SECTION I
GENERAL INFORMATION

1.1 DESCRIPTION

This manual contains operation and maintenance instructions for Magna-Power Electronics' SX Series three phase, SCR power supplies. These power supplies are constant voltage/constant current sources rack mounted with casters.

1.2 FEATURES

A crossover feature protects both power supply and load in constant voltage operation. Automatic crossover circuitry switches the power supply from constant voltage to constant current operation if the output current exceeds a preset limit. This crossover circuitry also protects the load from over voltage during constant current operation by automatically switching the power supply into constant voltage operation The user can adjust the crossover point via the front panel controls.

SX series power supplies are engineered from standardized modules, standardized control panels, and modular cabinets. Modules are configured for system specific applications.

SX series power supplies are fully programmable via resistance, voltage, current, or optional IEEE-488/RS232. Program lines are constantly monitored for range of operation. If a line should open or if a programmable input is set beyond that anticipated, the unit safely shuts down protecting the load.

Differential amplifiers isolate the programming lines from the dc output allowing programming at any distance from the load. Additional differential amplifiers are provided for master/slave series or parallel operation.

Diagnostic functions are contained directly within the supply's control loop. Exclusive circuitry eliminates guesswork as to which function has control -- voltage, current, soft-start, or a fault condition. If the fault condition requires user attention, mains power is disconnected. All diagnostic functions are monitored with optical isolators to be paralleled for master/slave operation. In addition, control functions are also set through optical isolators to allow simultaneous control of one or more SX series units.

Transient response is enhanced by means of feedforward compensation and optional electronic loading. Feedforward compensation detects line and load changes and offsets feedback signals before being corrected with the slower, error amplifiers. Optional electronic

loading maintains output rectifiers with continuous current regardless of load conditions. This prevents peak charging of output capacitors and drooping under transient loading.

SX series supplies have three levels of over voltage protection: shutdown of controlling thyristors, disconnect of main power, and optional SCR crowbar. Upon an over voltage condition, the supply must be reset forcing the user to observe the over voltage setting.

1.3 COOLING

Each power supply enclosure is cooled by suitable blowers exhausting warm air to the top and rear of the cabinet. Fresh air intake is from the bottom and front. Blocking ventilation will cause the power supply to overheat.

1.4 INSTALLATION

The power supply is rack mounted and ready for operation when shipped. Electrical connections are made through the rear access panel. Power and control cables must be totally separated. Cables should run in independent conduits and feed through dedicated holes punched in the access panel. The unit should be operated in the upright position.

1.5 POWER REQUIREMENTS

A suitable source of ac power is required for this supply. The unit is wired for 208 V, 3-phase, 50 to 60 Hz mains. For 240 V operation, four internal wiring changes must be made to the unit. Information concerning conversion is covered in Section 2.13.

SX series power supplies are optionally available for operation on 440/480 V, 3-phase, 50 to 60 Hz mains. Units are normally wired for 440 V operation and information concerning conversion is covered in Section 2.13.

1.6 SPECIFICATIONS

The following specifications describe the published operational characteristics of the SX series power supplies.

Input voltage: 208/240 Vac, 50-60 Hz, 3-phase (480 Vac, 50-60 Hz, 3-phase optional).

Regulation line and load combined: 0.1 %.

Stability: 0.1 % for 8 hours after 30 minute warm up.

Transient response: 75.0 ms to recover within 2 % of regulated output with 50 to 100 % or 100 to 50 % load change; 75.0 ms to recover within 10% of regulated output with 0 to 50% and 50% to 0% load change with optional electronic load module.

Ambient Temperature: 0 to 50°C.

Storage Temperature: -25 to +85°C.

Programming resistors: 1 KΩ full scale for output voltage, output current, and over voltage shutdown.

Temperature coefficient: 0.04 %/°C of maximum output current.

Size: 22" W by 28⅞" D for all cabinets. Height is dependent on power as defined in Table 1.1.

TABLE 1.1 SIZE AND WEIGHT

POWER	CASE	HEIGHT	WEIGHT
20 KW	A	49⅛	600
30 KW	B	59⅝	875
40 KW	C	68⅜	1150
50 KW	D	84⅛	1425

TABLE 1.2 MODELS AND RATINGS - 208/240 V

MODEL	OUTPUT VOLTAGE Vdc	OUTPUT CURRENT Adc	RIPPLE VOLTAGE mVrms	EFF.	AC INPUT CURRENT Aac
SX16-1200	16	1200	50	82	70
SX32-600	32	600	30	83	70
SX80-250	80	250	50	84	70
SX125-160	125	160	60	88	70
SX250-80	250	80	90	88	68
SX500-40	500	40	130	88	68
SX16-1800	16	1800	50	82	105
SX32-900	32	900	30	83	105
SX80-375	80	375	50	84	105
SX125-240	125	240	60	88	105
SX250-120	250	120	90	88	102
SX500-60	500	60	130	88	102
SX16-2400	16	2400	50	82	140
SX32-1200	32	1200	30	83	140
SX80-500	80	500	50	84	140
SX125-320	125	320	60	88	140
SX250-160	250	160	90	88	136
SX500-80	500	80	130	88	136
SX16-3000	16	3000	50	82	175
SX32-1500	32	1500	30	83	175
SX80-625	80	625	50	84	175
SX125-400	125	400	60	88	175
SX250-200	250	200	90	88	170
SX500-120	500	120	130	88	170

Notes:
1) Rating specified at 208 V input without electronic load module.
2) Specifications subject to change
without notice.

TABLE 1.3 MODELS AND RATINGS - 440/480 V

MODEL	OUTPUT VOLTAGE Vdc	OUTPUT CURRENT Adc	RIPPLE VOLTAGE mVrms	EFF.	AC INPUT CURRENT Aac
SX16-1200	16	1200	50	82	35
SX32-600	32	600	30	83	35
SX80-250	80	250	50	84	35
SX125-160	125	160	60	88	35
SX250-80	250	80	90	88	34
SX500-40	500	40	130	88	34
SX16-1800	16	1800	50	82	53
SX32-900	32	900	30	83	53
SX80-375	80	375	50	84	53
SX125-240	125	240	60	88	53
SX250-120	250	120	90	88	51
SX500-60	500	60	130	88	51
SX16-2400	16	2400	50	82	70
SX32-1200	32	1200	30	83	70
SX80-500	80	500	50	84	70
SX125-320	125	320	60	88	70
SX250-160	250	160	90	88	68
SX500-80	500	80	130	88	68
SX16-3000	16	3000	50	82	88
SX32-1500	32	1500	30	83	88
SX80-625	80	625	50	84	88
SX125-400	125	400	60	88	88
SX250-200	250	200	90	88	85
SX500-120	500	120	130	88	85

Notes:
1) Rating specified at 440 V input without electronic load module.
2) Specifications subject to change
without notice.