Cutler-Hammer a part of Eaton Corporation, is a worldwide leader providing customer-driven solutions. From power distribution and electrical control products to industrial automation, Cutler-Hammer utilizes advanced product development, world-class manufacturing, and offers global engineering services and support.

For more information on Cutler-Hammer products, call 1-800-525-2000 or 1-616-982-1059, for engineering services call 1-800-498-2678, or visit our web site at www.cutlerhammer.eaton.com

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EATON

GENERATION SYSTEMS

AUTOMATIC, NON-AUTOMATIC AND MANUAL TRANSFER SWITCHES WALL MOUNT 30 -1000 AMPERES

Cutler-Hammer

EATON

Introduction

TABLE OF CONTENTS

TRANSFER SWITCH FAMILY

- Residential/Light Commercial 30-200A
- Horizontal Industrial 30-150A
- Vertical Industrial 150-1000A

The Cutler-Hammer family of Wall Mount 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 to Transfer 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

Cutler-Hammer Wall Mount 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 Wall Mount family of transfer switches cover applications ranging from 30 to 1000A through 600 Vac, in Automatic, Manual or Non-Automatic configurations, open 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.

Cutler-Hammer Wall Mount 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.

- UL 1008 Listed
- Wall Mount
- Molded Case Switches
- High Withstand Ratings
- Safe Manual Transfer Under Load
- Multi-Tap Voltage Selection Plug
- Integral Service Entrance Capability
- Integral Overcurrent Protection Capability (Horizontal, Vertical)
- Curable Powder-Coated Enclosures
- UBC Zone 4 Seismic Qualified (Feature 42)
- American Bureau of Shipping Qualified
- ISO 9001 Designed
- ISO 9002 Manufactured

Dimensions and Weights — Industrial Horizontal and Vertical Transfer Switches

AUTOMATIC, NON-AUTOMATIC AND MANUAL TRANSFER SWITCHES

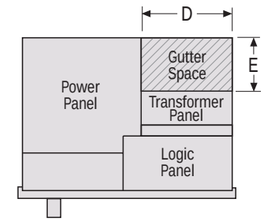
Enclosures meet all current applicable NEMA and UL standards for conduit entry, cable bending, gutter space and shielding of live components.

Switch Type	Power Panel			Enclosure			Gutter Space			Bolt Pattern		Approx. Shipping Weight
	Height	Width	Depth	Height	Width	Depth]	Width	Depth	Bending	Horizontal	Vertical	
	in (mm)	in (mm)	in (mm)❶	in (mm)	in (mm)	in (mm)❷	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lbs.(kg.)
				A	B	C	D	E	F	G	H	
FD (30-150A)	11.00 (279)	17.00 (432)	6.81 (173)	44 (1118)	21 (533)	18.13 (461)	21 (533)	14.5 (368)	4 (102)	11.00 (279)	42.86 (1089)	210 (95)
KD (150-225A)	24.50 (622)	11.88 (302)	17.5 (445)	44 (1118)	21 (533)	19.63 (499)	8 (203)	4.00 (102)	6 (152)	11.00 (279)	42.86 (1089)	380 (173)
KD (300A)	24.50 (622)	11.88 (302)	17.5 (445)	52 (1321)	21 (533)	19.63 (499)	8 (203)	4.00 (102)	9 (229)	11.00 (279)	50.86 (1292)	380 (173)
LD (400A)	26.00 (660)	16.88 (429)	17.5 (445)	61 (1549)	26 (660)	19.63 (499)	8 (203)	4.00 (102)	11 (279)	16.00 (406)	59.86 (1520)	430 (195)
MA (600A)❸	36.25 (921)	16.88 (429)	17.5 (445)	73 (1854)	26.(660)	20.63 (524)	8 (203)	4.75 (121)	12 (305)	16.00 (406)	71.86 (1825)	525 (238)
NB (800A)	36.25 (921)	16.88 (429)	19.0 (483)	79 (2007)	26.(660)	20.63 (524)	8 (203)	4.75 (121)	15 (381)	16.00 (406)	77.86 (1978)	610 (277)
NB (1000A)	36.25 (921)	16.88 (429)	19.0 (483)	79 (2007)	26.(660)	20.63 (524)	8 (203)	4.75 (121)	15 (381)	16.00 (406)	77.86 (1978)	610 (277)
ND (800A)❹	36.25 (921)	16.88 (429)	19.0 (483)	79 (2007)	26.(660)	20.63 (524)	8 (203)	4.75 (121)	15 (381)	16.00 (406)	77.86 (1978)	610 (277)
ND (1000A)❹	36.25 (921)	16.88 (429)	19.0 (483)	79 (2007)	26.(660)	20.63 (524)	8 (203)	4.75 (121)	15 (381)	16.00 (406)	77.86 (1978)	610 (277)

