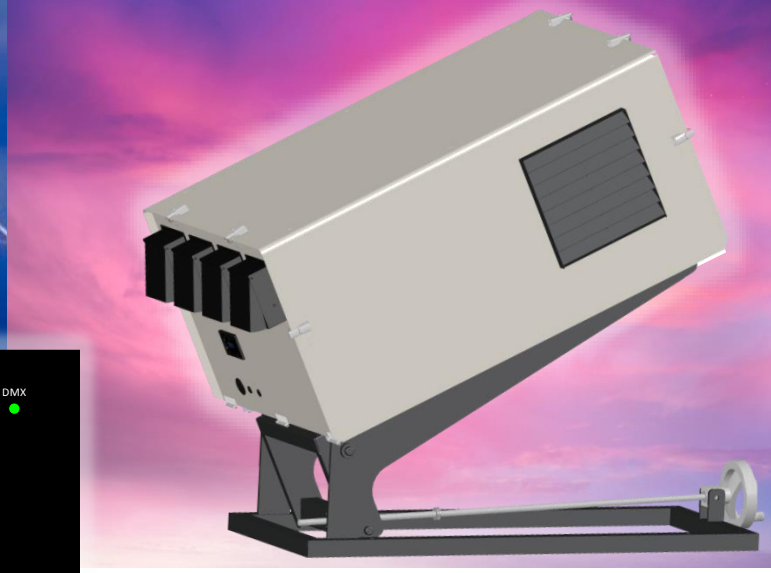
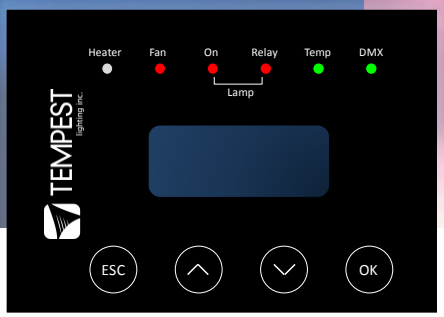
TEMPEST

User Manual

Cyclone Projector Enclosures





Tempest Lighting, Inc.
13110 Saticoy Street, Unit C
N. Hollywood, CA 91605, USA

Tel +1 818 787 8984
Fax +1 818 982 5510
info@tempestlighting.com

www.tempest.org

For all Cyclone projector enclosures manufactured after June 2013

Including Cyclone HUSH Enclosures

August, 2013

Table of Contents

CERTIFICATE AND DECLARATION OF CONFORMITY FOR CE MARKING

Tempest Lighting, Inc.
13110 Saticoy Street, Unit C, North Hollywood, CA 91605, USA
t: +1 818 787 8984 f: +1 818 982 5770 e: info@tempestlighting.com
www.tempest.org

Tempest Lighting, Inc. declares that their

Cyclone Projector Enclosure Series 8xxx.xxx

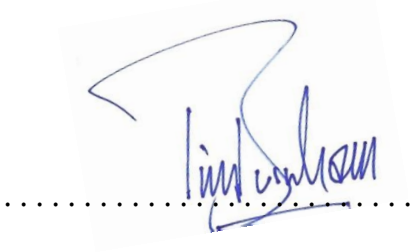
complies with the Essential Requirements of the following EU Directives:

Low Voltage Directive 2006/95/EC	Test Report 60065-6500-01
Electromagnetic Compatibility Directive 2004/108/EC	Test Report 61000-6500-03

and further conforms with the following EU Harmonized Standards:

EN 60065 : 2002	Test Report 60065-6500-01
EN 60529:2001-2002	Test Report 60529-6500-02
EN 61000-6-3:2007+A1:2011	Test Report 61000-6500-03
EN61000-6-1:2007	Test Report 61000-6500-03
EN55015:2006+A2:2009	Test Report 61000-6500-03

Dated: 1st October, 2010
Position of signatory: President
Name of Signatory: Tim Burnham
Signed below:
on behalf of Tempest Lighting, Inc.



. . . . . .

This is to certify that the following products

8000.US Series	**Cyclone 8000 Projector Enclosure, 230V**
8200.US Series	**Cyclone 8200 Projector Enclosure, 230V**
8400.US Series	**Cyclone 8400 Projector Enclosure, 230V**

Have been tested and approved to standards UL 508 (electrical) and UL 50 (environmental), as NEMA 3R enclosures, for use in the United States and Canada.

This declaration is made by the manufacturer

Tempest Lighting, Inc.
13110 Saticoy Street, Unit C
North Hollywood, CA 91605, USA

This declaration is based on tests that were conducted on the submitted samples of the above mentioned products.

Listing Report No. 3198609LAX-001a refers.

Dated: December 12th, 2010
Signature . . . . . .
Tempest Lighting Inc

Tempest Lighting, Inc.,
13110 Saticoy Street, North Hollywood, CA 91605, USA
www.tempest.org info@tempestlighting.com
t: +1 818 787 8984
f: +1 818 982 5582

1 Introduction

Products Covered by this Manual

8000 Series	Cyclone 8000
8100 Series	Cyclone 8100
8102 Series	Cyclone 8102
8120 Series	Cyclone 8120
8200 Series	Cyclone 8200
8210 Series	Cyclone 8210
8400 Series	Cyclone 8400
8450 Series	Cyclone 8450
840B	Ballast Enclosure*
8500 Series	Cyclone 8500
8600 Series	Cyclone 8600

Notes: *xx = Part # suffix .US for North American 208V electrical systems*

Xx = Part # suffix .IN for European 230V electrical systems

'Series' includes Outdoor, HUSH, Landscape, Portrait and Custom models

** Ballast Enclosure for Christie HD35K and D4K35 projectors*

Using This Manual

Please read this manual in its entirety before starting work. All the information contained is important, and should be read carefully before proceeding. Heed all warnings and advisories.

Icon Key:

ⓘ Valuable information

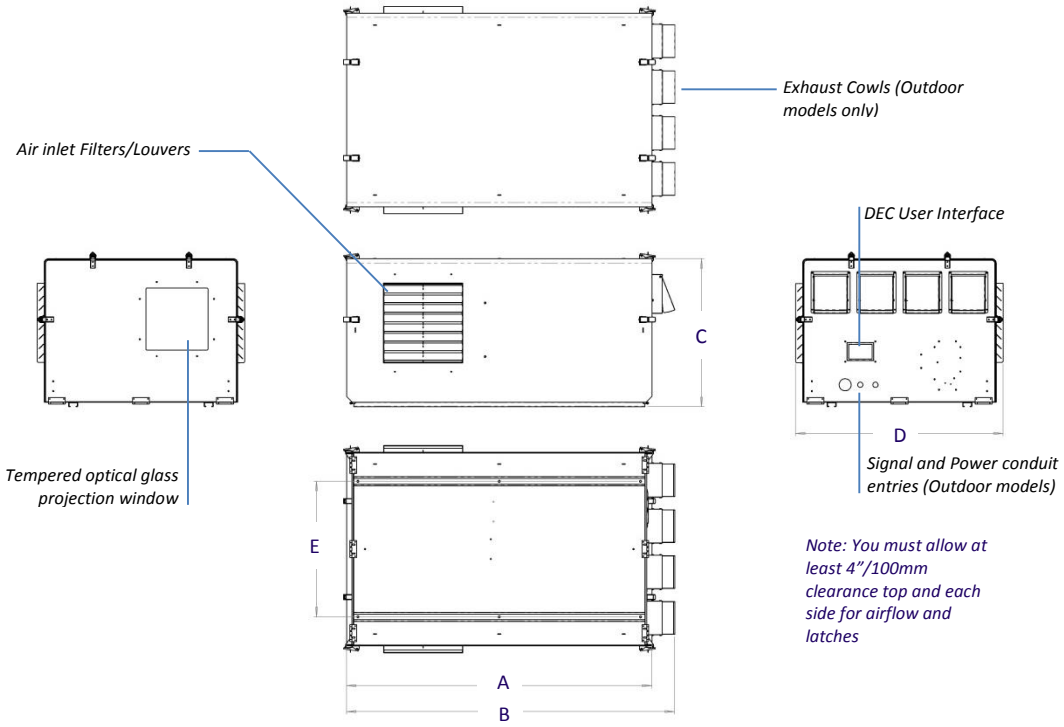
Electrical Warning

Safety Information

Dimensions, Weights and Projector Fit

Cyclone Outdoor Dimensions

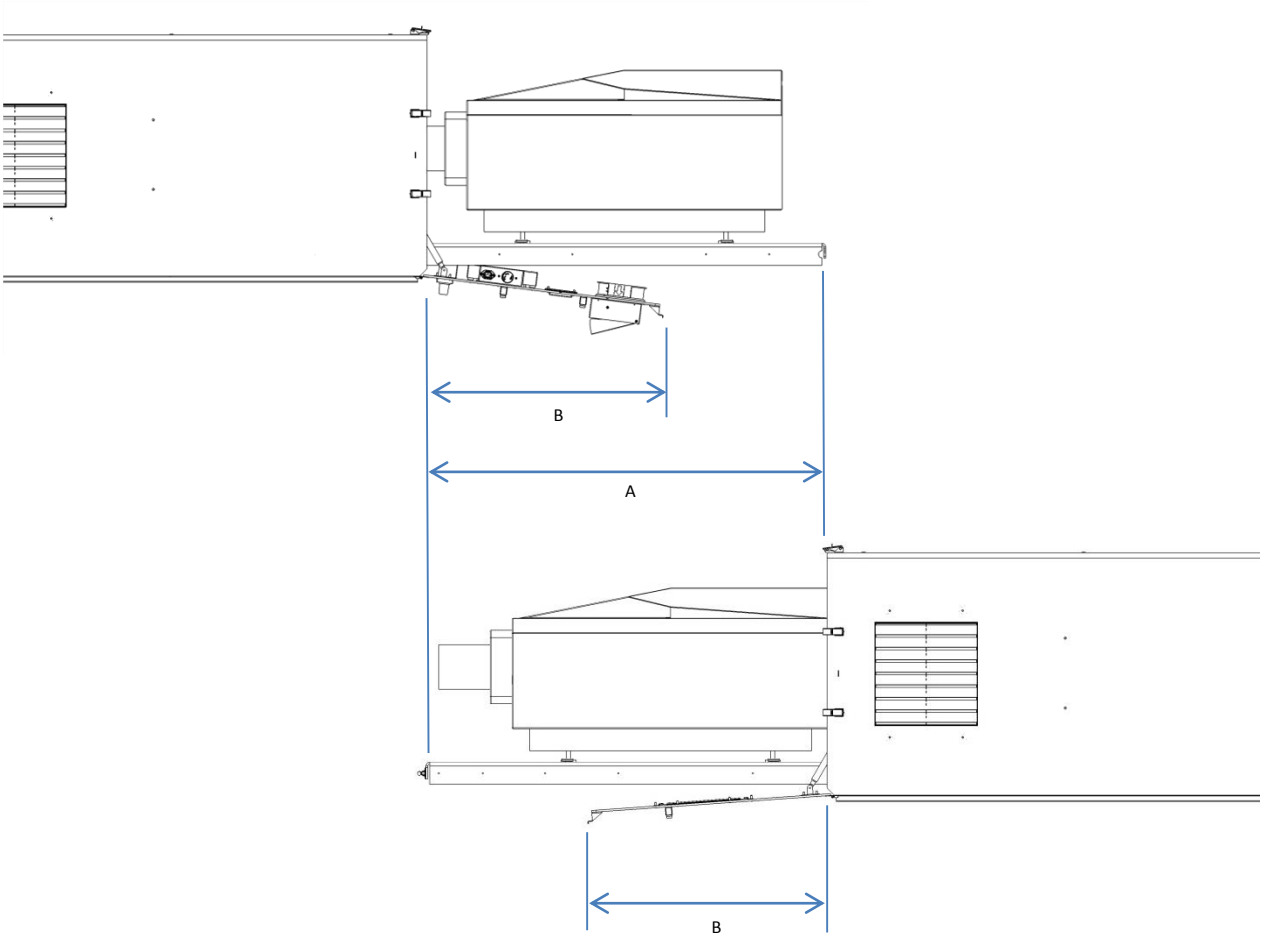
Note: Cyclone HUSH dimensions are the same, except that there are no exhaust cowls on HUSH models.



	DIM A	DIM B*	DIM C	DIM D	DIM E	Weight	Typical Projector Type
8000	44"/112cm	48"/122cm	22"/56cm	28"/71cm	16"/40.6cm	175lb/80kg	BARCO HDX
8100	44"/112cm	48"/122cm	17"/43cm	34"/86cm	16"/40.6cm	160lb/73kg	Panasonic PT-DS21K, DP Titan Quad
8102	44"/112cm	48"/122cm	31"/79cm	34"/86cm	16"/40.6cm	220lb/100kg	TWO x Panasonic PT-DS21K
8120	44"/112cm	48"/122cm	20"/51cm	34"/86cm	16"/40.6cm	185lb/84kg	Panasonic PT-EX16K
8200	54"/137cm	58"/147cm	26"/66cm	34"/86cm	16"/40.6cm	220lb/100kg	Christie Roadster
8210	54"/137cm	58"/147cm	30"/76cm	36"/91cm	16"/40.6cm	230lb/105kg	BARCO FLM, HDF
8400	70"/178cm	74"/188cm	33"/84cm	34"/86cm	16"/40.6cm	320lb/145kg	Christie Roadie HD35K
8450	70"/178cm	74"/188cm	33"/84cm	34"/86cm	16"/40.6cm	320lb/145kg	Christie D4K35, CP2210/20
840B	31"/79cm	34"/86cm	26"/66cm	24"/61cm	8"/20.3cm	65lb/30kg	Christie 35K Ballast Enclosure
8500	61"/155cm	65"/165cm	36"/91cm	38"/97cm	16"/40.6cm	330lb/150kg	BARCO HDQ 40K
8600	70"/178cm	74"/188cm	39"/99cm	34"/86cm	16"/40.6cm	350lb/159kg	Sony SRX-R320

** Does not apply to HUSH models*

Open Slide and Door Dimensions



	A	B
8000, 8100 Series, 8102	36”/92cm	Same as height, Dim C, previous page
8200 Series	38”/97cm	Same as height, Dim C, previous page
8400 Series	56”/142cm	Same as height, Dim C, previous page

2 Installation

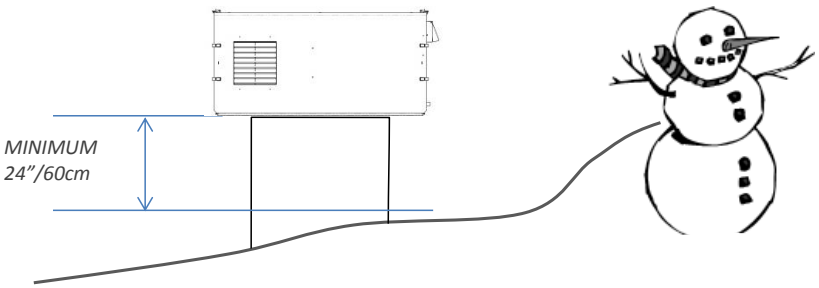
Safety and Warnings

These warnings are for your protection. Failure to comply may result in serious injury or death. Tempest Lighting, Inc. assumes no responsibility for damages or injury incurred by misuse or mishandling of product.

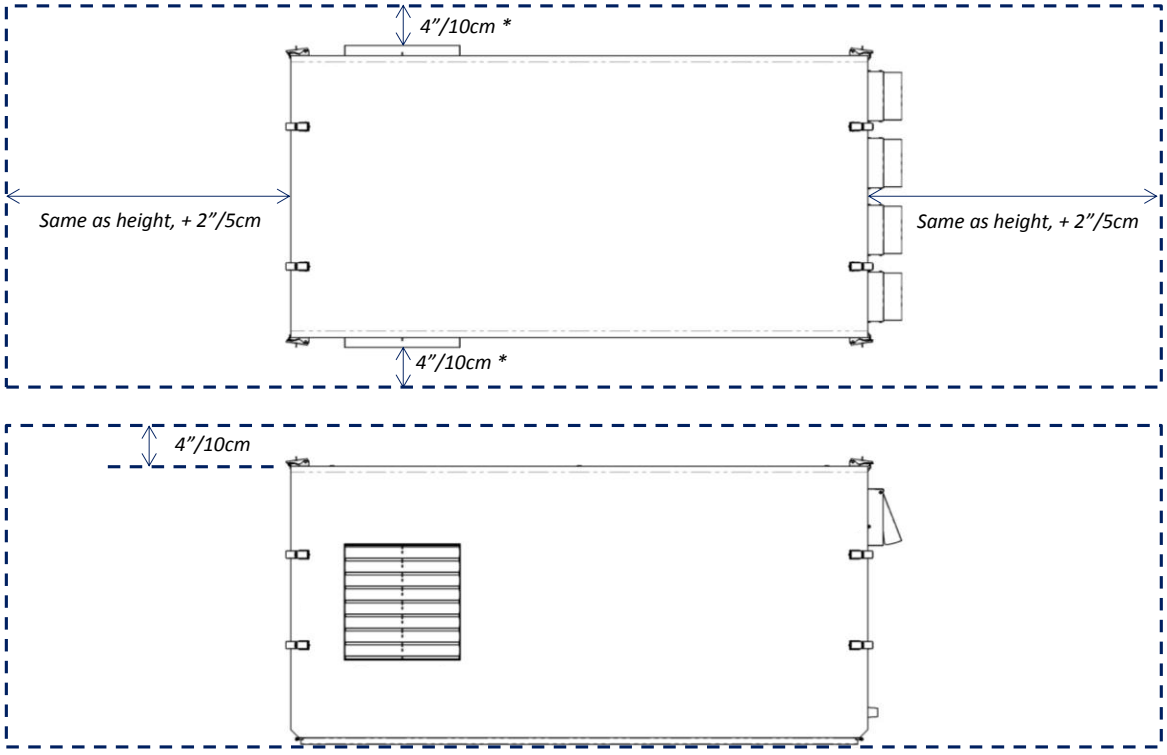
- **Do not** attempt to install or operate the enclosure before fully reading and understanding this manual
- **Never** allow anyone who has not read this manual to open the enclosure or perform maintenance on the projector within.
- **Never** leave the enclosure unattended when open.
- **Always** make sure all bolts and latches are tight and safety locks are in place after performing any form of maintenance on the unit.
- **Do not** open any electrical boxes until power has been shut off to all supply lines to the enclosure (including the one powering the projector).
- **Do not** open the enclosure in wet weather.

