

TemBreak^{PRO}

Temperature and Watts Loss

Moulded Case Circuit Breakers Tables

TECH DATA



Version

1.2.0

Summary of Changes

This section highlights the details of changes made since the previous issue of this document.

The versioning convention used to track changes in this document follows the structure **Vx.y.z** where:

- x:** Major revision, where extensive changes are made which is generally incompatible with the previous version. Such changes may include new products and/or features, or removal of information which is no longer relevant or applicable to the previous version
- y:** Minor revision, where changes made do not change the overall scope of the previous version, but may include additional information which complements or corrects the previous version, or provides additional clarity on an existing topic.
- z:** Patch version, where small changes are made to correct minor errors or adjust existing text, charts, figures and/or images, and which do not add or remove information from the previous version. Example changes may include spelling corrections, image re-sizing and adjustments, updated images, etc.

Version	Publication date	Changes	By
V 1.0.0	29-Apr-2021	Initial release	N.ALEX
V 1.0.1	10-May-2021	Watts Loss typo corrected	N.ALEX
V 1.1.0	27-May-2021	Reworded Watts Loss tables, Watts Loss typo corrected, Part Number Breakdown corrected	N.ALEX
V 1.2.0	20-Jan-2022	Added B250P_BE (In: 40, 125, 160A) temperature ratings, P160 & P250 Model DC and AC watts loss release, added DC watts loss for other models	N.ALEX

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Introduction

The technical data in this document relates to temperature ratings and watts loss data. This document provides data for the following MCCB models:

- A160, A250
- P160, P250, P400, P630
- B160, B250, B400, B800, B1000, B1250, B1600
- XS2000, XS2500, XS3200
- ZS125, ZS250

Additional Resources

The following resources also contain this information.

Resource	Description
NHP/Terasaki TemBreak <i>PRO</i> MCCB User Manuals P_TM-UM-001-EN P_BE-UM-001-EN P_SE-UM-001-EN B_TM-UM-001-EN B_BE-UM-001-EN	Reference guide for the TemBreak <i>PRO</i> MCCBs including information for installation, wiring, commissioning, configuration, and troubleshooting.
NHP/Terasaki TemBreak <i>PRO</i> Technical Catalogue NHP-TECH-PDP-CP-2020-11-27-EN	Catalogue for product selection and technical data

Terminology and Abbreviations

Abbreviation	Description	Abbreviation	Description
Calibrated Temperature	Temperature Rating for Thermal Magnetic MCCBs	MCCB	Moulded Case Circuit Breaker
Rated Temperature	Temperature Rating for Electronic and Non-Auto MCCBs		
TM	Adjustable Thermal and Adjustable Magnetic	FF	Fixed Thermal and Fixed Magnetic
FM	Fixed Thermal and Adjustable Magnetic	TF	Adjustable Thermal and Fixed Magnetic
BE	Basic Electronic Trip Unit (dial type, LSI and LSIG)	SE	Smart Energy Trip Unit
LSI	Long Time, Short Time and Instantaneous Protection	LSIG	Long Time, Short Time, Instantaneous and Ground Fault Protection
I_n	Rated Current	AF	Ampere Frame

Product Information

Part Number Break Down



a) Model Type

A	Basic applications (160...250 A)
P	Mid to advanced applications (160...630 A)
B	High current, high kA applications (160...1600 A)
ZS	Earth Leakage applications (125...250 A)
XS	Highest current applications (2000...3200 A)

b) Ampere Frame

125 A
160 A
250 A
400 A
630 A
800 A
1000 A
1250 A
1600 A
2000 A
2500 A
3200 A

c) Short Circuit Break Capacity I_{cu} (kA)

R	200 kA
L	150 kA
P	125 kA
S	110 kA
G	100 kA
HL	85 kA
H	70 kA
M	65 kA
N	50 kA
F	36 kA
E	25 kA
D	Switch

d) Pole Pitch Size (mm) ¹⁾

1	25
2	30
3	35

e) No. of Poles

1	⁷⁾
2	⁸⁾
3	
4	

f) Trip Unit Rating (I_n)

I_n x A

g) Trip Unit Type

TF	Adj Thermal Fix Magnetic ⁴⁾
FF	Fix Thermal Fix Magnetic
TM	Adj Thermal Adj Magnetic
SX	Smart Ammeter ^{5) 6)}
BE	Basic Electronic ⁶⁾
SE	Smart Energy ⁶⁾
NN	Non-Auto Switch

h) Trip Unit Option

G	Ground Fault ²⁾
N	Neutral ²⁾
P	Pre-Trip Alarm ³⁾
SN	Solid Neutral ⁹⁾



Notice: Not all combinations are possible. Confirm part number combination with NHP for availability.

