USER MANUAL

VL5+™ Wash Luminaire
VL5Arc+™ Wash Luminaire

PRG

02.9634.0002

VL5+™ Series Wash Luminaire User Manual
Version as of: September 10, 2008 | PRG part number: 02.9634.0002

Production Resource Group
Dallas Office
8617 Ambassador Row, Suite 120
Dallas, Texas 75247
www.prg.com

Compliance Notice

FCC This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation.

Conforms to:

UL STD 1573

Certified to:

CAN/CSA STD E598-1
CAN/CSA STD E598-2-17

3077774

Safety Notice

It is extremely important to read ALL safety information and instructions provided in this manual and any accompanying documentation before installing and operating the products described herein. Heed all cautions and warnings during installation and use of this product. Safety symbols used throughout this manual are as follows:

CAUTION advising of potential damage to product.

WARNING advising of potential injury or death to persons.

GENERAL INFORMATION PERTAINING TO PROTECTION AGAINST ELECTRICAL SHOCK, FIRE, EXPOSURE TO EXCESSIVE UV RADIATION, AND INJURY TO PERSONS CAN BE FOUND BELOW.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST FIRE

1. PRG luminaires have been designed for use only with specific lamps. Note lamp type before replacing. Installing another type of lamp may be hazardous.
2. PRG luminaires may be mounted on any type of surface as long as mounting instructions are followed. See instructions detailed in this manual.
3. Replace fuses with same type and rating only.
4. Minimum distance from head to any flammable object is 2m.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST ELECTRICAL SHOCK

1. PRG luminaires are designed for dry locations only. Exposure to rain or moisture may damage luminaire.
2. Disconnect power before servicing any PRG equipment.
3. Servicing to be performed by qualified personnel only.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST EXPOSURE TO EXCESSIVE ULTRAVIOLET RADIATION

1. PRG luminaires may use an HID type lamp which produces UV radiation. DO NOT look directly at lamp.
2. It is hazardous to operate luminaires without complete lamp enclosure in place or when lens is damaged. Lenses or UV shields shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired.

WARNING: INSTRUCTIONS FOR PROTECTION AGAINST INJURY TO PERSONS

1. Exterior surfaces of the luminaire will be hot during operation. Use appropriate safety equipment (gloves, eye protection, etc.) when handling and adjusting hot equipment and components. Service and maintenance should be performed only by qualified personnel as determined by the high pressure lighting fixture manufacturer.
2. Arc lamps generate intense heat. Disconnect power and allow lamp to cool for 15 minutes before relamping.
3. Arc lamps emit ultraviolet radiation which can cause serious skin burn and eye inflammation. Additionally, arc lamps operate under high pressure at very high temperatures. Should the lamp break, there can exist a danger of personal injury and/or fire from broken lamp particles being discharged.
4. The lamp shall be changed if it has become damaged or thermally deformed.
5. Wear eye protection when relamping.
6. If lamp is touched with bare hands, clean lamp with denatured alcohol and wipe with lint-free cloth before installing or powering up the luminaire.
7. Serious injury may result from the generation of ozone by this lamp system. A proper means of venting must be provided.

Notes de sécurité

Avant de procéder à l'installation des produits décrits dans ce guide et de les mettre en marche, il est extrêmement important de lire TOUS les renseignements et TOUTES les directives de sécurité contenues dans ce guide ainsi que toute documentation jointe. Tenir compte de tous les avertissements et suivre toutes les précautions pendant l'installation et l'utilisation de cet appareil.

Les symboles de sécurité utilisés dans ce guide sont les suivants :

ATTENTION Ce symbole annonce que l'appareil risque d'être endommagé.

AVERTISSEMENT Ce symbole annonce qu'il y a risque d'accident grave ou même fatal.

CETTE SECTION CONTIENT DES INFORMATIONS GÉNÉRALES POUR SE PROTÉGER CONTRE LES DÉCHARGES ÉLECTRIQUES, LES INCENDIES, L'EXPOSITION EXCESSIVE AUX RAYONS UV ET TOUT AUTRE ACCIDENT POUVANT ENTRAÎNER DES BLESSURES.

AVERTISSEMENT: RISQUE D' EXPLOSION.

1. Le service et le maintenance ne devront être assurés que par des personnes qualifiées comme precisé par le frabricant des lampes à haute pression.
2. Des vêtement de protection et les procédures précisées dans le manuel du frabricant doit être fournies.

AVERTISSEMENT: RÉGLAGE DES LAMPES

1. Chaleur intense. Débrancher le matériel et laisser refroidir pendant 15 minutes avant de rallumer.
2. Risque l'incendie. N'utilise que des METAL HALIDE MSR 700 Watt G 22 Base.

AVERTISSEMENT: DIRECTIVES POUR SE PROTÉGER CONTRE UNE EXPOSITION EXCESSIVE AUX RAYONS UV

1. Risque d'explosion en cas de radiation ultraviolet imprantes.
2. Ne pas intervener en l'absence de confinement de la lampe en place ou quand la lentille est abîmée.

AVERTISSEMENT: DIRECTIVES POUR SE PROTÉGER CONTRE LES ACCIDENTS POUVANT ENTRAÎNER DES BLESSURES

1. Chaleur intense. Eviter tout contact avec des personnes ou des tissues. Attention, de graves blessures peuvent résulter de production d'ozone par cette lampe. Un système de ventilation adapté doit être fournies
2. La température de surface = 300.c
   La temperature de l'ambiance = 50.c
3. Ne convient pas pour un usage résidential.
4. Utilisable seulement dans les locaux secs

Revision History

This manual has been revised as follows:

Version	Release Date	Notes
BASIC	September 10, 2008	Initial release.

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Chapter 3. Operation

Chapter 4. Troubleshooting and Maintenance

Appendix A. Technical Specifications

Appendix B. Glossary

Notes

Introduction

About This Manual

This manual provides necessary information regarding product safety, installation, and operation for the following equipment:

- VARI✳LITE® VL5+™ Wash Luminaire (20.9634.0002)
- VARI✳LITE® VL5Arc+™ Wash Luminaire (20.9647.0002)

Familiarizing yourself with this information will help you get the most out of your lighting system.

WARNING: It is important to read ALL accompanying safety and installation instructions to avoid damage to the product and potential injury to yourself or others.

Additional Documentation

For extended service information, refer to the following manual:

- VL5+™ Series Wash Luminaire Service Manual (02.9634.0020)

For additional information regarding the use of VL5™ series luminaires in lighting systems, refer to the following manuals:

- VARI✳LITE Series 200™/300™ System Installation and Checkout Manual (02.3004.0200)
- VARI✳LITE Interface Devices Service Manual (02.5014.0010)
- VARI✳LITE Series 300™ Modular Rack Service Manual (02.9640.0010)
- Virtuoso® System Installation and Checkout Manual (02.3004.0400)
- Controlling VARI✳LITE Equipment Using a DMX512 Console (02.3004.0300.54)

Support for this product is provided by Production Resource Group. Technical updates regarding this equipment are issued by the PRG Dallas office (see "Customer Service" on page 2). These updates are in the form of Technical Bulletins, which contain procedures for equipment upgrades, retrofits, and repairs not found in the existing manual(s).

For additional documentation, please visit our support tech center at: www.prg.com/support

Customer Service

Our comprehensive technical services department ensures you get the full benefit of being a PRG customer. Whether your needs are simple or complex, our full-time staff of experienced professionals are on-hand to provide support. For assistance, contact your nearest PRG office:

PRG Dallas (International Service)
8617 Ambassador Row, Suite 120
Dallas, Texas 75247
Ph: 214.630.1963
Fx: 214.630.5867
Service Fx: 214.638.2125
Service Email: orders@prg.com

PRG Hi-Tech Atlanta
1053 Willingham Dr.
Atlanta, Georgia 30344
Ph: 404.214.4800
Fx: 404.214.4801

PRG Chicago
90 Rawls Rd.
Des Plaines, Illinois 60018
Ph: 847.227.5171
Fx: 847.557.9033

PRG Las Vegas
6050 South Valley View Blvd.
Las Vegas, Nevada 89118
Ph: 702.942.4774
Fx: 702.942.4775

PRG Los Angeles
9111 Sunland Blvd.
Sun Valley, California 91352
Ph: 818.252.2600
Fx: 818.252.2620

PRG Nashville
8351 Eastgate Blvd.
Mount Juliet, Tennessee 37122
Ph: 615.834.3190
Fx: 615.834.3192

PRG New Jersey
7777 West Side Avenue
North Bergen, New Jersey 07047
Ph: 201.758.4000
Fx: 201.758.4312

PRG Orlando
1902 Cypress Lake Dr.
Orlando, Florida 32837
Phone: 407.855.8060
Fax: 407.855.8059

PRG Canada
2480 Tedlo Street
Mississauga, Ontario L5A 3V3 Canada
Ph: 905.270.9050
Fx: 905.270.2590

PRG Asia
Asagami Fukagawa Logistics Center B-4F
2-2-1 Shiohama, Koto-ku, Tokyo, Japan 135-0043
Ph: 81.3.5439.4091
Fx: 81.3.5439.4092

PRG Europe
The Cofton Centre
Grovely Lane
Longbridge, Birmingham
B31 4PT, England
Ph: +44 (0) 845.470.6400
Fx: +44 (0) 845.470.6401

Essential Lighting
Unit E
Imber Court Trading Estate
Orchard Lane
East Molesey, Surrey
KT8 0BY, England
Ph: +44 (0) 208.335.6000
Fx: +44 (0) 208.398.7205

For additional resources and documentation, please visit our website at: www.prg.com

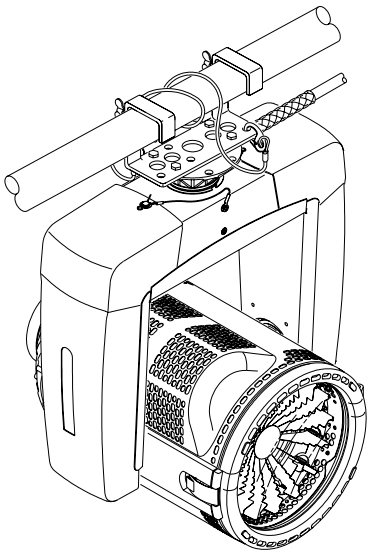
1. Description

This chapter contains descriptions of luminaire features, components, and operations.

- **Features**
- **Components**
- **Operation Overview**

Features

Overview



The VL5+™ Wash Luminaire from PRG Lighting is an improved version of the VARI✻LITE® VL5™ Wash Luminaire, while the VL5Arc+™ Wash Luminaire is an improved version of the VARI✻LITE® VL5Arc™ Wash Luminaire. All VL5+ Series Luminaires feature newly designed Blue, Amber and Magenta color filters to provide improved color matching from luminaire to luminaire. A new reflector has been installed to increase light output, and a thicker, more durable UV glass has been relocated to the rear of the luminaire head to reduce interior heat. Upgrades to the ventilation system provide superior reliability for all circuit boards and motors, while upgraded wiring and connectors further enhance the dependability and consistency of all motors and pan/tilt mechanisms. In addition, improvements to the VL5Arc luminaire's ignitor technology reduce hot restrike time from 8 minutes (VL5Arc) to 1 minute (VL5Arc+).

The VL5+ Series Luminaires can be controlled by PRG consoles or a wide variety of DMX512 consoles. Operation is identical to the standard VL5 models.

Features:

- 3200° tungsten halogen lamp source (VL5+) or 575W arc source (VL5Arc+).
- Lamp power provided by conventional dimmers or C3™ dimmer modules (VL5+) or APS6™ power supply modules (VL5Arc+).
- Luminaire power and data provided by either a Smart Repeater™ or Smart Repeater™ Plus unit.
- Enhanced DICHRO✻TUNE® cross-fadable dichroic colors feature independent cyan, magenta and amber color control. Smooth, timed color crossfades can occur in as little as 0.7 second.
- Internal douser provides intensity control.
- Interchangeable front lens.
- Low expansion glass reflector.
- Solid state ignitor with a hot restrike time of 1 minute (VL5Arc+).
- Smooth, time-controlled continuous 360° pan and 270° tilt movement.
- Control by PRG consoles or a wide variety of DMX512 consoles.
- Compatible with Series 300™ truss hooks for versatile hanging configurations.
- Optional floor stand.

Upgrade Summary

The VL5+™ Series Wash Luminaires feature many improvements over the standard VL5™ Wash Luminaire and VL5Arc™ luminaire, both to the exterior and interior components. The following is a complete summary of improvements:

- Improved color matching from luminaire to luminaire. This improvement was accomplished by installing newly designed Blue, Amber and Magenta color filters (made using an improved ion-assist process). The new color filters have less color shift problems. An anti-backlash drive ring was also installed to improve color match and dimmer accuracy, and increase repeatability of those functions.
- Increased reliability of the Controller PCB. This improvement was accomplished by adding ventilation holes to improve air flow.
- Increased reliability of Pan and Tilt functions. This improvement was accomplished by retrofitting the pan/tilt mechanisms with new clutches and encoders, replacing the pan/tilt cable assemblies and installing a newly designed pan stop which prevents sticking.
- Increased reliability of power and data transmission. This improvement was accomplished by replacing the Input Cable Assembly.
- Increased reliability of color and dimmer functions. This improvement was accomplished by replacing all linear actuator motors and connectors.
- Improved light output. This improvement was accomplished by installing a new reflector.
- Improved yoke covers. This improvement was accomplished by installing new yoke sheet metal which adds support to the yoke covers which will prevent damage to them during normal use. Ventilation holes have been added to the yoke leg for PCB cooling and air flow, along with heavy duty yoke covers and new safety tethers to prevent covers from falling off.
- Reduced head temperature. This improvement was accomplished by moving the UV glass to the rear of the luminaire head, while also switching to a thicker, more durable UV glass. This will allow replacement of the glass without the need to disassemble the luminaire, along with reducing the temperature of the Blue/Amber bulkhead, extending the life of filter pads and linear actuators.
- Increased reliability of motor harness. This improvement was accomplished by designing a new harness with highly stranded 24AWG PVC wire which makes a more reliable connection in the MTA connectors.
- (**VL5Arc+ only**) Increased reliability of the lamp strike. This improvement was accomplished by installing a new solid state ignitor which reduces hot restrike time from 8 minutes (VL5Arc) to 1 minute (VL5Arc+).
- (**VL5Arc+ only**) Added lamp douse switch to yoke cross-member. The switch should be used to douse the arc lamp before disconnecting the pigtail cable. This will prevent damage to the contacts in the CPC connector, which can be caused by drawing an arc during disconnect.

Components

Exterior Components

The following illustration shows the exterior VL5+™ Series Wash Luminaire components and controls.

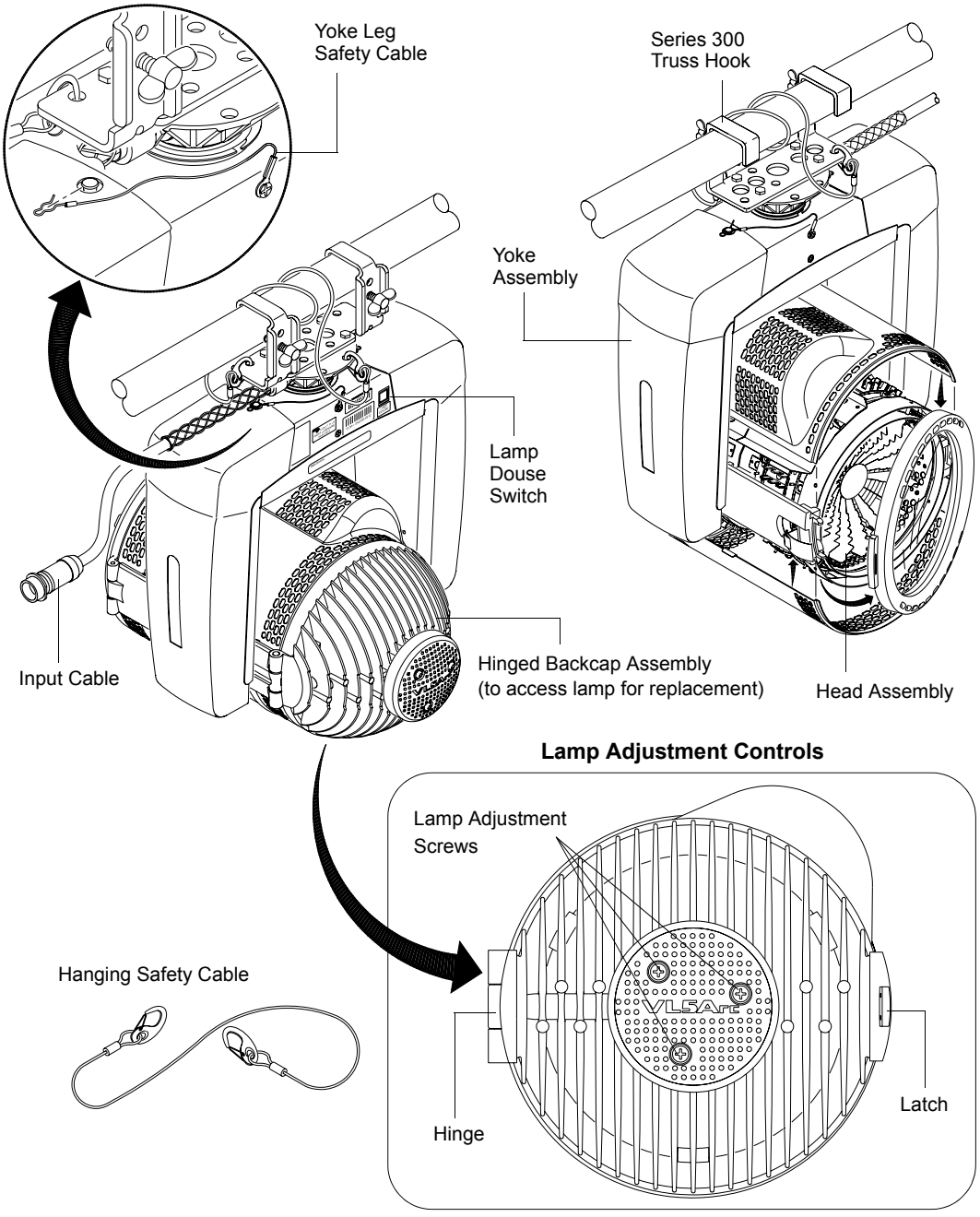


Figure 1-1: Exterior Components

Interior Head Components

The following illustration shows the major sub-assemblies located in the VL5+™ Series Wash Luminaire Head.

