Bypass/Isolation Switches

RTS-03 SERIES

Russelectric

Power Control People You Can Rely On

WORLDWIDE POWER PRODUCTS

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The Industry's Highest 3-Cycle Closing and Withstand Ratings |A

Russelectric RTS-03 Series transfer switches have the highest 3-cycle closing and withstand ratings for 600 VAC or less of any switches available today.

All Russelectric RTS-03 Series automatic transfer switches have been fully tested for 3-cycle closing and withstand ratings under UL-1008.

Before Underwriters' Laboratories, Inc. will allow a transfer switch to be listed with a short circuit rating, it requires that the switch be able to close in on the same amount of fault current that it can withstand. Consequently, in applications where extremely high short circuit current is available, fuse protection is mandatory.

When coordinated with current limiting fuses, Russelectric RTS-03 Series transfer switches have UL listed closing and withstand ratings of 200,000 amperes, at 480 VAC.

3-Cycle Closing and Withstand Ratings
RMS Symmetrical Amperes, 600 VAC or Less
UL Tested, Listed, and Labeled Under UL-1008

Switch Size *amperes*	Closing and Withstand Rating *amperes*
100-400	42,000
600-800	65,000
1000-1200	85,000
1600-4000	100,000 A

Built Rugged for Long Life, Minimum Maintenance, and Trouble-Free Service

Russelectric builds all its bypass/isolation switches for years of reliable, trouble-free operation with a minimum of maintenance. In fact, many of these Russelectric switches have been in continuous service for over 40 years.

Russelectric transfer switch contacts are segmented and have tungsten arcing tips. All contacts are machined from solid copper — not cast, forged, or stamped. All mechanical assemblies, linkages, and connecting rods are purpose-built and precision-machined in-house. Mechanical linkages are sturdy anodized steel rods — machined, not stamped or riveted — with aircraft-style ball joint fittings.

Bus bar is solid copper, silver plated in accordance with UL and ANSI standards.

All bus is formed, cut, and punched before being plated to guarantee the integrity of the silver plating and ensure maximum performance.

Enclosures are fabricated with code gauge steel to meet UL and other applicable standards. All enclosures feature arc-welded seams, extra bracing, and smooth, ground corners. Switches are seismic tested to International Building Code requirements for earthquake compliance.

All bypass/isolation switches are thoroughly inspected both mechanically and electrically under simulated operating conditions before shipment.

Manual Bypass/Isolation Capability Allows Emergency ATS Bypass, Maintenance and Testing

Russelectric RTS-03 Series bypass/isolation switches provide all the functions of a Russelectric automatic transfer switch plus the ability to bypass power from a live source to load in the event the transfer switch is disabled. It also allows the transfer switch to be isolated and de-energized for maintenance, testing, or repair.

- True drawout construction allows safe, easy removal of the transfer switch and eliminates the need to make any electrical or mechanical disconnections.
- Russelectric is the only manufacturer that offers both load-break and no-load-break bypass switch designs.

Compartmentalized Design Simplifies Installation, Ensures Personnel Safety

Russelectric bypass/isolation switches are designed with 3 distinct compartments, separated by barriers, to simplify switch installation and protect personnel.

Bypass Switch Compartment

This compartment contains the bypass/isolation switch assembly including operating handles, mechanism, and controls. It also houses associated buswork and the ancillary wiring (which must always remain energized). No access to this compartment is necessary during normal operation including bypass and isolation of the transfer switch. As a result, it significantly increases operator safety.

Automatic Transfer Switch Compartment

This compartment contains the ATS assembly and its ancillary circuits. Once the ATS has been isolated, the door can be opened and the switch safely drawn out.