1. 160AF only
2. For P_SE versions these features are standard and therefore are not added to the end of the part number.
3. PTA is standard with P electronic models and therefore P is not added to the end of the part number.
4. Only available in A & ZS models
5. Only available in B models
6. Not available in A and ZS models
7. Only available in A and B models (FF Only Trip Unit)
8. Not available in A and B models (FF Only Trip Unit)
9. ZS Models

Product Information

Available MCCBs in the TemBreak *PRO* range:

Rating Short Circuit Break Capacity (kA)		Frame Size											
		160	250	400	630	800	1000	1250	1600	2000	2500	3200	
E	25	A160E – TF A160E – FF B160E – FF	A250E – TM	P400E-TM	P630E – TM								
F	36	A160F – TF P160F – FF P160F – TM P160F – BE P160F – BEG P160F – SE	A250F – TM P250F – TM P250F – BE P250F – BEG P250F – SE	P400F – TM P400F – BE P400F – BEG P400F – SE	P630F – TM P630F – BE P630F – BEG P630F – SE	B800F – TM							
N	50	P160N – TM P160N – BE P160N – BEG P160N – SE	P250N – TM P250N – BE P250N – BEG P250N – SE	P400N – TM P400N – BE P400N – BEG P400N – SE	P630N – TM P630N – BE P630N – BEG P630N – SE	B800N – TM B800N – BE B800N – SX B800N – SE	B1000N – BE B1000N – BEG B1000N – SX B1000N – SE	B1250N – BE B1250N – BEG	B1600N – BE B1600N – BEG				
H	70	P160H – TM P160H – BE P160H – BEG P160H – SE	P250H – TM P250H – BE P250H – BEG P250H – SE	P400H – TM P400H – BE P400H – BEG P400H – SE	P630H – TM P630H – BE P630H – BEG P630H – SE	B800H – TM B800H – BE B800H – BEG B800H – SX B800H – SE	B1000H – BE B1000H – BEG B1000H – SX B1000H – SE	B1250H – BE B1250H – BEG					
HL	85							B1250HL – BE B1250HL – BEG	B1600HL – BE B1600HL – BEG	XS2000HL – BE XS2000HL – BEG	XS2500HL – BE XS2500HL – BEG	XS3200HL – BE	
G	100					B800G – TM B800G – BE B800G – BEG B800G – SX B800G – SE							
S	110			P400S – TM P400S – BE P400S – BEG P400S – SE	P630S – TM P630S – BE P630S – BEG P630S – SE								
P	125	B160P – TM	B250P – TM B250P – BE B250P – SE	B400P – BE B400P – BEG		B800P – BE B800P – BEG B800P – SX B800P – SE							
R	200	B160R – TM	B250R – TM	B400P – BE B400P – BEG		B800R – BE B800R – BEG B800R – SX B800R – SE							
D	Switch	A160D – NN P160D – NN	A250D – NN P250D – NN	P400D – NN	P630D – NN	B800D – NN	B1000D – NN	B1250D – NN	B1600D – NN	XS2000D – NN	XS2500D – NN		

