

CONVERSION GUIDE

Enclosed Breakers Transition Guide

Spectra™ and Q-Line to FORMULA A2 and Tmax® XT



- Spectra™ and Q-Line to Enclosed Circuit Breakers featuring:
- Tmax® XT MCCBs,
- NEMA 1 and 3R enclosures

Transition from Spectra™ to Tmax® XT

Combining ABB and GE Industrial Solutions leading-edge technologies offers you a new, comprehensive, one-line construction package.



The June 2019 acquisition of GE Industrial Solutions by ABB brought together the best of two technologies. As part of the continuing development of a new, leading-edge and comprehensive one-line construction package, the Spectra RMS and RMS with microEntelliGuard® technology breakers will be retired and replaced by the Tmax XT circuit breakers in traditional GE Industrial Spectra series and ReliaGear™ neXT power panelboards, A-line lighting boards, switchboards, busway plugs and motor control centers.

This brochure is designed to assist you in transitioning from Enclosed Spectra and Q-Line to Tmax XT and Formula A2.

Spectra performance range

		SE frame	SF frame	SG frame	SK frame
Frame size (A)		150	250	600	1200
Poles		2, 3	2, 3	2, 3	2, 3
Interrupt ratings (kA)	240 V AC	18, 65, 100, 200	65, 100, 200	65, 100, 200	65, 100, 200
	480 V AC	18, 25, 65, 100	35, 65, 100	35, 65, 100	50, 65, 100
	600 V AC	14, 18, 25	22, 25, 25	25, 65	25, 42, 65
Dimensions (in.)	Width	4.12	4.12	5.50	8.25
	Depth	3.38	3.81	3.81	5.50
	Height	6.31	10.12	10.09	15.50
Trip units	RMS	X	X	X	X
	microEntelliGuard	–	–	X	X

Tmax XT MCCBs

7 frame sizes to fit your application

A new generation of innovative molded case circuit breakers, designed to save you both money and time.

There's a lot more to the SACE Tmax XT than meets the eye, and the benefits for your business can be significant. To start with, everything you need is self-contained within the breaker, requiring no external relays or other devices to purchase, install or wire. Second, the Tmax XT product range includes a wide array of options and accessories. An online configurator makes it easy to select and order exactly what you need and skip what you don't. Then there's installation. Tmax XT MCCBs can be installed in up to 40% less time than traditional circuit breakers, and you can update their electronic trip units in the field in as little as 5 minutes. And finally, Tmax XT provides plug-and-play communication that allows you to connect to the cloud and access 30% more information. All these advantages add up to help deliver substantial savings in time and money to your business.



Tmax XT performance range

		XT1	XT2	XT3	XT4	XT5	XT6	XT7
Frame size (A)		125	125	225	250	600	800	1200
Poles		3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Interrupt rating (kA)	240 V AC	50, 65, 100	65, 100, 150, 200	50, 65	65, 100, 150, 200	65, 100, 150, 200	65, 100, 200	65, 100, 200
	480 V AC	22, 35, 65	22, 35, 65, 100, 150, 200	25, 35	22, 35, 65, 100, 150, 200	35, 50, 65, 100, 150, 200	35, 50, 65	50, 65, 100
	600 V AC	–	18, 22, 25, 35, 42	–	18, 22, 25, 50, 65, 100	18, 25, 35, 65, 100	20, 25, 35	25, 50, 65
Dimensions (in.)	Width	3.00	3.54	4.13	4.13	5.51	8.27	8.27
	Depth	2.75	3.25	2.75	3.25	4.07	4.07	6.57
	Height	5.12	5.12	5.90	6.30	8.07	10.55	10.55
Trip units	TMF	X	X	X	X	–	–	–
	TMA	–	X	–	X	X	X	–
	Ekip DIP	–	X	–	X	X	X	X
	Ekip Touch	–	X	–	X	X	–	X

