

# PROTECT STS

## TRANSFER SWITCH

63 A, 150 A, 250 A, 400 A 2 poles  
63 A, 150 A, 250 A, 630 A, 1000 A 3 poles  
63 A, 150 A, 250 A, 630 A, 1000 A 4 poles  
63 A, 2 poles, 3 poles and 4 poles  
as 19 inch rack version



Modern data and telecommunication systems require a power supply with maximum reliability and availability. Down-times are not acceptable nowadays, even during maintenance the redundancy has to be ensured. The Protect STS offers the possibility to switchover between two independent AC power sources.

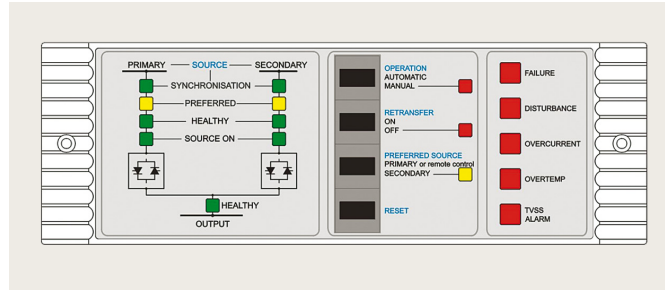
### Protect STS provides an effective solution for redundancy

- » Complete separation of the two power sources including associated input lines
- » Separation of the load to protect against mutual disturbances
- » Supplies loads from two sources (e.g. UPS which are different power ratings and types)

### Key features

- » Three redundant power supplies
- » User friendly control panel
- » Fail-Safe CMOS logic
- » Internal redundancy for power supply systems and SCR drivers
- » Easy to install
- » Easy to operate
- » Low installation and maintenance costs
- » Manual bypass
- » Neutral dimensioned for 200 % of nominal current

# POWER SAFETY



## Application

Static Transfer Switches (STS) are designed to transfer supply between independent one-phase or three-phase AC power sources.

Unlike traditional automatic transfer switches (ATS), STS provides 20 times faster load transfer (typically 1/4 of a cycle), which ensures the uninterrupted operation of even the most sensitive electronic equipment.

Load retransfer to preferred input source is virtually instantaneous (typically 100  $\mu$ s). The basic applications of STS are in automatic systems for the power industry, computer and telecommunication centres, automation and security systems of 'intelligent' buildings as well as other equipment which is highly sensitive to supply interruption.

Its high overload capacity and transfer algorithm enables rapid fuse blowing during short-circuits. As a consequence the voltage immediately returns to normal value to supply other loads. The built-in transient voltage surge suppression system for SCR switches provides additional protection against damage to supplied devices.

## Control panel

All Protect STS are equipped with LED indicators and control panel. Three buttons on the Control Panel determine the current operation mode:

- OPERATION,
- RETRANSFER and
- PREFERRED SOURCE.

The STS operates in one of the following three modes:

### Preferred source mode

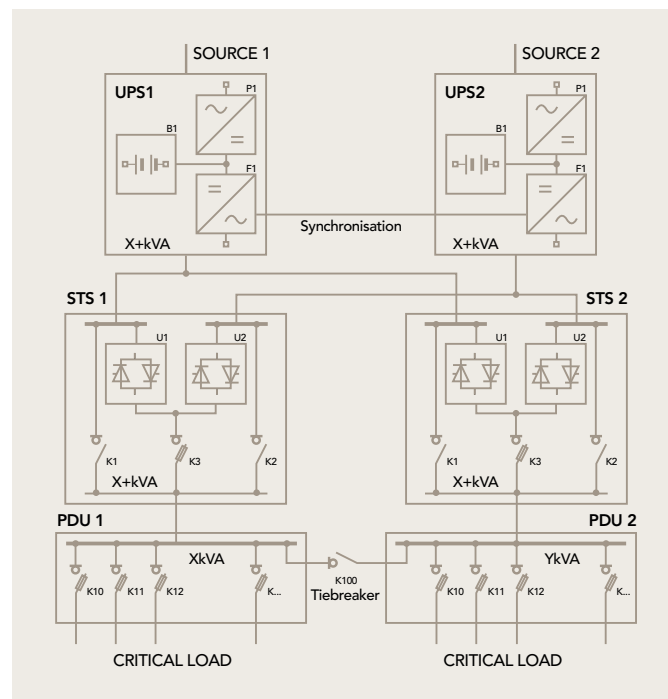
The selected preferred source supplies the load. The load is transferred to the other source if the voltage of the preferred source is outside acceptable range.

