CBC-300 & CBC-300-1 Series
Dual Channel Adjust Clutch/Brake Controls

Installation & Operating Instructions

P-2105-WE
819-0549

Warner Electric

An **Altra Industrial Motion** Company

Contents

⚠WARNING Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

Introduction

Warner Electric's CBC-300 and CBC-300-1 are constant current, solid state electronic power supplies designed to operate any of the Warner Electric 90 Volt clutches and brakes, including fail safe designs. They can operate a single clutch or brake, two clutches, two brakes, a combination clutch and brake, or a combination clutch and fail safe brake, depending on the switching arrangement used and the application requirements.

The CBC-300 series controls operate from 120 VAC single-phase input power. They provide constant current output as set by the torque adjustment potentiometers on the front panel or remote potentiometer. On the CBC-300 series both outputs are adjustable. Output current ranges are selectable for the adjustable output channels in one of five ranges by the DIP switches located on the control's printed circuit board.

Two versions of the CBC-300 are provided to handle a wide range of applications. The standard version is offered the same as before. The CBC-300-1 version is available where an external limit adjustment potentiometers are required.

Operations of both units are identical except for the method of the control potentiometer mounting. The CBC-300-1, external potentiometer option, has terminal blocks mounted on the PC boards for connection of the potentiometers.

The potentiometers used can be supplied either as optional accessory items or be obtained from a local electronic supply house.

An internal 1.5A FA fuse is provided for line to ground shorts.

Two LED indicators are provided on the front panel of the control for "POWER" and "SHORT" indications. The green indicator marked "POWER" is illuminated whenever the AC input power is applied to the control. A red indicator marked "SHORT" is illuminated whenever a short circuit condition occurs in either of the outputs. To reset, power must be removed, the shorted condition cleared, and the AC input power reapplied to the control.

The enclosed version may be used with or without the cover. Removal of the plastic cover when the control is used in an enclosure will increase the operating temperature range of the control.

Specifications

Input Power: 120 VAC, +10%, -15%, 50/60 Hz, single phase, 215 VA maximum.

Output: Pulse-width modulated full wave rectified DC. Constant current, switch selectable ranges designed for 90 volt DC clutches and brakes.

Ambient Temperature: -32°F to + 113°F (0°C to + 45°C) with plastic cover installed. -32°F to +150°F (0°C to + 66°C) with plastic cover removed, or board assembly only.

Circuit Protection: Internal short circuit protection on outputs. An internal fuse is provided for AC ground faults. It is rated at 1.5A FA replaceable (5 mm X 20 mm).

Control Adjust: CBC-300 via front panel potentiometer for current adjustment.

CBC-300-1 via external mounted potentiometer for current adjustment.

Status Indicators: "POWER" – green LED indicating AC power is applied to the control.

"SHORT" – red LED indicating that a short circuit condition exists on one or both of the outputs.

Internal Adjustments: Current Range Selection via DIP switches, SW1 for Channel 1 and SW2 for Channel 2.

Current Ranges:

Switch Setting	1	2	3	4	5
Max Output, ma	60	175	245	305	533

External Switching: Mechanical or Electro-mechanical Switching: Customer supplied, 1 amp, 125 V minimum rating.

Solid-state NPN isolated transistor
Customer supplied, 2 amp, 250V minimum rating. Maximum off state leakage current < 1 ma.

External Pots:

Remote current adjust pot
Customer supplied: 10,000 ohm, 2 watt, linear, maximum distance from control to potentiometer not to exceed 10 feet.

Optional Accessory Pot Kit;
part number, 6011-101-002

Wiring Entrance: Two 7/8" diameter entrance holes located on the bottom of the control chassis on enclosed units. No conduit entrances are on chassis mount versions.

Enclosure: Rated NEMA 1 only – Control must be kept clear of foreign materials, dust, grease and oil which might affect its operation.

Part Numbers:

Enclosed Versions

CBC-300	6021-448-009
CBC-300-1	6021-448-002

Mounting

Enclosed Units

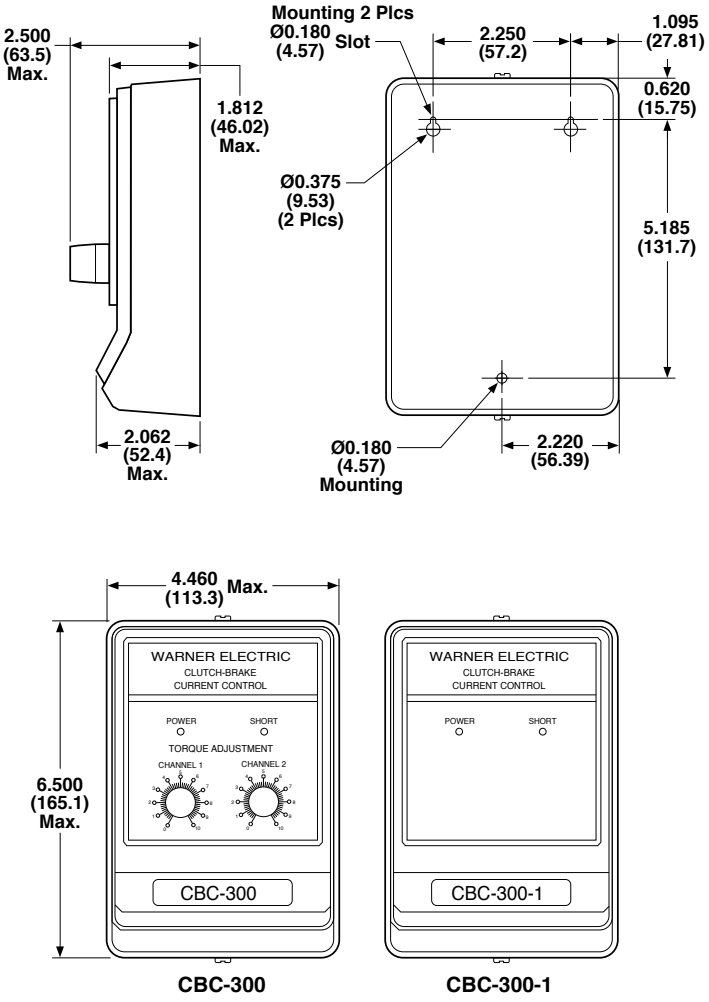
Any vertical, horizontal, or angled surface is suitable for mounting the CBC-300 and CBC-300-1.

Follow these procedures to mount your control.

- ❑ 1. Remove the front cover by removing the top and bottom retaining screws.
- ❑ 2. Set the control on the mounting surface and mark for the three mountings holes in accordance with “Dimensions.” (See Figure 1)
- ❑ 3. Install the top two mounting bolts or screws until they are nearly flush, set the control over the larger top mounting holes and pull down to position the control.
- ❑ 4. Tighten the top bolts or screws and install the bottom bolt or screw and tighten.

This completes the mounting of the control. The control is now ready for final wiring. Refer to the wiring section for final wiring.

- ❑ 1. If the CBC-300-1 control is used, first pre-wire the external potentiometers. Refer to: External Potentiometer wiring for CBC-300-1, page 5
- ❑ 2. If the CBC-300 control is used, refer to: Final Wiring, page 6



(Figure 1)

External Potentiometer wiring for CBC-300-1

- ❑ 1. Remove the four screw that hold the bracket assembly and PC Board to the chassis.

- ❑ 2. Route the potentiometer cable(s) through one of the conduit entrance holes on the bottom of the unit and wire to the appropriate terminal block on the PC board. Refer to the wiring diagrams below for the proper connections.

CBC-300-1 External Current Limit Adjustment

- ❑ 1. Wire the external current limit potentiometer to Terminal Block TB-3 for Channel 1 and TB-4 for Channel 2 as shown in the diagram. (See Figures 6 & 7)

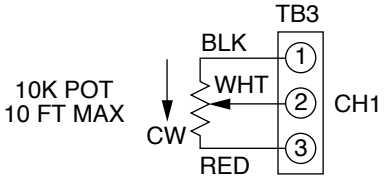
- ❑ 2. If the accessory potentiometer kit is used, wire the potentiometers per the colors as shown in the diagram.

- ❑ 3. Make sure all terminals are securely fastened and the wiring cable is secured so that it can't pull loose from the terminals.

This completes the preliminary wiring of the remote potentiometers. The control is now ready for final wiring. Refer to the wiring section for final wiring, page 6

Note: Be careful not to pinch or crimp the pot wiring to prevent shorting to the housing or components.

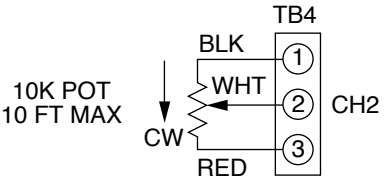
TB-3
CBC-300-1
External Current
Limit Adjust



10K, 2W POT
10% TOL, LINEAR OR
6011-101-002
ACCESSORY KIT (1)

(Figure 6)

TB-4
CBC-300-1
External Current
Limit Adjust



10K, 2W POT
10% TOL, LINEAR OR
6011-101-002
ACCESSORY KIT (1)

(Figure 7)

CBC-300/CBC-300-1
Final Wiring

Electrical Connections

⚠WARNING All electrical current must be off when making electrical connections to prevent injury or death which can result from contact with live wires.

