



شركة أولاد عبدالوهاب عبدالعزيز القطامي
Abdulwahab Abdulaziz Al Qatami's Sons Co.

Automatic transfer switches

Reliable, flexible and dependable



The Power of One™

Only Cummins Power Generation Inc. gives you PowerCommand® pre-integrated digital power systems — systems that are designed, built, tested and serviced by a single-source manufacturer.

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Important sectors for power generation solutions include; telecom, construction, IT/ITES, realty, hospitality, textiles, auto & auto ancillaries, food processing, government, pharma, gas and manufacturing. As the only single-source



Orange County Convention Center, Orlando, Florida

A 6 MW standby power system in the Phase V expansion includes 72 automatic transfer switches. The transfer switches are used for load distribution and for switching between the utility source and our 1500 kW PowerCommand diesel generator sets.

manufacturer of engines, alternators, digital controls, transfer switches and digital paralleling systems, Cummins PowerGeneration leads the way in the seamless integration of power system technology. Our proven pre-integrated systems provide you with a superior power system, ease of installation, low operating cost and a single source for maintenance and support.

A system with no equal

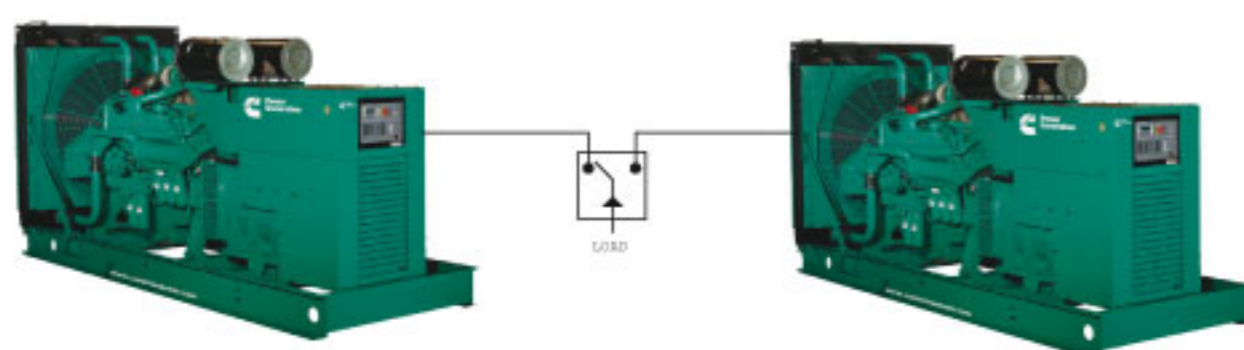
Imagine it. One integrated system designed specifically to work as a whole. That's the Power of One™. Whether you rely on your power system for prime or standby power, or to parallel with your local utility, a PowerCommand® digital system will deliver the reliability, flexibility and user-friendly interface you demand.

Pre-integrated systems are backed up by one of the largest sales, service and support organizations in the world. The Cummins Power Generation distribution channel is the single-source supplier of integrated systems — generators, paralleling switchgear, automatic transfer switches and local design-build support and service.

For over 30 years, Cummins Power Generation has been the industry leader in power system integrated designs. When you compare our pre-integrated digital technology with other offerings, you will understand that PowerCommand® is the ONE.

