New Information
Supersedes B1221
pages 1-8, dated February 1996.

Drawout Bypass Isolation Transfer Switches 800-4000 Amperes

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800-4000 Amperes SPB Drawout Automatic Transfer Switch with Bypass Isolation and Microprocessor (IQ Transfer) Logic – Types BIVISP, CBVISP (Closed Transition)

Introduction

Cutler-Hammer SPB Transfer Switches are designed for a variety of standby power applications for critical loads. They monitor both normal and standby power sources. In the event of a primary power source interruption, these switches will automatically transfer the load circuits to the standby power source. Once primary power has been restored, the process is automatically reversed.

The SPB family of transfer switches covers applications ranging from 600 to 4000 amperes through 600 Vac, in Automatic, Manual or Non-Automatic configurations, open or closed transition, standard or service entrance. They are designed for applications where total system coordination must be accomplished while achieving a high level of Withstand, Interrupting and Closing performance.

Drawout construction is available for applications, such as critical life support systems, where preventive maintenance, inspection and testing must be accomplished while maintaining continuity of power to the load.

Cutler-Hammer SPB Bypass Isolation Transfer Switches meet or exceed all industry standards for endurance, reliability and performance. They are listed under Underwriters Laboratories UL 1008 Standard for Transfer Switch Equipment. With certain options, they also comply with emergency and standby system requirements as defined in NFPA 99 for health care facilities.

SPB Bypass Isolation Transfer Switch

- SPB Drawout 800-4000 Amperes

The Cutler-Hammer family of SPB Bypass Isolation Transfer Switches offers the utmost in flexibility, reliability and value. These switches must exceed many national and international standards. They are designed and built in accordance with the following:

UL 1008	Standard for Safety for Automatic Transfer Switches
UL 489	Standard for Circuit Breakers and Molded Case Switches
NEC Articles 517, 700, 701, 702	Code Sections Applicable Switch Equipment
NFPA 110	Emergency and Standby Power Systems
NFPA 99	Health Care Facilities
EGSA 100S	Standard for Transfer Switches
NEMA ICS10	Standard for Transfer Switch Equipment
UBC	Uniform Building Code for Seismic Zone 4
ISO 9000	International Organization for Standardization

Design Highlights

- UL 1008 listed
- Free standing
- SPB insulated case switches
- High withstand ratings
- Full 60-cycle short time withstand capability
- Safe manual transfer under load
- No load break to same source
- IQ Transfer Logic (automatic)
- Multi-tap voltage selection plug
- Integral service entrance capability
- Integral overcurrent protection capability
- Drawout capability
- Durable powder-coated steel enclosures
- UBC Zone 4 seismic qualified
- American Bureau of Shipping qualified
- ISO 9001 designed
- ISO 9002 manufactured
- ISO 14001 manufacturing facility

Features

- Complies with UL 1008 and UL 489 standards
- Superior SPB main contact structure.
- Reliable microprocessor-based logic [IQ Transfer (ATC-600/ATC-800)]
- Ease of operation
- Designed to safely withstand fault currents
- Eliminates need for complex interlocks
- Most versatile Bypass Isolation Transfer Switch available
- Cutler-Hammer drawout cassette design
- Overcurrent protection available
- Optionally available as service equipment rated
- No loadbreak when bypassing to the same source
- Drawout capabilities on both ATS and Bypass portions
- Compact design
- Ability to test power switching elements during drawout process.
- Power switching devices completely interchangeable between ATS and Bypass portions

Benefits

The Cutler-Hammer BIVISP Bypass Isolation Transfer Switch offers many of the same benefits as the Type BIHI design, and more.

The BIVISP Bypass Isolation Transfer Switch features drawout SPB insulated case switches, providing the ultimate in coordination flexibility and maintainability, making the BIVISP the most versatile switch available.

