

Medium-Voltage Circuit Breaker-Type Automatic Transfer Switches and Bypass/Isolation Switches

RTS SERIES



Russelectric
POWER CONTROL PEOPLE YOU CAN RELY ON

RTS Series Medium-Voltage Circuit Breaker-Type Automatic Transfer

Circuit breaker medium-voltage automatic transfer switches and bypass/isolation switches are tested, listed, and labeled by UL under UL 1008A – Over 600 V

Ruselectric RPTCS programmable microprocessor-based control system

Metal-clad construction

3-pole construction



UL Tested, Listed, and Labeled Medium-Voltage Automatic Transfer Switches

Ruselectric was the industry leader in obtaining UL listing for its medium-voltage transfer switchgear. All Ruselectric RTS Series circuit breaker automatic transfer switches have been fully UL tested, listed, and labeled under UL 1008A. In addition, all Ruselectric medium-voltage transfer switchgear (operating above 600 volts

and below 15 kV) is listed per UL category “Circuit Breakers and Metal-Clad Switchgear – Over 600 Volts (DLAH)”. It is also designed, manufactured, and tested to meet or exceed stringent IEEE, NEMA, and ANSI standards.

Ruselectric RTS Series medium-voltage ATs are rugged, high-speed switching devices designed to transfer electrical loads from a normal

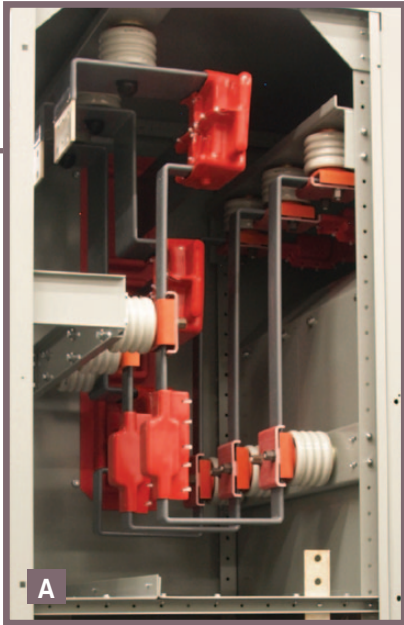
power source to an emergency power source upon reduction or loss of voltage and to retransfer loads when normal power is restored.

Supervised by the advanced RPTCS microprocessor control, Ruselectric Medium-Voltage Circuit Breaker Automatic Transfer Switches direct the flow of electric power through the carefully timed opening/closing of circuit breakers.

Ratings: Circuit Breaker-Type Medium-Voltage Automatic Transfer Switches

Ratings	Continuous Current Rating <i>Amperes</i>			
	1200 A	2000 A	1200 A	2000 A
Voltage Class <i>kV</i>	5	5	15	15
Short-Circuit Withstand <i>kA_{rms}</i>	40 or 50	40 or 50	25, 40, or 50	25, 40, or 50
Power Frequency <i>hz</i>	60	60	60	60

Switches and Bypass/Isolation Switches



Designed, for Maximum Safety and Operating Simplicity

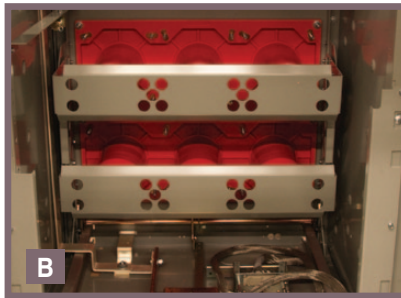
Switches are designed to provide maximum protection for operators and maintenance personnel and to minimize the danger of operator error. Drawout modules, metal-clad construction, segregation of controls from power elements, and separately accessible grounded compartments are all part of Russelectric's design safety philosophy.

All switches are designed for unattended automatic operation, but include controls for manual operation. Designs provide accessibility for maintenance, troubleshooting, and component replacement.

All switches are factory tested for functionality prior to shipment. Interconnect wiring diagrams enable proper interfacing of switches with the prime mover and other equipment.

Buswork | A

All bus is formed, cut, and punched before being insulated with high-dielectric epoxy coating to guarantee the integrity of the insulation and ensure maximum performance. Busbars pass through track-resistant, polyester glass barriers between cubicles. Main bus joints have silver-plated connections and are insulated with preformed boots.



Drawout Circuit Breakers | D

All circuit breakers are enclosed in drawout compartments. Self-aligning mating contacts ensure proper connections. Safety interlocks and closed door racking are standard. Stationary contacts have automatic shutter covers for safety.

Current Transformers

When provided, current transformers are located behind an automatic shutter barrier that isolates the primary disconnects when the breaker is in the disconnect position. Up to 12 CTs per breaker can be accommodated — 2 per phase on both the line and load sides. CTs are front-accessible when the shutter barrier is removed.

Potential Transformers | B

All potential transformers are housed on a drawout trunnion. They are barrier-protected to prevent flashover.

