

# IRIDEON<sup>®</sup>

## *AR500* Exterior Wash Luminaire Standard Version Installation Manual

# **AR500™ Exterior Wash Luminaire**

## **Standard Version Installation Manual**

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You can improve this manual. If you find any mistakes, or if you know of a way to improve procedures, please let us know. Send your letter to:

Electronic Theatre Controls, Inc.  
3030 Laura Lane  
Middleton, WI. 53562 USA.  
attn: Service Manager

Our FAX number in Middleton is (608) 836-1736.

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Canada Design Patent No. 81,234; 81,233; 76,046;

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Korea Patent No. 76,310; 42,639

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## Revision History

Basic	20 October 1994
Rev. A	14 June 1996
Rev. B	07 September 1999

# AR500™ Exterior Wash Luminaire

## Standard Version Installation

Each AR500™ fixture is shipped in two cartons, with the stanchion in one carton and the head assembly in another carton. Be sure that you have one stanchion and one head assembly for each fixture to be installed.

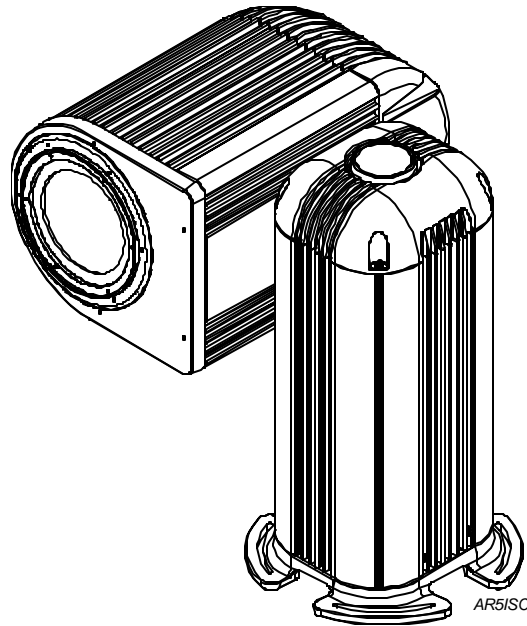
Included in each shipment is an installation tool kit. Check to be sure the tool kit contains the following items:

- 1-15/16" open-ended wrench
- 3/16" T-handle Allen wrench
- 100Ω termination resistor

Some additional tools will also be necessary in order to complete the installation. You will need to obtain the following item:

- #2 Phillips screwdriver
- #2 Straight slot screwdriver
- 3/4" (or 19mm) socket
- 9/16" (or 15mm) Socket

The installation site must provide an adequate mounting platform, sufficient clearance for focus adjustment of the head assembly and stanchion, sufficient access for relamping and other servicing, and provisions for power and data cabling.



**AR500 Exterior Wash Luminaire, Standard Version**



## Chapter 1 : Site Preparations

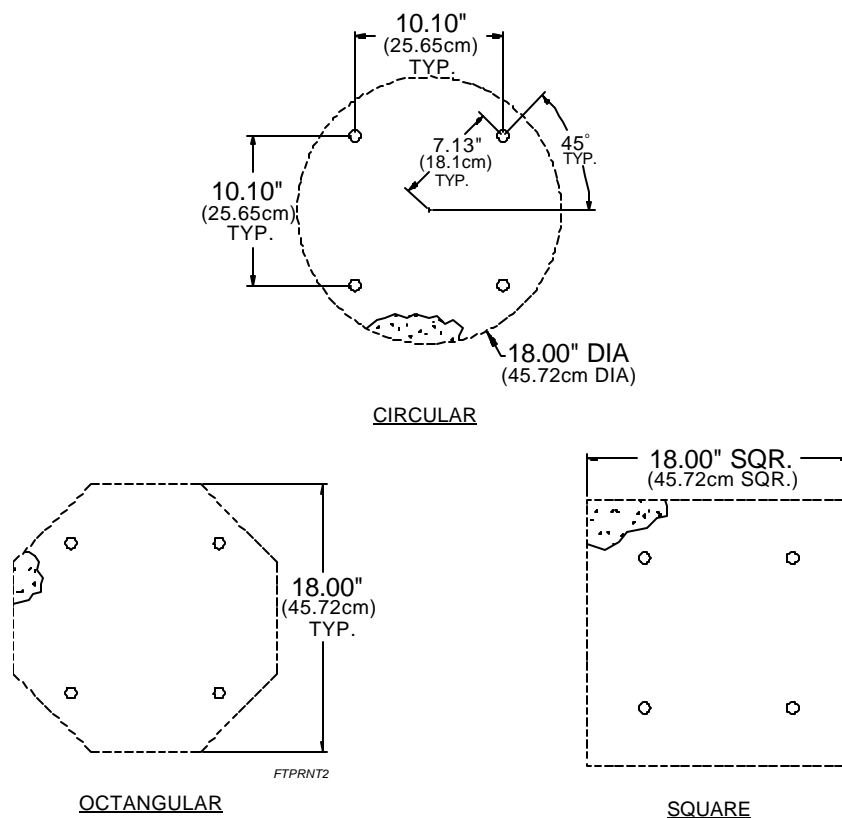
**Note:** The installation contractor is responsible for compliance with local electrical codes.

The luminaire stanchion is provided with 10 feet (3 m) data cable and 10 feet (3 m) power cable for external termination. To ensure proper operation, the installation site should be equipped with waterproof junction boxes for data and power cable termination. Data and AC power for each luminaire should be terminated in separate junction boxes, unless a single barriered junction box is installed. Terminal strips, not wire nuts, must be used to terminate wiring.

### 1.1 Mounting Platform for Stanchion Assembly

The stanchion mounting platform must have a diameter (or distance across flat sides) of at least 18 inches (45.00cm). The luminaire's mounting plate includes mounting holes sized to provide clearance for four sets of 3/8-18 (M10) (preferably stainless steel). The hole pattern for the mounting plate is a square that is 10.10 inch (25.65cm) on a side [or 10-7/64 inches (5.65cm)square].

