



# VFD Programmed for Hemisphere Fans 921893, 922139

## Quick Sheet



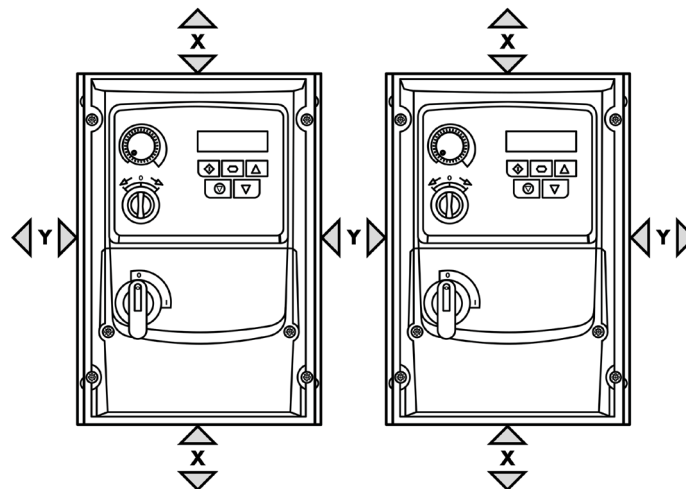
## Step 1: Mount VFD

### Guidelines for mounting (IP66 Units)

- Before mounting the drive, ensure that the chosen location meets the environmental condition requirements for the drive.
- The drive must be mounted vertically, on a suitable flat surface.
- The minimum mounting clearances shown in the diagram and table below must be observed.
- The mounting site and chosen mountings should be sufficient to support the weight of the drives.
- Using the drive as a template, mark the locations required for drilling.
- The mounting location should be free from vibration.
- Do not mount the drive in any area with excessive humidity, corrosive airborne chemicals or potentially dangerous dust particles.
- Avoid mounting close to high heat sources.
- The drive must not be mounted in direct sunlight. If necessary, install a suitable shade cover.
- Do not restrict the flow of air through the drive heatsink. The drive generates heat which must be naturally allowed to dissipate. Correct air clearance around the drive must be observed.
- If the location is subject to wide ambient temperature and air pressure variation, install a suitable pressure compensation valve in the drive gland plate.

**NOTE:** If the drive has been in storage for longer than 2 years, the DC link capacitors must be reformed.  
For guidance, please consult with Valco Tech Support.

<b>Mounting Clearances</b> (Not intended for installation using rigid conduit system.)			
<b>X Above &amp; Below</b>		<b>Y Either Side</b>	
mm	in	mm	in
200	7.87	10	0.39
<b>NOTE:</b> Above are guidelines only and the operating ambient temperature of the drive <b>MUST</b> be maintained within the following limits at all times:			
<b>Operational Ambient Temperature Range:</b> -4° – 104°F (-20° – 40°C) frost & condensation free			
<b>Maximum Humidity:</b> 95%			
<b>Maximum Altitude:</b> 6,500ft (2000m) : derate above 3,280ft (1000m) : 2.5%/328ft (100m)			



**NOTE:** VFD recommended to be within 100ft (30m) of fan.  
If located over 330ft (100m), dV/dT filter required to maintain warranty.

## Step 2: Wiring the VFD

INPUT POWER SUPPLY REQUIREMENTS				
Supply Voltage	200 – 240 RMS Volts for 230 Volt rated units, 240 Volt RMS Maximum.			
	380 – 480 Volts for 400 Volt rated units, + / - 10% variation allowed, Maximum 500 Volts RMS.			
Imbalance	Maximum 3% voltage variation between phase – phase voltages allowed.			
	All Optidrive E3 units have phase imbalance monitoring. A phase imbalance of > 3% will result in the drive tripping. For input supplies which have supply imbalance greater than 3% (typically the Indian sub-continent & parts of Asia Pacific including China) Invertek Drives recommends the installation of input line reactors.			
Frequency	50 – 60Hz + / - 5% Variation			
Short Circuit Capacity	Voltage Rating	Min kW (HP)	Max kW (HP)	Maximum supply short-circuit current
	230V	0.37 (0.5)	11 (15)	100kA rms (AC)
	400 / 460V	0.75 (1)	22 (30)	100kA rms (AC)
	All the drives are suitable for use on a circuit capable of delivering not more than the above specified maximum short-circuit Amperes symmetrical with the specified maximum supply voltage when protected by Class J fuses.			