Instrument and Control Wiring | C

Flame-retardant SIS switchboard-type instrument and control wiring is neatly harnessed and labeled at both ends with permanent sleeve markers. Premium-quality cage clamp connectors ensure wiring consistency and ease of



troubleshooting. Instruments, control devices, and wiring are separated from high-voltage compartments by grounded metal barriers.

Bus/Cable Connection Compartment

Two-breaker vertical cable compartments have space for termination of two 750 MCM cables per phase. Compartments can be factory-configured with power cable exits top or bottom. Solderless compression cable connectors and boots are provided.

Rugged Enclosures

Every Russelectric enclosure is built to NEMA standards from heavy-gauge steel with gussets and reinforcements for strength and rigidity. All have tough, electrostatic powder coated finishes for corrosion resistance. Standard indoor enclosures or weatherproof outdoor enclosures can be furnished.

Backed by 24-Hour Factory Field Service

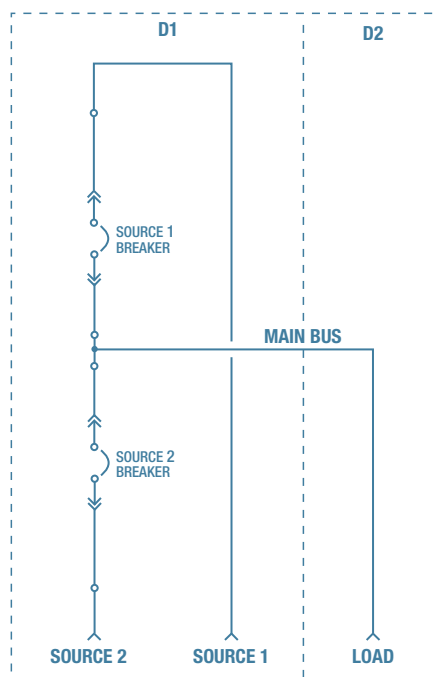
Russelectric's reliable equipment designs are backed by a factory-direct field service organization available on a 24-hour, 365-day basis.

Medium-Voltage Circuit Breaker Automatic Transfer Switches

Sequencing of circuit breakers allows for open- or closed-transition transfer

Adjustable center-off time delay

Russelectric RPTCS programmable microprocessor-based control system



Configurable for Open- or Closed-Transition Transfer

Switches may be configured for open- or closed-transition transfer.

For either configuration, if the primary source is lost, the control initiates an open-transition transfer to the emergency source by tripping the breaker from the primary source and closing the breaker to the emergency source.

For open-transition transfer, once power has been restored, retransfer to normal is accomplished by reversing this process — first tripping the breaker from the emergency source and then closing the breaker to the primary source.

For closed-transition retransfer to the normal source, the RPTCS control's power monitoring functions ensure that both sources are within an acceptable window of synchronism before effecting a closed-transition retransfer to the normal source by first closing the normal source breaker and then opening the emergency source breaker.

Adjustable Center-Off Time Delay

In open-transition transfers between two live sources where large inductive loads are involved, induced voltage transients can result in a lack of synchronism between the sources, causing a bump upon transfer. A time delay between the opening of the primary source breaker and the closing of the secondary source breaker allows these voltage transients to decay. This center-off delay is factory preset at 3 seconds, but can be adjusted via the RPTCS control.

Center-off positioning is ideal for load-shed control schemes.

Medium-Voltage Circuit Breaker Bypass/Isolation Switches

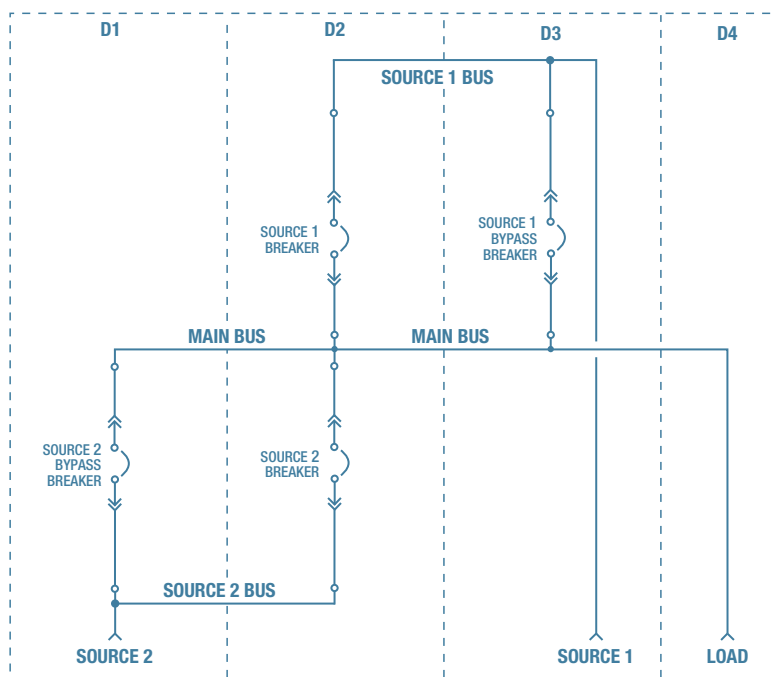
Manual bypass/isolation capability allows emergency ATS bypass, maintenance and testing

Compartmentalized design ensures personnel safety and simplifies installation

Selector switch allows for load-break or no-load-break bypass operation

Sequencing of circuit breakers allows for open- or closed-transition transfer

Russelectric RPTCS programmable microprocessor-based control system



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

Russelectric RTS Series Medium-Voltage Circuit-Breaker Bypass/Isolation Switches provide all the functions of an automatic transfer switch plus the ability to bypass power from a live source to load in the event the transfer switch becomes disabled. In addition, they are designed to allow isolation and de-energization of the automatic transfer breaker for maintenance, testing, or repair.

