

 ABB Oy, Drives Service		On-Site Service Instructions		Document nbr 3AXD10000303479
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3.5 Replacement of main circuit semiconductor modules

3.5.1 Measuring semiconductor condition from main connectors

The condition of an IGBT and an input bridge can be measured with a multimeter to ensure component functionality. In this section there are given the pass criteria for values measured from main connectors. In order to measure IGBT condition directly from IGBT pins, see section 3.5.2 *Measuring IGBT condition*. In the tables below the infinite value is OL = Over limit.

Note: Always make sure there is no voltage connected to input terminals. In case a permanent magnet motor is used, the motor axel must not rotate as it would feed voltage to drive side.

STEP 1	Input bridge diode measurement		
Performance	Use a multimeter to make sure that the measurements for the input bridge diodes are OK.		
Pass criteria	By using the diode measurement setting for the multimeter, you should get the following values: Note: In case of a controlled charging circuit, the input bridge measurement is not possible for all phases.		
	+ probe	- probe	Display
	L1	+DC	~1,1 Vdc
	L2	+DC	OL
	L3	+DC	OL
	+DC	L1	OL
	+DC	L2	OL
	+DC	L3	OL
	+ probe	- probe	Display
	L1	- DC	OL
	L2	- DC	OL
	L3	- DC	OL
	- DC	L1	~0,45 Vdc
	- DC	L2	~0,45 Vdc
	- DC	L3	~0,45 Vdc
Meaning of the test	To ensure that the input bridge diodes are OK.		

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STEP 2	IGBT freewheeling diode measurement																																										
Performance	Use a multimeter to make sure that the measurements for the output bridge freewheeling diodes are OK.																																										
Pass criteria	<p>By using the diode measurement setting for the multimeter, you should get the following values:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">+ probe</th> <th style="width: 33%;">- probe</th> <th style="width: 33%;">Display</th> </tr> </thead> <tbody> <tr> <td>U</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>V</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>W</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>+DC</td> <td>U</td> <td>OL</td> </tr> <tr> <td>+DC</td> <td>V</td> <td>OL</td> </tr> <tr> <td>+DC</td> <td>W</td> <td>OL</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">+ probe</th> <th style="width: 33%;">- probe</th> <th style="width: 33%;">Display</th> </tr> </thead> <tbody> <tr> <td>U</td> <td>- DC</td> <td>OL</td> </tr> <tr> <td>V</td> <td>- DC</td> <td>OL</td> </tr> <tr> <td>W</td> <td>- DC</td> <td>OL</td> </tr> <tr> <td>- DC</td> <td>U</td> <td>~0,4 Vdc</td> </tr> <tr> <td>- DC</td> <td>V</td> <td>~0,4 Vdc</td> </tr> <tr> <td>- DC</td> <td>W</td> <td>~0,4 Vdc</td> </tr> </tbody> </table>	+ probe	- probe	Display	U	+DC	~0,4 Vdc	V	+DC	~0,4 Vdc	W	+DC	~0,4 Vdc	+DC	U	OL	+DC	V	OL	+DC	W	OL	+ probe	- probe	Display	U	- DC	OL	V	- DC	OL	W	- DC	OL	- DC	U	~0,4 Vdc	- DC	V	~0,4 Vdc	- DC	W	~0,4 Vdc
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- DC	W	~0,4 Vdc																																									
Meaning of this test	To ensure that the output freewheeling diodes are OK.																																										