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***TeaTronics Lighting Controls***

## **GENESIS 660 Dimmer**



The Comstar Genesis 660 is a very rugged, heavy duty 50-Amp per channel dimmer. It uses SSR modules for dimming and will carry 6000 watts per channel. Hot patching, overloading, or miswiring of the power feeds should not cause functional damage. This 6 channel unit can be wired for single or three phase input power at 50 or 60 Hz, and can be used on 120 or 240 volt power grids. Input power phase switching is extremely simple and the unit may be mounted in a standard 24 inch equipment rack, if desired.

Typical uses for the Genesis line would be locations where ruggedness is important and downtime is unacceptable. Any use where the personnel using the products are inexperienced and where load and power input connections could be miswired, calls for Genesis dimmers. Broadcast Television, Cable Studios, Theaters, Schools, Night Clubs, and heavy Touring Companies should all use these heavy duty dimmers in any critical application where the best is required.

The Genesis 660 is equipped with many standard deluxe features to make life easier for the user:

- Each channel has an on/off override switch which illuminates to mimic the control signal
- Every dimmer has a thermal magnetic circuit breaker with a 10,000 AIC interrupting capacity
- Prominent LEDs are also provided on the front panel to indicate the presence of each power phase, as well as to warn of an overtemperature condition
- Any number of channels may be set to snap on as Non-dims by adjustments located on the Comstar control card

Servicing of all control electronics is easily accessible through the front removable electronics drawer using only a screwdriver and pliers. A high degree of noise filtering is provided by a toroidal-core filter choke on each channel and cooling is provided by a quiet, low-speed fan to prolong product life.

The Comstar Genesis 660 accepts a 0-10 volt DC analog control signal simultaneously with either AMX 192 or DMX 512. This allows a backup console or stage manager's panel to be on line at all times.

Customized systems using the Comstar Genesis 660 as a component are available. Contact TeaTronics Lighting Controls or your local distributor for more information on a system to meet your exact lighting needs.

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### ARCHITECTURAL & ENGINEERING SPECIFICATIONS

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The dimmer pack shall include, but not be limited to, the following components: an aluminum and steel enclosure containing 6 complete 6000 watt solid-state dimmers with associated circuit breakers and chokes. Dimensions of the enclosure without mounting brackets in place shall not exceed 5.25" (14 cm) high, 22" (56 cm) deep, and 22" (56 cm) wide. Weight of the dimmer pack shall not exceed 60 lbs. (27.3 kg).

All metal parts shall be thoroughly cleaned and anodized or finished with two coats of industrial grade, mar and scratch resistant baked enamel paint. All nomenclature will be silk screened to the front and rear panel surfaces.

Front access shall allow operation of all circuit breakers without exposing live electrical parts. It shall also allow for the removal of the electronics drawer for access to the main driver circuitry, power supply, trim adjustments, non-dim mode adjustment, and protection fuses.

Front panel indicators shall include one over temperature, three phase present, and twelve control present status lights.

Front-panel controls shall include:

- ° A separate switch able to turn each channel ON or OFF in the absence of a control console.
- ° A thermal magnetic circuit breaker for each channel.

The internal design shall be modular for easy replacement and repair. Any number of channels shall be capable of being designated as dim or non-dim channels by the use of adjustments on the easily accessible main circuit board. Equipment not allowing for dim/non-dim selection shall not be acceptable.

Rear access shall provide all necessary terminations for line, load, and control connections. Access to supply and load terminals shall be provided via a separate quarter-turn fastened cover. The back panel shall be replaceable to allow for Stage Pin or Terminal Block output panels. All units shall include a knockout at the rear side panel for optional wiring access.

Standard control connections shall be provided in two different ways. First, by means of a circular 16-pin SRC connector in cast aluminum alloy with a satin zinc finish. The connector shall have five key polarization slots to ensure proper alignment and mating of the control cables to the unit. Units without locks or having jackscrew connectors will not be acceptable. The connector shall be a SRC flange mount receptacle connector sourcing control current directly from the control console.

