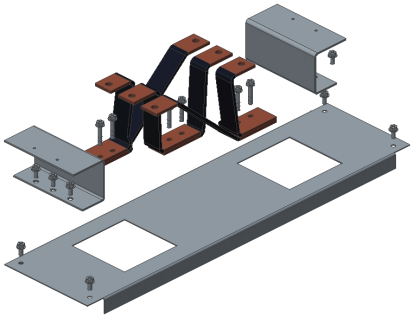
Component	Qty.
Dual XT4 strap 1 phase A and C	2
Dual XT4 strap 2 phase B	1
Dual XT4 strap 3 phase B	1
Dual XT4 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500	10
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6

Circuit breaker mounting strap kits



Single–T5 3P frame

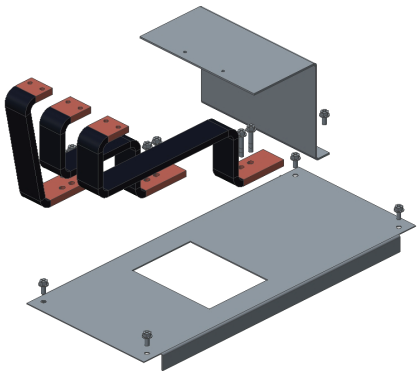
Component	Qty.
Single T5 strap 1 phase A	1
Single T5 strap 2 phase B	1
Single T5 strap 3 phase C	1
Support	1
Front panel	1
Screw ¼-20 x 0.500	13
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6



Dual–T5 3P frame

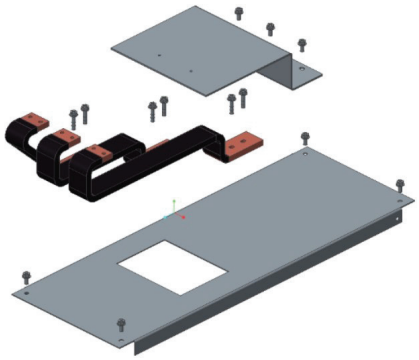
Component	Qty.
Dual T5 strap 1 phase A and C	2
Dual T5 strap 2 phase B	1
Dual T5 strap 3 phase B	1
Dual T5 strap 4 phase A and C	2
Support	2
Front panel	1
Screw ¼-20 x 0.500 (1.25)	10
Screw ¼-20 x 0.500 (1.375)	12
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6

Circuit breaker mounting strap kits



Single–T6 3P frame (32" wide)

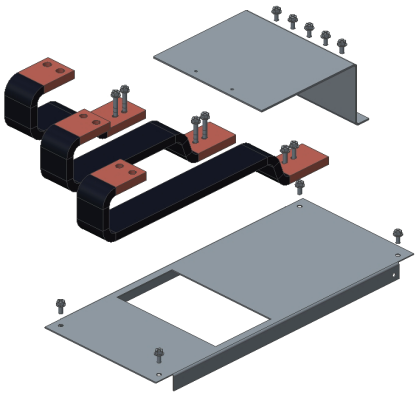
Component	Qty.
Single T6 strap 1 phase A	1
Single T6 strap 2 phase B	1
Single T6 strap 3 phase C	1
Support	1
Front panel	1
Screw ¼-20 x 0.500	9
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6



Single–T6 3P frame (28" wide)

Component	Qty.
Single T6 strap 1 phase A	1
Single T6 strap 2 phase B	1
Single T6 strap 3 phase C	1
Support	1
Front panel	1
Screw ¼-20 x 0.500	13
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6

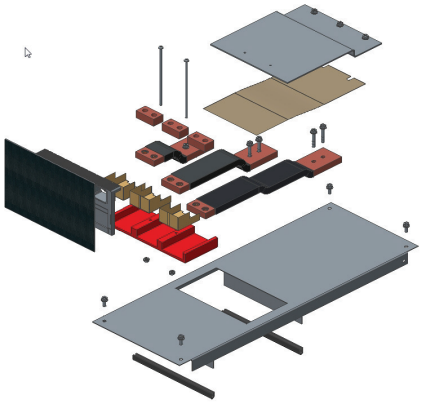
Circuit breaker mounting strap kits



Single–T7 3P frame (1.25" design[1])

Component	Qty.
Single T7 strap 1 phase A	1
Single T7 strap 2 phase B	1
Single T7 strap 3 phase C	1
Support	1
Front panel	1
Screw ¼-20 x 0.500	9
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6

[1]Switchboard use only



Single–T7 3P frame (32" wide – 1.375 design)

Component	Qty.
Single T7 strap 1 phase A	1
Single T7 strap 2 phase B	1
Single T7 strap 3 phase C	1
Single T7 strap interface	3
Support	1
Front panel	1
Insulating phase barrier	1
Insulation channel sleeve T7	3
Insulating sheet support T7	1
T7 term cover low 3-pole	1
Insulator arc-flash	1
Edge trim	2
Screw ¼-20 x 0.500	7
Screw ¼-20 x 0.750	6
Screw ¼-20 x 1.000	6
Screw ¼-20 x 1.25	6
Screw phillips pan 10-24 x 5.50	2
Washer flat #10	2
Nut hex keps 10-24	2

Notes

Notes

Contact us

ABB—USA
Electrification Products
8155 T&B Boulevard
Memphis, TN 38125
www.abb.us/lowvoltage

Customer Service: 800-816-7809
7:00 a.m. - 5:30 p.m., CST, Monday-Friday
elec_custserv@tnb.com
Technical Support: 888-385-1221, Option 1
7:00 a.m. - 5:00 p.m., CST, Monday-Friday
lvps.support@us.abb.com

ABB—Canada
Electrification Products
800 Hymus Boulevard
Saint-Laurent, Quebec, Canada
H4S 0B5
www.abb.ca/lowvoltage

1-800-567-0283
ep.support@ca.abb.com

1SXU210240C0201, February 2017