RELIANCE ELECTRIC

INSTRUCTION SHEET D2-3106
DYNAMIC BRAKING KIT
Model 1DB4005 and 1DB4010
For use with 2 thru 10 HP
GP-1200
General Purpose A-C V*S® Drive Controllers

WARNING

BEFORE INSTALLING AND/OR OPERATING THIS KIT, THE QUALIFIED ELECTRICAL MAINTENANCE PERSON WHO IS FAMILIAR WITH THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED SHOULD READ AND UNDERSTAND THIS ENTIRE INSTRUCTION SHEET. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY.

Description

The Dynamic Braking Kit provides rapid deceleration of the drive motor by providing 150% intermittent braking of the motor. When the D-C bus voltage (nominal 621 VDC) increases to 750 VDC, the controller automatically switches the dynamic braking resistor ON to discharge the excess voltage. The kit dissipates the power regenerated by the motor during deceleration through a resistor.

The dynamic braking resistor is protected by a fused thermal switch. If the temperature of the resistor reaches 210°C (410°F), the kit fuses blow, causing an Instantaneous Electronic Trip in the controller.

The Dynamic Braking Kit has two model numbers:

- Model number 1DB4005x* for 2 through 5 HP controllers.
- Model number 1DB4010x* for 7-1/2 through 10 HP controllers.

* x = U: UL Listed; C: CSA Approved.
no suffix = not UL Listed; not CSA Approved

The design specifications are listed below:

- Six starts/stops per minute.
- Maximum WR^2

  2.6 lb-ft^2 (1DB4005)
  6.6 lb-ft^2 (1DB4010)

- Resistor Wattage

  800 watts (1DB4005)
  1,600 watts (1DB4010)

- D-C Bus Fuses

  600 V, 20 A, Ferraz
  A060URB020T13

Installation

Note: All components of the Dynamic Braking Kit must be mounted in a clean and dry environment. Maximum ambient temperature must not exceed 55°C.

Wire sizings Note: Care should be taken to see that all interconnecting wiring is sized and installed in conformance with the National Electrical Code (NEC), published by the National Fire Protection Association, or the Canadian Electrical Code (CEC), and other applicable local codes.

DANGER

EQUIPMENT IS AT LINE VOLTAGE WHEN A-C POWER IS CONNECTED TO THE CONTROLLER. ALL UNGROUNDED CONDUCTORS OF THE A-C POWER LINE MUST BE DISCONNECTED FROM THE CONTROLLER. AFTER POWER IS REMOVED, USE A VOLTMETER AT TERMINALS 147(+) AND 45(—) TO VERIFY THAT THE D-C BUS FILTER CAPACITORS ARE DISCHARGED BEFORE TOUCHING ANY INTERNAL PARTS OF THE CONTROLLER OR INSTALLING KITS. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

1. Disconnect all power to the controller before installing this kit.
2. Remove the cover from the Dynamic Braking Kit by loosening the four screws.
3. Select a location within 30 feet of the controller where the heat generated by the resistor is not objectionable or hazardous and where convection air flow is unrestricted. Do not mount the unit under the controller. It is good practice to mount the unit above the normal reach of all personnel.

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4. Mount the unit vertically. Mounting hardware is not supplied. Refer to Figure 1 for physical size and mounting dimensions.
5. Remove the cover from the controller and lower the faceplate.
6. Connect a ground wire from the ground terminal in the kit to the chassis GND terminal in the controller.
7. Wire between the controller and the Dynamic Braking Kit in accordance with Figure 2 and all codes. Use wire that is rated at a minimum of a t least 600 volts.