Tmax XT trip unit capability

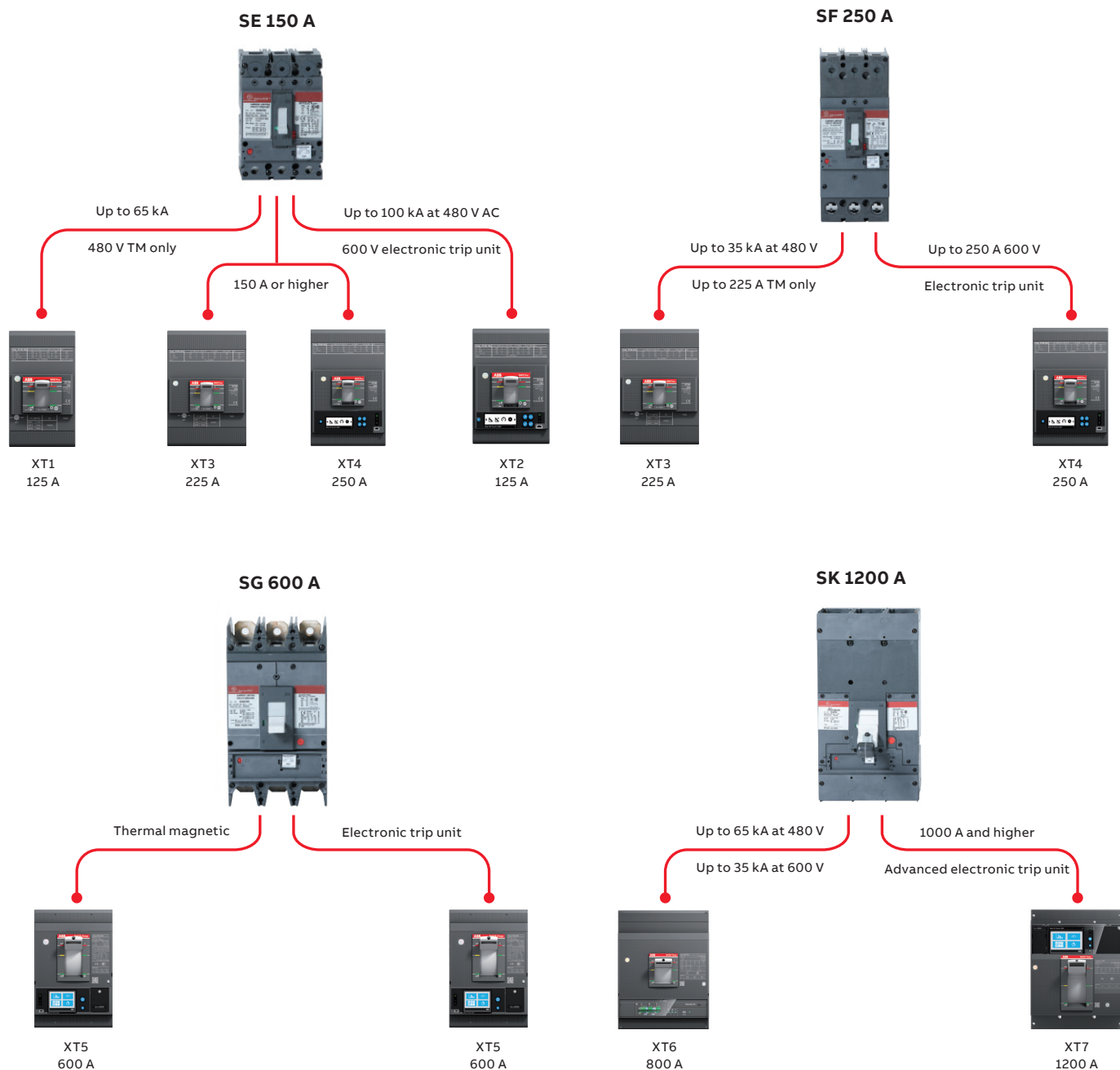
Features	TMF	TMA	Ekip DIP	Ekip Touch
Standard protection	X	X	X	X
LSIG	–	–	X	X
Adjustability to 40% of rating	–	–	X	X
Connectivity and communication	–	–	–	X
Embedded advanced functions	–	–	–	X
Online upgradability	–	–	–	X

Selecting the right Tmax XT molded case circuit breaker

Order exactly what you need, skip what you don't

Correct cross-referencing

Spectra breakers come with four frame options (SE, SF, SG and SK). Tmax XT breakers have seven frames (XT1, XT2, XT3, XT4, XT5, XT6 and XT7), bringing you more options to get your most efficient cross-reference.