Switch Operation — Types BIVISP, CBVISP

Bypass to Normal with ATS in Normal (No Load Interruption)

1. Turn "Generator" selector switch to "Off."
2. Lift K2 lock release lever on ATS Emergency ❷, turn and remove key.
3. Insert key in K2 on Normal Bypass ❸, unlock and close Normal Bypass.
4. Isolate ATS Normal ❶ via drawout handle.

Bypass to Emergency with ATS in Normal (Load Interruption)

1. Turn "Generator" selector switch to "Run."
2. Lift K1 lock release lever on ATS Normal ❶, turn and remove key (ATS Normal ❶ will open when lock engages).
3. Insert key in K1 on Emergency Bypass ❹, unlock and close Emergency Bypass.
4. Isolate ATS Normal ❶ via drawout handle.

Return to Normal Operation when Bypassed to Normal (No Load Interruption)

1. If isolated, return ATS Normal ❶ to connected position and close same.
2. Open Normal Bypass ❸.
3. Lift K2 lock release lever on Normal Bypass ❸, turn and remove key.
4. Insert key in K2 on ATS Emergency ❷, and unlock.
5. Return "Generator" selector switch to "Auto" position.

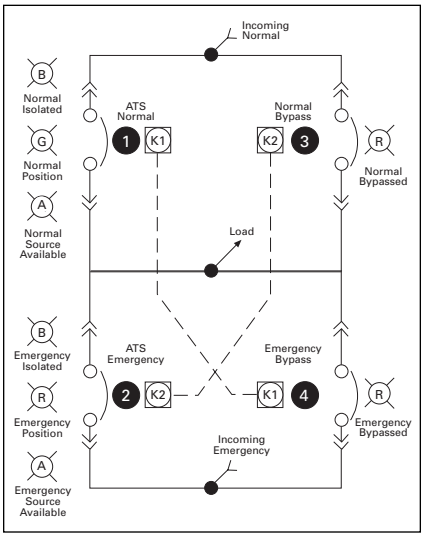
Return to Normal Operation when Bypassed to Emergency (Load Interruption)

1. If isolated, return ATS Normal ❶ to connected position (do not attempt to close yet).
2. Lift K1 lock release lever on Emergency Bypass ❹, turn and remove key (Emergency Bypass ❹ will open when lock engages).
3. Insert key in K1 on ATS Normal ❶, unlock and close ATS Normal ❶.
4. Return "Generator" selector switch to "Auto" position.

Use of Bypass Switch as Manual Transfer Switch

1. Removal of K1 and K2 lock keys from ATS and placement of lock keys in appropriate Bypass devices (as described above) will permit the Bypass Switch to be operated as a true Manual Transfer Switch.

Drawout SPB Bypass Isolation Transfer Switch



Single-Line Diagram of SPB Drawout Bypass Isolation Automatic Transfer Switch

Basic Switch Components

Transfer Switch Withstand Ratings

Systems Coordination Information — Withstand, Closing and Interrupting Ratings

Standard UL1008 3-Cycle									60-Cycle, Extended Rating
ATS Ampere Rating	Ratings when used with Upstream Breaker (kA)			Ratings when used with Upstream Fuse (kA)			Ratings used for Coordination with Upstream Breakers with Short Time Ratings		
	Volts			Maximum Fuse Rating	Fuse Type	Volts			
	240	480	600			600	240	480	600
SPB Drawout									
800	100	100	85	2000	L	200	51	51	51
1000	100	100	85	2000	L	200	51	51	51
1200	100	100	85	2000	L	200	51	51	51
1600	100	100	85	3000	L	200	51	51	51
2000	100	100	85	3000	L	200	51	51	51
2500	100	100	85	4000	L	200	51	51	51
3000	100	100	85	4000	L	200	51	51	51
4000	100	100	85	–	–	–	85	85	85

SPB Drawout Transfer Switch

- 800-4000 amperes
- 2-, 3-, 4-pole (except 4000 amperes: 2- and 3-pole only)
- 120-600 Vac
- 100,000 amperes withstand/closing/interrupting at 480 Vac
- Drawout construction with switch position indicator
- Completely interchangeable power switching devices
- Available in Type 1 and 3R enclosures
- Rear, sides and top cable access

The Cutler-Hammer Drawout SPB Switch should be considered for any systems requiring either greater redundancy, easier maintainability or where true selective coordination is desired.

