



Soft-Start System Interface Control Instruction Manual

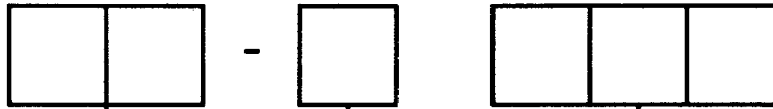
**Models
C_-3ATA**

RXE-0393

NIDEC-SHIMPO CORPORATION

DESCRIPTION OF MODEL NUMBER

The model number of RXC system interface controls is divided into three parts.



Mounting Type

CB	Door Mount
CU	Chassis Mount

Line Voltage

3	115 V AC, single phase
Note:	Some versions of this control in countries outside of the United States are designed for different line voltages. These will have a different digit in this position.

Type of system Interface Control

Signal Follower (Ratio Control)

	Input Signal / Output Signal
RAA	Analog DC Voltage / Analog DC Voltage
RAB	Analog DC Current / Analog DC Voltage
RAD	Analog AC Voltage / Analog DC Voltage
RAE	Analog DC Voltage / Analog DC Current
RAF	Analog DC Current / Analog DC Current
RAH	Analog AC Voltage / Analog DC Current
RAI	Rotary Encoder / Analog DC Voltage
RAJ	Magnetic Sensor / Analog DC Voltage
RAK	Rotary Encoder / Analog DC Current
RAL	Magnetic Sensor / Analog DC Current

Master Speed Reference

STA	Provides an Analog Output Voltage
STB	Provides an Analog Output Current

Signal Follower

RBA	Input: Analog Voltage or Current Output: Analog Voltage
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Soft Start Control

ATA	Soft Start Control
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Position Control

All of the model numbers listed below describe interface controls whose output signal is an analog DC voltage.

	Input Speed Follower Signal
PCA	Analog DC Voltage
PCB	Analog DC Current
PCC	Manual Potentiometer
PCD	Rotary Encoder
PCE	Magnetic Sensor

In this manual, an underline in place of a portion of a model number will indicate that the information applies equally well to all controls with any letter in that position. For example, the model number C_3-ST_ indicates that the information applies equally well to model numbers CB-3-STA, CU-3-STA, CB-3-STB, and CU-3-STB.

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INTRODUCTION

The C_3-ATA System Interface Control is used to control the operation of an RXC Adjustable Speed Drive and its drive motor. The C_3-ATA performs two functions in such a system.

First, it provides independently adjustable acceleration and deceleration rates. These rates are adjustable from 1 to 180 seconds.

Second, it coordinates the speed of the RXC and the starter for its drive motor. Each time the STOP push button is pressed, the drive will first decelerate to a preset minimum speed and then turn off the motor starter. This ensures that the drive will start the load smoothly from a low speed. The drive will also have a large amount of torque available for this starting operation.

In order to provide such control, the RXC Adjustable Speed Drive must be provided with an electric remote control and an L_A_0_ speed control, or its equivalent. The C_3-ATA control is then wired to the L_A_0_ speed control.

WARRANTY

The Company warrants the RXC System Interface Control to be free from defects in materials and workmanship under normal use and proper maintenance for a period of one year. If within such period any product shall be proved to the Company's reasonable satisfaction to be defective, such product shall be repaired or replaced at the Seller's option. The Company's obligation and the Buyer's exclusive remedy hereunder shall be limited to such repair or replacement and shall be conditioned upon the Company receiving written notice of any alleged defect no later than 10 days after its discovery within the warranty period and, at the Company's option, the return of such product to the Company, transportation charges prepaid, when such return is feasible. The Company reserves the right to satisfy its warranty obligation in full by reimbursing the Buyer for all payments made and the Buyer shall thereupon return the product to the Company. Products manufactured by others and supplied by the Company as part of the Company's product are not warranted by the Company and the Buyer's sole recourse shall be under the warranty, if any, of such other manufacturer.

These warranties shall not be effective if the product has been subject to overload, misuse, negligence or accident, nor if the product has been repaired or altered outside of our factory or authorized service station in any respect which in our judgment adversely affects its condition or operation.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES (EXCEPT OF TITLE, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE, OR OTHERWISE), and in no event shall the Company be liable for claims (based upon breach of express or implied warranty, negligence, or otherwise) for any other damages, whether direct, immediate, incidental, foreseeable, consequential, or special.

INSPECTION

Unpack the interface control and check to see that it is identical with what is specified in the purchase order. Check its model number using the chart on the inside front cover of this manual. Inspect for shipping damage. Notify the shipping agent immediately if any damage is discovered.

INSTALLATION

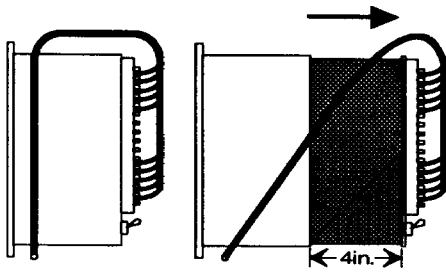
LOCATION

This control is designed to be mounted in a clean, dry location. If it must be mounted in a wet, dusty, or exceptionally dirty location, it should be mounted inside an enclosure to protect it.

