

## Transfer Switches

**CHPC-Close Transition**  
**OHPC-Open Transition**  
**PowerCommand®**

**125 - 800 Amp**  
**2, 3, and 4 Pole**



Optional Features Shown

### Description

Designed and constructed specifically for Closed Transition operation, this clean sheet, revolutionary design incorporates the proven PowerCommand Microprocessor Control, a stored energy system, and a blow-on contactor for uncompromising reliability.

Cummins Power Generation Series CHPC/OHPC PowerCommand automatic transfer switches monitor the primary power source, signal generator set startup, automatically transfer power, and return the load to the primary power source once the utility returns and is stabilized.

High-pressure silver alloy contacts can withstand thousands of switching cycles without burning, pitting, or welding. They require no routine contact maintenance and provide 100% continuous current ratings.

In **utility-to-genset applications**, the control system monitors utility and genset power. When utility power fails or is unsatisfactory, the switch starts the genset and transfers critical loads to the genset. The switch automatically transfers loads back to the utility when utility power returns.

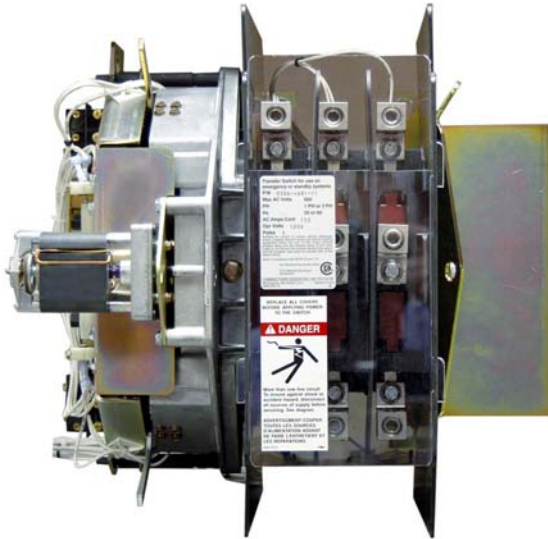
In **utility-to-utility applications (OHPC)**, the control system monitors the primary utility source and transfers the critical load to a secondary utility source when primary power fails or is unsatisfactory. The switch automatically transfers loads back to the primary source when power is restored.

In **genset-to-genset applications (OHPC)**, the transfer switch automatically controls multiple gensets, allowing one genset to power the load with another genset as standby. The running (lead) unit can be selected manually or may be changed automatically with a built-in changeover timer.

### Features

- **Advanced Transfer Switch Mechanism** - Unique blow-on contactor combines hi-speed (under 100 ms), transfers with high survivability in fault current conditions.
- **PowerCommand Microprocessor Control** - A standard, fully featured microprocessor control with a choice of options. All features, settings, and adjustments are software-enabled for ease of setup and accuracy. Optically isolated logic inputs and high isolation transformers for AC power inputs provide high-voltage surge protection.
- **Manual Operation** - Manual operating handles and stored energy transfer mechanism allow effective, manual operation. External lever available as an option for dead front manual operation.
- **Main Contacts** - Heavy-duty silver alloy contacts and multi-leaf arc chutes are rated for total system transfer including overload interruption.
- **Easy Service/Access** - Plug connections, door-mounted controls, ample access space, and compatible terminal markings. The control is field programmable.
- **Product lines, Accessories and Services** - Cummins Power Generation offers a wide range of accessories and services to suit your requirements.
- **Certifications** - Cummins Power Generation CHPC/OHPC Transfer Switches are certified to a wide range of standards.
- **Warranty** - Cummins Power Generation offers single-source responsibility at both the factory and distributor levels for warranty, service, and parts support.

# Transfer Switch Mechanism



- Blow-on contactor for high survivability in fault current conditions.
- Independent make-before-break action is used for 2, 3, and 4-pole switches (CHPC)
- Independent break-before-make action is used for 2 and 3-pole, and 4-pole/switched neutral switches. On 4-pole/switched neutral switches, this action also prevents the objectionable ground currents and nuisance ground fault tripping that can result from overlapping neutral designs (OHPC).
- A mechanical interlock prevents simultaneous closing of normal and emergency contacts (OHPC and CHPC models) in open transition mode. The action positively prevents out of phase and potentially damaging source-to-source connections.
- Mechanical interlock prevents source-to-source connection in the event the switch is manually operated.
- Electrical interlocks prevent simultaneous closing signals to normal and emergency contacts and interconnection of normal and emergency sources through the control wiring (OHPC and CHPC in open transition mode).
- Long-life, high pressure, silver alloy contacts resist burning and pitting. Contacts are mechanically held in both normal and emergency positions for reliable, quiet operation.