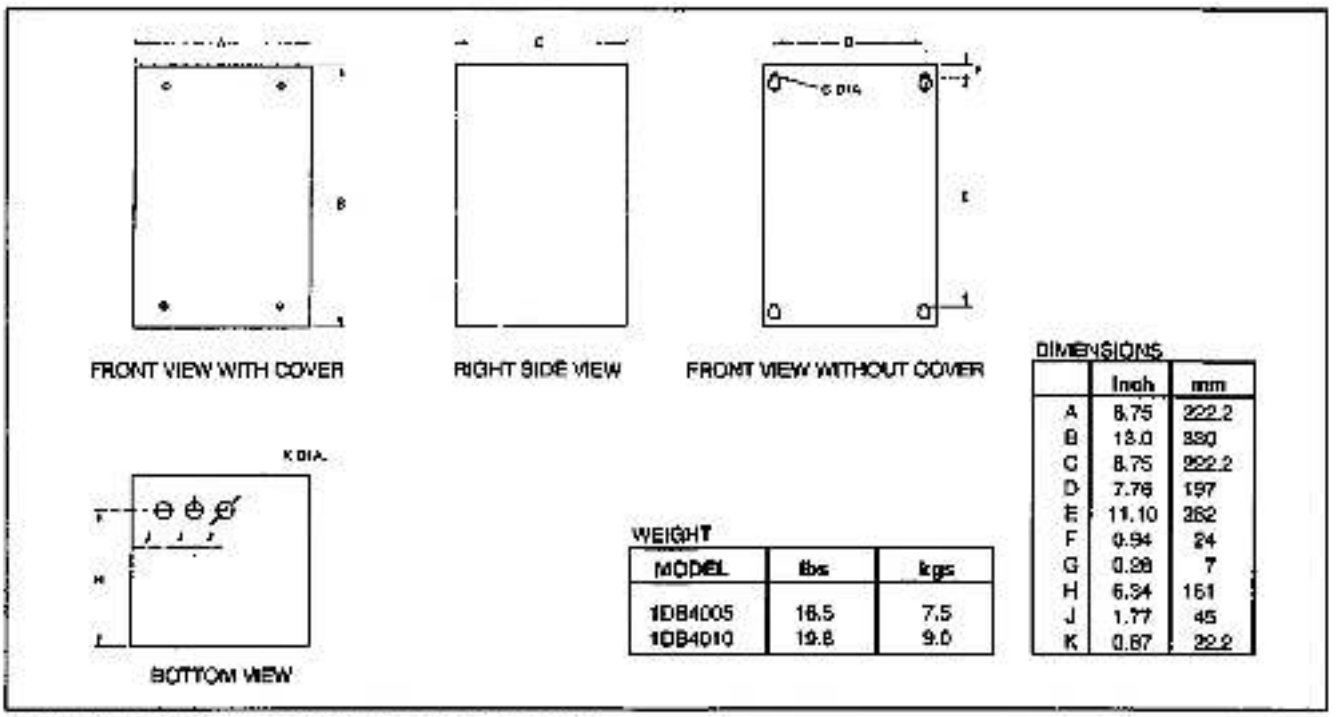
CAUTION: It is important to use wire rated at 600 volts or greater because this wiring may make contact with uninsulated (460 VAC) components. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

8. Put the dip switch 1SW(1) on the controller's regulator PC board in the OFF position. Refer to Figure 2 for the switch location.

   If switch 1SW(1) is ON, the regenerative voltage limit circuit will extend the deceleration time and the Dynamic Braking Kit will not function properly.
9. Replace the controller cover and the Dynamic Braking Kit cover.
10. Re-apply power to the controller. Refer to Instruction Manual D2-3103 for complete instructions of the controller installation and startup.

Operating Details

1. A neon lamp (RUN READY), mounted in the Dynamic Braking Kit, lights when the D-C bus voltage reaches 90 VDC or more. This light is not to be used as a power ON indication .
2. An IET occurs when the D-C bus voltage exceeds 800 V or regenerative A-C current exceeds 200% of the controller full-load rating. This may indicate that a different resistor value is required. Consult with Reliance Electric.



DIMENSIONS

	Inch	mm
A	8.75	222.2
B	13.0	330
C	8.75	222.2
D	7.76	197
E	11.10	282
F	0.94	24
G	0.28	7
H	6.34	161
J	1.77	45
K	0.87	22.2

