



GE Motors & Industrial Systems

RTBA RELAY TERMINAL BOARD

DS200RTBAG_A_ _

These instructions do not purport to cover all details or variations in equipment, nor to provide every possible contingency to be met during installation, operation, and maintenance. If further information is desired or if particular problems arise that are not covered sufficiently for the purchaser's purpose, the matter should be referred to GE Motors & Industrial Systems.

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CONTENTS

Safety Symbol Legend.....	1
Functional Description	1
Introduction	1
Relay Descriptions.....	2
Board Connections	2
Application Data	3
Configurable Hardware	3
Jumper and I/O Tables.....	3
Renewal/Warranty Replacement.....	8
Board Identification.....	8
Warranty Terms.....	8
Warranty Parts And Service	8
Procedure For Replacing Boards.....	8

FUNCTIONAL DESCRIPTION

WARNING

This equipment contains a potential hazard of electric shock or burn. Only adequately trained persons who are thoroughly familiar with the equipment and the instructions should install or maintain this equipment.

INTRODUCTION

The DS200RTBAG_A_ _ (RTBA) board is an optional board located within the drive (or exciter) cabinet. The RTBA board provides ten relays that are driven either directly from the pilot relays on the 531X307LTB LAN I/O Terminal Board (LTB) or remotely by the user. Seven of the ten relays have two Form C contacts (DPDT relays) and the other three relays have four Form C contacts (4PDT relays). Figure 1 shows a layout diagram of the RTBA board.

The RTBA board's relays are available with three coil voltages, depending on the group number as follows:

- RTBAG1 - 110 V dc
- RTBAG2 - 24 V dc
- RTBAG3 - 115 V ac

SAFETY SYMBOL LEGEND

WARNING

Indicates a procedure, practice, condition, or statement that, if not strictly observed, could result in personal injury or death.

CAUTION

Indicates a procedure, practice, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment

NOTE Indicates an essential or important procedure, practice, condition, or statement.

RELAY DESCRIPTIONS AND REPLACEMENT

The ten relays are designated K20 through K29. Relays K20 – K26 are the DPDT type relays and K27 – K29 are the 4PDT type (see Figure 1). Each relay has an LED that indicates when the relay is energized (located at the top of the relay inside the relay’s case). All I/O of the relays is protected by 130 V ac metal oxide varistors (MOVs).

Any of the ten relays can be replaced individually if needed. Refer to Table 1 for the part numbers of the relays per RTBA board group number.

CAUTION

To prevent equipment damage, do not remove or re-insert relays while power is applied to the drive.

To replace an RTBA board relay:

1. **Turn off the power to the drive.**
2. Open the drive's cabinet door to access the board. (The RTBA board is typically located below the drive’s board rack.)
3. Remove the retaining clip for the relay to be replaced by pressing on the top of the retaining clip and pulling on either side of the clip to release it.
4. Remove the old relay by pulling straight out from the relay socket.
5. Orient new relay on the socket (will only fit one way) and press the relay into seated position in the socket.

6. Replace the retaining clip on the new relay by centering it over the relay and pressing on the top until the bottom of the clip engages on the relay socket.

BOARD CONNECTIONS

A 16-pin connector (RPL) and a 2-pin connector (OPTPL) provide RTBA board I/O with the LTBA board. The usage of certain signals of the RPL connector is jumper selectable. See Table 2 for RTBA board jumper descriptions. See Table 3 for the RPL connector pin signal descriptions and Table 4 for the OPTPL connector pin signal descriptions.

Two stab connectors, CPH (control power hot, positive) and CPN (control power negative), are provided to supply control power to certain pluggable circuits. The usage of these stab connectors is jumper selectable. See Table 2 for RTBA board jumper descriptions and Table 5 for the stab connector descriptions.

The RTBA board provides pluggable circuits and access to relays K27 – K29 through connectors C1PL – C5PL and Y9PL – Y37PL. The control power source for these pluggable circuits is jumper selectable (see Table 2). See Table 6 for the C1PL – C5PL and Y9PL – Y37PL connector descriptions.

I/O between the RTBA board relays K20 – K26 and external signals can be connected at RTBA board terminals 1 – 52. The control power source for these relays is jumper selectable (see Table 2). See Table 7 for the terminal descriptions.