Power Connections/Bus Compartment

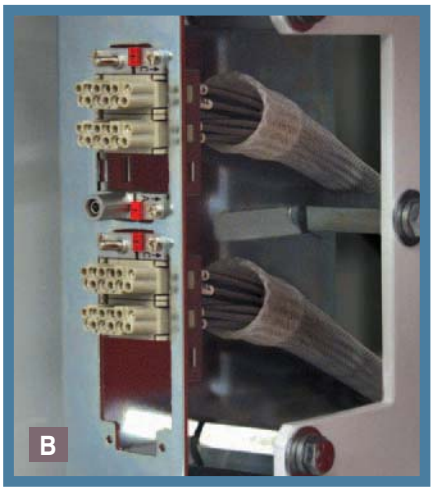
This separate rear compartment contains all power connections for the bypass/isolation switch. Designed to simplify power terminations, it protects switch components and equipment from damage during the pulling of feeder cables or the installation of feeder bus. Bottom, top and even side feeder connections are available. All RTS-03 Series bypass/isolation switches are designed with rear access — either a removable rear panel or a hinged/latched 3-point rear door.

Bypass Switch Contacts Are Identical in Design to ATS Switching Contacts

Rugged bypass switching contacts are identical in design and carry the same ratings as the ATS switching contacts.

Self-Connecting Secondary Controls | B

Self-connecting transfer switch has secondary control contacts which eliminate the need to make manual connections or disconnections.



RPTCS ATS Control System

The Russelectric RPTCS microprocessor automatic transfer control system controls all operational functions of the ATS. Each RPTCS is programmed at the factory to control customer-specified options as well as standard switch features.

Setup, alarm acknowledgement, and review of actual data are easily accomplished using the controller's soft keys and color display. The intuitive, interactive menu guides the user through controller setup and the entering of configuration data, including communications and timing setpoints, adjustable control parameters (interlocks, alarms, and security), and event logging..

Real-time metering of voltage (phase-to-phase and phase-to-neutral) and frequency of both sources is standard, and metering of current and power is available. The RPTCS can also monitor power quality with available waveform capture and historical trending. All metering can be accessed through the menu.

The controller senses Source 1 (usually the electric utility source) and Source 2 (usually the engine generator source) voltages and, by means of easy-to-see LEDs, indicates switch position and source availability. Through the menu, the user can also review operational data such as active time delays, transfer inhibits, metered values, fault and alarm reports, event records, and configuration settings. The controller also automatically displays the status of monitored conditions in color-coded banners at the top of the screen including faults and alarms, inhibits, and informational messages.

The RPTCS controller supports two communication interfaces: standard Modbus RTU or available Modbus TCP/IP via 10/100 Base-T Ethernet. An external communications port on the controller's faceplate allows fast, easy connection to a laptop.

Controller design accommodates the addition of accessories.

Open-Transition Switches

- Positive mechanical interlocks ensure that bypass/isolation functions are accomplished without danger of a short circuit between power sources.
- The bypass switch quick-break, quick-make contacts and basic operating mechanisms are identical to those of the transfer switch and have full load-break capability with the same electrical ratings.
- Single or dual operator versions

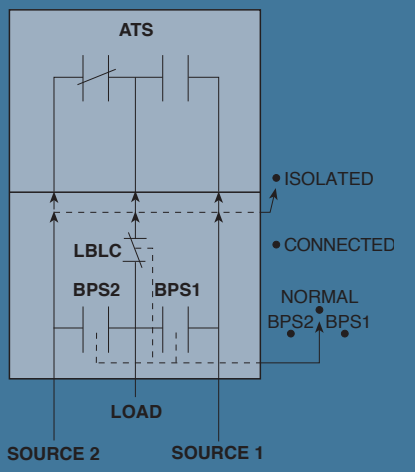
Safe Manual Operator |B

The bypass/isolation switch functions as a manually operated backup transfer switch when in the "Isolate" position. The bypass handle can be used to manually transfer the load to the selected source with the same speed as the automatic transfer switch. The preloaded switch mechanism transfers instantaneously, precluding heavy arcing or the possibility of flashover.

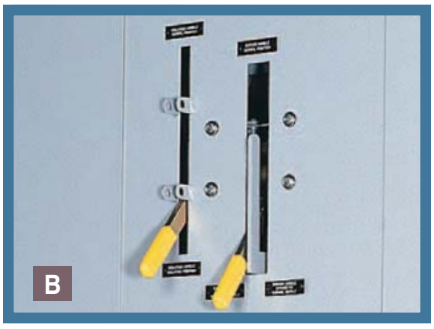
External Manual Operation |C

Optional external manual operator allows manual operation of the ATS with the door fully closed. This increases operator protection from arc flash.