Temperature Derating – Thermal Magnetic Trip Units

A Model MCCBs

Calibration Temperature: 50°C							
MCCB Type	Connection type	Rated I_n	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
A160E (Single pole)	Front Conn. Rear Conn.	16A	16	15	14	13	Not Available
		20A	20	19	18	17	
		25A	25	24	24	23	
		32A	32	30	28	27	
		40A	40	39	37	36	
		50A	50	48	47	45	
		63A	63	61	59	57	
		80A	80	76	73	70	
		100A	100	97	94	91	
		125A	125	122	118	115	
A160E A160F	Front Conn. Rear Conn.	25A	25	24	24	23	Not Available
		40A	40	39	37	36	
		63A	63	61	59	57	
		80A	80	77	73	70	
		100A	100	97	94	91	
		160A	160	156	152	149	
A250E	Front Conn. Rear Conn.	100A	100	98	96	94	Not Available
		125A	125	122	119	115	
		160A	160	156	152	148	
		200A	200	195	189	183	
		250A	250	243	236	229	
A250F	Front Conn. Rear Conn.	125A	125	122	119	115	Not Available
		160A	160	156	152	148	
		200A	200	195	189	183	
		250A	250	243	236	229	

Note 1: Rated current, based on $I_r = 1 \times I_n$ setting at given temperature.

Temperature Derating – Thermal Magnetic Trip Units

P Model MCCBs

Front and Rear Connections

Calibration Temperature: 45°C								
MCCB Type	Connection type	Rated I _n	Rated Current (A)					
			45°C	50°C	55°C	60°C	65°C	70°C
P160F_FF	Front Conn. Rear Conn.	15A	15	13	12	11	9	Not Available
		20A	20	18	17	16	15	
		30A	30	28	27	25	24	
		40A	40	37	35	32	29	
		50A	50	47	44	40	37	
		60A	60	57	53	50	46	
		75A	75	72	69	65	62	
		100A	100	96	93	89	85	
		125A	125	121	118	115	111	

Calibration Temperature: 50°C							
MCCB Type	Connection type	Rated I _n	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
P160_TM	Front Conn. Rear Conn.	20A	20	19	19	18	17
		32A	32	31	30	29	28
		50A	50	47	45	42	39
		63A	63	59	54	49	43
		100A	100	97	93	89	85
		125A	125	121	118	115	110
		160A	160	156	151	146	142
P250_TM	Front Conn. Rear Conn.	50A	50	49	47	45	44
		63A	63	60	57	54	50
		100A	100	96	92	88	83
		125A	125	121	117	113	109
		160A	160	154	148	141	134
		200A	200	190	180	170	159
		250A	250	242	233	224	215
P400_TM	Front Conn. Rear Conn.	250A	250	244	238	233	226
		400A	400	392	384	376	368

Calibration Temperature: 30°C											
MCCB Type	Connection type	Rated I _n	Rated Current (A)								
			30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
P630_TM	Front Conn. Rear Conn.	630A	630	615	600	577	560	540	520	500	479

Note 1: Rated current, based on $I_r = 1 \times I_n$ setting at given temperature.

Temperature Derating – Thermal Magnetic Trip Units

P Model MCCBs

Plug-in Connection

Calibration Temperature: 50°C							
MCCB Type	Connection type	Rated I_n	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
P160_TM	Plug-in Conn.	20A	20	19	19	18	17
		32A	32	31	30	29	28
		50A	50	47	45	42	39
		63A	63	59	54	49	43
		100A	100	97	93	89	85
		125A	125	121	118	115	110
160A		Not Available in Plug-in					
P250_TM		50A	50	49	47	45	44
		63A	63	60	57	54	50
		100A	100	96	92	88	83
		125A	125	121	117	113	109
		160A	160	154	148	141	134
		200A	200	190	180	170	159
P400_TM		250A	250	242	233	224	215
		400A	400	392	384	376	368
P630_TM		630A	Not Available in Plug-in				

Note 1: Rated current, based on $I_r = 1 \times I_n$ setting at given temperature.

