GE Motors & Industrial Systems

VOLTAGE FEEDBACK SCALING BOARD

DS200NATOG1A_ _

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.

CONTENTS

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.

FUNCTIONAL DESCRIPTION

INTRODUCTION

DS200NATOG1, the Voltage Feedback Scaling board (NATO) attenuates the AC and DC voltages of an SCR bridge so that bridge voltage feedbacks may be accurately derived. It works in conjunction with two other boards, a VME backplane and a gate distribution and status board.

DESCRIPTION

Input

The NATO board contains five identical, series-connected strings of precision resistors. There is one string for each of the three AC phases, and one more apiece for positive and negative DC bus voltage. Each string can be configured using a selection of three different input stab connectors and two wire jumpers to attenuate 6900, 4200, 3300, 2200, or 1200 volt input.

Output

The *outputs* of the five strings are connected to a single 20 pin ribbon header (see Table 2). A metal oxide varistor (MOV) prevents the output voltage of each string from becoming too high if the output ribbon circuit is interrupted while input voltage is present. The burden resistor is located on the gate distribution and status board, rather than the NATO board.

AGENCY APPROVALS

The NATO board is designed to meet the CSA / UL / EC standards for “transients known and controlled.”

APPLICATION DATA

RESISTOR STRINGS

The resistors on this board are grouped into five resistor strings denoted by the letters A through E (see string headings in Figure 1). Each string has three input points (stab connectors) for a total of 15 input points. Each string also has two optional wire jumpers, for a total of 10.

See Table 1 to correlate attenuator nominal source voltages, stab connectors, wire jumpers, and nominal output voltages.

STAB CONNECTORS

Three stab connectors in each of the five resistor strings allow the user to connect input power to a varying number of the resistors, in order to accommodate a range of voltages. In the **Stab Connector** column of Table 1, replace x with the designator of the string to ascertain the appropriate connector. For example, for string C, the relevant stab connectors are JC, JCA, and JCB. The stab connectors are described in more detail in Table 3.

STAB AND JUMPER COMBINATIONS

In order to accommodate the specified range of input voltages, two board groups were created. G1 contains six resistors per string. G2 substitutes two wire jumpers for the two bottom resistors and thus has four resistors per string. This permits combinations of stab and group numbers toobtain one, two, three, four, five, or six resistors per attenuator string, for inputs of 1200 to 6900 Vrms line-to-line (see Table 1).

TESTPOINTS

The testpoints (TP1 – TP5) are for factory tests at low voltage only. See Table 5.