Logic Panel: 38 in. H x 11 in. W x 6.5 in. D / 965 mm H x 279 mm W x 165 mm D
Transformer Panel: 22 in. H x 16.5 in. W x 6.5 in. D / 559 mm H x 419 mm W x 165 mm D (FD 30-150A)
28.63 in. H x 8.25 in. W x 5.5 in. D / 727 mm H x 210 mm W x 140 mm D (150-1000A)

❶ Depth includes the interior handle extended.
❷ Enclosure depth includes the exterior (or door) handle.
❸ 4 Pole, 600A use NB dimensions.
❹ Contact factory for availability.

Available Enclosures
NEMA 1
NEMA 3R
NEMA 4
NEMA 4X
NEMA 12

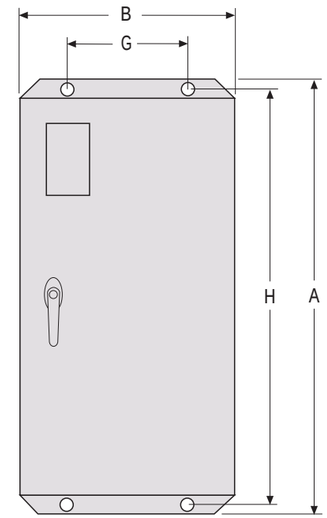


STANDARD WIRE SIZE DATA FOR POWER CABLE CONNECTIONS❺

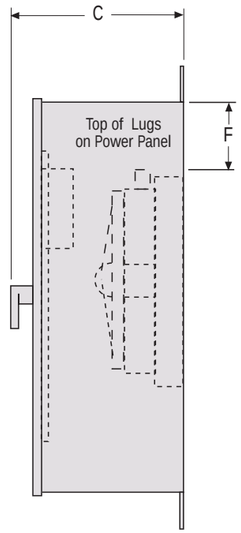
Switch Type	Cables Per Phase	Connection	Range of Wire	Type of Conductor
FD (30-150A)	1	Line/Load	#14 - 1/0	Cu/Al
KD (150-300A)	1	Line	#3- 350 MCM	Cu/Al
KD (150-300A)	1	Load	#6- 350 MCM	Cu/Al
LD (400A)	2	Line	250- 350 MCM	Cu/Al
LD (400A)	2	Load	#1- 500 MCM	Cu/Al
MA (600A)❻	2	Line/Load	#1- 500 MCM	Cu/Al
NB (800A)	3	Line/Load	3/0- 400 MCM	Cu/Al
NB (1000A)	2	Line/Load	#1- 350 MCM	Cu/Al

❺ Select Feature 21A for optional terminals and contact factory for availability.
❻ 4 Pole, 600A use NB (800A) Lug Data.

Dimensions are approximate in inches (millimeters) and should not be used for construction purposes.