### Fuse / Circuit Breaker Selection:

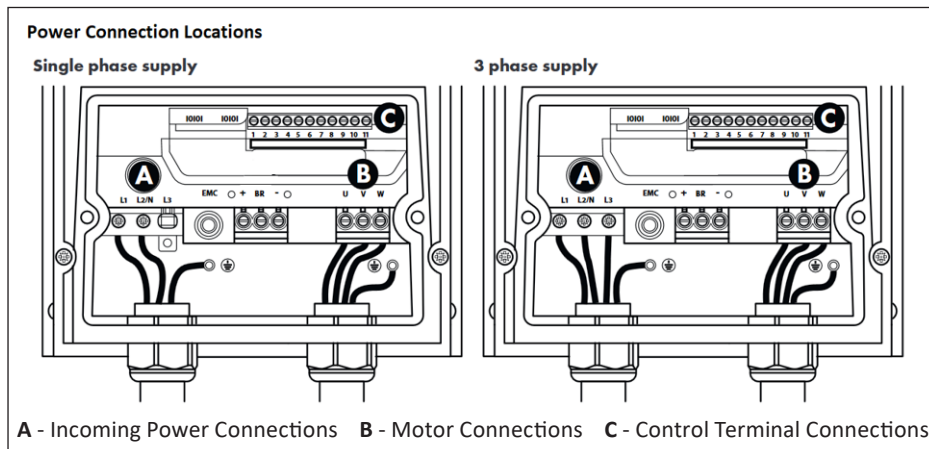
- Suitable fuses to provide wiring protection of the input power cable should be installed in the incoming supply line, as shown in the table below. The fuses must comply with any local codes or regulations in place. In general, type gG (IEC 60269) or UL type J fuses are suitable; however in some cases type aR fuses may be required. The operating time of the fuses must be below 0.5 seconds.
- Where allowed by local regulations, suitably dimensioned type B MCB circuit breakers of equivalent rating may be utilised in place of fuses, providing that the clearing capacity is sufficient for the installation.
- The maximum permissible short circuit current at the Optidrive Power terminals as defined in IEC60439-1 is 100kA.
- The cables should be dimensioned according to any local codes or regulations.

Each fan requires individual branch circuit protection in the form of either a circuit breaker (molded case) or a fused disconnect. The current ratings of these protection devices depend on the model of fan you have purchased. Please reference the table below for guidance on how to size your branch circuit protection. Also, correctly sizing the incoming supply wires to the fan is important. The wire gauge recommendations given in the table are minimum gauge sizes per the National Electric Code, however your local jurisdiction may have differing regulations, and for wire runs greater than 100ft, please consult with a certified electrician for correctly sizing the supply wiring. If a fused disconnect is chosen to protect your fan, use only fuse types gG, J, or aR to maintain UL compliance.

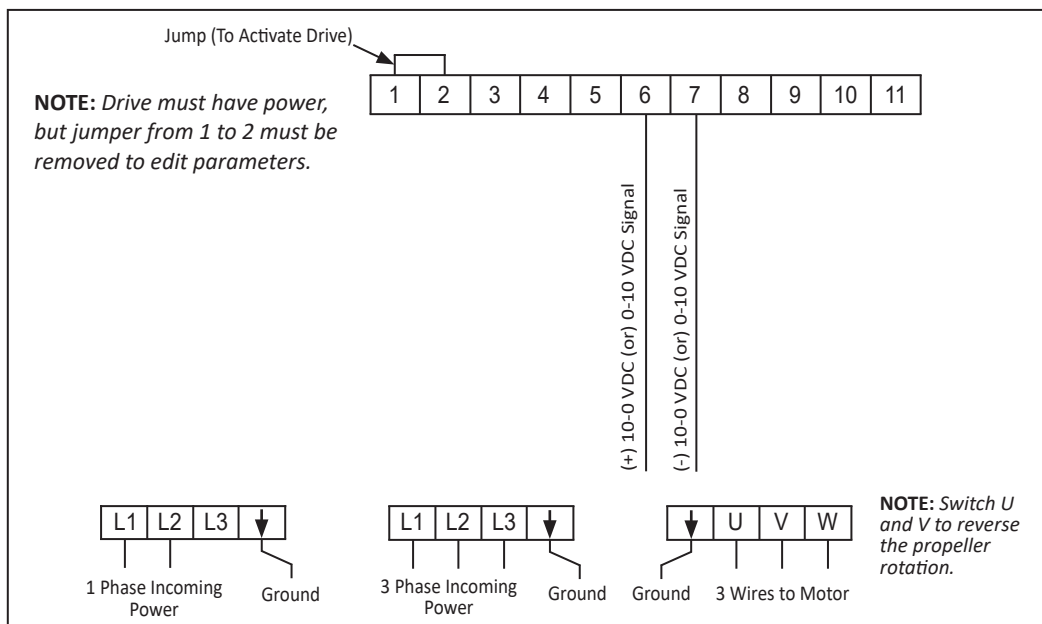
Current Ratings Per Fan Part Number			
		UL FUSE /	NEC MINIMUM
DRIVE TYPE (PART NUMBER)	INPUT CURRENT (A)	CIRCUIT BREAKER RATING (A)	SUPPLY WIRE GAUGE
921893	12.9	16	8 AWG
922139	9.5	16	8 AWG



