



DC DRIVE

**BC153 ELECTRONIC FORWARD BRAKE REVERSE**

**Installation and Operating Manual**

6/98

MN1370

## **TABLE OF CONTENTS**

<b><u>Section</u></b>	<b><u>Page</u></b>
i. Safety Warning .....	1
I. Operation .....	2
II. Setup.....	2
III. Mounting .....	3
IV. Wiring.....	4
V. Limited Warranty.....	10

### **TABLES**

1. BC153 Operation .....	2
2. General Performance Specifications .....	2
3. BC153 to BC154 or BCWD140 Connections .....	5
4. Parts List.....	7

### **FIGURES**

1. BC153 Mounted in the BC154 or BCWD140.....	3
2. BC154 and BCWD140 Jumper Removal .....	4
3. Switch Mounting.....	5
4. Remote Relay Contacts .....	5
5. Internal Wiring Diagram.....	6
6. Schematic .....	8
7. Mechanical Specifications .....	9



#### **i. SAFETY WARNING! C PLEASE READ CAREFULLY**

This product should be installed and serviced by a qualified technician, electrician or electrical maintenance person familiar with its operation and the hazards involved. Proper installation, which includes wiring, mounting in proper enclosure, fusing or other overcurrent protection and grounding, can reduce the chance of electric shocks, fires or explosions in this product or products used with this product, such as electric motors, switches, coils, solenoids and/or relays. Eye protection must be worn and insulated adjustment tools must be used when working with control under power. This product is constructed of materials (plastics, metals, carbon, silicon, etc.) which may be a potential hazard. Proper shielding, grounding and filtering of this product can reduce the emission of radio frequency interference (RFI) which may adversely affect sensitive electronic equipment. If information is required on this product, contact our factory. It is the responsibility of the equipment manufacturer and individual installer to supply this safety warning to the ultimate user of this product. (SW effective 11/92)

This control contains Start/Stop and Inhibit circuits that can be used to start and stop the control. However, these circuits are never to be used as safety disconnects since they are not fail-safe. Use only the AC line for this purpose.

The input circuits of this control (potentiometer, Start/Stop, Inhibit) are not isolated from AC line. **Be sure to follow all instructions carefully. Fire and/or electrocution can result due to improper use of this product.**



**This product complies with all CE directives pertinent at the time of manufacture. Contact factory for detailed installation instructions and Declaration of Conformity.**

**TABLE 1 B BC153 OPERATION**

Switch Position	Switch Connection		Output Polarity	
	A1	A2		
Forward (FWD)	S1, S2	+	-	
Brake (BRK) None (Center off)*		0	0	
Reverse (REV)	S2, S3	-	+	

**\*Note:** If no connection is made to S1, S2 and S3, the BC153 is in the brake mode which will rapidly stop the motor.

**I. OPERATION.**

The BC153 provides anti-plug instant reverse and solid state dynamic braking. It has been specifically designed for installation into the BC154 or BCWD140 speed control. The patented circuitry senses armature voltage and permits armature switching to take place only when current levels are near zero. This eliminates contact arcing normally associated with relay reversing circuits.

Braking is achieved via an electronic circuit utilizing an SCR and brake resistor. An LED indicates when the BC153 is in the brake mode. Operation is made via a SPDT switch with center off.

Do not use with BC160 5HP control, because BC153 has insufficient capacity. The unit installs easily into the inside cover of the BC54 or BCWD140 control. **Note:** Installation of the BC153 into the BCWD140 requires removal of the manual Forward-Brake-Reverse Switch. Wiring is made via quick-connect terminals.

**II. SET UP.**

Be sure the Jumpers J1 and J2 on the BC153 are both set to the proper AC line input voltage, 115 or 230VAC. Note: This should be the same setting as the Jumpers J2A and J2B are set for on the BC154 or BCWD140 main board which should correspond to the correct AC line input voltage. Refer to the BC154 and BCWD140 Installation and Operating Instruction Manual for complete information.