Front View



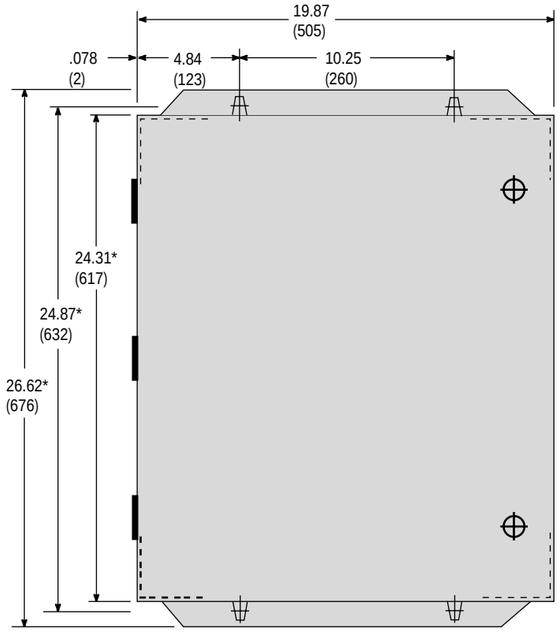
Side View

Dimensions and Weights — Residential/Light Commercial Transfer Switches

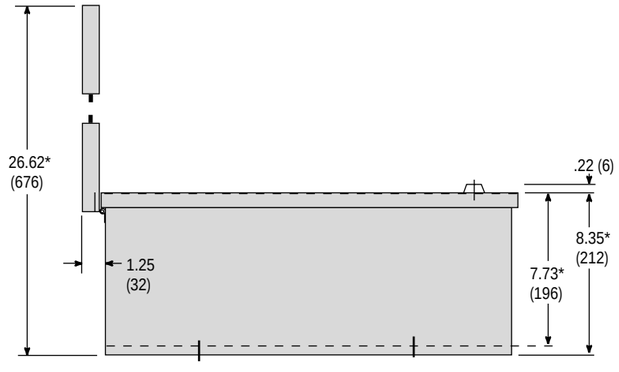
AUTOMATIC, NON AUTOMATIC AND MANUAL TRANSFER SWITCHES

Enclosures meet all current applicable NEMA and UL standards for conduit entry, cable bending, gutter space and shielding of live components.

Available Enclosures
NEMA 1
NEMA 3R
Weight: 100lbs



Front View



Plan View

Dimensions are approximate in inches (millimeters) and should not be used for construction purposes

* Add additional 3.00 inches (76mm) for 200A Residential Transfer Switch

Typical Applications

UTILITY - GENERATOR

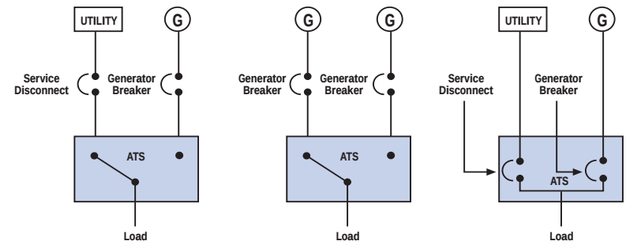
Transfer switches are traditionally applied between a utility and a generator set for emergency and stand-by power systems.

GENERATOR - GENERATOR

Transfer switches are sometimes applied between two generator sets for prime power use, often in remote installations. In such applications, source power is periodically alternated between the generator sets to equally share run time between the two.