*Rating plug into lower frame capacity = Consult lower frame

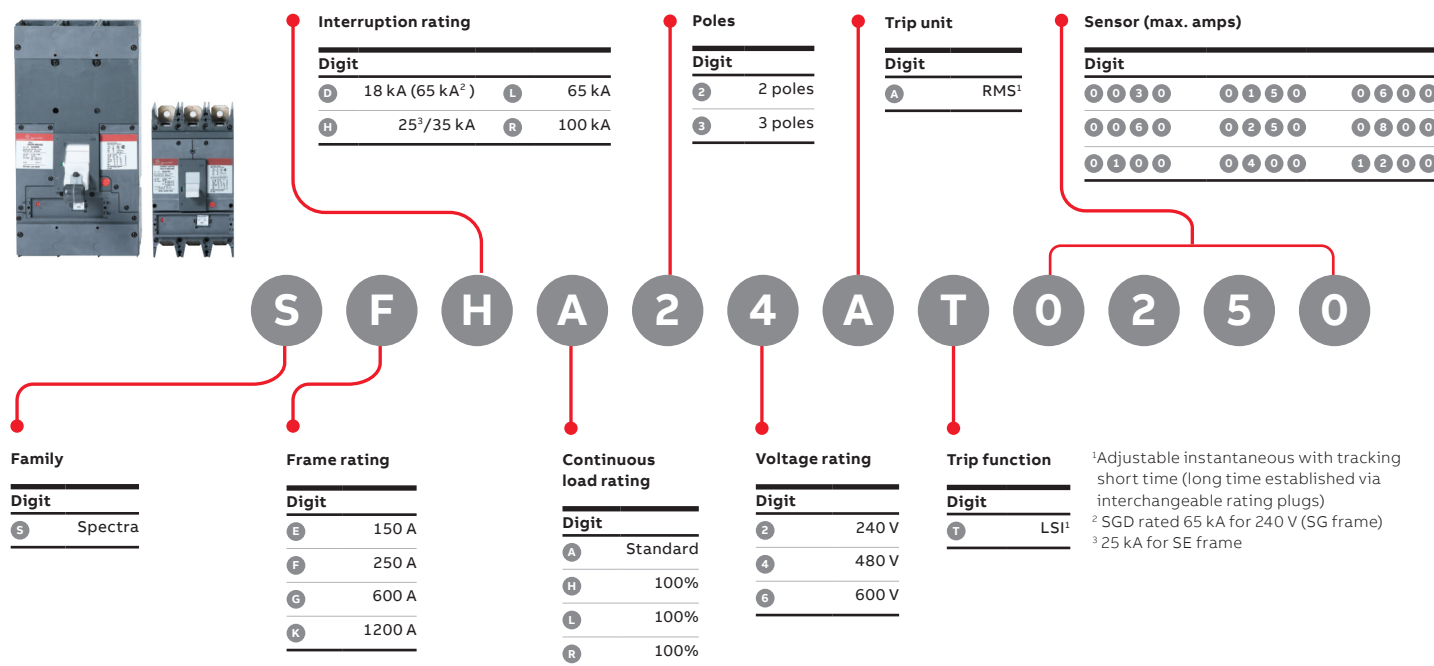
*Most efficient cross = Thermal magnetic, 480 V

Preliminary for reference only; subject to change.

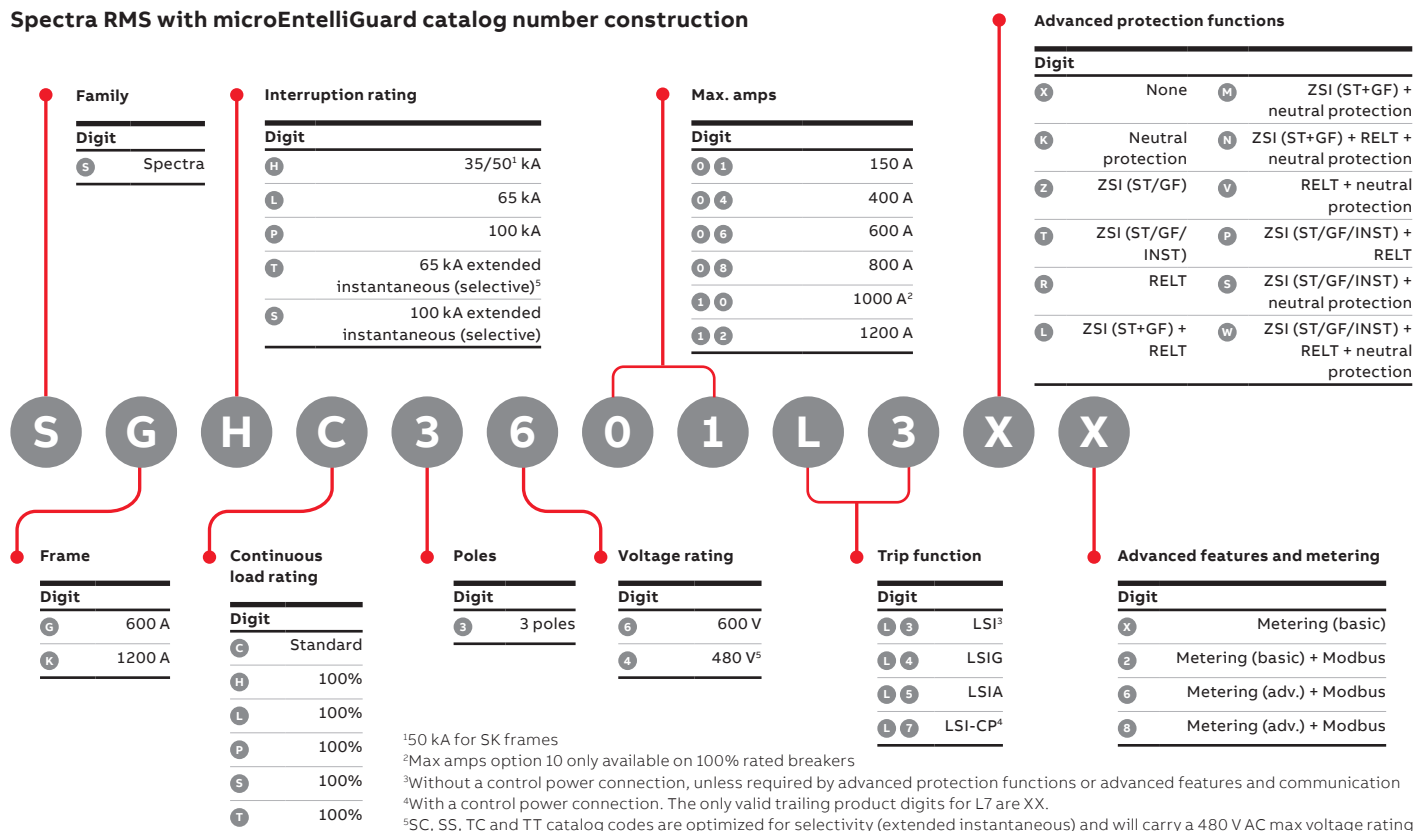
Spectra RMS and RMS with microEntelliGuard molded case circuit breakers