Planning

ⓘ Snow clearance:



ⓘ Observe the following MINIMUM clearances around enclosure for access and ventilation.



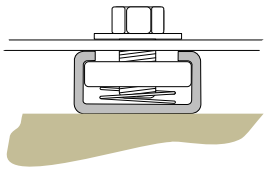
** Note: Side clearance must be doubled when two enclosures are mounted side by side*

Mounting

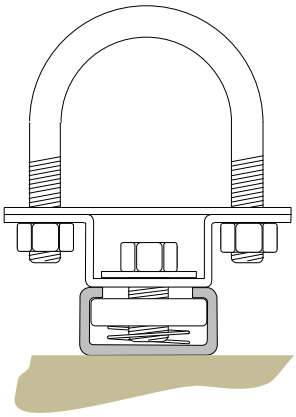
The Cyclone enclosure is provided with a pair of stainless steel Unistrut channels on the enclosure base, for mounting to your structure. You may use standard Unistrut accessories, or purchase mounting kits from Tempest Lighting – four kits are required per enclosure.

- ⓘ Each Enclosure must be mounted with FOUR points.
- ⓘ 8400 and up must be mounted with SIX points when suspended from a structure.
- ⓘ All mountings must be made using the two Unistrut channels on the base of the enclosure.
- ⓘ *Tempest Lighting recommends the use of stainless steel mounting hardware.*
- 🚚 ***IMPORTANT SAFETY NOTICE:***
  Installer must ensure that all mounting points are secure and conform to local safety regulations. Tempest Lighting Inc. accepts no responsibility for damage or injury arising from inappropriate or unsafe installation.

These mounting accessories are available from Tempest:



4900.MB *Stainless Steel Unistrut channel nut, bolt and washer. Four required per enclosure (6 when suspending Cyclone 8400 and up)*



4900.MC *Stainless Steel Unistrut channel nut, bolt and pipe clamp, for pipes 1.5" (38mm) to 2" (50mm) OD. Four required per enclosure (6 when suspending Cyclone 8400 and up)*

.

4925.MC *Stainless Steel Unistrut channel nut, bolt and pipe clamp, for pipes 2" (50mm) to 2.5" (64mm) OD.*

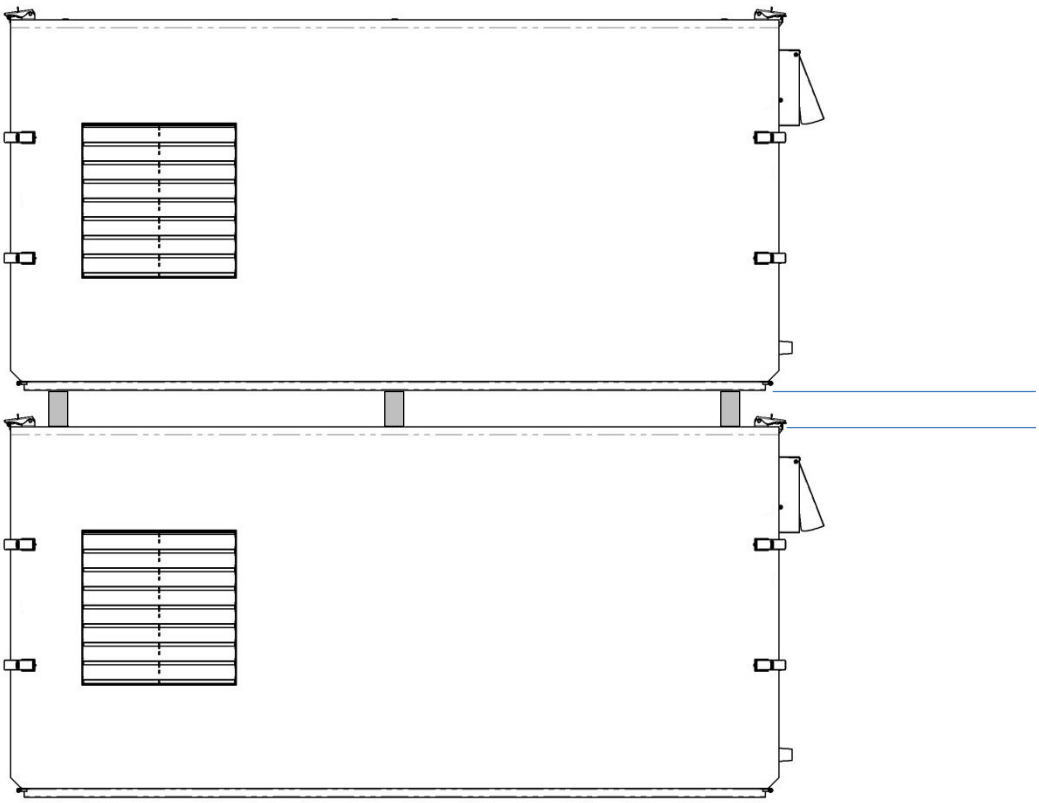
Four required per enclosure (6 when suspending Cyclone 8400 and up)

.

Stacking Cyclone Enclosures

Cyclone enclosures may be stacked, using the Cyclone Stacking Kit accessory.

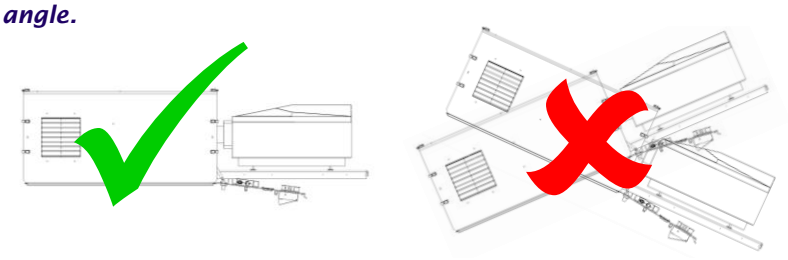
Item # **8000.SK**



Cyclovator Tilt Kit

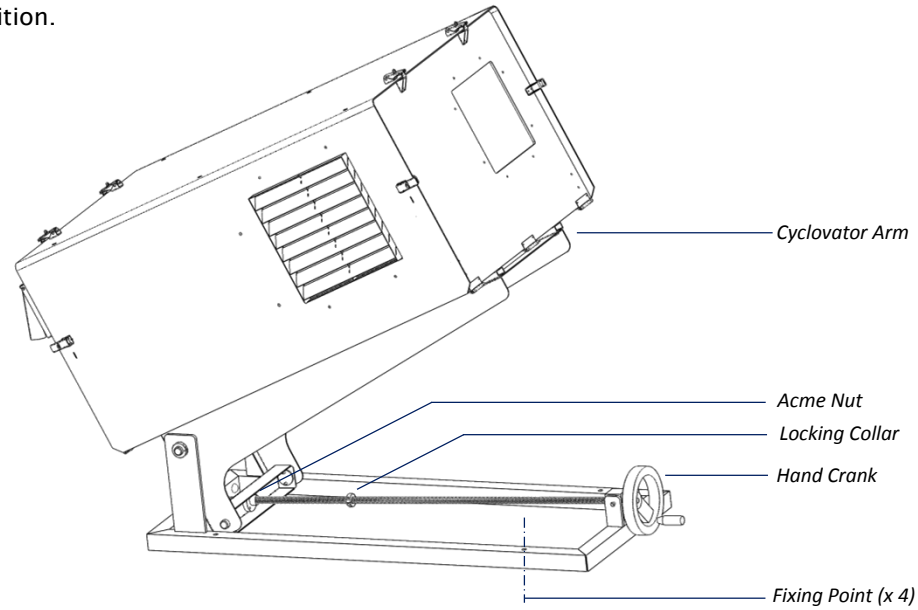
Cyclone enclosures are often used on video mapping projects where the angle of the projected beam needs to be more than the projector's lens shift range. The Cyclovator Tilt Kit allows the projector to be tilted up to 80˚ up or down, and then returned to horizontal for servicing.

IT IS A SAFETY REQUIREMENT that the projector only be slid out of the enclosure for service when the enclosure is horizontal. Many of the projectors used in Cyclone enclosures are very heavy, and it is DANGEROUS to slide them when the enclosure is set at an angle.



Installing the Cyclovator

1. Cyclovator must be bolted securely to a solid structure or a concrete pad, using ½" or M12 stainless steel hardware. Four fixing holes are provided in the Cyclovator base.
2. The Cyclone enclosure bolts to the Cyclovator using six 5/16" stainless steel bolts provided. The bolts drop through the enclosure base and screw into threaded inserts in the Cyclovator arm.
3. Using the hand crank, adjust the Cyclovator to the desired angle for the projection show.
4. Loosen the set screw and slide the locking collar on the threaded rod to make contact with the Acme nut in the Cyclovator arm, and tighten the set screw. This is the show position stop.
5. Now you can lower the enclosure to horizontal for service and return it accurately to the show position.



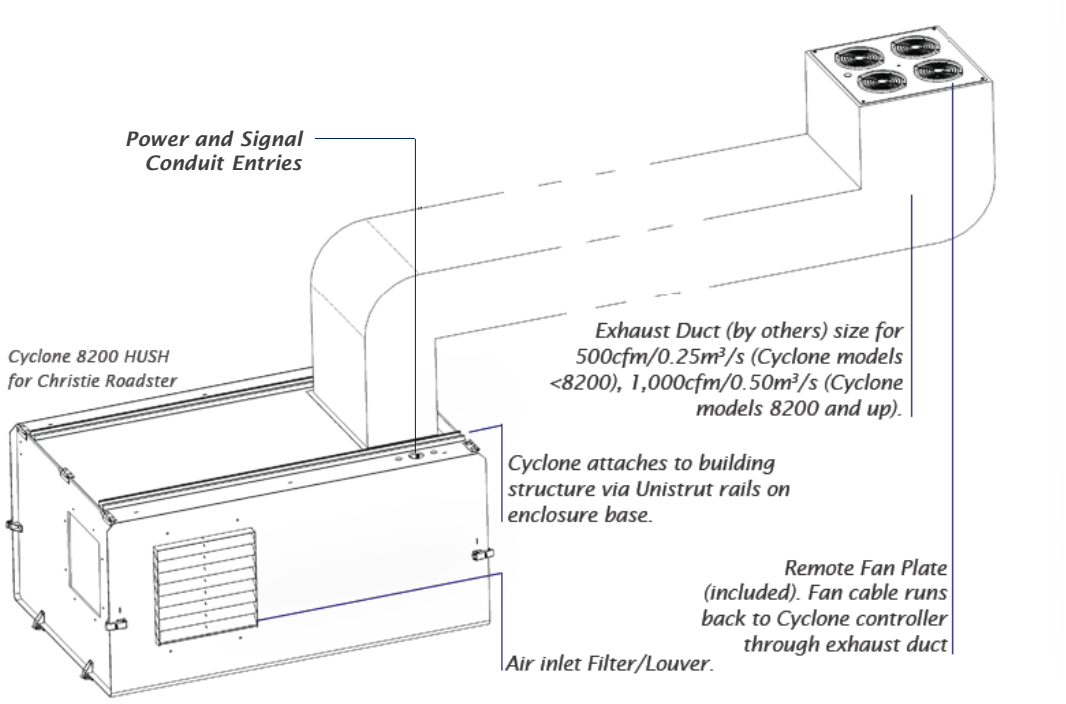
Cyclone HUSH Enclosures

Cyclone HUSH enclosures must be provided with an exhaust duct for exhaust air, from the top of the enclosure to a location where the noise of the Cyclone fans will not be heard. This is usually an insulated ceiling void, drop ceiling, an adjoining room, or an outside wall.

The exhaust duct is normally installed by an air conditioning installer, and rated for airflow as follows:

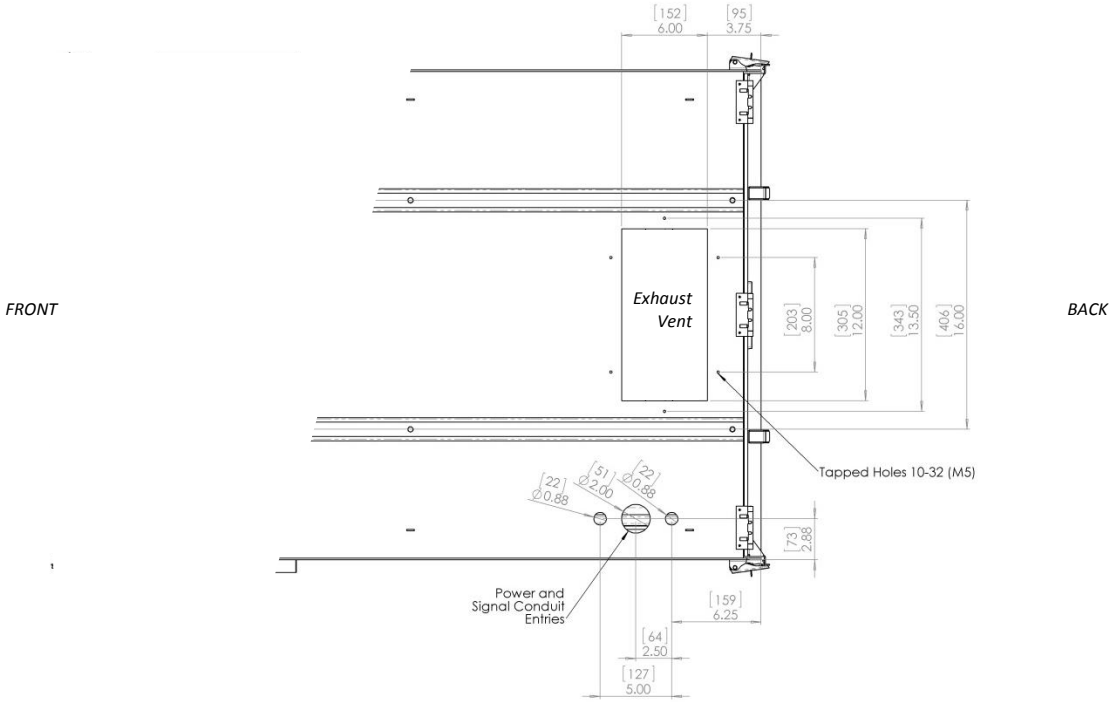
Cyclone 8000, 8100 HUSH	500cfm	0.25m³/s
Cyclone 8200 and up	1,000cfm	0.50m³/s

The Cyclone HUSH enclosure is supplied with a fan plate to be mounted at the far end of the duct. Installer must provide a 3-conductor flexible cable rated at 250VAC, 10 Amps, conforming to local electrical standards, to connect the fan plate to the Cyclone DEC controller, and pulled either through the duct or in a separate electrical conduit.