## Specifications-Transfer Switch Mechanism

### Voltage Rating

Transfer switches rated from 125 A through 600 A are rated up to 600 VAC, 50 or 60 Hz.

### Arc Interruption

Multiple leaf arc chutes cool and quench the arcs. Covers prevent interphase flashover.

### Neutral Bar

A full current-rated neutral bar with lugs is standard on enclosed 2 and 3-pole transfer switches.

### Auxiliary Contacts

Two contacts (one for each source) are provided for customer use. Wired to terminal block for easy access. Rated at 10A continuous and 250 VAC maximum.

### Operating Temperature

-40°F (-40°C) to 140°F (60°C)

### Storage Temperature

-40°F (-40°C) to 140°F (60°C)

### Humidity

Up to 95% relative, noncondensing

### Altitude

Up to 10,000 ft (3,000 m) without derating

### Surge Withstand Ratings

Control system surge-tested for Location Category B3, per IEEE C62.41 and IEEE C62.45. Also meets European standard EN 61000-4-5.

### Total Transfer Time (source-to-source)

Will not exceed 6 cycles at 60 Hz with normal voltage applied to the actuator and without programmed transition enabled.

### Manual Operation Handles

Transfer switches are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation. External manual operating lever available as an option for dead front operation.

# PowerCommand Microprocessor Control

## Control Packages

A choice of two control packages allows flexibility for determining the most suitable level of control for a given application:

| Level 1 Control   | Level 2 Control   |
|---|---|
| <b>Utility-to-Genset Applications</b>   | <b>Utility-to-Genset Applications</b><br><b>Utility-to-Utility Applications</b><br><b>Genset-to-Genset Applications</b>   |
| <b>Software Adjustable Time Delays:</b><br>Engine Start: 0 - 15 sec<br>Transfer Normal to Emergency: 0 - 120 sec<br>Retransfer Emergency to Normal: 0 - 30 min<br>Engine Stop: 0 - 30 min<br>Programmed Transition: 0 - 60 sec  | <b>Software Adjustable Time Delays:</b><br>Engine Start: 0 - 120 sec<br>Transfer Normal to Emergency: 0 - 120 sec<br>Retransfer Emergency to Normal: 0 - 30 min<br>Engine Stop: 0 - 30 min<br>Programmed Transition: 0 - 60 sec   |
| <b>Undervoltage Sensing</b> - 3-phase normal, 1-phase emergency<br>Pickup: 85% to 98% of nominal voltage<br>Dropout: 75% to 98% of pickup setting<br>Dropout Time Delay: 0.1 to 1.0 sec<br><b>Overvoltage Sensing</b> - 3-phase normal, 1-phase emergency<br>Dropout: 105% to 135% of nominal voltage<br>Pickup: 95% to 99% of dropout setting<br>Dropout Time Delay: 0.5 to 120 sec<br><b>Frequency Sensing</b><br>Pickup: $\pm 5\%$ to $\pm 20\%$ of nominal frequency<br>Dropout: $\pm 1\%$ beyond pickup<br>Dropout Time Delay: 0.1 to 15.0 sec | <b>Over/Undervoltage Sensing</b> - 3-phase normal and emergency<br>Pickup: 85% to 98% of nominal voltage<br>Dropout: 75% to 98% of pickup setting<br>Dropout Time Delay: 0.1 to 1.0 sec<br><b>Overvoltage Sensing</b> - 3-phase normal and emergency<br>Dropout: 105% to 135% of nominal voltage<br>Pickup: 95% to 99% of dropout setting<br>Dropout Time Delay: 0.5 to 120 sec<br><b>Frequency Sensing</b><br>Pickup: $\pm 5\%$ to $\pm 20\%$ of nominal frequency<br>Dropout: $\pm 1\%$ beyond pickup<br>Dropout Time Delay: 0.1 to 15.0 sec<br><b>Voltage Imbalance Sensing</b><br>Dropout: 2% to 10%<br>Pickup: 90% of dropout<br>Time Delay: 2.0 to 20.0 sec<br><b>Phase Rotation Sensing</b><br>Time Delay: 100 msec<br><b>Loss of Single Phase Detection</b><br>Time Delay: 100 msec |
| <b>Standard Open Transition Transfer Mode</b><br><b>Programmed Transition Transfer Mode</b><br><b>Synch Check Open Transition</b>   | <b>Standard Open Transition Transfer Mode</b><br><b>Synch Check Open Transition (OHPC)</b><br><b>Programmed Transition Transfer Mode</b><br><b>Synch Check Closed Transition (CHPC)</b>   |
| <b>Programmable Genset Exerciser</b> - One event/schedule with or w/o load  | <b>Programmable Genset Exerciser</b> - Eight events/schedules with or w/o load  |
| <b>Basic Indicator Panel</b><br>Source Available/Connected LED Indicators<br>Test/Exercise/Bypass Buttons<br>Digital Display (optional)   | <b>Basic Indicator Panel</b><br>Source Available/Connected LED Indicators<br>Test/Exercise/Bypass Buttons<br>Digital Display  |
| <b>Date/Time-Stamped Event Recording</b><br><b>Load Sequencing (optional with Network Communications Module)</b>  | <b>Date/Time-Stamped Event Recording</b><br><b>Load Sequencing (optional with Network Communications Module)</b>  |

