



Cyclone is the world's most popular outdoor enclosure for permanent installation of large format video projectors in any climate, for video mapping, outdoor attractions, advertising and outdoor movies.

Cyclone models are tailored specifically for each projector type. Each Cyclone model has been thoroughly tested and approved with its designated projector before being released for production

Cyclone comes with all the features you need:

- · Lightweight aluminum welded construction
- · Powerful AC fan
- Salt fog filtering, with positive pressure option
- · Local RDM, TCP/IP or webbased monitoring service

From 2020, standard Cyclones come with side doors and the option of projector slide to left or right. Versions with front or back slide are available to special order.

All Cyclone models feature Tempest's patented Digital Enclosure Control system (DEC4<sup>TM</sup>), now available with optional remote monitoring over your TCP/IP network, or globally, using JESE Agent.

Tempesst's patented DEC4 controller will keep your projector warm when it's cold, cool when it's hot, and will never allow deadly condensation to form.

And all Cyclone models feature Tempest's hydrophobic inlet filters, blocking salt, oil and other pollutants from getting near your projector.

### **Portrait**

Cyclone portrait enclosures are available to order for all applicable projectors.

### Ultra-Short-Throw

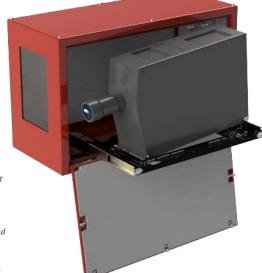
Cyclone is ready for the UST revolution — now you don't need to own the plot across the street to project on the front of your building! See the next page for more about UST configurations.

### Cyclovator

Cyclovator allows any Cyclone enclosure to be tilted up to 60 degrees up or down, and restored to horizontal for safe projector service access.



Tip: Specify left (shown here) or right slide when ordering



Cyclone 55.310P Portrait enclosure.

Tip: Cyclone's Portrait mounts vary by projector type, and generally allow for ± 5° tilt adjustment to compensate for limited horizontal lens shift..

Tip: Most of the shots in this brochure show Tempest standard light bronze powder coat finish, but you can specify white, black, or any RAL color when ordering.

The Cyclovator 2 under this Cyclone 55.210 can tilt its projector up to 60° either up or down, with a repeatable stop and a positive lock for accurate show positioning.

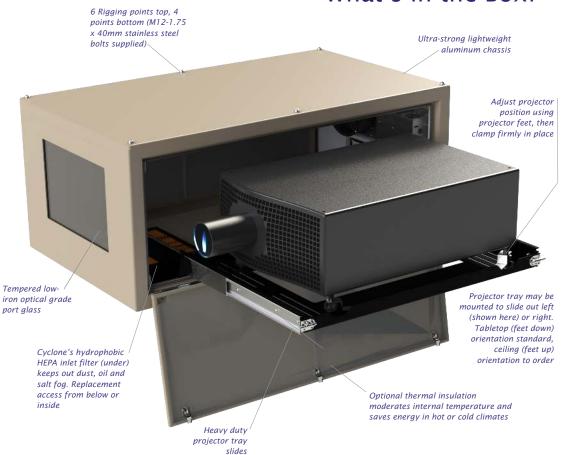
Tip: Use Cyclovator 2 feet-up to hang Cyclones at any angle from a truss or



Tip: Specify the inlet cowl shown here if the tilt angle will exceed 10° up or down.



### What's in the Box?







### Ultra Short Throw Lenses...

is getting excited about their amazing potential for mapping, informational signs and advertising. UST outdoor enclosures allow you to paint the outside of your building without having to own the block across the street!

Now that UST lenses are readily

available for large format projectors, the creative community

There are now a bewildering number of different UST configurations on the market, and it's critically important that we understand precisely which one you are planning to use. Each type will have different beam geometry, and these can be very challenging to accomodate, so most UST enclosures are in fact custom designs.

Cyclone UST enclosures may be configured to mount above the image (projecting down) or below it (projecting up).

The lenses may be fixed but the projector mount allows for adjustment of pan, tilt and roll when you get to the job site.



Cyclone 55.320.U with Panasonic PT-RZ31K and UST Lens.

Shown here feet-up, projecting down, but may also be configured feet-down, projecting up.

### Which UST?

This can be confusing. Please specify the UST lens configuration when ordering:



Perisope Style A



Periscope Style B



Right-angle Left



Right-angle Down



Right-angle Right



Right-angle Up

We will also need to know:

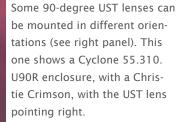
Projector and lens model #s

Projector - feet up or down?

