

FEATURES & BENEFITS

High Availability

- Extended Backup Time
- High Reliability
- Highly Accurate Run Time
- Consistent Performance over Time

Low Lifecycle Costs

- 20 Year Lifespan
- Low Maintenance
- Self-Diagnostic Capabilities
- Local & Remote Monitoring

Flexibility

- 0° to 40° C Operating Temperature
- Top / Bottom Entry
- Adjustable Output Voltage
- Small Raised Floor Footprint

Backup Cooling

- Provides Cooling during Discharge

Green Technology

- Battery-Free Energy Storage
- No Hazardous Byproducts
- No Disposal Issues

The Only Minute-for-Minute Alternative to Batteries

CoolAir DC, based on Active Power's revolutionary Thermal & Compressed Air Energy Storage (TACAS) technology, provides an extended runtime battery-free energy storage solution for 3-phase Uninterruptible Power Supply (UPS) applications. It represents the only minute-for-minute alternative to lead-acid batteries for all critical operations with none of the inherent problems typically associated with batteries.

High Availability

Unlike battery-based solutions that rely on over 200 complex electrochemical cells connected in series, the CoolAir DC system utilizes simple mechanical components that combine to produce a predictable and reliable source of extraordinarily "clean" DC power. The runtime calculated by a CoolAir DC system is based on real-time measurements of only two determinants: temperature and air pressure. This runtime is always accurate, whereas the estimated runtime of a battery can be very unpredictable over time. Additionally, the capacity and runtime of a CoolAir DC will be consistent over the life of the system, making it considerably more reliable than batteries.

Lower Lifecycle costs

CoolAir DC is comprised of robust and proven technologies. This allows CoolAir DC to have a 20-year lifespan as compared to VRLA batteries that need to be maintained regularly and replaced every 3 to 5 years. The ability of a CoolAir DC system to be managed locally through an LCD panel or remotely through a standard modem or Ethernet using SNMP or Modbus, along with a more predictable performance minimizes the need for frequent preventive maintenance typically associated with batteries.

Flexibility

The wide operating temperature range of the CoolAir DC Solution allows for remote locations away from premium air-conditioned raised floor environments, without any performance degradation. Adjustable output voltage between 360 – 480VDC integrates with the Active Power UPS and provides compatibility with most other 3-phase UPS systems. Extended backup runtime is also easily achieved by simply adding additional air tanks.

Backup Cooling

CoolAir DC is also the only energy storage solution that provides a significant amount of cooling during discharge. This feature allows the critical loads to run for a longer duration in the event of an extended power outage, especially at sites where the possibility of having a standby generator to keep the cooling system in continuous operation is impractical.

Green Technology

CoolAir DC uses breathing grade air and heat as the primary energy storage medium. This provides a safer solution in comparison to battery-based solutions that vent hydrogen gas during the charging process. CoolAir DC has no hazardous by-products, thus eliminating the special installation and disposal issues associated with battery-based solutions.





Key Specifications

Output	
Maximum Output Power	85kW ¹
Discharge Voltage Range	360 - 480VDC
Max. Runtime at Full Load	15 min.
DC Voltage Regulation	+/-1%
Input	
Float Voltage	400 - 540VDC
Auxiliary Voltage	480, 60Hz; 230VAC, 50/60Hz; 120VAC, 60Hz
Auxiliary Power	200 VA
System Recharge	
Minimum Recharge Power	2kW
Maximum Recharge Power	6kW
Bridging Energy (Flywheel)	30 seconds
TSU (100% Capacity)	< 2 hours ²
Compressed Air	Varies based upon configuration
Environmental	
Operating Temperature Range	0° to 40° C (32° to 104° F)
Non-operating Temperature Range	-25° to 70° C (-13° to 158° F)
Humidity	< 95% (non condensing)
Physical Data	
Dimensions in Inches (DxWxH)	31.5 x 31.5 x 78 ³ (800 x 800 x 1980mm) ³
Cable Access	Top or Bottom
Weight	2800 lbs. (1270 kg.) ³
Monitoring	
Real-time Capacity & Performance Data	
Local:	LCD Display & Alarms Standard
Remote:	Optional: Ethernet, Modem, SNMP, ModBus
Regulatory	
Agency Approvals & Standards	UL 1778, FCC

¹ Supports DC Bus of a 100kVA/80kW UPS & below.
² Based upon 80kW, 5 min. configuration.
³ Does not include dimensions of air tank cabinets which can be located remotely.

Comparison Matrix	CoolAir DC	VRLA Batteries
Extended runtimes	Yes	Yes
Lifespan	20 years	3 - 5 years
Consistent performance over time	Yes	No
Maintenance	1 time/year	4 times/year*
Runtime estimation	Highly accurate	Unreliable
Built-in monitoring	Yes	No
Non air-conditioned space	Yes	No
Shelf life	Virtually unlimited	6 months
Provides backup cooling	Yes	No
Non-toxic	Yes	No
Partial discharge availability	Immediate	>40% of capacity

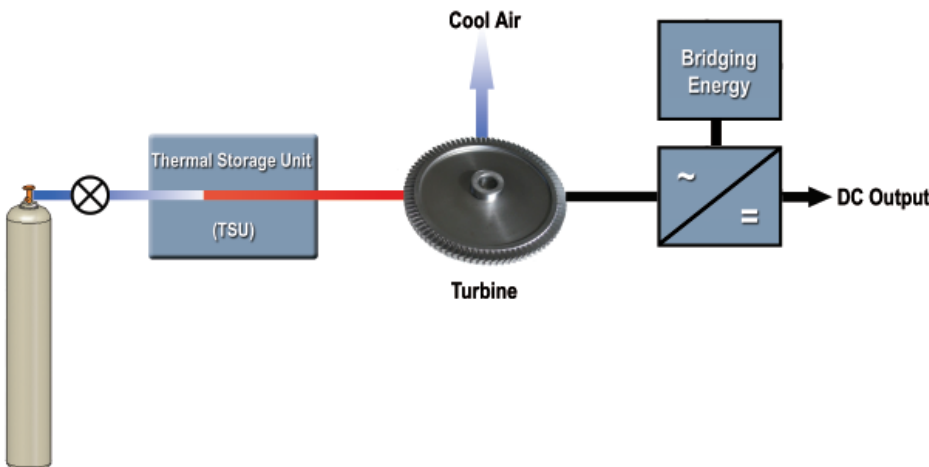
*According to IEEE Standard 1188-1996

Lifecycle Cost Comparison

Energy Storage Solution	Warranty (in Years)	Monitoring	Lifecycle costs (NPV)			
			Upfront	5 year	10 year	20 year
Redundant VRLA	1	No	1x	2 - 2.5x	3 - 4x	4 - 5x
Redundant VRLA	1	Yes	1.75x	3 - 3.5x	4 - 4.5x	5 - 5.5x
CoolAir DC*	5	Yes	.5x	2x	3x	3.5x

*Based on a 5 yr. Usage Plan Agreement

CoolAir DC Solution



How does CoolAir work?

- Compressed air is stored in standard cylinders that are maintained at full capacity via onsite compressor
- A Thermal Storage Unit (TSU) is heated by conventional electrical resistance heaters
- During an extended discharge event, compressed air passes through the TSU acquiring heat energy, and then drives a small turbine/alternator to provide AC
- IGBT-based converters change AC output of alternator or bridging energy to DC
- During extended outages, the bridging energy provides power until the turbine/alternator spins up and assumes the load.



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