**TABLE 2 B GENERAL PERFORMANCE SPECIFICATIONS**

Input AC line voltage B 50/60 Hz.....	115/230
Maximum number of run/brake or forward/reverse operations per minute* .....	4
Ambient temperature range (°C) .....	0 B 50

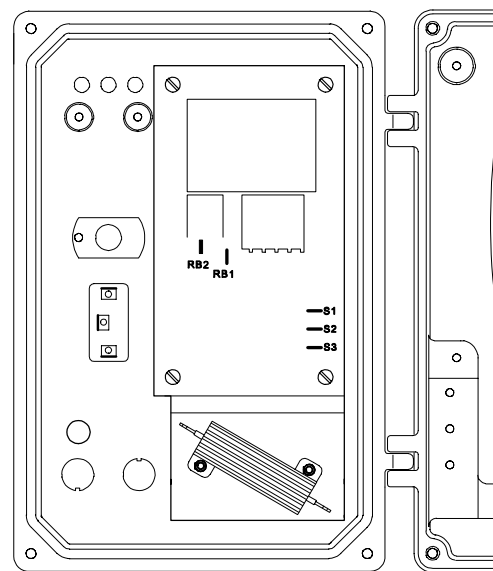
### III. MOUNTING.

1. Mount the BC153 on the 4 bosses located on the inside cover of the BC154 or BCWD140 using the four (4) # 6-32 screws provided. Position the BC153 so that the brake resistor is toward the bottom of the cover. Be sure not to trap any wires under the BC153 mounting bracket. (See fig. 1.)

**Note: Installation of the BC153 into the BCWD140 requires removal of the manual Forward-Brake-Reverse Switch.**

2. To mount the FWD-BRK-REV switch in the BC154 or BCWD140 first remove the rubber plug in the FWD-BRK-REV position by unscrewing the retainer nut on the inside cover. (See fig. 3 p. 5.)
3. Install the FWD-BRK-REV switch assembly into the front cover making sure the key in the hole lines up with the keyway in the switch bushing. Be sure the hex nut supplied is installed at the base of the switch bushing before inserting switch into the BC154 or BCWD140 cover.
4. Install the rubber switch boot with integral hex nut over switch lever. Switch should be in the stop position to facilitate installation. Also, the switch bushing threads should protrude no more than .25" (6.4mm) or no less than .10" (2.6mm) through the front cover for proper installation. Tighten the switch boot so that the bottom seals against the cover label. Do not overtighten.

FIG. 1 B BC153 MOUNTED IN THE BC154 or BCWD140



- 

**FIG. 2 B BC154 or BCWD140 JUMPER REMOVAL**

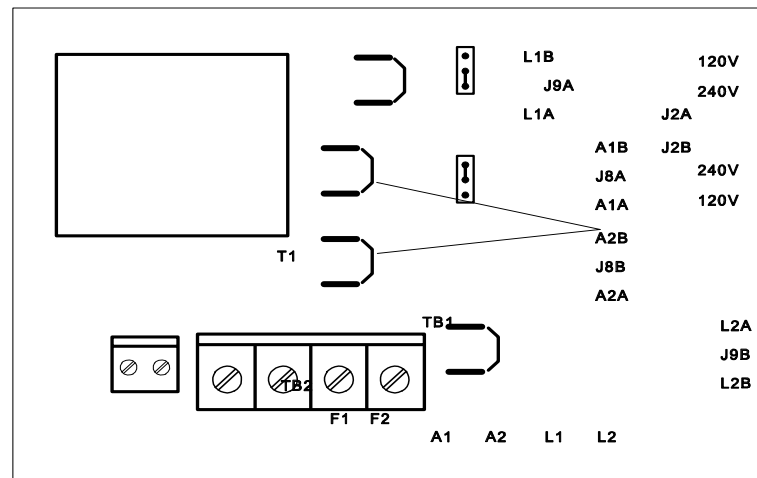


FIG. 3 B SWITCH MOUNTING

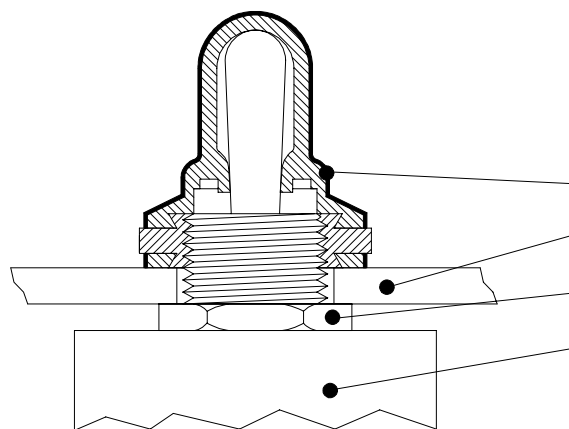
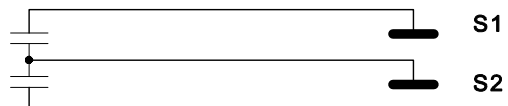