The Cutler-Hammer Drawout SPB Switch provides the capability to isolate either of the two power sources – Normal or Emergency – and its associated logic, while maintaining power to the load.

Each switching section is independent and can be replaced either with a spare switch or for less critical replacement needs, a replacement unit is available from the factory within 24 hours.

Catalog Number
BIVISPF3300XSU

Power and Transformer Panels

Unmatched Performance and Versatility

The Cutler-Hammer family of SPB transfer switches offers unmatched performance, versatility and value for standby power applications. At the heart of these designs is the SPB insulated case switch with the following features:

Superior Main Contact Structure

All Cutler-Hammer SPB Transfer Switches meet or exceed the standards set forth in UL 1008 and UL 489 with high withstand, totally enclosed SPB switches. No other transfer switch manufacturer has met the rigid testing requirements of this combination of standards. Completely enclosed contacts add a measure of safety and reliability. It also ensures the integrity of the contact assemblies and minimizes the need for periodic maintenance of the contacts, reducing downtime and maintenance time.

Fast, Powerful and Safe Switching Mechanism

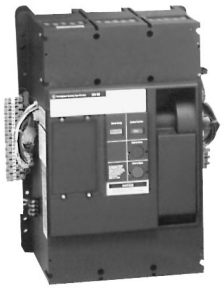
The mechanism utilizes a high speed five-cycle stored energy switching mechanism. This mechanism can be operated manually under a FULL LOAD.

Ease of Coordination and Application — Short Time Withstand

The use of electronic trips has allowed performance curve shaping to facilitate proper system coordination. The most significant is the “short time” rated trip unit.

These trip settings may be set for what are considered extremely high currents for much longer durations than the three-cycle withstand test required under UL 1008. To facilitate improved coordination, Cutler-Hammer’s SPB transfer switches have been tested and are provided with 60-cycle, extended withstand ratings.

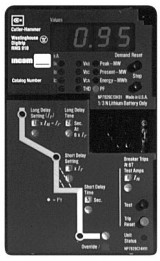
SPB Switch Features



SPB Insulated Case Switch

- UL 489 and UL 1008 listed
- 65-100 kA standard withstand ratings
- 60-cycle, extended withstand ratings
- Five-cycle closing speed
- Electrically operated
- True 4-pole switched neutral availability
- Totally enclosed contact assembly
- 3A/3B auxiliary contacts for customer connection (each SPB switch)

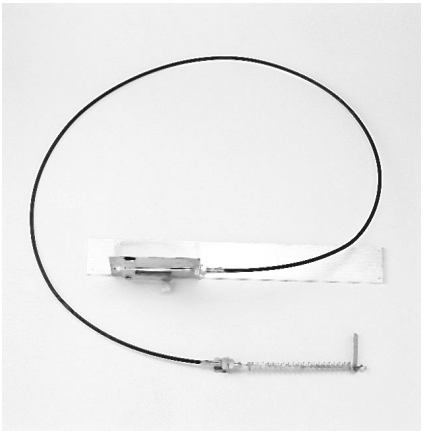
Optional Integral Overcurrent Protection Capability



Optional Digitrip SPB Trip Unit

For service entrance and other applications, Digitrip solid state trip units can be integrated into the power switching section. This eliminates the need for separate upstream protective devices, saving cost and space. Available with various combinations of Long, Short Time, Instantaneous, Ground Fault Protection and Communications.