WEIGHT

MODEL	lbs	kgs
1DB4005	16.5	7.5
1DB4010	19.8	9.0

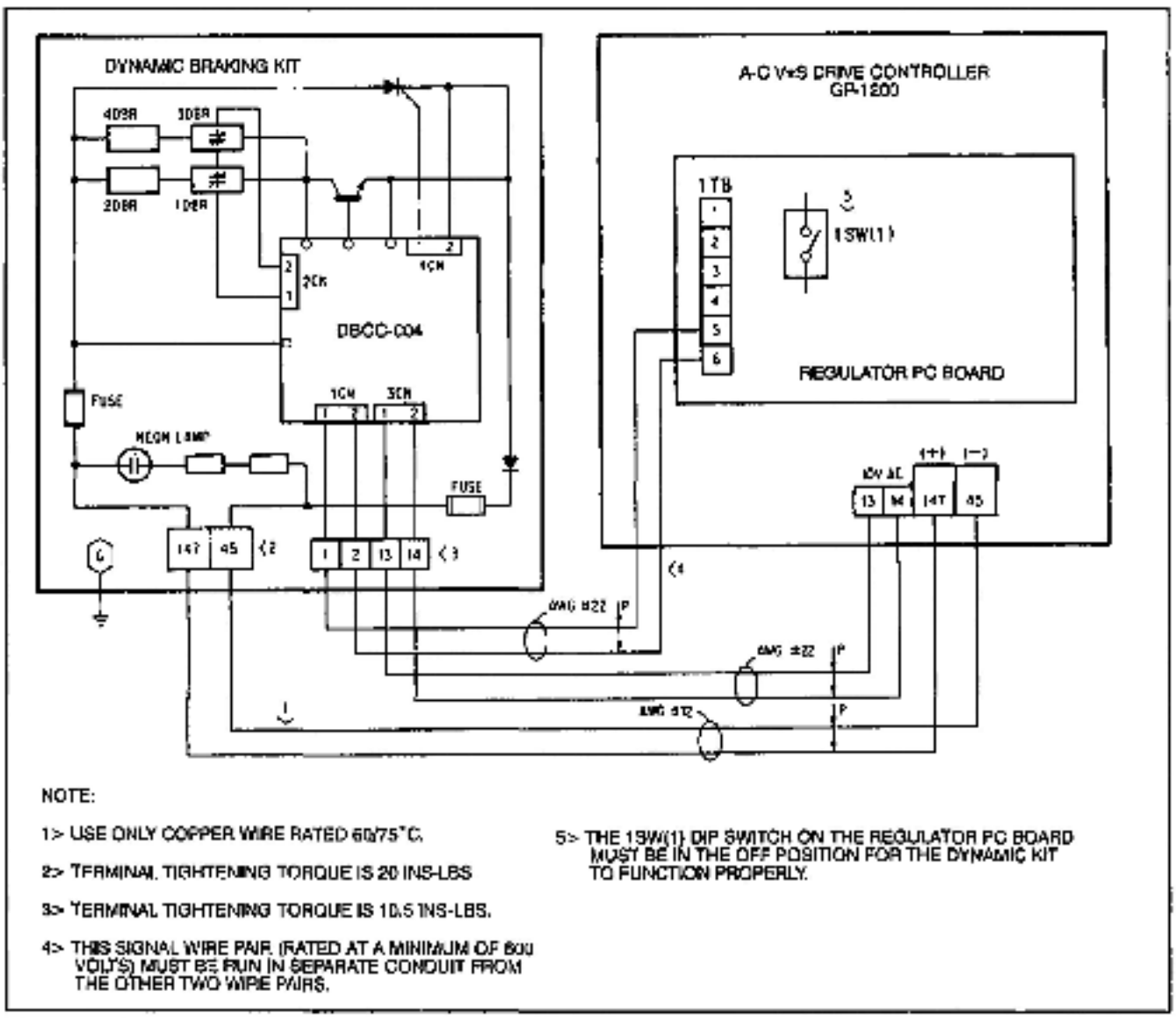
Figure 1. Mounting data for Dynamic Braking Kit.

3. If the temperature of the dynamic braking resistor exceeds the 210°C setting of the thermal switch, the dynamic braking kit fuses will blow and further regenerative operation will cause a controller fET. This indicates a regenerative condition in excess of the power rating of the dynamic braking resistor, which may be caused by a load inertia greater than the maximum recommended WR^2, or a duty cycle of more than six starts/stops per minute, or a combination of both of these conditions.

DANGER

DISCONNECT ALL UNGROUNDED CONDUCTORS OF THE A-C POWER LINE FROM THE CONTROLLER. AFTER POWER IS REMOVED, VERIFY WITH A VOLTMETER AT TERMINALS 147(+) AND 45(−) THAT THE D-C BUS CAPACITORS ARE DISCHARGED BEFORE TOUCHING ANY INTERNAL PARTS OF THE CONTROLLER. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

If the kit fuses have blown, disconnect all power to the controller, verify the capacitors are fully discharged at terminals 147(+) and 45(−) in the controller and in the kit, and allow adequate cooling time for the kit. Replace the fuses.



NOTE:

1> USE ONLY COPPER WIRE RATED 60/75°C.