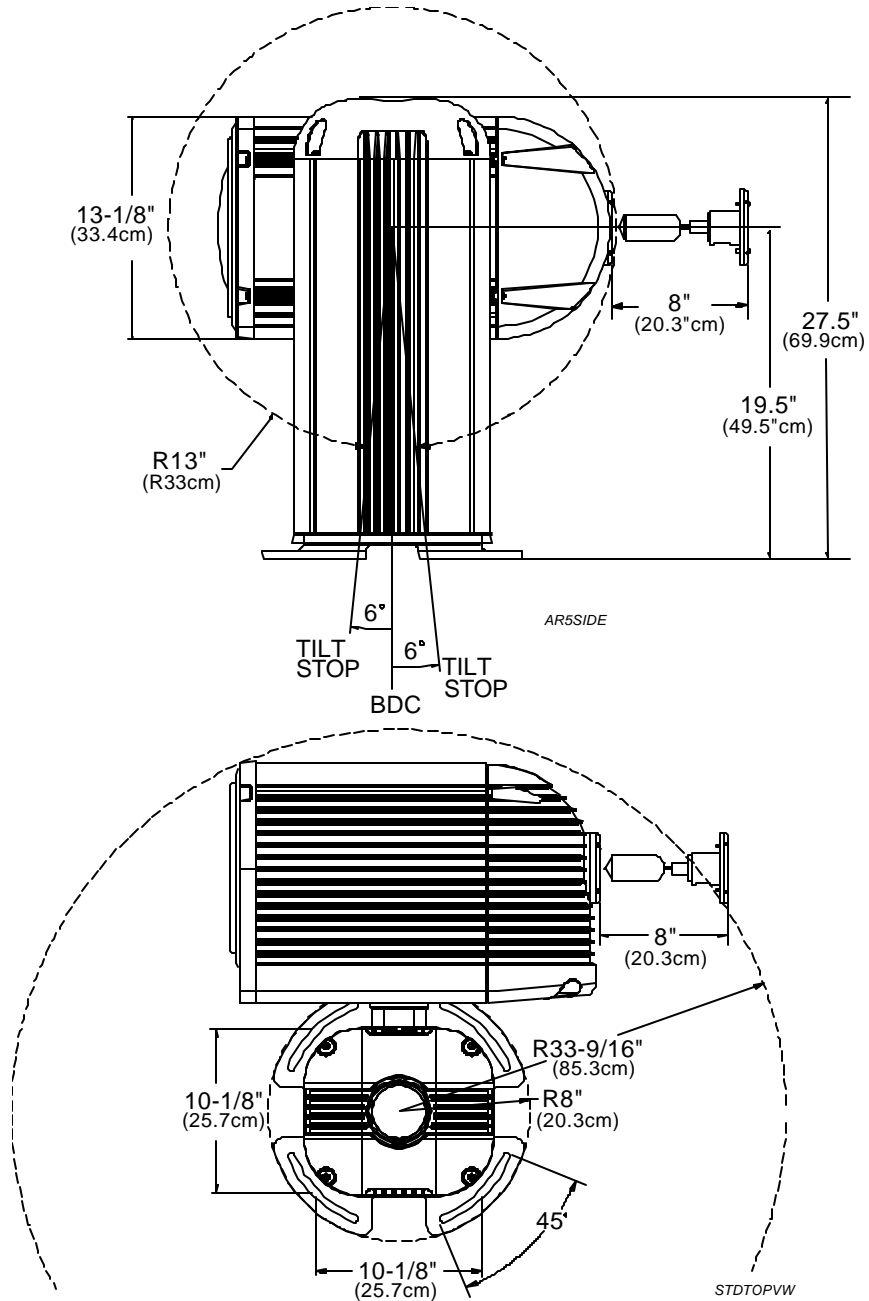
**Note:** Be sure to use four sets of 3/8 inch (M10) hardware when installing unit.



### 1.2 Clearance and Access

As shown, the head assembly can be rotated to any orientation thru 348° and requires 13 inch (33 cm) radius clearance around the vertical tilt axis. The stanchion assembly can be rotated 14° and requires 33-9/16 inches (85.3 cm) radius clearance around the horizontal pan axis.

**WARNING:** This appliance must be earthed. Flammable objects must be kept a minimum of 13'-2" (4.0 m) from lens.

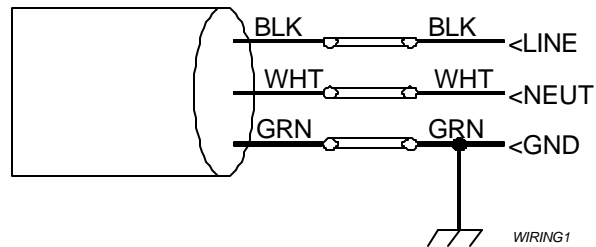


### 1.3 Input Power and Control Cabling

Each AR500 luminaire requires 1000 watts of power at the specified voltage and frequency. The luminaire is provided with 10 feet (3 m) of unterminated power cable type SJOW-A 16-3 (1.5mm<sup>2</sup>). Power wiring is to be connected as follows:

Wire	Connection
Black *(Brown)	AC Line
White *(Blue)	AC Neutral
Green *(Green/Yellow)	Ground

\* - European Model



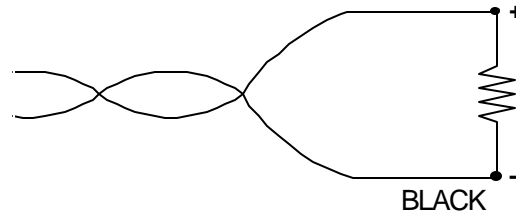
The AR500 luminaire is controlled by DMX-512 data connected to the two shielded twisted-pairs provided in the data cable. For DMX In and Thru configuration, connect data wiring as follows:

Wire	Connection
White/Red	Positive Data
Black/Black	Negative Data
Drain	Ground

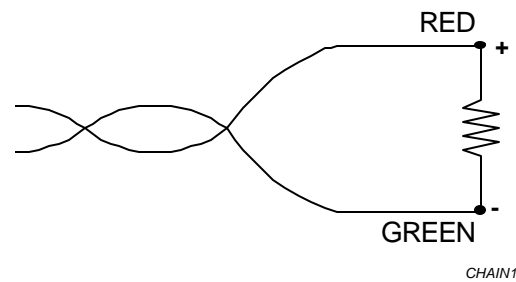
ETC requires 9729 cable for control signal distribution to the luminaire.