Reliable, flexible, easy to use

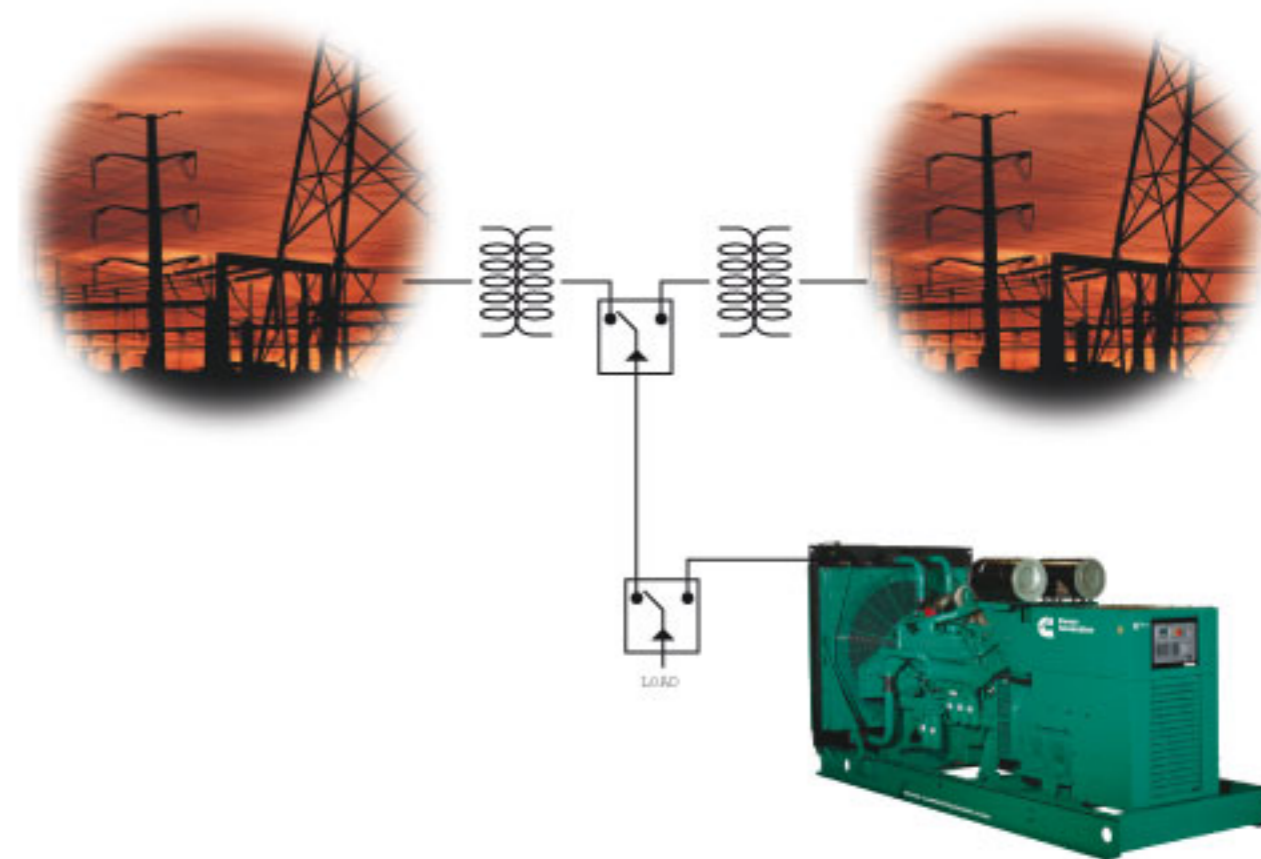
PowerCommand® transfer switches provide safe, dependable power transfer between sources.



Generator to generator

For facilities with a prime power system using multiple on-site generators. If the primary generator fails, the transfer switch sends a start signal to the second generator and then transfers the load.

It is a matter of pride for Cummins that more telecommunication companies rely on us than on any other brand. Today, our close partnerships with telecommunication customers enable us to deliver reliable services essential to keep operations running smoothly in this sector.