Table 1. RTBA Board Relay Part Numbers

Board Group #	Relay Designation	Relay Part Number	Description
G1	K20 – K26	68A9663PDC110X	110 V dc coil with 10 A DPDT contacts
	K27 – K29	336A5101PDC110	110 V dc coil with 1 A 4PDT contacts
G2	K20 – K26	68A9663PDC24X	24 V dc coil with 10 A DPDT contacts
	K27 – K29	336A5101PDC24	24 V dc coil with 1 A 4PDT contacts
G3	K20 – K26	68A9663PAC115X	115 V ac coil with 10 A DPDT contacts
	K27 – K29	336A5101PAC115	115 V ac coil with 1 A 4PDT contacts
G1, G2, G3	K20 – K26	323A2451P1	Hold-down clip
G1, G2, G3	K27 – K29	68A9662P3	Hold-down clip

APPLICATION DATA

CONFIGURABLE HARDWARE

The RTBA board includes Berg-type (manually movable) hardware jumpers, identified by a *JP* nomenclature that must be set correctly for the application. Most of the jumper selections have been factory set. The data sheets supplied with each controller (in the drive/exciter door pocket) indicate these factory set positions. Table 2 lists the jumper descriptions, showing the default setting first.

Figure 1 is a layout diagram of the RTBA board, showing the locations of the jumpers.

JUMPER AND I/O TABLES

Tables 2 – 7 list the jumper descriptions and I/O of the different connectors on the RTBA board. The tables are organized as follows:

- Table 2 – Jumper Descriptions
- Table 3 – RPL Connector Pin Descriptions
- Table 4 – OPTPL Connector Pin Descriptions
- Table 5 – Stab Connector Descriptions
- Table 6 – C1PL – C5PL and Y9PL – Y37PL Connector Descriptions
- Table 7 – Terminal Point Descriptions