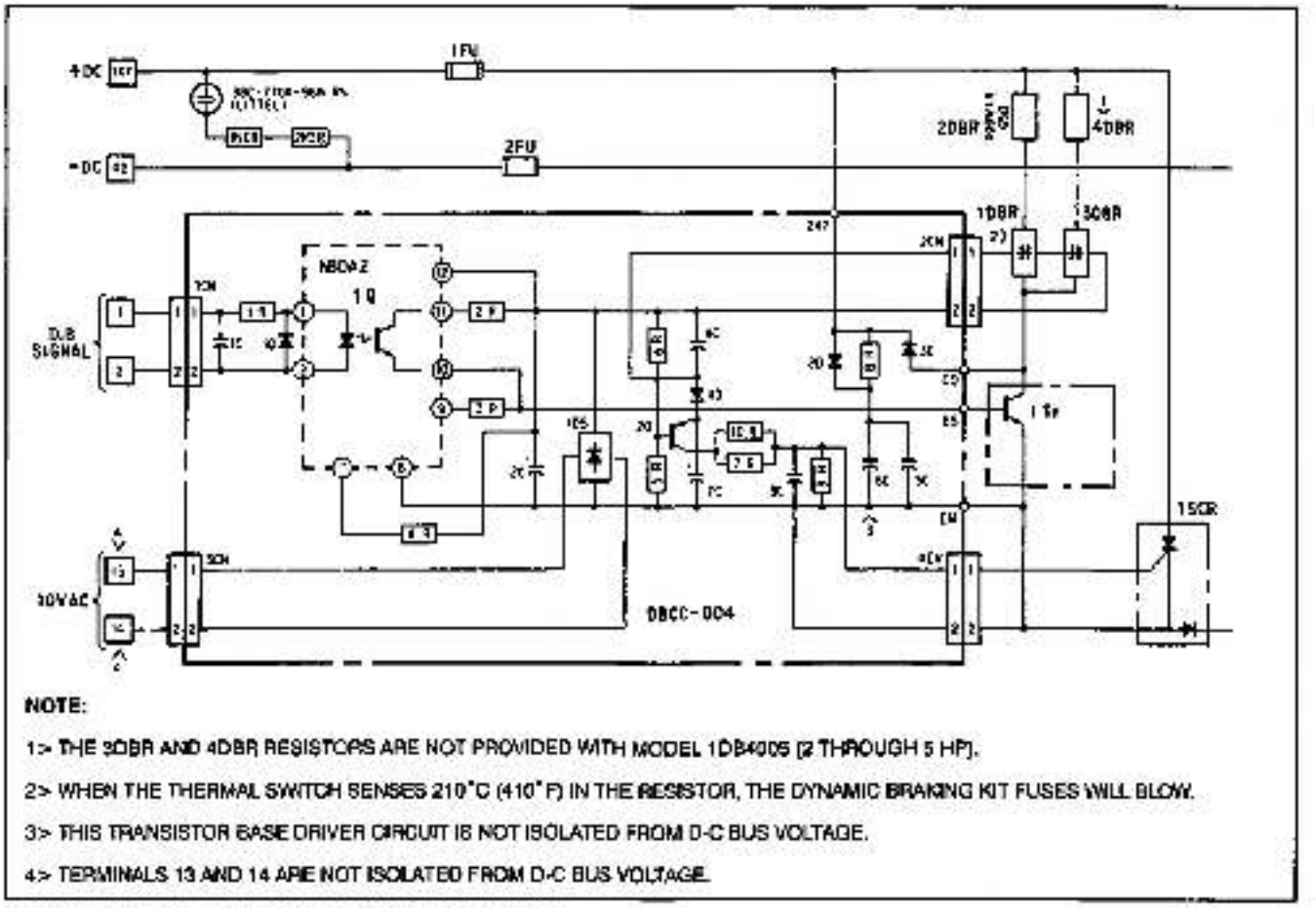
2> TERMINAL TIGHTENING TORQUE IS 20 INS-LBS

3> TERMINAL TIGHTENING TORQUE IS 10.5 INS-LBS.

4> THIS SIGNAL WIRE PAIR (RATED AT A MINIMUM OF 600 VOLTS) MUST BE RUN IN SEPARATE CONDUIT FROM THE OTHER TWO WIRE PAIRS.

5> THE 1SW(1) DIP SWITCH ON THE REGULATOR PC BOARD MUST BE IN THE OFF POSITION FOR THE DYNAMIC KIT TO FUNCTION PROPERLY.

Figure 2. Connection Diagram.



NOTE:

1> THE 3DBR AND 4DBR RESISTORS ARE NOT PROVIDED WITH MODEL 1DB4005 (2 THROUGH 5 HP).

2> WHEN THE THERMAL SWITCH SENSES 210°C (410°F) IN THE RESISTOR, THE DYNAMIC BRAKING KIT FUSES WILL BLOW.

3> THIS TRANSISTOR BASE DRIVER CIRCUIT IS NOT ISOLATED FROM D-C BUS VOLTAGE.

4> TERMINALS 13 AND 14 ARE NOT ISOLATED FROM D-C BUS VOLTAGE.

Figure 3. Dynamic Braking Kit Circuit Diagram.