FANWALL® Smart Cube

Fully-integrated Inverter Control Solution for New Construction and Retrofit Applications

FANWALL TECHNOLOGY®

FANWALL® Smart Cube

Fully-integrated Solution for Inverter Control of FANWALL® Arrays

The FANWALL® Smart Cube places active control components at the point of service, where they are wired for quick connection to power at the control panel. Integral to this approach is the FANWALL Variable Frequency Drive (VFD), designed specifically for seamlessly mounting at the FANWALL cube and including an integrated bi-directional pressure transducer, MCP disconnect and touch screen controls. The FANWALL Smart Cube offers multiple benefits to reduce installed costs and speed installation for new construction, replacement or fan retrofit applications.

Reduced Field Labor and Materials

- Easy installation of the FANWALL VFD, wiring, pressure tubing and communication cabling reduces field install labor and provides a seamless fit to avoid airflow disturbance.
- No need to separately install a pressure transducer because it is already integrated in the FANWALL VFD.
- R³FILTERING™ feature of the FANWALL VFD helps meet IEEE519 without an external line reactor or filter.
- No external power supply needed for remote touch screen.
- Field labor and commissioning savings are especially ideal for retrofit applications where timelines are tight.

Fast, Easy Commissioning and Control

- One remote touch screen controls up to 32 drives and enables one touch auto-commissioning with intuitive menus for all control parameters.
- Set up or monitor drives with your laptop with standard Ethernet connection port, or wire to network for remote monitoring using a variety of handheld devices.

Compact, Modular Design Ideal for New Construction or Retrofit Applications

- Dramatically reduces the size and complexity of the unit control panel.
- Modular FANWALL Smart Cubes can fit through a standard 3-foot door for applications with access restrictions.

Certifications

- Plenum rated
- UL, cUL
- CE marked

The FANWALL VFD allows for up to 32 fan/motor assemblies to be controlled remotely via a single touchscreen. It provides advanced protection without the need for any additional components.

FANWALL® VFD

FANWALL Variable Frequency Drive (VFD)

The FANWALL VFD is designed specifically for the Smart Cube. It comes complete with a fully-integrated pressure transducer and MCP disconnect, and has been designed for seamless integration to avoid airflow disturbance. And with exclusive R³FILTERING™, the FANWALL VFD uses a re-engineered design and complex algorithm to stop the source of harmonic distortion and help meet IEEE519 without an external line reactor or filter.

The Quickest and Easiest VFD Commissioning

The FANWALL VFD keypad is an industry-leading control interface that is mounted externally for easy access to up to 32 separate VFDs in a FANWALL array. From this keypad you have full control of each VFD, individual or aggregate motor status and all the parameter adjustments, fault feedback and displays you need.

Turn on the disconnects on your VFDs, and with a single press, auto-commission every VFD on your array for the fastest startup possible. Take a broad look at your total array power consumption, motor speeds and run status on the main menu display, or dig into the individual phase voltage and power factor for a single motor, or switch to hand mode to manually control speed on your whole array with one finger.

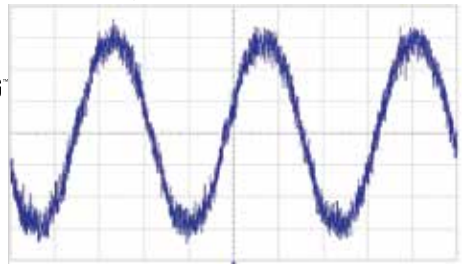
No more deciphering codes, swapping keypads for one-by-one VFD commissioning or lengthy troubleshooting. Everything you need is at the touch of a finger, with smooth transitions through intuitive menus on an easy-to-read, colorful and backlit LED touchscreen.

R³FILTERING™ of Harmonic Distortion

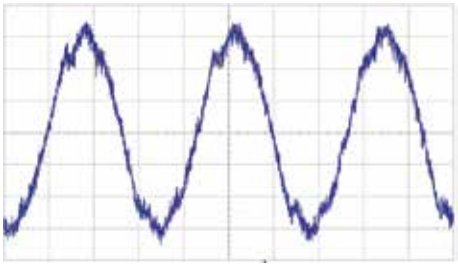
Traditional VFDs employ large aluminum electrolytic capacitor banks to store energy, filter the output switching, and create a steady DC bus voltage for use by the output power stage. They suffer excessive heating and a shorter lifespan. R³FILTERING technology uses film capacitors and a highly sophisticated algorithm that monitors the DC bus voltage in real time and compensates for any fluctuation, ensuring a pure sine wave at the output of the drive. Ultimately this means the FANWALL VFD can utilize a greatly reduced capacitance, on the order of 1/100th, in addition to offering much less heating, a longer lifespan and smaller footprint, and significantly improved input current distortion.

