

# ACH550 No Power Test Procedure To Check Input Diodes and Output Transistors

**CAUTION:** This is a NO POWER Static Test Procedure. Verify Power has been removed from the VFD for at least 5 minutes prior to proceeding!

**Purpose:** Provide a safe no power Step-by-Step instructions on how to determine if a ACH550's input diode(s) or output transistor(s) have failed. These components may have failed if the drive input fuses or circuit breaker opened, or the drive keypad displays a fault such as Ground Fault, Short Circuit, or Overcurrent. Test results are based on using a diode ( $\rightarrow|$ ) setting on a multi-meter.

**Step 1:** Verify power has been removed from the drive for at least 5 minutes.

**Step 2:** Identify the drive you will be testing in Table 1, using the drive model number located on the drive rating label (nameplate).

Table 1: Drive Identification			
Voltage	Drive Model Number	HP	Power Terminal Figures
200/240	ACH550-UH-04A6-2 thru -031A-2	1-10	1, 2
	ACH550-UH-04A6-2 thru -114A-2	15-40	1
	ACH550-UH-143A-2 thru -248A-2	50-100	3
460/480	ACH550-UH-03A3-4 thru -023A-4	1-15	1, 2
	ACH550-UH-031A-4 thru -097A-4	20-75	1
	ACH550-UH-125A-4 thru -246A-4	100-200	3
575/600	ACH550-UH-02A7-6 thru -017A-6	2-15	1, 2
	ACH550-UH-022A-6 thru -062A-6	20-0	1
	ACH550-UH-077A-6 thru -144A-6	75-150	3

**Step 3:** Identify and familiarize yourself with the specific terminal locations for the drive selected in Step 2 using the designated figure(s) in Table 1. Note that some connections (-UDC) may not be terminals.

Figure 1

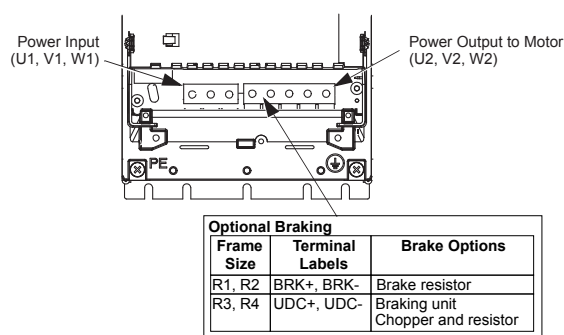


Figure 2

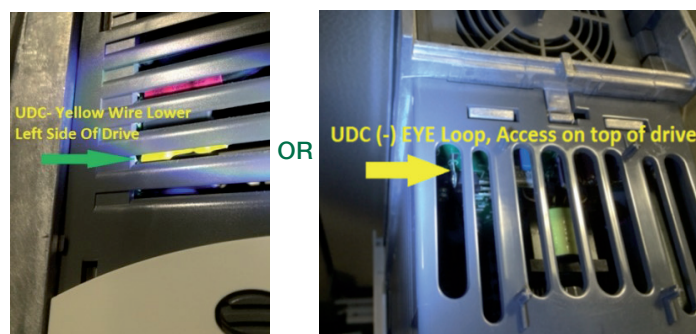
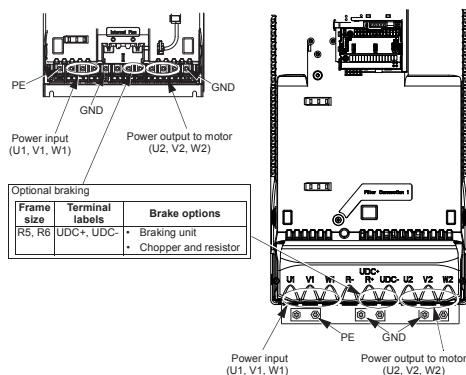


Figure 3



**Step 4:** Set your multi-meter to the Diode setting.

**Step 5:** To check the input bridge diodes place the multi-meter probes (positive and negative leads) on the indicated terminal pair locations listed in Test 1 and record your results for each input bridge diode being measured.