Projector - Landscape or Portrait?



Cyclone 55.310.U90R with Christie Crimson and rightangle UST Lens.







### Cyclone

Outdoor Projector Enclosures

### **Rigging Options**

All Cyclones come with six M12 threaded sockets on the top surface, and four on the bottom. So you can bolt the enclosure directly to your structure, or use them to attach these Tempest rigging accessories.

Stainles steel bolts are provided for attachment to any suitable support structure.

Tempest recommends only the use of stainless steel hardware for installing enclosures outdoors.

#### **Unistrut Kit**

Easy attachment to any structure using these two Unistrut rails. Use standard Unistrut hardware to attach to your structure, without worrying about precise hole locations.

Unistruts may be mounted top (shown here) or bottom.

Note: A Unistrut Kit is required for use with Cyclovator 2.



55.UR.310 Unistrut Kit.
Unistrut rails may be mounted top or bottom.

Two Cyclone 55.310.L with 51.SK Stacking Kit. The stacking kit gives the enclosures the required 3" [75] airgap, and assembles easily with clevis pins



### Stacking Kit

Stack two or more Cyclone enclosures of the same type using this stacking kit.

Male and female parts attach to the threaded corner holes, and are simply joined together using a stainless steel clevis pin.

Maximum two enclosures stacked if hung, up to three with ground support.

See also the swivel stacking kit on the next page.

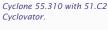
#### Cycolvator 2

Our fabled Cyclovator tucks snugly under the center of gravity of the enclosure.

Use Cyclovator on the ground to cover tall buildings, or on a rooftop to project to ground level. Either way, Cyclovator allows you to project up to about 60° off horizontal, and then bring the projector safely back to horizontal for service access.

You can even bolt this Cyclovator to a truss or other structure and use it to hang any Cyclone enclosure at any angle.

In every case, Cyclovator has a positive index ring that you set to come back to your show position with absolute repeatability, time after time...







### Sun Shade

This aluminum panel mounts easily on the top of any Cyclone enclosure to provide extra daytime protection in hot, sunny climates. The cover not only deflects sunlight, but also provides a 75mm (3in) air gap between the shade and the enclosure top, promoting convective air movement. Use in conjunction with 55.TI thermal insulation in sunny areas with daytime temperatures frequently above 35 ℃ (95 F).

See also Thermal Insulation Kit, next page.

### **Rigging Options**

55.SH.xxx Sun Shade attaches easily to the Cyclone's top rigging points. Note that the xxx matches the enclosure part number, eg 55.SH.310 for Cyclone 55.310 shown here.

### **Swivel Stacking Kit**

Stack two Cyclone enclosures (must be the same model), and angle them up to 40 degrees apart — handy for short-throw edge blending jobs.

Stainless steel stacking kits attach to M12 rigging points, and locking bolts are provided to secure rotation angle when aligned.

Swivel Stacking kit part number must match Cyclone enclosure — eg 55.SS.310 is the Swiveel Stacking kit for two Cyclone 55.310 enclosures shown here.

### **Custom Rigging Options**

Don't see what you need? We do a lot of custom designs and we'll be happy to work with you to find the best solution for your project.





### What to do when it's HOT

### Don't panic!

Tempest enclosures have been in use for years in some very warm places — think Singapore, Dubai, Las Vegas. In most cases our standard enclosures will protect your equipment without problems.

Outdoor projection, by definition, is used at night. So you need to think about daytime and showtime temperatures quite separately:

#### Daytime - Insulation

In hot locations (anywhere with daytime temperature regularly exceeding 35°C), we strongly recommend specifying the Cyclone Thermal Insulation option (55.Tl.xxx). This is a factory-fitted thermal insulation lining to the enclosure that effectively moderates daytime temperatures, reducing stress on your equipment and prolonging fan life.

#### Daytime — Hot Sun

If your enclosures will be regularly exposed to hot sun, the Cyclone Sun Shade (55.SH.xxx) is a simple, low-profile aluminum cover, that protects the enclosure from the midday sun and creates a 75mm (3in) air gap above the enclosure body. This protects the enclosure and its contents from the worst of the sun anywhere in the tropics or in desert conditions.

#### Showtime — Cooling

Tempest has traditionally avoided the use of active air-conditioning to cool video projectors, due to the high risks of damaging condensation, as well as the effect of vibration on the projection beam, especially for long throw work.