### Automatic retransferring mode

After a transfer triggered by disturbances in the preferred source, the load is transferred again to the preferred source with a delay (time is set by dipswitches) if the preferred source is healthy again.

### Manual mode

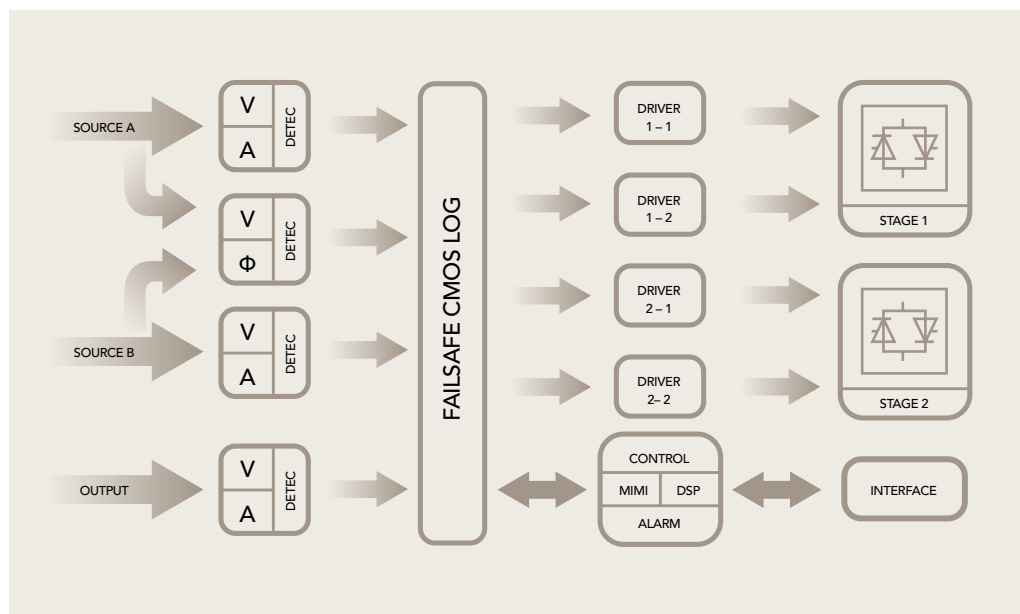
Connections are set manually (not automatically).