Temperature Derating – Thermal Magnetic Trip Units

B Model MCCBs

Front and Rear Connections

Calibration Temperature: 50°C							
MCCB Type	Connection type	Rated I_n	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
B160E_FF	Front Conn. Rear Conn.	16A	16	15	14	13	12
		20A	20	18.5	18	17.5	17
		25A	25	23.5	22.5	21.5	20.5
		32A	32	30	29	28	27
		40A	40	33.5	30	26	21
		50A	50	46	44	42	40
		63A	63	59	57	55	53
		80A	80	76	74	71	69
		100A	100	94	91	88	84
		125A	125	117	113	109	104
B160P_TM B160R_TM	Front Conn. Rear Conn.	160A	160	151	146	141	135
		20A	20	18.5	18	17.5	Not Available
		32A	32	30	29	28	Not Available
		50A	50	57	45	44	42
		63A	63	59	57	55	53
		100A	100	95	92	89	86
		125A	125	118	114	111	107
B250P_TM B250R_TM	Front Conn. Rear Conn.	160A	160	151	147	143	Not Available
		250A	250	237	230	223	
B800F_TM B800N_TM B800H_TM	Front Conn. Rear Conn.	630A	630	600	584	569	
		800A	800	758	737	716	
		630A	630	600	584	569	
B800G_TM	Front Conn. Rear Conn.	800A	800	758	737	716	

Note 1: Rated current, based on $I_r = 1 \times I_n$ setting at given temperature.

Temperature Derating – Thermal Magnetic Trip Units

Plug-in Connection

Calibration Temperature: 50°C							
MCCB Type	Connection type	Rated I_n	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
B160P_TM B160R_TM	Plug-in Conn.	20A	20	18.5	18	17.5	Not Available
		32A	32	30	29	28	Not Available
		50A	50	57	45	44	42
		63A	63	59	57	55	53
		100A	100	95	92	89	86
		125A	125	118	114	111	107
B800F_TM B800N_TM B800H_TM	Plug-in Conn.	630A	630	600	584	569	Not Available
		800A	800	758	737	716	
B800G_TM	Plug-in Conn.	630A	630	600	584	569	
		800A	800	758	737	716	

Calibration Temperature: 30°C											
MCCB Type	Connection type	Rated I_n	Rated Current (A)								
			30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
B250P_TM B250R_TM	Plug-in Conn.	250A	250	244	236	225	219	209	200	190	Not Available

Note 1: Rated current, based on $I_r = 1 \times I_n$ setting at given temperature.

Temperature Ratings – Electronic Trip Units

P Model MCCBs

Maximum setting of the I_r at the nominated current at the specified ambient.

Values in bold are the maximum value for I_r , different combinations of I_{r1} and I_{r2} can be set if the combined settings are not greater than the I_r value advised.

P160 Electronic

MCCB Type	Connection Type	OCR Type	OCR Rating	Setting	Rated Current (A)								
					40°C	45°C	50°C	55°C	60°C	65°C	70°C		
P160	Front Conn. Rear Conn. Plug-in Conn.	BE BEG	40A	I_r (A)	40	40	40	40	40	40	40	40	
				I_{r1} (A)	40	40	40	40	40	40	40		
				I_{r2}	1	1	1	1	1	1	1		
		SE	I_r (A)	40	40	40	40	40	40	40	40		
			BE BEG	100A	I_r (A)	100	100	100	100	100	100	100	
					I_{r1} (A)	100	100	100	100	100	100	100	
	I_{r2}	1			1	1	1	1	1	1			
	SE	I_r (A)	100	100	100	100	100	100	100				
		Front Conn. Rear Conn.	BE BEG	160A	I_r (A)	160	160	160	160	160	156.8	145.5	
					I_{r1} (A)	160	160	160	160	160	160	160	
	I_{r2}				1	1	1	1	1	0.98	0.97		
	SE		I_r (A)		160	160	160	160	160	156	145		
			BE BEG		160A	I_r (A)	125	125	125	125	125	120	110
						I_{r1} (A)	125	125	125	125	125	125	110
	I_{r2}	1		1		1	1	1	0.96	1			
	SE	I_r (A)	125	125	125	125	125	120	112				

