LSE | LAKE SHORE ELECTRIC

Manual Transfer Switch

MMC Molded Case Dual Operator

Model: 100A-400A

TRANSFER

Lake Shore Electric's MMC Manual Transfer Switch utilizes industry-proven molded case switches to perform safe transfers under load. The MMC Transfer Switch is UL 1008 listed and offered in ampacities ranging from 50A to 1200A, up to 600VAC, and interrupting ratings starting at 35kAIC @480VAC. Service entrance rated configurations are also available.

Standard Features:

- Molded Case Switches
- 100% Rated Copper Bus
- Front Accessible
- Mechanically Interlocked Sources (Open Transition)
- Open Position
- NEMA 1 Enclosure with Gray Powder Coat Finish

Optional Features:

- Service Entrance Rated
- Breaker Trip Ratings
- Switch Position & Source Available Aux Contacts
- Electrical Assist
- Space Heater
- Surge Protection Device
- Mechanical Lug Sizes

Technical Data

Standard & Optional Features

Molded Case Units

The MMC utilizes two UL 489-listed molded case switches and/or breakers. Switches are constructed using circuit breaker components and are of the high instantaneous automatic type, tripping at 10X the frame rating. Breakers can be configured with either thermal magnetic or electronic trip units.

Mechanically Interlocked Sources

A walking beam-style mechanical interlock is used to prevent the unintentional paralleling of the Normal Source (Source 1) and Alternate Source (Source 2). Strategically located on the rear side of the back pan, the restricted access to the walking beam ensures a touch-free and tamper-resistant interlock.

Open Position

The MMC Transfer Switch allows both switches to be placed in the open ensuring that no current flows to the load during this state.

NEMA 1 Enclosure with Gray Powder Coat Finish

All MMC Transfer Switch enclosures come standard with an environmental rating of NEMA Type 1, with a textured gray powder coat finish. See page 7 for additional NEMA ratings and materials that are available.

Standard & Optional Lug Sizes

Mechanical lugs are provided for all incoming and outgoing connections. See table on page 12 for available lug sizes. Compression lugs are not available on the MMC Transfer Switch.

Service Entrance Rated (Optional)

The service entrance rated option provides overcurrent protection on the Normal Source (Source 1), allowing it to be designated as a means of service disconnect. A neutral ground bond is also provided (where applicable). Service entrance rated MMCs that are 1000A and greater come standard with arc flash reduction features and ground fault protection when service disconnects installed on solidly grounded wye electrical systems over 150 line to ground.

Breaker Trip Ratings (Optional)

The MMC can be configured to include overcurrent protection on both the Normal Source (Source 1) and the Alternate Source (Source 2). The available trip sizes are based on the frame amperage of the breaker. See page 9 for a complete list of available trip sizes.

Auxiliary Contacts & Lights (Optional)

Switch Position and Source Available Auxiliary Contacts & Lights are an optional accessory that can be added to the MMC.

Switch Position includes green indicating lights that are mounted on the exterior and illuminate when their corresponding switch is in the closed position. A Form C contact is provided on each source for remote monitoring.

Source Available includes white indicating lights that are mounted on the exterior and illuminate when their corresponding source is within the acceptable voltage range as determined by the phase monitoring relay. The pickup and drop-out ranges are adjustable. A Form C contact is provided on each source for remote monitoring.

Table 1 : Aux Contacts

Maximum Voltage	Frequency	Maximum Current (A)	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	DC	0.5	2500
250	DC	0.25	2500

Electrical Assist (Optional)

The Electrical Assist option includes motors to operate both the Normal Source (Source 1) and the Alternate Source (Source 2). This option also comes with the Switch Position and Source Available Auxiliary Contacts and Lights, as mentioned above. Please note that the “Source Available” indicator is for indication purposes only and does not serve as a permissive circuit. A selector switch is provided for each source to control its operation. The switch configuration also includes a neutral position.

Space Heater (Optional)

A 50W heater is provided on a constant circuit to aid in the regulation of the interior temperature and mitigate the formation of condensation in the enclosure and on the internal components.

Surge Protection Device (Optional)

A surge protection device (SPD) is included on the Normal Source to protect the control circuit from transient voltage surges.