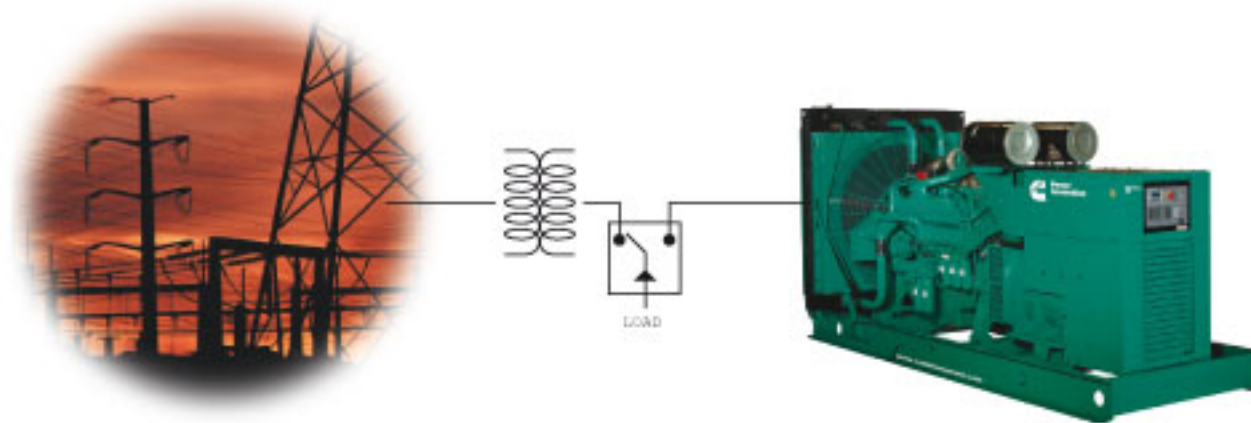
Three-source system

For facilities with a standby power system and two utility feeds. The utility transfer switch controls the feeds from the two utilities based on a pre-established priority. If both utility feeds fail, the generator transfer switch sends a start signal to the standby generator and transfers the load.

Another three-source system uses a standby generator in place of the second utility (dual standby). If the utility fails, the first transfer switch sends a start signal to the primary standby generator and transfers the load. If the primary standby generator fails, the transfer switch sends a start signal to the second generator set and transfers the load.

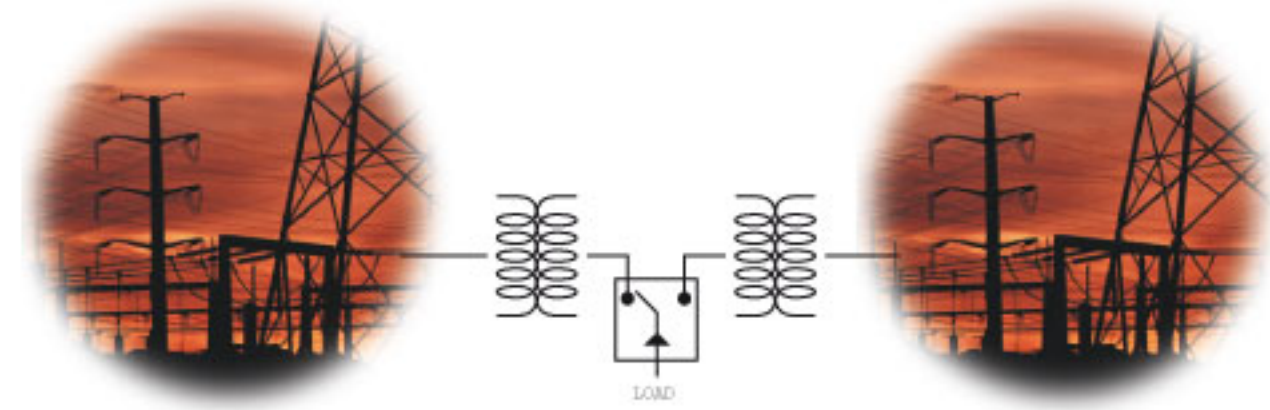
Reliable, flexible, easy to use

All PowerCommand® transfer switches include unique features that provide flexibility for all types of applications. The microprocessor-based controls optimize performance while simplifying operation and service.



Utility to generator

For facilities with a standby power system and a single utility feed. The transfer switch senses when utility power has been lost, sends a start signal to the standby generator and transfers the load.



Utility to utility

For use in facilities with redundant utility feeds but no standby generator. If one utility feed fails, the transfer switch automatically connects the load to the second utility feed.

Dependable power transfer

PowerCommand® transfer switches optimize system reliability and performance, reduce maintenance costs and enhance your entire system with unique capabilities.

Open, Closed or Programmed Transition Transfer



GTEC

- Open or programmed transition
- 40-2000 amps
- 2-, 3- and 4-pole
- IEC and CE-labeled



OTEC

- Open (in-phase) or programmed transition
- 40-1000 amps
- 3- and 4-pole
- UL-labeled



OTPC

- Open, closed or programmed transition
- 40-4000 amps
- 3- and 4-pole
- UL-labeled



CHPC

- Closed transition
- 125-800 amps
- 2-, 3- and 4-pole
- UL-labeled



OHPC

- Open or programmed transition
- 125-800 amps
- 2-, 3- and 4-pole
- UL-labeled

Bypass, Isolation, Load Transfer



BTPC

- Open, closed or programmed transition
- 150-4000 amps
- 3- and 4-pole
- UL-labeled

