

Technical Specifications

**MGE™ Epsilon™ STS
200/400/600 A 208 V**



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Technical Data

Model List

<ul style="list-style-type: none">• MGE Epsilon STS 200 A	
<ul style="list-style-type: none">• MGE Epsilon STS 400 A• MGE Epsilon STS 600 A	

Efficiency at 100% In

	208 V	480 V	600 V
200 A	97.76%	99.01%	99.20%
400 A	97.71%	99.00%	99.19%
600 A	97.75%	99.02%	99.21%

Communication and Management

The relay communications card contains six programmable dry contact outputs and two programmable dry contact inputs, and is standard on the Epsilon STS. The inputs and outputs are factory programmed according to functions listed below.

Contact	Factory Setting	Options
Input		
1.A	Select source S1 as preferred	Reset memorized faults Select source S1 as preferred Select source S2 as preferred Enable automatic retransfer Disable automatic retransfer Enable transfers Disable transfers
1.B	Select source S1 as preferred	
Output		
1.1	Power supplied to the load	Power supplied to the load Summary alarm (source or STS fault) STS fault Source S1 out of tolerance Source S2 out of tolerance Sources out of phase Source S1 active Source S2 active Source 1 is preferred source Automatic transfer disabled Overload condition
1.2	Summary alarm (source or STS fault)	
1.3	STS fault	
1.4	Overload condition	
1.5	Source S1 out of tolerance	
1.6	Source S2 out of tolerance	

Characteristics of the Input Contacts

Switched voltage	5 VDC
Consumption	10 mA
Cable	4x22 AWG, hole diameter 0.2 inch ± 0.02 inch

Characteristics of the Output Contacts

Relay type	Normally Open
Max voltage	250 VAC, 30 VDC
Max current	2A
Cable	4x18 AWG, cover plate hole diameter 0.26 inch ± 0.01 inch

Compliance

- IEEE 587–1980/ANSI C62.41 for Cat. B3, 1980 Standards for Surge Withstand Ability
- FCC rules and regulations of Part 15, Subpart J, Class A, EN50081–2 (use shielded cables)
- UL listed under 1008, Standards for Transfer Switch Equipment
- NEMA PE 1 — Uninterruptible Power Systems
- NEMA 250 — Enclosures for Electrical Equipment (1000 Volts Maximum)
- NFPA 70 — National Electrical Code
- ISO 9001 Quality Assurance, NEC, ANSI, NEMA, NFPA, IEEE
- Occupational Safety & Health Administration (OSHA)

Facility Planning

AC Input Specifications

Nominal Input Voltage	208, 220, 240, 440, 480, 575, 600 V +/-15%
Maximum operating voltage	690 V (600 V +15%)
Minimum operating voltage	177 V (208 V -15%)
Connection Type	3-phase 3-wire plus ground 3-phase 4-wire plus ground
Maximum Continuous Current	200, 400, 600 A
Molded Case Switch Rating	250, 400, 600 A
Rated Frequency	50 or 60 Hz
Maximum frequency	66 Hz (60 Hz +10%)
Minimum frequency	45 Hz (50 Hz -10%)
Overload Rating	150% for 15 minutes 1000% for three cycles
THDI	<10%
Voltage Transient Withstand	Up to 6 kV (6000 volt spike) per IEEE C62.41 for Cat. B3. Meets EN 50082-1 (with optional TVSS installed). Such transient levels shall not effect the operation of the STS. The STS may transfer on over-voltage conditions.
Maximum permissible short circuit power	up to 240 V: 100 kA
	up to 480 V: 65 kA
	up to 600 V : 25 kA
Harmonic Current (feedback from the load)	Unlimited



Note: The frequency of the two sources must be identical to that of the load.



Note: The devices in the Epsilon STS range do not offer galvanic isolation between sources 1, 2 and the load. Switching is carried out by SCRs.

AC Output Specifications

Nominal Output Voltage	208, 220, 240, 440, 480, 575, 600 V +/-15%
Connection Type	3-phase 3-wire plus ground 3-phase 4-wire plus ground
Rated Frequency	50 or 60 Hz
Overload Rating	150% for 15 minutes 1000% for three cycles
Output Voltage Distortion	Less than 1% added
Load Power Factor	Unity to 0.60 lagging or leading
Non-Linear Loads Capability	100% of its rating up to maximum crest factor of 3.5

Recommended Cable Sizes



Caution: All wiring must comply with all national and/or local electrical code.