Product number structure

Spectra RMS catalog number construction

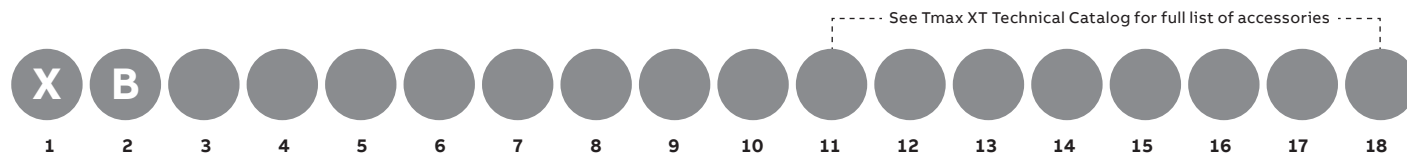


Spectra RMS with microEntelliGuard catalog number construction



Enclosed Circuit Breakers

Product number structure



1 & 2 Version

Digit
X B

3 Frame

Digit
1 2 3 4 5 6 7

4 Interrupting ratings – 480 V AC*

Digits	XT1	XT2	XT3	XT4	XT5	XT6	XT7
N	25	25	25	25	35	35	–
S	35	35	35	35	50	50	50
H	65	65	–	65	65	65	65
L	–	100	–	100	100	–	100
V	–	150	–	150	150	–	–
X	–	200	–	200	200	–	–

5 Standard UL and IEC

Digit	
U	UL 80%
Q	UL 100%

6 Number of poles

Digit	
2	2 Poles
3	3 Poles

7, 8, 9 Frame amps

XT1–4		XT5–7	
Digits	Amps	Digits	Amps
0 1 0	10	2 5 A	250 (XT5)
0 1 5	15	3 0 A	300 (XT5)
0 2 0	20	4 0 A	400 (XT5)
0 2 5	25	5 0 B	500 (XT5)
0 3 0	30	6 0 B	600 (XT5)
0 3 5	35	6 0 0	600 (XT6)
0 4 0	40	6 0 C	600 (XT7)
0 4 5	45	8 0 0	800 (XT6)
0 5 0	50	8 0 C	800 (XT7)
0 6 0	60	1 0 D	1000 (XT7)
0 7 0	70	1 2 E	1200/1250 (XT7)
0 8 0	80		
0 9 0	90		
1 0 0	100		
1 1 0	110		
1 2 5	125		
1 5 0	150		
1 7 5	175		
2 0 0	200		
2 2 5	225		
2 5 0	250		

10 Trip unit

Digit	
A	TMF
B	TMA
C	Ekip DIP LIG
D	MCS
E	Ekip DIP LS/I
F	Ekip DIP LSI
G	Ekip DIP LSIG
J	Ekip DIP I
K	Ekip DIP M-I
L	Ekip DIP M-LIU
M	MA (MCP)
N	TMG
P	Ekip Touch LSI
Q	Ekip Touch LSIG
R	Ekip Touch Measuring LSI
S	Ekip Touch Measuring LSIG
T	Ekip Hi-Touch LSI
U	Ekip Hi-Touch LSIG
W	Ekip M Touch LRIU
X	Ekip G DIP LS/I
Y	Ekip G Touch LSIG
Z	Ekip G Hi-Touch LSIG



*For 240 V AC and 600 V AC ratings, refer to Tmax XT UL Technical Catalog.

†IEC only.