FIG. 4 B REMOTE RELAY CONTACTS



RL  
BC  
CC  
HE  
SV

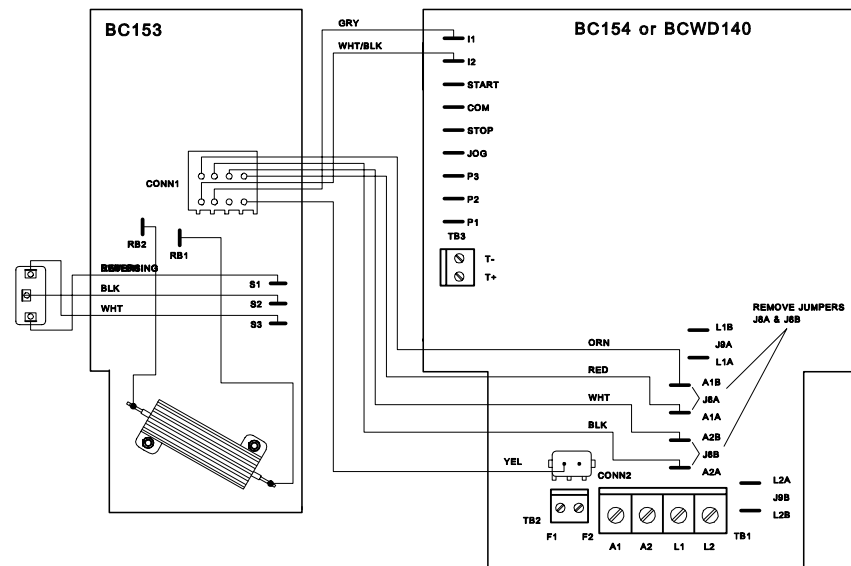
TABLE 3 B BC153 TO BC154 OR BCWD140 CONNECTIONS  
BC153 Wire Color    Terminal Position on BC154 or BCWD140 PC Board

Red	A1A
Orange	A1B
Black	A2A
White	A2B
Gray	I1
White / Black	I2
Yellow	F1*

**\*Note:**

Newer models contain a connector on the yellow BC153 lead. Observe correct polarity and insert the plug onto the mating connector just behind terminal block TB2. (See fig. 5, p. 6)

FIG. 5 B INTERNAL WIRING DIAGRAM



To avoid erratic operation do not bundle AC line and motor wires with reversing, potenti-ometer, voltage following, enable, inhibit or other signal wiring. Use shielded cables on all signal wiring over 12" (30 cm) B Do not ground shield.

**Note:**  
Reversing switch can be remotely mounted.



TABLE 4 B PARTS LIST

Ckt Ref	Specification	Manufacturer-Type	Description
C1			
C2,5,6,13			
C3,4			
C7			
C8			
C9,10			
C11			
C12			
C14			
D1-3,6			
D4,5,7			
IC1			
IC2			
IC3			
LED1			
Q1,4			
Q2,5			
Q3	100μF-35V-20%		
	0.01μF-50V-20%		
	0.022μF-50V-20%		
	0.01μF-50V-20%		
	1μF-35V-20%		
	0.1μF-50V-20%		
	10μF-100V-20%		