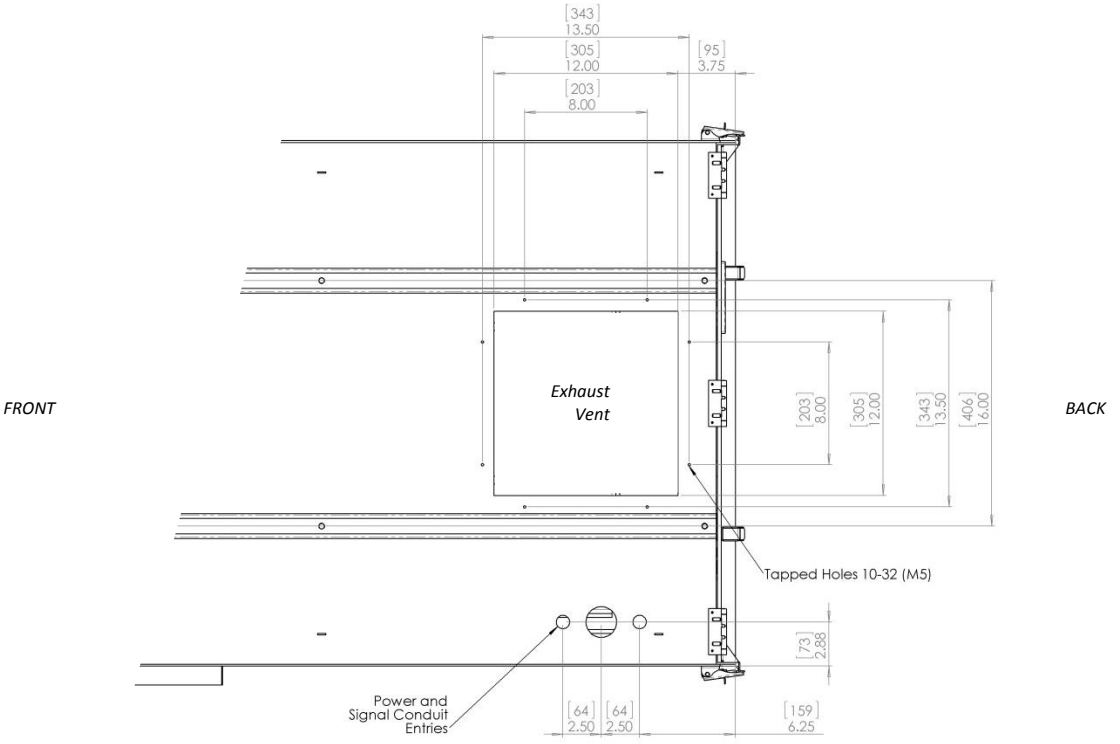


Cyclone HUSH Enclosure Top Surface Dimensions

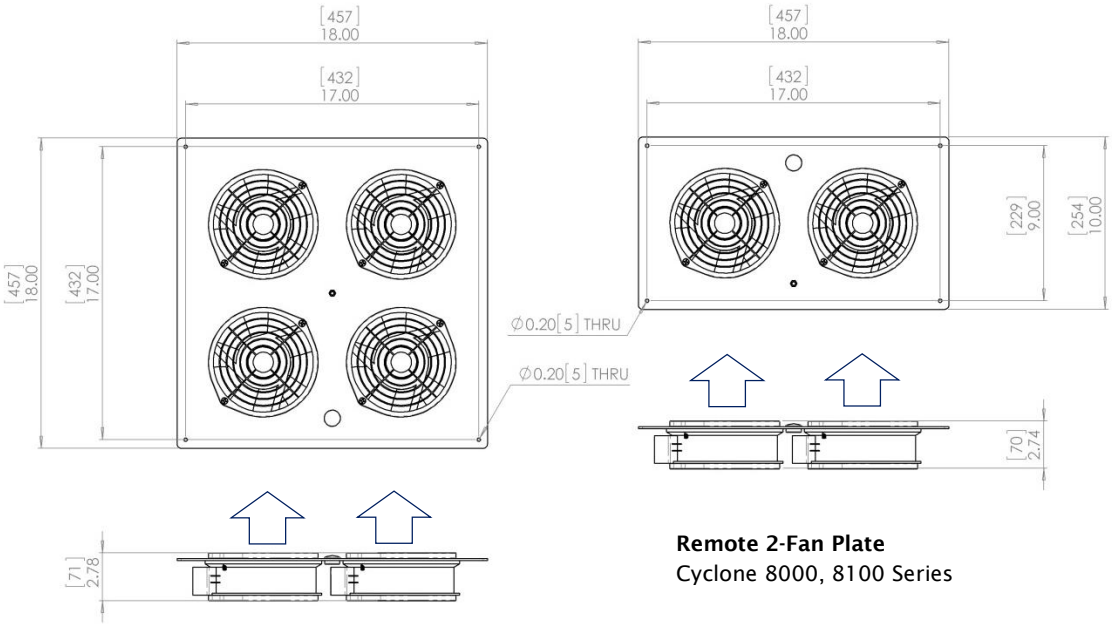
Smaller HUSH Enclosures (8000, 8100 Series)



Larger HUSH Enclosures (8102, 8200 and up)



Cyclone HUSH Remote Fan Plate



Remote 2-Fan Plate
Cyclone 8000, 8100 Series

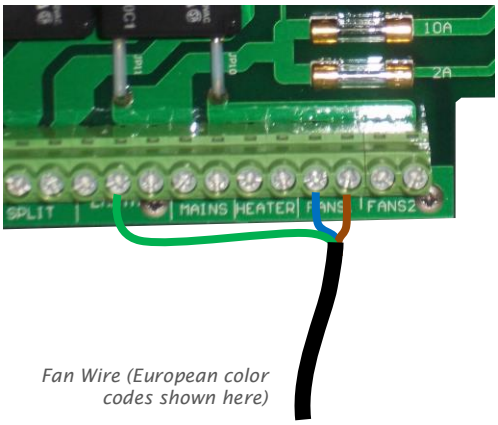
Remote 4-Fan Plate
Cyclone 8102
Cyclone 8200 and up

1. Install the Remote fan plate at the end of the exhaust duct, with the airflow direction AWAY from the Cyclone enclosure. See illustration on p12

2. Connect a 3-conductor wire rated at 10 Amps, 250 Volts to the terminals on the Remote Fan Plate.

3. Pull the Fan wire through the duct to the Digital Enclosure Control (DEC) controller in the Cyclone enclosure.

4. Terminate the fan wire to the DEC FAN 1 and Earth (Ground) Terminals as shown here:



Fan Wire (European color codes shown here)

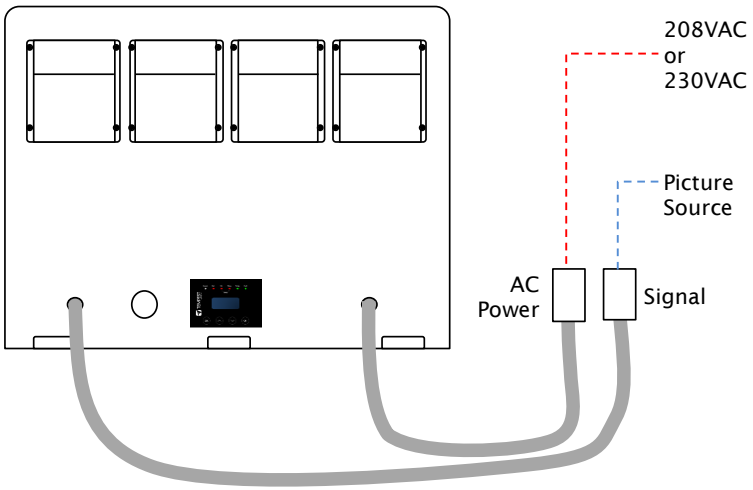
3 Wiring

All electrical work must be carried out by a properly licensed electrician, in compliance with local electrical standards. Failure to observe this point will void the factory warranty for the Tempest Enclosure.

1 Switch off power to the branch circuit, carefully following lockout and tag-out procedures. Failure to do so could cause serious injury or death.

2 You will need two electrical junction boxes, located within a short distance from the enclosure, one for power, one for signal (usually CAT5). Use outdoor-rated flexible conduit between the box and the enclosure, to allow for the back door to open.

3 AC and signal circuits must be wired in separate conduits.

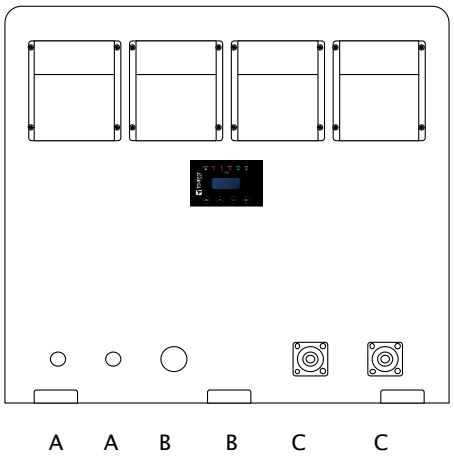


Conduit Entry Holes

1 .875"/22.2mm for AC power
2 .875"/22.2mm for Data (CAT5 or fiber)
3 2"/50.8mm for pre-wired signal cables with large connectors.

Conduit Entries may be fitted with flexible conduit fittings or cable glands (not included)

Conduit Entry Holes – 8400 Model (for Christie Roadie)

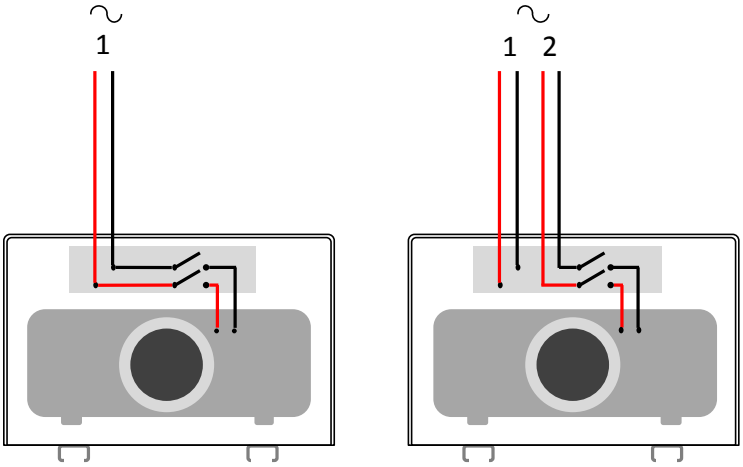


The smaller conduit entry holes (A) accept US ½" conduit fittings, and international 20-22mm (OD) conduit fittings.

The larger entry holes (B) accept 2"/50mm OD fittings for signal cables with larger molded connectors.

The CamLok Connectors (C) are for the DC ballast cables.

One or Two Power Circuits?



Single Feed Split Feed

Tempest enclosures may be wired on single or double line supplies. On a single feed, both enclosure and projector are permanently on. With a split feed supply, you can switch off the projector when not in use, while the enclosure continues to protect it 24/7.

Single Feed

Enclosure and projector are permanently on.

Enclosure and Projector must be rated for the same voltage.

Supply must be rated for projector current plus 150 watts.

Supply must be permanently ON.

Split feed

Enclosure power must be permanently ON.

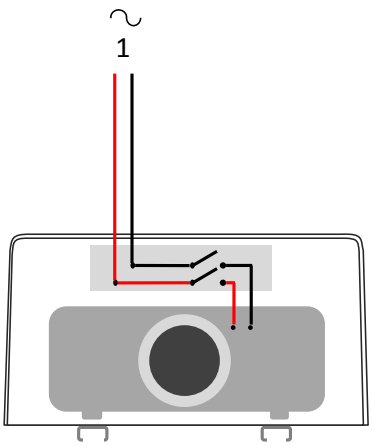
Projector power may be switched off.

Enclosure power must be rated for 1150W

Projector power must be rated for the projector (see projector manual).

Projector and enclosure power must be same voltage.

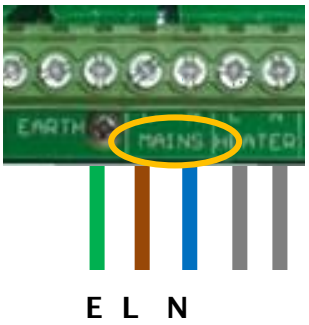
Single Feed Operation (factory default)



Enclosure and projector share the same electrical circuit.

Circuit must be powered ON 24/7.

Connect incoming power to the terminals labeled **MAINS**:



(E) Earth/Ground

(L) Live

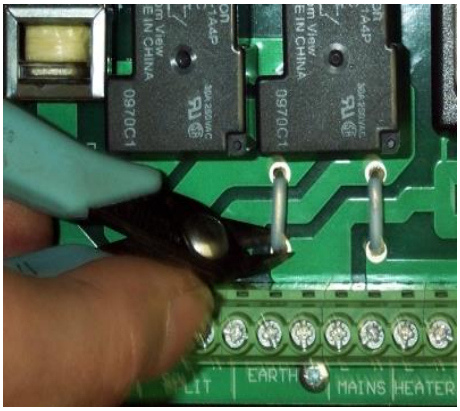
(N) Neutral

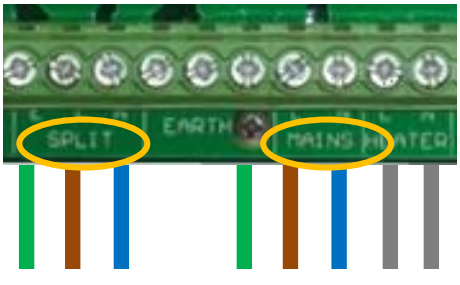
Split Feed Operation

Enclosure and projector have separate electrical feeds.

The enclosure circuit must be powered ON 24/7.

When splitting the feeders, both circuits should be on the same phase and at the same supply voltage.





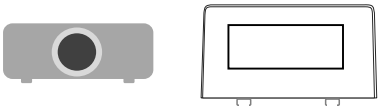
1 Use a wire cutter to cut the copper links on the DEC3.3 board in four places.

2 Connect incoming **ENCLOSURE** power to the terminals labeled **MAINS**. This supply MUST be maintained 24/7.

(E) Earth/Ground **(L) Live** **(N) Neutral**

3 Connect incoming **PROJECTOR** power to the terminals labeled **SPLIT**:

(E) Earth/Ground **(L) Live** **(N) Neutral**



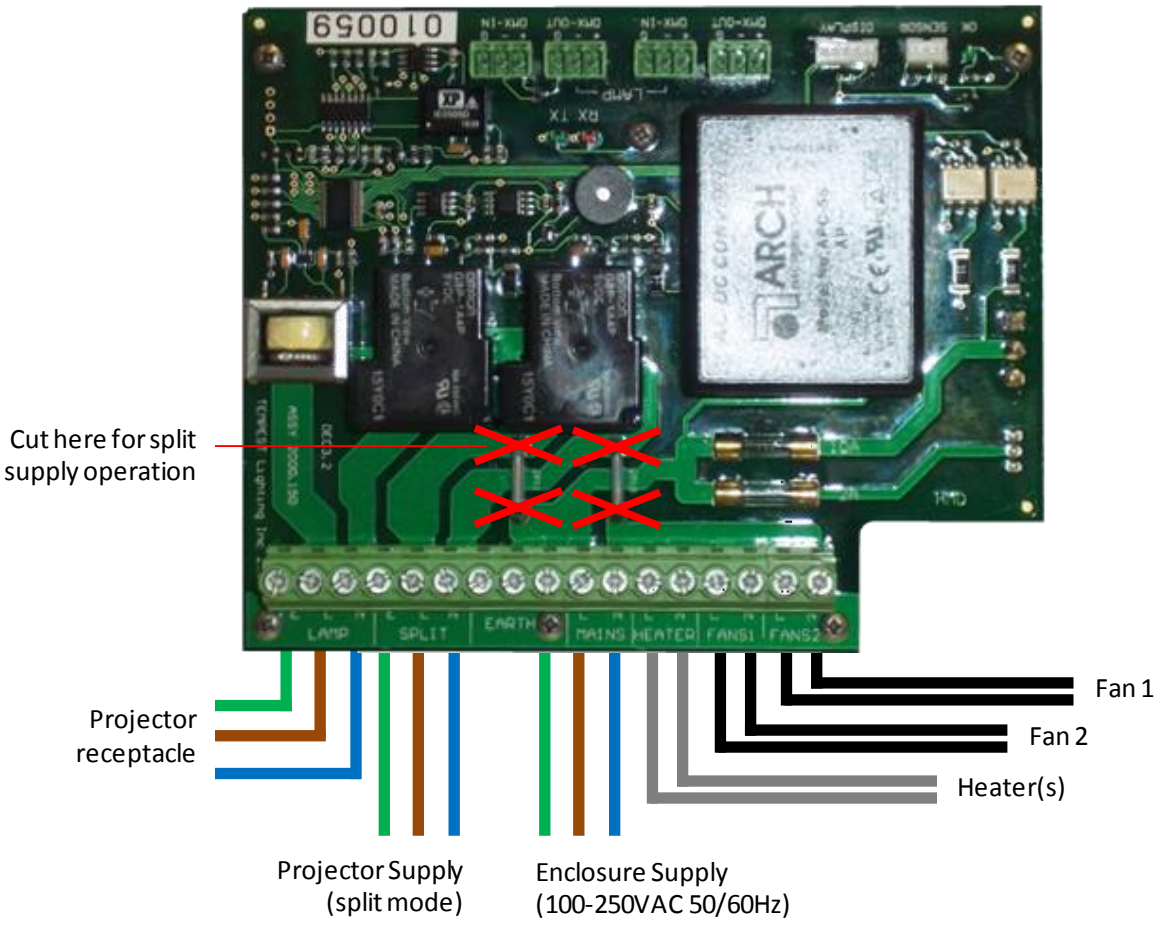
Power Connections

IMPORTANT **Tempest enclosures are supplied for either 120VAC 50/60Hz, or 208-240VAC, 50/60Hz operation. Tempest Lighting is not liable for damage or failure to operate correctly due to connection to an inappropriate electrical supply.**

ALL ELECTRICAL CONNECTIONS MUST BE UNDERTAKEN BY A QUALIFIED ELECTRICIAN, IN COMPLIANCE WITH LOCAL NORMS AND STANDARDS.

For 3-phase connections (Cyclone 840B, 8500 and similar), see following sections.