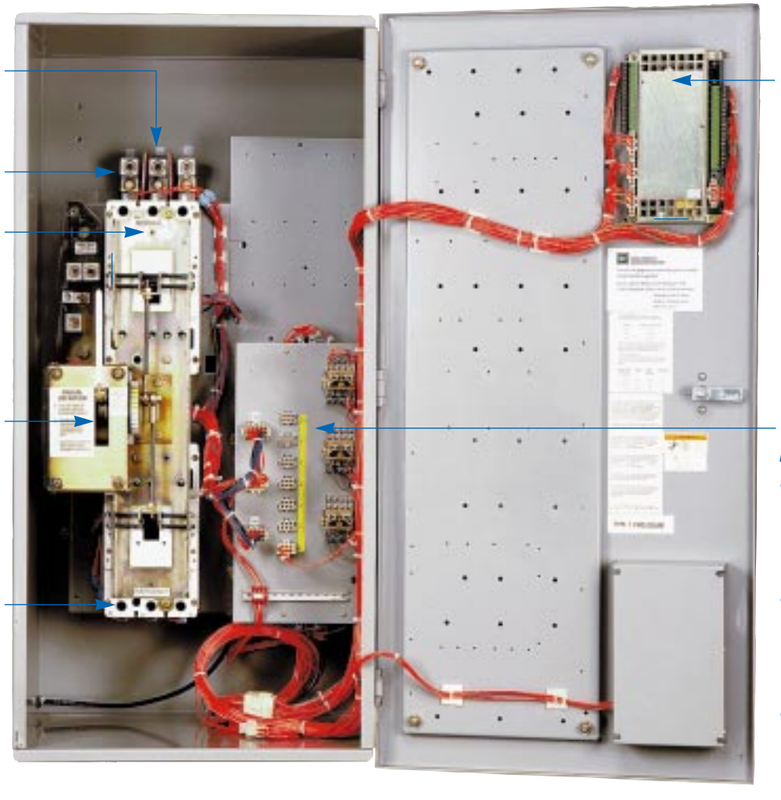
SERVICE ENTRANCE EQUIPMENT

Often, it is desirable to apply the transfer switch as a service equipment device thereby eliminating the need for separate service disconnects and overcurrent protective devices. This switch is particularly adaptable to wastewater and water treatment plants, pumping stations, industrial plants, telecommunications facilities and other installations where all the loads are critical in nature and need to be backed up by an alternate power source. See Publication PA.15A.03.S.E for more information.



Standard Applications **Service Entrance Application**

Basic Components Of Automatic Transfer Switches



Logic (IQ Transfer Shown)

- Monitors Source Condition
- Initiates Power Transfers

Transformer Panel

- Steps line power down to 120 Vac for logic and electrical operator control power
- Multi-Tap Voltage Selector for application on a variety of system voltages
- Engine Start Contacts

Residential/Light Commercial and Horizontal Industrial Transfer Switches

RESIDENTIAL / LIGHT COMMERCIAL

- **30-200A**
- **2, 3 pole**
- **120, 120/208, 120/240 Vac**
- **Horizontal Switching Mechanism**
- **100,000A Withstand/Closing/Interrupting at 240 Vac**
- **Relay Logic**
- **Available in Type 1 and 3R Enclosures**
- **Front Cable Access**

Note: The switch's intelligence circuit requires a control reference to the neutral conductor.

150 ampere, 3 pole Nema 1 Enclosed
Catalog Number RTHEFDA30150BSU

HORIZONTAL INDUSTRIAL

- **30-150A**
- **2, 3, 4 pole**
- **120-600 Vac**
- **Horizontal Switching Mechanism**
- **Up to 65,000A Withstand/Closing/Interrupting at 480 Vac**
- **Solid State Logic (IQ Transfer Logic Optional)**
- **Available in Type 1, 3R, 4, 4X and 12 Enclosures**
- **Front Cable Access**

