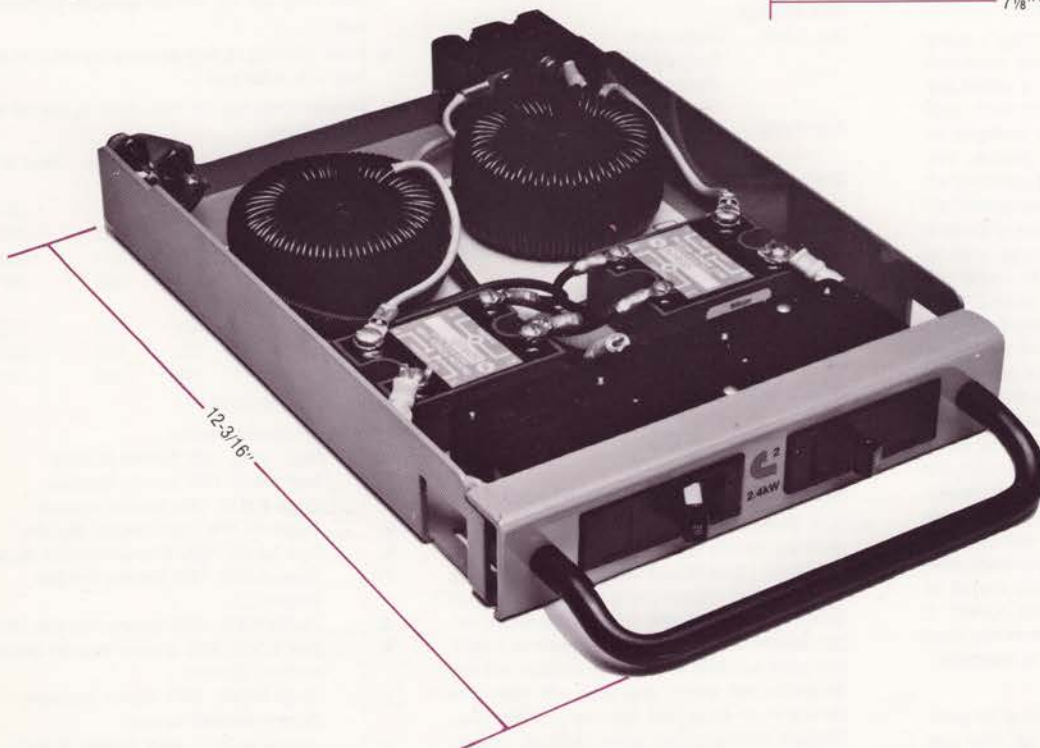
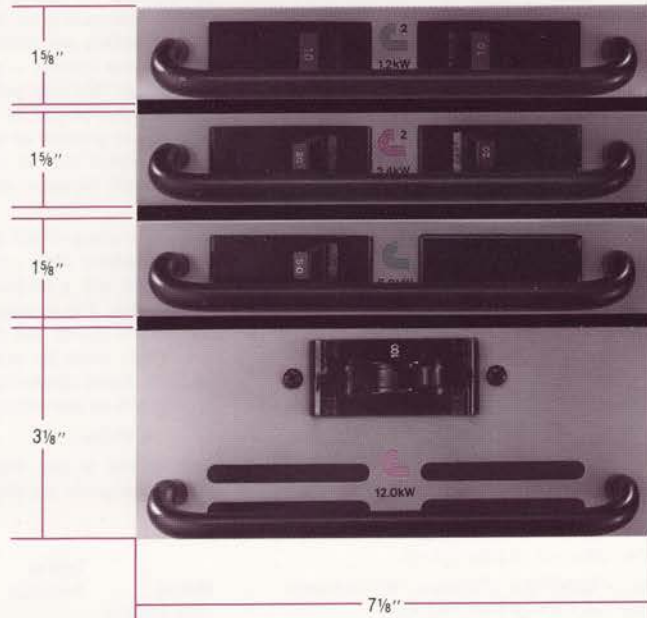


# Dimension 192 THE DIMMER MODULE.

The densest packaging of dimmers in the industry.

- The Dimension 192 dimmer module represents an elegant design.
- Using conservatively-rated, fully proven components, we have packaged 2 — 2400W dimmers into minimum space. This is partly achieved by the rack bus design, and partly by the unique control and power connector systems.
- Each dimmer is independently cooled with adjacent dimmers being separated by a cooling air flow of 400 feet/minute of ambient air.
- State-of-the-art solid state relays and chokes are used to achieve broadcast-quality filtration.