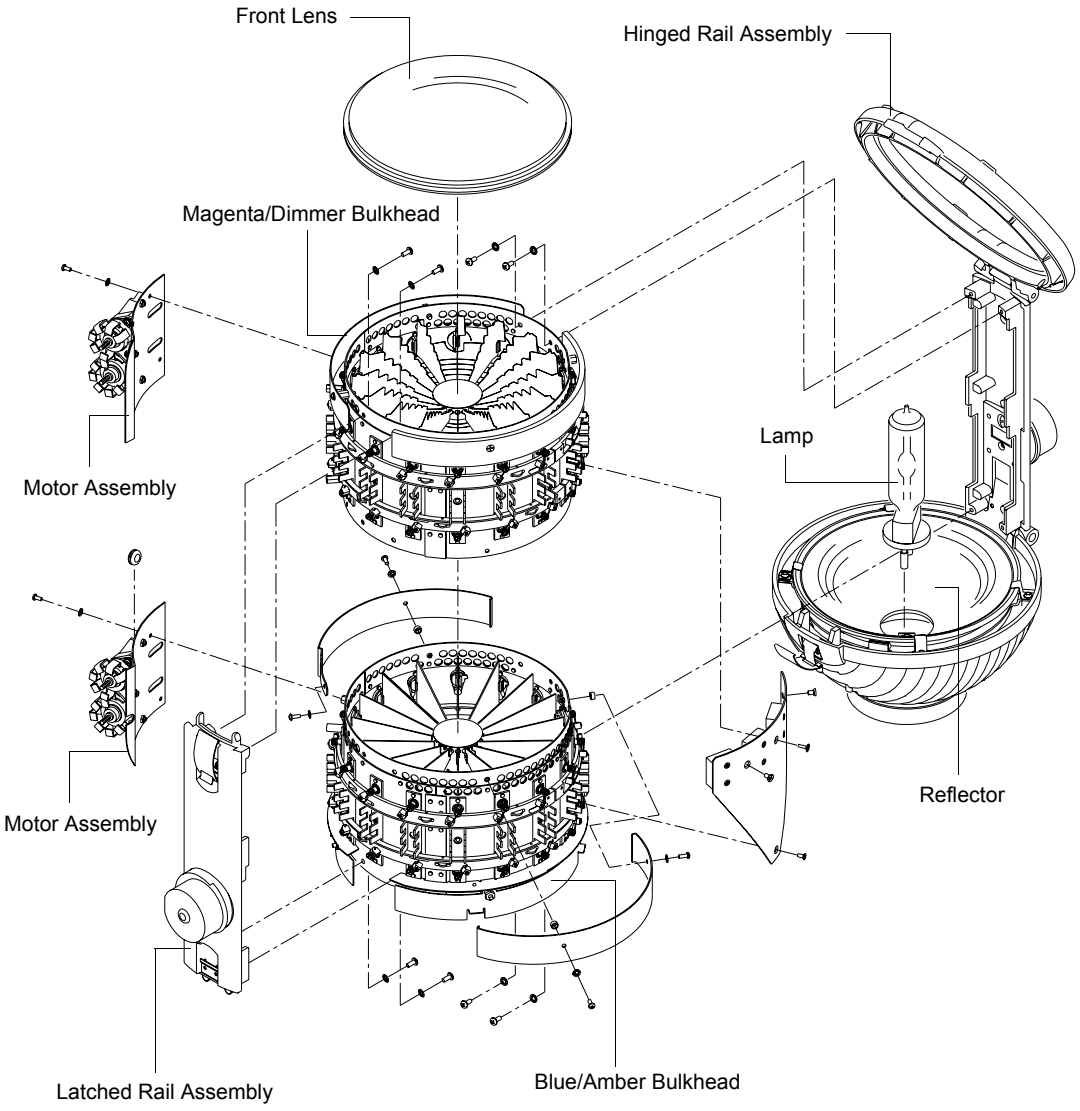
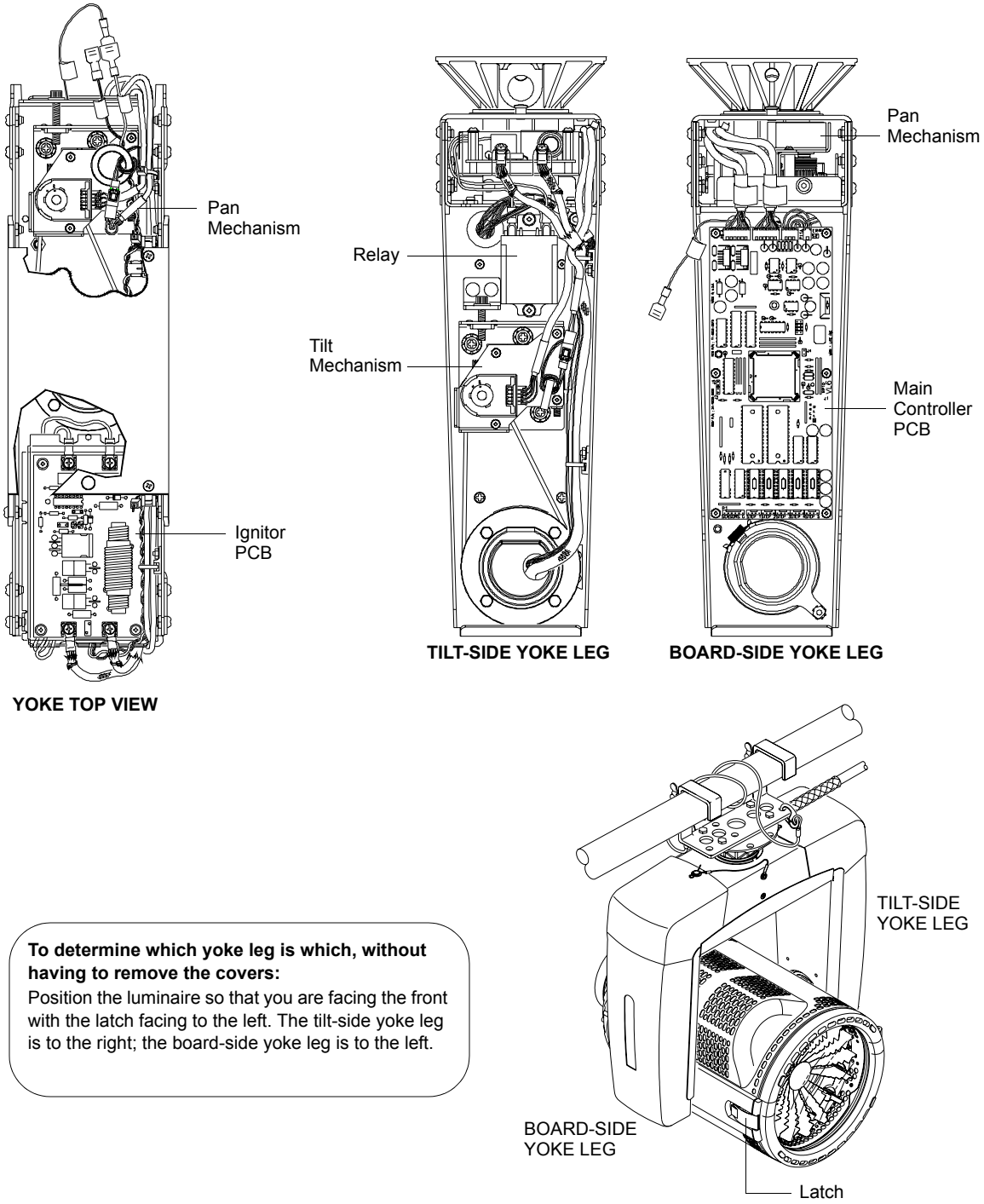


Figure 1-2: Head Components

Interior Yoke Components

The following illustration shows the major sub-assemblies located in the VL5+™ Series Wash Luminaire Yoke.



To determine which yoke leg is which, without having to remove the covers:
Position the luminaire so that you are facing the front with the latch facing to the left. The tilt-side yoke leg is to the right; the board-side yoke leg is to the left.

Figure 1-3: Yoke Components

Replacement Items and Accessories

The following items can be ordered from PRG. (Please order by PRG part number.)

PRG P/N	Accessory
71.2526.0100	1000W 100 VAC Tungsten Lamp (VL5+)
71.2526.0120	1000W 120 VAC Tungsten Lamp (VL5+)
71.2526.0230	1000W 230 VAC Tungsten Lamp (VL5+)
71.2529.0120	1200W 120 VAC Tungsten Lamp (VL5+)
71.2528.0575	575W Arc Lamp (VL5Arc+)
22.9634.0206	Top Hat/Gel Holder with Rings
22.9634.0207	Top Hat/Gel Holder without Rings
22.9634.0145	Series 300 Safety Cable
22.9634.0161	Series 300 Floor Stand
22.9634.0195	Series 300 Third-Point Truss Hook
22.9634.0217	Series 300 Double Truss Hook
25.7042.0006	6 ft. Shielded Series 300 Lamp Cable
25.7042.0012	12 ft. Shielded Series 300 Lamp Cable
25.7042.0020	20 ft. Shielded Series 300 Lamp Cable
25.7155.0050	50 ft. Shielded Series 300 Lamp Cable (Smart Lamp Plus)
25.7155.0100	100 ft. Shielded Series 300 Lamp Cable (Smart Lamp Plus)
25.7155.0XXX	Custom Length Shielded Series 300 Lamp Cable *
20.9623.0111	Smart Repeater Unit
20.9623.0600	Smart Repeater Plus Unit
22.9620.0217	Series 200 Truss Hook (2 each required for Smart Repeater)
20.9625.0018	Series 300 Molded Plastic Six Luminaire Case
20.9625.0024	Series 300 Molded Plastic Work Trunk
42.5002.0004	Clear Lens
42.5002.0005	Stipple Lens
42.5002.0006	8-Row Lenticular Lens
42.5002.0007	10-Row Lenticular Lens
42.5002.0008	12-Row Lenticular Lens

* Cannot exceed 200 ft. in length.

Operation Overview

External Power and Data Configuration

Control data signals, 24Vdc, and lamp power are provided by a Series 300™ Smart Repeater™ or Smart Repeater™ Plus processing unit to Series 300™ luminaires via lamp cables. Up to (6) VL5+ Series Luminaires may be powered from a single Smart Repeater or Smart Repeater Plus unit. Lamp power for VL5+™ Wash Luminaires is provided by conventional dimmers or C3™ dimmer modules located in a Series 300™ Modular Rack. Lamp power for VL5Arc+™ Wash Luminaires is provided by APS6™ power supply modules also located in a Series 300 Modular Rack. The following diagram shows how data and power are distributed to VL5+ Series Luminaires in a sample DMX512 system.

Note: Refer to the VARI✻LITE® Interface Devices Service Manual (02.5014.0010), VARI✻LITE Series 300 Modular Rack Service Manual (02.9640.0010) and Controlling VARI✻LITE Equipment Using a DMX512 Console Manual (02.3004.0300.52) for more information about the associated equipment.

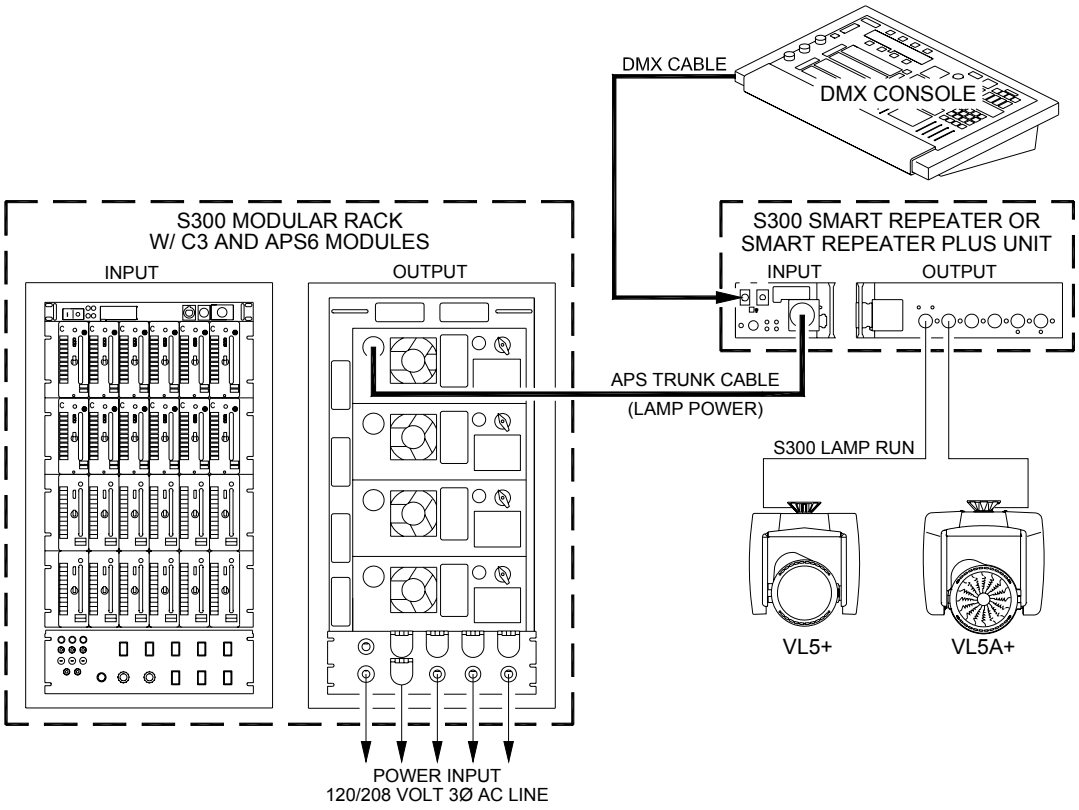


Figure 1-4: Power and Data Configuration (Typical DMX512 System)

Smart Repeater Units

The Smart Repeater™ processing units combine electrical power and data signals from different sources and provide it for up to six VL5+™ Series Wash Luminaires via a single connector to each luminaire.

Smart Repeater features:

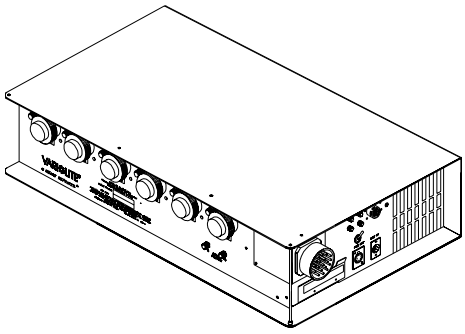
- Receives Virtuoso® or Series 200™ data signal, and AC power for electronics through standard, 9-pin Series 200 lamp cable from ACS rack and sends it to connected luminaires.
- Receives lamp power from conventional dimmers or APS6™/C3™ power supply modules through standard Socapex-type 19-pin lighting connector and sends it to connected luminaires.
- Provides a thumbwheel switch for setting the starting address for the six luminaire outputs.
- Provides Broadcast and Reply LEDs to monitor data traffic.
- Contains test software for Series 300™ luminaires.
- Attaches to truss or pipes with two truss hooks and a safety cable.
- Operates up to six VARI✻LITE® VL5™, VL5+™ VL5Arc™, VL5A+™, VL5B™, VL6™, or VLM™ luminaires; one on each output connector.
- When using multiple combinations involving the VL6C, use the point system indicated below. Combinations of luminaires connected to the Smart Repeater unit should not exceed 6 points.

  VL5 / VL5+ = 1 point
  VL5Arc / VL5Arc+ = 1 point
  VL6 = 1 point
  VL6B = 2 points
  VL6C / VL6C+ = 2 points
- Accepts DMX512 protocol from DMX control desks and translates it to Series 300 comm for DMX control of VARI✻LITE luminaires.

Two versions of the unit are available: a standard Smart Repeater unit and a Smart Repeater Plus unit. The standard unit can operate any of the Series 300 luminaires with the exception of the VARI✻LITE VL7™, VL7B™, and VL7U™ luminaires, which can only be operated with a Smart Repeater Plus unit.

Smart Repeater Plus Unit

The Smart Repeater Plus unit has the ability to operate all Series 300 luminaires including the VL7 series spot luminaires, which require additional power not available with the standard Smart Repeater unit.



Operation and functionality of the Smart Repeater Plus unit is identical to the standard unit, with the addition of an active DMX512 termination switch and fan cooling. The Smart Repeater Plus unit can control up to six VL7, VL7B or VL7U luminaires.

