Direct Connect VDC
For UPS Systems

VYCON

Flywheel
Energy Storage

VDC
VDC-XE

"Batteries are the primary field failure with UPS systems."

Electric Power Research Institute (EPRI)

High Reliability
Low Maintenance
Small Footprint

Direct Connect VDC and VDC-XE

VYCON's VDC flywheel systems store and deliver a reliable source of DC power utilizing the kinetic energy of a high speed flywheel. Compatible with most major brands of three-phase UPSs, the systems interface with the DC bus of the UPS, just like a bank of batteries, receiving charging current from the UPS and providing DC current to the UPS inverter during discharge.

VYCON's VDC and VDC-XE Direct Connect UPS backup systems bring unprecedented power capacity for instantaneous and reliable backup power for today's mission-critical applications. **Data centers, hospitals, broadcast studios, casino gaming centers and manufacturing plants** are enjoying the reliability benefits of VYCON's flywheel energy storage systems.

Utilizing clean energy storage from VYCON's patented flywheel technology, the VDC and VDC-XE are the perfect solutions for users needing a more reliable and greener approach to backup power in place of hazardous, lead-acid based batteries.

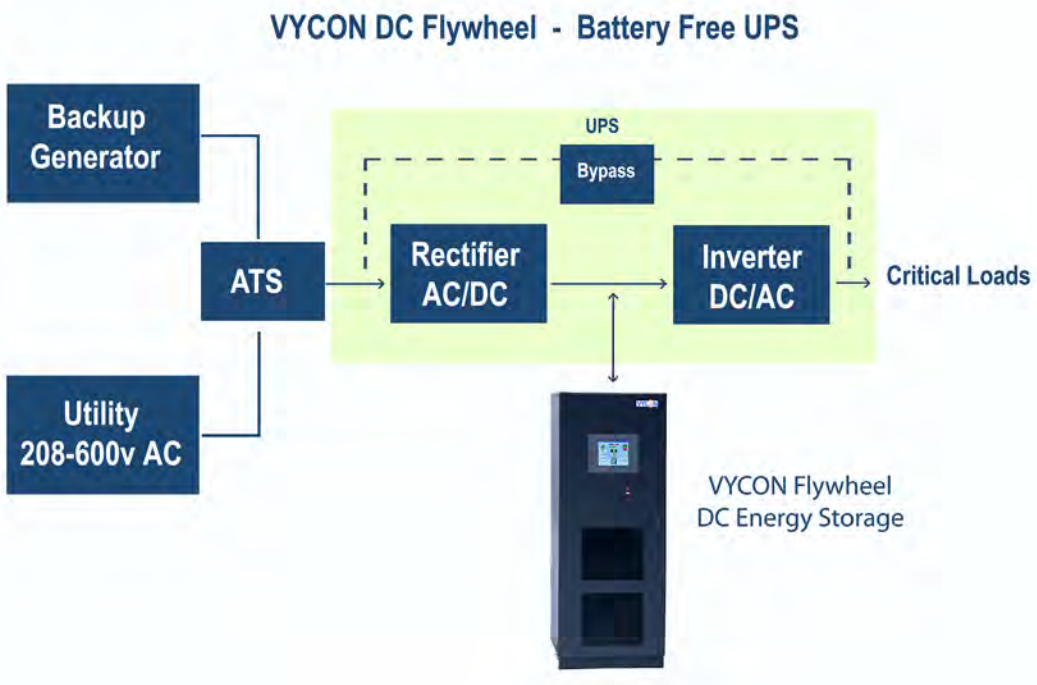
Batteries – The Weakest Link

When it comes to power continuity, batteries are the weakest link in the power infrastructure chain. Relied upon to provide ride-through power for UPS systems, valve regulated lead-acid (VRLA) batteries are unreliable, unpredictable, maintenance intensive, space intrusive, temperature sensitive and are not environmentally friendly.

VYCON's innovative VDC and VDC-XE are dependable high-speed flywheel systems that provide clean ride through backup power that is **predictable and seamless**. The VDC units can replace traditional UPS batteries or work in tandem with batteries to provide the most reliable, **instantaneous power**.