Table 2 : SPD Size

Amperage	SCCR	Line to Neutral
100A - 1200A	200kA	20kA

Technical Data

100A & 400A Frame

Table 2 : 100 Amp Frame Molded Case Details

kAIC @ 480V	Rated Current (A)	Breaker Model Code			Switch Model Code		
		2 Pole	3 Pole	4 Pole	2 Pole	3 Pole	4 Pole
35	50	FD3050		FD4050	FD3100K		FD4100K
	70	FD3070		FD4070			
	100	FD3100		FD4100			
65	50	HFD3050		HFD4050	HFD3100K		HFD4100K
	70	HFD3070		HFD4070			
	100	HFD3100		HFD4100			
100	50	FDC3050		FDC4050			
	70	FDC3070		FDC4070			
	100	FDC3100		FDC4100			

Table 3 : 400 Amp Frame Molded Case Details

kAIC @ 480V	Rated Current (A)	Breaker Model Code			Trip Unit Model Code		Switch Model Code		
		2 Pole	3 Pole	4 Pole	3 Pole	4 Pole	2 Pole	3 Pole	4 Pole
35	125A	KD3400F		KD4400F	KT3125T	KT4125T	KDB3400K		KDB4400K
	150A				KT3150T	KT4150T			
	175A				KT3175T	KT4175T			
	200A				KT3200T	KT4200T			
	225A				KT3225T	KT4225T			
	250A				KT3250T	KT4250T			
	300A				KT3300T	KT4300T			
	350A				KT3350T	KT4350T			
	400A				KT3400T	KT4400T			
65	125A	HKD3400F		HKD4400F	KT3125T	KT4125T	HKD2400K		HKD4400K
	150A				KT3150T	KT4150T			
	175A				KT3175T	KT4175T			
	200A				KT3200T	KT4200T			
	225A				KT3225T	KT4225T			
	250A				KT3250T	KT4250T			
	300A				KT3300T	KT4300T			
	350A				KT3350T	KT4350T			
	400A				KT3400T	KT4400T			
100	125A	KDC3400F		KDC4400F	KT3125T	KT4125T			
	150A				KT3150T	KT4150T			
	175A				KT3175T	KT4175T			
	200A				KT3200T	KT4200T			
	225A				KT3225T	KT4225T			
	250A				KT3250T	KT4250T			
	300A				KT3300T	KT4300T			
	350A				KT3350T	KT4350T			
	400A				KT3400T	KT4400T			

- Models stated above are Eaton C Series Molded Case Switches
- 3-pole variant with the center phase open may be used in place of a 2-pole at LSE discretion
- A higher withstand rating and/or frame rating may be used in place of a lesser rating at LSE discretion
- Contact factory for technical information on switching devices or withstand ratings not listed in Table
- Data subject to change without notice

Technical Data

600A - 1200A Frame

Table 4 : 600 Amp Frame Molded Case Details

kAIC @ 480V	Rated Current (A)	Breaker Model Code			Trip Unit Model Code		Switch Model Code		
		2 Pole	3 Pole	4 Pole	3 Pole	4 Pole	2 Pole	3 Pole	4 Pole
35	450A	LD3600F		LD4600F	LT3450T	LT4450T	LDB3600WK		LDB4600WK
	500A				LT3500T	LT4500T			
	600A				LT3600T	LT4600T			
65	450A	HLD3600F		HLD4600F	LT3450T	LT4450T	HLDB3600WK		HLDB4600WK
	500A				LT3500T	LT4500T			
	600A				LT3600T	LT4600T			
100	450A	LDC3600F		LDC4600F	LT3450T	LT4450T			
	500A				LT3500T	LT4500T			
	600A				LT3600T	LT4600T			

Table 5 : 800 Amp Frame Molded Case Details

kAIC @ 480V	Rated Current (A)	Breaker Model Code			Switch Model Code		
		2 Pole	3 Pole	4 Pole	2 Pole	3 Pole	4 Pole
50	630A	NGS308032E		NGS408032E			
	700A						
	800A						
65	630A	NGH308032E		NGH408032E	NGK3080KSE		NGK4080KSE
	700A						
	800A						
100	630A	NGC308032E		NGC408032E			
	700A						
	800A						

