

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 ($\text{---}|\text{---}$) 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).

Voltage	Drive Model Number	HP	Power Terminal Figures
200/240	ACH550-UH-04A6-2 thru -031A-2	1-10	1, 2
	ACH550-UH-046A-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

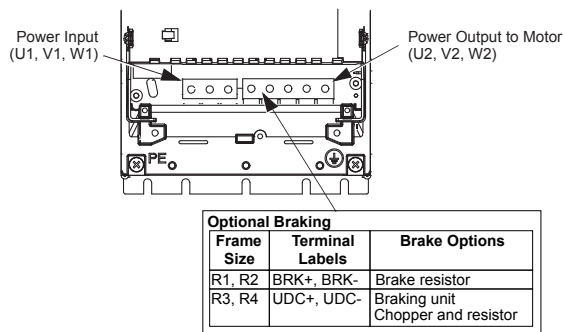


Figure 2

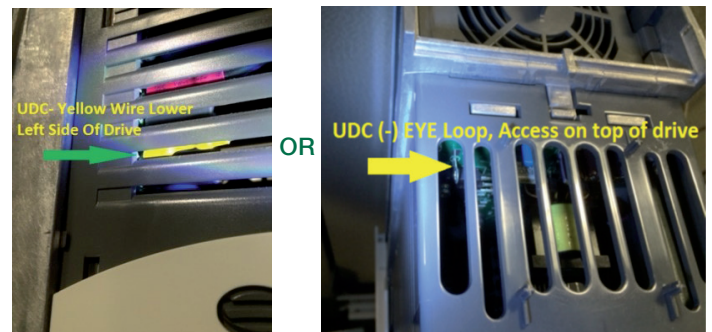
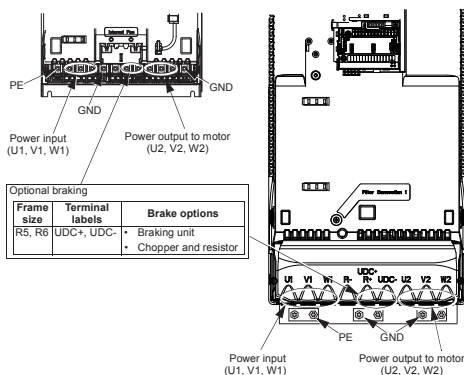


Figure 3



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:

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