### 1.4 Data Wire Termination

If data cable is installed in a daisy-chain (feed-thru) configuration, install 100Ω termination resistor (provided) at end-of-line between positive(white or red) data line and negative(black) data line. If data splitter is installed, the last luminaire on each data run, as well as the transmitter to splitter data run, must be terminated. (See diagram in 1.7 Multiple Data Run.)



-OR-



### 1.5 Cable Specifications

#### AC POWER INPUT (to stanchion)

Wire Gauge: 16 AWG 3-conductor \*(1.5mm<sup>2</sup>×3-conductor)

Rating: 300V / 13 Amps

O.D.: 0.345 inches(8.77cm) \*[0.433inches(11mm)]

#### DATA INPUT (to stanchion)

Wire Gauge:

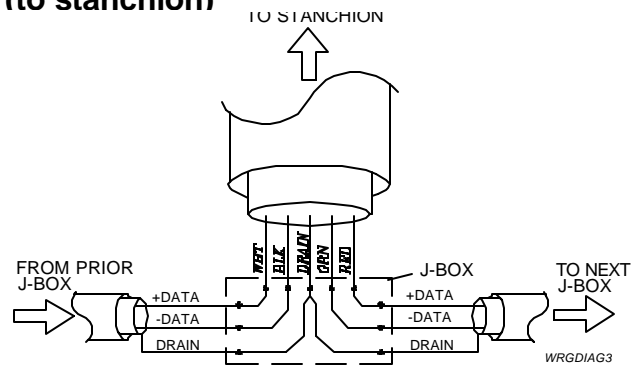
Shield (inner):

Shield (outer):

Rating:

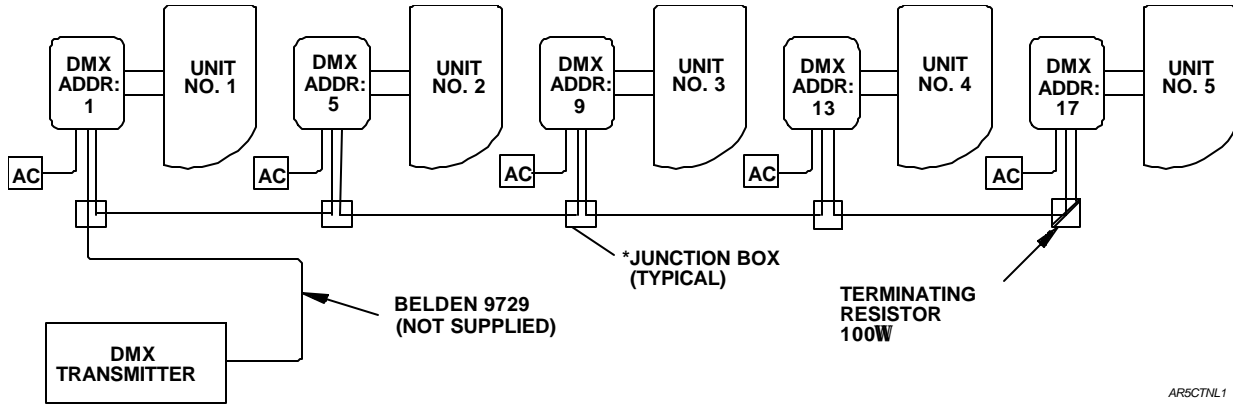
O.D.:

\* European mod



### 1.6 Single Data Run

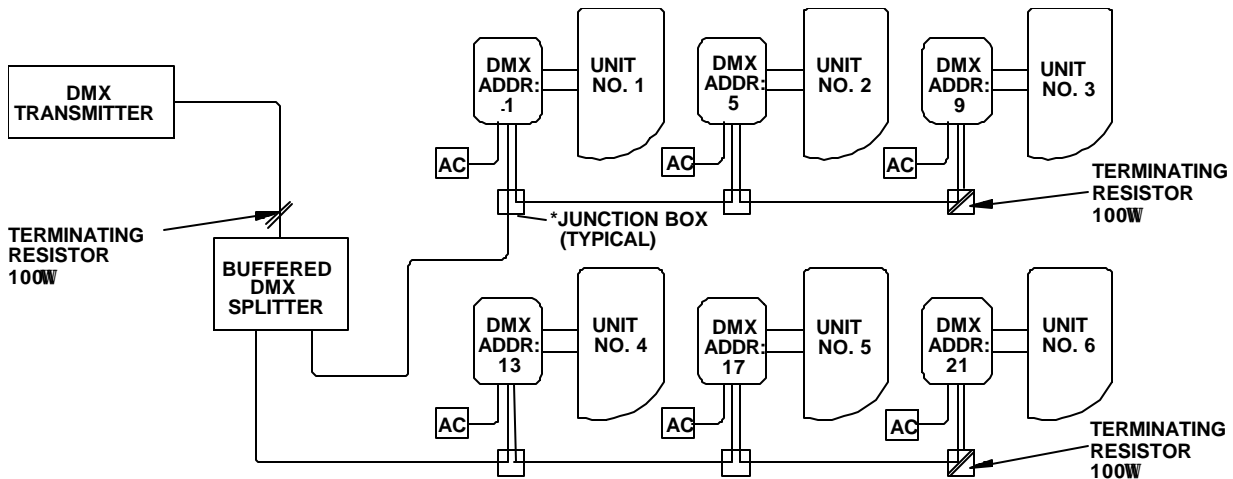
The following illustration displays a five units layout with a single data run. Notice the 100Ω resistor at the end of the data line.



AR5CTNL1

### 1.7 Multiple Data Run

The following illustration displays a six unit layout with a buffered DMX splitter. Notice the three 100Ω termination resistors.



AR5CTNL2

## Chapter 2 : Luminaire Installation Procedure

The following chapter describes unpacking shipping cartons, installing, preparing, and wiring the stanchion and head unit for the AR500 luminaire. This section also covers lamp installation and focus procedures.