But there are cases where some help is needed, and Tempest offers two powerful options.

### Tempest AC Assist

A powerful outdoor-rated spot cooler that blends cool air through the standard Cyclone inlet filter to lower the temperature of the blended air reaching the projector inlet by as much as 12 °C.

The AC Assist cooler can cool up to four projectors, depending on the projectors' thermal load and the amount of cooling needed — more details below.

AC Assist operation is fully automatic, and AC Assist will operate only when the projector is running, and the ambient temperature exceeds a preset level.



AC Assist Cooler with Cyclone 55.310.L Enclosure

### Tempest ActiveCool

Some of today's most powerful laser projectors demand not only a low operating temperature, but also that the inlet temperature should be controlled within a tight temperature range. An RGB laser projector has three laser engines for the three primary colors, and they all react differently to varying temperatures. So an RGB laser system calibrated at, say 23 °C, may lose its color balance if that temperature changes by more than a few degrees.

Tempest ActiveCool is an outdoor rated closed-circuit cooling system that provides a constant operating temperature for the projector, in any ambient, and is recommended for certain projectors regardless of the outside ambient conditions.



ActiveCool Cooler with Cyclone 55.324.LAC Enclosure

### Special Case — Christie D4K40 RGB

Christie's super-bright RGB laser projector is in high demand for both outdoor mapping and indoor theme park rides, and Tempest has been working with Christie to optimize performance in several different enclosure types (see also Tempest Tacit and Zen enclosures for indoor solutions).

For outdoor use in any climate type we strongly recommend using Tempest ActiveCool, to provide a constant operating temperature for optimal laser life and color consistency.

For all D4K40 enclosure types we supply a special internal

fan box that rigs on the side of the ptojector (landscape), or in the enclosure base (portrait), and concentrates the incoming airflow into the projector inlet. This accessory is included with any Cyclone 55.324.xxx enclosure for the D4K40 projector.





### Tempest ACAssist™

Tempest AC Assist blends cooled air with filtered outside air to deliver operating temperatures within limits for sensitive laser projectors, in the hottest parts of the world.

There are times — and places — where the only way to keep a projector within its operating limits is to cool the air it breathes. The new generation of laser projectors may also need lower ambient temperatures to achieve maximum life and/or brightness.

The active cooling unit is housed in a separate ETL-listed weatherproof enclosure, eliminating compressor vibration.

### **How Much Cooling?**

As a rule of thumb, we suggest cooling to approximately 70% the projector's btu rating, for a temperature reduction of 10-12°C.

The Tempest AC Assist Cooler is rated at 14,000btu/hr, so can assist the cooling of projectors with thermal dissipation up to about 20,000btu. This may be a single projector enclosure, or a group of up to four enclosures housing smaller projectors.

There is no downside to exceeding the recommended cooling mix — it will simply result in a lower operating temperature.

### Configuration

The AC Assist unit is plug and play: Set it next to the enclosure, connect the air hose and power connector to the enclosure, and run the condensate drain hose to a convenient location — easy!

### Control

Enclosures equipped with AC Assist will automatically turn on the cooling unit whenever the controller senses power going to the lamp/light engine. In locations with cold seasons a simple disable function prevents winter operation.





### Tempest ActiveCool™

Now, from Tempest, closed circuit active cooling for larger, heatsensitive laser-phosphor video projectors used outdoors.

Tempest ActiveCool™ will keep your projector running within a narrow constant temperature range, in any climate.

Operation is completely automatic - just set the target temperature and leave the rest to Tempest's patented DEC4 control system. As soon as DEC4 senses the projector is active, cooled air starts circulating through the enclosure, regulated by the cooler control. The optional Salt Fog protection kit protects the cooler from corrosive air conditions by the beach or shipboard.

The cooler is isolated from the projector enclosure to prevent condenser vibration transmitting to the beam. An anti-vibration mounting kit is available and recommended when ActiveCool is mounted on the same base as the projector enclosure, especially for long throw applications.

### **Suitable Projectors**

For use with projectors with thermal dissipation in the range 10—15,000btu, including:

- · Barco UDX, XDL
- · Christie Crimson
- · Christie D4K40-RGB
- · Panasonic PT-RZ21K
- · Panasonic PT-RZ31K
- · Panasonic PT-RZ50K





### **More Options**

### Climate and Filter Protection

### 55.xxx.TI Thermal Insulation Kit

Cyclone enclosures may be used safely in climates with temperatures ranging from 0-40°C. In hot climates where the enclosures may be exposed to direct sun during the day, and in cold areas where the temperature may drop below freezing, we offer a factory installed Thermal Insulation kit. With the TI kit Cyclone may be used in temperatures down to -20°C, and it will also thrive in direct sun with daytime temperatures above

See also Sun Shade on previous page.