P250 Electronic

MCCB Type	Connection Type	OCR Type	OCR Rating	Setting	Rated Current (A)								
					40°C	45°C	50°C	55°C	60°C	65°C	70°C		
P250	Front Conn. Rear Conn. Plug-in Conn.	BE BEG	40A	I_r (A)	40	40	40	40	40	40	40		
				I_{r1} (A)	40	40	40	40	40	40	40		
				I_{r2}	1	1	1	1	1	1	1		
		SE	I_r (A)	40	40	40	40	40	40	40			
			BE BEG	100A	I_r (A)	100	100	100	100	100	100	100	
					I_{r1} (A)	100	100	100	100	100	100	100	
	I_{r2}	1			1	1	1	1	1	1			
	SE	I_r (A)	100	100	100	100	100	100	100				
		Front Conn. Rear Conn.	BE BEG	160A	I_r (A)	160	160	160	160	160	160	155.2	
					I_{r1} (A)	160	160	160	160	160	160	160	
	I_{r2}				1	1	1	1	1	1	0.97		
	SE		I_r (A)		160	160	160	160	160	160	155		
			BE BEG		160A	I_r (A)	160	160	160	160	160	160	148.5
						I_{r1} (A)	160	160	160	160	160	160	150
	I_{r2}	1		1		1	1	1	1	0.99			
	SE	I_r (A)	160	160	160	160	160	160	149				
		Front Conn. Rear Conn.	BE BEG	250A	I_r (A)	250	250	250	250	242.5	225	209.25	
					I_{r1} (A)	250	250	250	250	250	225	225	
	I_{r2}				1	1	1	1	0.97	1	0.93		
	SE		I_r (A)		250	250	250	250	242	225	209		
			BE BEG		250A	I_r (A)	250	250	250	242.5	225	213.75	198
						I_{r1} (A)	250	250	250	250	225	225	200
	I_{r2}	1		1		1	0.97	1.0	0.95	0.99			
	SE	I_r (A)	250	250	250	243	228	214	198				

P Model MCCBs

Maximum setting of the I_r dial/s at the nominated current at the specified ambient.

Values in bold are the maximum value for I_r, different combinations of I_{r1} and I_{r2} can be set if the combined settings are not greater than the I_r value advised.

P400 Electronic

MCCB Type	Connection Type	OCR Type	OCR Rating	Setting	Rated Current (A)						
					40°C	45°C	50°C	55°C	60°C	65°C	70°C
P400	Front Conn. Rear Conn. Plug-in Conn.	BE BEG	250A	I _r (A)	250	250	250	250	250	250	250
				I _{r1} (A)	250	250	250	250	250	250	250
				I _{r2}	1	1	1	1	1	1	1
		SE	400A	I _r (A)	250	250	250	250	250	250	250
				I _r (A)	400	400	400	400	400	358.9	300
				I _{r1} (A)	400	400	400	400	400	370	300
	BE BEG	400A	I _{r2}	1	1	1	1	1	0.97	1	
			SE	I _r (A)	400	400	400	400	400	360	312

P630 Electronic

MCCB Type	Connection Type	OCR Type	OCR Rating	Setting	Rated Current (A)								
					30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
P630	Front Conn. Rear Conn.	BE BEG	630A	I _r (A)	630	630	630	630	630	611	558	500	400
				I _{r1} (A)	630	630	630	630	630	630	600	500	400
				I _{r2}	1	1	1	1	1	0.97	0.93	1	1
		SE	630A	I _r (A)	630	630	630	630	630	615	560	497	434
				I _r (A)	570	570	570	570	500	500	400	400	372
				I _{r1} (A)	600	600	600	600	500	500	400	400	400
	BE BEG	630A	I _{r2}	0.95	0.95	0.95	0.95	1	1	1	1	0.93	
			SE	I _r (A)	570	570	570	570	546	500	455	400	372

Example setting

MCCB – P400H3400BE

Temperature – 65°C

MCCB Type	Connection Type	OCR Type	OCR Rating	Setting	Rated Current (A)						
					40°C	45°C	50°C	55°C	60°C	65°C	70°C
P400	Front Conn. Rear Conn. Plug-in Conn.	BE BEG	250A	I _r (A)	250	250	250	250	250	250	250
				I _{r1} (A)	250	250	250	250	250	250	250
				I _{r2}	1	1	1	1	1	1	1
		SE	400A	I _r (A)	250	250	250	250	250	250	250
				I _r (A)	400	400	400	400	400	358.9	300
				I _{r1} (A)	400	400	400	400	400	370	300
	BE BEG	400A	I _{r2}	1	1	1	1	1	0.97	1	
			SE	I _r (A)	400	400	400	400	400	360	312

I_{r1} dial set to 370A

I_{r2} dial set to 0.97

Therefore, the maximum at 65°C is I_r = 370A x 0.97 = 358.9A

Other combinations of I_{r1} and I_{r2} in this case can be set as long as they don't exceed 358.9A.