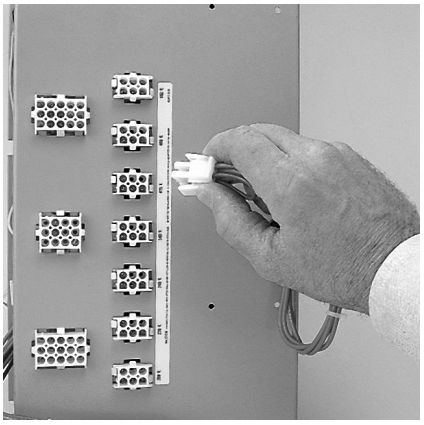
Interlocking for Open Transition Applications



Mechanical Cable Interlock

The open transition type SPB Transfer Switches feature both mechanical (cable) and electrical interlocking to prevent paralleling of sources.

Multi-Tap Voltage Selector



Multi-Tap Voltage Selector

Allows transfer switch to be readily applied on most system voltages worldwide by proper insertion of selector plug. Available system voltages include 208, 220, 240, 380, 415, 480 or 600 Vac, 50 or 60 Hz.

Logic

Application Versatility

Whether the application calls for open or closed transition, manual or automatic operation, Cutler-Hammer has the right logic controller for the task. IQ Transfer controllers have set a new standard for transfer switch technology featuring:

- Microprocessor-based logic
- Digital display
- Field set point programmability
- Transfer history
- PowerNet Communications capability
- Voltmeter and frequency meter
- True rms voltage sensing
- Mimic BUS/LED display
- Load voltage decay delayed transition capability
- In-phase monitor capability
- Field upgrade capability

Automatic Transfer Open Transition

IQ Transfer (ATC-600)

Open transition type SPB transfer switches utilize the Cutler-Hammer programmable IQ Transfer microprocessor-based logic controller.

Available with:

- Time delayed neutral
- Load voltage decay delayed transition capability
- In-phase motor

Closed Transition

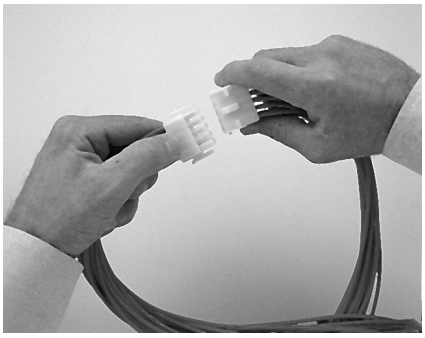
Closed Transition (ATC-800) IQ Transfer

Closed transition applications feature the Closed Transition IQ Transfer logic controller.

Available with two operating sequence choices:

- Closed/alarm
- Closed/in-phase/load voltage decay

Ease of Maintenance



Logic Disconnect Plugs

Keyed quick-disconnect plugs are provided for easy and complete isolation of the control circuitry.

Maintenance can be performed on the logic independent from the power sections and still allow the user to manually transfer power under full load conditions.

Switch and Feature Selection

Cutler-Hammer Transfer Switch Equipment offers flexibility and versatility to the system designer and user. All switches include the basic features necessary for normal operation as standard. Cutler-Hammer also offers an extensive array of optional features/accessories that allows the user to customize a new transfer switch to match the application. Select the appropriate catalog number for the application from the table below. Then choose from the following pages any optional features/accessories needed to complete the project requirements.

Catalog Number System

Catalog Number: BIVISPF31600XSU with Optional Features 16B, 37B, 32B, 23J, 42

The below example would specify the following:

- Automatic Transfer Switch
- 480 volts
- 3-phase
- 4-wire
- 3-pole
- 1600 amperes
- IQ Transfer Logic (ATC-600)
- NEMA 1 enclosure
- UL listed
- Integral overcurrent protection both sources
- Service entrance rated
- Load voltage decay delayed transition capability
- Plant exerciser
- Seismic Zone 4 certified
- Feature Group 9 included

Catalog Number Selection Guide

BIVISP E 3 1600 X S U

Switch Type
BIVI

Arrangement Normal/Emergency
E = Drawout Switch/Switch
F = Drawout Breaker/Breaker
G = Drawout Breaker/Switch
H = Drawout Switch/Breaker