Power You Can Depend On

Genset Ride-Through: NFPA 99 regulations for Emergency Power Systems stipulate that Gensets must be able to assume the load within 10 seconds. While batteries can perform this function, their reliability is always in question. Are they fully charged? Has a cell gone bad in the battery string? When was the last time they were checked? By contrast, VYCON's VDC systems provide reliable energy storage instantaneously to assure a predictable transition to the stand-by gen-set, all in a compact footprint.



Battery Hardening: For applications without Gensets or for those who still want to use batteries, the VDC and VDC-XE can operate in parallel with batteries. In this configuration, the VDC is the first line of defense against power anomalies – saving the batteries for prolonged power outages. By being first to provide the necessary energy to ride-through power glitches, the VDC system significantly increases battery life by absorbing over 98% of the discharges that would normally cause the batteries to be cycled.

The VYCON Flywheel

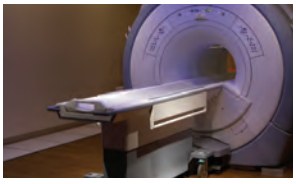
Serving as a mechanical battery, the flywheel is a kinetic energy storage system that replaces traditional backup batteries and performs in applications where batteries and other storage devices fall short.

The VYCON flywheel stores kinetic energy in the form of a rotating mass and is designed for high power, short discharge applications. VYCON's patented technology used within the flywheel includes the flywheel hub that is formed from aerospace-grade steel, a high speed permanent magnet motor generator, contact-free magnetic bearings that levitate and sustain the rotor during operation, and a superior touch-screen control system that provides vital information on system performance.

This innovative patented technology enables the VYCON flywheel to charge and discharge at high rates for countless cycles without degradation throughout its 20 year life – unlike traditional batteries.

Mission Critical Protection for...


Data Centers


Healthcare/Hospitals


Manufacturing

Broadcast


Education


Casinos/Gaming

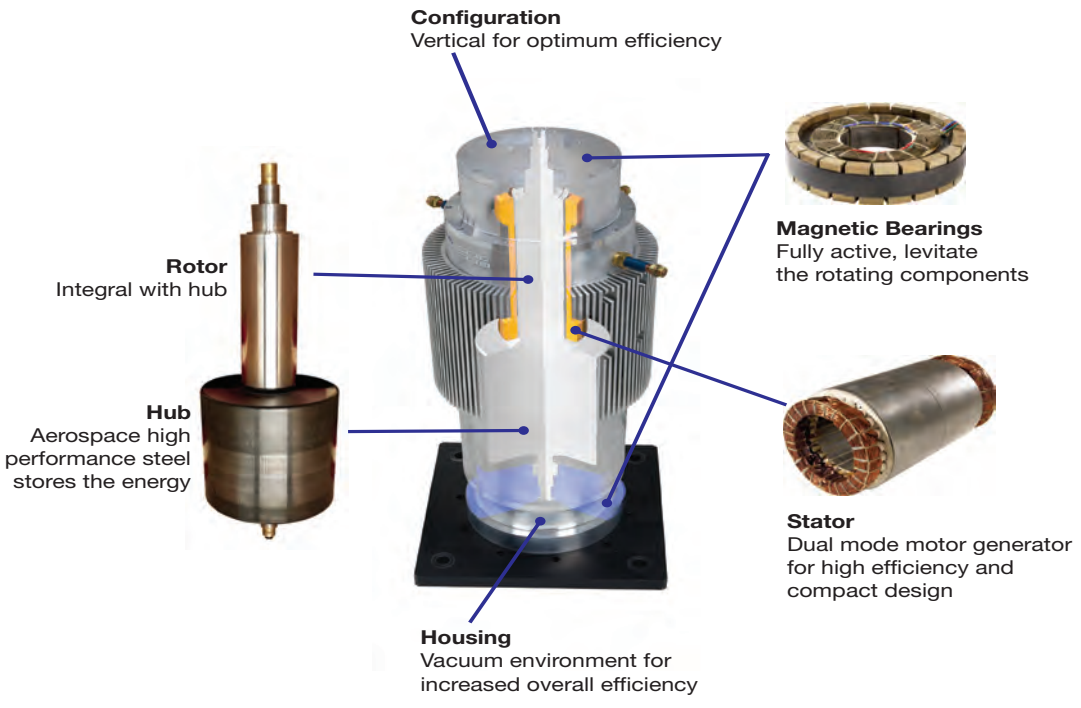
Benefits

Key Configuration Features

- Single flywheel can provide up to 300kW of power *(See run time table for power and run time combinations)*
- Parallel flywheel cabinets for higher power, longer autonomy or redundancy
- Parallel with batteries for added redundancy and longer battery life
- Each flywheel operates independently
- Integrates with various UPS makes & models

