Transfer Switches

OTPC PowerCommand®

40 - 3000 Amp
3 Pole and 4 Pole

Optional Features Shown

Description

Designed for continuous current operation and switching of electrical loads between primary power and standby generator sets, Cummins Power Generation Series OTPC 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,** 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,** 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 bi-directional linear actuator provides virtually friction-free, constant force, straight-line transfer switch action during automatic operation.
- **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, shielded termination, and over-center type contact mechanisms allow effective, manual operation (40-1000A switches).
- **Positive Interlocking** - Mechanical and electrical interlocking prevent source-to-source connection through the power or control wiring.
- **Main Contacts** - Heavy-duty silver alloy contacts with separate arcing surfaces and multileaf 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 OTPC 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

- A bi-directional linear actuator powers OTPC Transfer Switches. This design provides virtually friction-free, constant force, straight-line transfer switch action. No complex gears or linkages.
- Independent break-before-make action is used for both 3-pole and 4-pole/switched neutral switches. On 3-pole/switched neutral switches, this action also prevents the objectionable ground currents and nuisance ground fault tripping that can result from overlapping designs.
- A mechanical interlock prevents simultaneous closing of normal and emergency contacts. The action positively prevents dangerous source-to-source connections.
- Electrical interlocks prevent simultaneous closing signals to normal and emergency contacts and interconnection of normal and emergency sources through the control wiring.
- Long-life, high pressure, silver alloy contacts resist burning and pitting. Separate arcing surfaces further protect the main contacts. Contacts are mechanically held in both normal and emergency positions for reliable, quiet operation.

Specifications-Transfer Switch Mechanism

Voltage Rating	Transfer switches rated from 40 A through 3000 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 and are transparent for visual inspection.
Neutral Bar	A full current-rated neutral bar with lugs is standard on enclosed 3-pole transfer switches.
Auxillary 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	Surge-tested for location category B3, per IEEE C 62.41. Testing per guidelines in IEEE 62.45. Control tested to European Surge Test 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 installed.
Manual Operation Handles	Transfer switches rated through 1000 A are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation. Transfer switches over 1000 A are equipped with manual operators for service use only under de-energized conditions.

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

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 2002 NEC Table 312.6 (B).

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	
40, 70, 125	27.0	686	20.5	521	12.0	305	31.5	800	82	37	310-0544
150, 225	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	310-0414
260	43.5	1105	28.5	724	16.0	406	43.0	1093	170	77	310-0540
300, 400, 600	54.0	1372	25.5	648	18.0	457	42.0	1067	225	102	310-1307
800, 1000	68.0	1727	30.0	762	19.5	495	48.5	1232	360	163	310-0417
1200	75.0	1905	36.0	915	21.5	546	54.0	1372	450	283	310-0482
1600, 2000(1)	90.0	2286	36.0.	915	48.0	1219	84.0	2134	1100	499	310-0483
3000(1)	90.0	2286	36.0	915	48.0	1219	84.0	2134	1250	567	310-0484

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		
40, 70, 125	34.0	864	26.5	673	12.5	318	36.5	927	125	57	3R, 12,	310-0453
40, 70, 125	34.0	864	26.5	673	12.5	318	36.5	927	125	57	4	310-0445
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	3R, 12	310-0454
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	4	310-0446
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	3R, 12	310-0455
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4	310-0447
300, 400, 600	59.0	1499	27.5	699	16.5	419	41.5	1054	275	125	3R, 12	310-1315
300, 400, 600	59.0	1499	27.5	699	16.5	419	41.5	1054	275	125	4	310-1316
800, 1000	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	3R, 12	310-0457
800, 1000	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4	310-0449
1200	75.0.	1905	36.0	915	19.5	495	55.0	1397	450	204	3R, 12, 4	310-0482
1600, 2000 (1)	90.0	2286	32.5	826	51.0	1295	79.0	2007	1100	499	3R, 12, 4	310-0744
3000 (1)	90.0	2286	38.0	965	51.0	1295	84.5	2146	1250	567	3R, 12, 4	310-0745

Note 1: Rear or side access is required to complete power wiring installations.

