Sarel Electronics Ltd.

Power Electronic, Controls and More

Solid State Transition Transfer Switch (SSTTS):

Mission Critical Load Switching

An Operational Description

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SOLID STATE TRANSITION TRANSFER SWITCH (SSTTS GENERAL DESCRIPTION

The **Sarel Electronics Solid State Transition Transfer Switch (SSTTS)** is a merger of modern uninterrupting static transfer technology with the traditional solenoid operated electro-mechanical transfer switch (ATS). The SSTTS transfers critical loads between "Primary" and "Alternate" sources, without interruption ***and without closed transition source interconnection*.** The SSTTS product line is available in sizes from 200A up to 4000A in a wide range of voltages from 208v to 600v. The SSTTS' system uses a standard electro-mechanical automatic transfer switch (ATS). For **customers who demand the maximum in power system security**, a **bypass/isolation switch is available in a SSTTS configuration.** Certain models of currently installed ATS units may be suitable for upgrading to SSTTS operation.

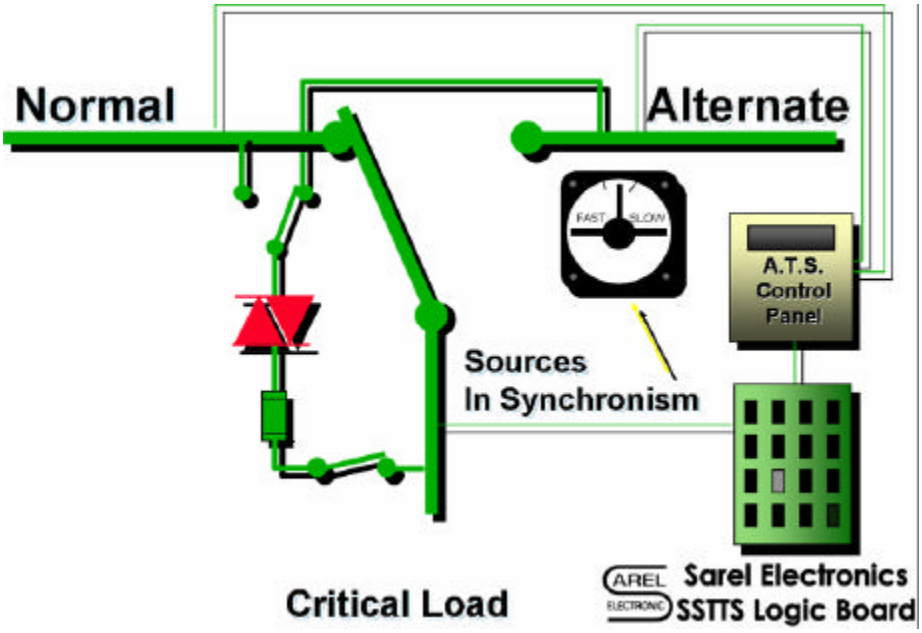


Figure 1 - An SSTTS in a configuration with an ATS. This figure illustrates the basic topology of such a setup. Note that an SSTTS can also be configured in a maintenance bypass switch (mbp) and other hybrid configurations.

OPERATION

The Solid State Transition Transfer Switch operates in two distinct modes. These are “Automatic” and “Solid State Transition Enabled (Enabled)”. For maintenance purposes the SSTTS has an “Off/Reset” key operated selector switch. A conventional ATS, as part of the SSTTS system, remains working at all times as protection against total loss of utility power.