Cummins Power Generation transfer switches give you a range of controls for safe, dependable and easy-to-use power transfers for these modes:

Open-transition transfer

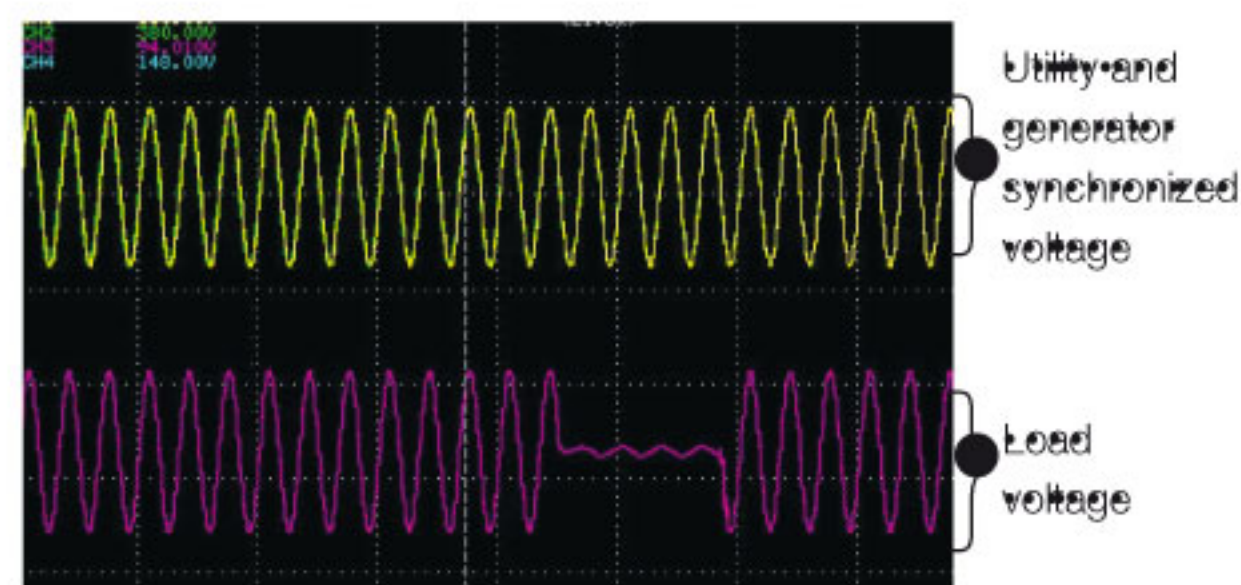
Break-before-make switching action. The most basic type of transfer; the connection to one source is opened before the connection to the second source is closed. The sync-check feature included in the open-transition transfer control monitors both sources and initiates the transfer — avoiding out-of-phase closing.

Applications: Emergency, code-required and optional standby systems; resistive loads; small motor loads.

Programmed-transition transfer

Similar to open-transition transfer. The switch opens the connection to one source, pauses for an adjustable delay time, then closes the connection to the second source. The adjustable time between sources allows the decay of residual voltage before connecting to the second source.

Applications: Inductive (motor) loads; recommended by some manufacturers of UPS and VFD equipment.



Break-before-make switching action opens the connection to one source before closing the connection to the second source. Shown: open transition with sync check.

Safe, reliable performance

Closed-transition transfer

Make-before-break switching action for uninterrupted power transfer. The transfer switch provides a seamless transfer of the load from one source to another by momentarily paralleling both sources (<100 milliseconds) during the transfer period.