150 ampere, 3 pole, Nema 1 Enclosed
Catalog Number ATHSFDA30150XSU

Feature Selection

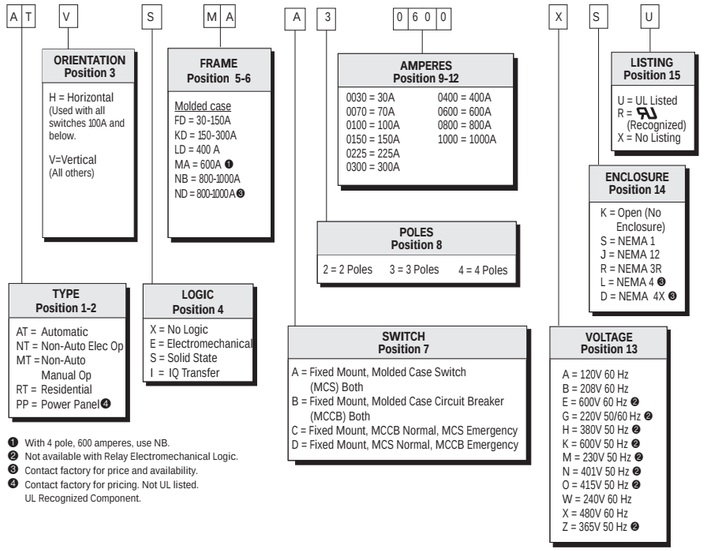
TRANSFER SWITCH FEATURES	*FEATURE NUMBER*	*RTHE Residential Light Commercial*	*ATHS ATVS*	*ATHI ATVI*	*NTHS NTVS*	*MTHX MTVX*
History Display						
• Source Availability Time		…	…	S	…	…
• Source Run Time		…	…	S	…	…
• Source Connected Time		…	…	S	…	…
• Load Energized Time		…	…	S	…	…
• Number of Transfers		…	…	S	…	…
• Date, Time and Reason for last 16 transfers		…	…	S	…	…
Viewable Set Points						
Digital Display				S		
Real Time Clock		…	…	S	…	…
Integral Overcurrent Protection						
Both Sources	16B	…	O	O	O	O
Normal Source	16N	…	O	O	O	O
Emergency Source	16E	…	O	O	O	O
Service Entrance Rating (Requires Feature 16B or 16N)						
Service Entrance without Ground Fault Protection	37A❷	…	O	O	O	…
Service Entrance with Ground Fault Protection	37B❷	…	O	O	O	…
Plant Exerciser-Solid State Digital						
No Load Exercise	23C	O	O	…	…	…
Load Exercise	23D	O	O	…	…	…
Selectable Load/No Load Exercise	23G	…	O	…	…	…
Load Exercise with Fail Safe	23I	…	O	…	…	…
Selectable Load/No Load Exercise with Fail Safe	23J	…	O	O	…	…
Battery Chargers (For Separate Mounting)						
5A, 12Vac output- requires 120Vac source	24C	…	O	O	O	…
5A, 24Vac output- requires 120Vac source	24D	…	O	O	O	…
Load Transitioning (Inductive Motors and Transformers)						
Delayed Transition-Timer (Time Delay Neutral)	32A	…	O	O	…	…
Delayed Transition-Load Voltage Decay	32B	…	…	O	…	…
Load Control						
Load Sequencing, up to 10 Devices	45❸	…	…	…	…	…
Load Shed from Emergency (Remote)	36	…	O	O	…	…
Metering						
Integrated Digital Meters						
Voltage-Normal, Emergency, Load						
Frequency - Normal, Emergency						
IQ Generator (Volts, Amps, Frequency)						
Normal Source	18I	…	O	O	O	…
Emergency Source	18J	…	O	O	O	…
Both Sources	18K	…	O	O	O	…
IQ DP 4000 Microprocessor Metering Package						
Normal Source	18L	…	O	O	O	…
Emergency Source	18M	…	O	O	O	…
Both Sources	18N	…	O	O	O	…
IQ Analyzer (Power Quality)	❸					
IMPACC Communications						
IMPACC Capability		…	…	S	…	…
IPONI		…	…	O	…	…
Remote Alarm Contact						
3-Wire Start Circuit	13B	0	…	…	…	…
Space Heater with Thermostat						
(Requires separate 120V Power Supply)						
100 Watts	41A	…	O	O	O	…
200 Watts	41B	…	O	O	O	…
400 Watts	41C	…	O	O	O	…
Non-Standard Terminals	21A	…	O	O	O	O
Logic Extender Cable						
48"	34A	…	O	O	O	…
72"	34B	…	O	O	O	…
96"	34C	…	O	O	O	…
120"	34D	…	O	O	O	…
144"	34E	…	O	O	O	…
Seismic Zone 4 Certification	42	…	O	O	O	O

❶ See IQ Transfer logic controller Sales Aids B.15A.01.S.E. and B.15A.02.S.E. for additional details/customer adjustments.
❷ See Service Entrance Sales Aid PA.15A.03.S.E. for more information. Service Entrance is not available on horizontal industrial transfer switches.
❸ Contact Factory.