AC Input Power Connections

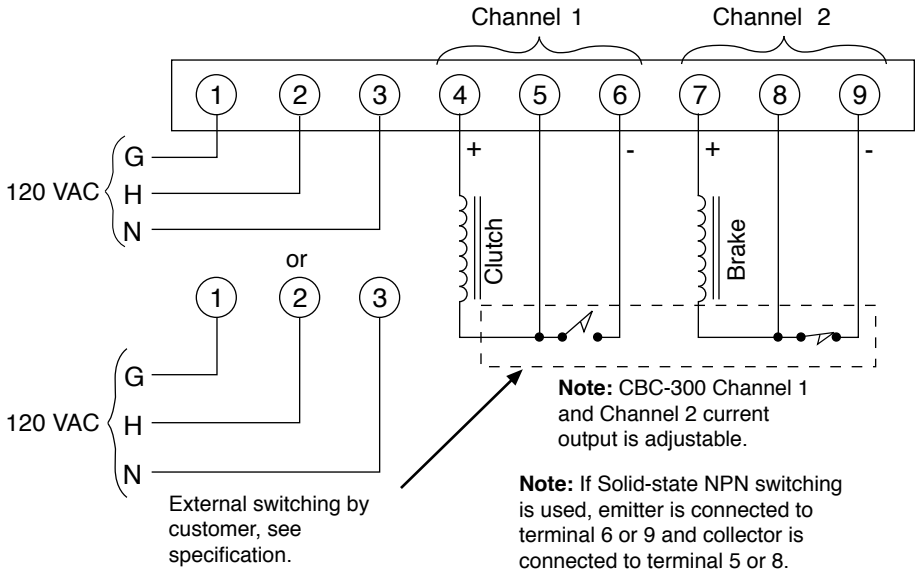
- ❑ 1. Connect Earth Ground wire to Terminal 1 and tighten securely.
- ❑ 2. Connect the Hot side of the 120 VAC line to Terminal 2 and tighten securely.
- ❑ 3. Connect the neutral side of the 120 VAC line to Terminal 3 and tighten securely.
- ❑ 4. Determine which clutch/brake arrangement is to be used and proceed to the appropriate wiring section (Normal wiring or Electrically Released Wiring, page 7).

Normal Clutch–Brake Wiring (Power applied clutch or brakes)

- ❑ 1. Connect either the clutch or brake magnet to Terminals 4 and 5. Tighten Terminal 4 securely.
- ❑ 2. Connect the other magnet, either brake or clutch to Terminals 7 and 8. Tighten Terminal 7 securely.
- ❑ 3. Connect switching for Channel 1 to Terminals 5 and 6. Tighten both terminals securely.
- ❑ 4. Connect switching for Channel 2 to Terminals 8 and 9. Tighten both terminals securely.
- ❑ 5. Set DIP Switch, SW1 for proper current setting before applying power to the control.

See Internal Switch Settings Chart for proper DIP Switch settings

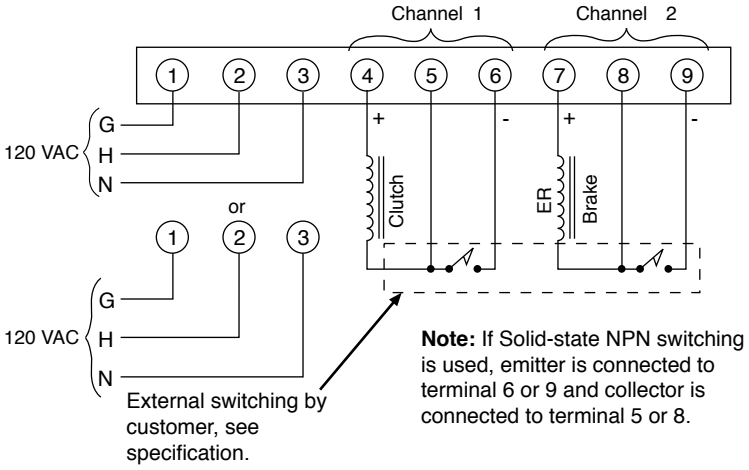
- ❑ 6. If external potentiometers are being used, then proceed to the external potentiometer wiring section. If external potentiometers are not used, this completes the wiring of the control.
- ❑ 7. Double check all connections before applying power.



(Figure 3)

Clutch – Electrically Released Brake Wiring (Power on clutch / power off Brake)

- ❑ 1. Connect the Brake to Terminals 4 and 5. Observe the polarity when making connections. Tighten Terminal 4 securely.
- ❑ 2. Connect the Clutch to Terminals 7 and 8. Tighten Terminal 7 securely.
- ❑ 3. Connect the switching for Channel 1 to Terminals 5 and 6. Tighten terminals securely.
- ❑ 4. Connect the switching for Channel 2 to Terminals 8 and 9. Tighten terminals securely.
- ❑ 5. Set DIP Switch, SW1 for proper current setting before applying power to the control. See Internal Switch Settings Chart for proper DIP Switch settings.
- ❑ 6. If external potentiometers are being used, then proceed to the external potentiometer wiring section. If they are not used, this completes the wiring of the control.
- ❑ 7. Double check all connections before applying power.