All tests with a 10 HP drive, output current at 60 Hz 2m V/A.

R³FILTERING™



Competitor A



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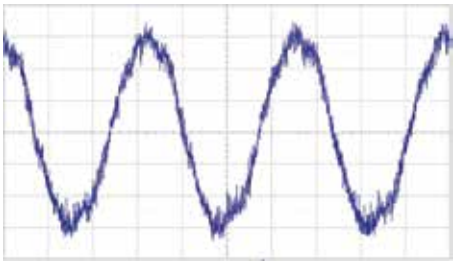

The FANWALL VFD offers a standard Ethernet connection port for set-up using your laptop, or it can be wired to a network for remote monitoring using a multitude of handheld devices to access drive information through a standard ethernet or wireless communications.

FANWALL® VFD Specifications

Input Ratings	Voltage	3-phase 200 - 240VAC (+15% / -10%)	3-phase 380 - 480VAC (+15% / -10%)
	Frequency	50/60 Hz (+/-5%)	
	Efficiency	>= 96%, full load	
	Power Factor	>= 0.9	
Output Ratings	Frequency	15 - 240 Hz (20-240 Hz for Permanent Magnet motor)	
	Voltage	200-240VAC	380-480VAC
Control	Control Method	V/F Scalar Space Vector Pulse Width Modulation	
	Carrier Frequency	2kHz - 10kHz, 0.1kHz resolution, Default 8kHz	
	Frequency Resolution	0.01Hz	
	Frequency Accuracy	0.01% of Max. Output Frequency	
	V/F Ratio	Linear, Squared Pattern	
	Overload Capacity	110%, 60 seconds	
Operation	Operation Method	Remote Keypad, MODBUS RS485	
	Shutdown Input	Interrupts the output of the inverter (24VDC 1mA)	
	Remote Display Interface	MODBUS RTU, 2 ports to daisy-chain units	
	Communications Interface	MODBUS RTU, 9600 or 19200 or 38400 bps	
	Pressure Transducer	Optional Pressure Transducers: 0-10", 0-25" (H20)	
	Indication	3 LEDs: Power, Run, Fault	
	Operation Functions	Frequency Limit, Frequency Jump, Reverse Rotation Prevention, Auto Restart, Flying Start	
Protection	Protective Functions	Over Voltage, Under Voltage, Over Current, Inverter Over Heat, Output Phase Open, Overload, Communication Error, Loss of Analog Signal, Hardware Fault, Short Circuit Protection, Temperature Sensor Fault, Ground Fault	
	Short Circuit Rating (kAIC)	100	65
Environment	Cooling Method	Additional forced air cooling must be supplied to meet ratings (accomplished when mounted on FANWALL cube)	
	Ambient Temperature	-10°C ~ 40°C, (14°F~ 104°F)	
	Storage Temperature	-20°C ~ 65°C, (-4°F~ 149°F)	
	Location	Pollution Degree 2 Environment, for use in plenum	
	Altitude	Altitude Max: 1000m above sea level. Above 1000m, de-rate maximum drive current 2% for each added 1000ft above sea level.	
	Relative Humidity	95% Relative Humidity or less (non-condensing)	
Certifications	Agency Approvals	UL and cUL listed (UL508C, UL1053), CE marked	
	Vibration	Built to IBC 2006 International Building Code, no certification required	
	Enclosure Rating	UL Type 1, Plenum-rated	
	Harmonic Distortion	<35% THDI, meeting IEEE519 and EN50160	
	EMC	EN 61800-3 (Radiated and Conducted Emissions)	
	CE	Electromagnetic compatibility 2004/108/EEC, Low-voltage directive 2006/95/EEC	
Remote Display	Display	3.5" diagonal, 262K colors, TFT	
	Illumination	LED Backlight, auto-dim option	
	Operator Interface	Touch Panel	
	Web Interface	HTML Web Server for easy setup, accessed by connecting laptop to RJ-45 port with standard CAT-5 cable	
	Power	No external supply needed. Power provided by first drive in daisy-chain (over CAT-5 cable)	

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