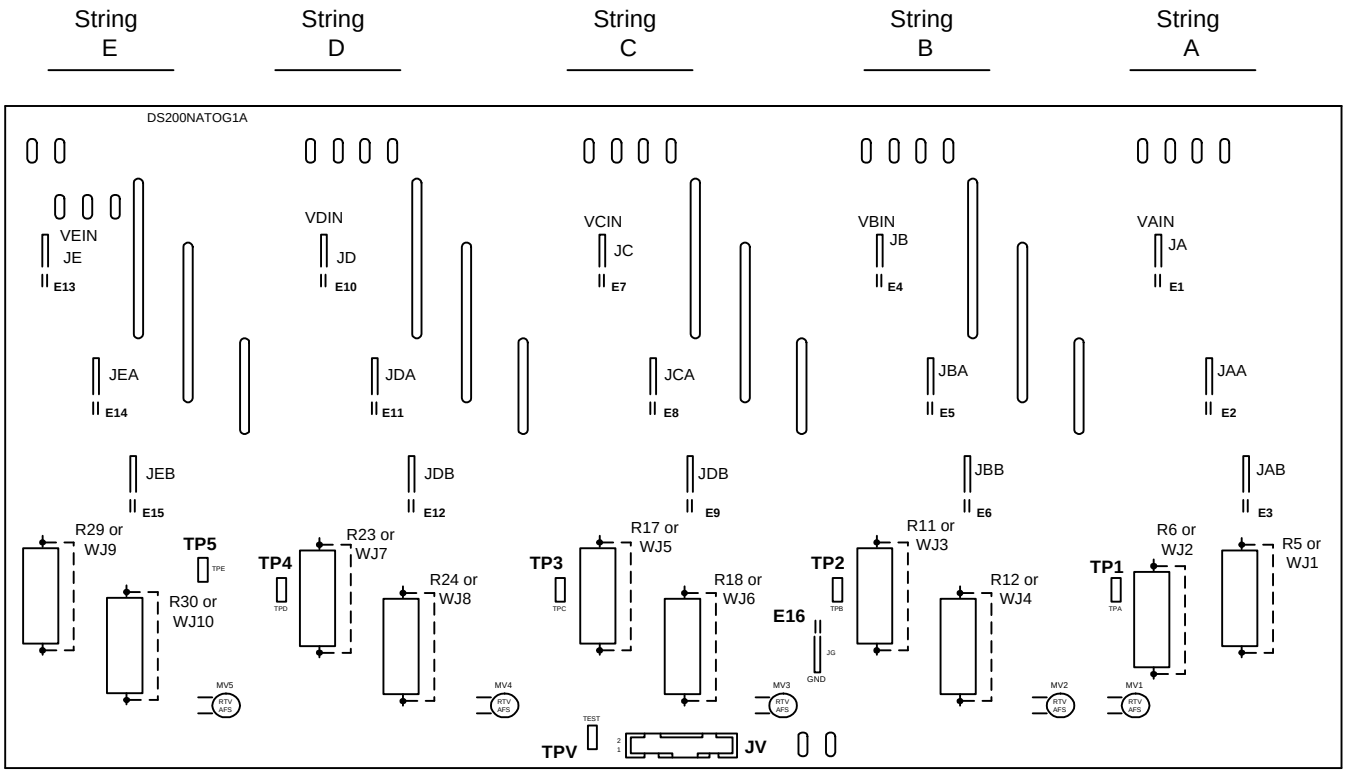

Figure 1. NATO Board Layout Drawing

Table 1. Attenuator Voltages As Set By Wire Jumpers and Stab Connectors

Input (nom. Vrms)		NATO	Wire	No. of	Input Stab	Output (nom. Vrms)
V_{LL}	V_{LG}	Group	Jumpers	Resistors	Connector	V_{LG}
6900	3983.72	G1	No	6	Jx	1.994
4200	2424.87	G2	Yes	4	Jx	1.820
3300	1905.26	G1	No	3	JxB	1.906
2200	1270.17	G2	Yes	2	JxA	1.905
1200	692.82	G2	Yes	1	JxB	2.075

Table 2. Pin Assignments, Ribbon Cable Connector JV

Name	Nomenclature	Description
JV-4	VA	Outputs to VBPL of String A (Resistors R1 – R6)
JV-6	VB	Outputs to VBPL of String B (Resistors R7– R12)
JV-8	VC	Outputs to VBPL of String C (Resistors R13 – R18)
JV-10	VD	Outputs to VBPL of String D (Resistors R19 – R24)
JV-12	VE	Outputs to VBPL of String E (Resistors R25 – R30)
JV-1, 3, 5, 7, 9, 11, 13	ACOM	These odd pins are connected to each other and to common ground to minimize crosstalk on the ribbon cable.
JV-2, 14, 20	JG	Connected to ground stab and to one end of each of the MOVs (MV1 – MV5)

Table 3. NATO Board Stab Connectors

Name	Nomenclature	Description (in each case, G2 will reduce resistor count by two)
E1	JA	String A, HV input for 6 resistors in series (G1)
E2	JAA	String A, HV input for 4 resistors in series (G1)
E3	JAB	String A, HV input for 3 resistors in series (G1)
E4	JB	String B, HV input for 6 resistors in series (G1)
E5	JBA	String B, HV input for 4 resistors in series (G1)
E6	JBB	String B, HV input for 3 resistors in series (G1)
E7	JC	String C, HV input for 6 resistors in series (G1)
E8	JCA	String C, HV input for 4 resistors in series (G1)
E9	JCB	String C, HV input for 3 resistors in series (G1)
E10	JD	String D, HV input for 6 resistors in series (G1)
E11	JDA	String D, HV input for 4 resistors in series (G1)
E12	JDB	String D, HV input for 3 resistors in series (G1)
E13	JE	String E, HV input for 6 resistors in series (G1)
E14	JEA	String E, HV input for 4 resistors in series (G1)
E15	JEB	String E, HV input for 3 resistors in series (G1)
E16	JG	