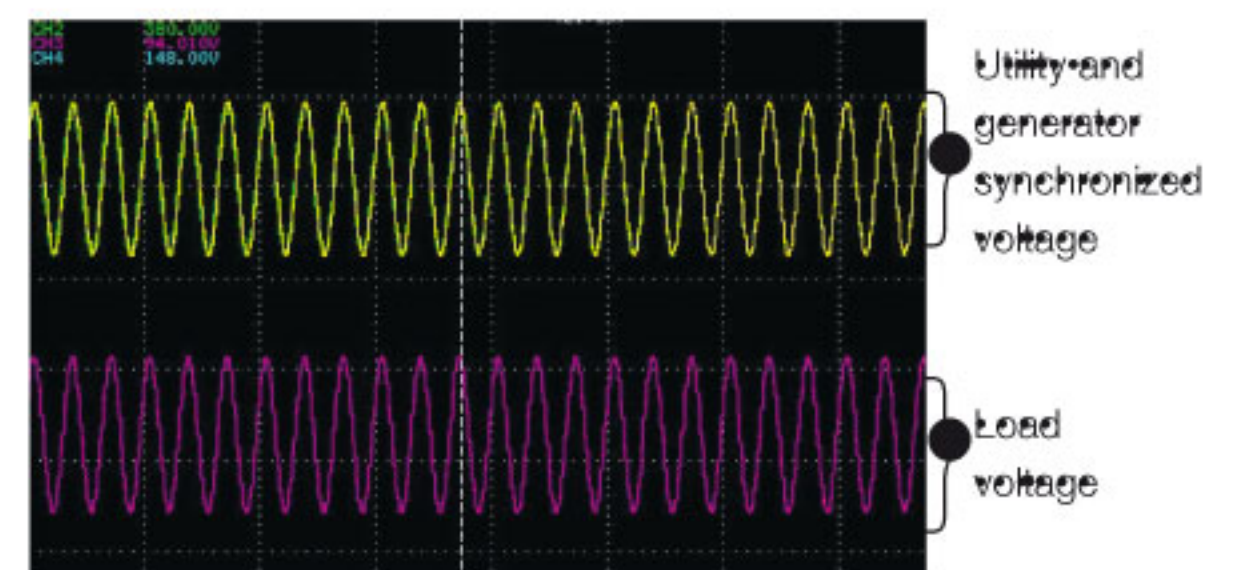
Applications: Critical power requirements, including hospitals and data centers.

Bypass isolation transfer

Allows maintenance to the main ATS without disconnecting the load. By having two transfer switches connected in parallel, the bypass transfer switch adds redundancy to the system.

Applications: Critical power and maintenance requirements, including healthcare and data centers.

Compare PowerCommand® transfer switches to conventional switches



Make-before-break switching action provides uninterrupted power transfer. The switch closes the connection to the second source before opening the connection to the first source.

| Conventional switches | PowerCommand® switches |
|---|--|
| In many cases, programmed transition is an expensive option. | A single standard controller provides both industry-preferred programmed transition capability and in-phase transfer control. All settings in the system are made via the operator panel or optional easy-to-use PC-based software. |
| Passive control operation waits for the generator set to drift into synchronization with the utility. If the generator set doesn't synchronize, open transition with power interruption occurs. | Active control of generator set during in-phase transfer and closed-transition modes enables reliable operation. Active synchronizing is accomplished over the PowerCommand® network to minimize installation cost. |
| As the transfer switch ages, changes in the mechanical operation speed of the transfer switch make in-phase and closed-transition transfer less accurate, putting loads and the generator at risk. | The control system continuously monitors operating time of the transfer switch mechanism and automatically adjusts in-phase transfer and closed-transition set points to maintain accurate synchronizing over the life of the transfer switch. |
| Conventional switches are not designed to record power source-related or transfer switch state-related events that are often required for maintenance purposes and for effective troubleshooting. | Data logging capabilities: The PowerCommand® controller keeps a log of faults and events. The PowerCommand iWatch® web servers can be used with this control for more sophisticated data logging requirements. |
| Basic AC metering (voltage and frequency) can sometimes be viewed on an alphanumeric display. When full data is necessary, separate metering equipment is added to the controls; this equipment is not integrated with the ATS control. | Optional analog AC load metering display allows the user to quickly view the status of power to loads. Data include 3-phase AC volts and amps, frequency, kW and power factor. AC metering is integrated into the controller. |
| Conventional switches do not have the capability to communicate with SCADA systems and are limited to information collected through auxiliary contact closure. They are limited by proprietary protocols not designed to communicate with devices from other manufacturers. | The PowerCommand® network interface enables data-sharing between all system components and many interfaces to the outside world. External interfaces are available for other manufacturers' generator sets and transfer switches in nearly any protocol. |

GTEC automatic transfer switches



GTEC 40-2000 amp series automatic transfer switch

The GTEC automatic transfer switch combines reliability and flexibility in a small, economical package for normal and generator set source monitoring, generator set starting and load transfer functions. GTEC automatic transfer switches are ideal for emergency, standby and optional standby applications.