Test 1: Input Diode Bridge Circuit				
Meter + Probe Terminal	Meter (-) Probe Terminal	Expected Results*	Diode Being Measured	Your Results
U1	+UDC/R+	~0.4	U1 Upper	
V1	+UDC/R+	~0.4	V1 Upper	
W1	+UDC/R+	~0.4	W1 Upper	
-UDC	U1	~0.4	U1 Lower	
-UDC	V1	~0.4	V1 Lower	
-UDC	W1	~0.4	W1 Lower	
U1	-UDC	OL	U1 Lower	
V1	-UDC	OL	V1 Lower	
W1	-UDC	OL	W1 Lower	
+UDC/R+	U1	OL	U1 Upper	
+UDC/R+	V1	OL	V1 Upper	
+UDC/R+	W1	OL	W1 Upper	

**Step 6:** To check the output transistors (IGBTs) place the multi-meter probes (positive and negative leads) on the indicated terminal pair locations listed in Test 2 and record your results for each output transistor circuit being measured.

Test 2: Output Transistor (IGBT) Circuit				
Meter + Probe Terminal	Meter (-) Probe Terminal	Expected Results*	Diode Being Measured	Your Results
U2	+UDC/R+	~0.4	U2 Upper	
V2	+UDC/R+	~0.4	V2 Upper	
W2	+UDC/R+	~0.4	W2 Upper	
-UDC	U2	~0.4	U2 Lower	
-UDC	V2	~0.4	V2 Lower	
-UDC	W2	~0.4	W2 Lower	
U2	-UDC	OL	U2 Lower	
V2	-UDC	OL	V2 Lower	
W2	-UDC	OL	W2 Lower	
+UDC/R+	U2	OL	U2 Upper	
+UDC/R+	V2	OL	V2 Upper	
+UDC/R+	W2	OL	W2 Upper	

#### NOTES:

\*Results may range from 0.4 - 0.7 depending on drive size and meter being used. Looking for consistency in results for all input diode bridge tests, and output transistors respectively to determine if component is functional.

\*\*The process of checking the output transistors is to measure the fly-back diode in parallel to the transistor. In almost all scenarios of the failure of the transistor it will cause either a shorting, or opening of the fly-back diode.

**NOTE:** If you have a drive indicated in the table below, complete Step 7, otherwise proceed to conclusion:

Voltage	Drive Model Number	HP
200/240	ACH550-UH-04A6-2 thru -031A-2	1-10
460/480	ACH550-UH-03A3-4 thru -023A-4	1-15
575/600	ACH550-UH-02A7-6 thru -017A-6	2-15

**Step 7:** To check the brake circuit diodes place the multi-meter probes (positive and negative leads) on the indicated terminal pair locations listed in Test 3 and record your results for each brake circuit being measured.

Test 3: Brake Chopper Circuit				
Meter + Probe Terminal	Meter (-) Probe Terminal	Expected Results*	Diode Being Measured	Your Results
+UDC/BRK+	BRK-	OL	BRK Diode	
BRK-	+UDC/BRK+	~0.4	BRK Diode	
BRK-	-UDC	OL	BRK Transistor	

#### Conclusion:

Test results showing 0.0 Vdc instead of ~0.4 Vdc indicate a shorted drive component. Test results showing OL instead of ~0.4 Vdc indicate an open circuit. In either case of an open or shorted circuit, the drive has a failed component and either needs to be repaired or replaced.

Contact ABB Technical Support at 1-800-752-0696 or your local ABB representative.

For more information please contact:

#### ABB Inc.

Discrete Automation & Motion  
Drives and Controls  
New Berlin, WI 53151  
Ph: (800) 752-0696

[www.abb.com/drives](http://www.abb.com/drives)

© Copyright 2015 ABB. All rights reserved.  
Specifications subject to change without notice