Transition from Q-Line to FORMULA A2

Legacy Product Line: TQD & THQD



TQD & THQD 2 pole molded case circuit breaker



TQD & THQD 3 pole molded case circuit breaker

Replacement Product Line: FORMULA A2



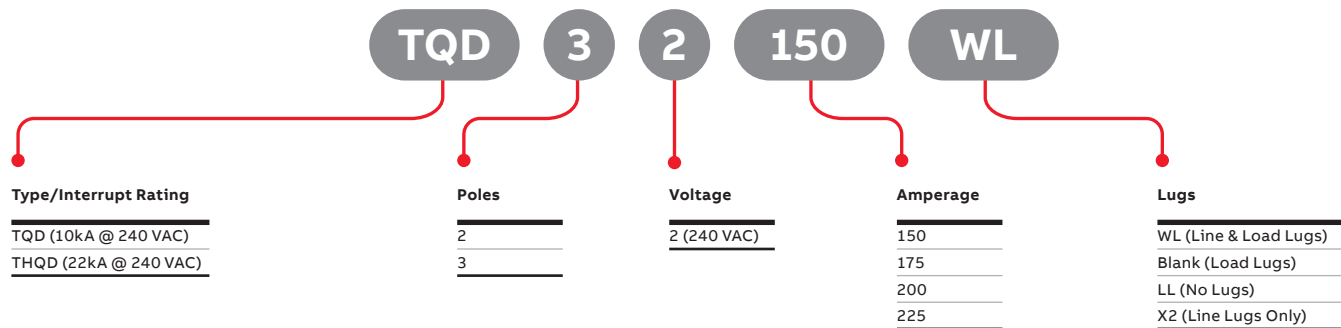
FORMULA A2 2 pole molded case circuit breaker



FORMULA A2 3 pole molded case circuit breaker

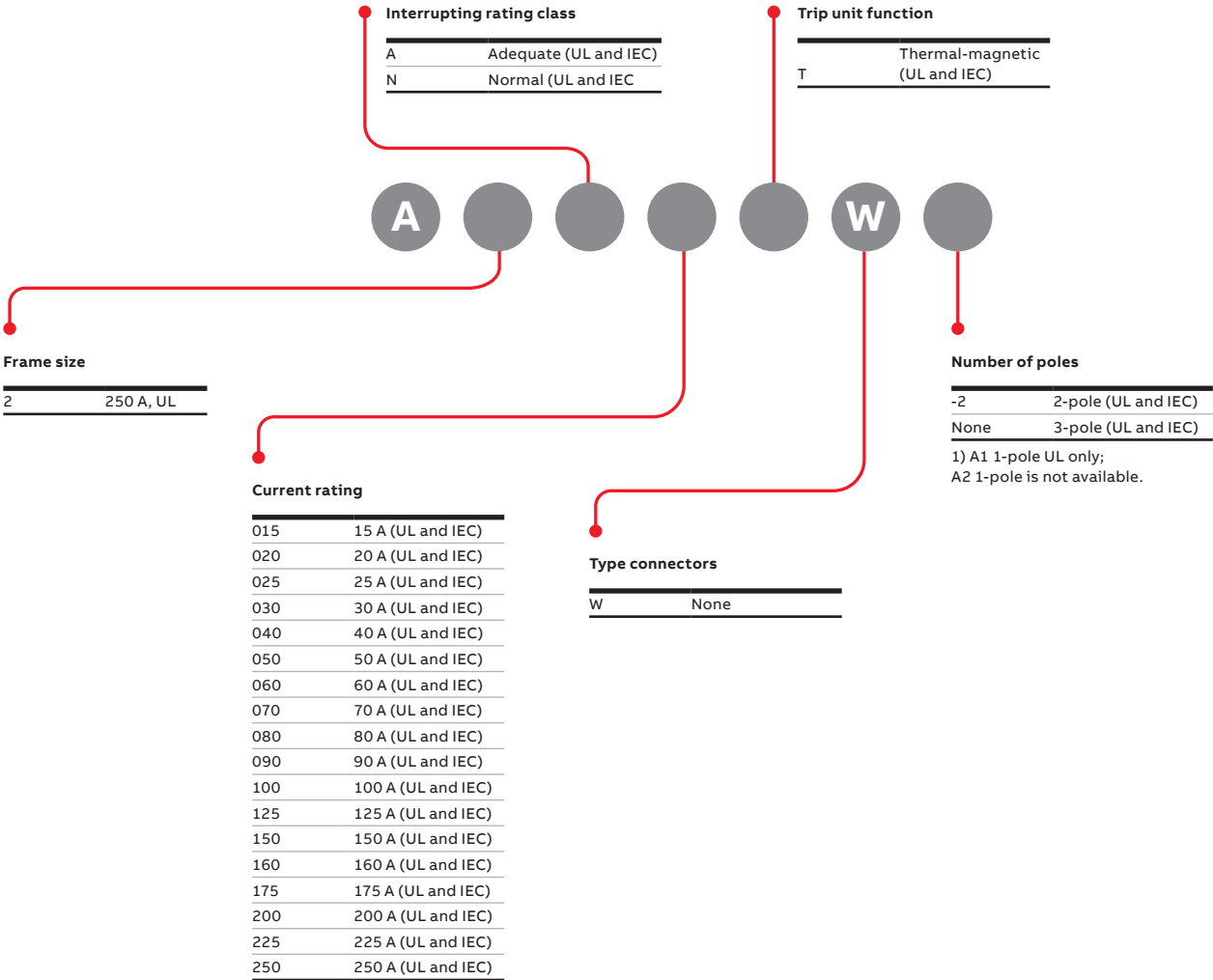
Affected Legacy Products

TQD/THQD Product Number Structure



Replacement Products

FORMULA A2 circuit breaker part number scheme



Circuit Breaker Enclosures

NEMA Type 1

Product Features

- Suitable for use as service equipment (SE) as noted.
- 60°C/75°C conductor ratings
- Short circuit ratings are equal to the rating of the installed breaker.