### 2.1 Unpack Shipping Cartons

**Note:** Stanchion weighs 82 pounds (37.19Kg) or less, depending on voltage configuration; head enclosure weighs 62 pounds (28.12Kg) for a total weight of 144 pounds (65.31Kg). The luminaire requires two people for installation.

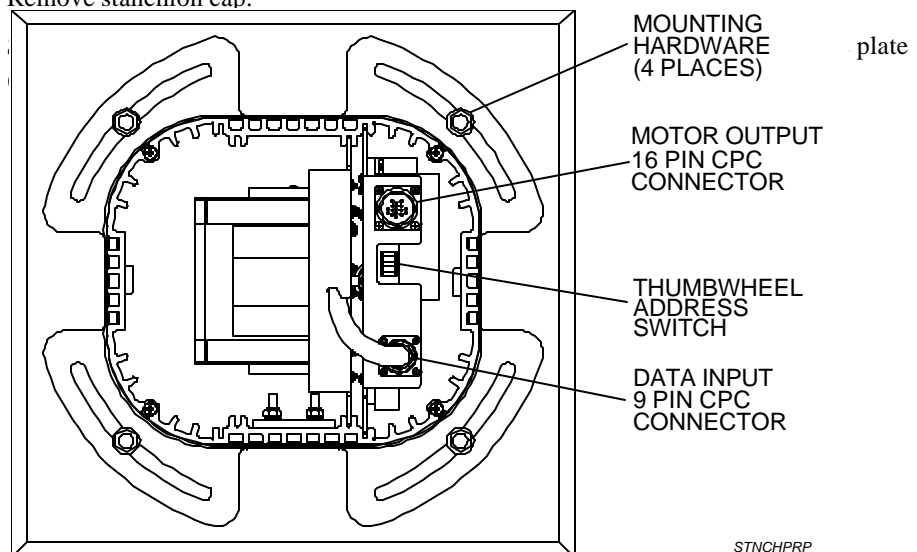
1. Remove stanchion and head assembly from cartons.
2. Locate tool kit (provided).

### 2.2 Install Stanchion

3. Set stanchion on mounting pad in required orientation. Loosely secure stanchion to pad using 3/8 inch (M10) hardware (not provided). Typically, this requires four flat washers, four lock washers, and four hex nuts.

### 2.3 Prepare Stanchion

4. Remove stanchion cap.
- 5.

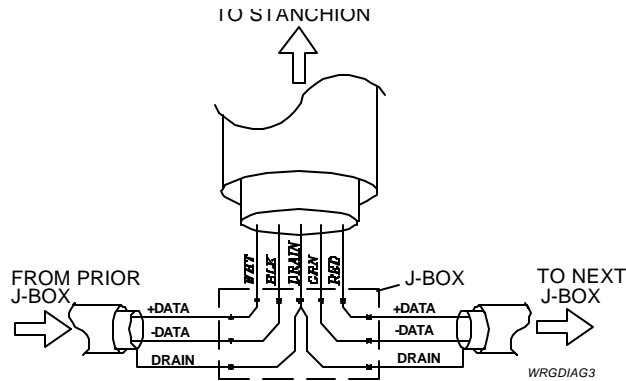


## 2.4 Wiring to Stanchion

6. Strip both data cable and power cable to expose conductors. Install 100Ω termination resistor (provided) at end-of-line between positive(white or red) data line and negative(black) data line. If data splitter is installed, the last luminaire on each data run, as well as the transmitter to splitter data run, must be terminated. (See diagram in [1.3 Input Power and Control Cabling](#).) Connect as follows:

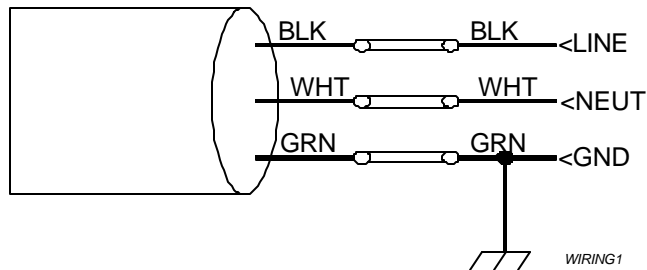
- a. DATA Wires:

Wire	Connection
White/Red	Positive Data
Black	Negative Data
Drain	Ground



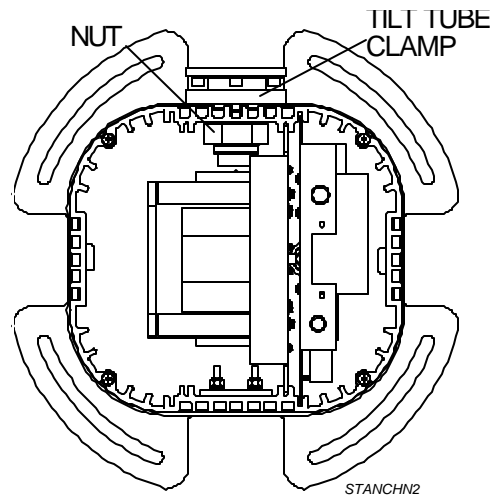
- b. POWER wires:

Wire	Connection
Black *(Brown)	AC Line
White *(Blue)	AC Neutral
Green *(Green/Yellow)	Ground

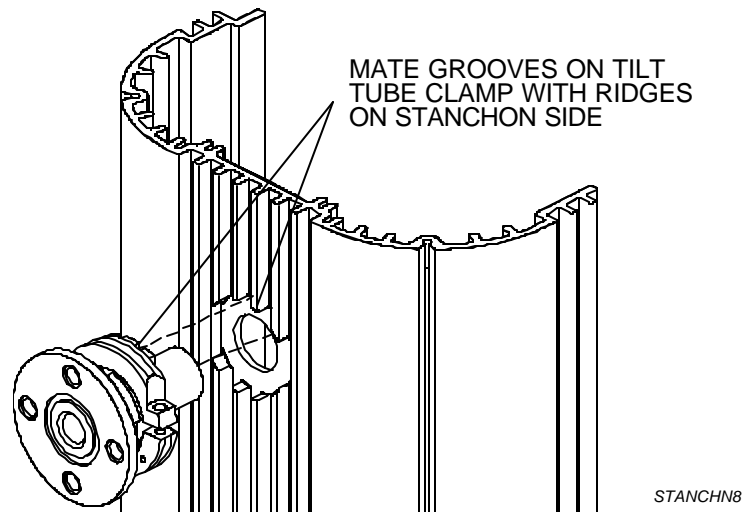


## 2.5 Install Head Enclosure

7. Connect head enclosure to stanchion as follows:
  - a. Remove nut, spring washer, and flat washer from the head enclosure tilt tube and from cables. Ensure black o-ring stays in tilt tube groove.
  - b. Dress cables through hole in stanchion.
  - c. Position grooves in tilt tube clamp so that they face upwards (head enclosure can later be rotated to face desired direction) and put head enclosure tilt tube through hole in stanchion.