Enclosure Dimensions - Transfer Switch in U.L. Type 4X Stainless Steel 316 Enclosure

Amp Rating	Height		Width		Door Closed		Door Open		Weight		Cabinet Type	Outline Drawing
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	500-4184
150, 225	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	500-4184
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	500-4184
300, 400, 600	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	500-4185
800, 1000	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	500-4185

Note: Not available 1200 – 3000 Amp..

Transfer Switch Lug Capacities

All lugs accept copper or aluminum wire unless indicated otherwise.

Amp Rating	Cables Per Phase	Size
40, 70, 125	1	#12 AWG-2/0
150, 225	1	#6 AWG - 300 MCM
260	1	#6 AWG - 400 MCM
300, 400	1	3/0 - 600 MCM
300, 400	2	3/0 - 250 MCM
600	2	250 - 500 MCM
800 - 1000	4	250 - 500 MCM
1200	4	#2 AWG to 600 MCM
1600, 2000	8	#2 AWG to 600 MCM (lugs optional)
3000	8	#2 AWG 600 MCM (lugs optional)

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.

	MCCB PROTECTION			CURRENT LIMITED BREAKER PROTECTION		
Transfer Switch Ampere	**WCR@Volts Max with Specific Manufacturers MCCBs**	**Max MCCB Rating**	**Drawing Reference**	**With Specific Current Limiting Breakers (CLB)**	**Max CLB Rating**	**Drawing Reference**
40 - 125	14,000 @ 480	225 A	098-6885	200,000 @ 480	225 A	098-6918
40 - 125	14,000 @ 600	225 A	098-6885	100,000 @ 600	225 A	098-6918
150 - 260	30,000 @ 480	400 A	098-6886	200,000 @ 480	400 A	098-6919
150-260	30,000 @ 600	400 A	098-6886	100,000 @ 600	400 A	098-6919
300 - 600	65,000 @ 480	1200 A	098-6887	200,000 @ 480	1200 A	098-6920
300 - 600	65,000 @ 600	1200 A	098-6887	100,000 @ 600	1200 A	098-6920
800 - 1000	65,000 @ 480	1400 A	098-6888	150,000 @ 480	1400 A	098-6921
800 - 1000	NA	NA	098-6888	100,000 @ 600	1400 A	098-6921
1200	85,000 @ 480	1600 A	098-7312	85,000 @ 480	1600 A	098-7312
1200	65,000 @ 600	1600 A	098-7312	65,000 @ 600	1600 A	098-7312
1600 - 2000	100,000 @ 480	4000 A	098-7311	100,000 @ 480	4000 A	098-7311
1600 - 2000	85,000 @ 600	4000 A	098-7311	85,000 @ 600	4000 A	098-7311
3000	100,000 @ 480	4000 A	098-7313	100,000 @ 480	4000 A	098-7313
3000	85,000 @ 600	4000 A	098-7313	85,000 @ 600	4000 A	098-7313

	FUSE PROTECTION		
Transfer Switch Ampere	**WCR @ Volts Max. with Current Limiting Fuses**	**Max Fuse, Size and Type**	**Drawing Reference**
40 - 125	200,000 @ 480	200 A Class, J, RK1, RK5	098-6885
40 - 125	200,000 @ 600	200 A Class, J, RK1, RK5	098-6885
150 - 260	200,000 @ 480	600 A Class, J, RK1, RK5	098-6886
150-260	200,000 @ 600	1200 A Class L	098-6886
300 - 600	200,000 @ 480	1200 A Class L	098-6887
300 - 600	200,000 @ 600	1200 A Class L	098-6887
800 - 1000	200,000 @ 480	2000 A Class L	098-6888
800 - 1000	200,000 @ 600	2000 A Class L	098-6888
1200	200,000 @ 480	3000 A Class L	098-7312
1200	150,000 @ 600	3000 A Class L	098-7312
1600 - 2000	200,000 @ 480	2500 A Class L	098-7311
1600 - 2000	150,000 @ 600	2500 A Class L	098-7311
3000	200,000 @ 480	4000 A Class L	098-7313
3000	150,000 @ 600	4000 A Class L	098-7313