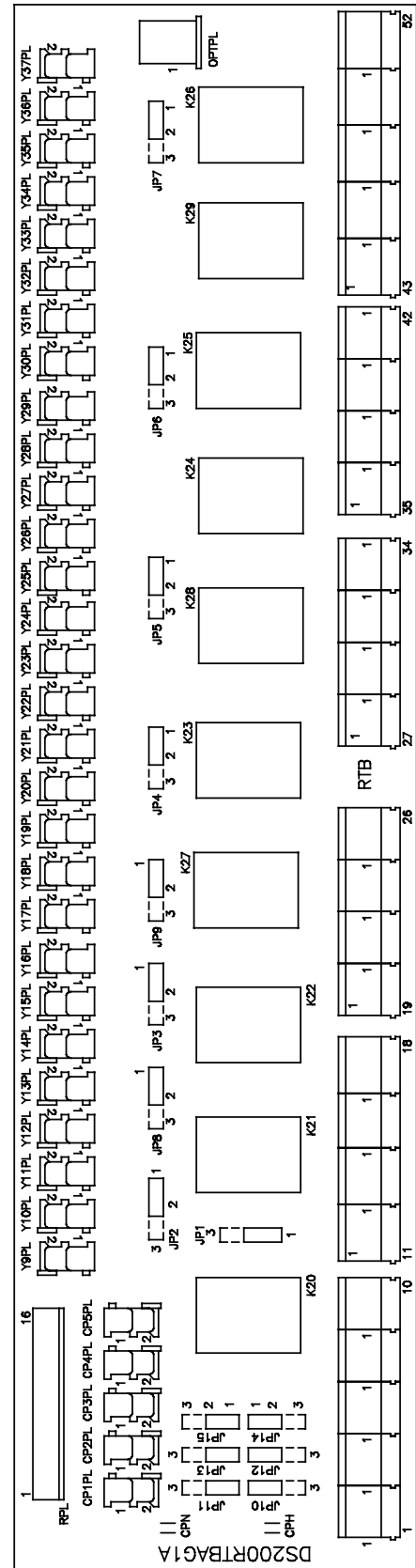


Figure 1. RTBA Board Layout

Table 2. Jumper Descriptions

Revision	Name	Description
All	JP1	Relay #20 coil voltage source Each RTBA relay may be picked up by either an internal control voltage source supplied through plug RPL from LTB or an external voltage source connected on the terminal board between KnA (n = 20-26) and KCM. (Note that additional options are available for K20-K22 via JP8 and JP9.) 1.2 Use external power source (RTBA.TB.K20A) 2.3 Use internal power source from LTB through plug RPL
All	JP2	Relay #21 coil voltage source 1.2 Use external power source (RTBA.TB.K21A) 2.3 Use internal power source from LTB through plug RPL
All	JP3	Relay #22 coil voltage source 1.2 Use external power source (RTBA.TB.K22A) 2.3 Use internal power source from LTB through plug RPL
All	JP4	Relay #23 coil voltage source 1.2 Use external power source (RTBA.TB.K23A) 2.3 Use internal power source from LTB through plug RPL
All	JP5	Relay #24 coil voltage source 1.2 Use external power source (RTBA.TB.K24A) 2.3 Use internal power source from LTB through plug RPL
All	JP6	Relay #25 coil voltage source 1.2 Use external power source (RTBA.TB.K25A) 2.3 Use internal power source from LTB through plug RPL
All	JP7	Relay #26 coil voltage source 1.2 Use external power source (RTBA.TB.K26A) 2.3 Use internal power source from LTB through plug RPL
All	JP8	K20-K22 coil neutral source In the 1.2 position, the coil neutrals of K20-K26 are tied to RTB.50 (KCM). In the 2.3 position, the coil neutrals of K20-K22 are isolated from RTB.50; JP9 must be set to position 2.3 to connect the coil neutrals to RPL.1 and LTB. 1.2 K20-K22 coil neutrals connected to RTB.50, KCM 2.3 K20-K22 coil neutrals isolated from RTB.50
All	JP9	RPL.1 connection 1.2 Ties RPL.1 to RTB.51 and OPTPL.2 2.3 Ties RPL.1 to K20-K22 coil neutrals
All	JP10	Selects whether pluggable circuit Y25PL-Y28PL is powered from control power hot (CPH) 1.2 Pluggable circuit using Y25PL-Y28PL, not connected to CPH 2.3 Pluggable circuit using Y25PL-Y28PL powered from CPH
All	JP11	Selects whether pluggable circuit Y25PL-Y28PL is powered from control power neutral (CPN) 1.2 Pluggable circuit using Y25PL-Y28PL, not connected to CPN 2.3 Pluggable circuit using Y25PL-Y28PL powered from CPN
All	JP12	Selects whether pluggable circuit Y31PL-Y34PL is powered from CPH 1.2 Pluggable circuit using Y31PL-Y34PL, not connected to CPH 2.3 Pluggable circuit using Y31PL-Y34PL powered from CPH
All	JP13	Selects whether pluggable circuit Y31PL-Y34PL is powered from CPN 1.2 Pluggable circuit using Y31PL-Y34PL, not connected to CPN 2.3 Pluggable circuit using Y31PL-Y34PL powered from CPN
All	JP14	Selects whether pluggable circuit Y19PL-Y22PL is powered from CPH 1.2 Pluggable circuit using Y19PL-Y22PL, not connected to CPH 2.3 Pluggable circuit using Y19PL-Y22PL powered from CPH
All	JP15	Selects whether pluggable circuit Y19PL-Y22PL is powered from CPN 1.2 Pluggable circuit using Y19PL-Y22PL, not connected to CPN 2.3 Pluggable circuit using Y19PL-Y22PL powered from CPN

Table 3. Connector RPL Pin Descriptions

Pin No.	Nomenclature	Description
1	X2	Return for CFX1 120 V ac loads (isolated from COM) Same as OPTPL-1.
2	-----	Not Connected
3	RX1	RX1 pilot input from LTB for RTBA relay K20
4	-----	Not Connected
5	RX2	RX2 pilot input from LTB for RTBA relay K21
6	-----	Not Connected
7	RX3	RX3 pilot input from LTB for RTBA relay K22
8	-----	Not Connected
9	RX4	RX4 pilot input from LTB for RTBA relay K23
10	-----	Not Connected
11	RX5	RX5 pilot input from LTB for RTBA relay K24
12	-----	Not Connected
13	RX6	RX6 pilot input from LTB for RTBA relay K25
14	-----	Not Connected
15	RX7	RX7 pilot input from LTB for RTBA relay K26
16	-----	Not Connected

Table 4. Connector OPTPL Pin Descriptions

Pin No.	Nomenclature	Description
1	X2	Return to NTB/3TB board for CFX1 120 V ac loads (isolated from COM) Same as RPL-1.
2	CFX1	120 V ac, ±15%, from NTB/3TB board, fused at 500 mA total including internal fans (isolated from COM)

Table 5. Stab Connector Descriptions

Connector	Description
CPH	Pluggable circuit control power positive side (hot) for RTBA Board pluggable circuits as shown in Table 6
CPN	Pluggable circuit control power negative side for RTBA Board pluggable circuits as shown in Table 6

Table 6. C1PL–C5PL and Y9PL–Y37PL Connectors (RTBA Board Pluggable Circuits)