S = Standard
O = Optional
… = Not Available

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 (see pages 6-7). 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 to the right. Then choose from the table below and opposite page any optional features/accessories needed to complete the project requirements.



❶ With 4 pole, 600 amperes, use NB.
❷ Not available with Relay Electromechanical Logic.
❸ Contact factory for price and availability.
❹ Contact factory for pricing. Not UL listed. UL Recognized Component.

TRANSFER SWITCH FEATURES *Feature Numbers indicated with an asterisk(*) are part of Feature Group 9.*	***FEATURE NUMBER***	***RTHE Residential Light Commercial***	***ATHS ATVS***	***ATHI ATVI***	***NTHS NTVS***	***MTHX MTVX***
Source Monitoring-Normal Power						
Undervoltage Sensing - All Phases		S	S	S	…	…
Overvoltage Sensing - All Phases	26C	…	O	O	…	…
Underfrequency	26E	…	O	O	…	…
Overfrequency	26F	…	O	O	…	…
Interruptible Rate (Area Protection)	26D	…	O	O	…	…
Phase Rotation	26H	…	O	O	…	…
Source Monitoring-Emergency Power						
1 Phase, Undervoltage/Underfrequency	5B*	…	O	…	…	…
1 Phase, Overvoltage/Overfrequency	5C	…	O	O	…	…
1 Phase, Undervoltage	5D	O	O	…	…	…
Phase Rotation	5H	…	O	O	…	…
3 Phase, Undervoltage/Underfrequency	5J	…	O	S	…	…
3 Phase, Overfrequency and Overvoltage Sensing	5K	…	O	O	…	…
Time Delays						
Time Delay Normal to Emergency (TDNE)	1*	O	O	S	…	…
Time Delay Emergency to Normal (TDEN)	3*	O	O	S	…	…
Time Delay Engine Start (TDES)	2*	O	O	S	…	…
Time Delay Engine Cooldown (TDEC)	4*	…	O	S	…	…
Bypass TDEN Pushbutton	8C	…	O	O	…	…
Bypass TDNE Pushbutton	8D	…	O	O	…	…
Pre-transfer Signal Contacts (Elevator Control), up to 10 Devices	35A	…	O	O	…	…
Cranking Limiter	30A	…	O	O	…	…
Test Operators & Selector Switches						
Programmable Engine Test	6	…	…	S	…	…
System Selection		…				
Maintenance Selector Switch	9B	…	O	O	…	…
Preferred Source Selector Switch Utility/Utility or Utility/Generator	10B	…	O	O	…	…
Preferred Source Selector Switch Generator/Generator	10D	…	O	O	…	…
Pushbutton Return to Normal	29E	…	O	O	…	…
Relay Auxiliary Contacts	14C*& 14D*	…	O	S	…	…
Indicating Lights						
Position Indicators	12C*& 12D*	…	O	S	…	…
Source Availability Indicators	12G & 12H	…	O	S	…	…
Preferred Source Indicator		…	…	S	…	…
Load Energized Indication		…	…	S	…	…

Series C Vertical Industrial Transfer Switch

VERTICAL INDUSTRIAL

- **150-1000A**
- **2, 3, 4 pole**
- **120-600 Vac**
- **Vertical Switching Mechanism**
- **Up to 65,000A Withstand/ Closing/Interrupting at 480 Vac**
- **Solid State Logic (IQ Transfer Logic Optional)**
- **Available in Type 1, 3R, 4, 4X and 12 Enclosures**
- **Front Cable Access**