## Time-Delay Functions

**Engine Start:** Prevents nuisance genset starts in the event of momentary power system variation or loss. Not included in utility-to-utility systems.

**Transfer Normal to Emergency:** Allows genset to stabilize before application of load. Prevents power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems.

**Retransfer Emergency to Normal:** Allows the utility to stabilize before retransfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems.

**Engine Stop:** Maintains availability of the genset for immediate reconnection in the event that the normal source fails shortly after transfer. Allows gradual genset cool down by running unloaded. Not included in utility-to-utility systems.

**Programmed Transition:** Transfers load to neutral position, disconnected from sources, to allow inductive load voltages to decay.

## **Control Options**

### **Relay Signal Module**

Provides an adjustable transfer, pending time delay of 0 to 60 seconds and Normal and Emergency status signals, to prevent interruption of power during elevator operation. Relay outputs include: Source 1 Connected and Available, Source 2 Connected and Available, Not in Auto, Test/Exercise Active, Failed to Disconnect, Failed to Synchronize, Failed to Transfer/Retransfer, and Pending Transfer (elevator signal).

### **Loadshed**

Removes the load from the emergency power source by driving the transfer switch to the neutral position when signaled remotely. Transfers load back to the emergency source when the signal contacts open. Immediate retransfer to the preferred source when it is re-established.

### **PowerCommand Network Interface**

Provides connection to the PowerCommand network. LonWorks® compatible for integration into customer monitoring strategy.

### **Load Power and Load Current Monitoring**

Measures load phase and neutral, current, power factor, real power (kW) and apparent power (kVA). Warns of excessive neutral current resulting from unbalanced or nonlinear loads.

### **User Interfaces**

#### **Basic Interface Panel**

LED indicators provide at-a-glance source and transfer switch status for quick summary of system conditions. Test and Override buttons allow delays to be bypassed for rapid system checkout.

#### **Digital Display**

The digital display provides a convenient method for monitoring load power conditions, adjusting transfer switch parameters, monitoring PowerCommand Network status, or reviewing transfer switch events. Password protection limits access to adjustments to authorized personnel. The digital display comes standard with the Level 2 PowerCommand microprocessor control, and is optional with the Level 1 Control.

#### **User Interface Options**

##### **Front Panel Security Key**

Front panel access can be locked out using this option. Prevents unauthorized transfers or testing. Prevents unauthorized adjustments via the digital display.

##### **Analog Bargraph Meter**

An LED bar graph display provides easy to read indication for Normal and Emergency voltages and frequencies, load currents, power factor, and Kilowatts. Green, amber, and red LED's provide at-a-glance indication of system acceptability. Available as an option with the Level 2 PowerCommand microprocessor control.