(Figure 4)

Internal Adjustments

The internal DIP Switch on the control circuit board adjusts the control for the proper current range to the clutch and/or brake coil being used. The Chart below indicates the proper setting based on coil resistance and Warner Electric product. To adjust for products not listed, obtain coil resistance information and set switches per coil resistance.

Switch DIP No.	1	2	3	4	5
Coil Resistance at 20° C (W)	1000-1550	350-999	250-349	205-249	100-204
Current Range	0 - 60 ma	0 - 175 ma	0 - 245 ma	0 - 305 ma	0 - 533 ma
Warner Electric	SF-120	EC-375	ATC-25	SF-500	ATC-115
Clutch Models	SF-170 SF-250 SF-400	EC-475 EM-50 EM-100 EM-180 UM-50 UM-100 UM-180 UM-50C UM-180C EUM-50 EUM-100 EUM-180	PC-500 SF-825 PC-1000 SF-1225 PC-1225 PC-1525 EC-1000 EM-210 UM-210 UM-215 UM-210C EUM-210 EUM-215	SF-650 SF-825BM PC-825 SF-1000 EC-650 EC-825 EC-1225 ATC-55	SF-1525 (Not SF-1525HT Models)
Warner Electric Brake Models	PB-120 PB-170 PB-250 PB-400	EB-375 EB-475 EM-50 EM-100 EM-180 UM-50 UM-100 UM-180 UM-50C UM-180C EUM-50 EUM-100 EUM-180	ATB-25 PB-500 PB-650 PB-1000 PB-1225 PB-1525 EB-650 EB-1000 EB-1225 EMFB-50 UMFB-50 ER/FB-375 EM-210 UM-210 UM-215 UM-210C EUM-210 EUM-215	EB-825 EMFB-180 UMFB-180 ER/FB-475 ATB-55 ER-825	EMFB-210 UMFB-210 ER/FB-650 ATB-115

Note: Only one switch number is to be set to the “on” position at any time.

System Troubleshooting

A. Symptom:
Green LED indicator marked "Power" does not come on when power is applied to the CBC-200 Controller.

Probable Cause	Solution
No Power is applied to the Control	• Check that AC power is applied to the control. • Incorrect wiring on AC power to the control. • Check for 120 VAC at Terminals 2 and 3 with an AC Voltmeter.
Internal line fuse is blown	• Check for blown fuse – replace.
Indicator LED is defective	• Check for 120 VAC at Terminals 2 and 3 of the control. • Check for output voltage at output terminals for Channel 1 and Channel 2. If voltage is not present, replace control or board.

B. Symptom: Red LED marked "short" illuminates

Probable Cause	Solution
Shorted magnet coil	• Check resistance of magnet coil used and replace if necessary.
Wiring between control and magnet shorting	• Check for shorted conditions in wiring between the magnets and the control, and wiring to chassis ground.
Improper magnet coil voltage	• Check magnet for proper coil voltage rating.
Transient noise	• Check for source of transient noise and suppress. Wire control using shielded cables. Segregate wiring runs.

C. Symptom: Magnets do not engage when power is applied.

Probable Cause	Solution
External switching improperly wired	• Check wiring and switch connections and rewire if necessary.
Torque adjust set to zero (0)	• Set torque adjustment potentiometer to maximum level.
Current range switch improperly set	• Check DIP Switch settings per chart and reset if required.
No power applied to the control	• Refer to Symptom A above.
System incorrectly wired	• Check wiring per the wiring diagram and rewire if necessary.
Fail safe brake used in place of power applied brake	• Check to insure that a fail safe brake is not being used in place of a power applied brake. Replace brake with correct brake.

D. Symptom: Magnets do not disengage when power is removed

Probable Cause	Solution
External switches incorrectly wired	• Check wiring of switching circuits and rewire if necessary.
Fail safe brake magnet being used	• Check to see if fail safe brake is being used in place of power applied brake.
Faulty control	• Replace control and see if problem is resolved.

E. Symptom: Magnets do not appear to have enough torque

Probable Cause	Solution
DIP Switch improperly set	• Check DIP switch setting per chart and reset if necessary.
Magnets incorrectly wired	• Check wiring between control and magnets and rewire if required.
Torque adjust potentiometer set too low	• Check setting of torque adjust potentiometer and set to maximum if required.
Magnets are incorrectly sized	• Verify sizing is correct by repeating selection process.

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