Selectable Load-Break or No-Load-Break Bypass

Operator can easily choose between load-break bypass or no-load-break bypass by means of a selector switch on the front of the control cubicle.



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 VGA 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

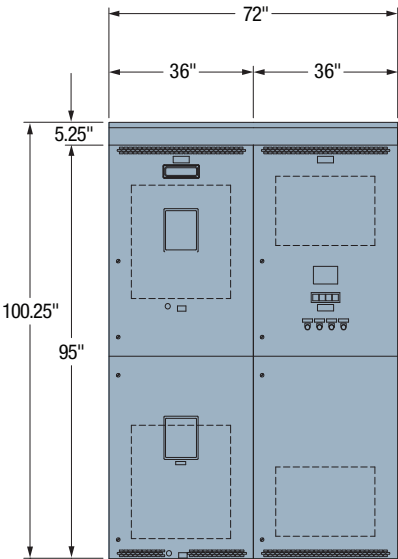
of monitored conditions in color-coded banners at the top of the screen including faults and alarms, inhibits, and informational messages.

The RPTCS controller supports the following communication protocols: Modbus RTU (standard) or Modbus TCP/IP via 10/100Base-T Ethernet (available). With the Russelectric DTWG Web Server Communications Gateway accessory, the RPTCS can also accommodate web-based digital and analog I/O serial communications over industrial fieldbus networks using other protocols.

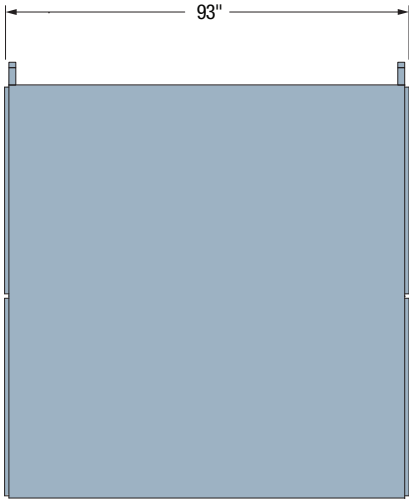
An external communications port on the controller's faceplate allows fast, easy connection to electronic devices.

Controller design accommodates the addition of accessories.

Automatic Transfer Switches

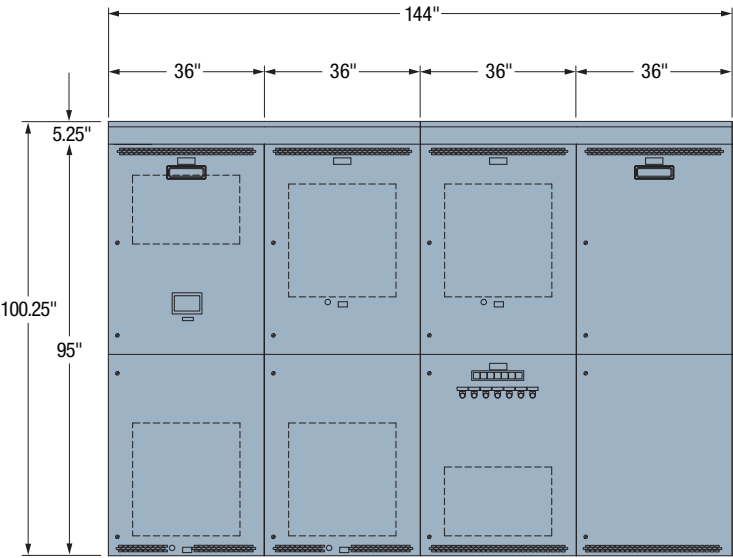


Front

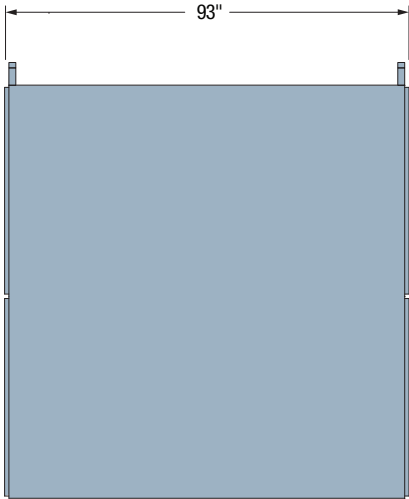


Side

Bypass/Isolation Switches



Front



Side

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.
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.