Note: The recommended cable sizes are based on copper cables in an environment with an ambient temperature of 30°C (86°F)

STS Rating	Number of cables per			Minimum cable size	Cable lug (supplied)	Number of conduits	Conduit hole diameter (in)
	Phase	Neutral	Ground				
200 A	1	2	1	4/0 AWG	4/0, 3/8 in stud	3	2.5
400 A	2	4	1	250 MCM	250 MCM, 3/8 in stud	3	4
600 A	3	5	1	250 MCM	250 MCM, 3/8 in stud	3	4.5

Molded Case Switch Rating

- 250, 400, 600 A

Physical

Weight and Dimensions

STS Enclosure	Weight kg (lb)	Height mm (in)	Width mm (in)	Depth mm (in)
200 A	412.8 (910)	1828.8 (72)	635 (25)	762 (30)
400–600 A	623.69 (1375)	1828.8 (72)	990.6 (39)	762 (30)

Clearance



Note: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.

Minimum clearance in mm (in)	
Front clearance	915 (36)
Top clearance	305 (12)

Environmental

Operating Temperature	10 to 40 °C (50 to 104 °F)
Storage Temperature	-10 to 60 °C (-14 to 140 °F)
Relative Humidity	STS units can operate at relative humidity–levels of 10–95% without condensation at the ambient the ambient temperature
Maximum Operating Altitude	<= 2590.8 metres (8500 feet)
Audible Noise — 1½ meter (5 feet) from surface of unit	65 dBA at rated load
Protection Class	NEMA 1 Seismic Zone 4 rated enclosure
Recommended environment	20 to 25 °C (68 to 77 °F) at 50% relative humidity

Heat Dissipation

	208 V	480 V	600 V
200 A	5499 BTU/hr	5591 BTU/hr	5654 BTU/hr
400 A	11820 BTU/hr	11372 BTU/hr	11436 BTU/hr
600 A	16625 BTU/hr	16717 BTU/hr	16780 BTU/hr

Settings

Default Settings

Personalization accessible via panel display

Parameter (Configuration)	Setting Range	Default Setting
Nominal Voltage Rating	208 V, 220 V, 240 V, 440 V, 480 V, 575 V, 600 V	480 V
Nominal Frequency Rating	50 Hz, 60 Hz	60 Hz
Maintenance Mode	0: inactive / 1: active	0
Parameter (Transfer)	Setting Range	Default Setting
Automatic Re-Transfer Authorization	0: authorized / 1: forbidden	0
Auto-Re-Transfer Delay (Tret)	1 second to 5 minutes (1 sec. steps)	1 sec.
Transfer Break Time Delay (Ttrou)	0 second to 3 seconds (10 msec. steps)	0 msec.

Personalization accessible via J-BUS

Parameter (Advanced Configuration)	Setting Range	Default Setting
Zone	E: EMOA / N: NASA	N
Nominal Current Rating	100 A, 200 A, 400 A, 600 A	200 A
Neutral Present	0: No / 1: Yes	0
Supply starting from the load	0: No / 1: Yes	0
Transfer Abort Delay (Tno_trans) Operating Time	10 seconds to 30 minutes (1 sec. steps)	60 sec. 0
Automatic Transfer Authorization	0: authorized / 1: forbidden	0
Slow Under/Over-Voltage Delay (Tcdult)	1 msec. to 20 msec. (1 msec. steps)	10 msec.
RMS Under/Over-Voltage Delay (Tcdurms)	200 msec. to 5 seconds (100 msec, steps)	1 sec.
Detection of UV w/Overload Delay (Tcdce)	1 msec. to 20 msec. (1 msec. steps)	5 msec.
RMS Current Overload Delay (Tcsi1 10)	-	30 sec.
Regular Out-of-Sync Delay (Tdph12)	5 periods to 15 periods (1 period steps)	10 periods
Rolling Out-of-Sync Delay (Tdph12p)	1 period to 5 periods (1 period steps)	2 periods
SCR Queue Delay (Tqueue)	100 usec. to 500usec. (50usec. steps)	300usec.
Parameter (Tolerances)	Setting Range	Default Setting
Fast Over-Voltage	+20% to +32% (1% steps)	+25%
Fast Under-Voltage	-20% to -32% (1% steps)	-25%
Slow Over-Voltage	+5% to +20% (1% steps)	+10%