For all standard single-phase Cyclone enclosures:



Note: wire colors may differ depending on applicable electrical standards. European wire colors are shown here.

IMPORTANT: MAKE SURE THAT TERMINAL SCREWS ARE FULLY BACKED OUT BEFORE INSERTING WIRES.

Auxiliary Power Outlet

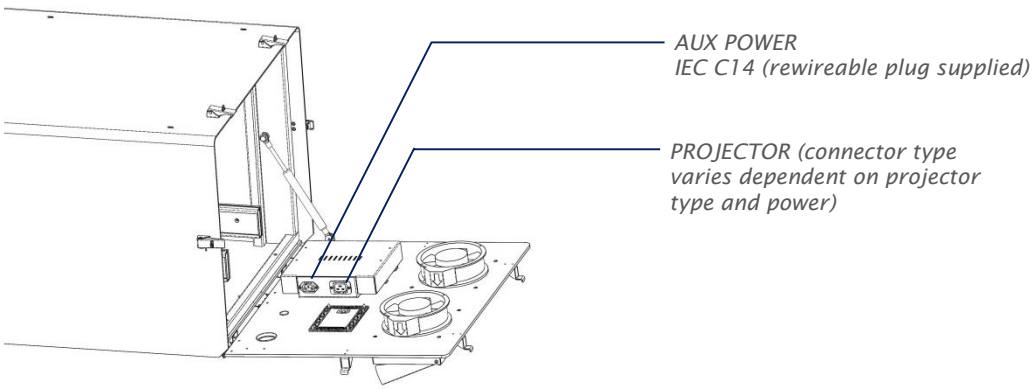
An auxiliary IEC power outlet is provided for any auxiliary equipment needed (routers, CD players etc) in the enclosure. Wiring is different dependent on electrical standard:

North America (208 volt Cyclone enclosures with .US part # suffix)

AUX receptacle is UNWIRED. Installer should run a separate 120V supply to back of IEC C14 receptacle. Receptacle is rated 250V, 10 Amps in Europe, 15 Amps North America.

International (230 volt Cyclone enclosures with .IN part # suffix)

AUX receptacle is wired in parallel with the projector outlet (NEMA 30 Amp or IEC C19).



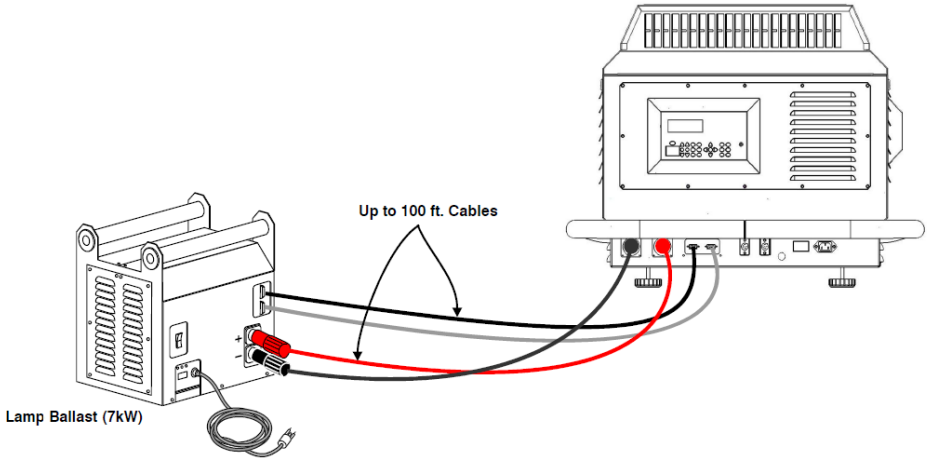
Note: Projector Connector

Cyclone 8000 and 8100 Series enclosures are provided with IEC C19 projector power outlets.

Cyclone 8200 enclosures and up are equipped with NEMA (US-style) 30 Amp 250 Volt Twistlock receptacles (NEMA L6-30). *For shipments outside North America a mating plug is supplied for wiring to the projector power cable.*

Cyclone 840B Ballast Enclosure (3-phase)

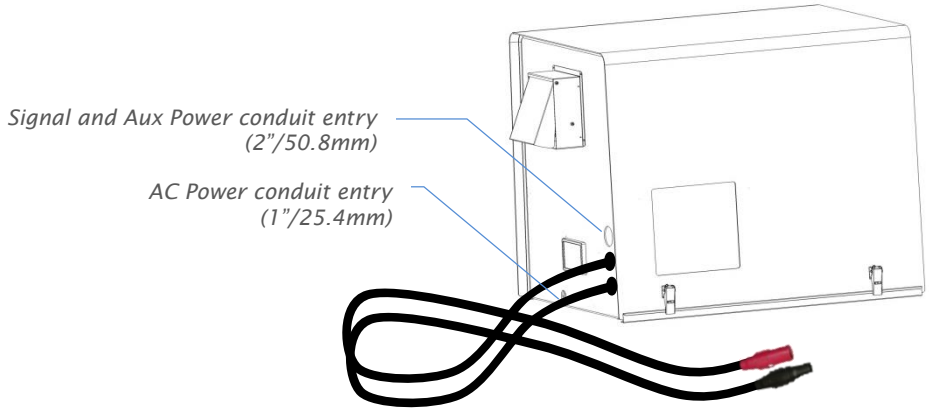
Christie Roadie and some Christie Cinema Projectors require a separate Ballast, which is too large to fit inside the projector enclosure.



Christie allows 100'/30m of DC cable between the ballast and the projector. For outdoor installations when it is not possible to house the ballast in a convenient equipment room, a Cyclone 840B ballast enclosure must be used.

As well as the ballast cables there are two DB15 signal cables and one IEC C14 auxiliary power cable that must be connected between the ballast and the projector.

NOTE: The 840B Ballast enclosure comes with 10'/3m DC pigtails to connect to the Cyclone projector enclosure. If you are using the 840B you do NOT need to purchase DC cables from Christie.

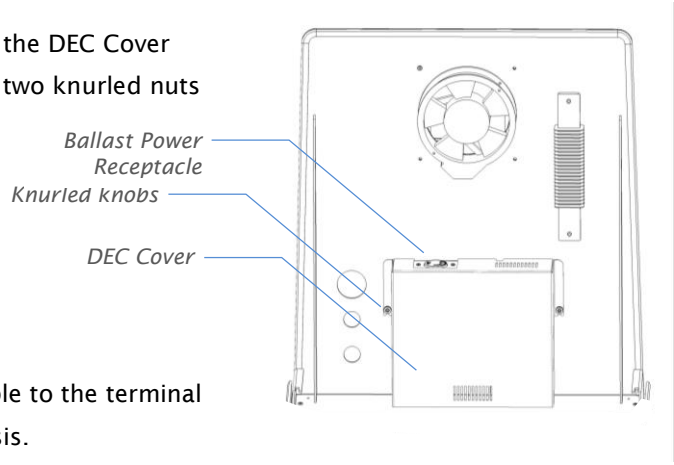


10'/3m DC Pigtails. Note: Camlok connectors for Roadie projector, Ring Lugs for Cinema projectors

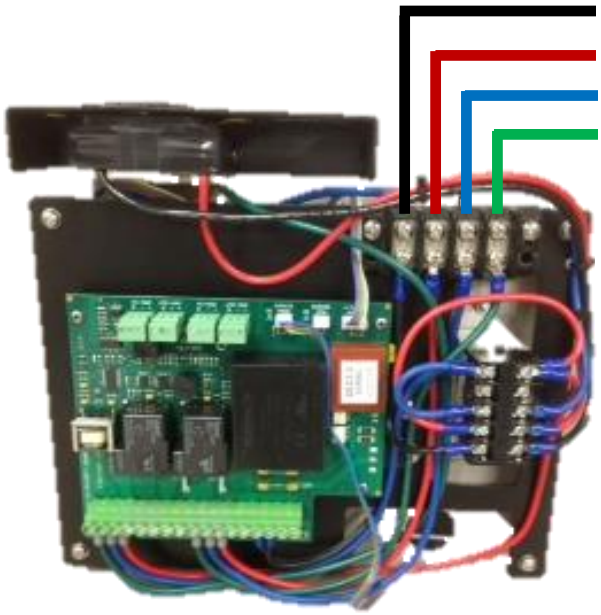
Power Connections to 840B Christie Ballast Enclosure

The 840B enclosure requires a three phase 208V supply in North America, and a 3-phase + neutral 380-415V supply in 230V countries.

1. Remove the enclosure cover and the DEC Cover inside the enclosure. Loosen the two knurled nuts and slide the cover up.

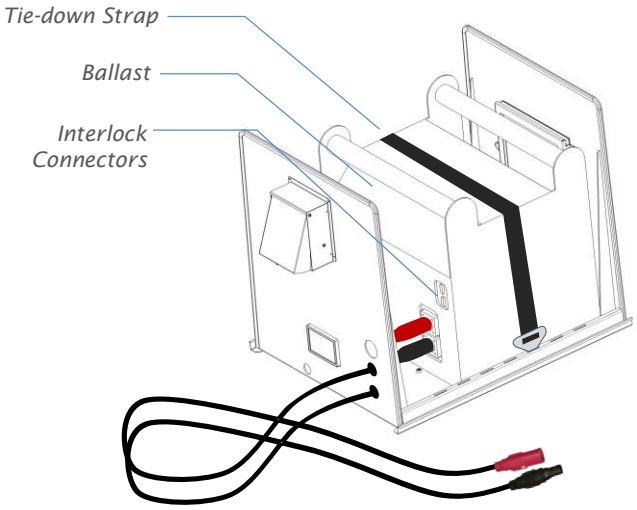


2. Connect the incoming power cable to the terminal block mounted on the DEC chassis.



3. Replace the DEC Cover

4. Place the Christie Ballast in position and secure in place with the tie-down strap provided



5. Plug the ballast power cable into the 3-phase Ballast Power receptacle provided
6. Plug the two Camlok tails into the ballast. BE SURE TO TWIST CLOCKWISE to make a good connection.
7. Connect the two Interlock cables to the Ballast D-Connectors.
8. Replace the Enclosure cover.
9. AUX POWER CONNECTION
    a. Set the DEC3.3 wiring to Split Feed – see pp 18-19
    b. Wire the AUX POWER output from the ballast to the SPLIT terminals on the DEC3.3 circuit board
    c. Connect an IEC C13-C14 power cable between the receptacles on the side of the DEC3.3 assembly to the AUX Power inlet on the projector head. This enables the DEC to sense current to the projector when the head is active, running the fans when needed. It also enables the DEC to shut down the projector in the event of a catastrophic overtemp event.

Power Connections to Cyclone 8500 for Barco HDQ

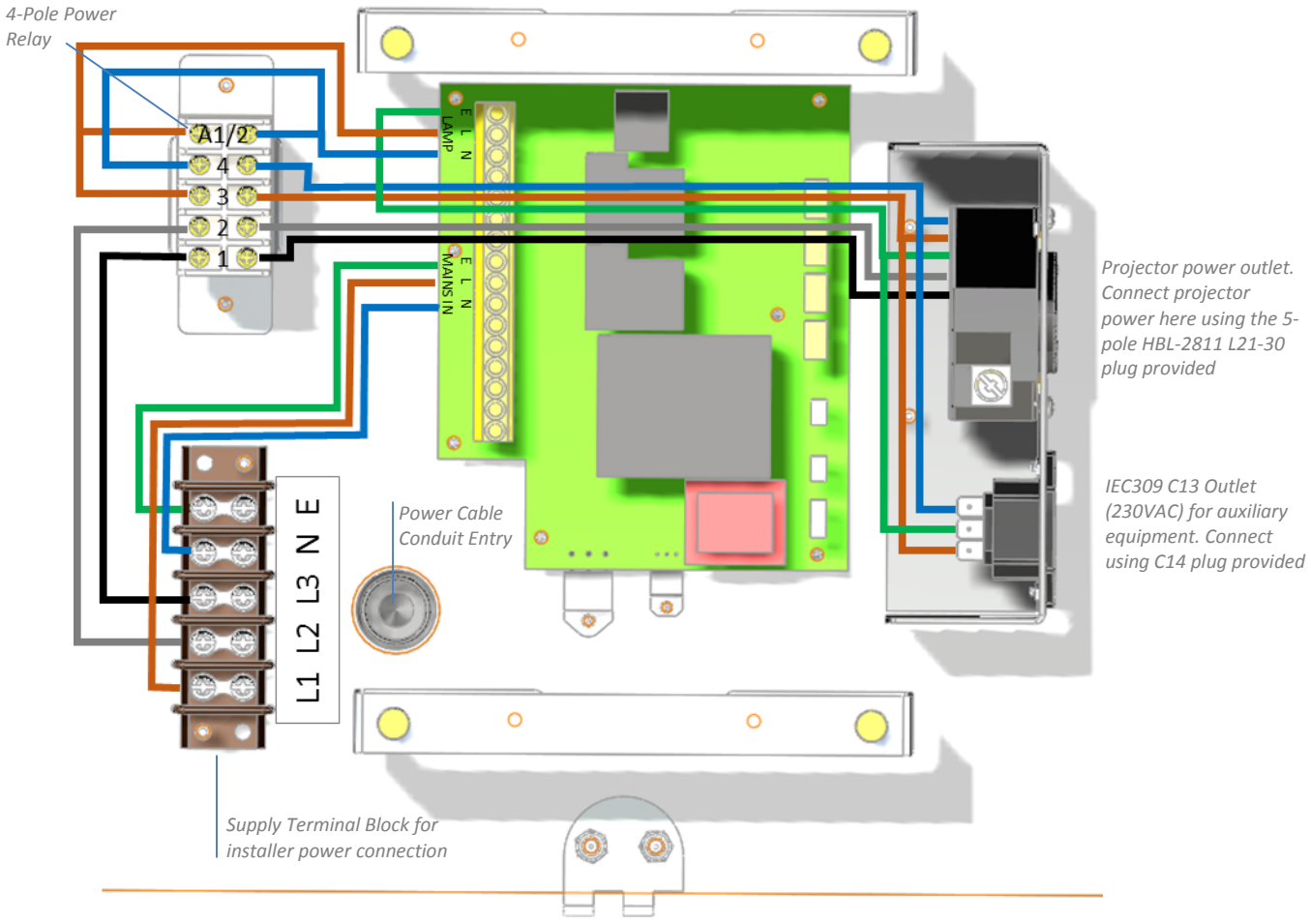
Important Note:

The Barco HDQ comes as standard witvh a large rigging frame and an air diffuser assembly that mounts atop the projector. NEITHER OF THESE ACCESSORIES may be used when installing the HDQ projector in a Cyclone 8500 enclosure.

The HDQ projector requires a three-phase supply for its internal ballast. The Cyclone 8500 DEC incorporates additional power components to allow this. Because the three-phase supplies used in North America will be different from those used in the rest of the world, it is important to follow the correct wiring procedure shown here.

Power Wiring for Cyclone 8500.IN (International)

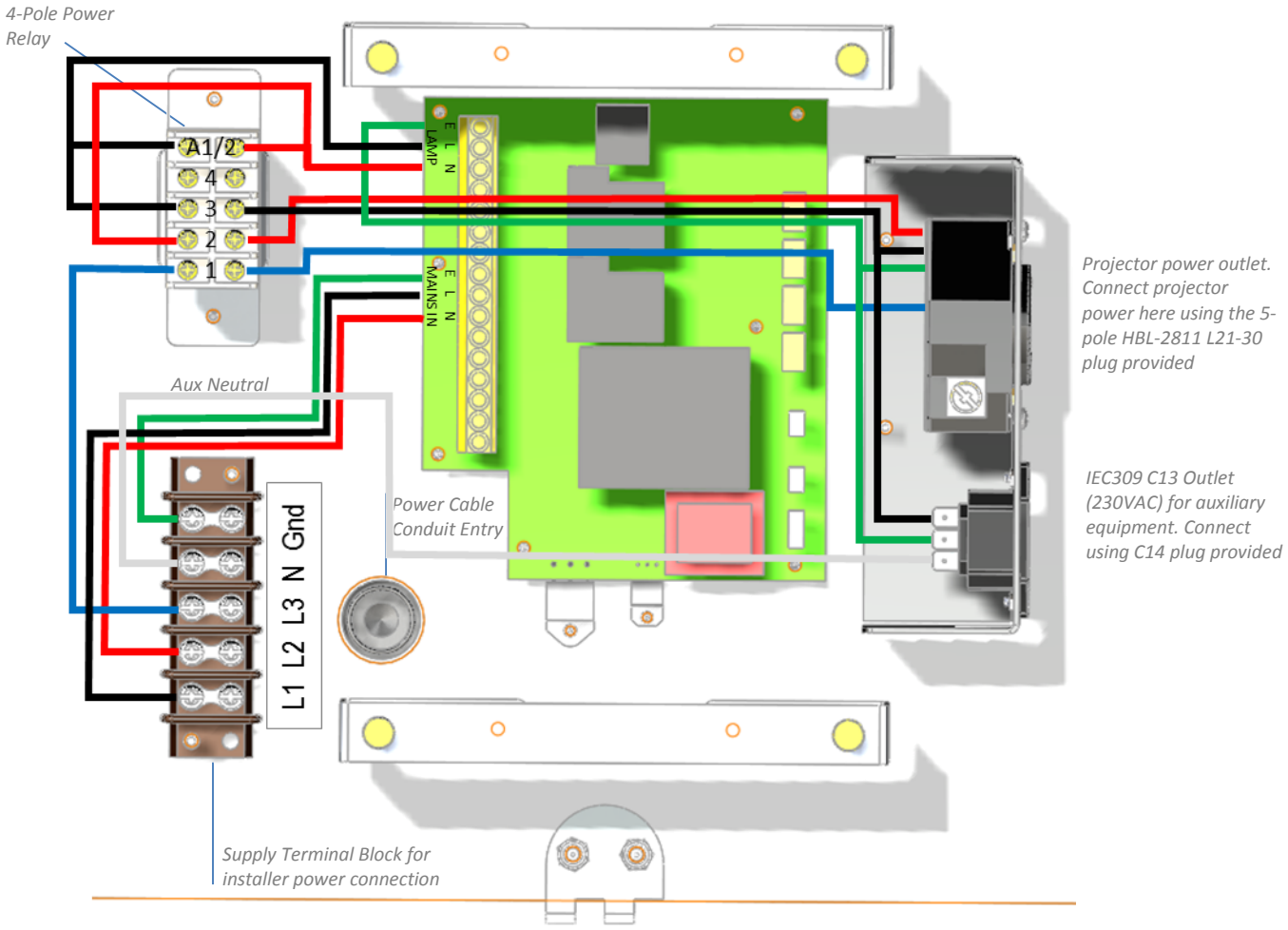
For connection to 3-phase, neutral and earth, 230/400VAC supply:



Power Wiring for Cyclone 8500.US (North America)

For connection to 3-phase and ground supply – three hots @ 120V

Note: A Neutral is also required to supply the 120V Aux outlet:



Split Feed Wiring for three-phase Enclosures:

Follow the instructions on p19-20.