Number of Switched Poles
2 = 2-Pole
3 = 3-Pole
4 = 4-Pole

Switch Rating
0800 = 800 Amperes
1000 = 1000 Amperes
1200 = 1200 Amperes
1600 = 1600 Amperes
2000 = 2000 Amperes
2500 = 2500 Amperes
3000 = 3000 Amperes
4000 = 4000 Amperes

Voltage/Frequency
A = 120/60
B = 208/60
E = 600/60
G = 220/50/60
H = 380/50
K = 600/50
M = 230/50
N = 401/50
O = 415/50
W = 240/60
X = 480/60
Z = 365/50

Enclosure Type
S = Type 1

Listing
U = UL

Switch and Feature Selection

Feature Number	Description	SPB Combination Bypass IQ Transfer Logic	
		BIVISP	CBVISP
Available Options			
OG9 for IQ Transfer	Includes the most often selected options (1-2-3-4-5B/5J-12C-12D-12G-12H-14C-14D) listed below	S	S
1	Time Delay Normal to Emergency (TDNE)	S	S
2	Time Delay Engine Start (TDES)		
	Adjustable 0-120 seconds (IQ Transfer Only)	–	–
2B	Adjustable .5-15 seconds	S	S
2C	Adjustable 4-120 seconds	O	O
3	Time Delay Emergency to Normal (TDEN)	S	S
4	Time Delay Engine Cool-Off (TDEC)	S	S
5	Emergency Source Sensing		
5B	1-Phase Under Voltage/Under Frequency	–	–
5C	1-Phase Over Voltage/Over Frequency	O	O
5D	1-Phase Under Voltage	–	–
5E	1-Phase Over Voltage	O	O
5F	3-Phase Under Voltage	–	–
5G	3-Phase Over Voltage	O	O
5H	Phase Reversal	O	O
5J	3-Phase Under Voltage/Under Frequency	S	S
5K	3-Phase Over Voltage/Over Frequency	O	O
6	Alternate Test Operators/Momentary Test Pushbutton		
6D	Maintained 2-Position Test Switch	O	O
6H	Maintained 4-Position Test Switch	O	O
7	Time Delay Engine Failure	S	S
8	Pushbutton Bypass of Time Delays		
8C	Bypass TDEN (Feature 3 Required)	O	O
8D	Bypass TDNE (Feature 1 Required)	O	O
9	Maintenance Selector Switch		
9B	Permits Isolation of Electric Operator	O	O
10	Preferred Source Selector Switch		
10B	Utility to Utility or Utility to Generator	O	O
10D	Generator to Generator	O	O
12	Pilot Lights		
12C	Normal Position	S	S
12D	Emergency Position	S	S
12G	Normal Source Available	S	S
12H	Emergency Source Available	S	S
12L	Normal Tripped (Requires Feature 16)①	S	S
12M	Emergency Tripped (Requires Feature 16)①	S	S
14	Auxiliary Relay Contacts		
14C	Normal Source Available 4NO/4NC	S	S
	Emergency Source Available 4NO/4NC	–	–
14D	2NO/2NC on SPB Switches only	S	S
16	Integral Overcurrent Protection		
16N	Normal Side Only	–	–
	30-150A	–	–
	225-300A	–	–
	400A	–	–
	600A	–	–
	800-1000A	O	O
	1200-2000A	O	O
	2500-4000A	O	O
16E	Emergency Side Only (Same price as 16N)	–	–
	Both Normal and Emergency Sides	–	–
16B	(Double Price of 16N)	–	–
17	High Withstand Rating		
17C	100 kA at 480 Vac	S	S

① Tripped indicator is provided by a "lockout" message on the IQ Transfer (ATC-600 or ATC-800) display.