Key User Benefits

- High reliability/predictability
- Lowest cost of ownership
- High power density
- Small footprint
- High efficiency - 99.4%
- 20 year lifespan
- Green technology
- Minimal maintenance
- No bearing replacement
- Simple installation



Specifications

Run Times*

VDC

UPS Output Power Rating (kVA)

Number of Flywheels	40	60	80	100	120	160	225	275	450	550	750	1100
1	99.8	67.0	50.3	40.3	33.6	21.9	11.7	6.4				
2				80.0	65.0	48.8	34.8	26.6	11.3	6.2		
3						72.3	51.5	42.2	23.2	16.8	8.5	
4	Run Time in Seconds							55.6	34.1	26.1	16.0	6.0
5										34.8	23.0	11.7

VDC-XE

UPS Output Power Rating (kVA)

Number of Flywheels	40	60	80	100	120	160	225	275	450	550	750	1100
1	99.8	67.0	50.3	40.3	33.6	25.6	17.4	11.7				
2				80.0	65.0	48.8	34.8	28.6	16.8	11.4	6.1	
3						72.3	51.5	42.2	26.1	21.5	13.9	6.2
4	Run Time in Seconds							55.6	34.1	28.0	20.8	11.1
5										34.8	25.8	17.1

** Backup times are typical using .9 Output Power Factor, 80% Full Load Rating, 96% Inverter Efficiency*

Operating Parameters

	Direct Connect VDC	Direct Connect VDC-XE
Power / Duration Ratings		
Max Power	215kW	300kW
Max Energy Storage	3000kW-sec @100kW	3000kW-sec @160kW
Flywheel Rotational Speed	18,500 to 36,000 RPM	18,500 to 36,000 RPM
Input		
Input Voltage	400 – 600 VDC	400 – 600 VDC
Recharge Rate	15-50 Amps Adjustable per application	15-50 Amps Adjustable per application
Efficiency	99.2% at Max Power Rating	99.4% at Max Power Rating
Output		
Voltage Discharge	400–520 VDC Adjustable per application	400–520 VDC Adjustable per application
Voltage Regulation	+/- 1%	+/- 1%
DC Ripple	Less than 2%	Less than 2%
Operating Temperature	-4°F to 104°F (-20°C to 40°C)	-4°F to 104°F (-20°C to 40°C)
Humidity	95% non-condensing	95% non-condensing
Altitude	5,000 ft. (1524m) max without de-rating	5,000 ft. (1524m) max without de-rating
Audible Noise	< 68dBA at 3.3 ft. (1M)	< 68dBA at 3.3 ft. (1M)
Dimensions and Weight		
Height	73.7 in. (1872mm)	73.7 in. (1872mm)
Width	30.0 in. (762mm)	30.0 in. (762mm)
Depth	30.0 in. (762mm)	30.0 in. (762mm)
Weight	1554 lbs. (705kg)	1554 lbs. (705kg)

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For more information on our award-winning Flywheel technology, please visit **www.vyconenergy.com** or contact your local Authorized Reseller.

FSC Mixed Sources
Product group from well-managed forests and other controlled sources
www.fsc.org Cert no. BV-COC-080701
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About Vycon

VYCON is a leading manufacturer of flywheel-based energy storage systems. VYCON employs the latest technologies in power electronics, digital controls, magnetic bearings and high speed motor generators to provide products that are reliable, long lasting and essentially maintenance free.

It is time to expect more from an energy storage solution...

FROST & SULLIVAN
2009 Green Excellence Award in Product Innovation

engineer 2009 Product of the Year Finalist

Network Products Guide Best Products & Services 2009

EC&M Product of the year 09 Category Winner

FacilityCare The Symposium Distinction Awards
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VYCON

23695 Via del Rio
Yorba Linda, CA 92887, USA
Phone: +1-714-386-3800
Fax: +1-714-386-3891
www.vyconenergy.com