Table 6 : 1200 Amp Frame Molded Case Details

kAIC @ 480V	Rated Current (A)	Breaker Model Code			Trip Unit Model Code		Switch Model Code		
		2 Pole	3 Pole	4 Pole	3 Pole	4 Pole	2 Pole	3 Pole	4 Pole
50	900	NGS312036E		NGS412036E	NGS312032E	NGS412032E			
	1000A								
	1200A								
65	900	NGH312036E		NGH412036E	NGH312032E	NGH412032E	NGK3120KS		NGK4120KSE
	1000A								
	1200A								
100	900	NGC312036E		NGC412036E	NGC312032E	NGC412032E			
	1000A								
	1200A								

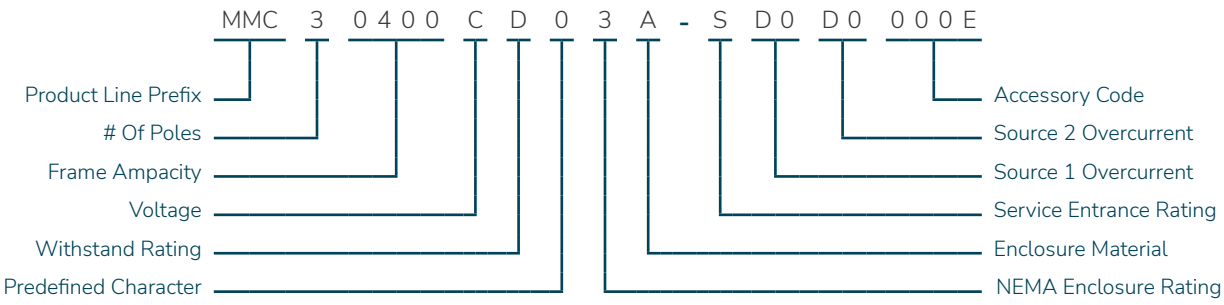
- Models stated above are Eaton C Series Molded Case Switches
- 3-pole variant with the center phase open may be used in place of a 2-pole at LSE discretion
- A higher withstand rating and/or frame rating may be used in place of a lesser rating at LSE discretion
- Contact factory for technical information on switching devices or withstand ratings not listed in Table
- Data subject to change without notice

Selection Guide

Characters & Designations

All Lake Shore Electric Transfer products are designed using a structured, smart-style model code ordering system. The complete MMC model code comprises 22 customer-selected characters, each identifying a feature or function of the design. The first thirteen characters of the model code define the basic configuration. The nine characters that follow identify the service rating and any additional accessories.

Sample Model Code:



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Selection Guide

Model Code Configuration

Number of Poles

Following the MMC prefix of the model code is the number of poles. Available in configurations of 2–pole, 3–pole, and 4–pole, this character distinguishes between a solid or switched neutral.

Table 9 : Number of Poles

Poles	Alpha Numeric
2	2
3	3
4	4

Frame Ampacity

The MMC product line is designed using industry-standard molded case frame sizes and is available in amperages raging from 100A - 1200A. A breaker trip rating can be selected for both the Normal and Alternate Sources based on the fame size chosen below. See page 9 for a complete list of available trips,

Table 10 : Amperage Codes

Amp Frame	Alpha Numeric
100	0100
400	0400
600	0600
800	0800
1200	1200

Voltage

Identification of the system voltage determines the number of phases, as well as the presence of a neutral wire.

Table 11 : Voltage Codes

Voltage	Phase/Wire	Alpha Numeric
120/240VAC	1 Ph 3W	A
208Y/120VAC	3 Ph 4W	B
480Y/277VAC	3 Ph 4W	C
240/120VAC	3 Ph 4W	G
480VAC	3 Ph 3W	K

Withstand Rating

The withstand rating is based on UL 489 & 1066 Switching Device Ratings at 480VAC; Lower voltages offer higher kAIC ratings within the same alphanumeric code. Contact the factory for these ratings.

Table 12 : Withstand Rating Codes

kAIC	Alpha Numeric
35kAIC @ 480V	D
50kAIC @ 480V	F
65kAIC @ 480V	G
100kAIC @ 480V	I

Predefined Character

This space contains a fixed character. No selection required.

Table 13 : Unselectable

Description	Alpha Numeric
Fixed Character	0

NEMA Enclosure Rating

MMC Transfer Switches are available in NEMA Type 1 or NEMA Type 3R enclosures.

Table 14 : NEMA Code

Enclosure Rating	Alpha Numeric
NEMA 1	1
NEMA 3R	3

Enclosure Material

The standard enclosure material of the MMC Transfer Switch is hot rolled steel with a textured ANSI-61 gray powder coat finish. Additional material options are listed below.