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 **Colortran, Inc.**

# Specifications

## DIMENSION 192 PLUG-IN MODULES

### I. MECHANICAL

- A. Each plug-in module shall be assembled on a formed aluminum chassis at least .090" thick and finished in grey powder paint. The chassis shall form the basic heat sink for the module and provide both air entry means **through the front of the module and flow control through the module.** The chassis shall also form the faceplate for the module and the switchboard that houses it, and the mounting means for all components. Each chassis shall be equipped with a handle for easy insertion and withdrawal. Except for circuit breakers, mode-selector switching devices and connectors, the module shall contain only solid-state electrical components with no moving parts. Each module shall be labeled with the manufacturer, catalog number and complete rating information.

- B. The Dimmer Modules shall have the following maximum dimensions and weights:

#### 120V MODELS

Dual — 1.2kW 1 $\frac{1}{8}$ " (4.1 cm) H x 7 $\frac{1}{8}$ " (18.1 cm) W x 12-3/16" (30.9 cm) D. 3.9 lbs. (1.8 kg).

Dual — 2.4kW 1 $\frac{1}{8}$ " (4.1 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 5.7 lbs (2.6 kg).

Single 6.0kW 1 $\frac{1}{8}$ " (4.1 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 5.6 lbs (2.5 kg).

Double — 12.0kW 3 $\frac{1}{8}$ " (7.9 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 9.3 lbs (4.2 kg).

#### 220/240V Models (foreign electrical service)

Dual — 2.0kW 1 $\frac{1}{8}$ " (4.1 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 5.7 lbs (2.6 kg).

Single — 5.0kW 1 $\frac{1}{8}$ " (4.1 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 5.6 lbs (2.5 kg).

Double — 10.0kW 3 $\frac{1}{8}$ " (7.9 cm) x 7 $\frac{1}{8}$ " (18.1 cm) x 12-3/16" (30.9 cm). 9.3 lbs. (4.2 kg).

Each dual Dimmer Module shall contain a power connector, two circuit breakers, two solid-state switching modules, two filter chokes, a control connector and required associated wiring. Each single Dimmer Module shall contain a power connector, circuit breaker, solid-state switching module, filter choke, control connector and required associated wiring. Modules fitted for non-dim capability shall also contain a min. .062" thick solder-plated glass-epoxy printed-circuit board with plated through holes for each solid-state switching module. The control connector shall be of tin-plated brass "banana" jacks. The power connector shall be of spring-bronze flat-blade fuse clips providing .375 sq." contact area for all modules protected at 50A and below and twice the contact area for all modules protected at above 50A. Power connectors of the split-pin-and-sleeve type shall not be acceptable. The circuit breaker(s) handle shall be accessible through the faceplate which also includes a label containing capacity information. Dimmer Modules with different ratings within a system shall be keyed so that modules with larger ratings are not interchangeable with switchboard openings designed to accept dimmer modules of small ratings. Dimmer modules that do not contain all power-related components for a single or dual circuit on a single plug-in chassis shall not be acceptable.

### II. ELECTRICAL-DIMMING CHANNEL

- A. Each dimming channel shall be capable of hot patching cold incandescent loads up to its full rated capacity without malfunction or change in dimmer operation, independent of control setting.

- B. Each dimming channel shall operate satisfactorily on 50/60Hz, 100 Volts to 130 Volts or 200 Volts to 260 Volts AC lines and in ambient air temperatures from 0 to 40°C (32-104°F).

- C. Each dimming channel output shall be AC, containing less than 1% DC component, and at maximum output produce essentially a full sine wave. Output shall be symmetrical with respect to the zero voltage axis at any control setting. At any load the output of the dimming channel shall be zero volts when the input signal commands zero intensity.

- D. The output voltage of each dimming channel shall be automatically regulated for incoming line voltage variations except that output voltage cannot be increased above a level equal to the difference between incoming line voltage and dimmer insertion — voltage drop. Dimmer insertion — voltage drop shall not exceed 3V for 120V units and 5V for 240V units. Line regulation shall be  $\pm 2V$  for 110V to 130V. Regulation shall also be provided for variations in load current. Load regulation shall be  $\pm 2V$  for 1% to 100% of rated current. Regulation shall be at any control setting.

- E. The output voltage of each dimming channel shall repeatedly respond within  $\pm 2V$  to a 0% to 100% control signal with a modified square-law transfer characteristic. This response shall not exceed 6 cycles or 1/10 second, and shall be insensitive to the phase from which the control signal is taken. All dimming channel transfer characteristics shall be factory set with no user adjustments required.