For International systems (part # suffix .IN) use a separately protected 10amp 230V LNE feed connected to the SPLIT terminals.

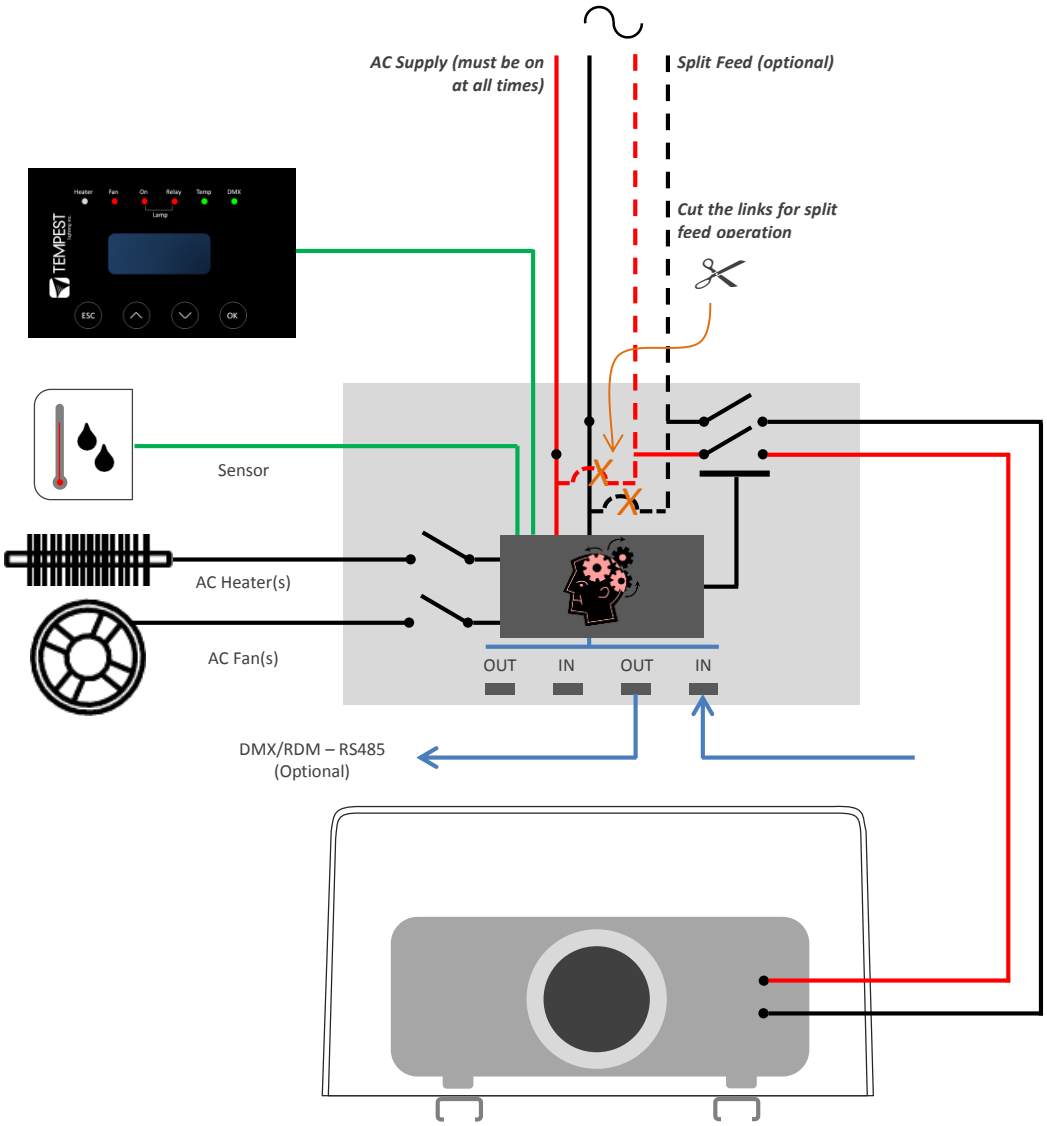
For North American systems (part # suffix .US) use a separately protected 10amp 208V feed (2 hots and ground) connected to the SPLIT terminals.

Digital Enclosure Control – DEC3.3™ with Goldilocks™

DEC3.3™ – that's *Digital Enclosure Control, third Generation, revision 3* – is the brain of your Tempest enclosure. It will maintain the internal environment in a comfortable temperature and humidity range, and prevent condensation – the real killer of outdoor equipment. DEC3.3 monitors internal temperature, humidity and lamp current at all times, and uses this information to control the enclosure's lamp relay, fan(s) and heater(s). It can report back over the DMX cable, using the RDM protocol (Remote Device Management) if desired.

From summer 2013 DEC is running Tempest's new ***Goldilocks™*** operating system (patents pending). A completely new OS, ***Goldilocks*** analyzes temperature and humidity trends, targeting and maintaining safe ranges, and acting to prevent condensation before it happens. ***Goldilocks*** is also much more energy-efficient than previous generations, so your equipment is always in the Goldilocks zone, and you save money too.

DEC3.3 Schematic



Which Controller?

The following Table shows which controller is used in different types of Tempest Enclosure. This section does NOT apply to enclosures with Tempest MiniDEC™ Control

Enclosure	Type	DEC3.3/Goldilocks	MiniDEC
Blizzard	Indoor		■
	HUSH		■
	Outdoor	■	
Cyclone	HUSH	■	
	Outdoor	■	
Thunder	Outdoor	Special order	■
Tornado	Outdoor	■	
Twister	Outdoor		■

DEC3.3 Main Functions

1 Sense current to projector (lamp on/off)
2 Record lamp hours
3 Monitor temperature and humidity inside Enclosure
4 Maintain temperature at safe operating level
5 Maintain relative humidity within safe limits
6 Prevent condensation
7 Isolate projector in case of unsafe temperature
8 Report status over RDM
9 (Optional) remote projector relay control over DMX

DEC3.3 constantly monitors the following parameters:

- Projector/Luminaire power
- Line Voltage
- Temperature
- Humidity

DEC 3.3's patented Goldilocks™ algorithm uses a combination of heaters and fans to maintain a safe operating temperature and a safe relative humidity level that will not allow condensation to take place.

As air is heated it is able to support more moisture without condensing, so Goldilocks uses heat to raise the air temperature inside the enclosure in the event that relative humidity approaches dewpoint.

Factory Settings – Basic Mode

In most applications, DEC3.3 will operate correctly with its factory default settings, in Basic operating mode.

You do not need to do anything. Please skip to the ***Power Connections*** section below.

If your needs are more complex, read on.

Operating Modes

DEC3.3 may operate in one of four modes, set using either the Front Panel or by RDM control. In all configurations, the projector inside the enclosure may also be an RDM enabled device.

Basic Mode (factory setting)

- Best for standalone operation
- DMX and RDM disabled
- Tempest Equipment Management Protocol (TEMP) enabled when option supported (see below)

Monitor Mode

- As Basic mode, plus:
- RDM status reporting
- RDM configuration – settings may be changed remotely or at the enclosure control panel
- DEC3.3 does not require a DMX signal to operate

Control Mode

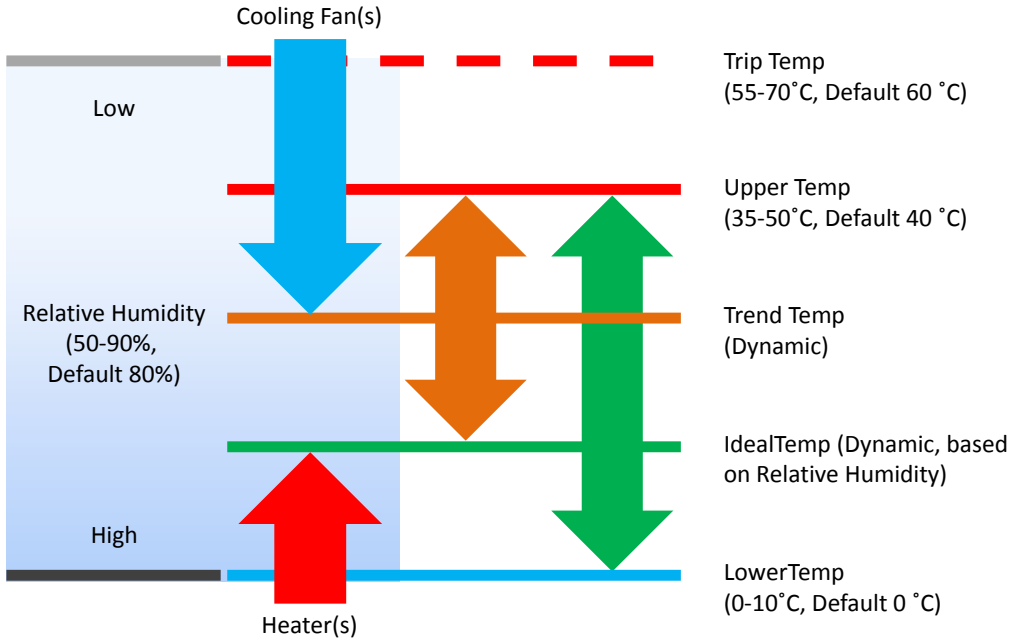
- As Basic mode, plus:
- Enclosure functions as a 1-channel DMX device, with remote control of the lamp relay
    - The DMX level ranges and times that operate the relay are configured using the DMX CURVE and DMX RESPONSE SETTINGS, see below.
    - DMX control of the lamp/projector relay enables a remote hard reset of the luminaire/projector in the event of a malfunction.
- Control mode is recommended for show control applications, but can be risky in live show operation, since the DMX slot used for the enclosure MUST be kept high to prevent the lamp relay from opening.

Service Mode

- For trained service personnel only
- Normal operation is suspended and the enclosure functions as a 3-channel DMX device:
    - Lamp Relay (Slot 1)
    - Fans (Slot 2)
    - Heater (Slot 3)
- Service mode is ONLY for troubleshooting – DO NOT use Service mode for normal operation.

DEC3.3 Control Parameters

Temperature and Humidity Ranges:



Notes:

1 *In moving light enclosures the temperature sensor is located in the exhaust airflow. Temperatures shown may be higher than those around the projector.*

2 *We recommend using the factory default settings for several weeks or months before making any changes. In most cases they will not be necessary.*

Max Humidity Range 50-90%, *Default 80%*
The threshold at which air inside the enclosure is heated to raise dewpoint and prevent condensation. Setting a higher Max Humidity is not a bad thing in high-humidity climates. Setting the Max Humidity too low will result in unnecessary heating and excessive energy use. So set the Max Humidity at the top end of the relative humidity likely to be experienced on site.

DMX Address *Range 001-510, Default 001*
Sets the DMX address for the lamp relay control. *(See also DMX Response)*

Set Temp Units Display Degrees Celsius or Fahrenheit. Default Celsius
Note that temperature settings must always be Celsius.

Lamp Hours *Default 0000*
Counts lamp hours – you must reset to zero when changing lamps.

Lamp On Point The lamp current at which DEC detects the projector/luminaire lamp is running. Default is 1 Amp, which allows for equipment fans and power supplies to run without changing the air in the enclosure. Lamp on point may be set in 0.2 Amp increments between 0.2 Amps and 2.0 Amps.

Start-up Validation

When you switch power ON to the DEC3.3 controller (firmware 01.00.006 and up), the following indications will confirm that the major system elements are working correctly:

- BEEP! – a loud beep indicates that the processor has initialized and is functioning correctly.
- FANS – fans run for three seconds
- HEATER – the heater turns on for 15 seconds. This is enough to get warm to the touch.

DMX Connections

DMX refers to USITT DMX512, a commonly used control protocol in the entertainment industry, running over RS485. Consult USITT DMX installation guidelines when laying out a system, or employ a qualified DMX system integrator.

A DMX network will be required if:

a) The projector inside the enclosure requires a DMX control signal

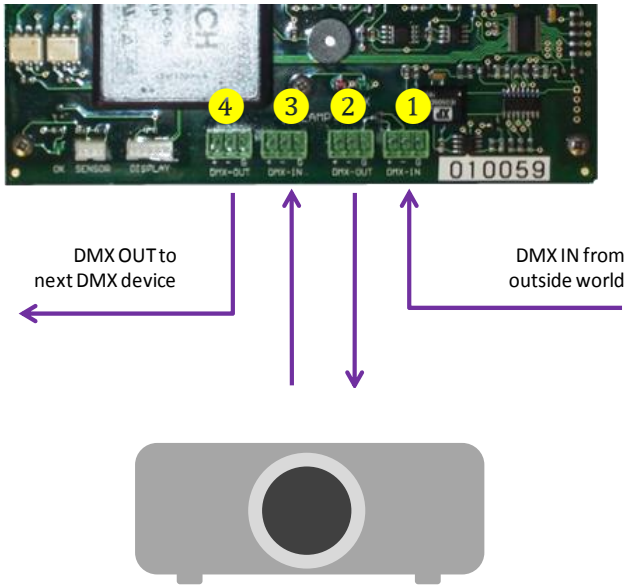
b) You wish to monitor the enclosure using RDM

c) You wish to control the enclosure lamp relay over DMX

DMX Terminations

Note: DMX will not normally be used in projector installations.

Pinout: (1) Ground, (2) Data -, (3) Data +.



DMX Connectors:

1 DMX IN from network

2 DMX OUT to projector (or to network if not controlling projector)

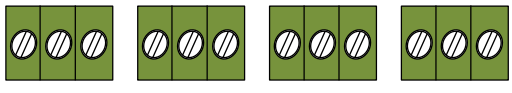
3 DMX IN from projector

4 DMX OUT to network

Note: If the enclosed equipment does not use DMX, then connector (2) on the controller is DMX OUT for the enclosure.

DMX Line Terminations

DMX cable runs must be terminated at the far end of the cable run with a termination resistor as detailed in the DMX512 standard.



The individual equipment installed inside the Tempest enclosures must NOT be terminated. It is recommended that any line termination is done using the 3-pin terminal connector fitted to the DEC3.3 control circuit board.

Remote Device Management (RDM)

RDM refers to ANSI E1.20, a control protocol in the entertainment industry used for device configuration and monitoring, and essentially an "extension" of DMX512. The use of RDM is optional, and uses *the same RS485 cable connection* as DMX512, so ***no additional wiring*** is required if DMX is already present. The user must ensure that any DMX splitters or other routing devices used are RDM operable. Tempest strongly recommends working with a qualified RDM system integrator when designing an RDM network. Go to www.tempest.org for contact information.

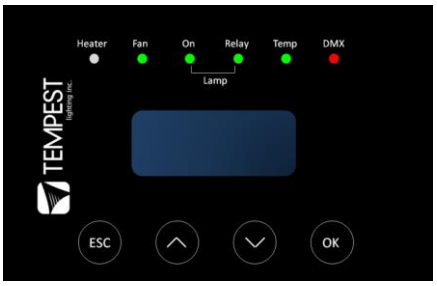
RDM and RDM Integration

DEC3.3's RDM implementation allows system integrators to remotely configure, control or monitor DEC3.3 attributes, including:

- Relative Humidity
- Air Temperature
- PCB Temperature
- Lamp Current
- Elapsed Lamp Hours
- Lamp Relay Status
- Fan Relay Status
- Heater Relay Status
- DMX Status
- DMX Start Address
- DMX Personality (RDM Mode)
- Device Type
- Device Label
- Software Version

RDM is an effective and powerful tool for commissioning and monitoring an installation, particularly in large systems. For further guidance, please consult a qualified RDM system integrator. Tempest Lighting warrants DEC3.3 to be compliant with the RDM standard, but is not an RDM systems integrator, and can offer only basic guidance on RDM utilization.