Table 15 : Enclosure Code

Material	Alpha Numeric
Hot Rolled Steel (Powder Coat Finish)	A
Stainless Steel – 304 (#4 Brushed Finish)	C
Stainless Steel – 316 (#4 Brushed Finish)	D

Selection Guide

Accessory Code Configuration

Service Entrance Rating Code

Following the source configuration character is the option for service entrance rated or non-service entrance rated. See page 2 for more information.

Table 16 : SER Code

Rating	Alpha Numeric
Non-Service Entrance Rated	N
Service Entrance Rated	S

Source 1 Overcurrent

The MMC can be configured to include overcurrent protection on the Normal Source (Source 1), which is based on the frame ampacity as selected on page 7. The table below lists the default two-character trip rating offered on the Normal Source (S1) as well as the option for no overcurrent protection. Additional trip rating codes and selection instructions are available on page 9.

Table 17 : S1 Default Trip Rating

Rating	Alpha Numeric
No Source 1 Trip (Switch Only)	00
100A Thermal Magnetic	A0
400A Thermal Magnetic	D0
600A Thermal Magnetic	E0
800A LSI	F0
1200A LSIG	G0

Source 2 Overcurrent

The option to include overcurrent protection on the Alternate Source (Source 2) is also available and is based on the frame ampacity as selected on page 7. The table below lists the default two-character trip rating offered on the Alternate Source (S2), as well as the option for no overcurrent protection. Additional trip rating codes and selection instructions are available on page.

Table 18 : S2 Default Trip Rating

Rating	Alpha Numeric
No Source 2 Trip (Switch Only)	00
100A Thermal Magnetic	A0
400A Thermal Magnetic	D0
600A Thermal Magnetic	E0
800A LSI	F0
1200A LSIG	G0

Accessory Code Position 1

The first position of the four-digit accessory code allows for the addition of Switch Position & Source Available Aux Contacts with Lights, as well as Electrical Assist.

Table 19 : Accessory Code 1

Description	Alpha Numeric
No Option	0
Switch Position & Source Available Aux Contacts with Lights	1
Electrical Assist	2

Accessory Code Position 2

The second position of the four-digit accessory code provides the option to include a space heater.

- Space Heaters operate on 120VAC and may include a control power transformer when necessary. Overcurrent protection is also provided.

Table 20 : Accessory Code 2

Description	Alpha Numeric
No Option	0
Space Heater	1

Accessory Code Position 3

The third position of the four-digit accessory code is used to specify the need for an Alternate lug size and/or Surge Protection Device (SPD).

- Optional Lug sizes can be found on page 12
- Surge Protection Device's are sized per the frame amperage of the MTS. See page 2 for more information.

Table 21 : Accessory Code 3

Description	Alpha Numeric
No Option (Standard Lug Size)	0
Optional Lug Size	1
Surge Protection Device	2
Optional Lug Size & Surge Protection Device	3

Accessory Code Position 4

The fourth position of the four-digit accessory code is a fixed character with no selection required.

Table 22 : Accessory Code 4

Description	Alpha Numeric
Manufacturer Code	E

Selection Guide

Overcurrent Trip Rating

The tables below provide a list of available trip ratings based on the MMC frame ampacity as selected on page 7. Different trip ratings within the same breaker frame size can be selected for each source (example below). The default two-character trip rating of each frame size has been highlighted. Refer to table 20 & 21 on page 8 if overcurrent protection is not needed.

Fixed Thermal Magnetic Trip

Table 26 : 100A Frame

Trip	Alpha Numeric
100A	A0
70A	A2
50A	A1

Table 27 : 400A Frame

Trip	Alpha Numeric
400A	D0
350A	D8
300A	D7
250A	D6
225A	D5
200A	D4
175A	D3
150A	D2
125A	D1