Secondly, for multiplexed control, control connections shall be by means of a locking 5-pin XLR-type connector. The connector shall be polarized to ensure proper alignment and mating of the control cables to the unit. There shall be an input and an output connector to allow connecting additional units on the same multiplexed line.

Power input connections shall be designed to allow two or three separate line connections for single or three-phase use. Phase change shall be achieved by moving the ØBÓ phase wiring (2 conductors) fully to the center terminal or to the outside terminals. All wiring is enclosed within the dimmer module. At full load wired for single phase, each input requires 150 Amperes at 120/240 volts AC, 50/60 Hz., and each connection shall feed three dimmers of 50 Amps each. At full load wired for three phase, each input requires 100 Amperes at 120/208 volts AC, 50/60 Hz., and each connection shall feed two dimmers of 50 Amps each. In all cases a common neutral is required.

All electrical components shall be fuse or circuit breaker protected. All circuit breakers shall be physically protected to prevent accidental tripping during operation. A self-restoring overvoltage protection circuit shall operate to prevent damage from overvoltage or miswiring situations. Channel circuit breakers shall be rated for branch circuit protection having a minimum rating of 10,000 AIC interrupting capacity.

Each dimmer shall be capable of accepting a full rated load hot-patch without injury to the dimmer. All manufacturers must be willing to submit their equipment to this test, which shall be conducted on all dimmer channels.

Cooling shall be accomplished by a quiet, forced-air fan system that will maintain proper operating temperature under all load conditions, provided that ambient intake temperature does not exceed 35 degrees Celsius (95 degrees Fahrenheit) non-condensing, 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: one-eighth inch 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
- Convection cooling shall not be acceptable.

The unit shall be protected against excessive or abnormal temperature rise by a thermostatically operated switch which shall cause the dimmer outputs to cease, while the fan shall continue to operate to cool down the unit. The unit shall automatically reset itself when the internal temperature has been reduced to a safe level.

When dimmer units are mounted in an enclosure, the enclosure must be force-cooled at a minimum volume of 50 cubic feet per minute, exhausted out the top or top side of the enclosure. The units need not be mounted with more than one-eighth inch space between each unit. 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 analog control voltage required shall be 0-10 volts +DC at a current not to exceed 1 milliampere per channel. The multiplex control signal shall be either USITT Standard AMX 192 or DMX 512.

The dimmer output voltage shall not deviate by more than 1.5 volts RMS during a fade between two 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 the 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 level. The response shall not vary nor be dependent upon the loading on the dimmer. (Except for the thermal lag caused by the lamp filament.)

The no-load losses of the dimmer (exclusive of the filter choke) shall not exceed 6 watts.

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 (SSR) which shall also contain all snubber circuitry. With the exception of filter chokes and circuit breakers, 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 drawer. All integrated circuits shall be socketed.

All semiconductor power devices shall be constructed with glass-passivated silicon active elements. Individual power modules carrying load current shall be epoxy-molded sealed devices with 2500volt isolation between control and line connections. These devices shall have a peak non-receptive surge current (1 cycle at principal applied voltage) of 500 Amps to withstand accidental application of excessive voltage or short circuit.

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

- V<sub>f</sub>pk = 500 repetitive
- V<sub>r</sub>pk = 500 repetitive

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

Output 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 form of the switching action of the SSRs to reduce noise of an acoustical origin in lamp filaments
- Have a Rise Time of not less than 500 microseconds at 60 Hz, measured at 10% to 90%

Electronic characteristics shall be:

- Single signal impedance:20K Ohms
- Sensitivity to RFI:Not Affected
- Temperature stability:Not affected
- Test points:Channel 1 input signal, (+) & (-) supply voltages, trigger signal, sync signal

Consistency of output:

- Channel to Channel: 2% or better
- Control Isolations: 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.

The dimmer pack specified herein shall be the Genesis 660 as manufactured by Teatronics Lighting Controls, Inc.

[Vendor Information](#)