Control Interface



LED Indicators		
Heater	ON (Green)	Heater is ON, to maintain lower temperature level or to prevent condensation
Fan	ON (Green)	Lamp is ON, **or** Temperature is HIGH and Fan is cooling enclosure. Short burst when lamp off indicates fan moving air to stabilize temp/humidity
Lamp On	ON (Green)	Current sensing shows lamp is ON Lamp hour counter is running
	OFF	Current sensing shows lamp is OFF Lamp hour counter is not running
Lamp Relay	ON (Green)	Lamp relay is closed (normal) Projector power receptacle is energized
	ON (Red)	Lamp relay is open due to over-temperature event. Projector power receptacle is isolated.
Temp	FLASHING (Green)	Temperature is below lower temp setting
	ON (Green)	Temperature is in normal range
	ON (Amber)	Humidity is above target limit
	ON (Red)	Temperature is above top setting
	FLASHING (Red)	Temperature is above Trip level Projector power is isolated
DMX	OFF	DEC3.3 is in BASIC Mode – DMX not used. **OR** DEC3.3 is in Monitor or Control Mode and no valid DMX or RDM packet has been detected.
	ON (GREEN)	Good DMX or RDM data packet received.
	ON (RED)	Control Mode: DMX Fail. A previously good DMX signal has failed. Monitor Mode: No RDM information being received (this is normal)

Control Display

The display on the Control display provides additional status information, depending on the operating mode:

Basic Mode & Monitor Mode

28˚C 47%
209V OFF

internal temperature, relative humidity
line voltage, lamp status

DMX Mode & Service Mode

28˚C 47%
209V OFF

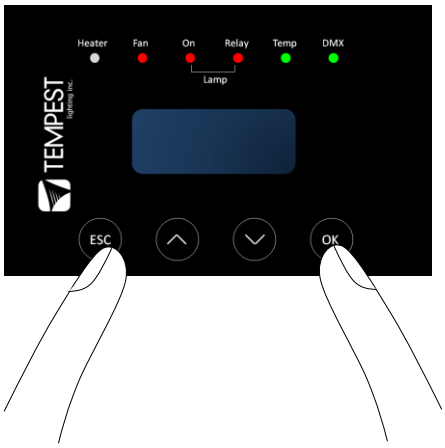
internal temperature, relative humidity
line voltage, lamp status

Alternating with:

DMX: 001
No DMX

DMX Start Address
DMX Status

Control Interface Operation



The Control Interface is normally LOCKED.

To UNLOCK, hold **ESC** and **OK** together for 5 seconds.

You are now in the **CONTROL MENU**

Use ↑ ↓ to scroll up and down the menu.

Press **OK** to enter a menu item

Use ↑ ↓ to set the item parameter, or to scroll to the next menu level.

Use **ESC** to go BACK, and **OK** to confirm settings (↵).

To LOCK, hold **ESC** for 5 seconds.

Menu will time out after ten minutes.

Control Menu

SET DMX OPTIONS

SET DMX MODE

From the Front Panel, this menu item allows the user to check (and if necessary change) the RDM mode.

BASIC	Standalone operation, no DMX/RDM (factory default)
MONITOR	Standalone, plus support for RDM remote configuration and monitoring
CONTROL	Monitor, plus use of a single DMX slot to control Lamp relay
SERVICE	Monitor, plus use of three DMX slots to control Lamp, Heater and Fan

Important: Please ensure that the DEC3.3 is NOT left in Service Mode.

SET DMX ADDRESS (in Monitor, Control or Service modes)

Select a DMX starting address in the range 001 to 510

1 – Lamp Relay

In Service Mode an addition two slots are available

2 – Fan Duty Control

3 – Heater Duty Control

Note that the DMX control is designed using a SAFETY pile-on Logic. So the DMX input can only override automatic settings within safe limits.

SET DMX CURVE

DMX Curves affect the way the fixture relay is controlled in Control Mode.

DMX levels are shown as %.

Response Curve 1 (default)

DMX level 0-25 Relay disabled (open)

DMX level 26-75 *No change to relay status*

DMX level 76-100 Relay enabled (normally closed)

Response Curve 2

DMX level 0-19 *No change to relay status*

DMX level 20-40 Relay disabled (open)

DMX level 41-59 *No change to relay status*

DMX level 60-80 Relay enabled (normally closed)

DMX level 81-100 *No change to relay status*

SET DMX RESPONSE

DMX Response sets a delay time before DMX Control Mode settings are acted on. Setting a response delay of a few seconds would prevent unintended fixture relay state changes in the event of a short accidental change in DMX level.

NOTE: from firmware revision 0.00.100, DEC holds last valid DMX level if DMX is interrupted.

Response Delay Values are:

No Delay (default), 1, 2, 5, 10, 15, 20, 30, 60 seconds.

SET TEMP UNITS

Choose to display temperature values in Celsius or Fahrenheit (default Celsius)

Note that temperature settings must be entered in Celsius.

SET TEMP RANGES

Set three temperature trigger points for Bottom, Top and Trip temperatures, in ˚C.

SET TEMP LOWER *(minimum temperature to be maintained)*

(default 0˚C, permissible range 0-10˚C).

SET TEMP UPPER *(maximum desired temperature)*

(default 40˚C, permissible range 35-50˚C).

SET TEMP TRIP *(temperature at which load will be isolated – see note)*

(default 60˚C, permissible range 55-70˚C).

Note: A thermal emergency is when enclosure ventilation fails with the lamp on, in which case the temperature will rise very quickly. To avoid nuisance tripping we recommend setting a higher Trip temperature, 60˚C or above.

SET MAX HUMIDITY

(default 80%, permissible range 50-90%).

Set target maximum relative humidity level. This should be set at or a few % higher than the normal high humidity levels expected on site.

SET LAMP ON POINT

The lamp current at which DEC detects the projector/luminaire lamp is running. Default is 1 Amp, which allows for equipment fans and power supplies to run without changing the air in the enclosure. Lamp on point may be set in 0.2 Amp increments between 0.2 Amps and 2.0 Amps.

RESET LAMP HOURS

Reset each time you change the lamp in the projector/projector.

Make this a part of your maintenance instructions.

STATUS DISPLAY

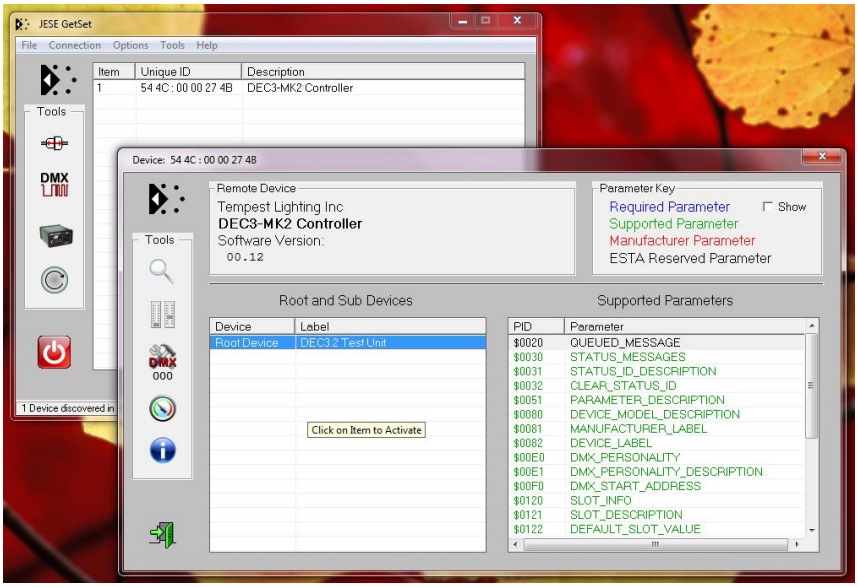
View current status information, using the arrow keys to scroll through:

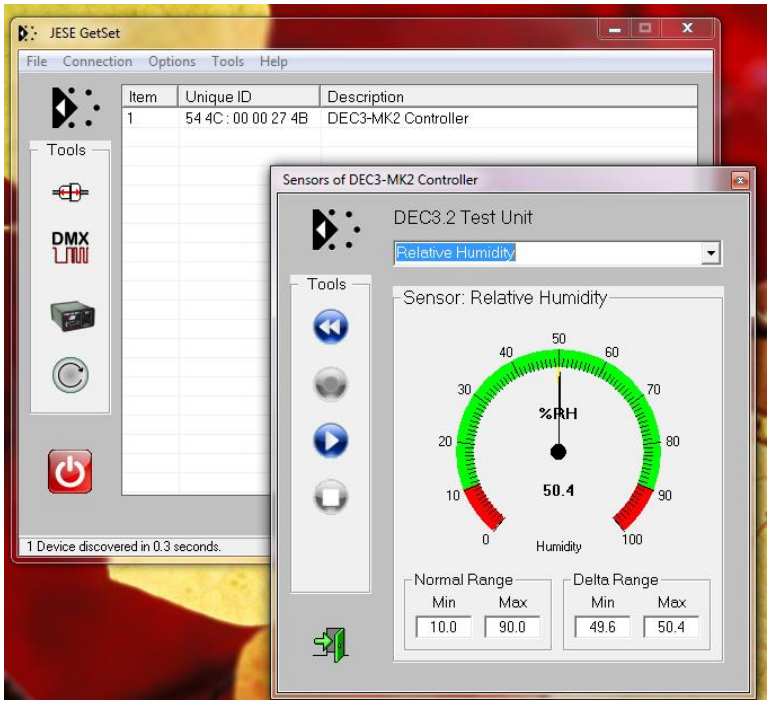
a) Humidity – relative humidity in %
b) Air temperature, in degrees C or F
c) PCB temperature (this will usually be significantly higher than air temperature)
d) Voltage – line Voltage reaching the DEC

e) Current being drawn by projector/light, in Amps
f) Lamp Hours elapsed since last reset
g) Firmware version
h) DEC Electronics Unique ID

RDM Monitoring and Configuration

All the features accessible over the DEC3.3 control panel are also available over RDM. Just how this information is displayed will depend on the RDM interface used. These screen shots were taken running the GetSet program in Windows 7, and connecting to a DEC3.3 controller using a RDM TRI MK1 interface, Tempest part # 2000.190

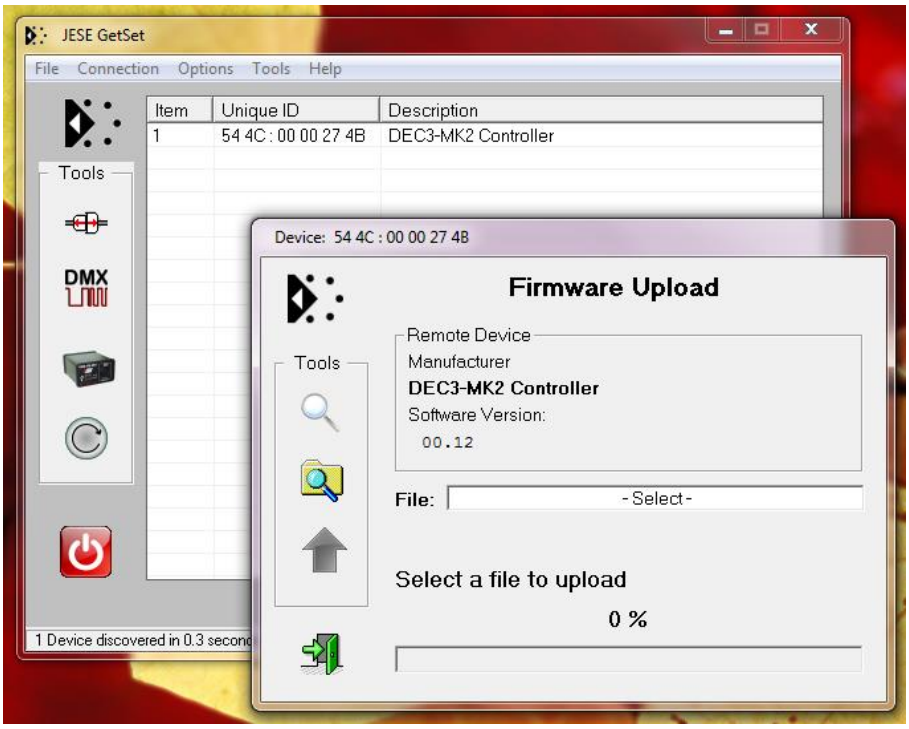




This view shows a single DEC3.2 test unit that has been correctly discovered and labeled by the GetSet software suite, and a log of RDM messages.
This RDM interface provides a graphic view of the various sensor functions supported by DEC3.2 and up

Important:
Check that your RDM interface vendor has tested his interface with Tempest enclosures and all other RDM devices you plan to use on the same network.

Firmware Upgrade over RDM



DEC3.3 firmware is field-upgradeable, using RDM. A field upgrade requires a JESE RDM TRI MK1 interface to be connected to the DMX network on which the DEC3.3 is located, and the use of JESE GetSet software. The kit is available from Tempest under part # 2000.190.

Tempest Equipment Management Protocol (TEMP)

AVAILABLE TO SPECIAL ORDER

Tempest can optionally provide a firmware load that facilitates TEMP over RS485, suitable for interfacing to an Ethernet adapter. TEMP is a lightweight proprietary ASCII based protocol, intended for rapid integration into management systems.
With TEMP and a suitable RS485 to Ethernet adaptor connected to the DEC DMX connectors, your DEC may be configured and monitored over an IP network.

Please contact factory for ordering information.

Suitable Converters include:

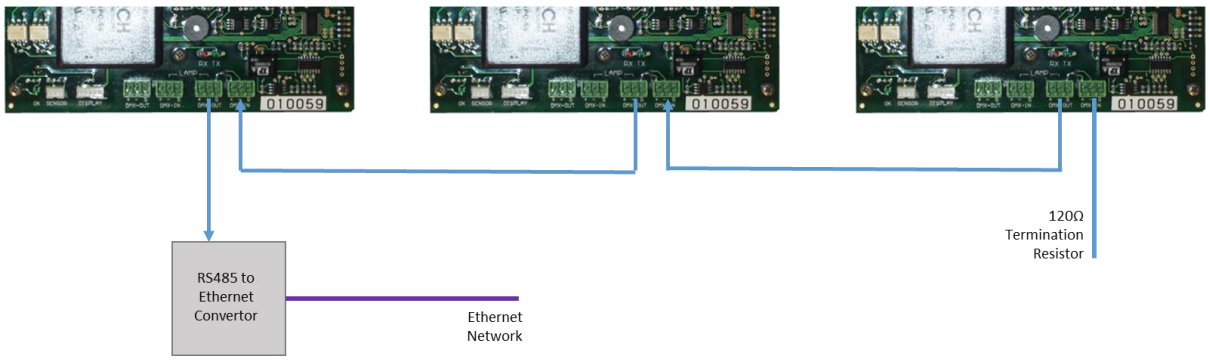
http://gridconnect.com/rs485-ethernet.html

http://www.audon.co.uk/lan232/ENET485-POE.html

http://uk.rs-online.com/web/generalDisplay.html?id=brainboxes

Physical Layer

- You may connect one converter to either a single DEC controller or to a series of DECs wired together in an RS485 daisy chain.
- The DEC board has four RS485 (DMX) connectors. For a single DEC/Convertor pair use one of the DMX Out terminals (they are marked +, -, C). For a series of DECs on one convertor (the number of DECs and the cable length and topology must follow the RS485 standard), connect as shown here.



Protocol Implementation

The protocol is a half-duplex ASCII syntax, based on a client-server model.

1. Terms and Conventions

   All commands are initiated by a TEMP Controller and are responded to by a TEMP Responder.

   Commands and Responses are collectively referred to as packets.

   A single Command and associated Response is referred to as an exchange.

2.1 TEMP Controller

A TEMP controller is not to be confused with a DEC or 'DEC Controller'. The TEMP Controller, referred to here on in as a Controller will be the system of software that is a client of the Tempest DECs.

All serial packets sent by the Controller will be referred to as a command.

2.2 TEMP Responder

A TEMP Responder, for the purpose of this document, referrers to a Tempest DEC and from here on, is referred to as a Responder.

All serial packets sent by a Responder will be referred to as a response.

3. Connectivity

3.1 Physical Connection

The connection to the Tempest Equipment is via an RS485 Buss with Controller Idle Sate bias, compliant with ANSI E1.20 section 2.4.1. at 250K Baud, 8 data bits, two stop bits.

3.2 DEC Configuration

For a DEC to be operable with TEMP, the DEC must be configured to be in 'BASIC' mode. For further details on configuring a DEC, refer to the accompanying user manual.