##### **External Operation Handle**

Dead-front manual operating handle for safe manual operation. Can be operated while the switch is energized.

## Enclosures

The transfer switch and PowerCommand control are mounted in a single-door enclosure.

- Key locking cabinet, UL tested and Type-Rated
- Interface panels
- Wire bend space complies with NEC requirements.

### Enclosure Dimensions - Transfer Switch in U.L. Type 1 Enclosure

| Amp Rating         | Height |      | Width |     | Door Closed |     | Door Open |      | Weight 3-Pole Type |     | Outline Drawing |
|--------------------|--------|------|-------|-----|-------------|-----|-----------|------|--------------------|-----|-----------------|
|                    | in     | mm   | in    | mm  | in          | mm  | in        | mm   | lb                 | kg  |                 |
| 125, 150, 225, 260 | 49     | 1245 | 25.05 | 635 | 19.6        | 497 | 44        | 1118 | 231                | 105 | 0500-3504       |
| 300, 400, 600      | 60     | 1524 | 30.00 | 762 | 19.6        | 497 | 49        | 1245 | 288                | 131 | 0500-3383       |
| 800                | 72     | 1828 | 34.40 | 875 | 21.0        | 532 | 53        | 1335 | 411                | 186 | 0500-3826       |

### Enclosure Dimensions - Transfer Switch in U.L. Type 3R, 4 or 12 Enclosure

| Amp Rating         | Height |      | Width |     | Door Closed |     | Door Open |      | Weight |     | Cabinet Type | Outline Drawing |
|--------------------|--------|------|-------|-----|-------------|-----|-----------|------|--------|-----|--------------|-----------------|
|                    | in     | mm   | in    | mm  | in          | mm  | in        | mm   | lb     | kg  |              |                 |
| 125, 150, 225, 260 | 51.5   | 1309 | 25.4  | 645 | 20.1        | 510 | 44.5      | 1130 | 231    | 105 | 3R, 4, 12    | 0500-3724       |
| 300, 400, 600      | 62.5   | 1588 | 30.4  | 773 | 20.1        | 510 | 49.5      | 1256 | 288    | 131 | 3R, 4, 12    | 0500-3725       |
| 800                | 72     | 1828 | 34.4  | 875 | 21.0        | 532 | 53.0      | 1335 | 411    | 186 | 3R, 4, 12    | 0500-3988       |

## Transfer Switch Lug Capacities

All lugs accept copper or aluminum wire unless indicated otherwise.

Two hole compressions lugs available 5/16", 3/8", 1/2", 5/8"

| Amp Rating | Cables Per Phase | Size             |
|------------|------------------|------------------|
| 125, 150   | 1                | #10 AWG-3/0      |
| 125, 150   | 2                | #10 AWG-1/0      |
| 225, 260   | 1                | #6 AWG - 400 MCM |
| 225, 260   | 2                | #6 AWG - 4/0     |
| 300, 400   | 1                | 1/0 - 750 MCM    |
| 300, 400   | 2                | #6 AWG - 400 MCM |
| 600        | 2                | #4 AWG - 600 MCM |
| 800        | 4                | #2 AWG - 600 MCM |

Caution: Do not run control wiring through power cable conduit or raceway.

## UL Withstand and Closing Ratings

The transfer switches listed below must be protected by circuit breakers or fuses. Reference drawings include detailed listings of specific breakers or fuse types that must be used with the respective transfer switches. Consult with your Distributor/Dealer to obtain the necessary drawings. Withstand and Closing Ratings (WCR) are stated in symmetrical RMS amperes.

