

## **Anytronics : Contractor 24 : Installation Guidance**

The Contractor 24 is a 24 channel wall mounting pack capable of dimming or switching both resistive and inductive loads. It is designed for use on single phase or three phase star supplies, with a maximum rating of 12 Amps / channel or 80 Amps per phase. The pack uses DMX 512 as its primary operating protocol, but an optional 0 to +10V analogue input card is also available.

### **Wall mounting**

The Contractor 24 is designed to be mounted vertically on the wall using the mounting bracket supplied. Before fixing in place please ensure that there will be a gap of at least 125mm from the top edge of the case to any obstructions such as trunking or ceiling etc as the cooling fans will need this space to operate efficiently.

The dimensions and fixing centres of the bracket are detailed on the pack lid. As the pack weighs 30 kilograms this bracket must be fitted securely to the wall using 4 screws which have at least 40mm of their length in either brick or block wall. If the pack is to be fixed to a stud work wall ensure that all four screws go into the timber frame, and increase the screw length to allow for the thickness of the plaster board. Once the pack has been hung on the bracket, two more screws should be fitted to the side flanges near the bottom of the pack to secure it. Cover plates which may be removed for cable access are provided on the bottom edge and the right hand side of the case.

### **Input supply connections**

The Contractor 24 is supplied with one of three input supply connection options, DIN rail terminal, multi-pole isolator or RCD. The DIN rail on which these input connectors are mounted is in the bottom right corner of the equipment. Three phase connections, and neutral and earth connections are all required for safe operation of the equipment.

### **Single Phase working**

The Contractor 24 can be run on a single phase supply, but the maximum allowable current will then be limited by the input supply connection system in use. Note that all versions are limited to 80 Amps per circuit breaker block by the rating of the circuit breaker connections.

The DIN rail terminal system is limited by the 140 Amp rating of the Neutral connection. Both the RCD and isolator versions are limited by the 63 Amp rating of their Neutral terminals.

### **DIN rail terminals**

The Neutral and Earth cables must be made off into the two DIN rail mounted terminals marked N and E or PE, located at the bottom right of the case. The live cables should be made off into either of the two middle breakers in each group of eight. This ensures even current distribution via the bus bar connecting all eight breakers.

For equipment fitted with Neutral disconnection breakers, the three Live cables and the Neutral should be made off into the four way DIN rail mounted terminals marked L1, L2, L3 and N. The Earth should be connected to the central bus bar mounted on the equipment chassis.

### **Isolator** (This connection option limits the pack rating to 63 Amps per phase)

The three Live cables and the Neutral must be made off into the isolator on the terminals marked 1, 3, 5 and 7 respectively. The Earth should be connected to the central brass bus bar mounted on the equipment chassis.

### **RCD** (This connection option limits the pack rating to 63 Amps per phase)

The three Live cables and the Neutral must be made off into the RCD on the terminals marked 2, 4, 6 and N respectively. The Earth should be connected to the central brass bus bar mounted on the equipment chassis.

### **Output connections**

The Contractor 24 is provided with two Live and two Neutral output terminals per channel on the main PCB, with a chassis mounted common bus bar for all the Earth connections.

For Contractors fitted with Neutral disconnection breakers, the Neutral output terminals will not be fitted on the PCB and so the load connections should be made to the Live output terminals on the PCB, the Neutral terminal on the same numbered breaker, and the common Earth bus bar.

Note that the C13 circuit breakers used in the Contractor require a total fault loop impedance of less than 2.7ohms in order to achieve a 5 second disconnection time (1.7ohms for 0.5 seconds). To avoid damage to the dimmer such cabling impedances should be checked only by calculation, or else measured with the dimmer taken out of circuit and replaced by a cable from phase to output.

**DO NOT use a Megger or similar high voltage testing equipment on any part of a circuit or equipment connected to a dimming pack.** Any insulation or isolation testing must be completed before installing the dimmer. The electronics in the dimmer will not withstand the voltages associated with such test equipment.

### **Emergency Lighting Terminals**

The Contractor 24 is equipped with one emergency lighting terminal per channel which is located on the vertical circuit boards near the heatsinks. Electrically these are located after the breaker but before the triac dimmer. They should therefore remain live whilst the breaker is on. With this terminal connected to a change over relay with a mains rated coil, battery powered emergency lighting equipment can be activated when a circuit fault causes the breaker to trip.

