

# Transfer Switches

## BTPC™ PowerCommand

**Bypass Isolation**  
**150-3000 Amp**

**3- and 4-Pole**



Optional Features Shown

### Description

The Cummins Power Generation BTPC Series Bypass Isolation Transfer Switch combines an automatic transfer switch and a manual bypass switch with a drawout isolation mechanism. It provides a redundant power transfer and retransfer capability for critical-need applications that must maintain a reliable power supply to the load.

The non-load break design allows automatic transfer switch bypass and isolation without power interruption to the load. When bypassing to the same power source to which the automatic transfer switch is connected, bypass action occurs without load break. Bypassing to the opposite source causes load break to prevent source-to-source connection.

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**, 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.

The automatic transfer switch can be isolated for testing, maintenance, service and, if needed, convenient replacement.

Because all key components are packaged into a single unit, automatic transfer switch bypass and isolation can be performed without disconnecting power or control cables, or rigging a temporary transfer switch.

### Features

- **Bypass to Normal or Emergency Power Source** - The BTPC is a two-source system which can bypass the automatic transfer switch to engage normal or emergency power sources.
- **Mechanical and Electrical Interlocks** - Reliable mechanical interlocks prevent source-to-source connections. An electrical interlock prohibits closing to a dead source.
- **Easy Closed Door Operation** - Dead-front cabinet design permits operation with the door closed. Easy to read instructions are permanently mounted on the front door.
- **Advanced Transfer Switch Mechanism** - Unique linear actuator offers virtually friction-free, constant force action during automatic operation.
- **PowerCommand® Microprocessor Control** - A feature-rich 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.
- **Main Contacts** - Heavy-duty silver alloy contacts are rated for total system transfer including overload interruption.
- **Easy Service/Access** - Plug connections, door-mounted controls, ample access space, and compatible terminal markings.
- **Product lines and services** - Cummins Power Generation offers a wide range of products and services to precisely suit your requirements.
- **Certifications** - Cummins Power Generation BTPC 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



- **Manual Bypass Switch Mechanism** - Allows the operator to select either the normal or emergency source by closing the bypass contacts. Visual indicators show bypass source selected, bypass "closed" or "open" to either source, and automatic transfer switch isolation or "disable."
- **Transfer Action** - Independent break-before-make action is used to prevent source-to source connections. On the 4-pole model, synchronous switching of the neutral pole prevents nuisance ground fault tripping that can result from overlapping designs.
- **Mechanically Held Contacts** - All contacts are mechanically held to maintain contact in all positions.
- **Main Contacts** - Long-life, silver alloy contacts resist burning and pitting and feature separate arcing surfaces. Power contacts are rated at 600 VAC.
- **Drawout Isolation Mechanism** - Isolation contacts allow the automatic transfer switch and the bypass switch to be separated electrically and mechanically. The automatic transfer switch is isolated by a drawout mechanism similar to that used on power circuit breakers.
- **Three Drawout Positions** - The drawout mechanism can be latched in one of three positions: CONNECTED, TEST and ISOLATED. In the CONNECTED position the mechanism is locked. In the TEST position, the transfer switch is isolated but the controls receive power. In the ISOLATED position, the switch is completely isolated.
- **Convenient Drawout Rails** - The automatic transfer switch can be rolled out on extension rails and can be removed with overhead lifting equipment. Wheel-mounted carriages are standard on 1600 A to 3000 A models.
- **Safety Shutters** - Protective safety shutters are provided on switches up to and including 1200 A, which cover the stationary power terminals on the bypass switch when the automatic transfer switch is isolated and removed.

## Specifications-Transfer Switch Mechanism

### Voltage Rating

600 VAC

### Arc Interruption

Leaf arc chutes cool and quench the arcs. See-through arc chute covers prevent interphase flashover and allow visual inspection.

### Neutral Bar

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

### Auxiliary Contacts

Easily accessible auxiliary contacts are rated at 10 A continuous and 250 VAC maximum. UL-recognized, and CSA-certified.

### 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, non-condensing

### Altitude

Up to 10,000 ft (3,000 m)

### Surge Withstand Ratings

Surge-tested for location category B3, per IEEE C 62.41. Testing per IEEE 62.45. Control tested to European Surge Test EN 61000-4-5.

# PowerCommand Microprocessor Control

## Control Package

The BTPC includes the Level 2 PowerCommand™ microprocessor control package for utility-to-genset and genset-to-genset load transfer applications. This full-function control and sensing package includes time delays, sensing adjustments, user interfaces and indicators listed below.

A calendar-based exerciser allows programming of eight schedules or events on a daily basis. A real-time clock keeps a rolling list of 50 data and time-stamped events for diagnostics and troubleshooting.