| Transfer Switch Ampere | MCCB PROTECTION                                 |                 |                   | CURRENT LIMITED BREAKER PROTECTION            |                |                   |
|------------------------|---|-----------------|-------------------|---|----------------|-------------------|
|                        | WCR@Volts Max with Specific Manufacturers MCCBs | Max MCCB Rating | Drawing Reference | With Specific Current Limiting Breakers (CLB) | Max CLB Rating | Drawing Reference |
| 125                    | 42,000 @ 480                                    | 500 A           | 098-7898          | 200,000 @ 480                                 | 500 A          | 098-7900          |
| 125                    | 30,000 @ 600                                    | 500 A           | 098-7898          | 200,000 @ 600                                 | 500 A          | 098-7900          |
| 150-260                | 42,000 @ 480                                    | 500 A           | 098-7898          | 200,000 @ 480                                 | 500 A          | 098-7900          |
| 150-260                | 30,000 @ 600                                    | 500 A           | 098-7898          | 200,000 @ 600                                 | 500 A          | 098-7900          |
| 300-600                | 65,000 @ 480                                    | 1200 A          | 098-7899          | 200,000 @ 480                                 | 1200 A         | 098-7901          |
| 300-600                | 50,000 @ 600                                    | 1200 A          | 098-7899          | 200,000 @ 600                                 | 1200 A         | 098-7901          |
| 800                    | 85,000 @ 480                                    | 1400 A          | 098-8164          | 200,000 @480                                  | 1400 A         | 098-8165          |
| 800                    | 65,000 @ 600                                    | 1400 A          | 098-8164          | 200,000 @ 600                                 | 1400 A         | 098-8165          |

| Transfer Switch Ampere | FUSE PROTECTION                              |                          |                   |
|------------------------|--|--------------------------|-------------------|
|                        | WCR @ Volts Max. with Current Limiting Fuses | Max Fuse, Size and Type  | Drawing Reference |
| 125                    | 200,000 @ 600                                | 400 A Class, J, T        | 098-7898          |
| 125                    | 200,000 @ 600                                | 200 A Class, RK1         | 098-7898          |
| 125                    | 200,000 @ 600                                | 100 A Class, RK5         | 098-7898          |
| 150-260                | 200,000 @ 600                                | 400 A Class J, T         | 098-7898          |
| 150-260                | 200,000 @ 600                                | 200 A Class RK1          | 098-7898          |
| 150-260                | 200,000 @ 600                                | 100 A Class RK5          | 098-7898          |
| 300-600                | 200,000 @ 600                                | 1200 A Class, L, T       | 098-7899          |
| 300-600                | 200,000 @ 600                                | 600 A Class, J, RK1, RK5 | 098-7899          |
| 800                    | 200,000 @ 600                                | 2000 A Class L           | 098-8164          |
| 800                    | 200,000 @ 600                                | 2000 A Class T           | 098-8164          |

| Transfer Switch Ampere | 3 cycle Ratings              |                 |                   |
|------------------------|------------------------------|-----------------|-------------------|
|                        | WCR@Volts Max 3 Cycle rating | Max MCCB Rating | Drawing Reference |
| 125                    | 25,000 @ 480                 | 500 A           | 0098-7898         |
| 125                    | 18,000 @ 600                 | 500 A           | 0098-7898         |
| 150-260                | 25,000 @ 480                 | 500 A           | 0098-7898         |
| 150-260                | 18,000 @ 600                 | 500 A           | 0098-7898         |
| 300-600                | 35,000 @ 480                 | 1200 A          | 0098-7899         |
| 300-600                | 22,000 @ 600                 | 1200 A          | 0098-7899         |
| 800                    | 65,000 @ 480                 | 1400 A          | 0098-8164         |
| 800                    | 65,000 @ 600                 | 1400 A          | 0098-8164         |

# Submittal Detail

## Automatic Transfer Switch Options

### Current Ratings

- S048 125 Amps
- S049 150 Amps
- S050 225 Amps
- S051 260 Amps
- S052 300 Amps
- S053 400 Amps
- S054 600 Amps
- S055 800 Amps

### Voltage (Line-Line) Ratings

- R020 120 Volts
- R038 190 Volts
- R021 208 Volts
- R022 220 Volts
- R023 240 Volts
- R024 380 Volts
- R025 416 Volts
- R035 440 Volts
- R026 480 Volts
- R027 600 Volts

### Pole Configuration

- A065 Poles - 2 (Solid Neutral)
- A028 Poles - 3 (Solid Neutral)
- A029 Poles - 4

### Frequency

- A044 60 Hertz
- A045 50 Hertz

### Application

- A035 Appl - Utility to Genset
- A036 Appl - Utility to Utility (OHPC)
- A037 Appl - Genset to Genset (OHPC)