4. Responder Addressing

The responder address will be the electronic UID of the responder. A responder UID is comprised of a PLASA manufacturer ID and a unique manufacturer serial number. For Tempest equipment, the vendor ID or VID is $544C. The remaining 8 characters are a hexadecimal extrapolation of the responder serial number, so for example, a serial number of 64035 would be represented by a hexadecimal value of $0000FA23. These two strings combined together form the responder address $544C0000FA23.

The responder serial number can be found on the Tempest electronics or by accessing the user display and scrolling the status information.

A Get command to address $FFFFFFFFFFFF will solicit a response from all responders, which having more than one responder on a single buss will cause a data conflict.

A Set command to address $FFFFFFFFFFFF will be acted on by a responder but not responded to.

5 Command Structure

Each packet is transmitted as an ASCII string, enclosed in the reserved characters '<' and '>'.

Any traffic between the < and > characters shall be disregarded.

On receipt of a < character before the final > character, all preceding data shall be disregarded.

Each packet is addressed to an associated Responder.

Each packet contains a reserved Command or Response Identifier character, being '?' or '!' respectively.

The responder address shall be sent immediately after the command or response Identifier.

There are two classes of exchange, Set to configure and Get to retrieve status data.

5.1 Get Command Example.

<?:$544C0000FA23;GET:STS=ALL>

5.2 Get Response Example

<!:$544C000FA23;STS:ACV=#223,ACC=#5.3,ATM=#32,RHM=#62,RLY=AUT>

5.3 Set Command Example

<?:$544C000FA23;SET:RLY=OFF>

5.4 Set Response Example

<!:$544C000FA23;RLY=OFF>

6 Packet Parsing

6.1 Order of Precedence

Packets are syntactically arranged for parsing in order of precedence, the precedence being a semicolon, colon and comma.

6.2 Type Identifiers

- Decimal values are preceded by a hash character
- Hexadecimal values are preceded by a dollar character
- Text strings are preceded by a literal character ‘ (Not enclosed)
- All other data implicitly represents and enumerated constant

6.3 Reserved Characters

The following character are reserved for syntactic control:

< > ! ? # $ ‘ = ; : , \

Reserved characters used in strings will be preceded by the reserved escape character \ .

Character Use Description

\ \\ Backslash

< \< Start of packet

> \< Packet terminator

? \? Command Packet Identifier

! \! Response Packet Identifier

\# Decimal Value Descriptor

$ \$ Hexadecimal Value Descriptor

‘ \’ String Literal

; \; Packet section separator

: \: Packet Section Label Identifier

, \, Parameter separator

= \= Parameter value Identifier

Packet Parameters

Each packet will contain one or more parameters, each parameter being in the format NNN=D, NNN being the three letter Mnemonic or PID to identify the parameter and D being the value or data of the parameter. In a frame payload, all parameters are cardinal with no pre-determination of the order.

Set command packets may only contain one parameter.

6.4 Set PIDs

6.4.1 RLY

This is used to change the operational mode of the relay in a DEC. Arguments for this PID are:

- AUT Automatic, in control of the DEC and closed (on) by default.
- OFF Takes control from the DEC and holds the relay open (off)

Response to this parameter will be one of the following enumerated constants:

- OFF When set to off by a controller
- AUT When in control of DEC and closed (on)
- TRP When in control of the DEC and tripped (off)

6.4.2 LBL

This writes a label to the responder, for use by the controller. The label may be up to 32 ASCII characters, with any reserved characters escaped as detailed on section 6.3

Response to this will echo the label back.

6.5.1 STS

This is used to return the current status of the DEC, arguments for this PID are:

- ALL Requests all information in one packet.
- SEN Requests only dynamic sensor information.
- CFG Requests configuration settings.

Responses parameter to this parameter include:

- ACV AC RMS Line Voltage
- ACC AC RMS Lamp current
- ATM Air temperature (Main) ˚C
- RHM Relative Humidity (Main) %
- PCT PCB temperature ˚C
- HRL Lamp hours
- RLY Relay Status (OFF | AUT | TRP)

6.5.2 LBL

This is used to retrieve the responder's label.

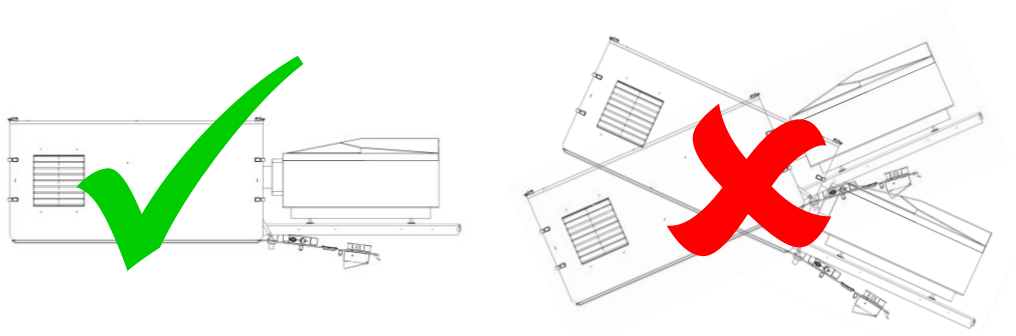
4 Mounting the Projector

IMPORTANT! READ THIS FIRST

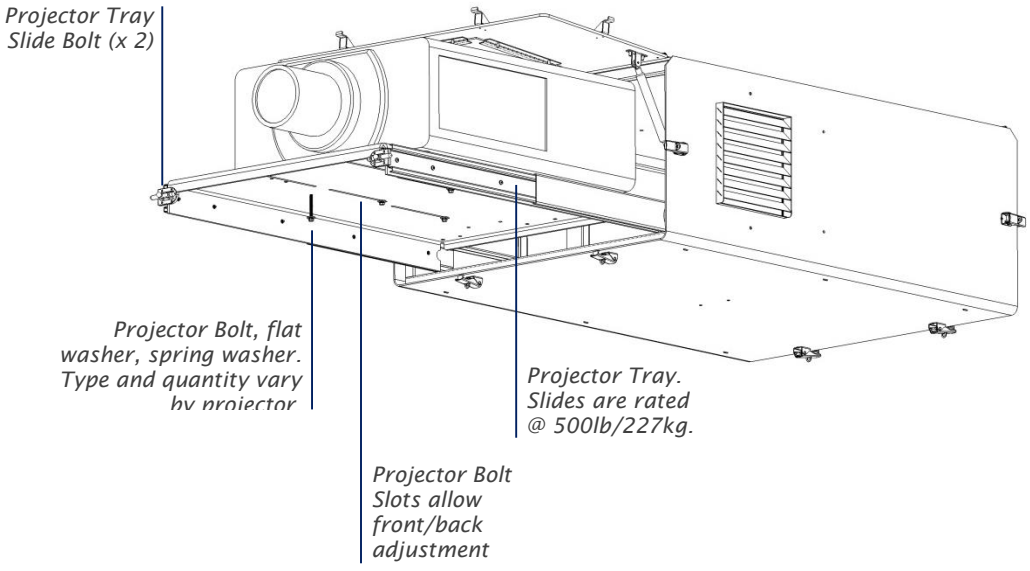
For safety, this must be done by two or more people.

IMPORTANT: The projector enclosure MUST be securely mounted BEFORE you attempt to install the projector.

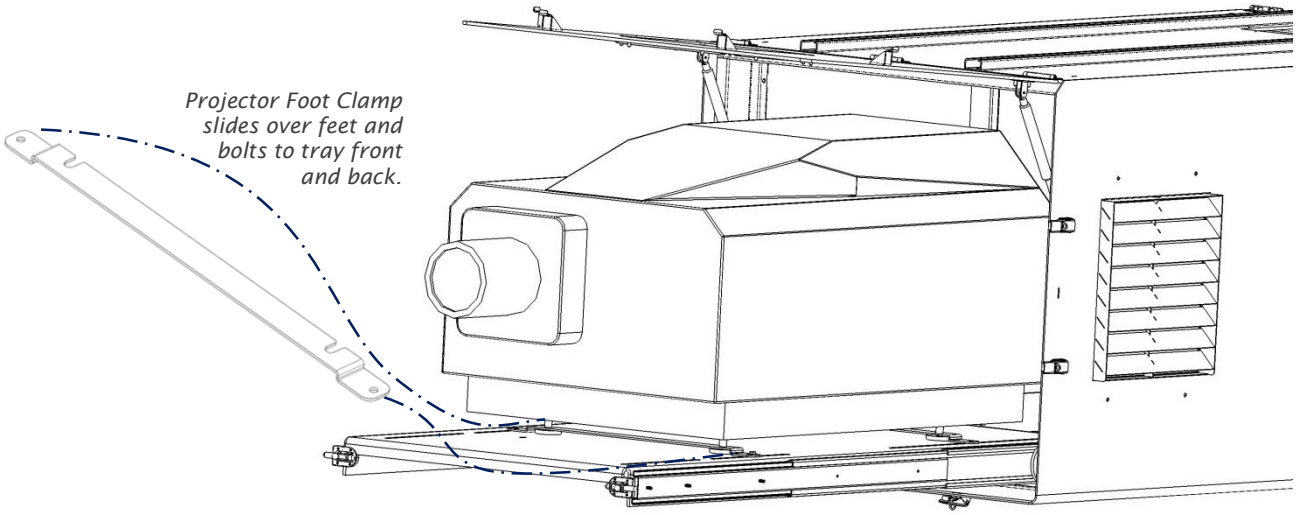
The enclosure must be horizontal for projector mounting and projector service. If the projection angle is NOT horizontal, a Cyclovator Tilt Kit should be used, and the projector returned to horizontal for projector mounting and service.



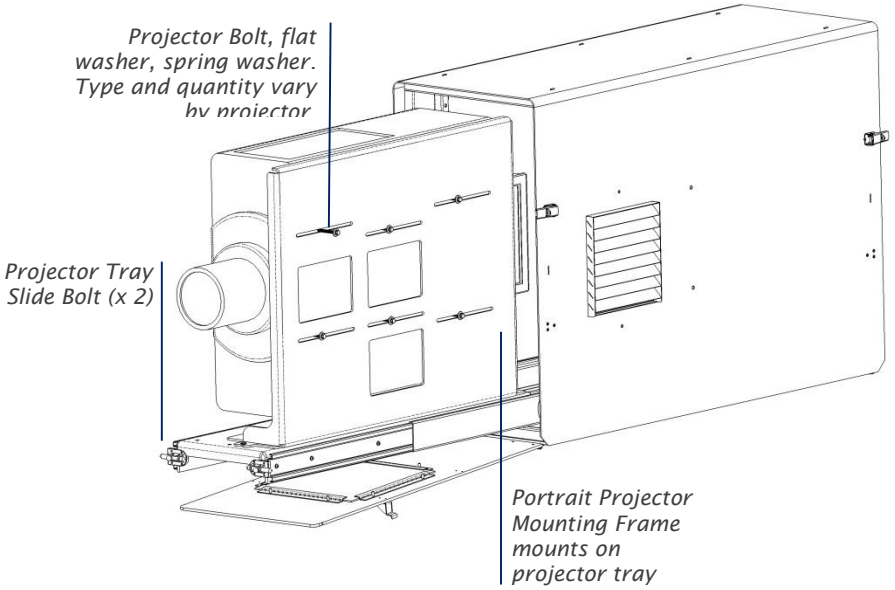
1. Cyclone enclosures may be provided with front or rear projector slides (the projector tray slides out of either the front or rear of the enclosure), to customer order.
2. Depending on the projector type and orientation, your mounting method may differ.
    a. Generally, the projector stands on the projector tray, and is bolted through slots from below to lock in place.



b. For projectors without threaded sockets on the underside, clamps are provided to secure the projector feet to the projector tray, to prevent movement.

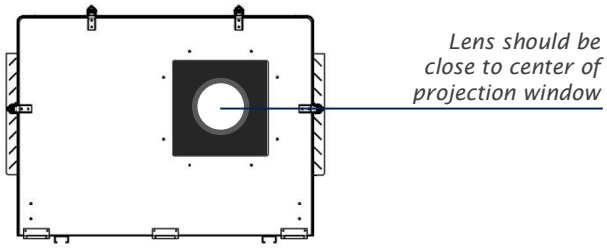


c. Portrait enclosures have a vertical mounting frame. The projector generally bolts to the frame.



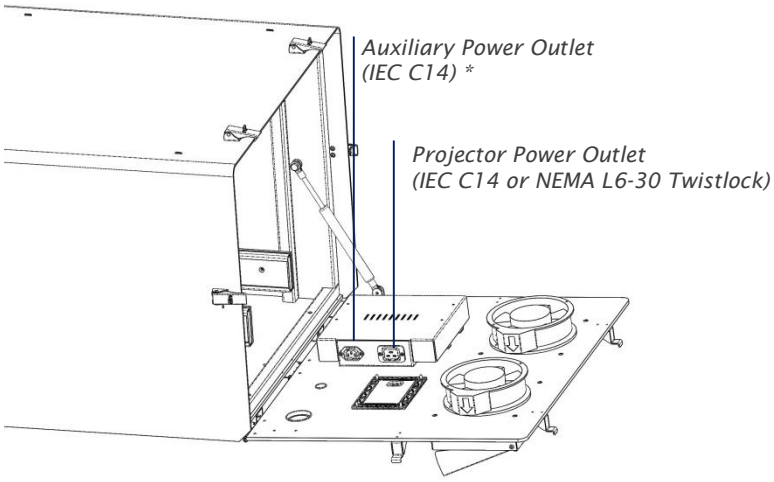
3. Release the two projector tray slide bolts and fully extend the tray.
4. Set the projector on the tray and check for center. The projector should be centered and mounted with the front of the lens above the end of the tray.
    a. Portrait Enclosures: Bolt the projector to the vertical projector mount, using the bolts provided. You can still adjust the feet, but this will require more people to:
        i. Support the weight of the projector
        ii. Loosen/tighten mounting bolts
        iii. Lower/raise projector feet

5. Return the projector tray into the Cyclone enclosure and check that the lens is aligned with the projection window. Projectors with wide-angle lenses should be positioned with the front of the lens as close to the window as possible to avoid clipping.



6. Connect all cables to the projector, threading them through the flexible cable management track. Allow for 7-13'/2-4m of cable inside the enclosure to run through the cable management track to the projector. Actual length depends on the Cyclone model, front or rear tray slide, and the location of connectors on the projector body.

7. Plug the projector into the Projector power outlet on the back door.



***IMPORTANT: North American models** (model # with .US suffix, running on 208V or 240V feeds): The Auxiliary power receptacle is NOT connected. Run a 15 Amp 120V circuit into the enclosure and terminate on the back of the IEC C14 receptacle.

International models (with .IN model # suffix, running on 230V feeds): the Auxiliary power socket is wired in parallel with the projector outlet.

8. Slide the tray back into the Cyclone enclosure. Power up the projector and adjust the projector feet as needed.

9. Pull the tray out of the enclosure and either:

    a. Bolt the projector through the mounting slots to the tray using the bolts and washers provided. **DO NOT OVERTIGHTEN – THIS MAY DAMAGE THE PROJECTOR.**

b. Slide the projector foot clamps in place over the projector feet and tighten the bolts through the projector tray slots to secure in place.

10. Return the projector tray to the enclosure and lock the two slide bolts in place.

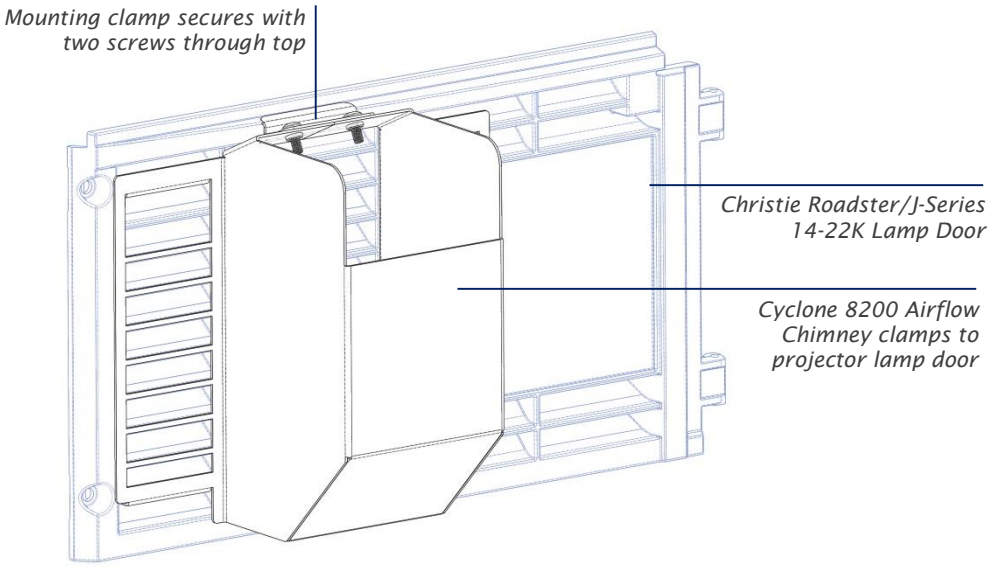
Airflow Chimneys

Certain projectors in certain enclosure types require additional airflow deflectors, baffles or chimneys to direct the projector's exhaust air towards the exhaust fans/duct and prevent recirculation and overheating.