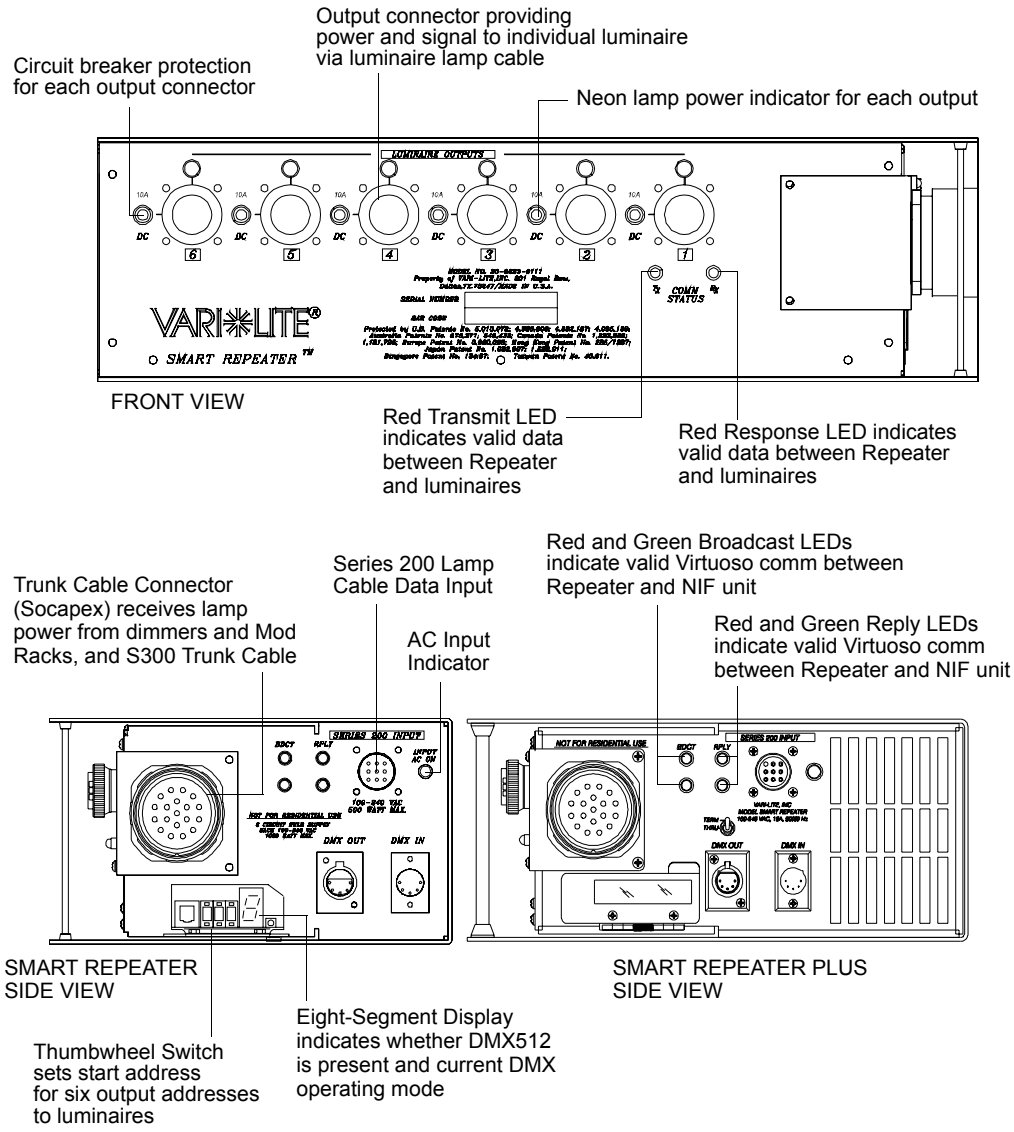


Figure 1-5: Smart Repeater / Smart Repeater Plus Input/Output Connections

Internal Power and Data Distribution

The following diagram shows how data and power are distributed within the VL5+ and VL5Arc+ Wash Luminaires.

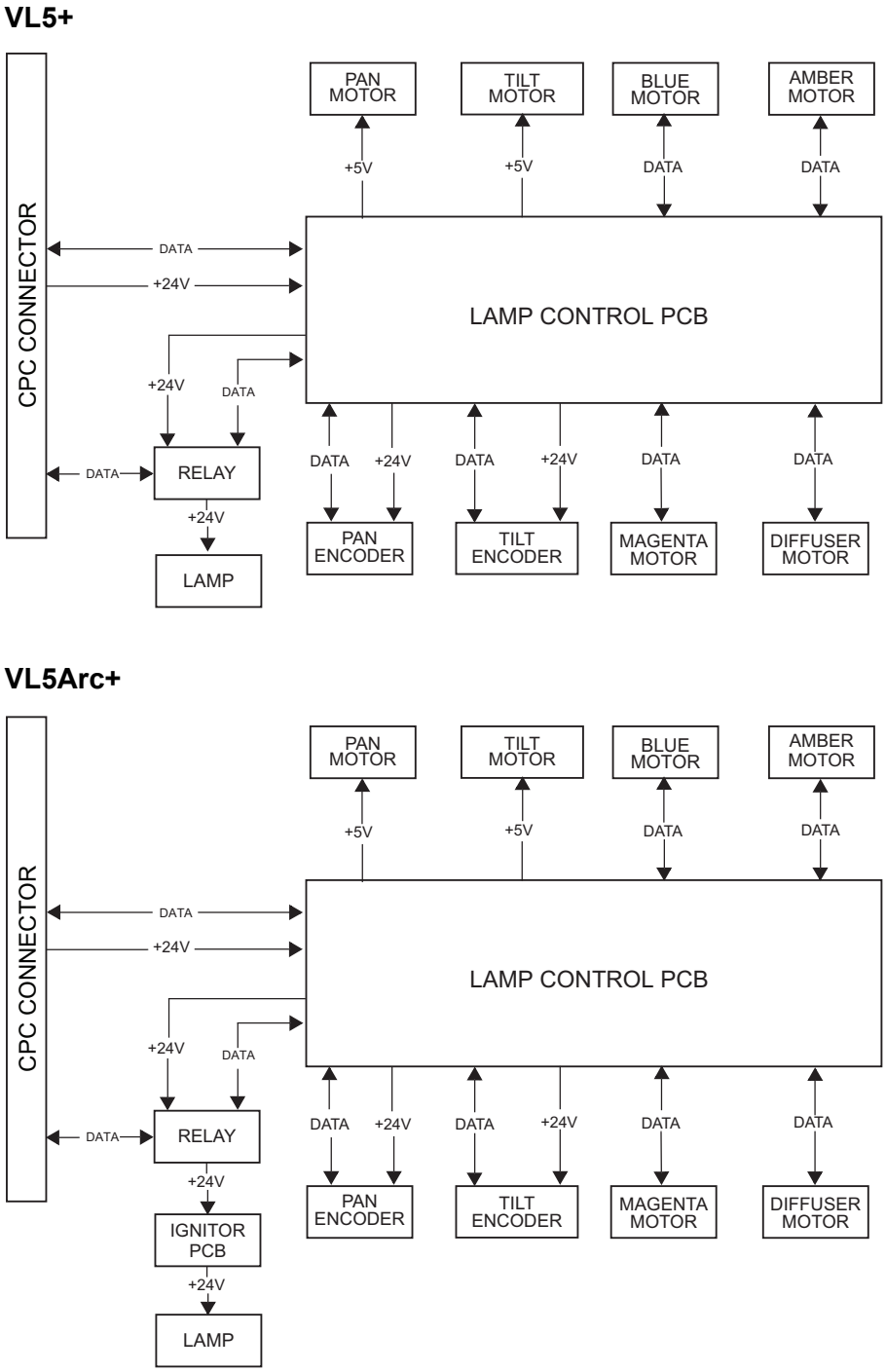


Figure 1-6: Internal Power and Data Distribution Diagram

Notes

2. Installation

This chapter contains instructions for hanging or floor mounting the luminaire and connecting it to the system.

- **Mounting the Luminaire**
- **System Connection**

Mounting the Luminaire

Attaching a Truss Hook

The VL5+™ Series Wash Luminaire can be hung horizontally or vertically from any structure designed to accommodate the load created by this moving luminaire. In standard hanging applications, the VL5+ Series Luminaire utilizes a Series 300™ double truss hook, which is bolted to the pan tube. The hook can be oriented in 45 degree increments to provide flexible mounting. (See "Standard Hang" on page 17.)

A special third-point truss hook, which mounts to the pan tube in addition to the double hook, is available to provide a third point of support. (See "Three-Point Hang" on page 19.)

To attach a double truss hook:

Step 1. Determine type of installation and required orientation of truss hook.

Step 2. At pan tube, attach truss hook using four 5/16-18 x 1" bolts and 5/16-18 nuts (**Figure 2-1**).

Step 3. Ensure truss hook is secure.

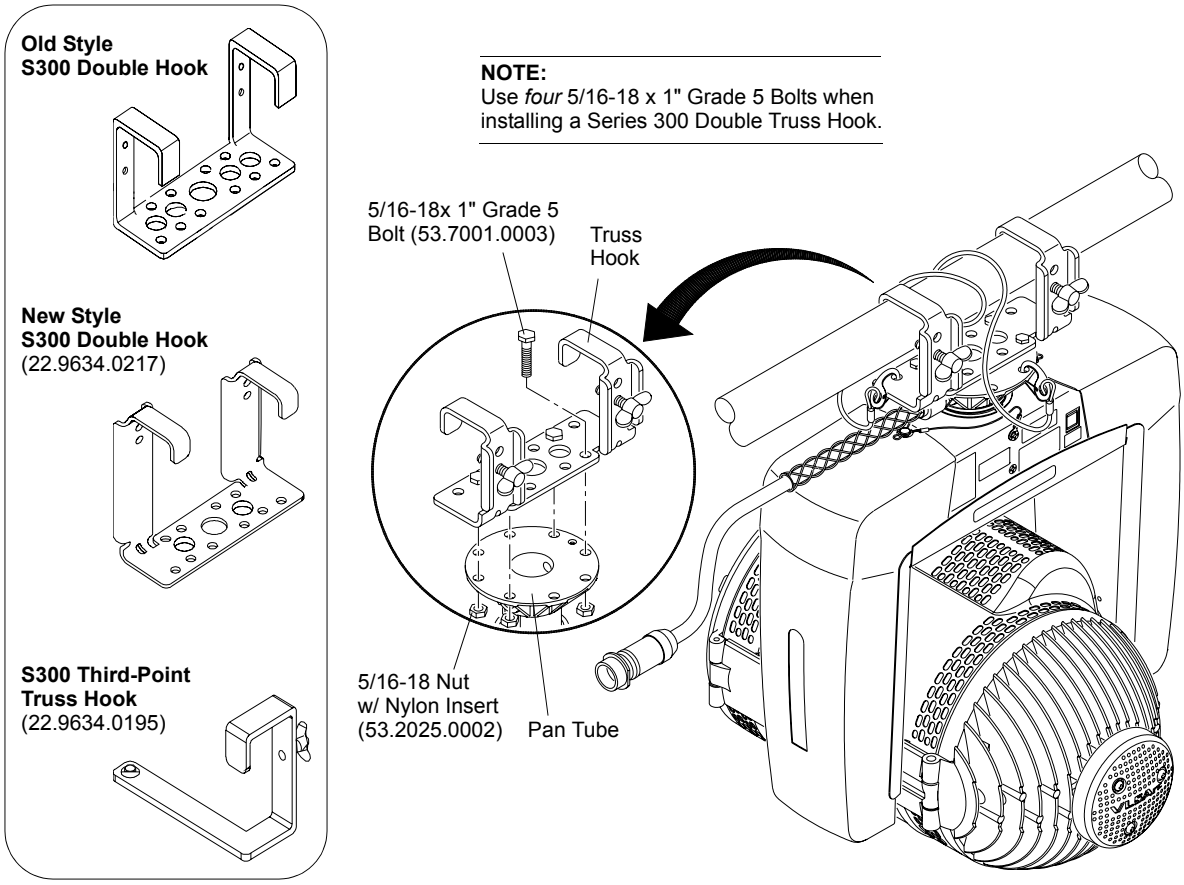


Figure 2-1: Attaching a Truss Hook

Hanging Methods

Standard Hang

In standard hanging applications, the VL5+™ Series Wash Luminaire utilizes a Series 300™ double truss hook, which is bolted to the pan tube and affixed to square tube or round pipe; the minimum outside dimension for a piece of pipe or tube is 1 inch (2.54 cm) and the maximum outside dimension is 2 inches (5.08 cm).

CAUTION: Wing bolts should be tightened only by hand. Do not use wrenches or other tools as this can damage the truss or the hook.

WARNING: A safety cable MUST be used in all hanging configurations.

Step 1. Lift luminaire into mounting position (**Figure 2-2** on next page).

Step 2. Tighten truss hook wing bolts by hand. Ensure that luminaire is fully supported.

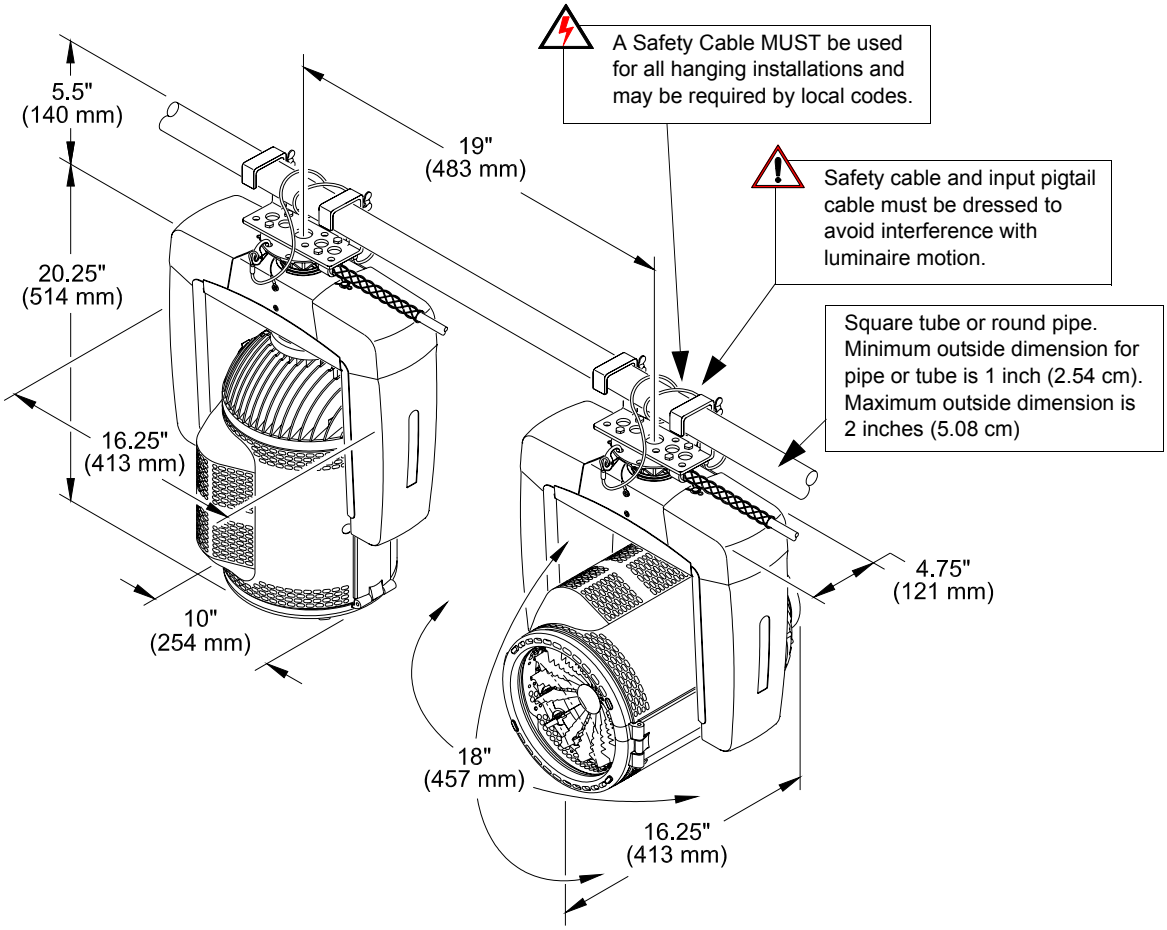
Step 3. Install safety cable as follows (referring to **Figure 2-2** DETAIL A):

a. Attach one end of safety cable to pan tube.

b. Loop several times around truss or pipe, leaving as little slack as possible.

c. Attach other end of safety cable to pan tube.

Step 4. Connect input pigtail cable to Series 300™ Lamp Run Cable which is connected to a Smart Repeater™ or Smart Repeater™ Plus unit. (Refer to "External Power and Data Configuration" on page 10 for an example system diagram.)



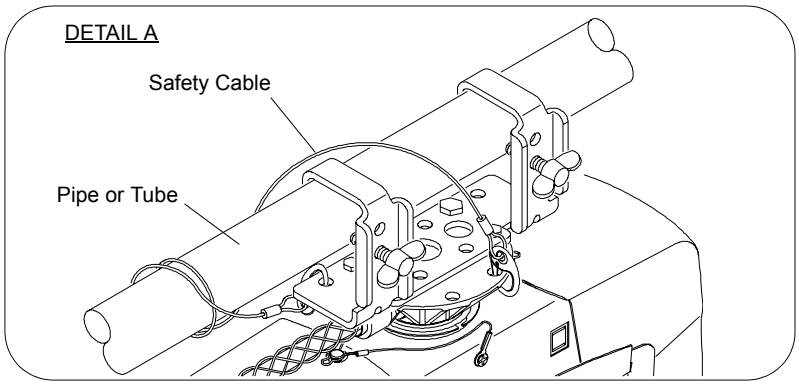


Figure 2-2: Standard Hanging Configuration and Clearances

Three-Point Hang

A Series 300™ third-point truss hook can be used to stabilize the luminaire in a three-point hanging configuration. The third-point hook is bolted to the pan tube in addition to the standard double hook. The following illustration shows how the hook is used to achieve a three-point hang.

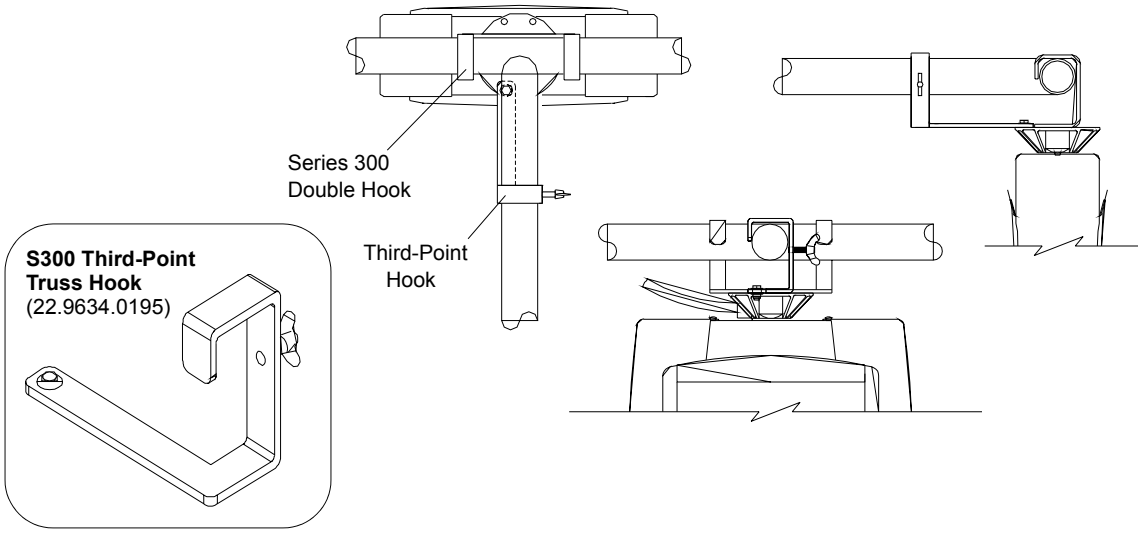


Figure 2-3: Three-Point Hang

Custom Hang

The luminaire can also be hung using custom hanging devices. The pan tube's multiple mounting holes allow flexibility for placement of hardware. To attach custom hanging devices to the pan tube, the following hardware can be used:

- 5/16"-18 x 1" HSCZ Grade 5 Bolt (53.7001.0003)
- 5/16"-18 Zinc nut with nylon inserts (53.2025.0002)

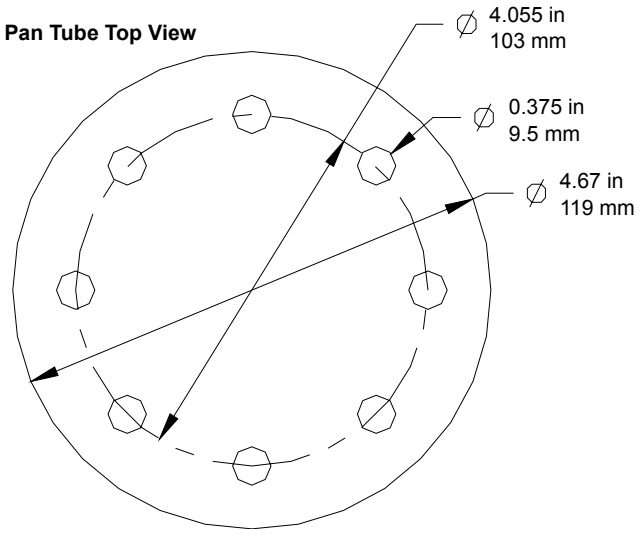


Figure 2-4: Pan Tube Hole Dimensions

Floor Mounting

The VL5+™ Series Wash Luminaire may be mounted in an upright floor position using a Series 300™ floor stand. The floor stand (22.9634.0161) includes all necessary hardware as shown in **Figure 2-5**.