Example: I_r = I_{r1} x I_{r2} = 350A x 1.0 = 350A

Temperature Ratings – Electronic Trip Units

B Model MCCBs

Maximum setting of the Ir dial at the nominated current at the specified ambient.

Rated Temperature											
MCCB Type	Connection type	Rated I _n	Rated Current (A)								
			30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
B250P_BE	Front Conn. Rear Conn.	40A	40	40	40	40	40	40	40	40	40
		125A	125	125	125	125	125	125	125	125	125
		160A	160	160	160	160	160	160	160	160	160
		250A	250	250	250	250	237.5	225	200	200	200
B400P_BE B400R_BE	Front Conn. Rear Conn.	250A	250	250	250	250	250	250	225	200	158
		400A	400	400	400	400	400	380	360	320	158
	Plug-in Conn.	250A	250	250	250	250	250	250	225	200	252
		400A	400	400	400	400	400	360	340	320	252
B800N_BE B800H_BE	Front Conn. Rear Conn. Plug-in Conn.	630A	630	630	630	630	630	598.5	567	504	397
	Front Conn.	800A	800	800	800	800	800	720	640	504	397
	Rear Conn. Plug-in Conn.	800A	800	800	800	800	760	720	640	504	397
B800G_BE B800P_BE B800R_BE	Front Conn. Rear Conn. Plug-in Conn.	630A	630	630	630	630	630	598.5	567	504	397
	800A	800A	800	800	800	800	720	640	504	504	397
B1000N_BE B1000H_BE	Front Conn. Rear Conn.	1000A	1000	1000	1000	1000	900	800	630	630	500
	1250A	1250	1250	1250	1250	1250	1250	1000	787	787	787
B1250N_BE B1250H_BE B1250HL_BE	Front Conn.	1250A	1250	1250	1250	1250	1250	1125	1000	787	787
	Rear Conn. Plug-in Conn.	1250A	1250A	1250	1250	1250	1125	1000	787	787	787
B1600N_BE B1600H_BE B1600HL_BE	Front Conn.	1600A	1600	1600	1600	1600	1600	1440	1280	1008	1008
	Rear Conn.	1600A	1600	1600	1600	1600	1520	1440	1280	1008	1008

XS Model MCCBs

Rated Temperature											
MCCB Type	Connection type	Rated I _n	Rated Current (A)								
			30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
XS2000_BE	Front & Rear	2000A	2000	2000	2000	2000	2000	2000	1600	1200	-
XS2500_BE	Rear	2500A	2500	2500	2500	2500	2250	2250	2250	2250	-
XS3200_BE	Rear	3200A	3200	3200	3200	3200	2720	2720	2720	2720	-

Watts Loss Tables

A Model MCCBs

Impedance Watts Loss

Frame	Rating In (A)	Impedance per pole (mΩ)	Watts Loss per pole Based from Impedance (W)	Pole numbers	Watts Loss per product Based from Impedance (W)
A160_TF	25	7.2	4.5	3/4P	13.6
	40	2.3	3.6		10.9
	63	2.5	9.8		29.3
	80	1.6	10.1		30.4
	100	1.1	11.4		34.1
	125	0.7	10.9		32.8
	160	0.6	14.1		42.3
A250_TM	100	0.89	8.9	3/4P	26.6
	125	0.52	8.2		24.5
	160	0.44	11.4		34.1
	200	0.34	13.8		41.4
	250	0.26	16.0		48.0