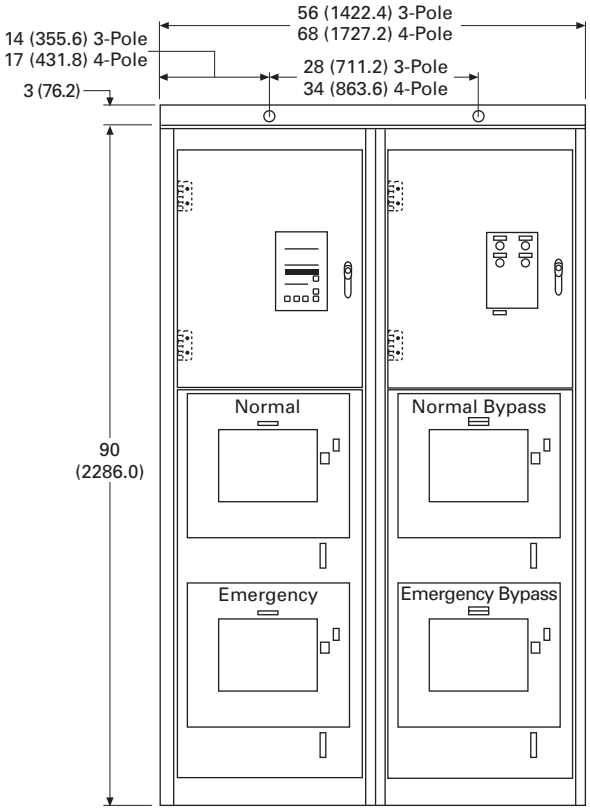
S = Standard, O = Optional.

Switch and Feature Selection, *Continued*

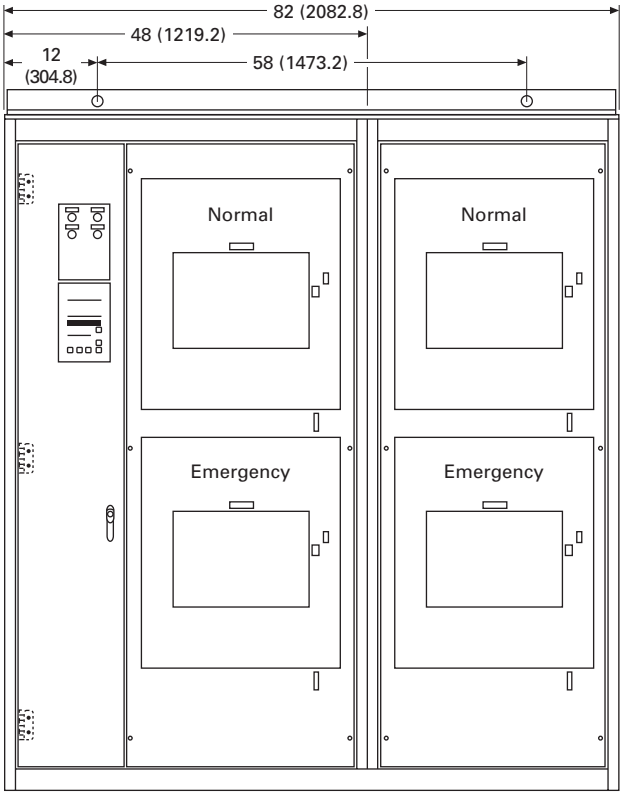
Feature Number	Description	SPB Combination Bypass IQ Transfer Logic	
		BIVISP	CBVISP
Available Options			
18	IQ Metering		
18I	IQ Generator – Normal Only	O	O
18J	IQ Generator – Emergency Only	O	O
18K	IQ Generator – Selectable, Normal or Emergency	O	O
18O	IQ Analyzer – Normal Only	O	O
18P	IQ Analyzer – Emergency Only	O	O
18Q	IQ Analyzer – Selectable, Normal or Emergency	O	O
18R	DP4000 – Normal Only	O	O
18S	DP4000 – Emergency Only	O	O
18T	DP4000 – Selectable, Normal or Emergency	O	O
20A	Rear Bus Connections	–	–
21A	Non-Standard Lugs Series C		
	SPB	O	O
23	Automatic Plant Exerciser Timer		
23C	No Load Exercise	O	O
23D	Load Exercise	O	O
23G	Selectable Load/No Load Exercise	O	O
23I	Same as 23D with Fail-safe	O	O
23J	Same as 23G with Fail-safe	O	O
24	Self-Contained Battery Charger		
24C	120 Vac Input, 12 Vdc Output	O	O
24D	120 Vac Input, 24 Vdc Output	O	O
26	Normal Source Sensing		
	All Phases Under Voltage	S	S
	1-Phase Under Voltage	–	–
26C	All Phases Over Voltage	O	O
26D	Go to Emergency Contact (Area Protection)	O	O
26E	Under Frequency	O	O
26F	Over Frequency	O	O
26H	Phase Reversal	O	O
29	Alternate Modes of Operation		
29E	Automatic N to E – Pushbutton Return to N	O	O
29G	Selectable Automatic or Pushbutton Operation	O	O
	Switch Cannot be UL Listed with this Feature		
29J	Selectable Automatic E or N or Pushbutton E to N – Auto N-E	O	O
30A	Cranking Limiter	O	O
32	Delayed Transition Operation Modes		
32A	Time Delay Neutral Timer	O	O
32B	Load Voltage Decay	O	O
32C	In-phase Monitor/Load Voltage Decay	O	O
32D	In-phase Monitor/Time Delay Neutral Timer	O	O
33	Shunt Trips for Customer Connectors		
33A	Normal Side – 120 Vac	O	O
33B	Emergency Side – 120 Vac	O	O
34	Logic Extender Cable — Specify Length: 48, 72, 96, 120, or 144-inch	–	–
35A	Pretransfer Signal Contacts 2 NO/NC	O	O
36	Load Shed from Emergency from Remote Set	–	–
37	Rated as Suitable for Use as Service Equipment		
	Requires Feature 16B or 16N		
37A	Without Ground Fault Protection		
	100-1000 Amperes	O	O
	1200-4000 Amperes	O	O
37B	With Ground Fault		
	400-1000 Amperes	O	O
	1200-4000 Amperes	O	O
	GFP Required if 1000A and Above if 480 Vac	–	–
41	Space Heater with Thermostat		
41A	100 Watts	O	O
41B	200 Watts	O	O
41C	400 Watts	O	O
42	Siesmic Zone 4 Certified	O	O
45	Load Sequencing Contacts	O	O
47	Closed Transition Feature Sets		
47C	Closed/In-phase/Load Voltage Decay	O	O
47D	Closed Transition Only	O	O