To install floor stand:

Step 1. Orient pigtail cable as shown in **Figure 2-5** DETAIL B and rotate pan tube accordingly.

Step 2. Secure pivoting legs to pan tube using, on each pivoting leg, one 5/16-18 bolt and nut; with two clutch disc springs, and one 1/4" flat washer between the bolt and the leg, one 1/4" flat washer between the leg and the pan tube. *Be sure to install disc springs with concave surfaces facing the flat washer.*

Step 3. Tighten nuts and bolts until there is proper tension: just enough so pivoting legs stay in place, but not so much that the legs don't pivot. See **Figure 2-5** DETAIL A.

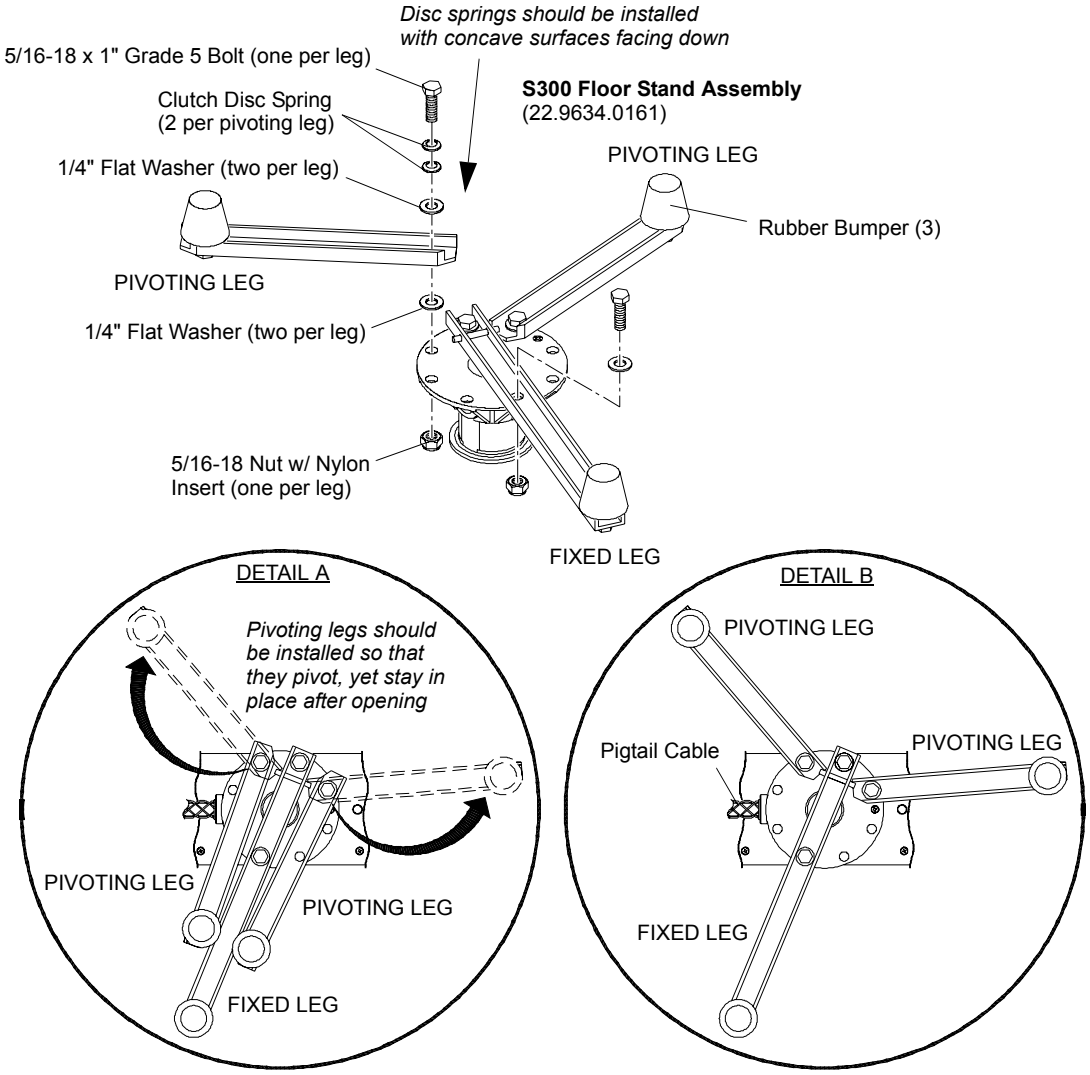


Figure 2-5: Installing Floor Stand

Step 4. Place luminaire in desired floor position. Refer to clearances in **Figure 2-6**.

Step 5. Connect input pigtail cable to Series 300™ Lamp Run Cable which is connected to a Smart Repeater™ or Smart Repeater™ Plus unit. (Refer to "External Power and Data Configuration" on page 10 for an example system diagram.)

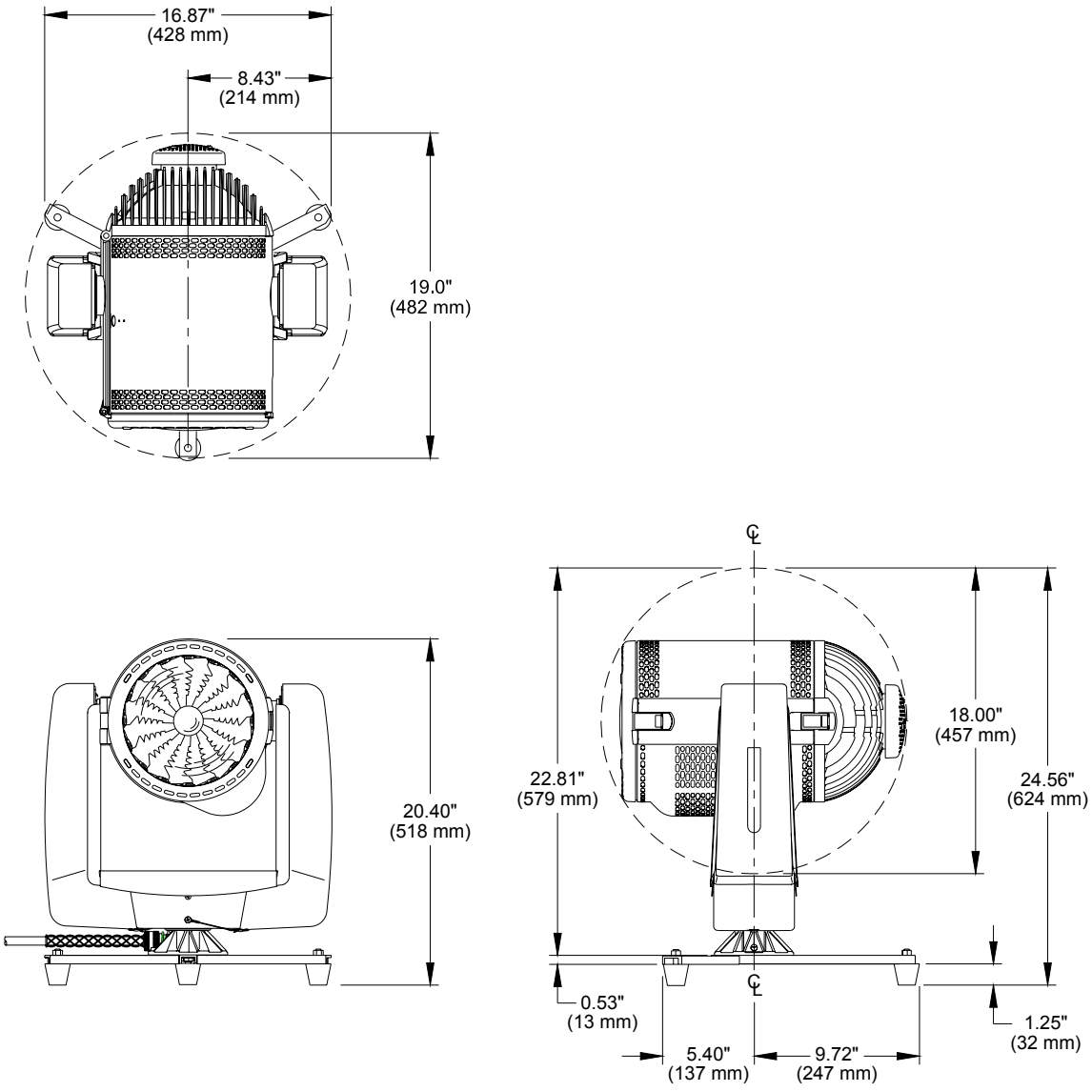


Figure 2-6: Floor Mounting Clearances

System Connection

Connecting to System (Typical)

The VL5+™ Series Wash Luminaire requires a Smart Repeater™ unit for power and control by DMX512 consoles. (Refer to "Smart Repeater Units" on page 11 of the Operation Overview section.) Lamp power is provided by a APS6™ power supply module installed in a Series 300™ Modular Rack.

WARNING: Voltages high enough to injure or kill a person exists in the AC power rack when power is applied. Verify that power has been removed from the AC rack before reconfiguring bus bars or performing other internal work.

Three-Phase Power Source

The system is commonly connected to a three-phase AC power source. Three-phase AC power is produced by alternators which contain three separate windings designed so that the voltages induced in them are equal in amplitude and out of phase with each other by exactly 120 degrees. The outputs can be connected in one of two methods to produce a three-wire, three-phase circuit: wye-connected source and the delta-connected source.

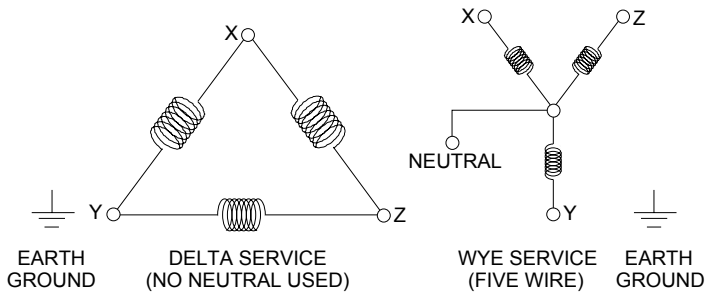


Figure 2-7: Three-Phase Power Diagram

In almost all cases the power source (house service) will be wye connected, but Series 200/300 equipment may be connected either as delta or wye loads as required. The most obvious difference between delta and wye loads is that a wye load uses a neutral and a delta load does not.

Note: The Series 200 powered outputs on the modular rack utilize the service neutral, and therefore must not be used with a delta service, and requires the presence of a neutral, even when connected as a delta load.

There are five connections for a wye source and four connections for a delta source. Cables are often color coded to represent corresponding connections.

Table 2-1: Delta/Wye Connections

	Delta Power *		Wye Power	
Connection	**US Color Code**	**UK Colour Code**	**US Color Code**	**UK Colour Code**
Phase X	Black	Gray	Black	Gray
Phase Y	Red	Black	Red	Black
Phase Z	Blue	Brown	Blue	Brown
Neutral	N/A	N/A	White	Blue
Ground	Green	Green	Green	Green

* Not applicable in Europe.

Input Voltage

When the system is configured for delta operation, the input voltage to the luminaires equals the phase-to-phase voltage of the power source. When the system is configured for wye operation, the input voltage to the luminaires equals the phase-to-neutral voltage of the power source. Single-phase power can be used to operate the system by configuring the equipment for wye operation and connecting all three phase inputs to the same single-phase source. APS6 modules usually operate under three-phase power, but can also be operated under 180-240 VAC, single phase mains with L1, L2, and L3 tied together at the SixPack chassis.

Typical wye services in the United States produce voltages ranging from 175 to 225 VAC phase-to-phase and 90 to 130 VAC phase-to-neutral. The SixPack Chassis and the ACS rack should be placed in delta mode so that the racks produce 175 to 225 VAC to the system. AC for the system is produced across the phases.

In Europe, wye services produce voltages ranging from 310 to 415 VAC phase-to-phase and 180 to 240 VAC phase-to-neutral. Since the system can not operate in voltages above 260 VAC, the SixPack Chassis and ACS rack must be placed in wye mode, thus activating the neutral and placing the system into the standard 180 to 240 VAC operating range.

Configuring Modular Rack, C3 Modules and APS6 Modules

Set Modular Rack SixPack chassis delta/wye switch(es) to correct setting:

Determine requirements for either delta or wye load.

- While operation as a delta load is typical in the U.S., most European countries require the system to be configured as a wye load. For example, if the house service is a wye-connected source and the phase-to-neutral voltage is 220, the system must be configured as a wye load.
- Also note that if line voltage is 120 phase-to-neutral, the system must be configured as a delta load. If line voltage is 220 phase-to-neutral, the system must be configured as a wye load.

Table 2-2: Requirements For Delta and Wye Loads

Type	VAC Phase to Neutral	VAC Phase to Phase	Delta/Wye Jumper Position	Voltage to Modules
Wye	100-130	175 - 225	Delta	175 - 225
Wye	180 - 240	310 - 415	Wye	180 - 240
Delta	-	180 - 240	Delta	180 - 240
Single Phase	180 - 240	-	Wye	180 - 240

At rear of SixPack chassis, set switch to required setting (**Figure 2-8**).

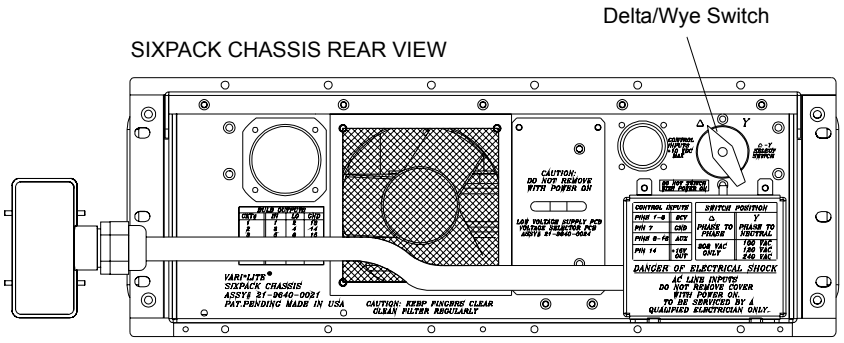


Figure 2-8: Series 300 Modular Rack SixPack Chassis

Connect Series 300 Modular Rack to power source:

Three-phase power will need to be supplied to the system. The maximum recommended Modular Rack power requirement is 200 amps, using 2/0 feeder with 4/0 Cam-Lok connectors and a 200A line disconnect. A SixPack Chassis requires 30 amps, and uses Hubbell or Epic connectors on 8/5 multicore cable. Connector choice is dependent upon location. This cable will need to be run from a house disconnect through a 30A line disconnect to the racks.

WARNING: The high voltages required to run this equipment are dangerous. Electrical "tie-ins" should be handled by a qualified electrician.

Note: Some equipment in Europe will work using single-phase power. Check with an Account Manager regarding your event.