Load-Break Bypass/Isolation Switch



- Load-break bypass/isolation switch is fully mechanical and not dependent upon interlock circuits for safe operation.
- Can be bypassed/isolated regardless of the position or condition of the automatic transfer switch.



Break-Before-Make Bypass Design

The Russelectric load-break design offers a fast, easy, and absolutely foolproof method of bypassing an ATS to either source, regardless of the switch's position or condition. It allows the operator to quickly restore power to a vital circuit in an emergency.

Bypass, Isolate, and Draw Out the Transfer Switch in 3 Simple, Safe Steps

1 | Bypass

To bypass the automatic transfer switch, simply slide the external bypass operating handle left to Source 2 or right to Source 1 position, and then move the handle to the "Bypass" position. This first opens the load-break contacts (LBLC) and then closes the bypass contacts (BPS1 or BPS2). Once in the "Bypass" position, the switch can be safely tested without affecting the load.

2 | Isolate

Once ATS is bypassed, moving the isolate handle to the "Switch Isolated" position simultaneously disconnects both primary and control power from the ATS — without having to open the enclosure door. It also physically releases the transfer switch base, which is equipped with wheels for easy removal from the enclosure for inspection, maintenance, and repair. A superior quality drawout mechanism ensures flawless positioning of the ATS for isolation.

3 | Draw Out

To remove the transfer switch from its enclosure, open its compartment door and roll it out.

When re-inserting the switch base, moving the isolate handle to the "Connected" position draws the switch base into the connected position, reconnecting both primary power and control power — all the while maintaining power flow through the bypass contacts. The transfer switch is now ready to come out of bypass.

Switching Between Bypassed Sources

Moving the bypass handle from the "Bypass" position of the connected source to the "Auto" position and then moving it again to the "Bypass" position of the alternate source manually transfers the load (open transition) from the initially connected source to the alternate source. This can be done regardless of the position or condition of the ATS.

1

2

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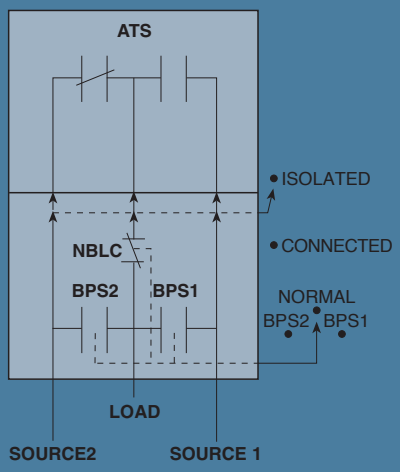
No-Load-Break Bypass/Isolation Switch



Bypass, Isolate, and Draw Out the Transfer Switch in 3 Simple, Safe Steps

1 | Bypass

To bypass from Source 1 to load, Source 2 to load, or return from either bypassed position, the bypass switch must parallel the source to which the ATS is connected. Pushing the solenoid interlock button and moving the bypass handle to the "Bypass" position closes the bypass (BP) contacts, paralleling them with the ATS contacts. After the BP contacts are closed, mechanical interlocks immediately open the no-break load contacts (NBLC), disconnecting the load from the transfer switch while maintaining power to the load through the BP contacts. Coming out of bypass reverses this procedure, closing the NBLC contacts before opening the BP contacts, restoring power flow through the ATS without power interruption. Once in the bypass position, the switch can be safely tested without affecting the load.

2 | Isolate

Once ATS is bypassed, moving the isolate handle to the "Switch Isolated" position simultaneously disconnects both primary and control power from the ATS and physically releases the transfer switch base, which is equipped with wheels for easy removal from the enclosure for inspection, maintenance, and/or repair. A superior quality drawout mechanism ensures flawless positioning of the ATS for isolation.

3 | Draw Out

To remove the transfer switch from its enclosure, open its compartment door and roll it out.

When re-inserting the switch base, moving the isolate handle to the "Connected" position draws the switch base into the connected position, reconnecting both primary power and control power — all the while maintaining power flow through the bypass contacts. The transfer switch is now ready to come out of bypass.