Cummins Power Generation switches are built to withstand thousands of switching cycles, ensuring reliable operation.

■ **Microprocessor control**

Fully-featured microprocessor control is standard with all settings and adjustments designed for easy operator use via the front display panel

■ **Operating modes**

Open transition with programmed transition (adjustable 0-10 seconds); open transition with sync-check monitor and programmed-transition backup; exercise mode; and test mode

■ **Manual operation handle (standard)**

Allows manual operation of the switch after proper disconnection of power sources

■ **Easy service/access**

Door-mounted controls, ample access space and compatible terminal markings allow for easy access

■ **Positive interlocking**

Mechanical interlocking prevents source-to-source connection through the power contacts

■ **Solenoid**

A powerful and economical solenoid power GTEC transfer switches

■ **Advanced transfer switch mechanism**

True transfer switch mechanism with break-before-make action

■ **Continuously rated**

Can be used in applications up to their nameplate rating

■ **Main contacts**

Long-life, high-pressure silver alloy contacts withstand thousands of switching cycles without burning, pitting or welding and provide 100% continuous current ratings

OTPC/OTEC automatic transfer switches

OTPC 40-4000 amp series OTEC 40-1000 amp series PowerCommand® automatic transfer switches

PowerCommand® automatic transfer switches
The OTEC series transfer switch provides the basic features you need for primary source and generator set monitoring, generator set starting and load transfer functions for emergency standby power applications. The OTPC series provides advanced features.



PowerCommand® automatic transfer switches feature microprocessor-based control technology for easy operation and robust, high-contact-force design.

■ **PowerCommand® control (OTPC)**

Microprocessor-based controls are developed specifically for automatic transfer switch operation

■ **Robust control system design (OTPC)**

Optically-isolated logic inputs and high-isolation transformers for AC power inputs provide high-voltage surge protection

■ **Communications capability (OTPC)**

Transfer switch communicates via a SCADA network

■ **Easy service/access**

Plug connections, door-mounted controls, ample access space, compatible terminal markings simplify access

OTPC/OTEC automatic transfer switches

■ Microprocessor control (OTEC)

Fully-featured microprocessor control is standard, with all features, settings and adjustments software-enabled for ease of setup and accuracy

■ Manual operation (OTEC)

Manual operating handles, shielded termination and over-center type contact mechanisms allow effective, manual operation under de-energized conditions

■ Positive interlocking (OTEC)

Mechanical and electrical interlocking prevent source-to-source connection through the power or control wiring

■ Advanced transfer switch mechanism

Bi-directional linear motor actuator provides virtually friction-free, constant-force, straight-line transfer switch action with no complex gears or linkages

■ Break-before-make action

Independent break-before-make action is used for both 3-pole and 4-pole/switched neutral switches

■ Main contacts

Heavy-duty silver alloy contacts with separate arcing surfaces and multi-leaf arc chutes are rated for total system transfer including overload interruption

■ Mechanical interlock

Prevents simultaneous closing of normal and emergency contacts



Bypass-isolation automatic transfer switches

BTPC 150-4000 amp series PowerCommand® bypass-isolation automatic transfer switches

BPTC series transfer switches combine the features of our advanced automatic transfer switch with a closed door drawout isolation mechanism, a two-source bypass switch and exclusive microprocessor-based controls. The switches allow maintenance, service and testing of the automatic transfer switch without disrupting power to critical loads. The resulting power transfer redundancy helps ensure constant, reliable power for critical applications.



PowerCommand® bypass-isolation transfer switches are ideal for critical-need applications where any disruption of supply power, even for routine maintenance, is unacceptable.