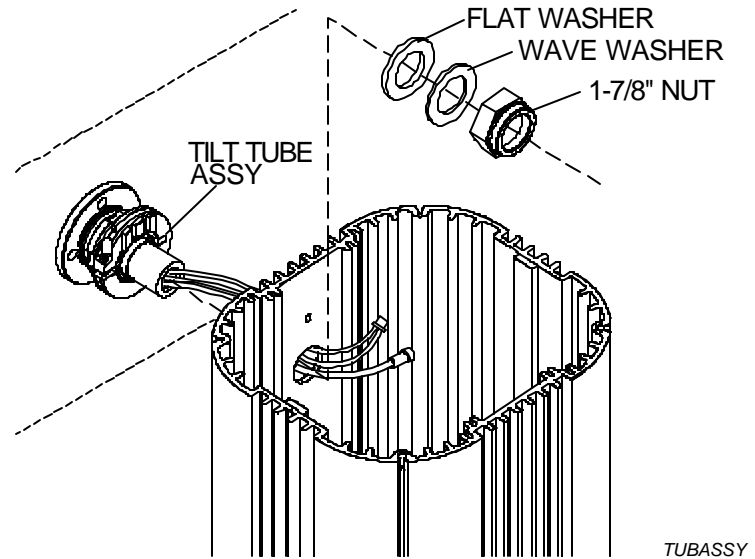
The grooves in the tilt tube clamp should fit over the two corresponding ridges running vertically on side of stanchion. Ensure black o-ring remains in groove of tilt tube.



- d. Place flat washer over cables and onto threaded part of tilt tube. Repeat for wave washer.
- e. Dress nut over cables and thread onto tilt tube as shown.
- f. Using 1-15/16 inch open-ended wrench (provided), tighten 1-7/8 inch nut only until snug. The head should rotate when moved by both hands,

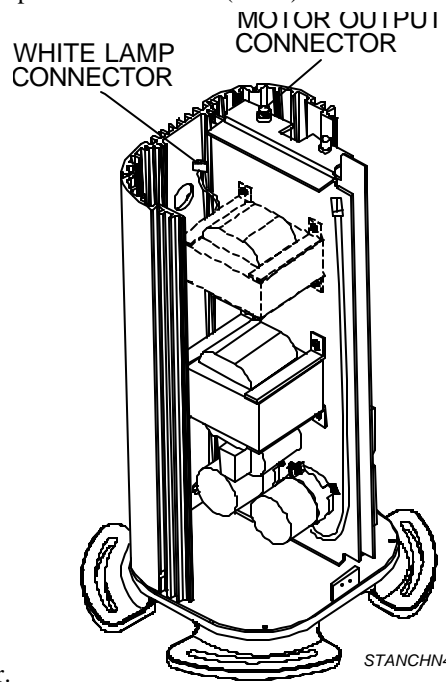


yet hold itself in place when left alone. There should be no gap between tilt tube and stanchion side.



## 2.6 Finish Preparing Stanchion

8. Connect head enclosure cables to stanchion.
  - a. Plug in white lamp connector to ballast output connector.
  - b. Plug in 16-pin CPC connector (black) to electronics plate motor output



connector.

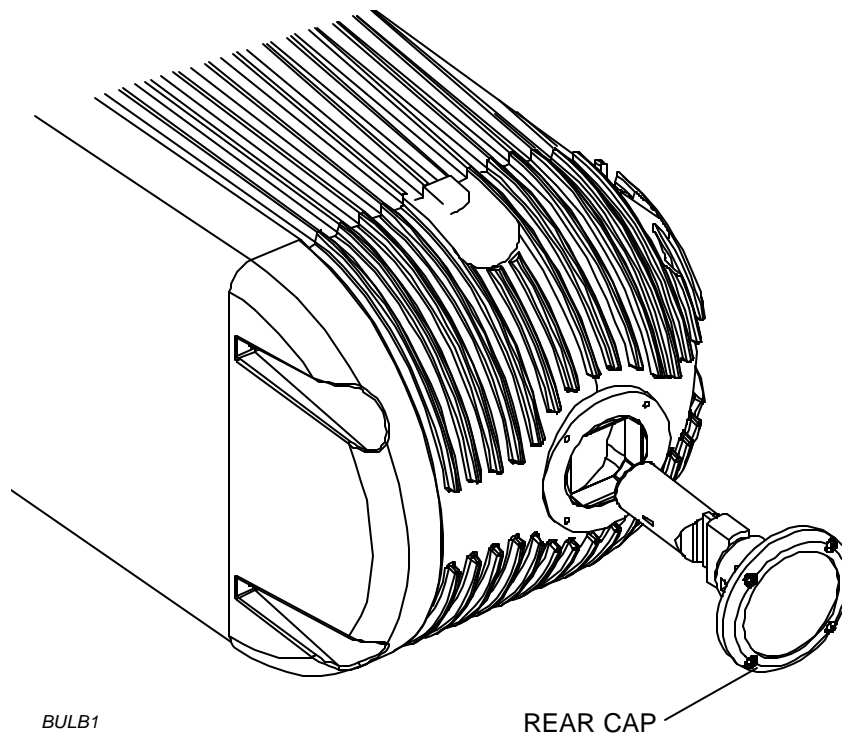
- c. Reinstall stanchion cap. Tighten screws in a diagonal cross pattern only until snug. Then tighten screws in same pattern until tight. Be sure gasket forms proper seal when replacing cap.