Slow Under-Voltage	-5% to -20% (1% steps)	-10%
RMS Over-Voltage	+5% to +20% (1% steps)	+15%
RMS Under-Voltage	-5% to -20% (1% steps)	-15%
Over-Frequency	+1% to +10% (1% steps)	+5%
Under-Frequency	-1% to -10% (1% steps)	-5%
In Phase Window	0° to ±45° (5° steps)	±15°
Peak Current Overload (Irms x Crest Factor)	(x 3.5) fixed	3500
Parameter (Hysteresis)	Setting Range	Default Setting
Fast Over/Under-Voltage Hysteresis	0% to 6% (1% steps)	3%
Slow Over/Under-Voltage Hysteresis	0% to 6% (1% steps)	3%
RMS Over/Under-Voltage Hysteresis	0% to 3% (1% steps)	1%
Over/Under-Frequency Hysteresis	0% to 5% (1% steps)	2%

Industrialization personalization

Parameter (Sensor)	Setting Range	Default Setting
Technical Voltage Gauge : CteU	208 V, 220 V, 240 V, 440 V, 480 V, 575 V, 600 V	600 V
Technical Sensor Voltage Gauge : CaptV	132 V, 140 V, 152 V, 279 V, 305 V, 365 V, 381 V	381 V
Technical Current Gauge : Cte I	100 A, 200 A, 400 A, 600 A	600 A
Technical Sensor Current Gauge : Capt I	100 A, 200 A, 400 A, 600 A	600 A
Output Voltage of Sensor V @ Vn : VsV	7.09 V	7090
Output Voltage of Sensor I @ In : VsI	2.857 V	2857
Time Base of FPGA: Tb in second	Base Temps fpga	100
Parameter (Application)	Setting Range	Default Setting
Serial Number of STS	Num serie	00000000

Drawings

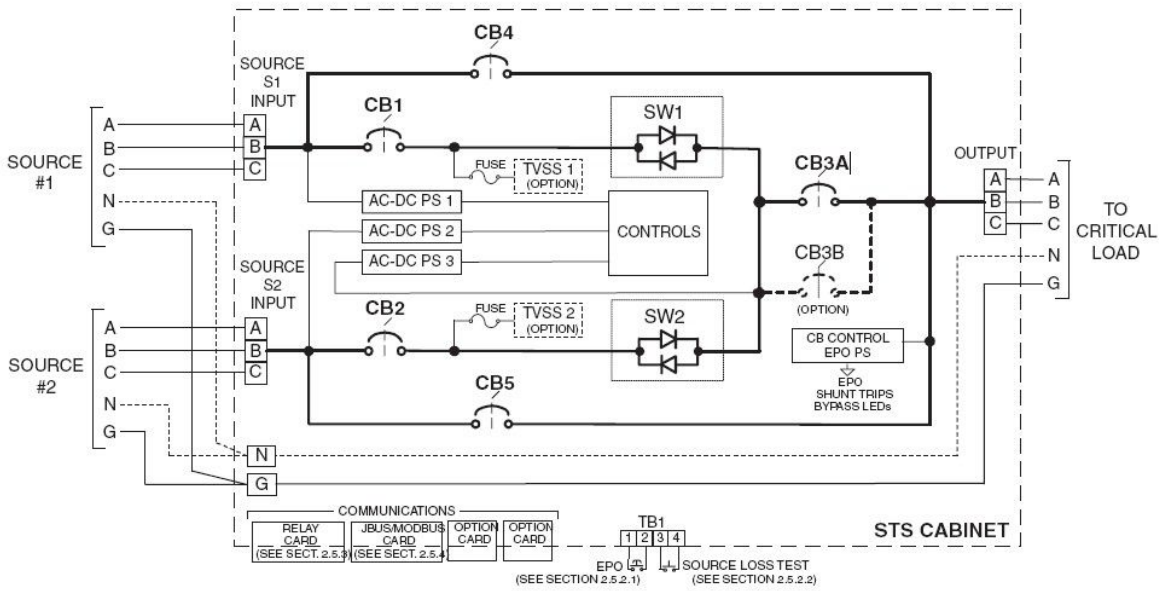


Note: A comprehensive set of drawings is available on the engineering website at engineer.apc.com.



Note: These drawings are for reference ONLY — subject to change without notice.

One Line Diagram of Epsilon STS with Options



Options

Hardware Options

- PMM Plus & PMM Ultra - Dual Input Power Distribution with Automatic Source Selection
 - STS pre-wired either downstream or upstream of integrated isolation transformer (s)
 - Ultra has dedicated isolation transformers feeding each STS input enables either transformer to be maintained without disturbing the load.
 - Up to 300 kVA of capacity -252 Branch Breakers

Configuration Options

- Redundant output isolation CB
- TVSS Network
- Automatic (thermal and magnetictrip) breakers
- Four key interlock
- 6 Additional programmable dry contact outputs/2 inputs

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