### System Options

- A041 Single Phase, 2-wire or 3-wire
- A042 Three Phase, 3-wire or 4-wire

### Enclosure

- B001 Type 1: General purpose indoor (similar to IEC type IP30)
- B002 Type 3R: Intended for outdoor use (dustproof and rainproof) (Similar to IEC type IP34)
- B003 Type 4: Indoor or outdoor use (watertight) (Similar to IEC type IP65)
- B004 Open Construction: No enclosure - includes Automatic Transfer Switch and Controls.
- B010 Type 12: Indoor use, dust-tight and drip-tight (similar to IEC type IP61)

### Listing

- A046 Listing - UL 1008/CSA Certification
- A064 Listing - NFPA 20

## Options and Accessories

### Controls

- C023 Switch Control - Level 1 (OHPC)
- C024 Switch Control - Level 2

### Control Options

- M017 Security Key - Front Panel
- M018 Display - Digital
- M031 Communications - LonWorks Network Communications Module
- M022 Monitoring - Load
- M023 Module - Relay Signal
- N038 Manual External Operating Handle

### Meters

- D009 Digital Bar Graph Meters

### Battery Chargers

- K001 Battery Charger - 2 Amps, 12/24 Volts
- K002 Battery Charger - 10 Amps, 12 Volts
- K003 Battery Charger - 10 Amps, 24 Volts

**Auxiliary Relays** - Relays are UL-Listed and factory installed. All relays provide (2) normally open and (2) normally closed isolated contacts rated 10A @ 600 VAC Relay terminals accept (1) 18 Ga. to (2) 12 Ga. wires per terminal.

- L101 Aux. Relay - 24 VDC Coil - Installed, not wired (for customer use).
- L102 Aux. Relay - Emergency Position - Relay energized when ATS in Source 2 (Emergency) position.
- L103 Aux. Relay - Normal Position - Relay energized when ATS in Source 1 (Normal) position
- L201 Aux. Relay - 12 VDC Coil Installed, not wired
- L202 Aux. Relay - Emergency Position - Relay energized when ATS in Source 2 (Emergency) position
- L203 Aux. Relay - Normal Position - Relay energized when ATS in Source 1 (Normal) position

### Applications Modules

- M003 Terminal Block - 30 points (not wired)
- M007 Load Shed - From Emergency - Drives CHPC/OHPC in neutral position when remote signal contact closes
- N002 Terminal Block - Battery Charger Alarms
- N008 Terminal Lugs - Cable
- N030 Lug Adapters-Compression (5/16 Stud)
- N031 Lug Adapters-Compression (3/8 Stud)
- N032 Lug Adapters-Compression (1/2 Stud)
- N043 Lug Adapters-Compressions (5/8 Stud)

### Warranty

- G002 One Yr Basic
- G004 Two Yr Comprehensive
- G006 Five Yr Basic
- G007 Five Yr Comprehensive
- G008 Ten Yr Major Components

## Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Power Generation products and services include:

- Diesel and Spark-Ignited Generator Sets
- Transfer Switches
- Bypass Switches
- Parallel Load Transfer Equipment
- Digital Paralleling Switchgear
- PowerCommand Network and Software
- Distributor Application Support
- Planned Maintenance Agreements

## Warranty

All components and subsystems are covered by an express, limited one-year warranty. Extended factory warranties and local distributor maintenance agreements are also available.

## Certifications

Transfer switches meet or exceed leading code requirements:

**NEMA** - All switches comply with NEMA ICS 10

**ISO9001** - This transfer switch was designed and manufactured in facilities certified to ISO9001



**CSA** - All switches are CSA certified up to 600 VAC



**NFPA Testing** - A complete representative prototype transfer switch has been subjected to a number of demanding tests to verify the design integrity and performance under both normal and abnormal operating conditions per the requirements of NFPA 70, 99, and 110



**UL** - All switches are UL 1008 Listed, and factory or field installed accessories comply with the UL Listing; UL Type Rated cabinets; UL Listed CU-AL terminals

## See your distributor for more information



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PowerCommand is a registered trademark of Cummins Power Generation.  
LonWorks is a registered trademark of Echelon.

**Warning:** Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.