Table 28 : 600A Frame

Trip	Alpha Numeric
600A	E0
500A	E2
450A	E1

Adjustable Electronic Trip

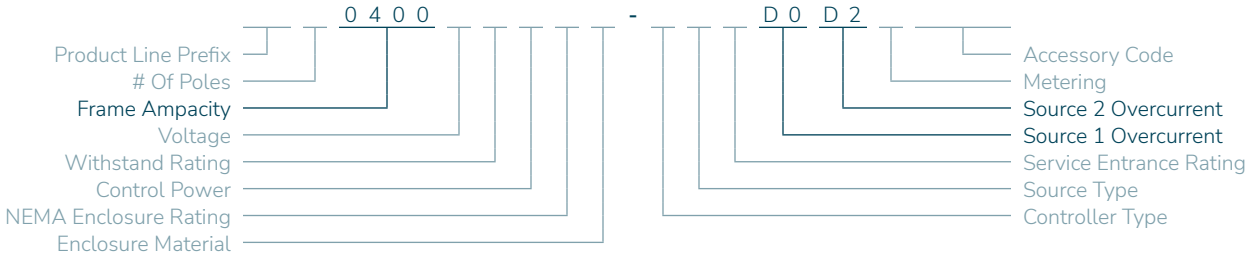
Table 29 : 800A Frame

Trip	Alpha Numeric
800A	F0
700	F2
630	F1

Table 30 : 1200A Frame

Trip	Alpha Numeric
1200A LSIG	G0
1200A LSI	G5
1000A LSIG	G4
1000A LSI	G3
900A LSIG	G2
900A LSI	G1

Trip Rating Selection Example



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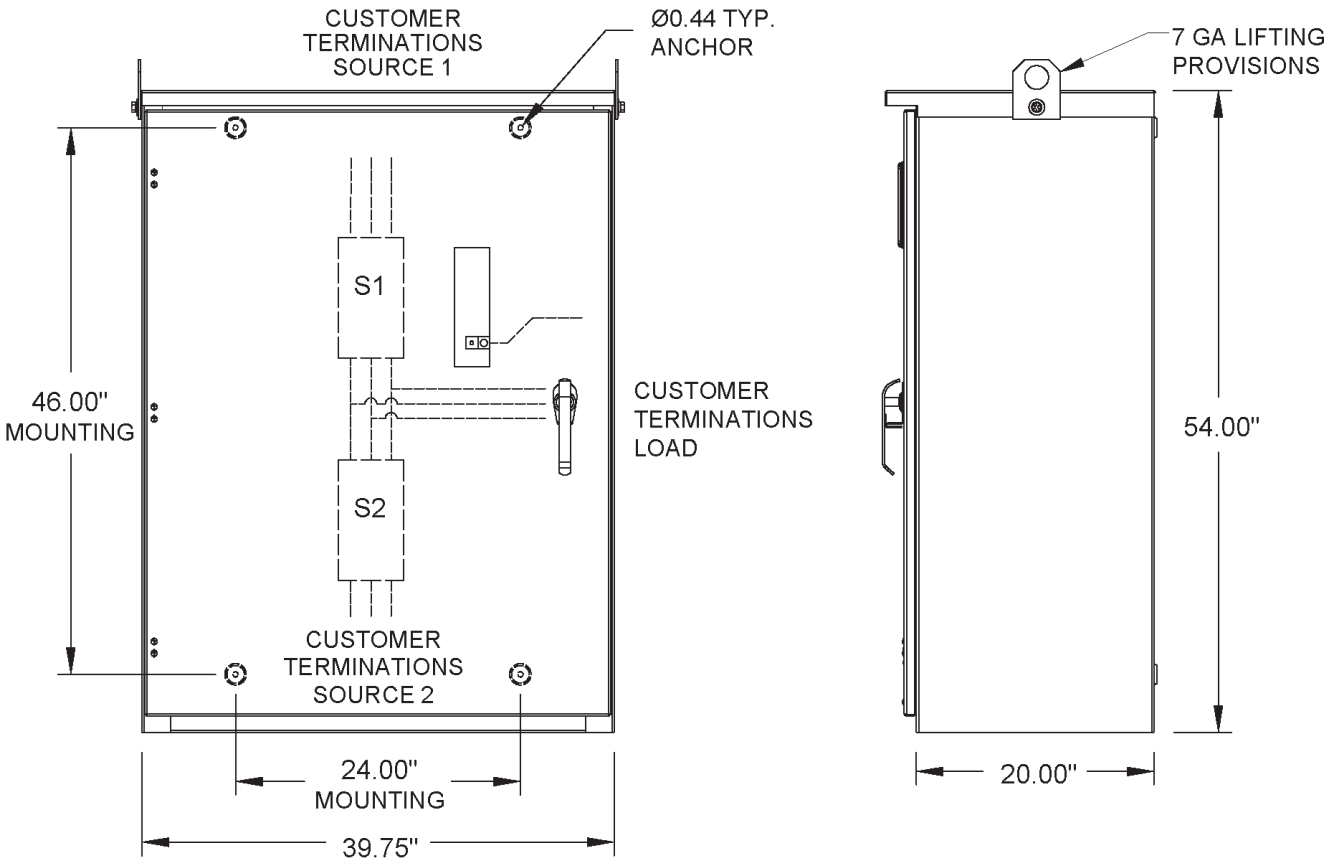
Weights & Dimensions