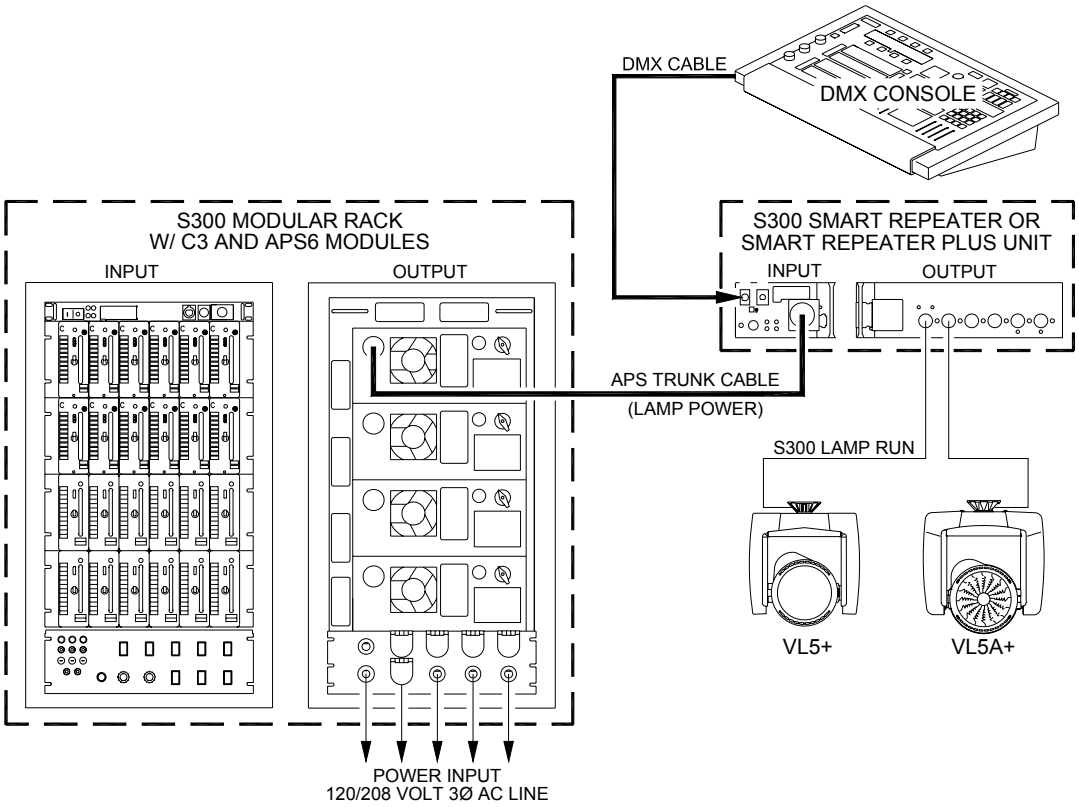


Figure 2-9: Power and Data Configuration (Typical)

Configure lamp power modules, as required:

Depending on the luminaire model (arc or incandescent), a different lamp power source will be required:

Luminaire	Lamp Type	Lamp Power Source
VL5+	incandescent	Conventional Dimmer *or* C3 Module (installed in a Series 300 Mod Rack)
VL5Arc+	arc	APS6 Module (installed in a Series 300 Mod Rack)

Configure APS6™ and/or C3™ modules in Modular Rack SixPack chassis with regard to port assignments for each Smart Repeater™ unit. In other words, if there is a VL5Arc+ luminaire connected to the first output on a Smart Repeater unit, an APS6 module should be installed in the first slot of the chassis connected to *that* Smart Repeater unit. If there is a VL5+ luminaire connected to the second output on a Smart Repeater unit, then a C3 module should be installed in the second slot of the chassis, and so on.

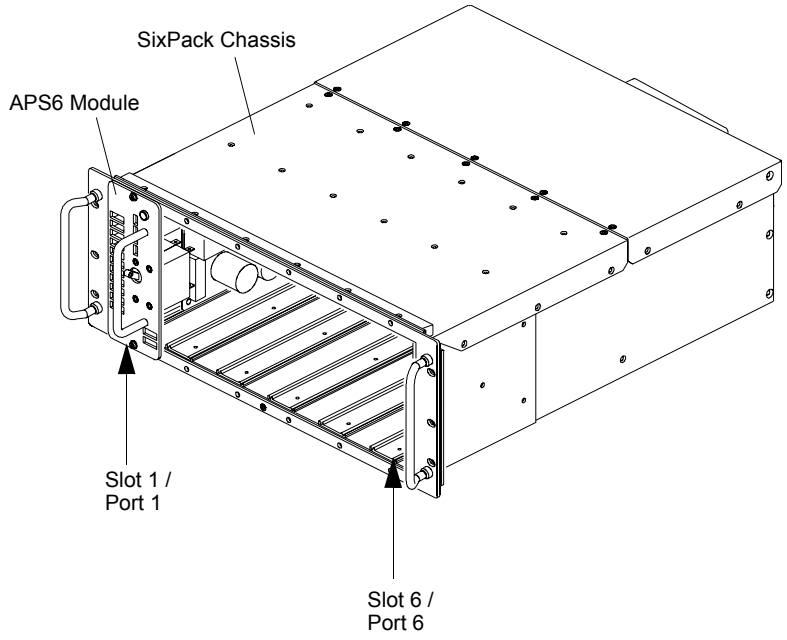
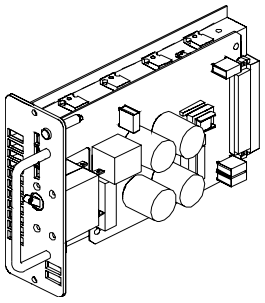


Figure 2-10: Placement of Lamp Power Modules in a S300 SixPack Chassis

Configure C3 Module(s) for VL5+ Luminaires:



Lamp power for a VL5+™ Wash Luminaire is provided by either a conventional dimmer or a C3™ dimmer module installed in a Series 300™ Modular Rack.

The C3 module can be configured in two different output modes to accommodate both the 1000 watt and 1200 watt versions of the 120V incandescent lamps used with VL5+ luminaires. The 8.33 mode is used with 1000W/120V lamps and the 10.0A mode is used with 1200W/120V lamps. A 0W shunt (blue programming jumper) installed at PCB determines the mode.

CAUTION: Do not change mode with power applied to module.

Step 1. Determine required mode by checking lamp type in the luminaire.

Step 2. At C3 module PCB, install 0W shunt (blue programming jumper) on header marked 8.33A for 1000W operation or 10.0A for 1200W operation.

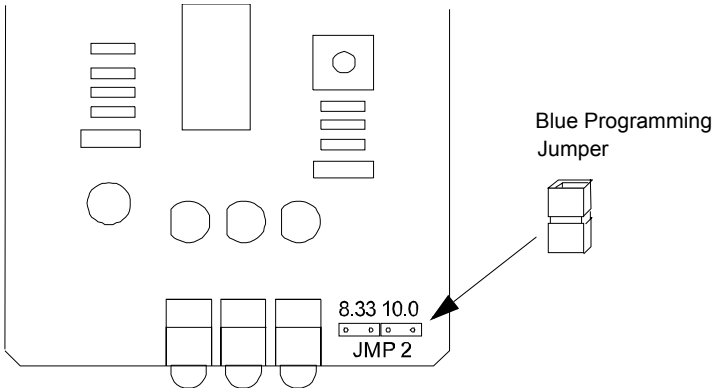
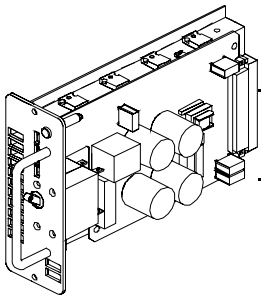


Figure 2-11: C3 Module PCB

Note: Since the C3 module does not have its own built-in brightness curve, the module must be used in conjunction with an SPC-36™ controller, which has the brightness curve in its operating system. The SPC-36 controller outputs 0 to +10 volts DC, which corresponds to 0% and 100% output respectively. Refer to the Series 300™ Modular Rack Service Manual (02.9640.0010) for more information.

Configure APS6 Module(s) for VL5Arc+ Luminaires:

Lamp power for a VL5Arc+ luminaire is provided by an APS6™ power supply module installed in a Series 300™ Modular Rack.



CAUTION: Do not change mode or power setting with power applied to module.

Step 1. At face of APS6 module(s), set rotary power switch to 625W - Position 1 (**Figure 2-12**).

Step 2. Set mode switch to PSET for manual operation.

Step 3. Apply power to lamp by moving circuit breaker switch to the ON position.

Note: The PSET (Preset) mode enables manual control of the module. This is the normal mode of operation. The DCV (Dimmer Control Voltage) mode operates the module with 0-10Vdc control input. This mode is only required when using an SPC-36 controller to remotely control modules from a console. Refer to the Series 300™ Modular Rack Service Manual (02.9640.0010) for more information.

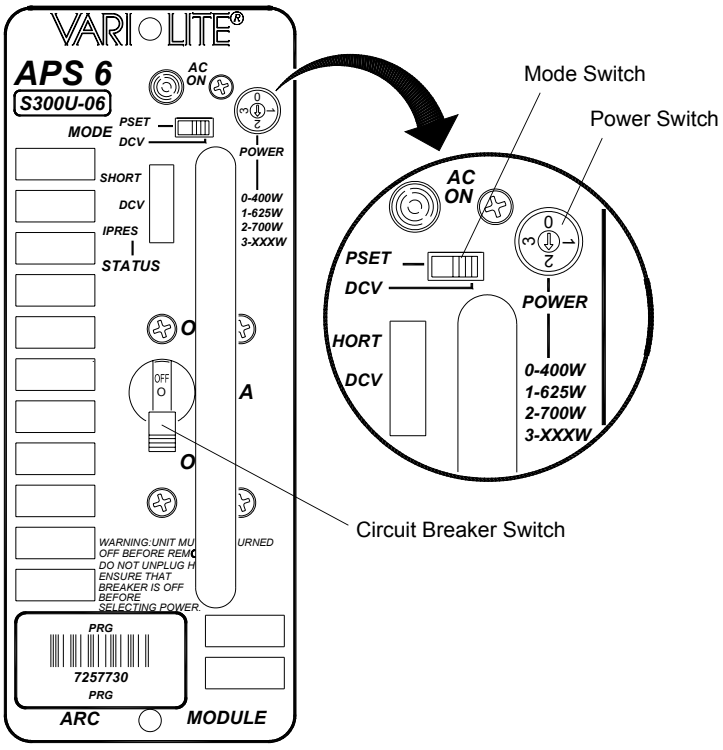


Figure 2-12: APS6 Module

Power Up the Luminaire:

Proceed to "Powering Up the Luminaire" on page 30 for further operating instructions.

3. Operation

This chapter contains instructions for power-up and lamp douse, along with DMX512 mapping information required for controlling the luminaire.

- **Power-Up Procedures**
- **Smart Repeater Modes**
- **DMX512 Mapping**

Power-Up Procedures

Powering Up the Luminaire

When power is applied, the VL5+™ Series Wash Luminaire will begin a calibration sequence which moves its pan, tilt, and all other mechanisms. After calibration, the luminaire head will either stop at its "home" position (which positions the pan and tilt axis at mid-rotation) or move to its current DMX-defined position if DMX512 data is present. All other mechanisms will also move to their "home" or DMX-defined positions.

CAUTION: Before applying power, be sure the luminaire is positioned so that the head and yoke can move freely without restriction. Refer to the Installation chapter for complete setup instructions.

To power up:

Step 1. Apply power and data to Smart Repeater™ or Smart Repeater™ Plus.

Step 2. Allow luminaire to complete calibration sequence.

Step 3. The luminaire is now ready for operation. See "DMX512 Mapping" on page 34 for control parameters.

Note: Refer to "Proper Lamp Servicing and Operation" on page 53 for correct lamp operating procedures.

Lamp Douse Switch (VL5Arc+)

The VL5Arc+ lamp douse switch should be used to douse the arc lamp before disconnecting the pigtail cable. This will prevent damage to the contacts in the CPC connector, which can be caused by drawing an arc during disconnect. To douse the lamp, press the lamp douse switch located at the yoke cross-member.

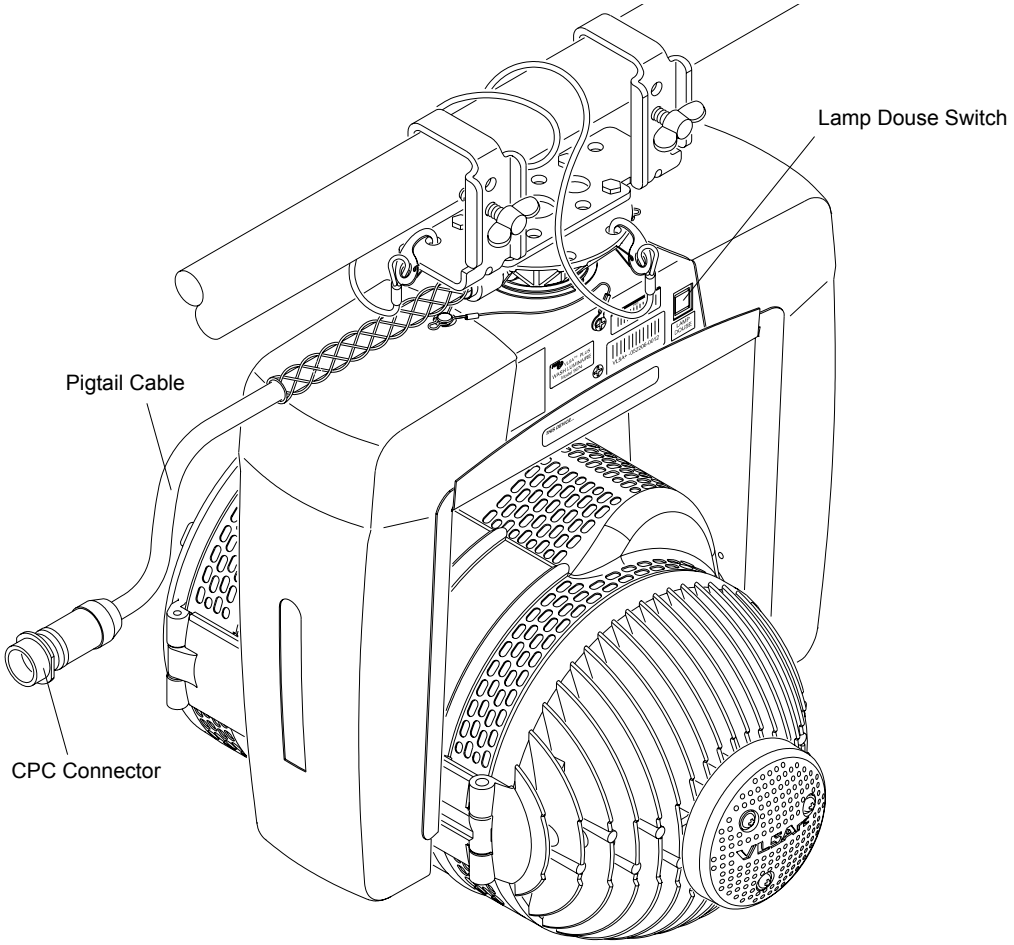


Figure 3-1: VL5Arc+ Lamp Douse Switch Location

Note: Refer to "Proper Lamp Servicing and Operation" on page 53 for correct lamp operating procedures.

Smart Repeater Modes

Setting Smart Repeater DMX512 Modes

There are a total of ten (10) software modes available for use in the Smart Repeater™ or Smart Repeater Plus™ units, allowing optimized control of the lighting system.

Note: It is possible to have multiple modes in a single system, but not on a single Smart Repeater unit.

MODE 1: 8-bit Mode with Reset - To set Mode 1, set the thumb wheel to 901. Mode 1 requires 8 channels per luminaire for a total of 48 channels per Smart Repeater unit.

MODE 2: Extended 8-Bit Mode - To set Mode 2, set the thumbwheel to 902. Mode 2 requires 11 channels per luminaire output port for a total of 66 channels per Smart Repeater unit.

MODE 3: 16-Bit with Reset - To set Mode 3, set the thumbwheel to 903. Mode 3 requires 10 channels per luminaire output port for a total of 60 channels per Smart Repeater unit.

MODE 4: Extended 16-Bit - To set Mode 4, set the thumbwheel to 904. Mode 4 requires 13 channels per luminaire output port for a total of 78 channels per Smart Repeater unit.

MODE 5: 16-Bit with Reset - To set Mode 5, set the thumbwheel to 905. Mode 5 requires 14 channels per luminaire output port for a total of 84 channels per Smart Repeater unit.

MODE 6: Extended 16-Bit - To set Mode 6, set the thumbwheel to 906. Mode 6 requires 17 channels per luminaire output port for a total of 102 channels per Smart Repeater unit.

MODE 7: 16-Bit with Reset - To set Mode 7, set the thumbwheel to 907. Mode 7 requires 17 channels per luminaire output port for a total of 102 channels per Smart Repeater unit.

MODE 8: Extended 16-Bit - To set Mode 8, set the thumb wheel to 908. Mode 8 requires 20 channels per luminaire output port for a total of 120 channels per Smart Repeater unit.

MODE 9: 16-Bit with Reset - To set Mode 9, set the thumbwheel to 909. Mode 9 requires 24 channels per luminaire output port for a total of 144 channels per Smart Repeater unit.

MODE 10: Extended 16-Bit - To set Mode 10, set the thumbwheel to 910. Mode 10 requires 27 channels per luminaire output port for a total of 162 channels per Smart Repeater unit.

To set Smart Repeater mode:

Step 1. With no signal applied (VARI✻LITE or DMX512), set thumbwheel to required mode number.

Step 2. Apply power to Smart Repeater or Smart Repeater Plus unit (plug it in). After a moment, a number from 1-9 or the letter “A” (hexadecimal 10) will be seen in the seven-segment display. The mode is now set and will remain that way until it is reassigned.

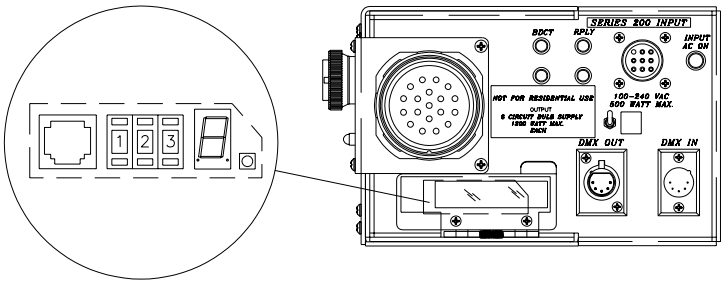


Figure 3-2: Smart Repeater Thumbwheel and Display

Note: The mode is stored in a battery backed-up RAM in the Smart Repeater unit. A dead battery may cause the Smart Repeater to revert to the default mode (Mode 4) on power-up.

Note: When no data is being received, the Smart Repeater unit will flash a "0" and the mode number.

DMX512 Mapping

DMX512 Mapping by Mode

The following charts provide DMX512 mapping, by Smart Repeater™ mode, for the VL5+™ Series Wash Luminaire.