Connector	Description
C1PL – C5PL, Pin 1	Pluggable circuit control power, positive (hot) side (CPH)
C1PL – C5PL, Pin 2	Pluggable circuit control power, negative side (CPN)
Y9PL-1	CPH
Y9PL-2	Connected to Y10PL-1; Y9PL and Y10PL form a powered pluggable circuit
Y10PL-1	Connected to Y9PL-2; see Y9PL-2
Y10PL-2	CPN
Y11PL-1	CPH
Y10PL – Y14PL	Two-position plugs forming a series string to coil of relay K27
Y15PL	Jumpers Y18PL-2 to CPN
Y16PL	Relay K27 normally open contacts
Y17PL	Relays K27 and K28 dry contacts in series
Y18PL	Relays K28 and K29 coil leads
Y19PL – Y22PL	Pluggable control circuit with K28 relay interlock
Y23PL – Y24PL	Dry circuit with K29 relay contact
Y25PL – Y28PL	Pluggable control circuit with K29 relay interlock
Y29PL – Y30PL	Dry circuit with K29 relay contact
Y31PL – Y34PL	Pluggable control circuit with K29 relay interlock
Y35PL – Y37PL	Pluggable control circuit

Table 7. Terminal Point Descriptions

RTBA Terminal	Nomenclature	Description
1	K20A	Relay K20 coil voltage source (see Table 2, JP1)
2	K201NO	Relay K20 form C contact #1 normally open
3	K201CM	Relay K20 form C contact #1 common
4	K201NC	Relay K20 form C contact #1 normally closed
5	K202NO	Relay K20 form C contact #2 normally open
6	K202CM	Relay K20 form C contact #2 common
7	K202NC	Relay K20 form C contact #2 normally closed
8	K21A	Relay K21 coil voltage source (see Table 2, JP2)
9	K211NO	Relay K21 form C contact #1 normally open
10	K211CM	Relay K21 form C contact #1 common
11	K211NC	Relay K21 form C contact #1 normally closed
12	K212NO	Relay K21 form C contact #2 normally open
13	K212CM	Relay K21 form C contact #2 common
14	K212NC	Relay K21 form C contact #2 normally closed

Table 7. Terminal Point Descriptions — Continued

RTBA Terminal	Nomenclature	Description
15	K22A	Relay K22 coil voltage source (see Table 2, JP3)
16	K221NO	Relay K22 form C contact #1 normally open
17	K221CM	Relay K22 form C contact #1 common
18	K221NC	Relay K22 form C contact #1 normally closed
19	K222NO	Relay K22 form C contact #2 normally open
20	K222CM	Relay K22 form C contact #2 common
21	K222NC	Relay K22 form C contact #2 normally closed
22	K23A	Relay K23 coil voltage source (see Table 2, JP4)
23	K231NO	Relay K23 form C contact #1 normally open
24	K231CM	Relay K23 form C contact #1 common
25	K231NC	Relay K23 form C contact #1 normally closed
26	K232NO	Relay K23 form C contact #2 normally open
27	K232CM	Relay K23 form C contact #2 common
28	K232NC	Relay K23 form C contact #2 normally closed
29	K24A	Relay K24 coil voltage source (see Table 2, JP5)
30	K241NO	Relay K24 form C contact #1 normally open
31	K241CM	Relay K24 form C contact #1 common
32	K241NC	Relay K24 form C contact #1 normally closed
33	K242NO	Relay K24 form C contact #2 normally open
34	K242CM	Relay K24 form C contact #2 common
35	K242NC	Relay K24 form C contact #2 normally closed
36	K25A	Relay K25 coil voltage source (see Table 2, JP6)
37	K251NO	Relay K25 form C contact #1 normally open
38	K251CM	Relay K25 form C contact #1 common
39	K251NC	Relay K25 form C contact #1 normally closed
40	K252NO	Relay K25 form C contact #2 normally open
41	K252CM	Relay K25 form C contact #2 common
42	K252NC	Relay K25 form C contact #2 normally closed
43	K26A	Relay K26 coil voltage source (see Table 2, JP7)
44	K261NO	Relay K26 form C contact #1 normally open
45	K261CM	Relay K26 form C contact #1 common
46	K261NC	Relay K26 form C contact #1 normally closed
47	K262NO	Relay K26 form C contact #2 normally open
48	K262CM	Relay K26 form C contact #2 common
49	K262NC	Relay K26 form C contact #2 normally closed
50	KCM	Relays K20 – K26 common
51	115V	115 V ac
52	-----	Not Connected

RENEWAL/WARRANTY REPLACEMENT

CAUTION

BOARD IDENTIFICATION

A printed wiring board is identified by an alphanumeric part (catalog) number stamped on its edge. For example, the RTBA board is identified by part number DS200RTBAG#. Figure 2 describes each digit in the part number.

NOTE

All digits are important when ordering or replacing any board.