■ Bypass to any source at any time

Allows for normal or emergency power, whichever is required

■ PowerCommand® microprocessor control

Allows user-friendly adjustments and network communications with other systems

■ Mechanical flags

Indicate bypass position

■ Permanently mounted instructions

Allows easy step-by-step operation

■ Easy manual operation

Allows manual transfer to any available source at any time

■ Drawout positions

Are connected, tested and isolated with door closed for safety

■ Automatic safety shutters

Drop into place once the bypass is engaged, covering the primary disconnects as the transfer switch is withdrawn

■ Convenient drawout rails

Allow automatic transfer switch to be quickly rolled out and replaced

■ Clear Lexan® barriers

Allow viewing of contact position

■ Control disconnect plugs for faster and safer service



CHPC/OHPC automatic transfer switches



CHPC closed-transition 125-800 amp series PowerCommand® automatic transfer switches

Designed specifically for uninterrupted, closed transition operation, the revolutionary design incorporates proven PowerCommand® micro-processor control with an innovative High-Endurance Mechanism (HEM) for uncompromising reliability.

OHPC open-transition 125-800 amp series PowerCommand® automatic transfer switches

PowerCommand® automatic transfer switches For open-transition operation, OHPC transfer switches also incorporate PowerCommand® microprocessor control and a reliable High-Endurance Mechanism. The OHPC is ideal for utility-to-utility, utility-to-genset and genset-to-genset applications.

■ **PowerCommand® microprocessor control**

Fully-featured, field-programmable microprocessor control; easy setup and accuracy

■ **Surge protection**

Optically-isolated logic inputs and high isolation transformers for AC power inputs provide high-voltage surge protection

■ **Selectable transfer method (OHPC)**

The switch automatically transfers the load back either by using the fast transfer or delayed-transition mode of operation

■ **Manual operation**

Manual operating handles and stored-energy transfer mechanism allow effective manual operation

■ **Easy service/access**

Plug connections, door-mounted controls, ample access space and compatible terminal markings simplify access

■ **Main contacts**

Heavy-duty silver alloy contacts and multi-leaf arc chutes are rated for total system transfer

■ **Stored energy mechanism**

Allows the mechanism to be switched between sources even when no source is available

■ **Permanently attached manual operator handles**

Allows for manual operation and easy servicing

PowerCommand[®] controls

| | GTEC/OTEC control | Level-1 (OTPC/OHPC control) | Level-2 (OTPC/OHPC/ CHPC/BTPC control) |
|---|------------------------------|--|---|
| Sensing | | | |
| 3-Phase voltage-sensing utility | S | S | S |
| 3-Phase voltage-sensing generator | N/A, single phase | N/A, single phase | S |
| Electrical isolation from AC mains | S; high impedance | S; transformer | S; transformer |
| Voltage-sensing accuracy | +/-2% | +/-1% | +/-1% |
| O/U voltage-sensing utility | U/V only | S | S |
| O/U voltage-sensing generator | U/V only | S | S |
| O/U frequency-sensing utility | N/A | S | S |
| O/U frequency-sensing generator | U/F only | S | S |
| Voltage imbalance | N/A | N/A | S |
| Phase rotation | N/A | N/A | S |
| Loss of phase | S | S | S |
| General features/serviceability | | | |
| Door-mounted | S | S | S |
| Controls isolated from switch during service | S | S | S |
| Single control package for sensing/timing | S | S | S |
| Voltage surge immunity | S | S | S |
| Optically isolated customer I/O | N/A | S | S |
| Method(s) for sensor/timer adjustments | LED configuration | Front panel, service software | Front panel, service software |
| Number of time/date-stamped events | N/A | 50 | 50 |
| Real-time clock (RTC) | N/A | S | S |
| On-board diagnostics/fault detection | S | S | S |
| Field-upgradeable software, PC diagnostics | N/A | S | S |
| Fully adjustable timers, sensors and control parameters | adjustable in steps | S | S |
| Mode control keyswitch interface with control | N/A | O | O |
| Supported voltages | | | |
| 120V; 200-240V; 380-480V or (220-277V L-N); 600V | S | S | S |
| Transition modes | | | |
| Programmed transition | S | S | S |
| Open transition with sync-check sensor | N/A | S | S |
| In-phase monitor | S | N/A | N/A |
| Closed transition (momentary) | N/A | N/A | S |
| Closed transition (soft loading/paralleling) | N/A | N/A | N/A |
| Display/metering/user interface | | | |
| Display offered/type | N/A | O, VFD | S, VFD |
| Front-panel LED status lamps | 6-fixed (8 for config.) | 6 fixed | 6 fixed |
| Front-panel test | S | S | S |
| Front-panel TD override | S | S | S |
| Front-panel lamp test/fault reset | N/A | S | S |
| Front-panel set exerciser | S | w/display | w/display |
| Color-coded bar graph meters for voltage, current, frequency, kW and power factor | N/A | N/A | O |
| Engine-exerciser clock | | | |
| Calendar-based exerciser with real-time clock | N/A | S | S |
| Once/week exerciser | S | N/A | N/A |
| Exerciser via external clock module | O | N/A | N/A |
| Number of exercise programs | 1 | 1 | 8 |
| Power output for external timer | N/A | N/A | N/A |
| Exercise exceptions | N/A | S, 1 | S, 8 |