DMX Mode 1

Table 3-1: DMX512 Mode 1 (8-bit with Reset)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Pan	Pan
	3	Tilt	Tilt
	4	Blue	Blue
	5	Amber	Amber
	6	Magenta	Magenta
	7	Diffusion	Diffusion
	8	Reset	Reset
2	9-16	--	--
3	17-24	--	--
4	25-32	--	--
5	33-40	--	--
6	41-48	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 2

Table 3-2: DMX512 Mode 2 (8-bit Extended)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Pan	Pan
	3	Tilt	Tilt
	4	Blue	Blue
	5	Amber	Amber
	6	Magenta	Magenta
	7	Diffusion	Diffusion
	8	Focus Time	Focus Time
	9	Color Time	Color Time
	10	Beam Time	Beam Time
	11	Reset	Reset
2	12-22	--	--
3	23-33	--	--
4	34-44	--	--
5	45-55	--	--
6	56-66	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 3

Table 3-3: DMX513 Mode 3 (16-bit with Reset)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Reset	Reset
2	11-20	--	--
3	21-30	--	--
4	31-40	--	--
5	41-50	--	--
6	51-60	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 4

Table 3-4: DMX512 Mode 4 (16-bit Extended)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Focus Time	Focus Time
	11	Color Time	Color Time
	12	Beam Time	Beam Time
	13	Reset	Reset
2	14-26	--	--
3	27-39	--	--
4	40-52	--	--
5	53-65	--	--
6	66-78	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 5

Table 3-5: DMX Mode 5 (16-bit with Reset)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Reset	Reset
	11	--	--
	12	--	--
	13	--	--
	14	--	--
2	15-28	--	--
3	29-42	--	--
4	43-56	--	--
5	57-70	--	--
6	71-84	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 6

Table 3-6: DMX Mode 6 (16-bit Extended)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer *	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Focus Time	Focus Time
	11	Color Time	Color Time
	12	Beam Time	Beam Time
	13	Reset	Reset
	14	--	--
	15	--	--
	16	--	--
	17	--	--
2	18-34	--	--
3	35-51	--	--
4	52-68	--	--
5	69-85	--	--
6	86-102	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 7

Note: Applies to Smart Repeater Plus Unit ONLY.

Table 3-7: DMX512 Mode 7 (16-bit with Reset)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Reset	Reset
	11	--	--
	12	--	--
	13	--	--
	14	--	--
	15	--	--
	16	--	--
	17	--	--
2	18-34	--	--
3	35-51	--	--
4	52-68	--	--
5	69-85	--	--
6	86-102	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 8

Note: Applies to Smart Repeater Plus Unit ONLY.

Table 3-8: DMX512 Mode 8 (16-bit Extended)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Focus Time	Focus Time
	11	Color Time	Color Time
	12	Beam Time	Beam Time
	13	Reset	Reset
	14	--	--
	15	--	--
	16	--	--
	17	--	--
	18	--	--
	19	--	--
	20	--	--
2	21-40	--	--
3	41-60	--	--
4	61-80	--	--
5	81-100	--	--
6	101-120	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 9

Note: Applies to Smart Repeater Plus Unit ONLY.

Table 3-9: DMX512 Mode 9 (16-bit with Reset)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Reset	Reset
	11	--	--
	12	--	--
	13	--	--
	14	--	--
	15	--	--
	16	--	--
	17	--	--
	18	--	--
1 (cont.)	19	--	--
	20	--	--
	21	--	--
	22	--	--
	23	--	--
	24	--	--
2	25-49	--	--
3	50-73	--	--
4	74-97	--	--
5	98-121	--	--
6	122-144	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

DMX Mode 10

Note: Applies to Smart Repeater Plus Unit ONLY.

Table 3-10: DMX512 Mode 10 (16-bit Extended)

Port Number	DMX Channel	VL5+ Wash Luminaire	VL5Arc+ Wash Luminaire
1	1	External Dimmer*	Intensity
	2	Hi Byte Pan	Hi Byte Pan
	3	Lo Byte Pan	Lo Byte Pan
	4	Hi Byte Tilt	Hi Byte Tilt
	5	Lo Byte Tilt	Lo Byte Tilt
	6	Blue	Blue
	7	Amber	Amber
	8	Magenta	Magenta
	9	Diffusion	Diffusion
	10	Focus Time	Focus Time
	11	Color Time	Color Time
	12	Beam Time	Beam Time
	13	Reset	Reset
	14	--	--
	15	--	--
	16	--	--
	17	--	--
1 (cont.)	18	--	--
	19	--	--
	20	--	--
	21	--	--
	22	--	--
	23	--	--
	24	--	--
	25	--	--
	26	--	--
	27	--	--
2	28-54	--	--
3	55-81	--	--
4	82-108	--	--
5	109-135	--	--
6	136-162	--	--

* When a DMX Power Pack is used, the first port channel controls the integral C3™ dimmer module for the VL5+ luminaires.

Timing Channels

Timing channel control improves the timed moves of certain groups of parameters. Three timing channels are provided: one for Focus (Pan and Tilt), one for color parameters and one for beam parameters. Timing channels support time values of up to six minutes.

Table 3-11: Channel Function / Timing Channel Relationship

Channel Function	Timing Channel		
	Focus Time	Color Time	Beam Time
Pan (Hi Byte/Lo Byte)	♦		
Tilt (Hi Byte/Lo Byte)	♦		
Blue		♦	
Amber		♦	
Magenta		♦	
Color Wheel		♦	
Diffusion			♦
Beam			♦
Edge			♦
Zoom			♦
Rotating Gobo			♦
Gobo Index (HiByte/LoByte)			♦
Shutter (all 9 motors)			♦

A timing value of zero is full speed. A time value of 100% (or 255 in DMX) causes the associated parameter(s) to follow cue fade time (console time) rather than the timing channel.

Color

DMX Values - First row are 0-100% values, second row are 0-255 values. Shaded boxes mean the matches are close, but not exact. "Similar To" reflects the gel indicated used with a 3200°K source. Due to the difference in color media and lamp source, color references are approximate and may vary by application.

Table 3-12: VL5+™ Series Wash Luminaire Color Chart

Color Name	No.	Similar To	VL5+ DMX *	VL5Arc+ DMX *
Pink Tint	101	Lux 55		0/15/36 0/39-40/92-94
Bastard Amber	103	Lux 02	0/13/43 0/34-35/110-112	0/43/33 0/110-112/85-86
GAM Bastard Amber	104	GAM 325	0/29/45 0/74-76/115-117	0/43/50 0/110-112/128-130
Warm Bastard Amber	105	Lee 162	29/25/0 74-76/64-66/0	0/41/47 0/105-107/120-122
Pale Golden Amber	107	Lux 09	0/30/43 0/77-79/110-112	0/43/50 0/110-112/128-130
Light Amber	110	Lux 16 Lee 204	0/41/49 0/105-107/125-127	0/45/50 0/115-117/128-130
Light Flame	112	Lux 17	0/38/53 0/97-99/136-137	0/45/55 0/115-117/141-142
Medium Bastard Amber	115	Lux 04	0/33/50 0/85-86/128-130	0/43/53 0/110-112/136-137
Dark Bastard Amber	116	Lux 03	0/33/51 0/85-86/131-132	0/42/52 0/108-109/133-135
Warm Amber	122	Lee 176 Lux 01	0/25/57 0/64-66/146-147	0/43/56 0/110-112/143-145
Peach	125	GAM 320	0/40/58 0/102-104/148-150	0/45/60 0/115-117/153-155
Flesh Pink	131	Lux 34	40/30/45 102-104/77-79/115-117	15/40/60 39-40/102-104/153-155
Dark Pink	134	Lee 111	0/29/63 0/74-76/161-163	0/43/65 0/110-112/166-168
Medium Salmon	136	Lux 32	0/43/65 0/110-112/166-168	0/43/63 0/110-112/161-163
Salmon	138	Lux 41	0/50/75 0/128-130/192-193	0/45/80 0/115-117/204-206
Brite Pink	141	Lee 128	0/42/90 0/108-109/230-232	0/45/90 0/115-117/230-232
Dark Peach	145		0/39/73 0/100-101/187-188	0/50/100 0/128-130/255
Lee Magenta	149	Lee 113	0/50/100 0/128-130/255	0/55/100 0/141-142/255
Dark Salmon	151		0/46/100 0/118-119/255	0/50/100 0/128-130/255

Table 3-12: VL5+™ Series Wash Luminaire Color Chart (Continued)

Color Name	No.	Similar To	VL5+ DMX *	VL5Arc+ DMX *
Deep Salmon	155		0/55/100 0/141-142/255	0/55/100 0/141-142/255
Medium Red	164	Lux 27	50/100/100 128-130/255/255	50/100/100 128-130/255/255
Primary Red	168	Lee 106	40/100/100 102-104/255/255	0/100/100 0/255/255
Dark Orange	173	Lux 26	0/56/100 0/143-145/255	0/100/100 0/255/255
Light Red	177	GAM 235	0/50/100 0/128-130/255	25/55/100 64-66/141-142/255
Dark Orange	181		0/100/90 0/255/230-232	0/100/90 0/255/230-232
Orange	183	Lux 19 Lee 164	0/100/75 0/255/192-193	0/100/80 0/255/204-206
Medium Amber	187	Lux 22	0/78/72 0/199-201/184-186	0/75/69 0/192-193/176-178
Deep Golden Amber	201	GAM 345	0/50/63 0/128-130/161-163	0/70/65 0/179-181/166-168
Canary	205	Lux 21	0/83/57 0/212-214/146-147	0/82/59 0/210-211/151-152
Light Amber	208		0/83/50 0/212-214/128-130	0/100/57 0/255/146-147
Lee Orange	212	Lee 105	0/83/50 0/212-214/128-130	0/100/53 0/255/136-137
Chrome Orange	214	Lux 15 Lee 179	0/100/40 0/255/102-104	0/100/53 0/255/136-137
Bright Yellow	219		0/100/0 0/255/0	0/100/50 0/255/128-130
Dark Straw	221		0/75/40 0/192-193/102-104	0/100/35 0/255/90-91
Deep Amber	223	Lee 104	0/56/40 0/143-145/102-104	0/80/40 0/204-206/102-104
Light Yellow	225	Lee 101	0/58/0 0/148-150/0	0/65/41 0/166-168/105-107
Straw	237	Lux 12	0/53/5 0/136-137/13-15	0/56/41 0/143-145/105-107
Light Straw	239		0/43/0 0/110-112/0	0/43/40 0/110-112/102-104
No Color Green	245	Lee 213 with Lee 202		0/35/10 0/90-91/26-28
Pale Yellow-Green	251			
Fern Green	254	Lee 122		
Yellow-Green	256			
Lime Green	257	Lee 139	100/72/0 255/184-186/0	100/85/0 255/217-219/0

Table 3-12: VL5+™ Series Wash Luminaire Color Chart (Continued)

Color Name	No.	Similar To	VL5+ DMX *	VL5Arc+ DMX *
Primary Green	259		100/64/0 255/164-165/0	100/64/0 255/164-165/0
Light Green	261		100/60/0 255/153-155/0	100/60/0 255/153-155/0
Moss Green	263		100/52/0 255/133-135/0	100/51/0 255/131-132/0
Light Blue-Green	267			
Kelly Green	268	Lux 94		
Dark Green	270	Lee 124		100/44/0 255/113-114/0
Fluorescent Green	273		100/50/0 255/128-130/0	100/45/0 255/115-117/0
Dark Fluor. Green	275		100/45/0 255/115-117/0	100/46/0 255/118-119/0
Blue-Grass Green	281	GAM 690 with GAM 440	87/44/0 222-224/113-114/0	100/44/0 255/113-114/0
Medium Blue-Green	284	Lee 116	100/39/0 255/100-101/0	100/43/0 255/110-112/0
Dark Peacock Green	286			
Peacock Green	287	Lee 115		
Dark Turquoise	289			
Light Aqua	291		100/37/0 255/95-96/0	100/39/0 255/100-101/0
Aqua	295		87/0/0 222-224/0/0	100/25/0 255/64-66/0
Rosco Peacock Blue	298	Lux 73		
Lee Steel Blue	299	Lee 117		
1/4 CTB	301	Lee 203		0/38/35 0/97-99/90-91
1/2 CTB	303	Lee 202 Lux 61		10/25/35 26-28/64-66/90-91
Full CTB	307	Lee 201		
City Blue	310	GAM 847 Polycolor 70		
N.C. Blue	313	GAM 840 with GAM 980		
Slate Blue	318	Lee 161		
Pale Blue	321	Lux 69		
Lee Light Blue	325	Lee 118	85/20/0 217-219/51-53/0	90/30/0 230-232/77-79/0
Bright Blue	330	Lee 141	78/0/0 199-201/0/0	100/0/0 255/0/0
Medium Blue	342	Lee 132	65/0/0 166-168/0/0	65/0/0 166-168/0/0
Sea Blue	345	Lux 68 GAM 810		100/0/45 255/0/115-117

Table 3-12: VL5+™ Series Wash Luminaire Color Chart (Continued)

Color Name	No.	Similar To	VL5+ DMX *	VL5Arc+ DMX *
Icy Blue	350	Lux 68	100/0/55 255/0/141-142	100/0/50 255/0/128-130
Just Blue	355	Lee 79	69/0/50 176-178/0/128-130	70/0/50 179-181/0/128-130
Primary Blue	359	Lux 83 GAM 850	73/0/56 187-188/0/143-145	70/0/52 179-181/0/133-135
Deep Blue	371		100/0/100 255/0/255	100/0/100 255/0/255
Dark Blue	374	Lee 120	85/0/100 217-219/0/255	100/0/80 255/0/204-206
Royal Blue	380	GAM 905	100/0/75 255/0/192-193	67/0/89 171-173/0/227-229
Indigo	403	Lux 59	62/0/100 159-160/0/255	55/0/55 141-142/0/141-142
Congo Blue	406	Lee 181	63/0/100 161-163/0/255	57/0/60 146-147/0/153-155
Darkest Lavender	409		62/0/100 159-160/0/255	52/0/70 133-135/0/179-181
Dark Rose Purple	411		70/0/60 179-181/0/153-155	60/0/55 153-155/0/141-142
Deep Lavender	415		70/0/60 179-181/0/153-155	55/0/40 141-142/0/102-104
Lilac	418		66/0/56 169-170/0/143-145	57/0/45 1461-47/0/115-117
Special Dark Lavender	421		75/0/57 192-193/0/146-147	55/0/37 141-142/0/95-96
Cool Lavender	422	GAM 845	72/0/55 184-186/0/141-142	55/0/30 141-142/0/77-79
Pale Lavender	425			
Mercury Vapor	429			53/0/33 136-137/0/85-86
Medium Violet	433	Lux 359	61/0/43 155-156/0/110-112	52/0/37 133-135/0/95-96
Dark Lavender	443	Lee 180	53/0/22 136-137/0/57-58	47/0/36 120-121/0/92-94
Lee Special Lavender	447	Lee 137		30/0/0 77-79/0/0
Twilight	451	GAM 915		
Deep Lavender	455	GAM 948	56/0/40 143-145/0/102-104	48/0/35 123-124/0/90-91
Pale Lilac	461		55/0/30 141-142/0/77-79	42/0/45 108-109/0/115-117
Periwinkle	463	GAM 960 with GAM 970	51/0/0 131-132/0/0	44/0/40 113-114/0/102-104
Dusty Lavender	466			30/0/0 77-79/0/0

Table 3-12: VL5+™ Series Wash Luminaire Color Chart (Continued)

Color Name	No.	Similar To	VL5+ DMX *	VL5Arc+ DMX *
No Color Lilac	468	Lux 52		28/0/48 72-73/0/123-124
Special Lavender	469	Lux 54		22/0/41 57-58/0/105-107
Dark Rose	471		59/0/63 151-152/0/161-163	45/0/70 115-117/0/179-181
Dark Fuchsia	474	Lux 358 with Lux 60	56/0/65 143-145/0/166-168	47/0/70 120-122/0/179-181
Dark Follies Pink	476		50/0/68 128-130/0/174-175	36/0/68 92-94/0/174-175
Magenta	478	Lee 126	51/0/78 131-132/0/199-201	
Hot Pink	480		42/0/100 108-109/0/255	
Mauve	483		42/0/70 108-109/0/179-181	
Follies Pink	489		0/0/77 0/0/197-198	
Flesh Pink	491		45/0/45 115-117/0/115-117	0/32/65 0/82-84/166-168
Rose Purple	492	Lux 48 with Lux 60		32/40/65 82-84/102-104/166-168
Carnation	494			0/0/53 0/0/136-137
No Color Pink	495		42/0/38 108-109/0/97-99	0/35/58 0/90-91/148-150
Cool Bastard Amber	496	Lux 52 with Lux 33		
Dusty Rose	497			0/35/53 0/90-91/136-137
Rouge	498		35/0/40 90-91/0/102-104	10/37/53 26-28/95-96/136-137

* The first value adjusts blue, the second adjusts amber and the third adjusts magenta.

Notes

4. Troubleshooting and Maintenance

This chapter provides a basic troubleshooting guide, along with procedures for extended care of the luminaire and lamp.

- **Troubleshooting**
- **Equipment Handling**
- **Routine Maintenance**

For more detailed troubleshooting and maintenance procedures, refer to the VL5+™ Series Wash Luminaire Service Manual (02.9634.0020).

Troubleshooting

Basic Troubleshooting Guide

The following is a basic troubleshooting guide to get the luminaire up and running. For more extensive troubleshooting and testing, refer to the VL5+™ Series Wash Luminaire Service Manual (02.9634.0020).

Table 4-1: Basic Troubleshooting Guide

Symptom	Cause(s)	Refer to...
No power to luminaire	Input cable not connected to Smart Repeater unit.	page 10
	Power not applied to Smart Repeater unit.	page 10
No lamp output	No intensity value.	Your console user manual
	C3 Module breaker switch not turned on (VL5+). APS6 Module breaker switch not turned on (VL5Arc+).	page 27 page 28
	Lamp needs replacement.	page 54 (VL5+) page 55 (VL5Arc+)

Equipment Handling

Proper Lamp Servicing and Operation

Servicing

- When handling a lamp, hold it by the ceramic base while wearing cotton gloves or finger cots. Do not touch the glass envelope (bulb). If you touch the glass with bare fingers, wipe off any fingerprints with alcohol.

Heat

- When lamps are lit, the interior of the luminaires becomes very hot. To aid in the airflow circulation within the luminaires, after dousing the lamps, wait ten minutes before removing power to the luminaires. This will provide enough time for the equipment fan to cool off the unit.

Lamp Life

- When operating arc lamps, allow luminaires to operate for at least 3 minutes. It takes about 3 minutes for the fill components (mercury and halogen-metal compounds) in the lamp tubes to vaporize completely. If the lamps are switched off earlier than 3 minutes, the fill components are partially vaporized. The inadequately vaporized fill components and the electrode material (tungsten) are deposited in the areas of the lamp tubes that have remained cool. As a result, the lamp tubes blacken prematurely and reduce the service lives of the lamps.
- If system will be unattended for more than 3-4 hours, luminaire lamps should be doused. Standby mode should NOT be used for more than 3-4 hours (only applies to systems using an SPC-36 Controller).