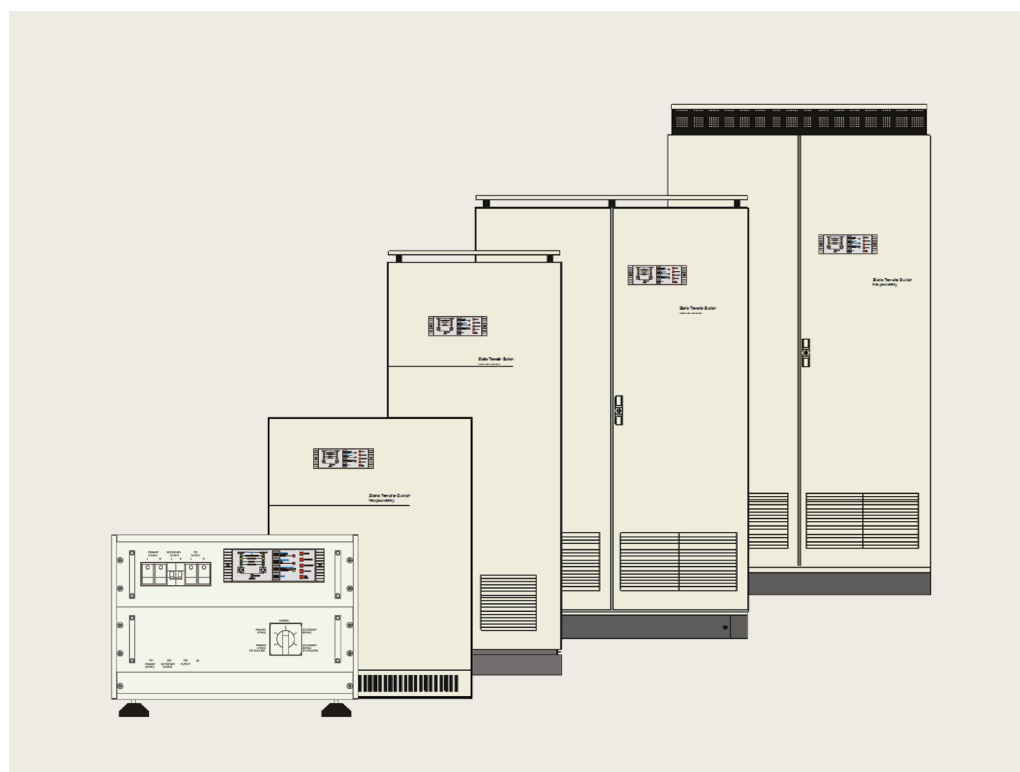
Typical application with UPS and STS

# APPLIED STANDARDS

Standards	European Standards description
EN 60950	Safety of information technology equipment, including electrical business equipment
EN 50178 (project)	Equipment of power plants with electronic resources
IEC 600076	Power transformers
IEC 60146-1-2	General requirements and line commutated converters
IEC 60529	Degrees of protection provided by enclosures (IP codes)
IEC 60617	Graphical symbols and diagrams
EN 50082-2	EMC requirements
DIN 41773 Part 1	Static power converters, semiconductor rectifiers equipment with IU characteristics for charging of lead acid batteries – guideline



Block diagram of Protect STS control unit



# PROTECT STS

SPECIFICATION

Model	P 3.33 – 10	P 3.33 – 20
<b>INPUT</b>		
Rated input voltage	3 x 400 VRMS phase to phase	TN-C, TN-S
Acceptable changes of input voltages	-25 % +20 %	
Frequency	50 Hz	
Acceptable changes of frequency	9 % +6 %	
Voltage surge withstand	<1.5 kV	Limp 15 kA 8 / 20 $\mu$ s
Voltage insulation	AC 2 kV 60 s	–
Efficiency	>99	Cos ( $\varphi$ ) >0.8
<b>OUTPUT</b>		
Nominal output current	63 A, 150 A, 250 A, 400 A 2 poles 63 A, 150 A, 250 A, 630 A, 1000 A 3 poles 63 A, 150 A, 250 A, 630 A, 1000 A 4 poles 63 A 2 poles, 3 poles and 4 poles as 19 inch rack version	
Maximum crest factor	3.5	
Power factor cos ( $\varphi$ )	0.5 – 1	Lag, lead
Voltage surge withstand	<1.5 kV <1.0 kV	For limp 15 kA 8 / 20 $\mu$ s For limp 5 kA 8 / 20 $\mu$ s
Overload capacity	125 % 400 % 800 % 1000 % 1500 %	t=1 h t=5 s t=0.4 s t=0.2 s t=20 ms
Short-circuit strength of thyristor switches	3 kA / 20 ms 8 kA / 20 ms 15 kA / 20 ms 28 kA / 20 ms	I <sub>n</sub> =63 A I <sub>n</sub> =150 A I <sub>n</sub> =250 A, 400 A I <sub>n</sub> =630 A
Fuse interrupting capacity	50 kA	
<b>OPERATIONAL PARAMETER</b>		
Preferred source selection	Primary source or Secondary source	With retransfer or without retransfer after disturbance clears
Remote preferred source selection	Primary source or Secondary source	Remote relay selection for preferred source
Over voltage level setting	+6 % +9 % +13 % +16 % +20 %	Transfer is performed when voltage value crosses the level. Programmed by DIP switch selection
Under voltage level setting	-8 % -12 % -16 % -20 % -24 %	Transfer is performed when voltage value crosses the level. Setting by DIP switch
Phase delay limit for synchronised lines	$\pm 8^\circ$ $\pm 12^\circ$ $\pm 16^\circ$ $\pm 20^\circ$ $\pm 24^\circ$	Setting by DIP switch
Switching interlock for output over current	3 I <sub>n</sub> 4.5 I <sub>n</sub> 6 I <sub>n</sub> 7.5 I <sub>n</sub> 9 I <sub>n</sub> No interlock	Setting by DIP switch
Manual transfer time for synchronised lines of a phase error within the limits	<0.2 ms	–
Automatic transfer time for synchronised lines of a phase error within the limits	<6 ms	–
Transfer delay in manual or automatic mode without synchronization	13 ms 17 ms 25 ms 50 ms	Setting by DIP switch
Retransfer to preferred line delay with both lines operational	0.9 s 1 s 8 s 25 s	Setting by DIP switch (both lines healthy)