400 ampere, 3 pole Nema 1 Enclosed
Catalog Number ATVSLDA30400XSU

Transfer Switch Withstand Ratings

SYSTEMS COORDINATION INFORMATION –WITHSTAND, CLOSING & INTERRUPTING RATINGS ❶

STANDARD UL1008 3 CYCLE						
ATS AMPERE RATING	Ratings when used with upstream breaker (kA)			Ratings when used with upstream fuse (kA)		
	240V	480V	600V	Max Fuse Rating	Fuse Type ❷	600V
Residential/Light Commercial						
30	100	…	…	…	…	…
70	100	…	…	…	…	…
100	100	…	…	…	…	…
150	100	…	…	…	…	…
200	100	…	…	…	…	…
Horizontal and Vertical Industrial						
30	100	65	25	200	J,T	200
70	100	65	25	200	J,T	200
100	100	65	25	200	J,T	200
150	100	65	25	400	J,T	200
225	100	65	25	400	J,T	200
300	100	65	25	400	J,T	200
400	100	65	25	600	J,T	200
600	65	50 ❸	25	800/1200	J,T	100/200
800	65	50 ❸	25	1200/1600	L	100/200
1000	65	50 ❸	25	1600	L	200

❶ For maximum breaker ratings in circuits when the transfer switch is evaluated as a "Motor Branch Circuit Conductor" refer to the NEC Section 430-25 for sizing.
❷ Also can use Class RK5 fuse with 100kA rating.
❸ 4 pole units rated 35kA.

Power and Transformer Panels

MOLDED CASE SWITCH FEATURES

- UL listed (UL 1087, 489)
- 35-65KA withstand ratings
- True four pole switched neutral availability
- Totally enclosed contact assembly

Molded Case Switch

OPTIONAL INTEGRAL OVERCURRENT PROTECTION CAPABILITY

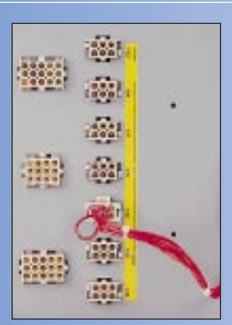
For service entrance and other applications, trip units can be integrated into the power switching section. This eliminates the need for separate upstream protective devices, saving cost and space.

Optional Thermal Magnetic Trip Unit

MECHANICAL INTERLOCK

Wall Mount Transfer Switches feature a rear-mounted, patented fail-safe mechanical interlock to prevent paralleling of sources. This is an addition to the interlocking inherently provided by the transfer mechanism.

Mechanical Interlock



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.

Multi-tap Voltage Selector

UNMATCHED PERFORMANCE AND VERSATILITY

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

SUPERIOR MAIN CONTACT STRUCTURE

All Cutler-Hammer Wall Mount Transfer Switches meet or exceed the standards set forth in UL 1008 and UL 489 with high withstand, totally enclosed molded case 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 uni-directional gear motor switching mechanism. This mechanism can be operated manually under a FULL LOAD.

Logic

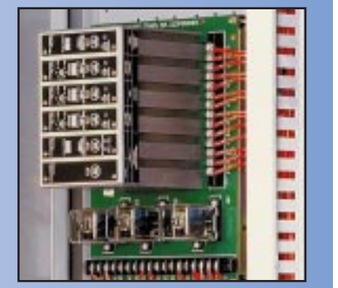
APPLICATION VERSATILITY

Whether the application calls for open transition, manual or automatic operation, Residential, Light Commercial or Industrial, Cutler-Hammer has the right logic controller for the task.

The optional IQ Transfer controllers have set a new standard for transfer switch technology featuring:

- Microprocessor based logic
- Digital display
- Field Set Point programmability
- Transfer History
- IMPACC communications capability
- Voltmeter and Ammeter
- True RMS voltage sensing
- Mimic BUS/LED display
- Load voltage decay delayed transition capability
- Field upgrade capability

Industrial Open Transition: Open transition transfer switches utilize the Cutler-Hammer Solid State logic controller for both Automatic and Non-Automatic applications.



Solid State

High Performance Industrial: Open transition transfer switches utilize the Cutler-Hammer programmable IQ Transfer microprocessor logic controller. See publication B.15A.02.S.E for a more detailed description.

Available with:

- Time Delayed Neutral
- Delayed Transition-Load Voltage Decay

IQ Transfer

Residential/Light Commercial: Open transition transfer switches utilize Cutler-Hammer Relay Logic control. See publication B.15A.10.S.E for a more detailed description.

Relay

Ease of Maintenance: 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.

Logic Disconnect Plugs