

### Transfer Switch Types

Although an automatic transfer is the most common type of transfer, transfer switches have the following types.

#### Switch Types

**Manual transfer**—This type of transfer is a non-automatic transfer switch manually initiated and manually operated. There is no motor operator or solenoid to initiate the transfer. The operator needs to open the enclosure door and operate the manual handle. Manual transfer is available only on a breaker-based design. Service entrance ratings are not available on manual transfer breaker-based designs.

**Non-automatic transfer**—This type of transfer is manually initiated, but electrically operated via the solenoid in a contactor-based design and the motor operator in a breaker-based design.

**Automatic transfer**—This type of transfer takes place automatically per the programmable settings in the ATS controller. The ATS controller senses source availability and when the programmed conditions are met, initiates a command to start the transfer including the generator start command (when transferring from a utility to a generator source). An automatic transfer switch can be configured to perform a utility-to-utility transfer or a generator-to-generator transfer (provided the ATS controller has this capability).

**Bypass isolation transfer switch**—This type of transfer switch includes an automatic transfer switch and also includes the bypass switch that allows the capability to transfer the load to the bypass switch without interrupting the power.

**Maintenance bypass transfer switch**—A maintenance bypass transfer switch is a manually (manually initiated and electrically operated) initiated transfer switch used for specific applications for a UPS.

**Soft load transfer switch**—This is an automatic closed transition transfer switch with active control of the generator voltage and governor frequency from the transfer switch controller.

#### Mounting Type

**Fixed-mount switch**—Most transfer switches use a fixed-mounted power device. For contactor-based designs and breaker-based designs, the transfer switch contactor or molded-case switch is a fixed-mounted design. Individual switching devices may not be removed from the circuit without breaking hard connections to bus bars.

**Drawout mount switch**—Both contactor-based and Magnum-based transfer switches have optional drawout capability. Magnum ATSs have optional drawout of both Source 1 and Source 2 Magnum power case switch or breaker. Bypass isolation switches have drawout ATS switches. In addition the bypass isolation contactor design has an optional dual drawout design. Magnum bypass isolation transfer switches are supplied as standard with drawout of all the power-case switches.

#### Transition Type

**Open transition**—This is a “break-before-make” transfer. There is a definite break in power as the load is taken off one source and connected to the other source.

**Open in-phase transition**—This is a “break-before-make” transfer. There is a definite break in power as the load is taken off one source and connected to the other source. The ATS controller allows the transfer only when the phase difference between the two sources is near zero. The two position transfer switch is closed on Source 1 or closed on Source 2.

**Delayed transition**—This is a “break-before-make” or open transition that also has a “center off” or neutral position with a programmable time delay setting for the neutral position. The three position transfer switch is either closed on Source 1, closed on Source 2, or in a center off, neutral position (not closed on either source).

**Delayed transition with load voltage decay**—This is a delayed transition with the optional feature to delay in the neutral position to point where the load voltage decays to a programmable voltage level. When the load voltage level reaches the programmable set point, the transfer from the neutral position initiates.

**Closed transition**—This is a “make-before-break” transfer. Both sources are connected to the load for less than 100ms before the break occurs. The two power sources have to be in synchronism and be good sources for the transfer to take place. These programmable settings for relative phase angle difference, frequency and voltage difference are made in the ATS controller.

**Soft load transition**—This is a closed transition type transfer with the soft load ATS controller having the ability to take active control of the generator voltage and frequency. This control is used to synchronize the generator source to the utility source.

Table 25.0-4. Transition Types

Transition	Contactor-Based		Breaker-Based	Magnum-Based
	Two Position	Three Position		
Open	Yes	Yes	Yes	Yes
Open in-phase	Yes	No	No	Yes
Delayed time delay neutral	No	Yes	Yes	Yes
Delayed load voltage decay	No	Yes	Yes	Yes
Closed	Yes	Yes	No	Yes
Soft load	No	No	No	Yes