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

## 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, 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.

### **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 and the load power and load current monitoring option.

## Enclosures

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

- Locking cabinet, UL tested and Type Rated
- Enclosure Colors: 150-400 A, Onan Green; 600-3000 A, Switchgear Gray (ANSI 61)
- Wire bend space complies with 2002 NEC

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

Amp Rating	Height		Width		Door Closed		Door Open		Weight		Outline Drawing
	in	mm	in	mm	in	mm	in	mm	lb	kg	
150, 225, 260	71.75	1822	36	914	22.75	578	55.2	1403	564	256	310-0538
300, 400	83.25	2115	36	914	22.75	578	55.2	1403	639	291	310-0535
600, 800, 1000	90.00	2286	48	1219	27.75	705	62.5	1588	1097	499	310-0570
1200 3-pole	90.00	2286	40	1016	27.00	686	67.0	1702	1980	898	310-0566
1200 4-pole	90.00	2286	46	1168	27.00	686	73.0	1854	2185	991	310-0566
1600, 2000 3-pole	90.00	2286	40	1016	62.00	1575	102.0	2591	3085	1399	310-0567
1600, 2000 4-pole	90.00	2286	50	1270	62.00	1575	112.0	2845	3650	1656	310-0567
3000 3-pole	90.00	2286	40	1016	74.00	1880	114.0	2897	4100	1860	310-0568
3000 4-pole	90.00	2286	50	1270	74.00	1880	124.0	3150	5010	2273	310-0568

### 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		
150, 225, 260	71.75	1822	36.00	915	22.75	578	55.20	1402	564	256	Type 3R, 12	310-0651
150, 225, 260	71.75	1822	36.00	915	22.75	578	55.20	1402	564	256	Type 4	310-0652
300, 400	83.25	2115	36.00	915	22.75	578	55.20	1402	639	290	Type 3R, 12	310-0653
300, 400	83.25	2115	36.00	915	22.75	578	55.20	1402	639	290	Type 4	310-0654
600, 800, 1000	90.00	2286	48.00	1214	27.75	705	62.50	1534	1097	498	Type 3R, 12	310-0711
600, 800 1000	90.00	2286	48.00	1214	27.75	705	62.50	1534	1097	498	Type 4	310-0712
1200 3-pole (1)	90.00	2286	40.00	1016	28.25	718	65.50	1654	1980	748	Type 3R, 12, 4	310-0734
1200 4-pole (1)	90.00	2286	46.00	1168	28.25	718	71.69	1821	2185	991	Type 3R, 12, 4	310-0734
1600, 2000 3-pole (2)	90.00	2286	43.52	1105	62.77	1594	99.77	2534	3085	1399	Type 3R, 12, 4	310-0725
1600, 2000 4-pole (2)	90.00	2286	53.52	1359	62.77	1594	109.77	2788	3650	1656	Type 3R, 12, 4	310-0725
3000 3-pole (2)	90.00	2286	43.52	1105	74.77	1899	111.77	2839	5010	2273	Type 3R, 12, 4	310-0726
3000 4-pole (2)	90.00	2286	53.52	1359	74.77	1899	121.77	3093	5010	2273	Type 3R, 12, 4	310-0726

Note 1: Dimensions shown are for top entry only. If bottom or side entry is required an adapter bay is required and the depth increases by 14 in. (356 mm). See outline drawing. Adapter needs to be part of the original order.

Note 2: 1600 through 3000 A are rear connected. Allow 36-inch wide (914 mm) space at rear for access to cable compartment.

Note 3: On the outline drawing the BT door is shown. All physical dimensions are the same for BT and BTPC.

## Transfer Switch Lug Capacities

All lugs accept copper or aluminum wire unless indicated otherwise.

Amp Rating	Cables Per Phase	Size
150, 225	1	#6 AWG to 300 MCM
260	1	#6 AWG to 400 MCM
150, 225, 260(2)	1	#4 AWG to 500 MCM
300, 400	1	#3/0 AWG to 600 MCM
300, 400	2	#3/0 AWG to 250 MCM
300, 400 (2)	1	350 MCM to 1000 MCM
300, 400 (2)	2	#2 AWG to 600 MCM
600	2	250 MCM to 500 MCM
600 (2)	2	#2 AWG to 600 MCM
800, 1000	4	250 MCM to 500 MCM
800, 1000 (2)	3	300 MCM to 750 MCM
1200	4	#2 AWG to 600 MCM
1600, 2000 (1)	8	#2 AWG to 600 MCM
3000 (1)	8	#2 AWG to 600 MCM

Note 1: Lugs on these ratings are optional.

Note 2: Optional available lug sizes.

