

DOTWORKZ D2 COOLDOME ENCLOSURE

There are several Industry options for electronic enclosure cooling solutions:

- 1) Radiator style of oil and water coolers (passive cooling)
- 2) Pressurized enclosures (minimal active cooling)
- 3) Vortex tube coolers (active cooling)
- 4) Traditional compressor air conditioning, Freon cooling systems (active cooling)
- 5) Thermal Electric Peltier effect/ solid state Coolers (active cooling)

All of these options, with exception to thermal electric coolers, are subject to larger and relatively noisy compressors or pumps, with potential for gas or fluid leakage and product failure.

Radiator Coolers: The electronics industry has come up with some relatively compact cooling solutions for water and oil coolers, but due to the need for mechanical pumps in these systems, and a real potential for liquid leakage and limited pump working lifespan, this makes for a significantly lower reliability and useful life. There is no active cooling element in these systems, so enclosure temperature will never be lower than outside ambient temperature.

Pressurized systems do not require fans to move air due to the existing pressure differential (nor do the vortex generators). Unfortunately the trade off is that a relatively larger compressor is required for the pressurized enclosure with pressure rated tubing from compressor to enclosure, and enclosure must be fully sealed. The pressurized systems usually use semi-exotic gasses such as Nitrogen holding tank which need to be recharged occasionally. Temperature differentials between the inside of enclosure and outer ambient temperature are typically relatively low on these systems.

Vortex generator cooling systems use a relatively small vortex generator tube, but the system requires pressurized tubing and a relatively large compressor, which may be subject to leakage. The compressor system is typically significantly larger than that of pressurized enclosure systems, and noise may be a significantly adverse issue due to high pressure and expensive compressors, expensive vortex tubes, and technical installation. Moisture control is a significant issue with these systems to keep lenses and electronics condensation free, so active moisture control systems must be integrated.

Traditional Freon air conditioners are typically much larger in size and capacity. Though there are some relatively smaller air conditioners for electronics cabinet cooling available, high power usage, environmental housing challenges, cost, and larger size makes them typically not compatible with camera enclosure systems. Remote ducting proposed, but condensation issues and difficulty in sealing out ambient moisture on cooled air makes these a bulky solution.

Thermal Electric Cooler (TEC)/ Peltier, solid state coolers are the most compact, reliable, economic solution for the heat dissipation for safe and simple electronic enclosure cooling solutions. The technology is based on low voltage DC current, so any high voltage power source requires an external Step down power supply that must be rectified to direct current. Power requirements are reasonable for active cooling systems. Dotworkz provides a highly reliable, externally mounted, step down voltage power supply with each of its COOLDOME Products. This must be housed indoors or in a protected enclosure, near COOLDOME enclosures installation location.

A relatively short Low voltage DC wire run then goes from the Power Supply to the COOLDOME Enclosure. The TEC has a lifespan of over 10 year's continuous usage. Lifespan can be much longer since cooling mode is only operational when internal enclosure temperatures are above 100 deg F. 2 integrated, highly reliable yet economical fans are field replaced if needed. Dotworkz uses outdoor rated IP55 fans on external exhaust fan.

There is no external air exchange on these systems, it is fully sealed, and so internal dust is not a factor. A compact moisture control kit (passive) is included in these systems to reduce possibility of condensation in high humidity environments. Dotworkz COOLDOME's patent pending; camera enclosure



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cooling systems are the most compact, effective, and cost effective, outdoor camera housing solutions in the industry, with reliability for the most demanding deployments.

The Dotworkz D2 enclosure line introduces the camera enclosure industry to the next generation of outdoor protection for analog and network based security camera systems. As camera technology evolves so has the housings that protect them. Dotworkz D2 has taken this protection to the next level with the COOLDOME™ thermo-electric cooling system for climates where temperatures exceed 105° F (41° C) and reaches as high as 145° F (63° C). Originally designed for video surveillance of the Pyramids of Egypt, the COOLDOME D2 is the ultimate safeguard for your PTZ cameras.

Most cameras shut down in extreme heat leaving an area vulnerable without video surveillance. The COOLDOME D2 keeps cameras operating flawlessly, even when subjected to soaring temperatures and direct sunlight. The solid state cooling system and high-flow fans remove heat without air exchange into the sealed housing, thus controlling humidity that can cause lens fogging and component corrosion.

The COOLDOME D2 turns off and on automatically at set temperature thresholds to generate up to a 45° F (25° C) differential with the outside environment. Besides preventing thermal shutdown, the lower temperature reduces wear on moving parts as well as damage to mounted wireless components, cell routers, and hard drives.