### **Dimming/Switching Channel assignment**

Three eight way dil switches are used to select either dimming or switching operation of the individual channels. With the switch in the ON position the channel will be a dimming channel, with the switch in the OFF position the channel will be a zero voltage switching channel.

### **Loads with Electronic Ballasts**

Lighting circuits with electronic ballasts often do not supply the Contractor triacs with the correct firing currents at low dimming levels (where they provide very little circuit loading). The minimum loading of 100W/channel must be provided for correct operation. If such loads tend to flash on at low dimming levels, the situation might be improved by setting DIL switch 2 marked 'A' to on.

### **Input Data Connections**

The Contractor series of dimmers operate on the DMX 512 protocol, although a 24 channel analogue to DMX card is available as an option. DMX cables should be connected to the screw terminals marked IN/THROUGH on the control board which is located on the top edge of the case next to the fans.

Optionally XLR and RJ45 sockets may have been factory fitted for DMX connection.

### **DMX Start Address settings**

The DMX start address is set on the three bcd switches (hundreds, tens and units) on the main control PCB. Setting an address of 0 (or in the range 600-799) will disable the DMX input. Start addresses in the range 1-489 are available by setting the bcd switches. Addresses 490-599 are interpreted as a start address of 489. The data LED will indicate DMX data at the start address.

Two LED's are visible through the lid. The green LED indicates power, and the yellow LED indicates that DMX is present at the set start address. The red LED inside the pack is an error indicator and should glow occasionally when the pack is functioning correctly.

### **Test Mode**

By setting DMX addresses from 901-924 Channels 1-24 can be individually switched full on. By setting addresses from 801-824 channels set for switching can be switched to 100% whilst channels set for dimming will be set to 50%. DMX inputs are inactive in this mode and the data LED will flash continually.

### **Input Control**

The dimmer can be controlled either from analogue inputs (if fitted) or from DMX inputs. If an analogue to DMX card has been factory fitted there will be a switch on the control board which can be operated from the top edge of the dimmer to allow the operator to switch between the analogue and DMX inputs. For analogue use the pack address must be set to a start address of 1 as this card converts the 0 to 10V analogue input levels to DMX data on addresses 1-24

If the DMX signal is disconnected with dual DIL switch 1 labelled 'F' in the OFF position the pack will retain the last input DMX levels until either the DMX signal is reconnected or the power is turned off. NB On channels which had a zero input the preheat level will be removed.

If instead dual DIL switch 1 labelled 'F' is in the ON position, the pack will fade dimming levels to zero after a 2 second delay and remove all preheat levels.

### **Preheat**

Preheat levels in the range 0-25% can be set per output block (channels 1-8, 9-16 or 17-24) on the three preset potentiometers on the control PCB. The packs leave the factory with no preheat set, as in many cases the preheat level will be set from a control desk. Preheat is particularly useful when used in conjunction with large resistive type loads such as par 64's as it allows the lamp filaments to be kept warm to reduce thermal shock on switch on and to increase lamp life.

NOTE that a new energy saving feature has been incorporated in the Contractor series. Preheat is now only active if there is an active DMX signal input or if the pack is in test mode.

### **Thermal management**

The Contractor 24 has twin variable speed fans which are thermostatically controlled and so will not start until a predetermined temperature has been reached.

It is important to observe the following conditions in relation to cooling :-

- 1) Ensure a clearance of at least 125mm above the fans on the top edge of the case.
- 2) Keep at least 60mm clear on the sides and bottom edge (except for the location of the trunking).
- 3) Do not cover the ventilation slots on the lid.
- 4) Do not restrict air flow to the pack by mounting the pack in a cupboard or similar enclosure.

### **General information**

The control electronics are powered from phase three (channels 17-24) therefore if phase three fails the whole pack will stop working. If any other phase fails while the pack is working only the eight channels on that phase will stop working.

### **Triac replacement**

Servicing should only be carried out by competent trained personnel.

Ensure that the dimming pack is isolated from the mains before commencing any servicing activity. In the unlikely event that a triac needs to be replaced, slide the spring clip off the device and along the heatsink until it comes clear. Loosen the three screw terminals holding the triac leads and remove the triac. When fitting a new triac take care when forming the legs of the device not to bend them where they enter the body of the device as this may damage it. To ensure good thermal conductivity a thin layer of heatsink compound should be applied to the side of the device which will be in contact with the heatsink. Replace the spring clip by pressing it over the triac and heatsink ensuring that the ends of the clip locate on the sides of the heatsink.

Triac type BTA41-600B, BTB41-600B or equivalent is recommended.

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