ENGINEERS' AND ARCHITECT'S SPECIFICATIONS
GENESIS 2400

e dimmer pack shall include, but not be limited to, the following components: aluminum enclosure and internal chassis containing 12 complete 2400 watt id state dimmers with associated circuit breakers and chokes. Dimensions of enclosure with mounting brackets in place shall not exceed 7" (18 cm) high, (61 cm) deep, and 22" (56 cm) wide. Weight of the dimmer pack shall not ceed 70 lbs. (31.8 kg).

metal parts shall be thoroughly cleaned and anodized or finished with two ats of industrial grade, mar and scratch resistant baked (painted) finish. All menclature will be either anodized or silk screened to the front and rear panel faces.

ont access shall allow operation of all circuit breakers without exposing live ctrical parts. It shall also allow for the removal of the front cover for access to main driver circuitry and trim adjustments.

ont panel indicators shall include "control on" and "input line energized" tus lights.

ditional front-panel controls shall include:

. A separate switch able to turn each channel on or off in the absence of a control console.
2. A control follower LED for each channel to indicate the presence of a control signal from the console.
3. A thermal/magnetic circuit breaker for each channel.
4. A magnetic circuit breaker for each line input to protect the control electronics.

e internal design shall be modular for easy replacement and repair.

ar access shall provide all necessary termination for line, load and control nnections. Access to supply and load terminals shall be provided via a screw- wn cover. The back panel shall be replaceable to allow for Stage Pin, U- ound or Twistlock output panels. All back panels shall include knockouts in rear side of the panel for optional wiring access.

ntrol connection shall be by means of a circular 16-pin SRC connector in cast minum alloy with a satin zinc finish. The connector shall have five key larization slots to ensure proper alignment and mating of the control cables to unit. Units without locks or having jackscrew connectors will not be accept- le. The connector shall be a Cannon SRC Flange Mount Receptacle connector urcing control current directly from the control console.

he optional multiplexed control system is installed, control connection shall by means of a locking 5-pin XLR-type connector. The connector shall be larized to ensure proper alignment and mating of the control cables to the lt. There shall be an "input" and an "output" connector to allow connecting ditional packs on the same multiplexed line.

ut service connections shall be designed to allow two or three separate line nnections for single or three-phase use. Phase change shall be by use of a nd-operable changeover plug fully enclosed within the dimmer pack. At full d wired for single phase, each input required 120 Amperes at 120/240 volts , 50/60 Hz. and each connection shall feed six dimmers of 20 Amps each. At load wired for three phase, each input requires 80 Amperes at 120/240 volts , 50/60 Hz. and each connection shall feed four dimmers of 20 Amps each. In cases a common neutral is required. Voltage selection shall be accomplished h the top panel removed, by an internally wired jumper. The rated load perage per channel shall not change as a result of the voltage of operation anging.

electrical components shall be circuit breaker protected. Devices using fuses ll not be acceptable. All circuit breakers shall be recessed to prevent acci- ntal tripping during operation. Input circuit breakers shall operate to prevent mage from overvoltage situations. Channel circuit breakers shall be rated for anch Circuit Protection having a minimum rating of 10,000 Ampere interrupt- capacity.

ch dimmer shall be capable of accepting a full rated load hot patch without ury to the dimmer. All bidders must be willing to submit their systems to this t, which shall be conducted on all dimmer channels.

oling shall be accomplished by a quiet fan forced air system that will maintain per operating temperature level under all load conditions provided that bient intake temperature does not exceed 40 degrees C. (105° F) non- ndensing, and that minimum ventilation spacings are adhered to:

Front (air intake): three inches minimum in free air.
Sides (air exhaust): two inches minimum each side.
Bottom: 1¾ inches minimum to plane surface or top of next unit in rack. If not rack mounted, unit must rest on a plane surface on its original equipment feet.
Back: three inches minimum

nvection cooling shall not be acceptable.

e unit shall be protected against excessive or abnormal temperature rise by thermostatically operated switches which shall cause the dimmer outputs to t off, while the fan shall continue to operate to cool down the unit. The unit ll automatically reset itself when the heat sink temperature has been reduced a safe range.

nen dimmer units are mounted in an enclosure, the enclosure must be force-cooled at a minimum volume of 50 cubic feet per minute, exhaused out the top or top side of the enclosure. The packs must be mounted with a 1¾ inch or greater space between each pack. If a front door is installed, it must have ventilation area equal to fifteen square inches per dimmer pack installed.