## 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
150-260	30,000 @ 480	400 A	0098-6889	200,000 @ 480	400 A	0098-6919
150-260	25,000 @ 600	400 A	0098-6889	100,000 @ 600	400 A	0098-6919
300-400	42,000 @ 480	1200 A	0098-6890	200,000 @ 480	1200 A	0098-6923
300-400	42,000 @ 600	1200 A	0098-6890	100,000 @ 600	1200 A	0098-6923
600-1000	65,000 @ 480	1400 A	0098-6891	200,000 @ 480	1400 A	0098-6924
600-1000	65,000 @ 600	1400 A	0098-6891	100,000 @ 600	1400 A	0098-6924
1200	85,000 @ 480	1600 A	0098-7312	85,000 @ 480	1600 A	Use MCCB ratings
1200	65,000 @ 600	1600 A	0098-7312	65,000 @ 600	1600 A	Use MCCB ratings
1600-2000	100,000 @ 480	4000 A	0098-7311	100,000 @ 480	4000 A	Use MCCB ratings
1600-2000	85,000 @ 600	4000 A	0098-7311	85,000 @ 600	4000 A	Use MCCB ratings
3000	100,000 @ 480	4000 A	0098-7313	100,000 @ 480	4000 A	Use MCCB ratings
3000	85,000 @ 600	4000 A	0098-7313	85,000 @ 600	4000 A	Use MCCB ratings

Transfer Switch Ampere	FUSE PROTECTION		
	WCR @ Volts Max. with Current Limiting Fuses	Max Fuse, Size and Type	Drawing Reference
150-260	200,000 @ 600	600 A Class J, RK1, RK5 or 1200 A Class L, T	0098-6889
300-400	200,000 @ 600	600 A Class J, RK1, RK5 or 1200 A Class L, T	0098-6890
600-1000	200,000 @ 600	600 A Class J, RK1, RK5, 1200 A Class T, or 2000 A Class L	0098-6891
1200	200,000 @ 480	3000 A Class L	0098-7312
1200	150,000 @ 600	3000 A Class L	0098-7312
1600-2000	200,000 @ 480	2500 A Class L	0098-7311
1600-2000	150,000 @ 600	2500 A Class L	0098-7311
3000	200,000 @ 480	4000 A Class L	0098-7313
3000	150,000 @ 600	4000 A Class L	0098-7313

Transfer Switch Ampere	3 cycle Ratings		
	WCR@Volts Max 3 Cycle rating	Max MCCB Rating	Drawing Reference
1200	50,000 @ 480	1600 A	0098-7312
1200	42,000 @ 600	1600 A	0098-7312
1600-2000	100,000 @ 480	4000 A	0098-7311
1600-2000	85,000 @ 600	4000 A	0098-7311
3000	100,000 @ 480	4000 A	0098-7313
3000	85,000 @ 600	4000 A	0098-7313

# Submittal Detail

## Automatic Transfer Switch Options

### Current Ratings

- S049 150 A
- S050 225 A
- S051 260 A
- S052 300 A
- S053 400 A
- S054 600 A
- S055 800 A
- S056 1000 A
- S057 1200 A
- S058 1600 A
- S059 2000 A
- S060 3000 A

### Voltage (Line-Line) Ratings

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

### Pole Configuration

- 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

### 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 (not available for 1200-3000 A)
- 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 (not available 1200-3000 A)

### Controls

- C024 Switch Control - Level 2
- M018 Display - Digital

## Options and Accessories

### Control Options

- M017 Security Key - Front Panel
- M022 Monitoring - Load
- M023 Module - Relay Signal
- M031 Communications - LonWorks Network Communications Module FTT-10

### Meters

- D009 Digital Bar Graph Meters

### Battery Chargers

- K001 Battery Charger - 2 A, 12/24 V
- KB59 Battery Charger - 15 A, 12 V
- KB60 Battery Charger - 12 A, 24 V

**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.

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

### Applications Modules

- M003 Terminal Block - 30 points (not wired)
- M007 Load Shed - From Emergency - Drives BTPC in neutral position when remote signal contact closes
- N002 Terminal Block - Battery Charger Alarms
- N008 Terminal Lugs - Cable (1600 - 3000 A only)
- N009 Power Connect - Bus Stabs (150 - 1000 A open construction only)

### Shipping Option

- A051 Packing - Export Box

## 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. Other optional and extended factory warranties and local distributor maintenance agreements are available.

Other available warranties include: 2-year prime power, 2-year standby, 5-year basic power, 5-year comprehensive power and 10-year major component. The 2-year prime power and the 10-year major component warranties are available in North America only.

## Certifications

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



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



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



**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



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

## See your distributor for more information



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Cummins Power Generation is a subsidiary of Cummins Inc. 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.