Proper Lamp Douse

- The lamp douse switch should be used to douse the arc lamp before disconnecting the pigtail cable. This will prevent damage to the contacts in the CPC connector, which can be caused by drawing an arc during disconnect. To douse the lamp, press the lamp douse switch located at the yoke cross-member. (Refer to “Lamp Douse Switch (VL5Arc+)” on page 31.)

Routine Maintenance

Replacing the Lamp (VL5+)

Parts:

71.2526.0100	1 EA	LAMP,VL5 1000W 100V (Asia,) or
71.2526.0120	1 EA	LAMP, VL5 1000W 120V (U.S.), or
71.2526.0230	1 EA	LAMP, VL5 1000W 230V (Europe), or
71.2529.0120	1 EA	LAMP, 1200W 120V BLUE PINCH (U.S.)

Tools:

Cotton gloves or finger cots

WARNING: Remove power from luminaire before performing any maintenance procedures.

CAUTION: Refer to "Proper Lamp Servicing and Operation" on page 53 before handling the lamp.

To replace lamp:

Step 1. Remove power from lamp and allow lamp to cool for at least 5 minutes.

Step 2. Remove power from luminaire.

Step 3. Unlatch and swing open rear heatsink assembly (**Figure 4-1**).

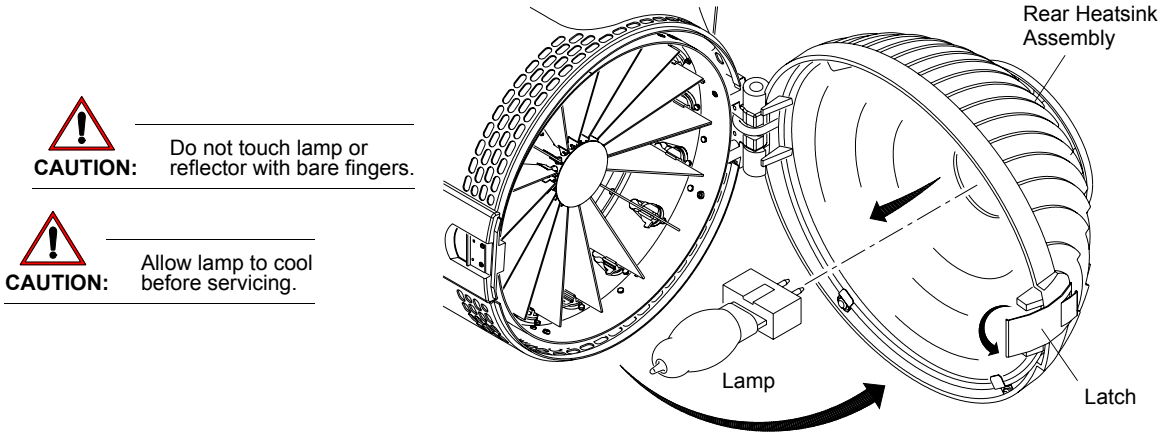


Figure 4-1: VL5+ Lamp Replacement

CAUTION: Wear cotton gloves or finger cots covering while servicing lamp. Touching lamp glass with bare fingers will leave oil and cause the lamp to explode or burn out early. If touched, use alcohol to thoroughly clean glass.

Step 4. At lamp socket, remove lamp by gripping base and pulling lamp straight out of socket.

Step 5. Install new lamp, pressing firmly into socket.

Step 6. Close and latch heatsink assembly.

Replacing the Lamp (VL5Arc+)

Parts:

71.2528.0575 1 EA LAMP, 575 WATT ARC - PHILLIPS MSR575HR

Tools:

Screwdriver, #1 Phillips
Cotton gloves or finger cots

WARNING: Remove power from luminaire before performing any maintenance procedures.

CAUTION: Refer to "Proper Lamp Servicing and Operation" on page 53 before handling the lamp.

To replace lamp:

Step 1. Remove power from lamp and allow lamp to cool for at least 5 minutes.

Step 2. Remove power from luminaire.

Step 3. Unlatch and swing open rear heatsink assembly (**Figure 4-2**).

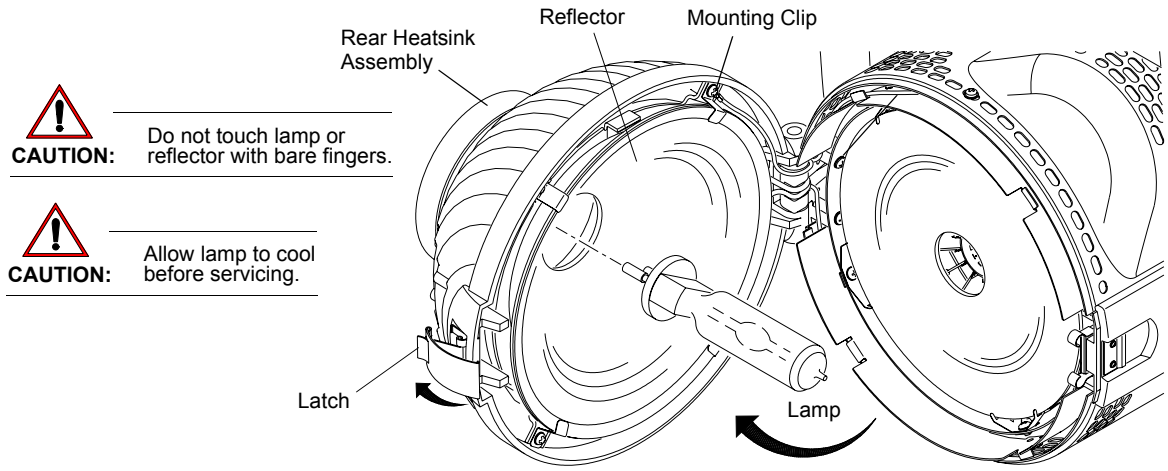


Figure 4-2: VL5Arc+ Lamp Replacement

Step 4. At four reflector mounting clips, loosen (but do not remove) 6-32 X 5/16" PPSS screws.

Step 5. Turn clips to free reflector and remove reflector.

CAUTION: Wear cotton gloves or finger cots covering while servicing lamp. Touching lamp glass with bare fingers will leave oil and cause the lamp to explode or burn out early. If touched, use alcohol to thoroughly clean glass.

Step 6. At lamp socket, remove lamp by gripping base and pulling lamp straight out of socket.

Step 7. Install new lamp, pressing firmly into socket.

Step 8. Adjust lamp. Refer to "Adjusting the Lamp (VL5Arc+)" on page 56.

Adjusting the Lamp (VL5Arc+)

The VL5Arc lamp requires adjustment to maximize beam intensity.

Tools:

Screwdriver, #1 Phillips
Cotton gloves or finger cots
Clean, soft, lint-free cloth
Glass cleaner (commercial grade)

WARNING: Remove power from luminaire before performing any maintenance procedures.

CAUTION: Refer to "Proper Lamp Servicing and Operation" on page 53 before handling the lamp.

To adjust lamp:

Step 1. Remove power from lamp and allow lamp to cool for at least 5 minutes.

Step 2. Remove power from luminaire.

Step 3. Unlatch and swing open heatsink assembly.

CAUTION: Wear gloves or finger cots when handling lamp or reflector.

Step 4. Ensure the following:

a. Reflector is mounted in center of rear casting and secure enough to prevent it from moving. If not, at four reflector mounting clips, loosen four 6-32 X 3/8" PPSS screws (but do not remove). Center reflector and retighten screws securely.

b. Lamp is plugged into socket firmly and is centered in opening of reflector. Adjust as necessary.

Step 5. Using clean, lint-free, soft dry cloth, wipe lamp and reflector clean of any dust or fingerprints.

Step 6. Close and latch heatsink assembly.

Step 7. Supply power to luminaire.

Step 8. Set color to white and intensity to 100%.

Step 9. Unlatch and swing open front lens ring (this will make hot spot and halo easier to see).

Step 10. Shine lamp on flat surface 10-20 feet away.

Step 11. Using lamp adjustment screws, adjust lamp (**Figure 4-3**).

a. Minimize size of halo around hot spot. It will not completely disappear, but should be even and symmetrical all the way around with no large blotches of color at any one point.

b. Maximize spot intensity by making hot spot as small and tightly focused as possible. Hot spot should be centered in halo and in larger brownish circle surrounding it.

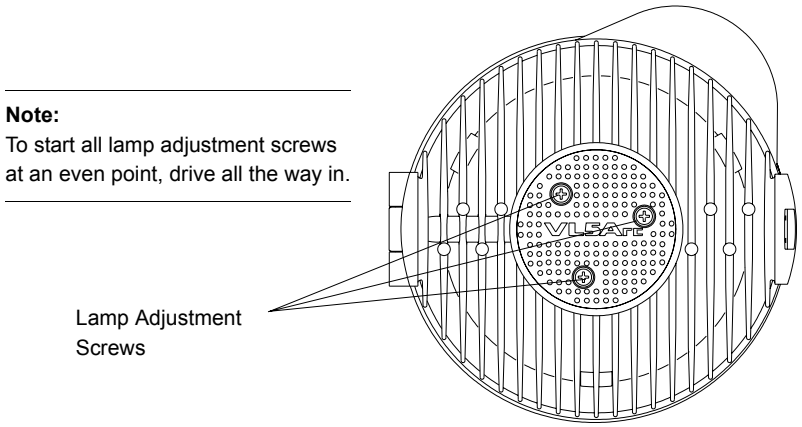


Figure 4-3: VL5Arc+ Lamp Adjustment Screws

Step 12. Close and latch front lens ring.

Replacing the Front Lens

Several styles of front lens are available for the luminaire. These can be easily changed as required.

Parts:

42.5002.0004	1 EA	LENS, CLEAR
42.5002.0005	1 EA	LENS, STIPPLE
42.5002.0006	1 EA	LENS, 8-ROW LENTICULAR
42.5002.0007	1 EA	LENS, 10-ROW LENTICULAR
42.5002.0008	1 EA	LENS, 12-ROW LENTICULAR

Tools:

none

WARNING: Remove power from luminaire before performing any maintenance procedures.

To replace front lens:

Step 1. Remove power from luminaire.

Step 2. Unlatch and swing open front lens ring.

Step 3. Remove current front lens by carefully pushing outward with fingers.

Step 4. Install new front lens.

Step 5. Close and latch front lens ring.

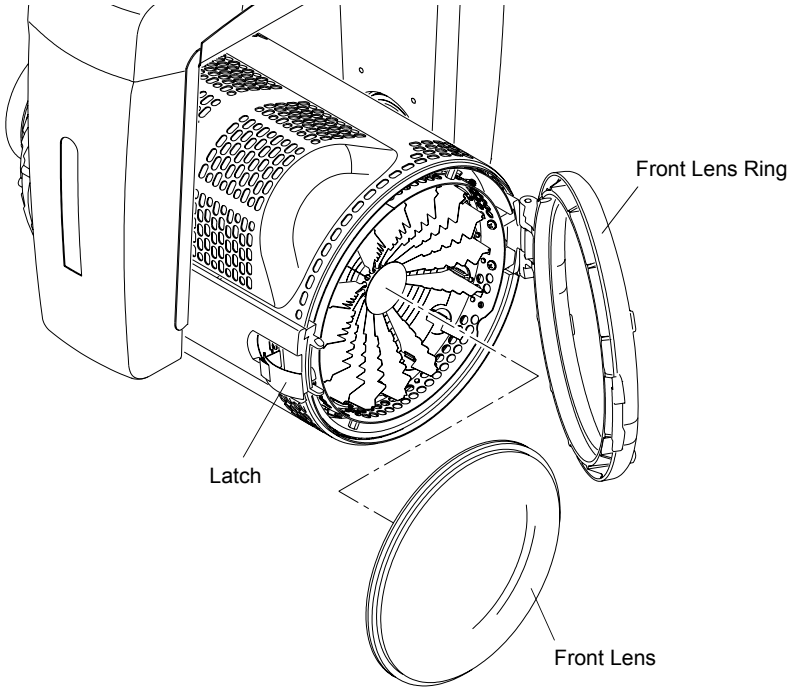


Figure 4-4: Front Lens Replacement

Installing a Tophat/Gelframe

The VL5 tophat can be used for two purposes: 1) to reduce the shape of the light output, and 2) to reduce the direct visibility of the lens. The tophat/gelframe consists of a connected two piece outer ring and a set of three removable smaller inner rings. The tophat/gelframe may be separated to incorporate circular or square color gels if needed. Three spring-loaded clips and a tether cord secure the tophat/gelframe to the front of the luminaire.

Note: When mounting a VL5+ luminaire using a tophat/gelframe you must allow an extra 3-1/2 inches per luminaire center-to-center mounting distance to avoid interference between luminaires.

Parts:

22.9634.0206	1 EA	ASSEMBLY, VL5 TOPHAT W/RINGS
22.9634.0207	1 EA	ASSY, VL5 TOPHAT W/HARDWARE
22.9634.0208	1 EA	ASSY, VL5 TOPHAT RINGS

Tools:

none required

To install tophat/gelframe:

Step 1. At front of luminaire, place tophat/gelframe over lens and secure to head covers with three spring-loaded clips (**Figure 4-5**).

Step 2. Attach tether cord snap ring to one of the head cover vent holes.

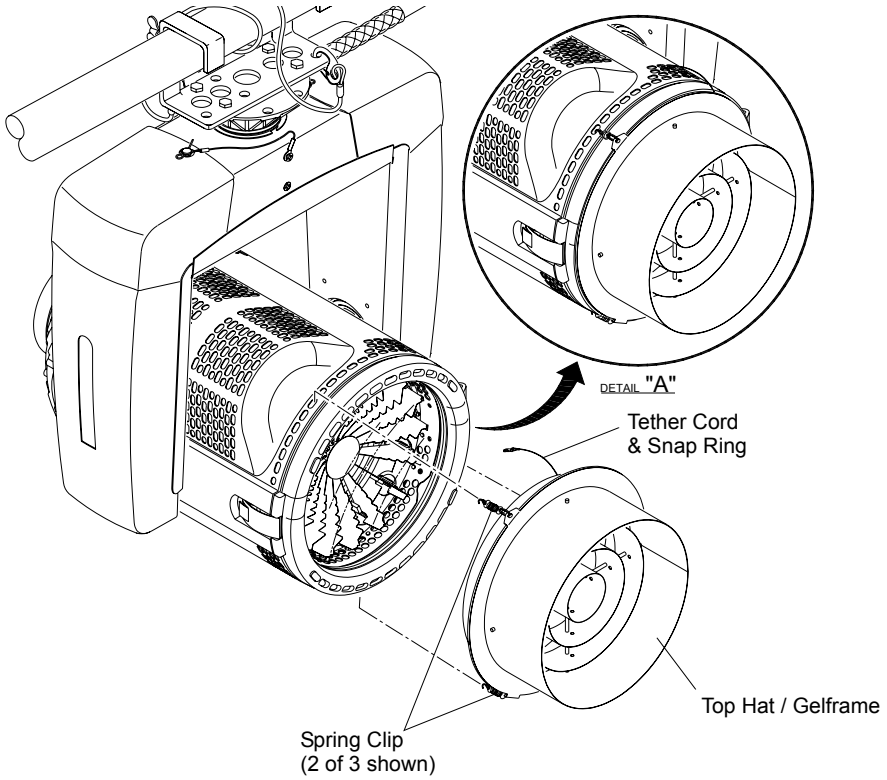


Figure 4-5: Tophat/Gelframe Installation

To remove tophat inner rings:

Step 1. At tophat/gelframe, remove four hitch pins that secure four ring rods to outer weldment (**Figure 4-6**).

Step 2. Push four ring rods toward center to clear outer weldment ring. Remove inner ring assembly.

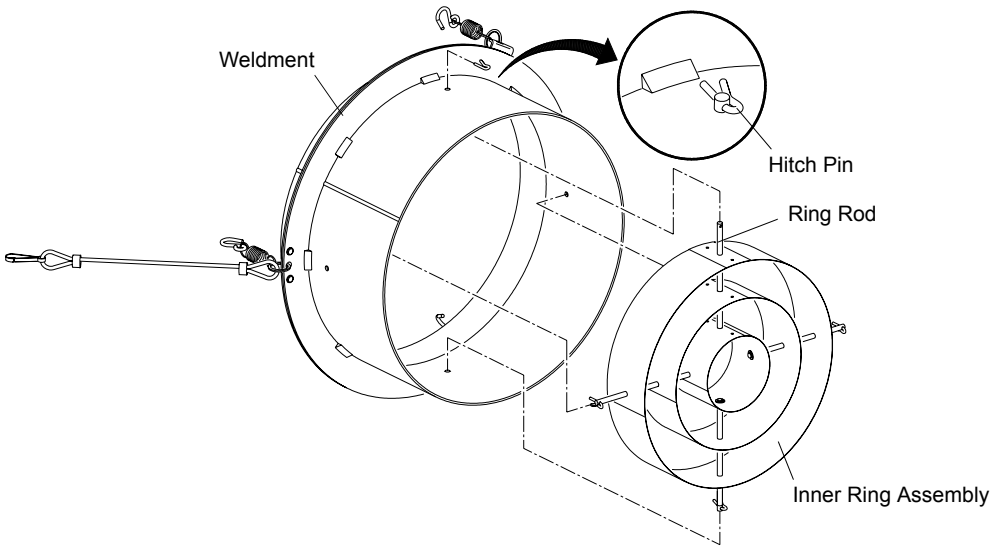


Figure 4-6: Removing Top Hat Inner Rings

To install a color gel:

Step 1. If installed, remove tophat/gelframe from luminaire.

Step 2. Open two rings and install color gel. Color gels may be circular (7-5/8 inches to 9-1/4 inches dia.) or square (7-5/8 inches^2 to 9-1/4 inches^2).