Watts Loss Tables

P Model MCCBs

Impedance Watts Loss

Frame	Rating In (A)	Impedance per pole (mΩ)	Watts Loss per pole Based from Impedance (W)	Pole numbers	Watts Loss per product Based from Impedance (W)
P160F_FF	16	14.80	5	2P	10
	20	13.83	8.3		16.6
	30	6.67	9		18
	40	3.88	9.3		18.6
	50	2.00	7.5		15
	60	0.65	3.5		7
	75	0.70	5.9		11.8
	100	0.45	6.7		13.4
	125	0.46	10.7		21.4
P160_TM	20	20.75	8.3	3/4P	24.9
	32	8.79	9.0		27
	50	3.00	7.5		22.5
	63	0.88	3.5		10.5
	100	0.67	6.7		20.1
	125	0.68	10.7		32.1
	160	0.55	14.1		42.3
P160_BE P160_SE	40	0.35	0.6	3/4P	1.8
	100	0.35	3.5		10.5
	160	0.35	9.0		27
P250_TM	50	2.00	5.0	3/4P	15
	63	1.17	4.7		14.1
	100	0.60	6.0		18
	125	0.60	9.3		27.9
	160	0.38	9.7		29.1
	200	0.30	12.0		36
	250	0.27	16.9		50.7
P250_BE P250_SE	40	0.24	0.4	3/4P	1.2
	100	0.24	2.4		7.2
	160	0.24	6.1		18.3
	250	0.24	15.0		45
P400_TM	250	0.36	22.3	3/4P	66.9
	400	0.27	42.4		127.2
P400_BE P400_SE	250	0.18	11.1	3/4P	33.3
	400	0.18	28.4		85.2
P630_TM	630	0.16	62.3	3/4P	186.9
P630_BE P630_SE	630	0.13	52.0	3/4P	156

Watts Loss Tables

P Model MCCBs

Resistance Watts Loss

Frame	Rating In (A)	Resistance per pole (mΩ)	Watts Loss per pole Based from Resistance (W)	Pole numbers	Watts Loss per product Based from Resistance (W)
P160F_FF	16	Contact NHP	Contact NHP	2P	Contact NHP
	20				
	30				
	40				
	50				
	60				
	75				
	100				
125					
P160_TM	20	12.23	4.89	3/4P	14.67
	32	6.562	6.72		20.16
	50	1.74	4.35		13.05
	63	0.44	1.75		5.25
	100	0.335	3.35		10.05
	125	0.34	5.31		15.93
	160	0.275	7.04		21.12
P160_BE P160_SE	40	0.144	0.23	3/4P	0.69
	100	0.144	1.44		4.32
	160	0.144	3.69		11.07
P250_TM	50	0.995	2.49	3/4P	7.47
	63	0.595	2.36		7.08
	100	0.3	3.00		9
	125	0.3	4.69		14.07
	160	0.19	4.86		14.58
	200	0.145	5.80		17.4
	250	0.135	8.44		25.32
P250_BE P250_SE	40	0.127	0.2032	3/4P	0.6096
	100	0.127	1.27		3.81
	160	0.127	3.2512		9.7536
	250	0.127	7.9375		23.8125
P400_TM	250	0.281	17.6	3/4P	52.8
	400	0.193	30.9		92.7
P400_BE P400_SE	250	0.128	8.0	3/4P	24
	400	0.128	20.5		61.5
P630_TM	630	0.092	36.5	3/4P	109.5
P630_BE P630_SE	630	0.064	25.4	3/4P	76.2

Watts Loss Tables

B Model MCCBs

Impedance Watts Loss

Frame	Rating In (A)	Impedance per pole (mΩ)	Watts Loss per pole Based from Impedance (W)	Pole numbers	Watts Loss per product Based from Impedance (W)
B160E_FF	16	17.21	4.41	1P	4.41
	20	17.21	6.88		6.88
	25	12.29	7.68		7.68
	32	8.58	8.79		8.79
	40	4.51	7.22		7.22
	50	2.13	5.34		5.34
	63	1.71	6.80		6.80
	80	1.35	8.67		8.67
	100	0.98	9.82		9.82
	125	0.71	11.10		11.10
	160	0.53	13.57		13.57
B160P_TM B160R_TM	20	34.33	13.73	3/4P	41.19
	32	17.39	17.81		53.42
	50	2.91	7.27		21.82
	63	2.37	9.39		28.18
	100	1.42	14.17		42.51
	125	1.07	16.67		50.00
	160	0.65	16.66		49.97
B250P_TM B250R_TM	250	0.40	25.00	3/4P	75.00
B250P_BE B250P_SE	40	0.40	0.64	3/4P	1.92
	125		6.24		18.73
	160		10.23		30.68
	250		25.00		75.00
B400P_BE B400R_BE	250	0.29	18.23	3/4P	54.69
	400		46.67		140.00
B800F_TM B800N_TM B800H_TM	630	0.18	70.75	3/4P	212.24
	800	0.15	93.33		280.00
B800N_BE B800H_BE	630	0.13	51.45	3/4P	154.34
	800	0.15	93.33		280.00
B800N_SX B800H_SX B800N_SE B800H_SE	800	0.15	93.33	3/4P	280.00
B800G_TM	630	0.18	70.75	3/4P	154.34
	800	0.15	93.33		280.00
B800G_BE	630	0.13	51.45	3/4P	154.34
	800	0.15	93.33		280.00
B800G_SX B800G_SE	800	0.15	93.33	3/4P	280.00
B800P_BE B800R_BE B800P_SX	630	0.16	64.31	3/4P	192.94
	800	0.15	93.33		280.00
B800R_SX B800P_SE B800R_SE	800	0.15	93.33	3/4P	280.00
B1000_BE B1000_SX B1000_SE	1000	0.11	106.67	3/4P	320.00
B1250_BE	1250	0.06	90.00	3/4P	270.00
B1600_BE	1600	0.05	133.33	3/4P	400.00