Switching Between Bypassed Sources

The bypass/isolation switch is designed to function as a manually operated backup transfer switch when in the "Isolated" position. Moving the bypass handle from the "Bypass" position of the connected source to the "Normal" position and then moving it again to the "Bypass" position of the alternate source manually transfers the load from the initially connected source to the alternate source. This transfer is done "open transition".

Closed-Transition Switches

Open-Transition Transfer, Closed-Transition Retransfer and Testing

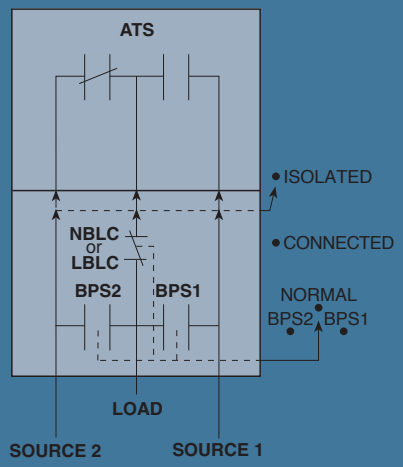
Russelectric RTS-03 Series closed-transition bypass/isolation switches combine a closed-transition automatic transfer switch with a manually operated bypass switch. They allow the open-transition transfer of electrical loads from a preferred power source to an alternate power source when voltage and/or frequency varies from preset limits, and the closed-transition retransfer of loads when the preferred source is restored. In addition, they offer the advantage of zero power interruption during testing.

Built to the same stringent standards as Russelectric's widely respected break-before-make switches, they are identical in size to RTS-03 Series open-transition switches.

High-Speed Operators Provide Transition in Less Than 100 Milliseconds

To achieve the rapid transition necessary to minimize the time during which both sources are connected to the load, Russelectric uses special high-speed operators. Transfer occurs only when both sources are within an acceptable window of synchronization. Tests show that these transition times are substantially less than 100 milliseconds.

Closed-Transition No-Load-Break or Load-Break Bypass/Isolation Switches



Bypass, Isolate, and Draw Out the Transfer Switch in 3 Simple, Safe Steps

1 | Bypass

No-Load-Break Version

To bypass from Source 1 to load, Source 2 to load, or to return from either bypassed position, the bypass switch must parallel the source to which the ATS is connected.

When the ATS is in Source 1 position, bypassing Source 1 to load may be accomplished. When the ATS is in Source 2 position, bypassing Source 2 to load may be accomplished. A solenoid interlock prevents bypassing to a source to which the ATS is not connected.

Load-Break Version

To bypass the automatic transfer switch (for inspection, maintenance, or repair), slide the external bypass operating handle to either the Source 1 or Source 2 "Bypass" position — regardless of the position or condition of the transfer switch — and move handle down to the "Bypass" position.

2 | Isolate

Once the ATS is bypassed, moving the isolate handle to the "Switch Isolated" position simultaneously disconnects both primary and control power and physically releases the transfer switch base, which is equipped with wheels for easy removal from the enclosure for inspection, maintenance, and/or repair. A superior quality drawout mechanism ensures flawless positioning of the ATS for isolation.

3 | Draw Out

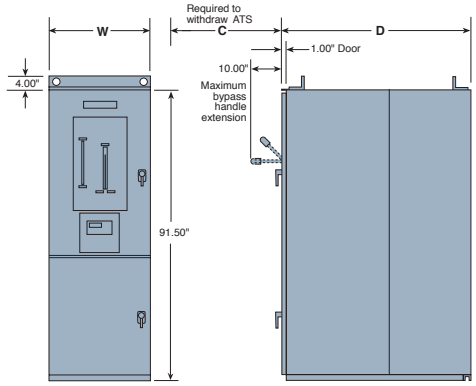
To remove the transfer switch from its enclosure, open its compartment door and roll it out.

When re-inserting the switch base, moving the isolate handle to the "Connected" position draws the switch base into the connected position, reconnecting both primary and control power while maintaining power flow through the bypass contacts. The transfer switch is now ready to come out of bypass.