S = Standard, O = Optional.

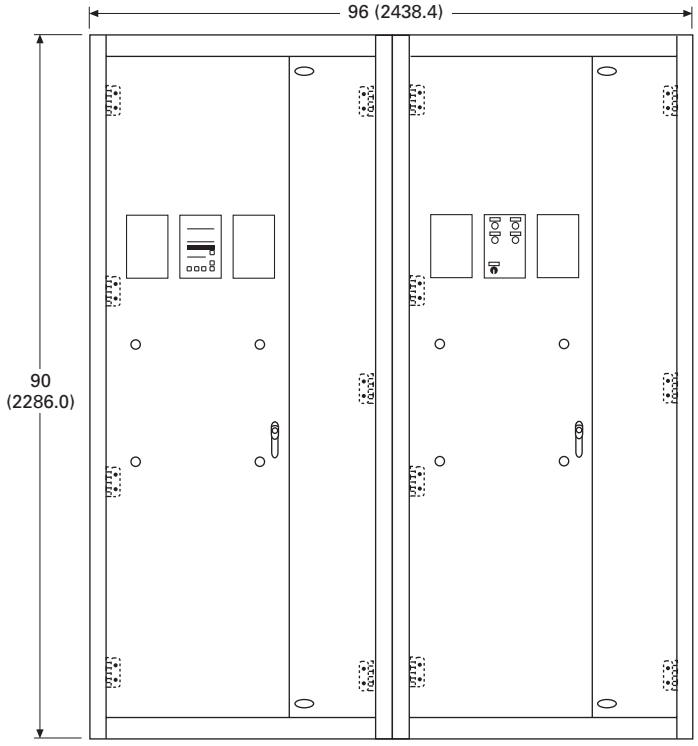
Dimensions and Weights – Dimensions in Inches (mm)



