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RELIANCE ELECTRIC

INSTRUCTION SHEET D2-3179-2
DYNAMIC BRAKING KIT
Models 2DB4010 and 2DB4020
For use with 1 thru 20 HP, 460 VAC
GP-2000
General Purpose A-C V★S® Drive Controllers

DANGER

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 SEVERE BODILY INJURY OR LOSS OF LIFE.

Description

The products described in this instruction manual are manufactured by Reliance® Electric Industrial Company.

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

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 2DB4010 for 1 through 10 HP controller; UL Listed/CSA Certified.
- Model number 2DB4020 for 15 through 20 HP controller; UL Listed/CSA Certified.

The design specifications are listed below:

- Three starts/stops per minute.
- Maximum WR^2 (including motor, reflected to motor)
  2.6 lb-ft² (2DB4010)
  6.6 lb-ft² (2DB4020)
- Resistor Wattage
  800 watts (2DB4010)
  1,600 watts (2DB4020)
- D-C Bus Fuses
  600 V, 20 A, Ferraz
  A060URB020T13

Installation

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.

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.*

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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.
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.

DANGER

THE USER IS RESPONSIBLE FOR CONFORMING WITH THE USA NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. WIRING PRACTICES, GROUNDING, DISCONNECTS AND OVERCURRENT PROTECTION ARE OF PARTICULAR IMPORTANCE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

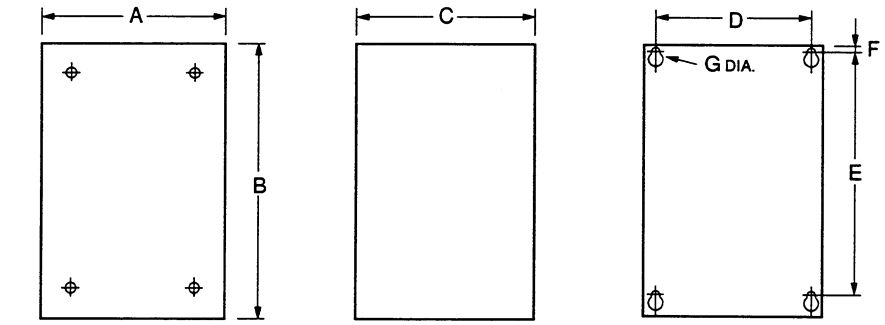
6. Wire between the controller and the Dynamic Braking Kit in accordance with Figure 2 and all codes. Use wire that is rated at a minimum of at least 600 volts.

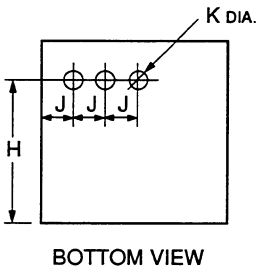
CAUTION: It is important to use wire rated at 600 volts or greater because this wiring may make contact with uninsulated (460 VAC) components. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

7. Replace the controller cover and the Dynamic Braking Kit cover.
8. Reapply power to the controller. Refer to GP-2000 Instruction Manual 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.
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 higher resistance value is required. Consult with Reliance Electric.





WEIGHT

MODEL	lbs	kgs
2DB4010	16.5	7.5
2DB4020	19.8	9.0

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

Figure 1. Mounting Data for Dynamic Braking Kit.

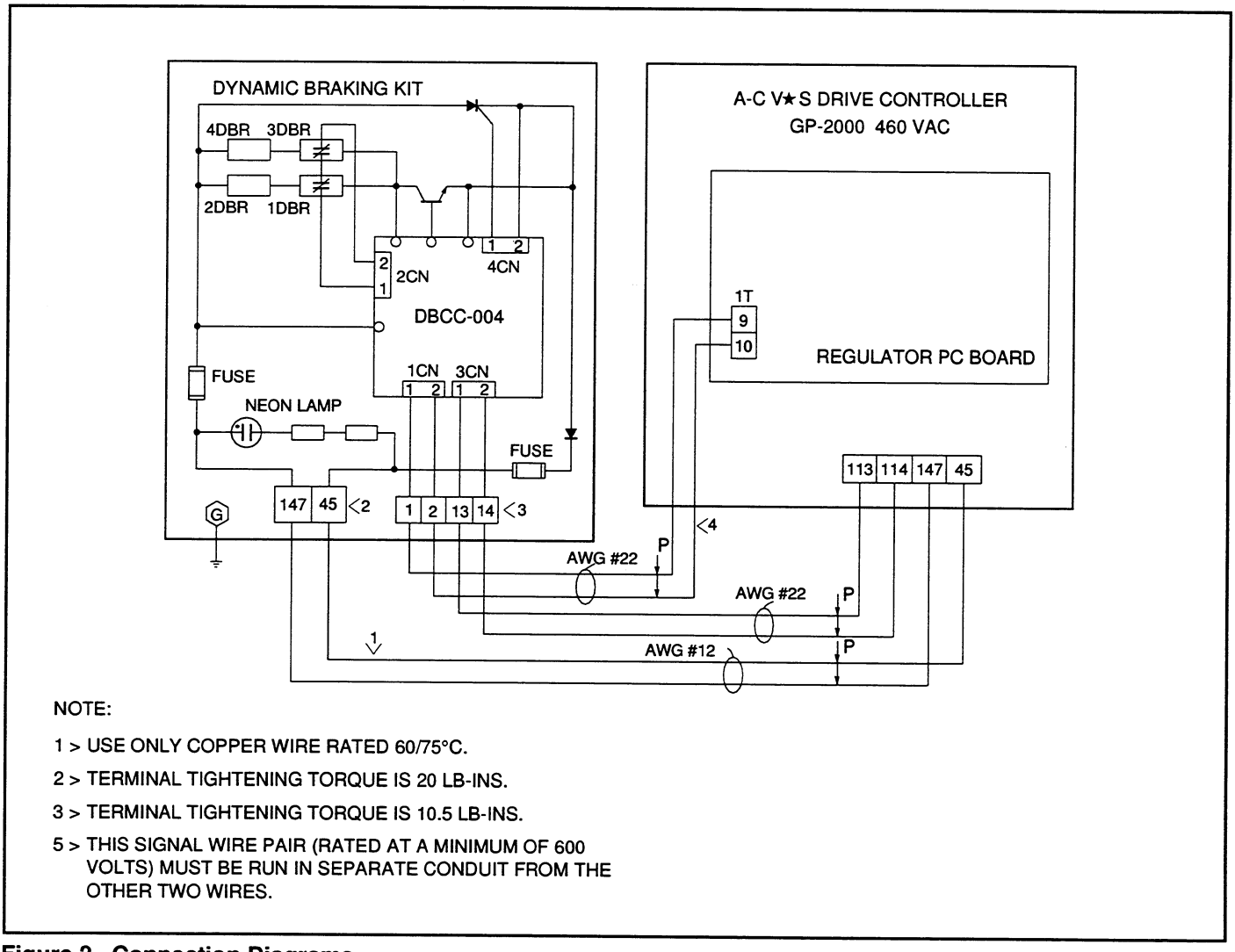
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3. If the temperature of the dynamic braking resistor exceeds the 210˚C setting of the thermal switch, the dynamic braking kit fuses will blow causing a controller IET. This indicates a regenerative condition in excess of the power rating of the dynamic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