### System Monitoring

#### **RS485 Comms (standard)**

Daisy-chain a group of Cyclone enclosures together with this RS485 board — one per enclosure, and monitor using a JESE RDM-TXI interface (Tempest part # 2000.195).

### **51.EN Ethernet Comms**

Use this Ethernet adapter to connect one Cyclone or a group of Cyclones connected using RS485 to a PC, and monitor using Tempest TEMP protocol. Download the TEMP Developer Guide from www.tempest.biz/tech-support.

### JESE Agent - Global Monitoring

Now, there's Agent, from Tempest partner JESE — monitor larger systems in the site control room, or worldwide, from our UK-based control center — see more below...

#### **Positive Pressure and Salt Air**

We do a lot of cruise ship jobs, as well as beach resorts and attractions where salt air can be a real problem. Now all Tempest outdoor enclosures can be supplied with a Constant Positive Pressure setting that runs the enclosure fan(s) all the time at low power, maintaining just enough positive pressure to prevent salt or other pollutants sneaking in the back door when the projector is not running.

Specify option 55.PP.

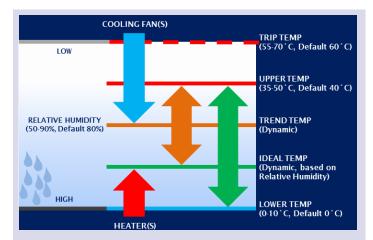
#### 55.IC.xx Inlet Cowl

Use this cowl to keep rain out of the inlet filter if the Cyclone enclosure is angled more than 20° up or down.

### 55.DFB.xx Desert Filter Baffle

In desert areas severe windblown sand may damage Cyclone's inlet filter, allowing sand and dust ingress in sandstorm conditions. The desert baffle slows down these particles, preventing filter abrasion.

Desert Filter Baffle



### Goldilocks™

How do we keep projectors from roasting when it's 50°C and there's no shade?

And prevent condensation from destroying your projector overnight?

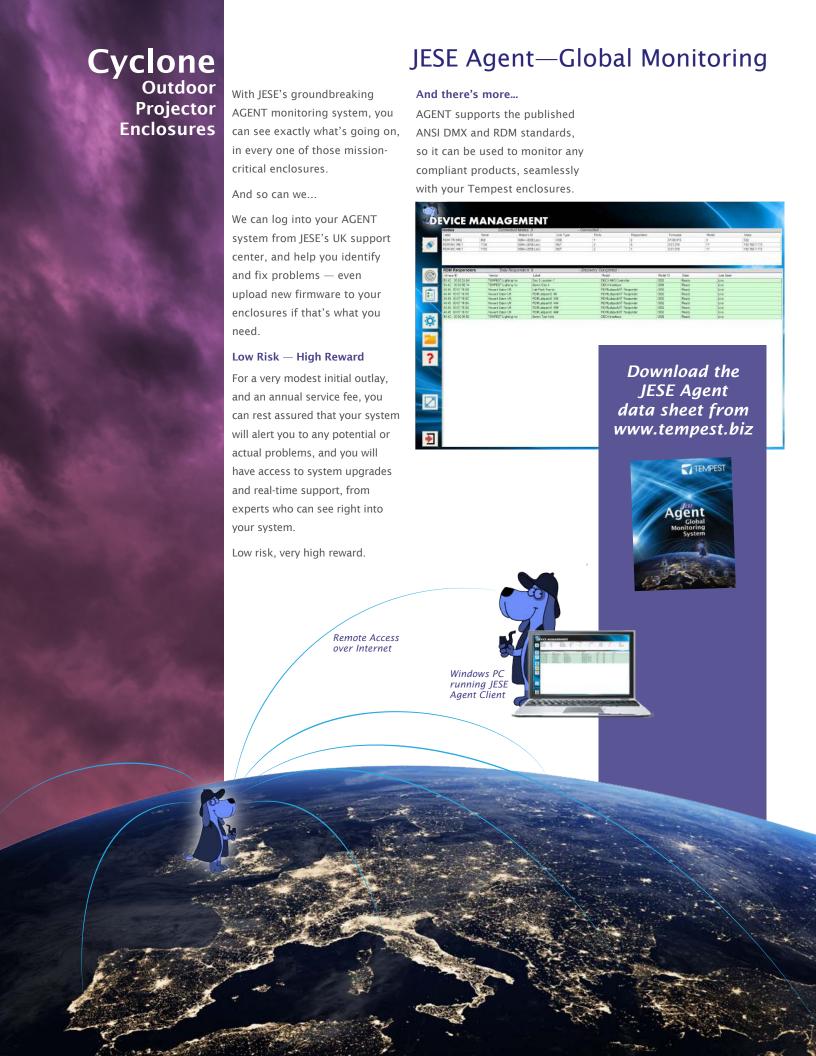
Tempest's unique Goldilocks™ Operating System (patents pending) brings enclosure control to a new level.