Front View 800-2000 Ampere



Front View 2500-3000 Ampere



Front View 4000 Ampere

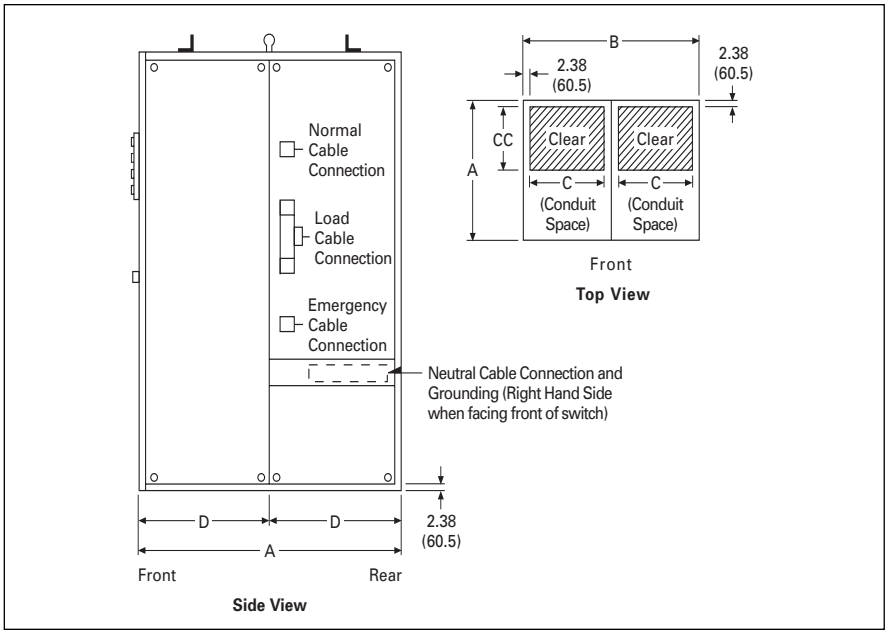
Note: Breakers have deadfront (not through-the-door construction which is different than other ratings 800-3000 amperes).

Dimensions and Weights, *Continued*

Dimensions and Conduit Openings

Ampere Rating	Dimensions and Conduit Openings in Inches (mm)				CC Cable Space Depth	Weight Lbs. (kg)
	A	B	C	D		
3-Pole						
800-2000	60.00 (1524.0)	56.00 (1422.4)	23.24 (590.3)	30.00 (762.0)	28.44 (722.4)	3400 (1544)
2500-3000	60.00 (1524.0)	82.00 (2082.8)	36.24 (920.5)	30.00 (762.0)	23.84 (605.5)	4500 (2043)
4000	78.00 (1981.2)	96.00 (2438.4)	36.24 (920.5)	39.00 (990.6)	22.00 (558.8)	6700 (3042)
4-Pole						
800-2000	60.00 (1524.0)	68.00 (1727.2)	29.24 (742.7)	30.00 (762.0)	28.44 (722.4)	4000 (1816)
2500-3000	60.00 (1524.0)	82.00 (2082.8)	36.24 (920.5)	30.00 (762.0)	23.84 (605.5)	4900 (2225)

All transfer switch enclosures are constructed of high quality, 12 gauge steel and include a key lockable door handle as standard equipment. Enclosures for Cutler-Hammer Drawout Bypass Isolation Switches are freestanding Type 1 and meet all current applicable NEMA and UL standards for conduit entry, cable bending, gutter space and shielding of live components. Approximate enclosure dimensions can be determined once you specify the ampere rating and number of poles required.



Dimensions in Inches (mm)

Notes