Switching Between Bypassed Sources

The bypass/isolation switch is designed to function as a manually operated backup transfer switch when in the "Isolated" position. Moving the bypass handle from the "Bypass" position of the connected source to the "Normal" position and then moving it again to the "Bypass" position of the alternate source manually transfers the load from the initially connected source to the alternate source. This transfer is done "open transition".

A



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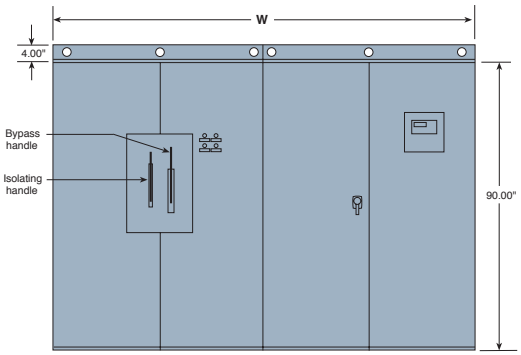

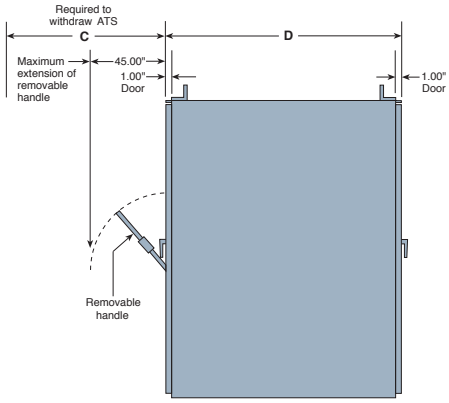

100-3000 AMP ENCLOSED FREESTANDING SWITCHES | A

Switch Rating *amps*	Switched Poles	Dimensions *inches* W	C	D	Lug Size: Source 1, Source 2, and Load[1] *per phase and neutral*	Approximate Shipping Weight[2] *pounds*
100	2 or 3 / 4	32 / 36	32 / 36	39	(1) #14—1/0	1250 / 1300
150	2 or 3 / 4	32 / 36	32 / 36	39	(1) #6—250 MCM	1300 / 1350
225	2 or 3 / 4	32 / 36	32 / 36	39	(1) #4—600 MCM or (2) #1/0—250 MCM	1350 / 1400
260	2 or 3 / 4	32 / 36	32 / 36	39	(1) #4—600 MCM or (2) #1/0—250 MCM	1400 / 1450
400	2 or 3 / 4	32 / 36	32 / 36	39	(1) #4—600 MCM or (2) #1/0—250 MCM	1500 / 1550
600	2 or 3 / 4	32 / 36	32 / 36	39	(2) #4—500 MCM	1600 / 1650
800	2 or 3 / 4	32 / 36	32 / 36	39	(2) #4—600 MCM or (4) #1/0—250 MCM	1700 / 1750
1000	2 or 3 / 4	36 / 42	45	59	(4) #4—600 MCM or (8) #1/0—250 MCM	2200 / 2500
1200	2 or 3 / 4	36 / 42	45	59	(4) #4—600 MCM or (8) #1/0—250 MCM	2400 / 2700
1600	2 or 3 / 4	36 / 42	45	59	(5) #4—600 MCM or (10) #1/0—250 MCM	2700 / 3000
2000	3 / 4	36 / 42	45	59	(6) #4—600 MCM or (12) #1/0—250 MCM	3100 / 3400
2500	3 / 4	36 / 42	45	66	(6) #4—600 MCM or (12) #1/0—250 MCM	3500 / 3800
3000	3 / 4	46 / 55	45	66	(8) #4—600 MCM or (16) #1/0—250 MCM	4000 / 4300

4000 AMPERES | B

Switch Rating *amps*	Switched Poles	Dimensions *inches* W	C	D	Lug Size: Source 1, Source 2, and Load[1] *per phase and neutral*	Approximate Shipping Weight[2] *pounds*
4000	3 / 4	108 / 130	65	72	(10) #4—600 MCM or (20) #1/0—250 MCM	9500 / 10500

[1] All lugs are mechanical type suitable for copper or aluminum cable. Ground lugs provided to NEC.

[2] Weights shown are approximate and may vary according to number and types of accessories specified.