Table 4. Wire Jumpers

Name	Location	Description
WJ1	R5	Replaces this resistor for Group 2 voltages, String A
WJ2	R6	Replaces this resistor for Group 2 voltages, String A
WJ3	R11	Replaces this resistor for Group 2 voltages, String B
WJ4	R12	Replaces this resistor for Group 2 voltages, String B
WJ5	R17	Replaces this resistor for Group 2 voltages, String C
WJ6	R18	Replaces this resistor for Group 2 voltages, String C
WJ7	R23	Replaces this resistor for Group 2 voltages, String D
WJ8	R24	Replaces this resistor for Group 2 voltages, String D
WJ9	R29	Replaces this resistor for Group 2 voltages, String E
WJ10	R30	Replaces this resistor for Group 2 voltages, String E

Table 5. Testpoints for NATO Board

Name	Nomenclature	Description
TP1	TPA	Testpoint for resistor string A
TP2	TPB	Testpoint for resistor string B
TP3	TPC	Testpoint for resistor string C
TP4	TPD	Testpoint for resistor string D
TP5	TPE	Testpoint for resistor string E

WARNING

Testpoints are for factory use only. Potentially lethal voltages are present at testpoints during normal operation.

RENEWAL/WARRANTY REPLACEMENT

BOARD IDENTIFICATION

A printed wiring board is identified by an alphanumeric part (catalog) number stamped on its edge. For example, the NATO is identified by part number DS200NATOG#AAA. Figure 2 describes each digit in the part number.

NOTE

All digits are important when ordering or replacing any board.

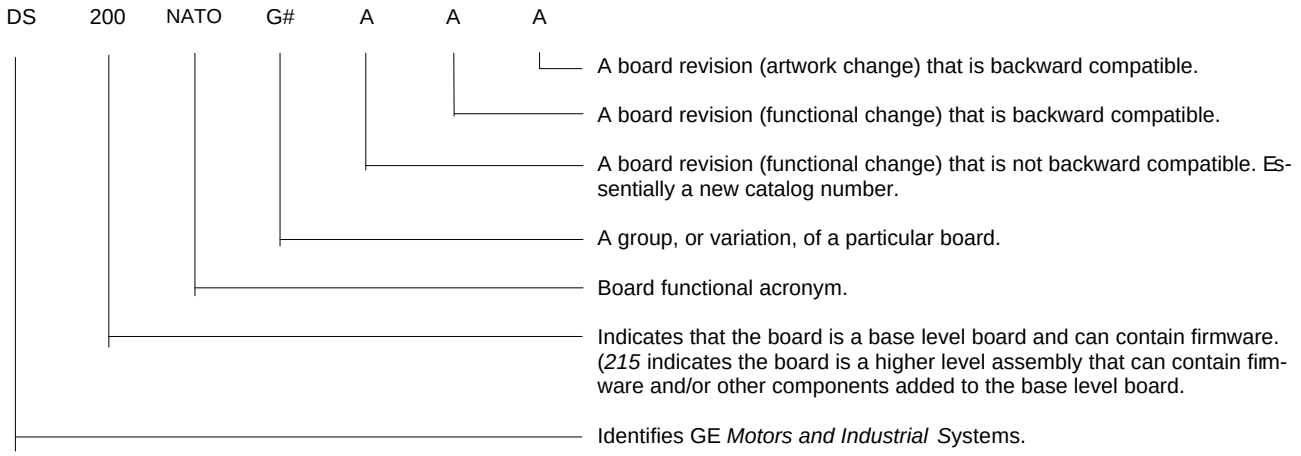

Figure 2. Sample Board Part Number, DS Series

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 able be obtained separately from the nearest GE Sales Office or authorized GE Sales Representative.

WARRANTY PARTS AND SERVICE

This board has no fuses or other end-user serviceable parts. If it fails, it needs to be replaced as a unit.

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
- LCI 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.

CAUTION

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

To replace a NATO board:

1. **Turn off power**.
2. To remove the NATO board, carefully disconnect all cables, as follows:
   - For ribbon cables without pull tabs, place one hand on each side of the cable connector that mates with the board connector. Gently pull the cable connector with both hands.
   - For ribbon cables with pull tabs, carefully pull the tab.

3. Remove the standoffs that hold the board in place. Remove the lock washers.

CAUTION

Avoid dropping the lock washers into the board or unit, which could cause damage.

4. Keep the NATO board level and carefully remove it with both hands by pulling the board straight out.

5. Install the new NATO board, replace the standoffs and lock washers.

6. Reconnect all cables, ensuring that each connector is properly seated at both ends.

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.

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