MMC Transfer Switch (100A - 400A)

Exterior Layout & Dimensions



Recommended Cable Entry

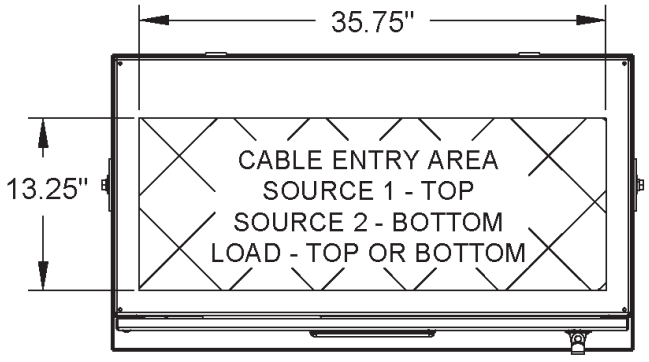


Table 29 : Enclosure Dimensions

Height	54”
Width	39.75”
Depth	20”
Approximate Weight	550 lbs
Cable Entry Dimensions	35.75”W x 13.25”D

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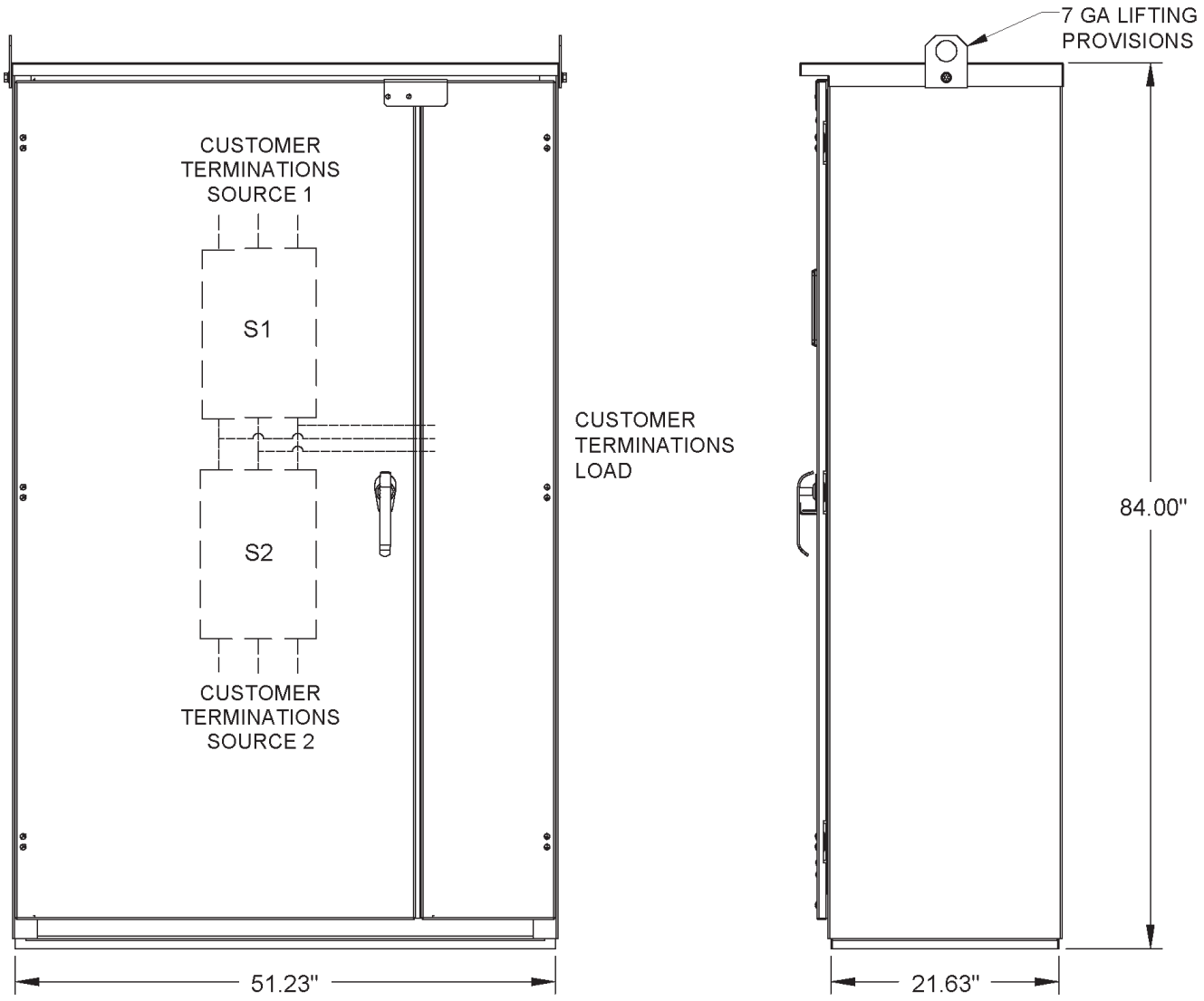
Weights & Dimensions