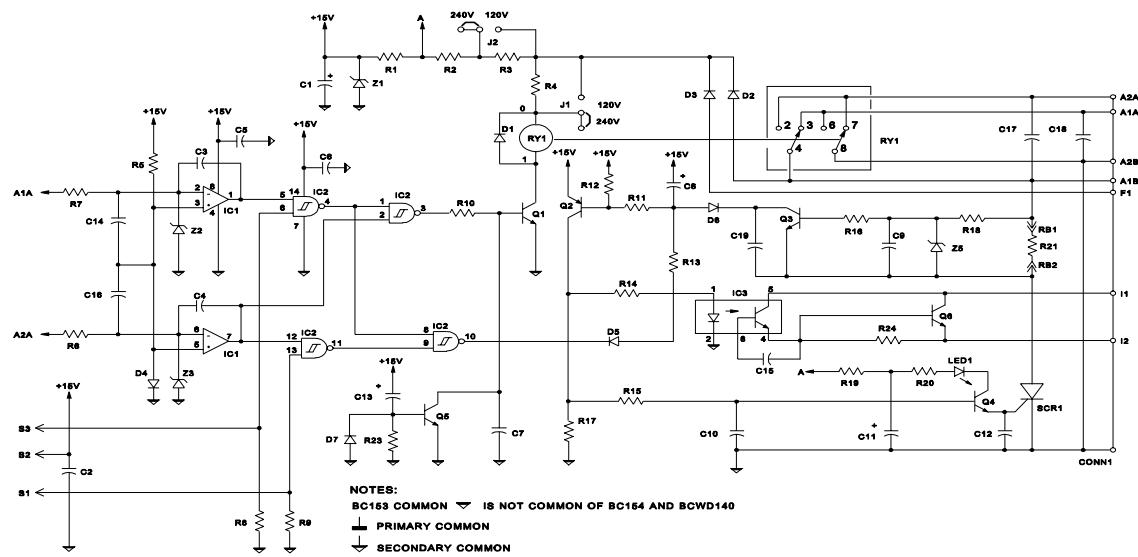


FIG. 6 B SCHEMATIC

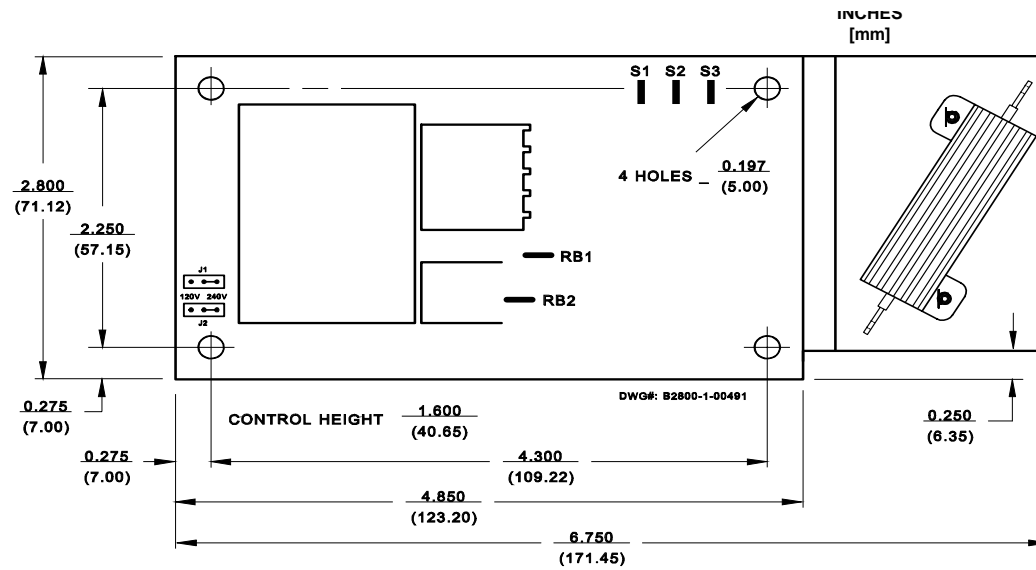


FIG. 7 B MECHANICAL SPECIFICATIONS

#### **X. B LIMITED WARRANTY**

For a period of 2 years from date of original purchase, BALDOR will repair or replace without charge controls which our examination proves to be defective in material or workmanship. This warranty is valid if the unit has not been tampered with by unauthorized persons, misused, abused, or improperly installed and has been used in accordance with the instructions and/or ratings supplied. This warranty is in lieu of any other warranty or guarantee expressed or implied. BALDOR shall not be held responsible for any expense (including installation and removal), inconvenience, or consequential damage, including injury to any person, caused by items of our manufacture or sale. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply.) In any event, BALDOR's total liability, under all circumstances, shall not exceed the full purchase price of the control. Claims for purchase price refunds, repairs, or replacements must be referred to BALDOR with all pertinent data as to the defect, the date purchased, the task performed by the control, and the problem encountered. No liability is assumed for expendable items such as fuses.

Goods may be returned only with written notification including a BALDOR Return Authorization Number and any return shipments must be prepaid.



**Baldor Electric Company**  
P. O. Box 2400  
Fort Smith, AR 72902-2400 U.S.A.  
(501) 646-4711 Fax (501) 648-5792  
International Fax (501) 648-5895

(A40220) B Rev. A B 5/98