Goldilocks keeps the air temperature inside your enclosure just right, removing heat from the projector when the lamp is on or when the enclosure is heated by the sun. We're changing the air every few seconds.

Goldilocks uses a heater to maintain a minimum temperature in cold climates.

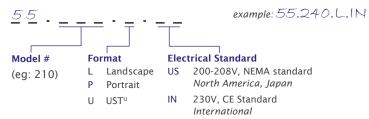
And Goldilocks tracks temperature and humidity 24/7, keeping relative humidity inside your enclosure just right by using heaters to raise the air temperature when needed, adapting constantly to prevent deadly condensation.







### Cyclone G4 Ordering Guide



Model	Description	Dimensions	(lwh)	Weight	Projector Type <sup>1</sup>	Shipping Dimensions (lwh)/W	eight
55.210.L	Cyclone 210.L	51x32x22in	130x81x56cm	145lb/66kg	Panasonic PT-DZ21K, PT-RZ12K,	70x38x32in/178x97x81cm	253lb/115kg
55.210.P	Cyclone 210.P	51x25x34in	130x64x86cm	175lb/80kg	PT-RZ21K, PT-RQ35K, Barco F90, DPI Highlite 4K, Titan Quad	70x33x50in/178x84x127cm	305lb/139kg
55.240.L	Cyclone 220.L	53x34x26in	135x86x66cm	190lb/86kg	Christie Roadster, (suffix.R)	70x38x32in/178x97x81cm	330lb/150kg
55.240.P	Cyclone 240.P	53x25x34in	135x64x86cm	182lb/83kg	BARCO HDX, (suffix H), Barco UDM	70x33x50in/178x84x127cm	374lb/170kg
55.250.L	Cyclone 250.L	51x38x24in	130x97x61cm	188lb/86kg	Epson Pro L25000U	70x38x32in/178x97x81cm	327lb/149kg
55.250.P	Cyclone 250.P	51x25x41in	130x64x104cm	212lb/96kg	Epson Pro L230000	70x33x50in/178x84x127cm	368lb/167kg
55.310.L	Cyclone 310.L	59x34x25in	150x86x64cm	203lb/92kg	Christie Boxer, Christie	70x38x32in/178x97x81cm	353lb/161kg
55.310.P	Cyclone 310.P	59x26x36in	150x66x91cm	224lb/102kg	Crimson, Barco UDX, DPI Insight 4K	70x33x50in/178x84x127cm	389lb/177kg
55.320.L	Cyclone 320.L	62x38x30in	157x96x76cm	247lb/112kg	Panasonic PT-RZ31K/RQ32K Barco FLM/HDF, DPI Insight Dual	70x44x32in/178x112x81cm	430lb/196kg
55.320.P	Cyclone 320.P	62x28x38in	157x71x96cm	260lb/118kg		70x33x50in/178x84x127cm	389lb/177kg
55.324.L <sup>4</sup>	Cyclone 324.L	62x38x34in	157x96x86cm	247lb/112kg	Christie CP4325, D4K40	70x38x32in/178x97x81cm	430lb/196kg
55.324.P <sup>4</sup>	Cyclone 324.P	62x31x40in	157x79x102cm	260lb/118kg		70x33x50in/178x84x127cm	389lb/177kg
55.400 <sup>d</sup>	Cyclone 400	71x42x33in	180x107x84cm	260lb/118kg	Christie Roadie 45K	76x48x43in/193x122x109cm	528lb/240kg
55.450 <sup>d</sup>	Cyclone 450	71x38x38in	180x97x97cm	280lb/127kg	Christie D4K35, CP2220/30	76x48x43in/193x122x109cm	539lb/245kg
55.525.Ld	Cyclone 525.L	67x38x29in	157x97x74cm	260lb/118kg	Danasania DT DOFOV	76x48x46in/193x122x117cm	468lb/213kg
55.525.P	Cyclone 525.P	67x29x40in	157x74x102cm	280lb/127kg	Panasonic PT-RQ50K	76x48x46in/193x122x117cm	488lb/222kg

 $<sup>^{1}</sup>$  For projectors not shown here, please contact factory — we will be happy to accomodate any projector type

All Cyclone products are built to order. Please consult factory for lead times.