## 2.7 Preliminary Focus Adjustment

9. Using 3/16 inch T-handle Allen wrench (provided), loosen Allen head screw on tilt tube clamp as needed.
10. Rotate head assembly to approximate desired angle.
11. Tighten Allen head screw on tilt tube clamp as needed to hold luminaire in place.

## 2.8 Install Lamp

12. Remove rear cap. Be sure O-ring remains in groove of rear cap.
13. Install lamp in lamp socket. Do not touch the quartz bulb with bare fingers. If touched, clean quartz bulb with alcohol.
14. Reinstall rear cap on head enclosure, assuring O-ring is still in-place. Tighten screws in a diagonal cross pattern only until snug. Then tighten screws in same pattern until tight.



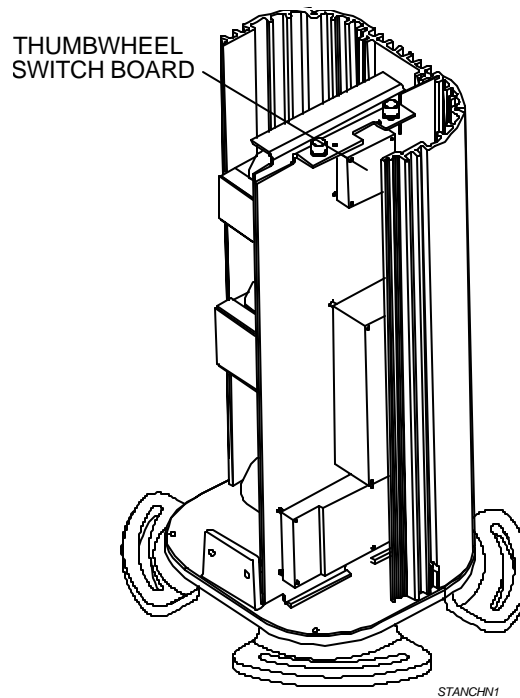
### Chapter 3: Fixture Address

Each AR500 luminaire requires four channels of DMX data to control the position of the color filters and diffuser/douser. The control sequence is as follows:

Channel	Filters & Diffuser/Douser
1	Blue Filters
2	Amber Filters
3	Magenta Filters
4	Diffuser/Douser Panels

#### 3.1 Setting the Starting Address

The luminaire starting address is set by a thumbwheel switch on the electronics plate in the stanchion. The next three channels will also be received. Each luminaire in a system must be set to the appropriate address in order to receive the four channels of data to control each luminaire.



In a simple case, only **AR500** luminaires are on a DMX-512 distribution network and the first luminaire is set for DMX channel 1. Thumbwheel addresses for **AR500** luminaires in such a case are given below:

<b>Lumi- naire</b>	<b>Thumbwheel Address</b>	<b>Luminaire</b>	<b>Thumb- wheel Address</b>	<b>Luminaire</b>	<b>Thumbwheel Address</b>
1	1	11	41	21	81
2	5	12	45	22	85
3	9	13	49	23	89
4	13	14	53	24	93
5	17	15	57	25	97
6	21	16	61	26	101
7	25	17	65	27	105
8	29	18	69	28	109
9	33	19	73	29	113
10	37	20	77	30	117

## 4

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## Composer Fixture Address

The luminaire address is set by two rotary switches located behind the access door in the yoke arm of the fixture. The switch furthest from the door's hinge is the ten's position and the switch closest to the door's hinge is the one's position (For example, in the illustration below a setting of 26 would require the switch on the left to be set to "2" and the switch on the right to be set to "6".) Each luminaire in a system must be set to the appropriate address in order to receive the proper data that controls that individual luminaire. Luminaire address selection typically results from the overall plans of the lighting designer. Specific addresses for each fixture should be furnished by that designer.

Fixture address "00" (that is, both rotary switches set to "0") is the luminaire's self test address. Internal commands direct the luminaire to perform a predetermined self test routine when switches are set in this position and power is applied. No external data commands are required for this test.

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**Note:** After the self test has been performed, return address switches to their designated fixture address or command data will not be recognized by the luminaire.

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## 4 Chapter 5 : Power-Up and Final Focus

1. Apply power to start lamp. The automatic calibration process will drive all filters to an open position. The luminaire will then remain on a solid white beam (unless DMX signal is present). Allow seven minutes for lamp to warm-up to full output.
2. Focus luminaire as follows:
  - a. Tilt head assembly to adjust for elevation.
  - b. Turn stanchion to adjust for azimuth.
  - c. Tighten Allen head screw in tilt tube clamp until secure.
  - d. Power unit off.
  - e. Remove stanchion cap.
  - f. Tighten 1-1/4 inch nut securely. Tilt tube clamp should hold head in place while tightening.
  - g. Replace stanchion cap (ensure gasket forms good seal).
  - h. Tighten nuts or bolts on stanchion securely.
  - i. Turn unit on.
3. Adjust front lens as follows:
  - a. Loosen screws securing the lens clamping ring. Loosen in diagonal cross pattern until you can rotate lens and rotate to desired position.
  - b. Tighten screws in diagonal cross pattern.
  - c. Clean lens.
4. Turn on DMX control unit. Test each channel to see if DMX and luminaire are working properly.

## Chapter 6: TEST ROUTINES

The AR500™ fixture has embedded test routines which allow you to control the unit using the thumbwheel switch. Use this feature to test and troubleshoot the unit without DMX control present. The settings are given below.

To start the tests, change thumbwheel address as required. Abort tests by moving address out of 900 range.

Test	Thumbwheel Address	Description of Routine
All Open	900	All panels open, static.
Blue Closed	910	Blue panels only closed, static.
Amber Closed	920	Amber panels only closed, static.
Magenta Closed	930	Magenta panels only closed, static.
Diffuser/Douser Closed	940	Diffuser/Douser panels only closed, static.
Blue Cycle	950	Blue panels only cycling. All other panels open.
Amber Cycle	960	Amber panels only cycling. All other panels open.
Magenta Cycle	970	Magenta panels only cycling. All other panels open.
Diffuser/Douser Cycle	980	Diffuser/Douser panels only cycling. All other panels open.
All Cycle	990	Sequential cycling of individual panels with an open state before the next panel closes.