S – standard features **O** – optional features **NA** – not available

PowerCommand® controls

PowerCommand® controls optimize the reliability and performance of the power generation system while keeping costs competitive and providing unique capabilities for the entire system.

| | GTEC/OTEC control | Level-1 (OTPC/OHPC control) | Level-2 (OTPC/OHPC/ CHPC/BTPC control) |
|---|------------------------------|--|---|
| Time delays | | | |
| Displays timer delay countdown | N/A | O | S |
| Field-adjustable time delays | S | S | S |
| Time-delay engine start | S | S | S |
| Time-delay transfer (normal to emerge) | S | S | S |
| Time-delay retransfer (emerge to norm) | S | S | S |
| Time-delay engine cooldown | S | S | S |
| Time-delay elevator pre-transfer | S | S | S |
| Time-delay programmed transition (delayed neutral) | S | S | S |
| Time-delay override/bypass feature | S | S | S |
| Automatic generator-generator changeover timer | N/A | N/A | S |
| Customer inputs/outputs | | | |
| Remote test with load/transfer to generator | S | S | S |
| Remote engine start | S | S | S |
| Transfer inhibit | S | S | S |
| Re-transfer inhibit | S | O | O |
| Generator (source-2) common alarm | N/A | S | S |
| Utility (source-1) common alarm | N/A | S | S |
| Panel security lock | N/A | S | S |
| Load shed input | N/A | O | O |
| Generator battery charger status input | N/A | S | S |
| Remote time delay override/bypass | S | N/A | N/A |
| Remote lamp test/fault reset | N/A | N/A | N/A |
| Synchronizer enable | N/A | S | S |
| Bypass switch position contacts | N/A | N/A | S |
| Generator interface | | | |
| Generator (1) start contact (relay) | S | S | S |
| Generator (2) start contact | N/A | N/A | S |
| 3-wire generator start compatible (use LT for this feature) | N/A | N/A | N/A |

**GTEC/OTEC
control****Level-1
(OTPC/OHPC
control)****Level-2
(OTPC/OHPC/
CHPC/BTPC
control)****Relay outputs**

| | | | |
|------------------------------|-----------------|-----|---|
| Source-1 connected | O | O | O |
| Source-2 connected | O | O | O |
| Source-1 available | N/A | O | O |
| Source-2 available | N/A | O | O |
| ATS not in auto | N/A | O | O |
| Test/exercise active | N/A | O | O |
| Pre-transfer/load disconnect | S, relay drives | O | O |
| Load shed active | N/A | O | O |
| Failure to disconnect | N/A | N/A | O |
| Failure to close/open | N/A | O | O |
| Failure to sync | N/A | O | O |

Remote communications

| | | | |
|-----------------------------------|---------------|---------------|-----|
| Remote communications module | N/A | O | O |
| Remote communications description | N/A LonWorks, | NCM LonWorks, | NCM |
| Remote fault dial-out/paging | N/A | O | O |
| Remote dial-in access | N/A | O | O |
| Event login | N/A | 50 | 50 |
| ATS load sequencing control | N/A | O | O |
| Peer-peer system status data | N/A | O | O |
| Internet-accessible sites | N/A | N/A | N/A |
| Current / load monitoring | N/A | N/A | O |

Agency approvals, code/standards

| | | | |
|-----------------|--------|-----|-----|
| UL1008 | N/A, S | S | S |
| IEC | S, N/A | N/A | N/A |
| CSA, NFPA, IEEE | N/A, S | S | S |
| IBC | N/A, S | S | S |
| NEMA ICS 10 | N/A, S | S | S |

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