

**VFD Troubleshooting Guide**

**1. Information:**

Customer Name: \_\_\_\_\_ Tested By: \_\_\_\_\_  
 Serial # \_\_\_\_\_ Model # \_\_\_\_\_  
 Temperature of Drive \_\_\_\_\_ °C Operating Ambient Temperature \_\_\_\_\_ °C

**2. Power System:**

Voltage \_\_\_\_\_ Transformer Size \_\_\_\_\_ KVA  
 Secondary Connection  Star with Solid Ground  
 Star with Neutral Ground Resistor (NGR) \_\_\_\_\_ ohms  
 Star with Neutral Ground Inductor \_\_\_\_\_ % Imp.  
 Delta  
 Delta with ZIGZAG transformer & NGR

**3. Motor Data:**

NEMA Design \_\_\_\_\_ Motor RPM \_\_\_\_\_  
 FLA of Motor \_\_\_\_\_ A Service Factor of Motor \_\_\_\_\_  
 Load: WK<sup>2</sup> \_\_\_\_\_ Load RPM \_\_\_\_\_  
 Breaker: Thermal Magnetic \_\_\_\_\_ Magnetic \_\_\_\_\_  
 Fusible: Type \_\_\_\_\_ Fuse Part # \_\_\_\_\_  
 Power Factor Caps \_\_\_\_\_ \* Must be on line side KVAR \_\_\_\_\_  
 Meter using: Manufacturer \_\_\_\_\_ Calibration Date \_\_\_\_\_  
 Application \_\_\_\_\_

**4. Power Off Tests:**

Is motor in circuit? Y N  
 Motor Insulation Test: Completed By \_\_\_\_\_ Megger Resistance \_\_\_\_\_ Scale \_\_\_\_\_

**4.1 Visual Inspection:**

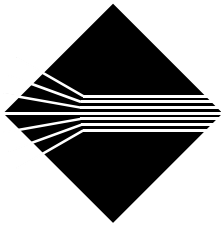
Visible burn marks? Y N  
 Loose connection? Y N  
 Smell test (burnt smell)? Y N

**4.2 Buss and Wiring:**

Check all power connections (customer and internal) for proper fastener torque. Examine all power connections for signs of burning or other damage indicating a poor connection.

**4.3 Resistance Checks:**

Disconnect wiring from R, S, T, U, V, and W when checking devices



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**4.4 INPUT DIODE MODULE:**

DMM set to Diode Check Mode

Probe +	Probe -	Display
R	DCN	INFINITE
R	DCP	0.3 – 0.4
S	DCN	INFINITE
S	DCP	0.3 – 0.4
T	DCN	INFINITE
T	DCP	0.3 – 0.4

DMM set to Resistance Check Mode

- R – DCP+ \_\_\_\_\_ ohms > 50K ohms
- S – DCP+ \_\_\_\_\_ ohms > 50K ohms
- T – DCP+ \_\_\_\_\_ ohms > 50K ohms
- R – DCN \_\_\_\_\_ ohms > 50K ohms
- S – DCN \_\_\_\_\_ ohms > 50K ohms
- T – DCN \_\_\_\_\_ ohms > 50K ohms

**4.5 IGBT MODULE:**

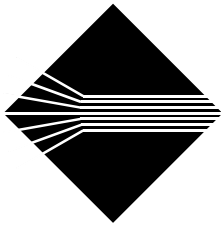
DMM set to Diode Check Mode

Probe +	Probe -	Display
U	DCN	INFINITE
DCN	U	0.3 ~ 0.4
U	DCP	0.3 ~ 0.4
DCP	U	INFINITE
V	DCN	INFINITE
DCN	V	0.3 ~ 0.4
V	DCP	0.3 ~ 0.4
DCP	V	INFINITE
W	DCN	INFINITE
DCN	W	0.3 ~ 0.4
W	DCP	0.3 ~ 0.4
DCP	W	INFINITE

DMM set to Resistance Check Mode

- U – DCP \_\_\_\_\_ ohms > 50K ohms
- V – DCP \_\_\_\_\_ ohms > 50K ohms
- W – DCP \_\_\_\_\_ ohms > 50K ohms
- U – DCN \_\_\_\_\_ ohms > 50K ohms
- V – DCN \_\_\_\_\_ ohms > 50K ohms
- W – DCN \_\_\_\_\_ ohms > 50K ohms

All gate to emitters should read the same resistance, ~2kΩ or ~ 10kΩ depending on the drive horsepower.



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**4.6 PRECHARGE CIRCUITRY:**

Status	Display
Contactor open	$\Omega$ of the precharge resistor
Contactor closed	Zero $\Omega$

**4.7 DB and Dynamic braking IGBT's:**

DMM set to Diode Check Mode

Collector - emitter

Probe +	Probe -	Display
DB2	DCN	0.3 ~ 0.4
DCN	DB2	INFINITE

Freewheeling diode, (DB resistor disconnected)

Probe +	Probe -	Display
B2	B1	0.3 ~ 0.4
B1	B2	INFINITE

DMM set to Resistance Check Mode

DB2 – DCN \_\_\_\_\_ ohms > 50 K ohms

G – DCN \_\_\_\_\_ ohms (few Kilo ohms)

**4.8 Fuses OK:**

DC Bus Fuse	Y	N
Control Power Fuses	Y	N
Power Fuses	Y	N