To order enclosed or accessorized circuit breakers, a configurator is available at: empower.abb.com



Type 1, Indoor Surface or Flush Mounting

NEMA Type 1

			Certifications			Product Number			For 3P4W Enclosures	For Enclosures with Ground Fault Protection		
Max. Ampere Rating	Frame Type	No. of Poles	UL SE	cUL	cUL SE ¹	CSA	Flush	Surface	Surface, Blank End Wall ²	Neutral Product Number	Neutral Product Number ³	Neutral Sensor for Ground Fault ⁶
70	THQL, TXQL, THQL-GF	1, 2, 3	•	•	-	-	TQL70F ⁴	TQL70S ⁴	-	Included	-	-
100	THQL, TXQL, THQL-GF	1, 2, 3	•	•	-	-	TQL100F ⁴	TQL100S ⁴	-	Included	-	-
125	THQL	2	•	•	-	-	TQL125F	TQL125S	-	Included	-	-
100	THQC, THHQC, TXQC	1, 2, 3	•	•	-	-	TQC100F ⁴	TQC100S ⁴	-	Included	-	-
250	Formula A2	2, 3	•	•	-	-	A2ENCL250F	A2ENCL250S	-	Included	-	-
100	SE150, THED, TED, TEB	2, 3	•	•	-	-	TE100F	TE100S	TE100SB	Included	-	-
150	SE150, THED, TED	2, 3	•	•	•	-	TE150F	TE150S	TE150SB	Included	-	-
125	Tmax XT1	3	•	•	-	-	XT1ENCL125F	XT1ENCL125S	-	Included	-	-
125	Tmax XT2	3	•	•	-	-	XT2ENCL125F	XT2ENCL125S	-	TNIA225 ⁵	TNIA250XTGF	1SDA067211R1 (10A DIP) 1SDA067212R1 (25A DIP) 1SDA081983R1 (60A DIP) 1SDA069143R1 (100A DIP) 1SDA081984R1 (125A DIP) 1SDA101971R1 (60A Touch) 1SDA101972R1 (100A Touch) 1SDA107406R1 (60A Touch V) 1SDA107407R1 (100A Touch V)
225	Tmax XT3	3	•	•	-	-	XT3ENCL225F	XT3ENCL225S	-	Included	-	-

¹cUL Listed - Suitable for use as service equipment.

²Enclosures with blank end walls (no Knockouts) and a feature to adjust the instantaneous setting on Spectra Circuit breakers.

³Neutral for ground fault required to mount neutral sensor in enclosure.

⁴3-Pole breakers with an accessory cannot be installed in these enclosures.

⁵For 250A rating, use copper cable only.

⁶Neutral Sensor for Ground Fault requires connector cable KXTCECNEFP purchased separately.

(Table continued on next page.)

Circuit Breaker Enclosures

NEMA Type 1

NEMA Type 1 (continued)

Max. Ampere Rating	Frame Type	No. of Poles	Certifications				Product Number			For 3P4W Enclosures	For Enclosures with Ground Fault Protection	
			UL SE	cUL	cUL SE ¹	CSA	Flush	Surface	Surface, Blank End Wall ²	Neutral Product Number	Neutral Product Number ³	Neutral Sensor for Ground Fault ⁷
250	Tmax XT4	3	•	•	-	-	XT4ENCL250F	XT4ENCL250S	-	TNIA225 ⁴	TNIA250XTGF	1SDA066975R1 (40A DIP) 1SDA081985R1 (60A DIP) 1SDA066977R1 (100A DIP) 1SDA081986R1 (150A DIP) 1SDA081987R1 (225A DIP) 1SDA066979R1 (250A DIP) 1SDA101973R1 (Touch) 1SDA107408R1 (Touch V)
250	SF250	2, 3	•	-	-	•	SF250F	SF250S	SF250SB	TNIA225 ⁴	-	-
600	Tmax XT5	3	•	•	-	-	XT5ENCL600F	XT5ENCL600S	-	TNIA400 TNIA600	TNIA400XTGF TNIA600XTGF	1SDA101966R1 (250A DIP) 1SDA105152R1 (300A DIP) 1SDA105154R1 (400A DIP) 1SDA105155R1 (600A DIP) 1SDA101974R1 (Touch) 1SDA107409R1 (Touch V)
400	SG400	2, 3	•	-	-	•	SG400F	SG400S	SG400SB	TNIA400	TNIA400VG	TSRG201 TSRG204
600	SG600	2, 3	•	-	-	•	SG600F	SG600S	SG600SB	TNIA600	TNIA600VG	TSRG206
800	Tmax XT6	3	•	•	-	-	XT6ENCL800F	XT6ENCL800S	-	TNIA800	TNIA800XTGF	1SDA105158R1 (800A)
1200	Tmax XT7	3	•	•	-	-	XT7ENCL1200F	XT7ENCL1200S	-	TNIA1200	TNIA1200XTGF	1SDA082134R1
1200	SK1200	2, 3	•	-	-	•	TK4V1200F ^{5,6}	TK4V1200S ^{5,6}	TK4V1200SB ^{5,6}	TNIA400 TNIA600 TNIA800 TNIA1200 TNIA1200	TNIA800G TNIA1200G	TSKG408 TSKG410 TSKG412

¹cUL Listed - Suitable for use as service equipment.