### III. ELECTRICAL-MODULE

- A. Each channel of each module shall be protected against overcurrent and short-circuit current as follows:

Module	Type of Protection	Over-current Rating	Interrupting Rating
<b>120V MODELS</b>			
Dual 1.2kW	Temperature-Compensated Thermal Magnetic Circuit Breakers	10A	10,000A
Dual 2.4kW	Fully-Magnetic Circuit Breakers	20A	10,000A
Single 6.0kW	Fully-Magnetic Circuit Breaker	50A	10,000A
Double 12.0kW	Fully-Magnetic Circuit Breaker	100A	10,000A
<b>220/240V MODELS</b>			
Dual 2.0kW	Temperature-Compensated Thermal-Magnetic Circuit Breakers	10A	10,000A
Single 5.0kW	Fully-Magnetic Circuit Breaker	25A	10,000A
Double 10.0kW	Fully-Magnetic Circuit Breaker	45A	10,000A

Circuit breakers shall also serve as disconnects.

- B. Each Dimmer Module shall employ a solid-state switching module containing two silicon-controlled rectifiers in a front-to-back configuration, a snubbing network and all required gating circuitry on the high voltage side of an integral opto-coupled control voltage isolator. Rectifiers shall be mounted on a beryllium oxide substrate for maximum isolation and heat dissipation, and encapsulated along with other components in an epoxy-filled high-impact plastic case. Dimmers employing triac power switching devices, pulse transformers or other isolating devices not providing at least 2500V RMS isolation, or current-limiting fuses to provide the short-circuit ratings listed shall not be acceptable. SCR power switching devices shall have the following minimum ratings:

Module	Peak Single Cycle Surge Current	I <sub>FT</sub>	Transient Voltage
<b>120V MODELS</b>			
Dual 1.2kW	350A	350	250V
Dual 2.4kW	650A	1,700	250V
Single 6.0kW	1,200A	6,000	500V
Double 12.0kW	2,000A	16,000	500V
<b>220/240V MODELS</b>			
Dual 2.0kW	350A	350	500V
Single 5.0kW	650A	1,700	500V
Double 10.0kW	1,200A	6,000	500V

- C. Special versions of the Dimmer Modules known as Non-Dim Modules shall contain an additional printed circuit board or boards. This board-per-solid-state-switching module shall contain solid-state circuitry and a switch which when in the "Non-Dim" position allows interception of the incoming phase-angle dependent control signal and converts it to a zero-point switch signal which is either on, fully, or off. When in the "Dimmer" position, the switch allows the incoming signals to pass on unmodified.

- D. Each 120V control module shall be a recognized component of Underwriters Laboratories, and be so labelled. NMTR2 Component, file No. E41099(S).

### IV. ENVIRONMENTAL

- A. Each Dimmer Module shall include a toroidal filter choke per dimming channel which shall limit the change in current with respect to time. The purpose of this filter is to limit objectionable harmonics, radiated radio frequencies, electromagnetically-induced interference on the conductors and acoustical noise in the load lamp filament. Current rise time shall be no less than 500 microseconds measured at 90° conductive angle from 10% to 90% of the output wave form with the dimmer operating at maximum load.

- B. Power efficiency of each dimming channel shall be at least 97% at full load.

- C. Maximum heat loss for each dimming channel shall be as follows:

Model	Watts	BTU/hr.	Tons of A/C
<b>120V Models</b>			
Dual 1.2kW	29	97	.008
Dual 2.4kW	58	197	.017
Single 6.0kW	111	377	.032
Double 12.0kW	236	802	.067
<b>220/240V Models</b>			
Dual 2.0kW	41	139	.012
Single 5.0kW	72	245	.021
Double 10.0kW	146	496	.042

### V. QUANTITIES AND SIZES

Provide the following modules:

- A. \_\_\_ Dual 1.2kW, 120V Dimmer Modules  
 B. \_\_\_ Dual 2.4kW, 120V Dimmer Modules  
 C. \_\_\_ Single 6.0kW, 120V Dimmer Modules  
 D. \_\_\_ Double 12.0kW, 120V Dimmer Modules  
 E. \_\_\_ Dual 2.4 kW, 120V Dimmer/Non-Dim Modules  
 F. \_\_\_ Single 6.0kW, 120V Dimmer/Non-Dim Modules  
 G. \_\_\_ Double 12kW, 120V Dimmer/Non-Dim Modules  
 H. \_\_\_ Dual 2.0kW, 240V Dimmer Modules (foreign electrical services)  
 I. \_\_\_ Single 5.0 kW, 240V Dimmer Modules (foreign electrical services)  
 J. \_\_\_ Double 10.0kW, 240V Dimmer Modules (foreign electrical services)  
 K. \_\_\_ Dual 2.0kW, 240V Dimmer/Non-Dim Modules (foreign electrical services)  
 L. \_\_\_ Single 5.0kW, 240V Dimmer/Non-Dim Modules (foreign electrical services)  
 M. \_\_\_ Double 10.0kW, 240V Dimmer/Non-Dim Modules (foreign electrical services)