NOTES:

NEMA 1 enclosed bypass/isolation switches are available with:

- 2-, 3-, or 4-pole construction.
- Single-operator or dual-operator.

Dimensions are typical, not for construction. Dimensions of 2-pole switches are identical to those of 3-pole switches.

Rear or side access required. Consult factory if switch is accessible from front only.

Conduits may enter top or bottom.

Accessories

	Following is a list of common accessories. For a complete list, consult factory.
VFS1	Programmable under-voltage sensing of Source 1 to restore at 90% and fail at 80%, range from 100% to 115%. Under-frequency sensing, adjustable from 45.0 Hz to 59.9 Hz. Failure set at 59.0 Hz and restore set at 59.5 Hz. Over-voltage and over-frequency sensing.
VFS2	Programmable under-voltage sensing of Source 2 to restore at 90% and fail at 80%, range from 100% to 115%. Under-frequency sensing, adjustable from 45.0 Hz to 57.0 Hz. Failure set at 54.0 Hz and restore set at 57.0 Hz. Over-voltage and over-frequency sensing.
TDES	Time delay of engine start signal to prevent transfer in the event of momentary Source 1 power outage.
TDPS	Time delay on retransfer to Source 1.
TDNPS	Time delay on transfer to Source 2.
TDNNP	Time delay to control contact transition time from neutral to Source 2.
TDNP	Time delay to control contact transition time from neutral to Source 1.
TDEC	Engine overrun to provide unloaded engine operation after retransfer to Source 1 (delay for engine cooldown).
ELEVATOR CONTACT	Elevator pre-signal contacts open prior to transfer in either direction, can be configured in one of the following ways: (1) Once transfer is initiated, contacts close after an adjustable time delay (0 seconds to 60 minutes); (2) After time delay (0 seconds to 60 minutes), transfer is initiated. Contacts close immediately after transfer; (3) After time delay (0 seconds to 60 minutes), transfer is initiated. Contacts close after an adjustable time delay (0 seconds to 60 minutes).
EXF	The mode of operation of the exerciser function can be selected with a time base of 1 day, 7 days, 14 days, 28 days, or 365 days. With a time base of 365 days, up to 24 events can be scheduled. With all other time bases, the number of exercise events is limited to 7.
XF8	Programmable function to bypass time delay on retransfer to Source 1.
XL14	2-position lever-operated preferred source selector switch to select either Source 1 or Source 2 supply as the preferred source. (1) Legend plate marked: “SOURCE 1” - “SOURCE 2”. (1) Nameplate marked: “PREFERRED SOURCE SELECTOR SWITCH”.
CS1P	(1) Auxiliary contact closed in Source 1 position, wired to terminal strip for customer connection.
CS2P	(1) Auxiliary contact closed in Source 2 position, wired to terminal strip for customer connection.
CES	Form “C” contact to initiate engine starting or other customer functions.
CS1A	(1) Source 1 status relay with Form “C” contact to indicate Source 1 availability.
CS2A	(1) Source 2 status relay with Form “C” contact to indicate Source 2 availability.
LT1	Green LED on Operator Interface Panel to indicate switch in Source 1 position.
LT2	Red LED on Operator Interface Panel to indicate switch in Source 2 position.
LT3	Green LED on Operator Interface Panel to indicate Source 1 power available.
LT4	Red LED on Operator Interface Panel to indicate Source 2 power available.
LT16	Green LED to indicate load bypassed to Source 1. Isolating contacts closed, transfer switch energized. (1) Nameplate marked: “BYPASSED TO SOURCE 1 SUPPLY”.
LT17	Red LED to indicate load bypassed to Source 2. Isolating contacts closed, transfer switch energized. (1) Nameplate marked: “BYPASSED TO SOURCE 2 SUPPLY”.
LT18	Amber LED to indicate transfer switch isolated. Isolating contacts open, transfer switch bypassed and isolated. (1) Nameplate marked: “ATS ISOLATED”.
LT20	Red LED on Operator Interface Panel to indicate transfer inhibit.
LT21	Red LED on Operator Interface Panel to indicate alarm condition.
XF20	Lamp test function to test all LEDs or Operator Interface Panel.
EMO	External Manual Operator.

Russelectric

Power Control People You Can Rely On

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