# PROTECT STS

SPECIFICATION

Model	P 3.33 – 10	P 3.33 – 20
<b>ALARMS</b>		
<b>Failure alarm</b>	Relay	Fuse failure, overload, over temperature, internal STS failure
<b>Disturbance alarm</b>	Relay	Primary source not healthy, secondary source not healthy, lack of synchronization, transient voltage surge, suppression alarm, manual control ON, automatic retransfer OFF
<b>Manual ON</b>	Relay	Service operation
<b>Retransfer OFF</b>	Relay	Retransfer to preferred line is not performed
<b>Primary source OK</b>	Relay	Indicating if primary source is healthy
<b>Secondary source OK</b>	Relay	Indicating if secondary source is healthy
<b>Primary source ON</b>	Relay	Indicating if primary source is active
<b>Secondary source ON</b>	Relay	Indicating if secondary source is active
<b>ALARM CONNECTORS PARAMETERS</b>		
<b>Maximum operational voltage</b>	300 VDC or 250 VAC	–
<b>Maximum current</b>	4 A for 220 VAC 0.3 A for 220 VDC	–
<b>COMMUNICATION INTERFACE</b>		
<b>Optional</b>	RS232/RS485	–
<b>ENVIRONMENTAL</b>		
<b>Operating temperature</b>	0 to 40 °C	–
<b>Storage temperature</b>	0 to 40 °C	–
<b>Humidity</b>	Max. 98 %	Without condensation
<b>Maximum altitude</b>	1000 m	–
<b>Cooling</b>	Natural, forced with built-in fan redundancy	For I <sub>n</sub> =63 A For I <sub>n</sub> =150 A, 250 A, 400 A, 630 A
<b>Acoustic noise</b>	Below 55 dBA	–
<b>Protection</b>	IP20	–
<b>EMC</b>	Class B	EN55022, EN60555-2,3

# PROTECT STS

DIMENSIONS AND WEIGHTS

Type	Rating (Amp)	W (mm)	Dimensions H (mm)	D (mm)	Weight (kg)
<b>2 POLES STANDARD</b>					
STS-230-63-2P	63	507	375	480	33
STS-230-150-2P	150	800	1100	400	105
STS-230-250-2P	250	800	1950	506	225
STS-230-400-2P	400	800	1950	506	280
<b>2 POLES RACK MOUNT</b>					
STS-230-63-2P-RM incl. MB	63	483	267	415	22
<b>3 POLES STANDARD</b>					
STS-400-63-3P	63	800	1100	400	110
STS-400-150-3P	150	800	1950	506	225
STS-400-250-3P	250	800	1950	506	260
STS-400-400-3P	400	1200	1950	506	365
STS-400-630-3P	630	1200	2240	606	420
STS-400-1000-3P	1000	1200	2240	806	900
<b>3 POLES RACK MOUNT</b>					
STS-400-63-3P-RM	63	483	730	479	50
<b>4 POLES RACK MOUNT</b>					
STS-400-63-4P	63	800	1100	400	110
STS-400-150-4P	150	1200	1950	506	320
STS-400-250-4P	250	1200	1950	506	390
STS-400-400-4P	400	1200	2155	606	450
STS-400-630-4P	630	1200	2240	606	520
STS-400-1000-4P	1000	1800	2240	806	1200
<b>4 POLES RACK MOUNT</b>					
STS-400-63-4P-RM	63	483	730	479	55

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## AEG Power Solutions

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