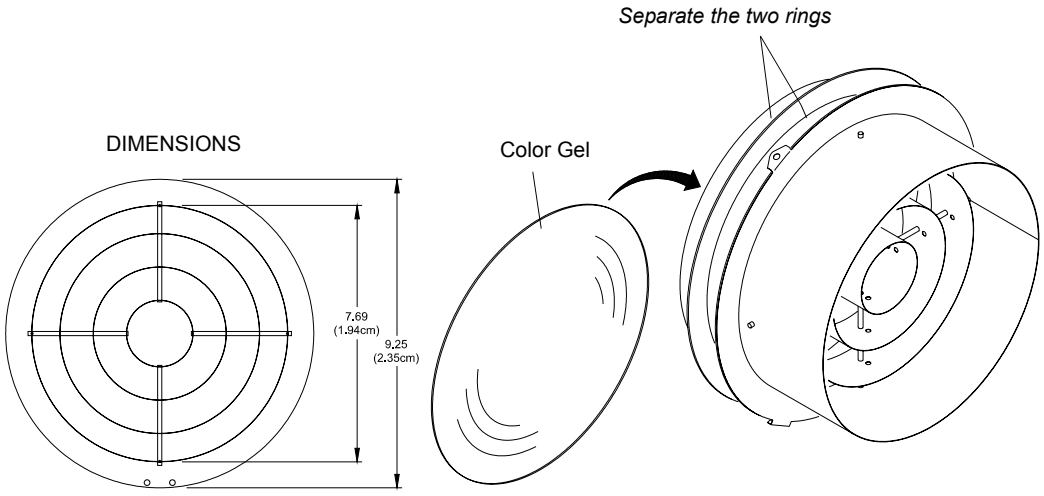


Figure 4-7: Gel Installation

Step 3. Re-install tophat/gelframe onto luminaire.

Cleaning the Luminaire

Tools:

Clean, lint-free cloth (2)
Window cleaner
99% + Isopropyl alcohol
Vacuum cleaner with brush nozzle or compressed air

To clean the outside of the luminaire:

WARNING: Remove power from luminaire before performing any maintenance procedures.

CAUTION: Use caution when handling lenses or reflector. Avoid scratching optical surfaces.

Step 1. Remove power from luminaire.

Step 2. Using vacuum cleaner with brush nozzle or compressed air, clean dust from external components. *If using compressed air to clean out luminaire, DO NOT allow fans or blower to spin at high speeds, as this will damage their bearings.*

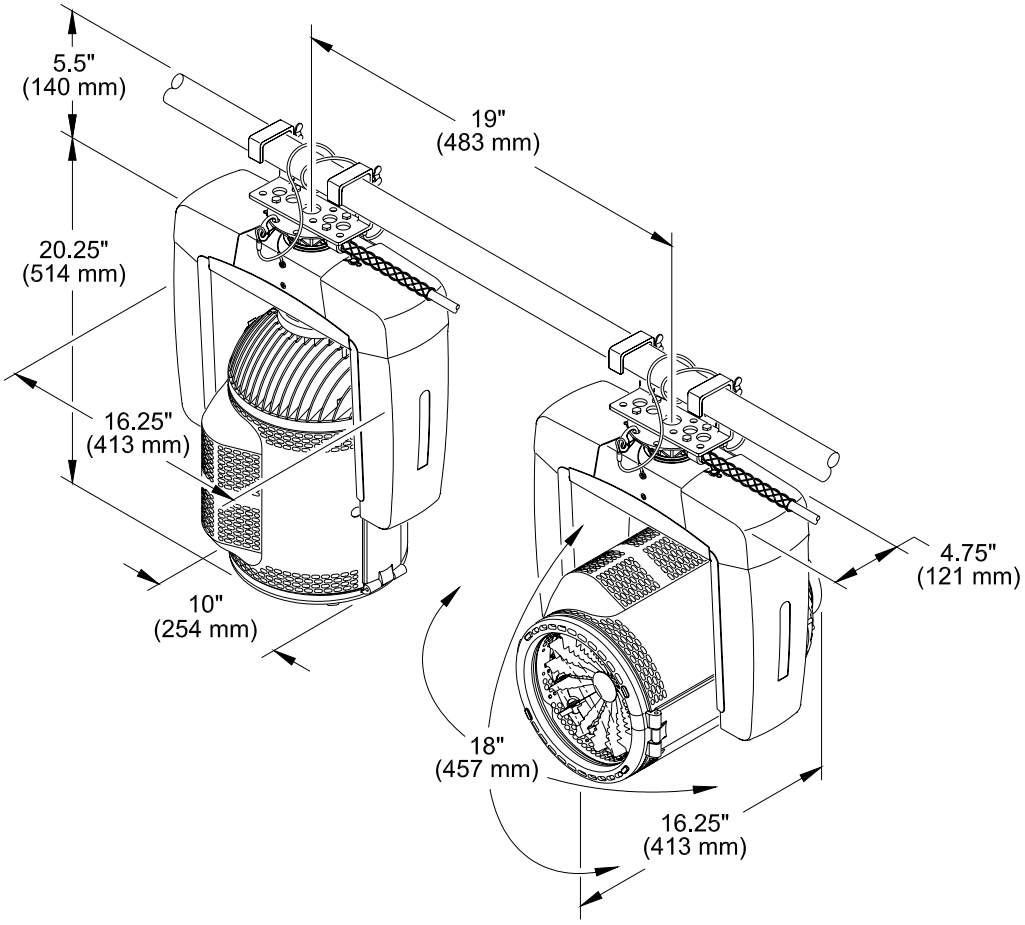
Step 3. Using window cleaner and a clean, lint-free cloth, wipe outside surface of luminaire. *DO NOT use window cleaner on lenses or reflector.*

Step 4. Using 99% + Isopropyl alcohol and a clean, lint-free cloth, clean lenses and reflector.

Notes

Appendix A.

Technical Specifications



VL5+™ Wash Luminaire

Description

SOURCE:	Philips 1000W tungsten lamp, available in 120 VAC, 230 VAC or 100VAC. Philips 1200W tungsten lamp, 120 VAC.
POWER & DIMMING:	1000W lamp is available in world-wide voltages permitting the use of locally available AC power and dimmers. 1200W lamp is available in 120 VAC, and can be used world-wide with a C3™ dimmer module installed in the Series 300™ Modular Power Distribution Rack. Luminaires are powered through a Smart Repeater™ or Smart Repeater™ Plus processing unit.
REFLECTOR:	8-inch glass, dichroic cold-mirror reflector.
OPERATING TEMP:	20° to 120°F (-29° to 49°C).
COOLING:	Convection cooled.
CONTROL:	Compatible with all PRG consoles and a wide variety of DMX512 consoles.
POSITIONING:	Can be mounted and operated in any orientation.
SPACING:	Hangs on 18 inch (460 mm) centers.
WEIGHT:	25 lbs (12 kg).

Programmable Functions

COLOR:	Enhanced DICHRO✻TUNE™ crossfadable dichroic colors feature independent cyan, magenta and amber color control. Smooth, timed color crossfades can occur in as little as 0.7 second.
INTENSITY:	The incandescent source is powered by conventional dimmers or C3™ dimmer modules through the Smart Repeater™ processing unit.
BEAM SIZE CONTROL:	A selection of easily interchangeable front lenses work with the internal diffusing mechanism to provide a variety of beam sizes and shapes.
BEAM DIFFUSION:	Textured diffusion panels intercept the beam, providing a continuous, time variable diffusion range for each of the available lenses.
PAN & TILT:	Smooth, time controlled continuous motion by way of a digital servo system.
RANGE:	Pan - 360°, Tilt - 270°
MAX VELOCITY:	220° per second.
ACCURACY:	0.3° resolution.

VL5Arc+™ Wash Luminaire

Description

SOURCE:	575W arc lamp, 5600°K integrated color temperature, 90 CRI.
POWER & DIMMING:	Lamps are powered by an APS6™ module installed in the Series 300™ Modular Power Distribution Rack. The APS6 module operates at 85 to 265 VAC, 50/60 Hz, requiring 5 to 10A, depending on line voltage. Luminaires are powered through a Smart Repeater™ or Smart Repeater™ Plus processing unit.
REFLECTOR:	8-inch glass, dichroic cold-mirror reflector.
OPERATING TEMP:	20° to 120°F (-29° to 49°C).
COOLING:	Convection cooled.
CONTROL:	Compatible with all PRG consoles and a wide variety of DMX512 consoles.
POSITIONING:	Can be mounted and operated in any orientation.
SPACING:	Hangs on 18 inch (460 mm) centers.
WEIGHT:	29 lbs (14 kg).

Programmable Functions

COLOR:	Enhanced DICHRO✻TUNE™ crossfadable dichroic colors feature independent cyan, magenta and amber color control. Smooth, timed color crossfades can occur in as little as 0.7 second.
INTENSITY CONTROL:	An internal douser provides intensity control.
BEAM DIFFUSION:	Textured diffusion panels intercept the beam, providing a continuous, time variable diffusion range for each of the available lenses.
PAN & TILT:	Smooth, time controlled continuous motion by way of a digital servo system.
RANGE:	Pan - 360°, Tilt - 270°
MAX VELOCITY:	220° per second.
ACCURACY:	0.3° resolution.

Notes

Appendix B.

Glossary

This glossary provides useful terms associated with operating VL5+™ Series Wash Luminaires.

Glossary of Terms

Address	A numerical "name" given to a device on a DMX512 line indicating which of 512 possible channels it will respond to.
Align (lamp)	The process of adjusting the lamp within the reflector to obtain the desired output quality of the beam.
APS6 Module	The lamp power supply (ballast) for arc lamps found in the VL5+ Series Luminaire.
APS6 Trunk Cable	Multi-conductor cable used to provide six circuits of arc lamp power to VARI✻LITE Series 300 luminaires. Differs from industry standard six circuit Socapex cable by using pin 19 as a shield to eliminate RF noise, which can interfere with sound systems. (Can be used with incandescent lamps.)
Arc Lamp	A type of lamp which creates light by forming an arc of electricity. Brightness is achieved by including gasses and metals within the envelope of the lamp which dissolve and give off a bright light. Arc lamps must be dimmed mechanically because electrical dimming will extinguish the arc.
Attribute	An individual controllable aspect of a luminaire: pan, tilt, color, etc. Also known as "parameter."
Beam	1) The size, shape and sharpness of image of the light beam as projected on stage. 2) A function of the luminaire related to the size, shape, and sharpness of the light beam, specified by beam and edge data, and use of gobos (patterns) as required.
C3 Dimmer	The VARI✻LITE current sensing dimmer that can be installed in a Modular Rack SixPack chassis to control the intensity of a VL5, VL5+, or VL5B wash luminaires.
Channel	A control reference which collects a device's associated thumbwheel address(es) (device, lamp power, etc.) and maps them to a single selectable number. Channels are assigned via the patch setup. (Also referred to as a "Control Channel.")
Console Timing	Time value in seconds or minutes applied to an entire cue.
Dimmer	Device used to control the relative output (or intensity) of an incandescent lamp.
DMX512	Digital multiplexing; an industry standard protocol. 8-bit protocol with a maximum of 256 steps of resolution per channel. Maximum of 512 controllable channels per DMX data stream.
DMX512 Cable	Industry standard cable consists of two twisted pair and a shield, and 5-pin XLR style connectors. The pin out is: pin 1 = common (shield), pin 2 = data -, pin 3 = data +. The second pair (pins 4 & 5) may be used for a secondary data link; in VARI✻LITE equipment, these pins are not used.
DMX Power Pack	The DMX Power Pack (DPP) is a portable electronics chassis that provides lamp power and control to Series 300 luminaires.
DMX512 Universe	A group of up to 512 DMX channels. Consoles may have more than one universe, usually labeled in groups of 512.
Douse	To de-energize a luminaire lamp. (Douse is unrelated to intensity states.)

Epic Connector	A six-pin, three-phase 35 amp connector found on 8/5 wire used to provide power to a Modular Rack SixPack chassis.
Fan-In	(Break-In) 6 male plugs to female multicore connector. In the case of Series 300 equipment, a Socapex connector.
Fan-Out	(Break-Out) A male multicore connector to 6 female plugs. In the case of Series 300 equipment, a Socapex connector.
Feeder	In the case of Series 300 equipment, 2/0 double-insulated wire, rated at 225 amps, with 4\0 Cam-Lok connectors on either end, color coded by phase, neutral and ground.
Fixture Orientation	Based on the direction the pigtail points as it exits the fixture.
Flipped Focus	When one or more fixtures inadvertently move differently from others in the system.
Focus	The point to which the light beam is directed. Also, a function of the luminaire related to the direction of the beam as specified by pan and/or tilt data.
Frame	A luminaire mechanism which allows framing of the light beam.
Gobo	A pattern (template) used to create backgrounds or texture when projected on to scenery or cycloramas, or to create the illusion of natural elements such as fire, windows or tree leaves.
Hard Reset	Restarts luminaires and reloads operating system and cue data.
Home Position	Pan and Tilt values at 50%. Also called “Zero Position” or a "50/50" cue or group.
Hubbell Connector	A five-pin, three-phase connector found on 8/5 wire, used to provide power to a Modular Rack SixPack Chassis, when used with the proper Epic to Hubbell adapter.
Indexing	A function of a rotating gobo mechanism.
Intensity	A value placed on the relative brightness of a lighting fixture; 100% is considered "full," and 0% is considered "out."
Lamp	Light source consisting of filament or electrodes, base, and envelope or "bulb."
Lamp Cable	VARI✻LITE cable that extends the fixture pigtail to a Smart Repeater unit.
Luminaire Calibration	The process of a luminaire finding its end stops for all parameters.
Mini-Stepping	Allows for smoother movement of color and gobo wheels in a VL6 spot luminaire.
Mode	Software contained within the Smart Repeater unit allowing for different control options for luminaires.

Modular (Mod) Rack	A power distribution and storage rack for SixPack chassis. The Mod Rack is fitted for 200A Cam-Lok input, with six Epic connectors for individual outputs for up to four rack-mounted chassis and up to two auxiliary chassis. The Mod Rack also has a space for one SPC-36 controller for control of the modules within the chassis.
Output Port	One of the six plugs on the long side of a Smart Repeater unit, with port one being closest to the Socapex connector.
Palette	Term for groups of groups; i.e. all the color groups would be considered the Color Palette, all the beam groups would be the Beam Palette, etc.
Pan	The 360° movement of the luminaire around the axis of the yoke.
Parameter	An individual controllable aspect of a luminaire: pan, tilt, color, etc. Also known as "Attribute."
Part Cue	Basically a "cue within a cue." A portion of a cue with a time applied that is different than the cue time.
Patch	The act of assigning a DMX512 channel to a control channel on a console.
Pigtail	Input cable of a Series 300 luminaire.
Reply	Digital data signals transmitted from each luminaire to the console. Only one luminaire may transmit at a time, in response to a request from the console.
Signal	Control protocol from a lighting console or interface.
SixPack Chassis	Case used for lamp power distribution. Each chassis can contain up to six modules - APS6 and/or C3 in any combination. Each slot in the chassis corresponds to an output port on the Smart Repeater unit. The SixPack Chassis connects to the Smart Repeater unit through an APS Cable or standard Socapex cable (if no APS6 modules are used).
Show File	A file containing all programmed cue data.
Shutter	A mechanism which controls the douser or strobe action of luminaires capable of this function.
Smart Repeater	The Smart Repeater unit is the hub for up to six Series 300 luminaires. The Smart Repeater unit is also an interface between the control system and the luminaires. It consolidates the three things necessary to run Series 300 luminaires into one lamp cable: Control Signal, Lamp power and Motor/Control power.
Socapex Cable	Industry standard multicore cable is used to distribute lamp power to luminaires. It is often created using 19-pin Socapex or Veam connectors and 12/18 cable for six 20A circuits.
Splitter (Isolator)	Device used to optically isolate and split a DMX512 signal. *Note: A DMX "two-fer" cannot be used to divide a signal.*
Start	To energize a luminaire arc lamp (applies to arc-lamp luminaires only).
Tails	In the case of Series 300 equipment, 2/0 double-insulated wire, rated at 225 amps, with 4\0 Cam-Lok connectors on one end color coded by phase, neutral and ground and bare wire on the other, or 8/5 multicore wire with a female connector (Hubbell or Epic) on one end, and bare wire on the other.

Terminate/ Termination Termination refers to the dampening of DMX signal at the end of the transmission line. Termination is created by placing a 100 ohm resistor between pins 2 and 3 of the DMX line. Often, there is a switch on DMX devices to do this internally. If not, a terminator is provided in the form of an XLR connector with the proper resistor between pins 2 and 3 to be placed in the DMX Thru port on the device.

Test Software Software resident in the Smart Repeater unit that allows for troubleshooting of a Series 300 luminaire.

Three-Phase Power In order to manufacture electricity efficiently, it is created in what is known as three "phases". In other words, in its creation, the sine wave of alternating current are offset by 120°. The VARI✳LITE system runs on three-phase power, as indicated by the five Cam-Lok connectors on the mod rack - Phase X, Phase Y, Phase Z, Neutral and Ground. Each phase in a 200A feed can support 200A of equipment. To adequately power the same amount of equipment on a single phase, you would need a 600A feed.

Thumb-wheel Switch Three digit switching device used to set the range of channels a particular Smart Repeater unit or other Series 300 hardware device looks at for control information. Also used to set the operating mode of a Smart Repeater unit.

Tilt The movement of the luminaire around the axis of the tilt tube.

Time Control of the duration of the change of the variable parameters of VARI✳LITE automated luminaires and other devices in a lighting system.

Timing Channel A Timing Channel is used in lieu of cue fade rate to determine the time it will take a luminaire to move from one setting to another. For example, a cue in which a luminaire pans from one side of stage to the other may look "steppy" if cue fade rate is used, because of the nature of the DMX512 signal. To overcome this, a timing channel causes the Smart Repeater unit and luminaire to calculate the move in time, effectively smoothing out the movement. To operate properly, the new position and timing channel levels need to be sent to the Smart Repeater in a zero count, (an instant change).

Zero Position Pan and Tilt values at 50%. Also called "Home Position" or a "50/50" cue or group.

8-Bit DMX The universally accepted lighting control protocol in the entertainment industry. A console uses this protocol to control specific devices in a lighting system. A DMX512 channel packet is eight bits of absolute parameter data. 8-bit refers to the resolution of the signal: 256 step resolution, providing channel values from 0 through 255. A DMX512 data packet is a group of 512 data channels.

16-Bit DMX To smooth out the movement of automated luminaires, the industry has adopted 16-bit DMX. This is not a change to the DMX512 specification, rather a change in the way luminaires and consoles treat DMX512 information. In practice, 16-bit DMX adds a DMX512 channel each to pan and tilt - pan coarse, pan fine, tilt coarse, tilt fine, instead of just pan and tilt. The console and luminaire combine these levels and increase the resolution of pan and tilt from 256 steps to a theoretical maximum 65,536 steps at the console level, resulting in the ability to position the luminaire more accurately.

Notes