## 6

In Composer self test, the Least Significant Digit (**LSD**) of the fixture address rotary switches selects the mechanisms to be tested. Use the table below to determine selected mechanisms.

LSD Setting	Test Description
0	Cycles each mechanism [blue, amber, magenta, dimmer (douser) or diffuser, pan, tilt] back and forth one at a time then all mechanisms at once.
1	Cycles blue filter mechanism open and closed
2	Cycles amber filter mechanism open and closed
3	Cycles magenta filter mechanism open and closed
4	Cycles dimmer (douser) or diffuser, whichever is installed, if any open and closed
5	Cycles pan to limit extremes
6	Cycles tilt to limit extremes
7	Cycles each filter (blue, amber, magenta, then dimmer) open and closed
8	Cycles pan then tilt to limit extremes
9	Cycles all mechanisms at once

**To perform self test:**

Step 1. Set both fixture address switches (MSD and LSD) to “0”. Within five seconds the Green LED will begin to blink at a rate of on for two seconds and off for two seconds.

Step 2. Wait for approximately ten seconds. Within ten seconds the Green LED will begin to flash at a rate of two flashes per second. At that point the luminaire will begin self test, as detailed in the above tables, for the MSD “0” and LSD “0” condition. Once self test begins, the MSD and LSD switches may be moved to other positions to test for proper operation of desired mechanisms.

When all desired tests have completed perform Step 3.

Step 3. Return switches to the “00” address. Wait for slow flash of Green LED to indicate luminaire has returned to normal operation. When LED begins to flash at the slower speed, return address switches to original fixture address within ten seconds. Failure to begin setting address switches within ten seconds will return luminaire to test mode.

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**Note:** To exit self test mode, address switches must be moved to some test position other than “00” and then returned to “00”. If test is performed only “00” LED will not resume slow flash to allow exit from testing.

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## Chapter 7 : TROUBLESHOOTING

Control Card LED state	Description
Slow Flashing	Control card operating normally but DMX signal is missing or invalid.
Fast Flashing	Control card operating normally and has valid DMX signal.
Solid On or Off	The control card has stopped running for some reason. Possible blown fuse, control card failure, loose connection, etc.

If the fixture has been installed and exhibits the following problems, try the suggested remedies and/or see the referenced section of the manual for possible solutions. If the problem cannot be solved, please call your local ETC distributor or call ETC Technical Support in Middleton, WI U.S.A. at 608-831-4116 or toll-free at 800-688-4116.

Refer to Figures 1 and 2 at end of troubleshooting section as needed.

## 7.1 GENERAL TROUBLESHOOTING

**WARNING:** Hazardous voltages are present. Tests to be performed by qualified personnel only.

*If bulb does not light...*

<b>Is the bulb installed?</b>	Power off unit. Make sure good lamp is installed. See <a href="#">2.8 Install Lamp</a> .
<b>Is ballast power connector plugged-in?</b>	Power off unit. Remove stanchion cap. Check brown 2-pin connector at top of ballast for good connection. (See Figure 1: <a href="#">Ballast Layout</a> for location).
<b>Is there AC power to ballast?</b>	Power off unit. Remove stanchion cap. Unplug white 3-pin connector at top of ballast card. Power on unit and check for proper input AC across pins on female connector. See Figure 1: <a href="#">Ballast Layout</a> . (Proper input AC dependent on configuration) Power off unit. Plug connector back in and reinstall stanchion cap.
<b>Is the AC correctly terminated?</b>	Power off unit. See <a href="#">2.4 Wiring to Stanchion</a> .
<b>Is bulb wire connected in stanchion?</b>	Power off unit. Bulb wires are on white connector at top of stanchion. Check for good connection.
<b>Are there any loose connections on ballast?</b>	Power off unit. Check other wire connections. <b>Note:</b> <i>The transformer and inductor each have unterminated wires for use in installations with alternate AC power. These should be "tied off" and are not considered loose connections.</i>
<b>Does the unit have a douser mechanism?</b>	If so, make sure douser mechanism is open. To open douser, remove DMX signal, then cycle power to fixture. The douser and all filters should go to open. If filters do not move, go to <a href="#">7.3 Electronics Troubleshooting</a> .

In order to troubleshoot the color mechanism, the bulb may be disabled by disconnecting the input power connector from the ballast card. This will allow repeated power-up of the fixture without the necessary cool down period (for the bulb).

Disable lamp and ballast as follows:

1. Remove power from **AR500** fixture.
2. Remove stanchion cap.
3. Unplug brown 2-pin power connector from ballast input connector.
4. Replace stanchion cap.
5. At conclusion of test, power off unit and reconnect brown 2-pin connector.

*If the fixture does not change color...*

<b>Do the color panels open when the fixture is powered-up?</b>	If so, go to <a href="#">7.2 DMX Troubleshooting</a> .
<b>Are the color panels already open?</b>	If so, listen for 'whirr' of motors as they attempt to drive panels for first 3 seconds after power-up. If panels do not open and motors do not 'whirr', go to <a href="#">7.3 Electronics Troubleshooting</a> .
<b>Do some panels open, while others remain closed?</b>	If so, go to <a href="#">7.4 Mechanical Troubleshooting</a> .

## 7.2 DMX TROUBLESHOOTING

<b>Is there DMX to the fixture?</b>	See description of LED operation in <a href="#">7 LED Functions</a> to check for DMX activity.
<b>Are the 1/16A fuses on the control card good?</b>	See <a href="#">Figure 2: Electronics Plate Layout</a> for location. Check for continuity across each green fuse (4 total). If there are blown fuses, remove fuseblock, rotate 180 degrees, then reinsert. This will provide two new fuses since only two fuses are in use at one time.
<b>Is the DMX address set properly?</b>	See <a href="#">3 Fixture Address</a> .
<b>Is the DMX line properly terminated?</b>	See <a href="#">1.3 Input Power and Control Cabling</a> .
<b>Does fixture respond properly to diagnostic tests given in 7. TEST ROUTINES?</b>	If so, problem may be with the incoming DMX data. See <a href="#">1.3 Input Power and Control Cabling</a> .