²Enclosures with blank end walls (no Knockouts) and a feature to adjust the instantaneous setting on Spectra Circuit breakers.

³Neutral for ground fault required to mount neutral sensor in enclosure.

⁴For 250A rating, use copper cable only.

⁵Not suitable for 100% rated 1200A SK breakers.

⁶Suitable for parallel 500 kcmil maximum.

⁷Neutral Sensor for Ground Fault requires connector cable KXTCECNEFP purchased separately.

Circuit Breaker Enclosures

NEMA Type 3R

Product Features

- Suitable for use as service equipment (SE) as noted.
- 60°C/75°C conductor ratings
- Short circuit ratings are equal to the rating of the installed breaker.

To order enclosed or accessorized circuit breakers, a configurator is available at: empower.abb.com



Type 3R, Outdoor, Raintight

NEMA Type 3R

Max. Ampere Rating	Frame Type	Certifications						For 3P4W Enclosures	For Enclosures with Ground Fault Protection		
		No. of Poles	UL SE	cUL	cUL SE ¹	CSA	Product Number ⁹	Neutral Product Number	Neutral Product Number ²	Neutral Sensor for Ground Fault ¹⁰	
100	THQL, TXQL, THQL-GF	1, 2, 3	•	-	-	•	TQL70R ³	Included	-	-	
100	THQL, TXQL, THQL-GF	1, 2, 3	•	-	-	•	TQL100R ³	Included	-	-	
125	THQL	2	•	-	-	•	TQL125R	Included	-	-	
100	THQC, THHQC, TXQC	1, 2, 3	•	-	-	•	TQC100R ³	Included	-	-	
250	Formula A2	2, 3	•	•	•	-	A2ENCL250R	Included	-	-	
100	SE150, THED, TED, TEB	2, 3	•	-	-	•	TE100R	Included	-	-	
125	Tmax XT1	3	•	•	•	-	XT1ENCL125R	Included	-	-	
125	Tmax XT2	3	•	•	•	-	XT2ENCL125R	TNIA225 ⁴	TNIA250XTGF	1SDA067211R1 (10A DIP) 1SDA067212R1 (25A DIP) 1SDA081983R1 (60A DIP) 1SDA069143R1 (100A DIP) 1SDA081984R1 (125A DIP) 1SDA101971R1 (60A Touch) 1SDA101972R1 (100A Touch) 1SDA107406R1 (60A Touch V) 1SDA107407R1 (100A Touch V)	
150	SE150, THED, TED	2, 3	•	-	-	•	TE150R	Included	-	-	
225	Tmax XT3	3	•	•	•	-	XT3ENCL225R	Included	-	-	
250	Tmax XT4	3	•	•	•	-	XT4ENCL250R	TNIA225 ⁴	TNIA250XTGF	1SDA066975R1 (40A DIP) 1SDA081985R1 (60A DIP) 1SDA066977R1 (100A DIP) 1SDA081986R1 (150A DIP) 1SDA081987R1 (225A DIP) 1SDA066979R1 (250A DIP) 1SDA101973R1 (Touch) 1SDA107408R1 (Touch V)	
250	SF250	2, 3	•	-	-	•	TF225R	TNIA225 ⁴	-	-	

¹cUL Listed - Suitable for use as service equipment.

²Neutral for ground fault required to mount neutral sensor in enclosure.

³3-Pole breakers with an accessory can not be installed in these enclosures.

⁴For 250A rating, use copper cable only.

⁵Suitable for parallel 250 kcmil maximum. If larger cable is required, use 600A enclosure.

⁶Not suitable for 100% rated 1200A SK breakers.

⁷Suitable for parallel 500 kcmil maximum.

⁸Service rated equipment only.

⁹100-250A devices have removable closing cap. Larger ampere devices require field cut openings. Order hubs separately. See page 7-10.

¹⁰Neutral Sensor for Ground Fault requires connector cable KXTCECNEFP purchased separately.

(Table continued on next page.)