 $All \ sales \ are \ subject \ to \ Tempest \ Lighting, \ Inc. \ Standard \ Terms \ and \ Conditions \ of \ Sale, \ available \ for \ download \ at \ www.tempest.biz.$ 

All Schedule B Export Code: 9405.99.0000

### **Custom Colors**

Most enclosures in this brochure are shown in our popular standard light bronze finish.

White, Black or any RAL color are available to special order.

### **Available Options**

55.UR.xxx	Unistrut Rail Kit (Use the 3-digit enclosure	51.EN	Ethernet Bridge		
	model #, eg 55.UR.200	51.TSM	Tempest G4 System Manager (coming soon)		
	51.SK	Stacking Kit	51.HF.11	Spare Inlet Filter Cyclone Portrait 55.320 (2	
	51.SS.xxx	Swivel Stacking Kit (xxx = Cyclone model #)		per enclosure)	
	55.C2	Cyclovator 2 (requires 55.UR.xxx)	51.HF.15	Spare Inlet Filter Cyclone Landscape 55.2-3xx	
	55.TI	Thermal Insulation Kit (factory fitted)		Portrait 55.324 and up	
	51.SH.xxx	Sun Shade (xxx = Cyclone model #)	51.HF.22	Spare Inlet Filter Cyclone 55.400 and up	
	55.IC.15	Cyclone Inlet Cowl for Cyclone 55.2-3xx	51.HF.23	Spare Inlet Filter Cyclone Portrait 55.2-310	
		,	55.PP	Positive Pressure Option	
	55.IC.22	Cyclone Inlet Cowl for Cyclone 55.400 and up	55.AC	Tompost AC Assist consult Foston	
	55.DFB.15	Cyclone Desert Baffle for Cyclone 55.2-3xx	33.AC	Tempest AC Assist — consult Factory	
	55.DFB22	Cyclone Desert Baffle for Cyclone 55.400	AC55	Tempest ActiveCool — consult Factory	
JJ.DFB22		and up	For custom options please consult factory		

 $<sup>^{</sup>m d}$  Consult factory for current dimensions and portrait aavailability

<sup>&</sup>lt;sup>U</sup> All UST versions are custom or semi-custom. Please consult factory for details

<sup>&</sup>lt;sup>4</sup> Requires Tempest ActiveCool



### **Cyclone Configurator**

### Please complete this form and email to us at info@tempest.biz

Name		
Company		
Email		
Phone		
Project Name & Location		
Projector Model Lens Model		
Cyclone Model	55	
Quantity		
Destination Country		
Install Date		
Туре	Landscape 🗆 Portrait	: 🗆 UST 🗆
Projector Slide	Left □ Right □ From	nt □ Back □
Projector Mount	Landscape/UST: Feet I Portrait: Feet Left □	· · · · · · · · · · · · · · · · · · ·
Required Options		
Thermal Insulation	Yes □ No □	
Inlet Cowl	Yes, Qty	No □
Desert Filter Baffle	Yes, Qty	No □
Positive Pressure	Yes, Qty	No □
Sun Shade	Yes, Qty	No □
AC Assist	Yes, Qty	No □
ActiveCool	Yes, Qty	No □
Cyclovator	Yes, Qty	No □
Stacking Kit	Yes, Qty	No □
Swivel Stacking Kit	Yes, Qty	No □
Unistrut Kit	Yes, Qty	No □
Ethernet Comms	Yes, Qty	No □
Spare Inlet Filter	Yes, Qty	No □

Color	Standard, Light Bronze □	
	Custom, RAL #	
	Gloss Level%	

UST Lens Configuration:			
	8		
90deg Up □	90deg Down □	Periscopic A	
e.			
90deg Right □	90deg Left □	Periscopic B □	
Sti	raight, Vshift Down 🛚	Straight, Vshift Up 🛚	

Custom Requests:				

Factory Use Only:		
SO Number		
Date		



User manuals and CAD drawings at www.tempest.biz



Made in the USA

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