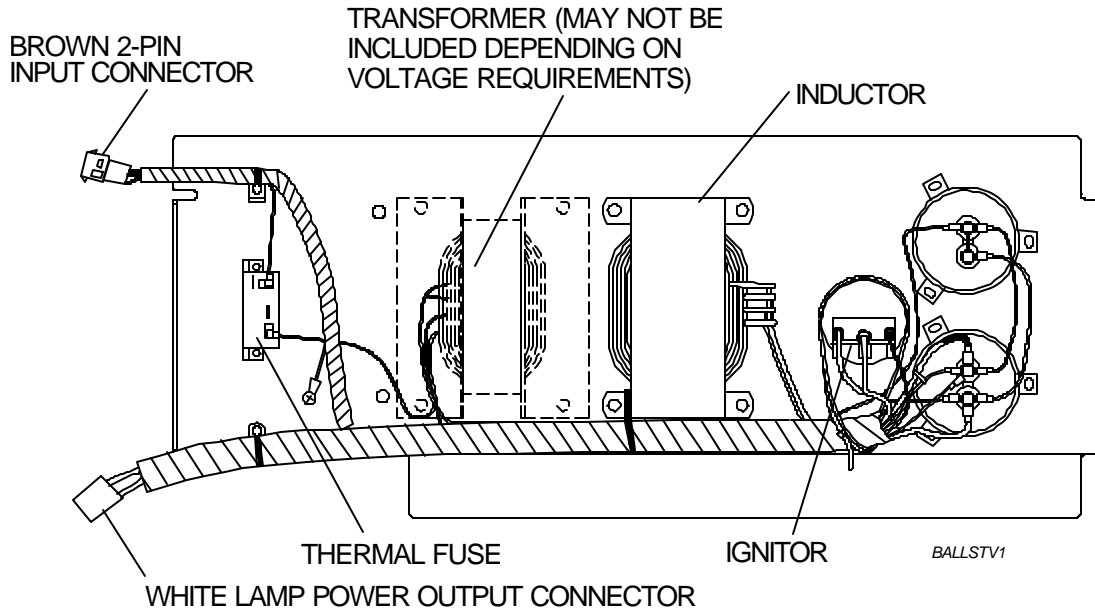
## 7.3 ELECTRONICS TROUBLESHOOTING

<b>Is there AC power to the electronics?</b>	Remove power from unit. Remove stanchion cap. Disconnect two CPC connectors from electronics card. Remove electronics card and reconnect connectors. Turn on power to unit. Measure the incoming AC voltage on the orange 6-pin plug connected to the DC power supply (see <a href="#">Figure 2: Electronics Plate Layout</a> ). There should be input AC across the black and white wires.
<b>Is there 24V DC power to the lamp control board?</b>	Check to see if green LED on power supply is lit. See <a href="#">6 LED Functions</a> .
<b>Is the 5A fuse on control card good?</b>	Power off unit. See <a href="#">Figure 2: Electronics Plate Layout</a> for location. Remove fuse to check continuity. If no continuity, replace fuse.
<b>Are there any loose connections on electronics plate?</b>	Power off unit. See <a href="#">Figure 2: Electronics Plate Layout</a> for locations. Plug-in any loose connections. Make sure none are plugged-in backwards.

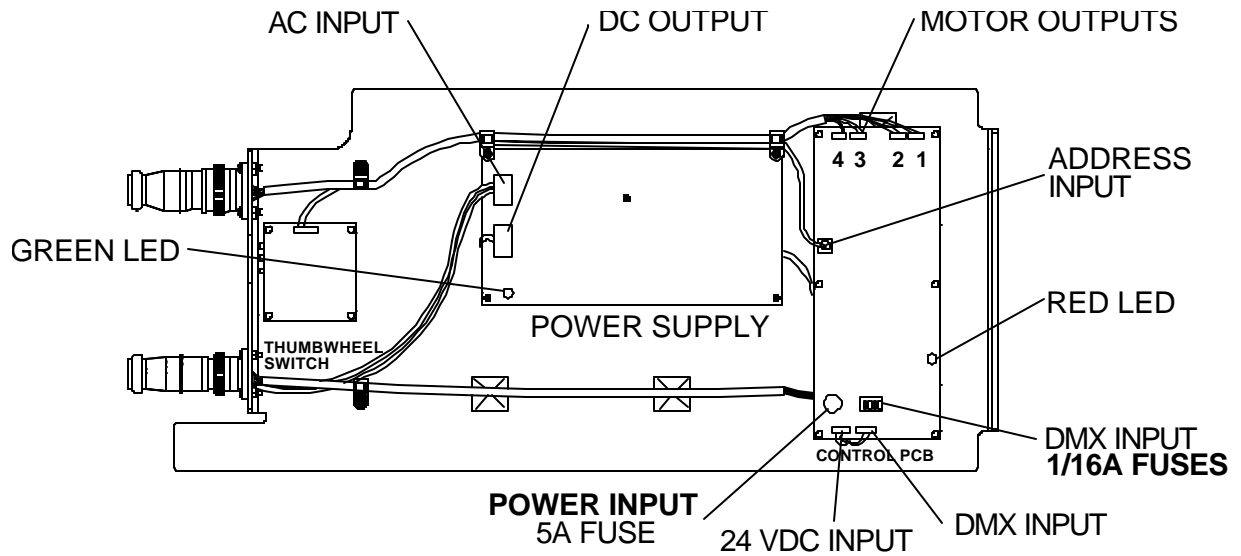
## 7.4 MECHANICAL TROUBLESHOOTING

<b>Are all drive linkages properly connected?</b>	Power off unit. Remove front of head enclosure. Make sure each filter ring is connected to its drive motor shaft by small brass link. (The drive arm on disconnected linkages will spin during power-up). If disconnected, reconnect by spreading tabs on drive arm link around corresponding brass link.
<b>Are all motor wires connected?</b>	Check connections at control card (4 total, match wire number to PCB Step number) and 16-pin CPC connector on electronics plate. See <a href="#">Figure 2: Electronics Plate Layout</a> and <a href="#">2.6 Finish Preparing Stanchion</a> .

**Note:** At conclusion of these tests replace all components, making sure all connections are clean and secure.



**Figure 1 - Ballast Layout**



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**Figure 2 - Electronics Plate Layout**