## Step 2 (continued): Wiring the VFD

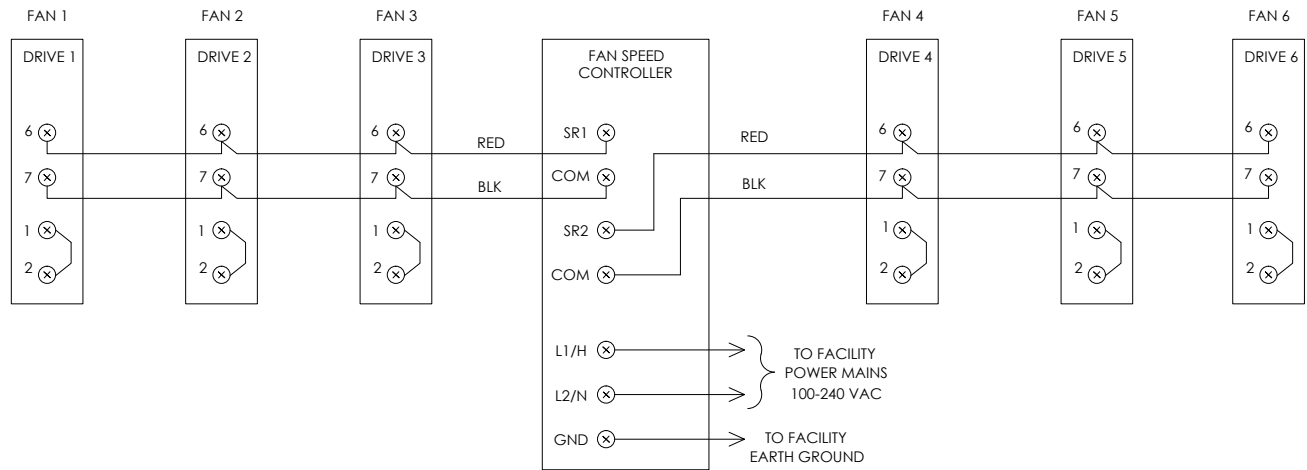


1. Connect the incoming power to L1, L2, L3 and ground for 3 phase (phase sequence is not important) and L1 / L, L2 / N and ground for single phase. Please reference Power Connection Locations Diagram above.  
**IMPORTANT:** Do not exceed 13 inch-pounds (1.5Nm) of torque on the power terminal connections.  
Wire gauge not to exceed 8 gauge for power connection terminals.
2. Control Terminal Wiring:
  - All analog signal cables should be suitably shielded. Twisted pair cables are recommended.
  - Power and Control Signal cables should be routed separately where possible, and must not be routed parallel to each other.
  - Signal levels of different voltages e.g. 24 Volt DC and 110 Volt AC, should not be routed in the same cable.
  - Maximum control terminal tightening torque is 0.5Nm.
  - Control Cable entry conductor size: 0.05 – 2.5mm<sup>2</sup> / 30 – 12 AWG.
3. This drive is programmed to work with a whole house controller that supports VFD fans via an analog output. Please reference the wiring diagram below. A jumper is provided, taped to the inside of the VFD cover.  
**IMPORTANT:** Do not exceed 4.4 inch-pounds (.5Nm) of torque on any control terminal connections.
4. Each Optidrive should be individually connected directly to the site ground.
5. Connect the VFD to your whole house controller or a fan speed controller (921885). Your whole house controller must have 0-10 volt DC output control, otherwise order 921885. Connect the controller variable output to terminals 6 and 7. Please reference wiring diagram below.
6. Tighten all cord grips when finished wiring the VFD.



### Step 3: Install Signal Cable Wires

Install signal cable wires connecting all fans that are to run together either back to a whole house controller or the fan speed controller (921885) as shown in the wiring diagram below.



**NOTE:** To wire in more than 3 drives per side, jump from Terminal 6 in the last drive to the next Drive Terminal 6 and from the last Drive Terminal 7 to the next Drive Terminal 7.

Maximum number of fans for 921885 per speed reference control is 10.

### Step 4: Install Jumper

With power disconnected, install jumper which is taped to the back of the VFD cover to terminals 1 & 2 and then reinstall cover.



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