These parts will be supplied as needed with your enclosure, and are generally mounted either on the enclosure frame or the projector tray. If they are not included, they should not be needed.

Christie Roadster Projectors

Cyclone 8200 enclosures for Christie Roadsters are supplied with a special airflow chimney that clamps to the lamp door at the back of the projector. The lamp door may still be opened for relamping without having to remove the airflow chimney. The Chimney will be packed inside the enclosure for shipping.



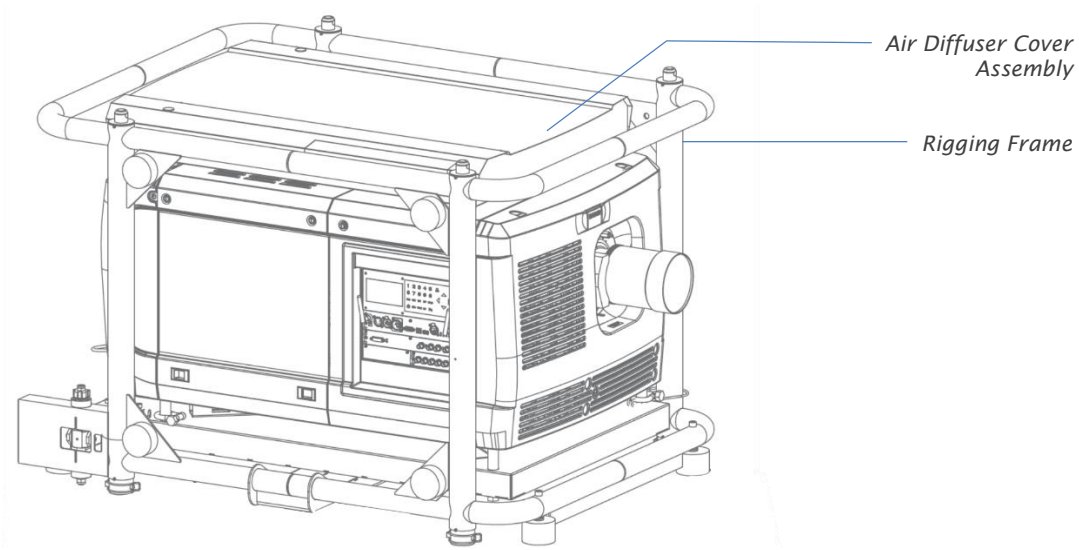
Christie Roadie HD35K Projectors

These projectors (mounted in Cyclone 8400 enclosures) use an external DC ballast to supply power to the projector lamp, over two 200 Amp single pole cables, with CamLok type single pole connectors. Christie specifies a cable run between ballast and projector of up to 100'/30m.

1. Cyclone 8400 Enclosures supplied for use with these projectors include two CamLok panel receptacles on the rear door, and internal DC wiring to the back of the projector. The cable loop inside the enclosure is approximately 10'/3m, so the maximum permissible cable length from the ballast to the outside is therefore reduced to 90'/27m.
2. When the projector is placed on the projector tray, connect the DC cables to the receptacles at the back of the projector BEFORE fixing the projector is in place.
3. Make sure that both Camlok plugs are fully inserted, and twisted ¼ turn clockwise.
4. Set the projector in position, and feed any cable slack back through the cable track, before fixing the projector in place.

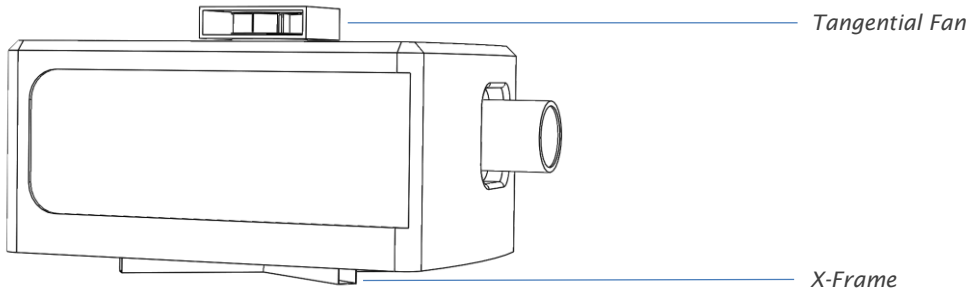
Barco HDQ Projectors

These projectors (mounted in Cyclone 8500 enclosures), require some modification prior to installation.



1. Remove projector from Rigging Frame, following manufacturer's service instructions
2. Remove air diffuser cover, following manufacturer's service instructions

What remains is the projector, with a tangential blower fan on the top of the lamp chimney.



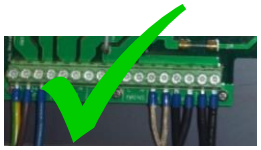
Set the projector on the Cyclone enclosure tray, and secure in place using the clamps provided, locating into the X-frame on the projector base.

Note that pan adjustment may be achieved by moving the projector right or left on the enclosure tray. Tilt adjustment must be achieved using projector lens shift.

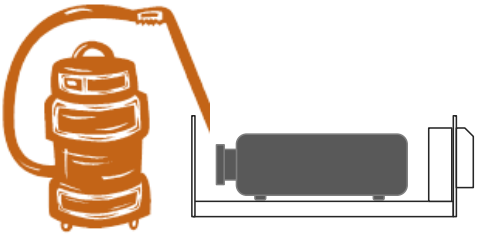
Barco HDQ projectors require a three-phase electrical supply – see projector-specific wiring instructions in page 26 above.

5 Closing up the Enclosure

1 Check all electrical connections



2 Clear the enclosure and projector of all dust and debris.



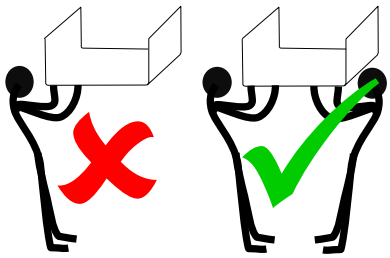
3 Check that the power switch on the projector is in the ON position.

4 Complete all signal connections, following projector manufacturer's instructions.

5 Test projector

6 Tie down cables so that they will not touch heaters or fans.

7 Replace the cover on the Blizzard base. This may require two people.



Congratulations! Your system is now ready for use.

6 Operation

- Outdoor Enclosures must receive power at all times. Enclosure, and will not provide proper protection for the projector inside if it is not connected to AC power.
- Unless the enclosure or projector is undergoing routine maintenance, the cover should be in place and locked down at all times.
- Only authorized personnel should open the enclosure (see maintenance warnings in the next section).
- If the ambient temperature is high enough, the over-temperature shutdown feature may engage and temporarily cut off power to the projector. Once the temperature reaches acceptable levels, power will be automatically restored after 5 minutes.

7 Routine Maintenance

It is very important to perform routine maintenance on both the enclosure and the projector within. Failure to do so may reduce lifetime for both the enclosure and the projector.

Note

Maintenance schedules depend on location and environment. The times given here are general guidelines for you to use. It is up to you to judge whether maintenance should be done more often. We do advise doing these tasks no less often than mentioned here.

Safety

- Although maintenance can be performed while the enclosure is powered, it is safer to carry it out with the power disconnected with proper lockout and tag out procedures followed.
- Be aware that once the enclosure has had power applied to it, the heater will get hot and the fans will start to turn. Make sure that your hands are clear of these areas before applying power to the enclosure.
- Only authorized personnel should perform maintenance on the enclosure or projector
- Do not service the unit in the rain or other adverse weather conditions (snow, sleet, high winds, etc.).
- Be aware that the cover is a large object that can be awkward to handle, especially when standing on a ladder or scaffolding.

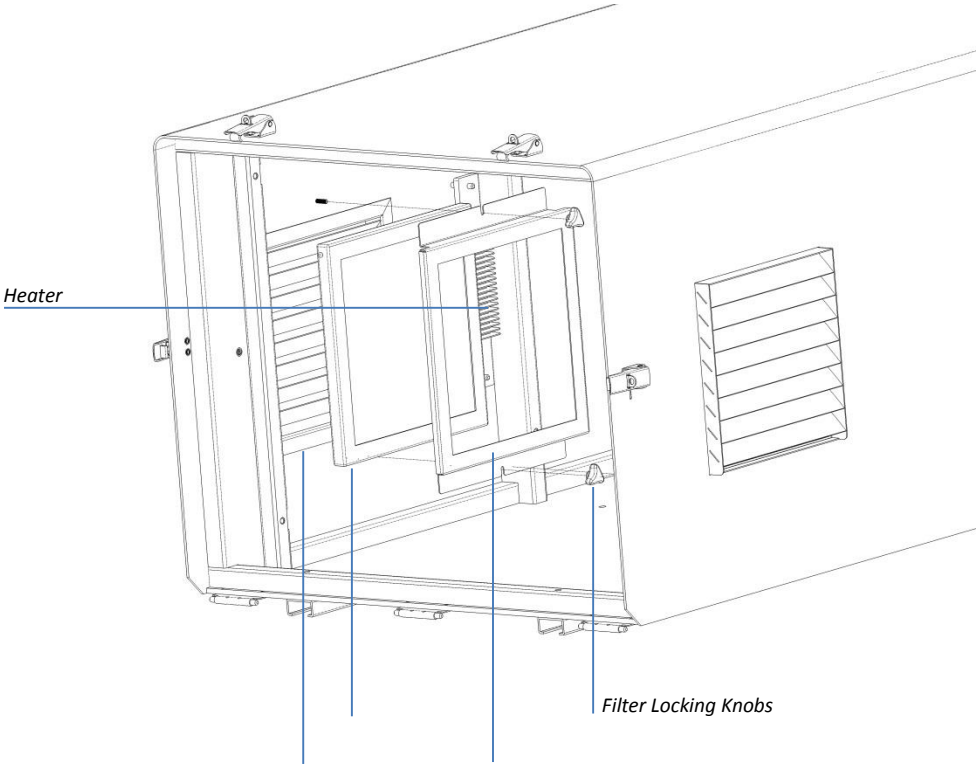
Inspection Checklist: - Every Three (3) Months

- ☐ All weep (drain) holes should be clear
- ☐ All vents should be free of debris
- ☐ Enclosure should be free of debris both inside and out
- ☐ Bolts should be tight
- ☐ Lid seal should be in good condition, Check seal inside and out for gaps.
- ☐ Window should not be cracked
- ☐ Fans should be moving (it will be necessary to have the power on to check this), with corresponding indicator status

Except for the last two items (concerning globe and fan), problems with any of these things can be easily remedied. Contact technical support for problems with the last two items.

Air Filter Replacement

The air filters should be removed and checked on a regular basis. We recommend initial inspection every three months. Inspection interval may be adjusted based on site conditions.



For HUSH enclosures in clean environments filter life will be much longer than for outdoor enclosures and inspection intervals may be correspondingly longer.

Filter Maintenance and Replacement

Remove any buildup of dust on the outside of the filter with a vacuum cleaner.

Eventually the filters will need to be replaced. Filters will appear dirty and clogged after vacuuming and the internal temperature will increase.

Replacement Filters are available from Tempest

Each Cyclone enclosure requires two filters

Filter Part #	Size	Blizzard Model
6500.799.HF	11”x11”/279x279mm	Cyclone 8000, 8100 Series
8000.799.HF	15.5”x15.5”/394x394mm	Cyclone 8102, 8200 and up

8 Troubleshooting

This is a guide to the general symptoms, problems, and solutions that may occur during the lifetime of your enclosure. However, it is important to remember that problems may occur within the projector itself and these must also be considered.

Projector does not have power.

Check power switch of projector. (Note: the following actions should be performed by a licensed electrician) If power is on, check wiring (including metering supply voltages, enclosure must receive 200-240VAC to operate properly). If LEDs on the DEC3 control panel controller are lit, check the Lamp Relay LED. If it is on, meter power in receptacle. If no power is present at the receptacle, contact technical support.

In case of over-temperature, the power disconnection is an intended function of the enclosure and is for the protection of the projector, which is not meant to operate in extreme conditions. In this case, the problem will only continue until temperature drops to acceptable levels. It is possible that the air intake or exhaust has become clogged, leading to higher temperatures inside the enclosure. Make sure that these areas are clear, the filters are clean, and the fans are working properly.

Projector turns on and off repeatedly

Check that vent areas and airways are clear. If so, ambient temperature may be too high (see over-temperature note above) or projector may have internal problem.

Fans are not spinning.

Fan cords may have become disconnected. Check connections between fan and cord.

Fans may be obstructed. Shut off power to enclosure and check for obstructions. Turn power back on to see if fans will start spinning. If fans do not turn and display on temperature controller is lit, contact technical support. If fans do not turn display is not lit, then enclosure is not receiving power. Turn off all power and check wiring. If the wiring is correct, contact technical support.

Excessive debris in unit.

Filters may not be properly seated. Check for gaps.

Excessive Water in enclosure.

Weep (drain) holes may be clogged. Clear them.

Latches do not latch properly.

Check for obstructions.

9 Limited Warranty

INSPECTION/WARRANTY/RETURNS.

A. Customer, at its sole expense, shall inspect all Goods promptly upon receipt and accept all Goods that conform to the specifications or catalog. All claims for any alleged defect in or failure of the Goods or Seller's performance to conform to the Contract, capable of discovery upon reasonable inspection, must be set forth in a written rejection notice detailing the alleged non-conformity, and be received by Seller within thirty (30) calendar days of Customer's receipt of the Goods. Failure by Customer to notify Seller of the alleged non-conformity within thirty (30) days will be conclusive proof that the Goods have been received by Customer without defects or damage, and in the quantities specified on the bill of lading and shall constitute an irrevocable acceptance of the Goods and a waiver of any such claim in connection with the Goods.

B. Seller warrants to Customer only that the Goods will be free from defects in material and workmanship at the time of delivery and, subject to the exceptions and conditions set forth below, for the following period (the "Warranty Period"): twelve (12) months from the date of shipment by Seller. Seller may provide additional years of warranty coverage beyond 12 month, at the rate of 2.5% of the net sale price per year, up to a total of four additional years' coverage beyond the standard 12 month warranty period. Seller will remedy a defect as set forth in paragraph 7 D, below, (the "Warranty"). The Warranty is subject to each of the following exceptions and conditions:

1. Customer must promptly (and in all events within the Warranty Period) notify Seller of any alleged defect in a written notice (the "Notice") which shall set forth the quantity, catalog number, finish, original purchase order number, Seller's invoice number on which Goods were originally billed and a statement of the alleged defect, along with digital photographs showing such defects where feasible.

2. The Warranty shall not apply: (i) to any claimed defect that was capable of discovery upon reasonable inspection and deemed to be waived under paragraph A, above; (ii) to any Goods that have been subject to misuse, abnormal service or handling, or altered or modified in design or construction; (iii) to any Goods repaired or serviced by any person other than Seller's authorized service personnel or to Goods installed other than according to installation instructions, or (iv) with respect to normal wear and tear.

3. Seller makes no Warranty with respect to parts or components that are not the product of Seller, and specifically makes no warranty whatsoever for equipment housed inside enclosure products manufactured by Seller.

4. The Warranty is Seller's exclusive warranty with respect to the Goods. Seller makes no warranties, guarantees or representations, express or implied, to Customer except as set forth in this section. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED AND DISCLAIMED.

C. Seller will accept the return of Goods properly rejected under paragraph A, above, or as to which Notice of an alleged breach of Warranty has been timely given and such Goods may be returned to Seller, freight prepaid, but only upon Customer's receipt of Seller's written return material authorization ("RMA") and shipping instructions. The RMA shall be void if the Goods are not received within 45 days after issuance of the RMA. No deduction or credit in respect of any rejected or returned Goods shall be taken until Customer has received Seller's further written deduction or credit/authorization following Seller's inspection to confirm nonconformity or defect. Seller will charge to Customer any and all costs incurred by Seller in connection with the handling, shipping, inspection and disposition of any returned Goods that are determined by Seller not to have been nonconforming upon Delivery or as to which the warranty hereunder is not applicable.

D. UPON ANY PROPER RETURN PURSUANT TO PARAGRAPH C, ABOVE, WHETHER IN CONNECTION WITH A REJECTION OF GOODS OR AN ALLEGED BREACH OF WARRANTY AND BASED UPON THE CONDITIONS SET FORTH IN THIS PARAGRAPH 7, SELLER AGREES THAT IT WILL, AS THE SOLE AND EXCLUSIVE REMEDY UNDER THE CONTRACT OR OTHERWISE, FOR ANY NONCONFORMITY OR BREACH OF WARRANTY, AND AT SELLER'S SOLE ELECTION: (i) REPAIR SUCH GOODS; OR (ii) REPLACE SUCH GOODS.

10Tempest Product Support

Step 1: First contact your local Dealer for support. Your dealer is best placed to respond quickly to your needs.

Step 2: If your dealer is unable to answer your questions please contact

Tempest Lighting
13110 Saticoy Street
North Hollywood, CA 91605, USA
Tel +1 818 787 8984
Fax +1 818 982 5582
info@tempestlighting.com

Visit our web site for current information and specifications:

www.tempest.org