Circuit Breaker Enclosures

NEMA Type 3R

NEMA Type 3R (continued)

Max. Ampere Rating	Frame Type	Certifications						For 3P4W Enclosures	For Enclosures with Ground Fault Protection	
		No. of Poles	UL SE	cUL	cUL SE ¹	CSA	Product Number ⁹	Neutral Product Number	Neutral Product Number ²	Neutral Sensor for Ground Fault ¹⁰
600	Tmax XT5	3	•	•	•	-	XT5ENCL600R	TNIA400 TNIA600	TNIA400XTGF TNIA600XTGF	1SDA101966R1 (250A DIP) 1SDA105152R1 (300A DIP) 1SDA105154R1 (400A DIP) 1SDA105155R1 (600A DIP) 1SDA101974R1 (Touch) 1SDA107409R1 (Touch V)
400	SG400	2, 3	•	-	-	•	SG400R	TNIA400	TNIA400VG	TSRG201 TSRG204
600	SG600	2, 3	•	-	-	•	SG600R	TNIA600	TNIA600VG	TSRG206
800	Tmax XT6	3	•	•	•	-	XT6ENCL800R	TNIA800	TNIA800XTGF	1SDA107671R1 (600A) 1SDA105158R1 (800A)
1200	Tmax XT7	3	•	•	•	-	XT7ENCL1200R	TNIA1200	TNIA1200XTGF	1SDA082134R1
1200	SK1200	2, 3	•	-	-	•	TK4V1200R ^{6,7}	TNIA400 TNIA600 TNIA800 TNIA1200 TNIA1200	TNIA800G TNIA1200G	TSKG408 TSKG410 TSKG412

NEMA Type 3R with Factory Installed Breaker

Max. Ampere Rating	Frame Type	Certifications						For 3P4W Enclosures	Notes
		No. of Poles	UL SE	cUL	cUL SE ¹	CSA	Product Number ⁹	Neutral Product Number	
100	THQL, TXQL, THQL-GF	1, 2, 3	•	•	-	-	TQL70RE ³	Included	100A circuit breaker factory installed (2-pole)
150	Formula A2	2	•	•	•	-	A2A250W150ECB	Included	150A circuit breaker factory installed (2-pole)
200	Formula A2	2	•	•	•	-	A2A250W200ECB	Included	200A circuit breaker factory installed (2-pole)
150	THQMV	2	•	•	•	-	THQMV150NRE ⁸	Included	150A circuit breaker factory installed (2-pole)
200	THQMV	2	•	•	•	-	THQMV200NRE ⁸	Included	200A circuit breaker factory installed (2-pole)

¹cUL Listed - Suitable for use as service equipment.

²Neutral for ground fault required to mount neutral sensor in enclosure.

³3-Pole breakers with an accessory can not be installed in these enclosures.

⁴For 250A rating, use copper cable only.

⁵Suitable for parallel 250 kcmil maximum. If larger cable is required, use 600A enclosure.

⁶Not suitable for 100% rated 1200A SK breakers.

⁷Suitable for parallel 500 kcmil maximum.

⁸Service rated equipment only.

⁹100-250A devices have removable closing cap. Larger ampere devices require field cut openings. Order hubs separately. See page 7-10.

¹⁰Neutral Sensor for Ground Fault requires connector cable KXTCECNEFP purchased separately

Guide for the migration process, focused on application requirements

Questions to ask your customer

What are your system requirements?

1. What voltage do you need?
2. What amperage do you need?
3. What interrupting current do you need?
4. How many poles do you need?
5. Do you need 80% or 100% rated?

What are your electrical requirements?

1. What trip unit do you need?
 - L (overload protection) – Fixed or adjustable?
 - S (selective short circuit protection) – Yes (adjustable) or no?
 - I (short circuit protection) – Fixed or adjustable?
 - G (ground fault protection) – Yes or no?
2. What will the application be?
 - General protection?
 - Motor protection?
 - Generator protection?
 - Molded case switch?
3. Do you need communications/monitoring?
 - Bluetooth® connectivity?
 - Metering?
 - Monitoring?
 - Communication?
 - Cloud connectivity?

Migration example

Your customer currently uses a Spectra SF frame breaker, outlined below.

What are your system requirements?

1. What voltage do you need?
 - 480 V
2. What amperage do you need?
 - 200 A
3. What interrupting current do you need?
 - 65 kA
4. How many poles do you need?
 - 3 poles
5. Do you need 80% or 100% rated?
 - 80% rated

What are your electrical requirements?

1. What trip unit do you need?
 - L (overload protection), fixed
2. What will the application be?
 - General protection
3. Do you need communications/monitoring?
 - No communications/monitoring

Based on the customer's needs, ABB would suggest the following options:

1. XT3 – Since the customer wants a thermal magnetic trip for a breaker rated 200 A at 480 V.
2. XT4 – If the customer ends up needing an electronic trip unit or needs the ability to install the breaker into a Spectra power panelboard with the Spectra retrofit kit.

System	Spectra SF	Tmax XT3	Tmax XT4
Frame size (max.) (A)	250	225	250
Interrupt rating (kA)	65	65	65
Poles	3	3	3
Voltage (V)	600	480	480
Amperage (A)	250	200	200
Trip unit	Electronic trip	Thermal magnetic	Thermal magnetic, ETU
Dimensions (W X H X D) (in.)	4.12 x 3.81 x 10.12	4.13 x 2.75 x 5.90	4.13 x 3.25 x 6.30



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