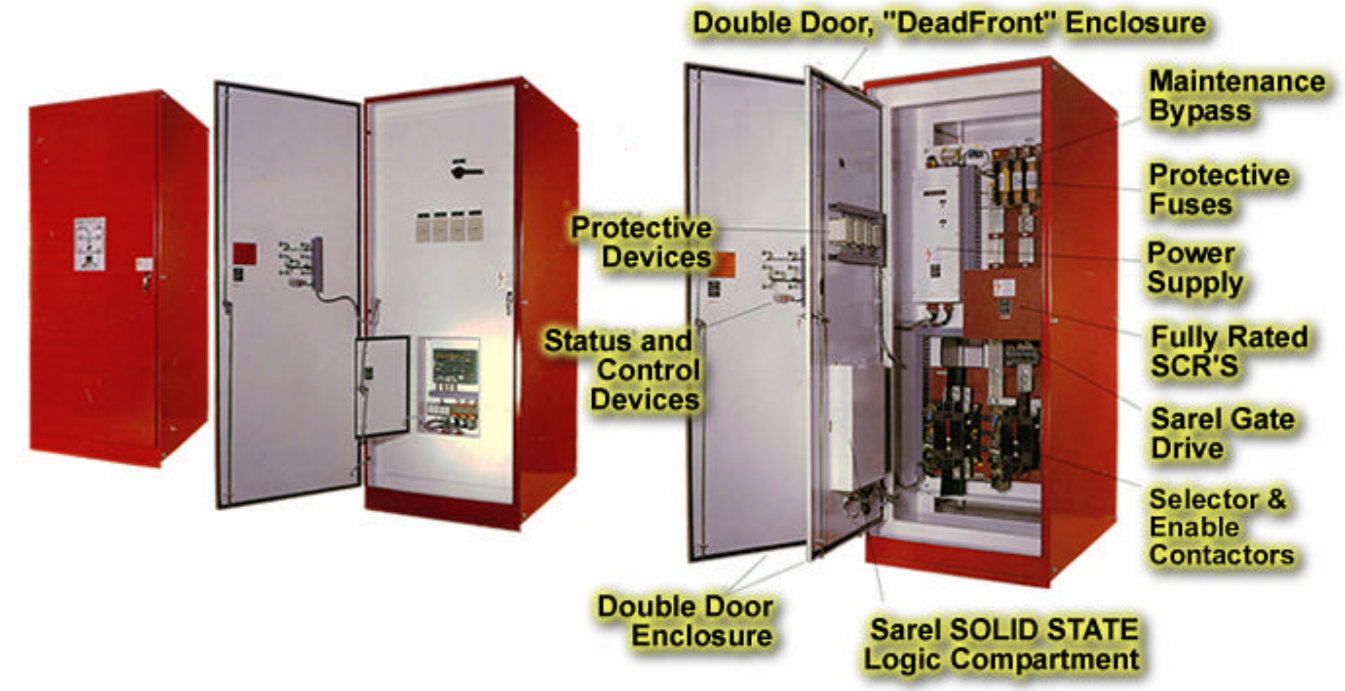
OPERATIONAL MODES

Automatic Mode

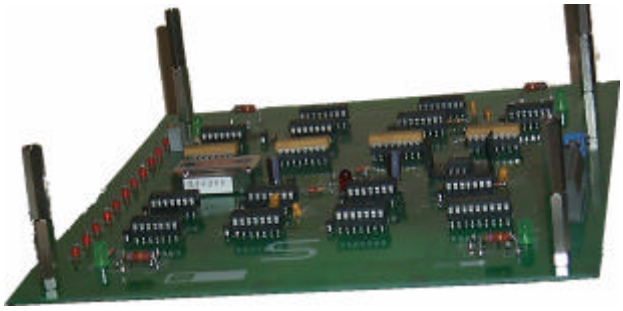
- SSTTS functions as a standard electro-mechanical transfer switch.
- Automatic response to loss of normal power by starting diesel generator set and transferring the load to this alternate power source.
- Return to the normal power source may also operate in the automatic mode.
- Because automatic mode operation is akin to a conventional transfer switch, momentary interruption of power to the load will occur both on the original loss of power (~4-10 seconds) and again upon retransfer (50 – 500 milliseconds).

Enabled Mode

- Enables Solid State Transition – the SSTTS acts as an uninterruptible switch
- Automatic response to loss of normal power by sending “generator start” signal if an alternate source is not immediately available. When adequate voltage and frequency are present, sensing circuitry signals the SSTTS that “Load Uninterrupted Transfer” operation is enabled. When the normal source and alternate source phase relationships are within the operating tolerance window, the electro-mechanical switch begins to operate. Ultra high speed circuitry detects seoaratuib if the mechanical contacts and instantly turns on the solid state power components that maintain uninterrupted power to the load (during the latent and switching period of the transfer). External synchronizing equipment between the two sources is not a requirement.
- Since the solid state power components only conduct power during the actual mechanical switching interval (typically 50 milliseconds), dissipation of heat is not a factor in the overall unit design. Consequently, lifespan of all **power components, including the semiconductors is greatly enhanced when compared to that of a purely solid state design**. Except for the brief transfer interval, all of the power will flow through the massive contact structure of the electro-mechanical transfer switch.
- Retransfer to the normal source is accomplished in precisely the same fashion, once again providing uninterrupted transfer of power to the load.
- **No loss of power to the critical load occurs during the transfer operation.** The effective operation appears as though a closed transition transfer (the connection of normal, alternate and load contacts) has taken place. Be assured, the SSTTS is an open transition switch. The load is fed from only one source at any one time. It is the high speed operation of the SSTTS that makes this possible.



An SSTTS Configuration with Components



The heart of the SSTTS, the ***Sarel Electronics*** *SSTTS Logic Board*

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