WARRANTY TERMS

The GE Motors & Industrial Systems Terms and Conditions brochure details product warranty information, including the **warranty period** and **parts and service** coverage.

The brochure is included with customer documentation. It may be obtained separately from the nearest GE Sales Office or authorized GE Sales Representative.

WARRANTY PARTS AND SERVICE

To obtain a replacement board, or service assistance, contact the nearest GE Service Office.

Please have the following information ready to exactly identify the **part** and **application**:

- GE requisition or shop order number
- Equipment serial number and model number
- Board number and description

PROCEDURE FOR REPLACING BOARDS

WARNING

To prevent electric shock, turn off power to the board, then test to verify that no power exists in the board before touching it or any connected circuits.

To prevent equipment damage, do not remove boards or connections, or re-insert them, while power is applied to the drive.

Treat all boards as static-sensitive. Use a grounding strap when changing boards and always store boards in anti-static bags or boxes they were shipped in.

To replace an RTBA board:

1. **Turn off the power to the drive**, then wait several minutes for all the capacitors to discharge. Test any electrical circuits before touching them to ensure the power is off.
2. Open the drive's cabinet door to access the board. (The RTBA board is typically located below the drive's board rack.)
3. Carefully disconnect all cables from the RTBA board as follows:
 - For ribbon cables, grasp each side of the cable connector that mates with the board connector and gently pull the cable connector loose.
 - For cables with pull tabs, carefully pull the tab.
 - For wires attached to RTB terminals, loosen the screw located at the top of each terminal and carefully pull each wire free. (Ensure that wires are labeled to simplify reconnection.)
 - Two-conductor plugs (CP1PL–CP5PL and Y9PL–Y37PL) feature integral holding clips. Press the connector lever to release the connector.
4. Remove the four screws with washers that secure the RTBA board to the four standoffs and remove the board.

CAUTION

Avoid dropping mounting hardware into the unit, which could cause damage.

5. Set all configurable items on the replacement (new) board in the exact position as those on the board being replaced (old board).

If a board revision has added or eliminated a configurable component, or re-adjustment is needed, refer to *Configurable Hardware* paragraph and Table 2 in this instruction book.

NOTE

Because of upgrades, boards of different revision levels may not contain identical hardware. However, GE Motors & Industrial Systems ensures backward compatibility of replacement boards.

6. Install the new board on the four standoffs with the four screws and washers removed in step 4.
7. Reconnect all cables disconnected in step 3, ensuring that each connector is properly seated at both ends.
8. Reconnect all individual wires disconnected in step 3 (as labeled), ensuring that each wire is properly secured in the terminal.

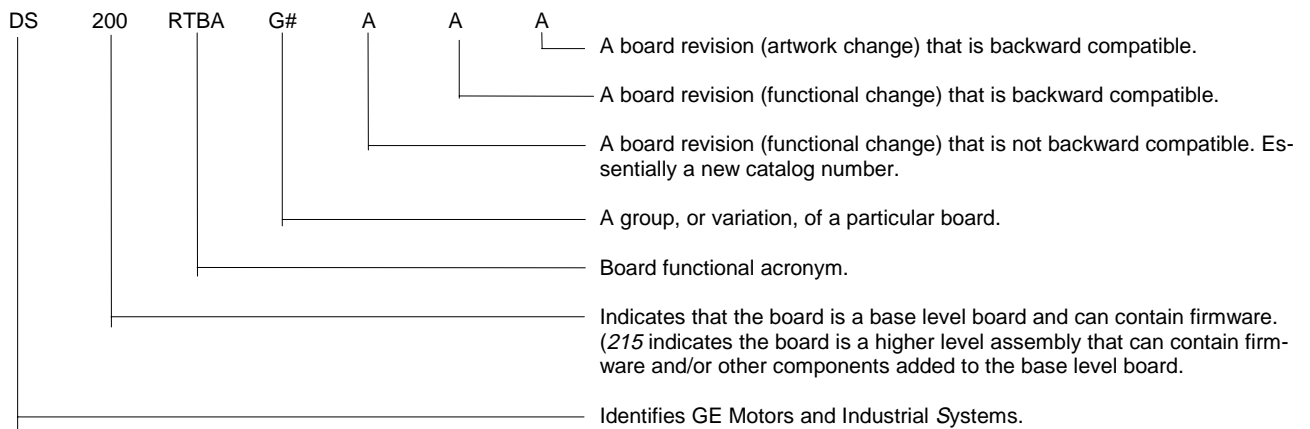


Figure 2. Sample Board Part Number, DS Series

Notes:



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