For more than six years, Dotworkz COOLDOME enclosures have been used in a variety of mission critical applications, including NASA, Military, Casinos, Dams and border Security operations.

Specifications:

IP PTZ Camera Support	Yes
Analog PTZ Camera Support	Yes (may require minimal modification)
IP Fixed Camera Support	Some models
Analog Fixed Camera Support	Some models
Mount Type	Integrated Wall Mount
ENVIRONMENTAL	
Operating Temperature	30°F to 145°F (-1 °C to 63 °C)
Cooling Element Activates	100°F (38 °C)
Cooling Element Deactivates	70°F (21 °C) Internal Blower always on
Operating Humidity-Ext Housing	0-99% RH Non-Condensing
Operating Humidity: Power Supply & Electr.	0 to 90% RH Non-condensing
INTERNAL ENVIRONMENTAL CONTROLS	
Active Systems Thermostatically Controlled	Active Cooling
Active Cooling and Heating	Active Cooling, Q = 120 watt/ 408btu w/fan
Internal Fan(s) included (Qty, Size, Output)	(1) 80 x 80 x 15mm, 42 cfm
Solar Guard Insulation Kit Available	Dual Ply, Solar guard insulation kit installed
Humidity Control Package Available	Included as Standard with COOLDOME
ELECTRICAL	
Power Consumption (In to D2)	12V, 150W @ enclosure, cooler only@ full load 10A DC
Power Source options	110VAC/ 220 VAC manually switched w/12 VDC
Internal Power Available for Camera	2-4 amps @ 12 VDC
AC Frequency	47-63 Hz
Input Current	@ External P/S, 4.8 amps @ 115 VAC
CONSTRUCTION	
Enclosure Construction	Polycarbonate (Lexan), 0.15"
Lens (colors)	High Impact Acrylic, .0625" (clear or tinted)
NEMA 4X Certified	Yes
Shipping Dimensions	13" x 12.5" x 19"

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Shipping Weight	15 lbs (6.8 kg)
ACCESSORIES (optional)	Dotworkz Pole Mount Adapter (BR-MPM1) Tilt Angle Correction Plate (BR-MPM1-AC)
	Integrated Wireless 900MHz (SK-D2-900)
	Integrated Wireless 2.4GHz (SK-D2-2.4) Integrated Wireless
	Integrated Wireless 5.8GHz (SK-D2-5.8) Integrated Wireless

Working Life of D2 COOLDOME Products:

Circuit components (relays, thermostats) **100,000 cycles minimum**
 External Fan (E9225E12B) temperature dependant @ 40 C = 104 F: **6.9 years continuous**
 @ 30 C = 86 F: 7.8 years continuous
Exterior fan is only operational when interior enclosure temperatures are above 100 F degrees. Lifespan based on 90% tested confidence of average lifespan when operated continuously at the stated temperatures. No moisture or particulate testing is implied. Exterior fan has an encapsulated motor, equivalent to IP55. Dotworkz recommends evaluating fans for field replacement every 5 years.

Interior Fan (G8015E12B) temperature dependant @ 30 C = 86 F deg **5.5 years continuous**

Interior fan is always on while enclosure is powered up. Lifespan based on 90% tested confidence of average lifespan when operated continuously at the stated temperatures

Thermal Cooler	@ working ambient temp. <u>over</u> 40 C = 104 F deg.	11.4 years avg.
continuous	@ Working ambient TEMP. <u>under</u> 30 C deg.	34.2 years avg.

Thermal cooler is only powered up when interior enclosure temperatures rise to 100 F degrees, then cycles off when interior drops below 70 F degrees.

Safety: 12 VDC input Low Voltage only within COOLDOME
 Thermal cutoff fused for overheat condition
 Fused circuitry within for Cooler and camera

COOLDOME Power Supply

Dotworkz 250W single output, switchable power supply.

Features

- AC input range selectable by switch
- Protections: Short circuit / Overload / Over voltage
- Forced air cooling by built-in DC fan
- Fixed switching frequency at 60KHz
- 100% full load burn-in test
- Low cost, high reliability

Optional Dotworkz Custom NEMA Enclosure for the COOLDOME Power Supply

This product is a weatherproof outdoor enclosure box. Contains an integrated COOLDOME power supply, and is designed for outdoor mounting of the COOLDOME Power supply. For use as a termination point in power runs which will lead to the COOLDOME

Features

- Weatherproof
- Contains an integrated COOLDOME power supply
- Dimensions 10"H x 7"W x 6"L