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TeaTronics Lighting Controls

DMX DPI 1212D Dimmer

The DPI 1212D is a rugged, 12 channel, 10 Amp heavy duty dimmer. It uses SSR modules for dimming, and each channel will carry 1200 watts. Input power is easily obtained, since it requires only two 60 Amp legs of any phase plus neutral to operate. The unit is designed to be mounted in a standard 19 inch equipment rack.

Typical uses would include connecting standard fixtures such as two 500 watt Fresnels per dimmer, or dimmer-per-circuit installations with 1000 watt Ellipsoidal spots or PAR cans. DPI dimmers are suitable for use in all forms of theatrical and television productions as well as clubs and touring, music and dance. Each channel is protected from overload by its own 10 Amp thermal magnetic circuit breaker rated for 10,000 AIC.

Each phase-independent input has an LED indicator to show it is energized and the unit will operate from 120 or 240 volt power grids, at 50 or 60 hertz via an internal voltage selection switch. Noise filtering is provided by a 2.6 inch diameter toroidal filter for each channel.

The DPI 1212D accepts USITT Standard DMX 512 control input. Two 5-pin XLR connectors are used, one as input from your console and the other to provide loop-through capacity to "chain" several packs together.

DPI dimmers are ruggedly built of aluminum in a compact 5.25 inch rack-height cabinet (3 rack spaces). Circuitry is modular and circuit boards and SSR modules can be replaced in moments if needed, using only a screwdriver and pliers. No soldering is required. Other standard deluxe features include a control signal following LED and an ON/OFF control override switch for each channel.

Customized systems incorporating the DPI 1212D, 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.

ARCHITECTURAL & ENGINEERING SPECIFICATIONS

The dimmer pack shall include, but not be limited to, the following components: an aluminum enclosure and internal chassis containing 12 complete 1200 watt solid-state dimmers with associated circuit breakers and filter chokes. Dimensions of the enclosure (not including rack ears) shall not exceed 5.25" (13.3 cm) high, 19.10" (48.4 cm) wide, and 20.75" (54.0 cm) deep. Weight of the dimmer shall not exceed 40 lbs. (18.2 kg).

All metal shall be thoroughly cleaned and anodized or painted with two coats of industrial grade, mar and scratch resistant baked (painted) finish. All nomenclature shall 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 front cover for access to the main driver circuitry and adjustments.

Front panel indicators shall include +V, -V, Line 1 and Line 2.

Additional front-panel controls include:

- A separate switch, able to turn each channel ON or OFF in the absence of a control console.
- A control follower LED for each channel to indicate the presence of a control signal from the console.
- A thermal/magnetic circuit breaker for each channel, branch protection rated.
- Through the front panel screwdriver adjustments for Idle 1 and Idle 2 quiescent level.
- The internal design shall be modular for easy replacement and repair.

Top access shall provide all necessary terminations for line and load connections. Access to supply and load terminals shall be provided via a screw-down cover. The back panel shall be replaceable to allow for Stage Pin or U-ground Receptacles. All back panels shall include knockouts for wiring access.

DMX control connection shall be by means of a 5 pin XLR connector in aluminum finish. The connector shall have a key polarization slot 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 XLR mount receptacle connector sourcing control signal directly from the control console.

Input service connections shall be designed to allow two separate line connections for single or two phase use. At full load, wired for single phase, each input requires 60 Amperes at 120 volts AC, 50/60 hertz and each connection shall feed six dimmers of 10 Amps each. In all cases a common neutral is required. Voltage selection shall be accomplished by an internal switch. The rated load amperage per channel shall not change as a result of a variation in operation voltage.

All electrical components shall be circuit breaker protected. All circuit breakers shall be protected by protruding handles to prevent accidental tripping during operation. Fuses shall operate to prevent electronic damage from overvoltage situations. Dimmer channel circuit breakers shall be rated for branch circuit protection having a minimum rating of 10,000 Ampere interrupting capacity.

Each dimmer shall be capable of accepting a full rated load hot patch without injury to the dimmer. All bidders must be willing to submit their systems to this test, which shall be conducted on all dimmer channels. Each dimmer pack shall be capable of switching 3 channels at a time from dim to nondim as a standard feature. Units requiring mechanical relays, additional circuit boards, or any modification to the dimmer to achieve this feature will not be acceptable.

Cooling shall be accomplished by a quiet fan forced-air system that will maintain proper operating temperature level under all load conditions provided that ambient intake temperature does not exceed 40 degrees Celsius (105 degrees Fahrenheit), non-condensing, and that minimum ventilation spacings are adhered to:

- Front (air intake): three inches minimum
- Sides (air exhaust): two inches minimum each side
- 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 shut off, while the fan shall continue to operate to cool down

the unit. The unit shall automatically reset itself when the temperature has been reduced to a safe range.

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 through the top or top side of the enclosure. If a front door is installed, it must have a 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 cards. 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 dimmer output voltage shall not deviate by more than 1.5 volts RMS during a fade between two equally set presets.

Each dimmer shall 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 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 control 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 (SSR) which shall also contain all snubber circuitry. 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 circultry, and shall be acessible upon removal of the front access panel. All intergrated circuits shall be socketed.

All semiconductor devices shall be constructed with glass-passivated silicon active elements. 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 overload.

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

- Vfpk = 600 repetitive
- Vrpk = 600 repetitive

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

Output voltage of a fully loaded dimmer, including chokes, shall be within 6.0 volts RMS of the incoming 120 volt 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 2.6

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 hertz, measured 10% to 90%

Electronic characteristics shall be:

- Signal input impedance: 100 K ohm minimum
- Sensitivity to RFI: Not affected
- Temperature stability: Less than 3 volts AC change for 40 degrees F rise.
- Test points: supply voltages, ground, sync

Consistency of output:

- Channel to Channel: 2% or better
- Control Isolation: 2500 volts HV isolation
- Quiescent output: Factory set at 3%

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 DPI 1212D as manufactured by Teatronics Lighting Controls, Inc.

Vendor Information