Submittal Detail

Automatic Transfer Switch Options

Current Ratings
[ ] S046 40 Amps
[ ] S047 70 Amps
[ ] S048 125 Amps
[ ] S049 150 Amps
[ ] S050 225 Amps
[ ] S051 260 Amps
[ ] S052 300 Amps
[ ] S053 400 Amps
[ ] S054 600 Amps
[ ] S055 800 Amps
[ ] S056 1000 Amps
[ ] S057 1200 Amps
[ ] S058 1600 Amps
[ ] S059 2000 Amps
[ ] S060 3000 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
(*): Line to Neutral Voltage (not available on 1200 - 3000 amp switches)

Pole Configuration
[ ] A028 Poles - 3 (Solid Neutral)
[ ] A029 Poles - 4 (Switched Neutral - not available 40 - 125 amps)

Frequency
[ ] A044 60 Hertz
[ ] A045 50 Hertz

Application
[ ] A035 Appl - Utility to Genset
[ ] A036 Appl - Utility to Utility
[ ] A037 Appl - Genset to Genset

System Options
[ ] A041 Single Phase, 2-wire or 3-wire (not available 1200-3000 amps)
[ ] 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)
[ ] B025 Type 4X: Indoor or outdoor use (watertight) (similar to IEC Type IP65) (Not available 1200-3000 Amps)

Listing
[ ] A046 Listing - UL 1008/CSA Certification
[ ] A064 Listing - NFPA 20 (not available 1200-3000 amps)

Options and Accessories

Controls
[ ] C023 Switch Control - Level 1
[ ] C024 Switch Control - Level 2

Control Options
[ ] M017 Security Key - Front Panel
[ ] M018 Display - Digital
[ ] M022 Monitoring - Load
[ ] M023 Module - Relay
[ ] M031 Communications - Lon Works Network Communications Module (FTT-10)

Meters
[ ] D009 Digital Bar Graph Meters

Battery Chargers
[ ] K001 Battery Charger - 2 Amps, 12/24 Volts
[ ] KB59 Battery Charger - 15 Amps, 12 Volts
[ ] KB60 Battery Charger - 12 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 OTPC in Source 2 (Emergency) position
[ ] L103 Aux. Relay - Normal Position - Relay energized when OTPC in Source 1 (Normal) position
[ ] L201 Aux. Relay - 12 VDC Coil Installed, not wired
[ ] L202 Aux. Relay - Emergency Position - Relay energized when OTPC in Source 2 (Emergency) position
[ ] L203 Aux. Relay - Normal Position - Relay energized when OTPC in Source 1 (Normal) position

Applications Modules
[ ] M003 Terminal Block - 30 points (not wired)
[ ] M007 Load Shed - From Emergency - Drives OTPC in neutral position when remote signal contact closes
[ ] N002 Terminal Block - Battery Charger Alarms
[ ] N008 Terminal Lugs - Cable (1600 - 3000 amps only)
[ ] N009 Power Connect - Bus Stabs (150 - 1200 amp open construction only)

Shipping Option
[ ] A051 Packing - Export Box
[ ] N013 Extension Harness

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 switch accessories comply with UL Listing; UL Type Rated cabinets; UL Listed CU-AL terminals

See your distributor for more information

Power Generation

Cummins Power Generation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
763.574.5000
Fax: 763.574.5298
www.cumminspower.com

Warning: Backfeed to a utility system can cause electrocution and/or property damage. Do no connect to any building's electrical system except through an approved device or after building main switch is open.