Printed circuit cards shall be constructed of 0.0625-inch (0.159 cm) thick FR-4 flame retardant epoxy or equivalent, copper plated to a density of at least one ounce per square foot on one or both sides of the card. Cards shall be finished with a 63/37 tin/lead reflow solder to prevent oxidation of the copper. All components shall be soldered with a 60/40 tin/lead solder.

The control voltage required shall be 0-10 volts + DC at a current not to exceed 1 milliampere per channel.

The dimmer output voltage shall not deviate by more than 1.5 volts RMS during a fade between to equally set presets.

Each dimmer shall be able to control incandescent lamp loads from 10 watts to full rated capacity.

With the dimmer controller set at "0", the output voltage shall not exceed 8.4 volts RMS with no internal or external switches required.

The dimming curve shall be modified square law so that a change of specified magnitude on the controller shall produce an apparent corresponding change in light output.

The dimmer output shall operate from full ON to full OFF and from full OFF to full ON in less than two cycles under all loads up to rated size. The response shall not vary nor be dependent upon the loading on the dimmer.

The no-load losses of the dimmer shall not exceed 6 watts with the controllers set at "0".

The full load losses of the dimmer (exclusive of the filter choke) shall not exceed 30 watts.

Individual dimmers shall be solid-state devices utilizing "Front-to-Back" Silicon Controlled Rectifiers in a sealed module which shall contain all snubber circuitry as well. With the exception of filter chokes, circuit breakers, and power supply, all other active circuitry shall be contained on a single board. This board shall include synchronization, and channel drive circuitry, and shall be accessible upon removal of the front access panel. All integrated circuits shall be socketed.

All semiconductor devices shall be constructed with glass-passivated silicon active elements. Individual power modules carrying load current shall be epoxy-molded sealed devices with 2500-volt isolation between control and line connections. These devices shall have a peak non-repetitive surge current (1 cycle at principal applied voltage) of 600 Amps to withstand accidental application of excessive voltage or short circuit.

Input voltage rating shall be 120 or 240 volts AC +/-10% ,50/60 Hz. Power modules shall have at least the following ratings:
Vfpk = 600 repetitive
Vrpk = 600 repetitive

Ouput waveform shall be symmetrical with respect to zero voltage and current axis, using variable conduction angle sinusoidal techniques.

Ouput voltage of a fully loaded dimmer, including chokes, shall be within 6.0 volts RMS of incoming line voltage with the dimmer controller set at "10".

Each dimmer shall have associated with it an inductive toroidal type filter with an iron core of at least 4 inches diameter. The filter shall accomplish the following:

- Limit the objectionable harmonics.
- Limit radiated radio frequencies on conductors.
- Modify the steep wave front of the switching action of the SCRs to reduce noise of an acoustical origin in lamp filaments.
- Have a Rise Time of not less than 600 microseconds at 60 Hz., measured 10% to 90%.

Electronic characteristics shall be:	1 megohm minimum
Signal input impedance:	Not affected
Sensitivity to RFI:	Less than 3 volts AC change for 40 deg. F. rise
Temperature stability:	
Test points:	0-10 VDC signal, + & - supply voltages, gate signal, ground service input, load output, sync.
Consistency of output	
Channel to channel:	1% or better
Control isolation:	2500 volts HV isolation
Quiescent output:	Adjustable from 0-15%

All components shall be of current manufacture at the time the dimmer is delivered and shall be branded, where practical, with the actual maker's name and catalog listed replacement part identification. Resistors shall be marked with standard color code or number code. Custom transformers and filters shall bear the manufacturer's replacement part identification.

Manufacturer shall provide a limited warranty on all equipment subject to this specification for a period of one year.

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