Watts Loss Tables

B Model MCCBs

Resistance Watts Loss

Frame	Rating In (A)	Resistance per pole (mΩ)	Watts Loss per pole Based from Resistance (W)	Pole numbers	Watts Loss per product Based from Resistance (W)	
B160E_FF	16	Contact NHP	Contact NHP	1P	Contact NHP	
	20					
	25					
	32					
	40					
	50					
	63					
	80					
	100					
	125					
160						
B160P_TM B160R_TM	20	23.5	9.4	3/4P	28.2	
	32	11.9	10.7		32.1	
	50	1.99	4.98		14.9	
	63	1.62	5.83		17.5	
	100	0.97	9.7		29.1	
	125	0.73	11.4		34.2	
	160	0.57	12.83		38.5	
B250P_TM B250R_TM	250	0.36	22.4	3/4P	67.5	
B250P_BE B250P_SE	40	0.39	0.62	3/4P	1.87	
	125		6.01		18.28	
	160		9.98		29.95	
	250		24.38		73.13	
B400P_BE B400R_BE	250	0.2	12.5	3/4P	37.5	
	400		32		96	
B800F_TM B800N_TM B800H_TM	630	0.11	43.7	3/4P	131.1	
	800	0.09	57.6		172.8	
B800N_BE B800H_BE	630	0.08	31.75	3/4P	95.26	
	800		51.2		153.6	
B800N_SX B800H_SX B800N_SE B800H_SE	800	0.08	51.2	3/4P	153.6	
B800G_TM	630	0.11	43.7	3/4P	131.1	
	800	0.09	57.6		172.8	
B800G_BE	630	0.08	31.75	3/4P	95.26	
	800		51.2		153.6	
B800G_SX B800G_SE	800	0.08	51.2	3/4P	153.6	
B800P_BE B800R_BE B800P_SX	630	0.1	39.69	3/4P	119.07	
	800		64		192	
B800R_SX B800P_SE B800R_SE	800	0.1	64	3/4P	192	
B1000_BE B1000_SX B1000_SE	1000	0.07	70	3/4P	210	
B1250_BE	1250	0.04	62.5	3/4P	187.5	
B1600_BE	1600	0.022	56.32	3/4P	168.96	

Watts Loss Tables

XS Model MCCBs

Impedance Watts Loss

Frame	Rating In (A)	Impedance per pole (mΩ)	Watts Loss per pole Based from Impedance (W)	Pole numbers	Watts Loss per product Based from Impedance (W)
XS2000_BE	2000	0.028	113.3	3/4P	340
XS2500_BE	2500	0.028	173.3	3/4P	520
XS3200_BE	3200	0.028	286.72	3P	860.16

Resistance Watts Loss

Frame	Rating In (A)	Resistance per pole (mΩ)	Watts Loss per pole Based from Resistance (W)	Pole numbers	Watts Loss per product Based from Resistance (W)
XS2000_BE	2000	0.017	68	3/4P	204
XS2500_BE	2500	0.017	106.2	3/4P	318.6
XS3200_BE	3200	0.017	174.1	3P	522



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