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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.

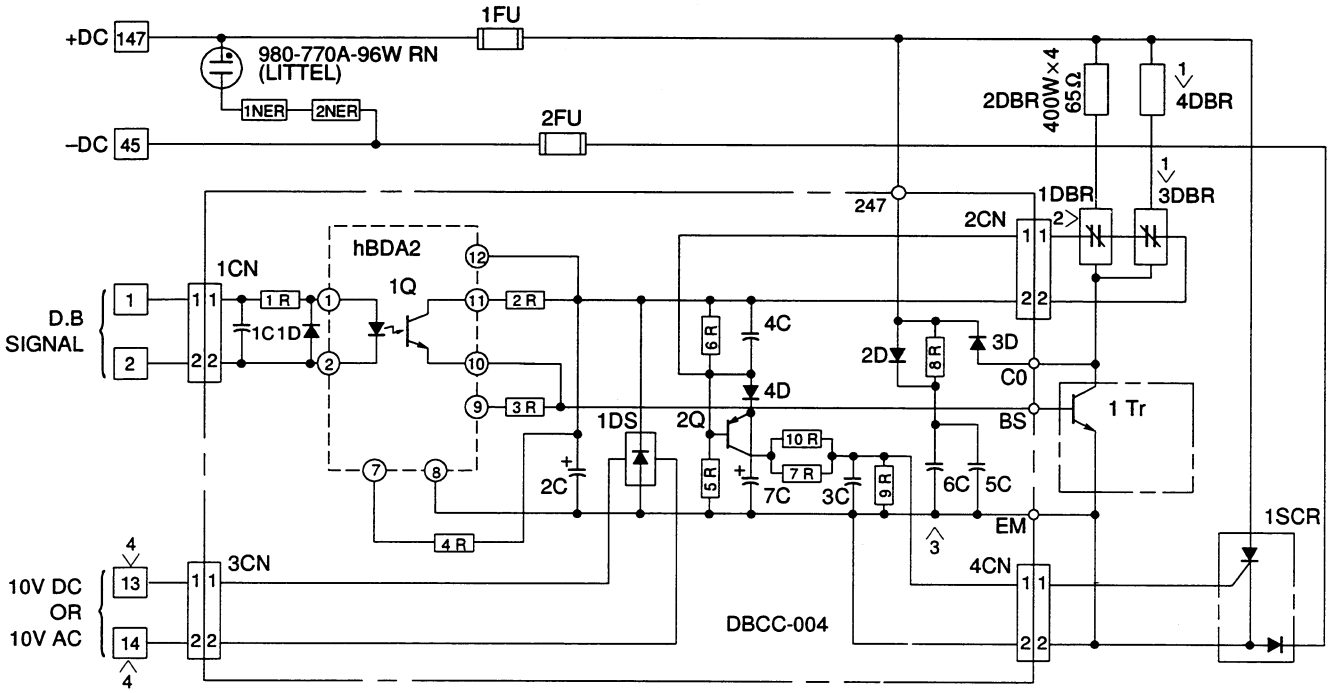
2 > TERMINAL TIGHTENING TORQUE IS 20 LB-INS.

3 > TERMINAL TIGHTENING TORQUE IS 10.5 LB-INS.

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

Figure 2. Connection Diagrams.

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NOTE:

1 > THE 3DBR AND 4DBR RESISTORS ARE NOT PROVIDED WITH MODEL 2DB4010.
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.

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