MMC Transfer Switch (600A - 1200A)

Exterior Layout & Dimensions



Recommended Cable Entry

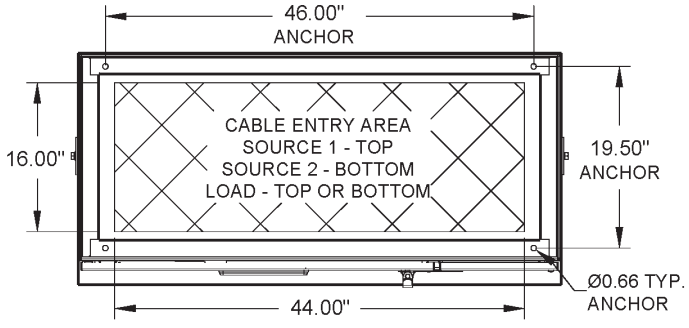


Table 30 : Enclosure Dimensions

Height	84”
Width	51.23”
Depth	21.63
Approximate Weight	750 lbs.
Cable Entry Dimensions	44”W x 16”D

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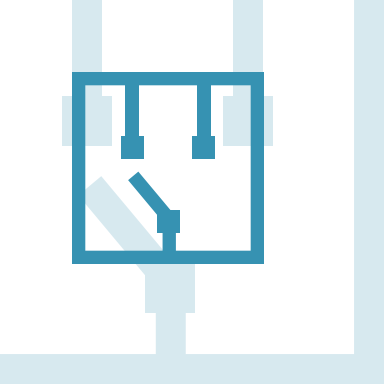
Connection Information

Mechanical Lug Size & Quantity

Table 31 : Lug Size & Quantity

Ampacity	Location		Standard Lug	Optional Lug	Ground
100A	Normal Source	Per Phase	(1) #14-1/0	N/A	(1) #14-1/0
		Neutral	(1) #14-1/0		
	Alternate Source	Per Phase	(1) #14-1/0		
		Neutral	(1) #14-1/0		
	Load	Per Phase	(1) #14-1/0		
		Neutral	(1) #14-1/0		
400A	Normal Source	Per Phase	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	(1) #14-1/0
		Neutral	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	
	Alternate Source	Per Phase	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	
		Neutral	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	
	Load	Per Phase	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	
		Neutral	(1) 2/0-500MCM or (2) 2/0-250MCM	(1) 500-750MCM	
600A	Normal Source	Per Phase	(2) 400-500 MCM	N/A	(1) #14-1/0
		Neutral	(2) 400-500 MCM		
	Alternate Source	Per Phase	(2) 400-500 MCM		
		Neutral	(2) 400-500 MCM		
	Load	Per Phase	(2) 250 - 500 MCM		
		Neutral	2) 250 - 500 MCM		
800A	Normal Source	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	(1) #6-350MCM
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	
	Alternate Source	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	
	Load	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	
1200A	Normal Source	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	(1) #6-350MCM
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	
	Alternate Source	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	
	Load	Per Phase	(3) 500-750 MCM	(4) 4/0-500MCM	
		Neutral	(3) 500-750 MCM	(4) 4/0-500MCM	



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