WIRING

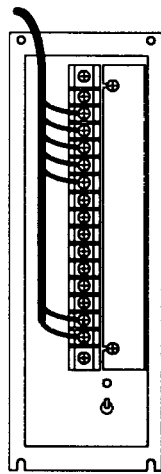
1. Typical wiring diagrams are provided on pages 6 and 7 of this manual. These will be appropriate for the majority of applications. Contact the factory for specialized requirements.
2. Wiring must be done in compliance with all applicable national and local electrical codes. Recommended minimum wire sizes are listed below.

Terminal	Recommended Minimum Wire Size (AWG)
E	12
12, 13, R, S	20
3, 4, 5, 6, 9, 10	24



3. The circuit board is designed to slide out of the enclosure. This simplifies adjustments and trouble shooting. In order to take advantage of this feature, be sure to provide enough slack in the wiring to allow the board top slide out four inches.

4. Wires should be connected so that they extend to the left side of the terminal strip. In this way they will not cover the potentiometers and switches under the plastic cover to the right of the terminal strip.



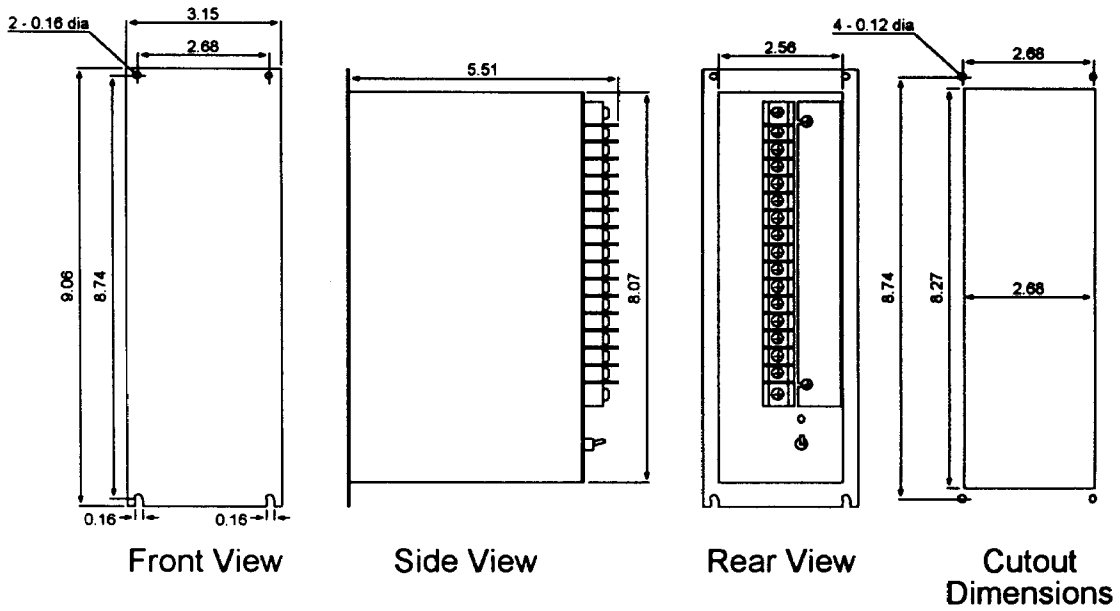
5. Line power for this control is wired to terminals R and S. This should be wired so that power is always available to this control, even though power to other parts of the system might be removed when power to the main drive motor is removed.

6. The wiring to terminals TB4 through TB6 carries low voltage control signals. These must be shielded to prevent the introduction of electrical noise. The shield at *one* end of each cable should be connected to circuit common, as indicated in the wiring diagrams. Circuit common for these interface controls is provided at terminals TB6. At the other end of the cable, the shield *must* be insulated so that it cannot come into electrical contact with other components or with ground. **DO NOT CONNECT BOTH ENDS OF THE SHIELD.**

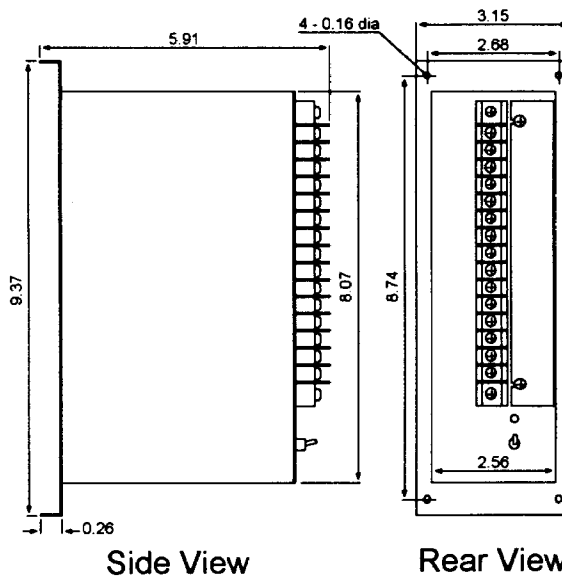
The length of the wires used for these connections should be kept to less than 65 feet.

7. Electrical common on this control is not connected to earth ground. Therefore, signal isolators are seldom needed to prevent ground loop noise problems.

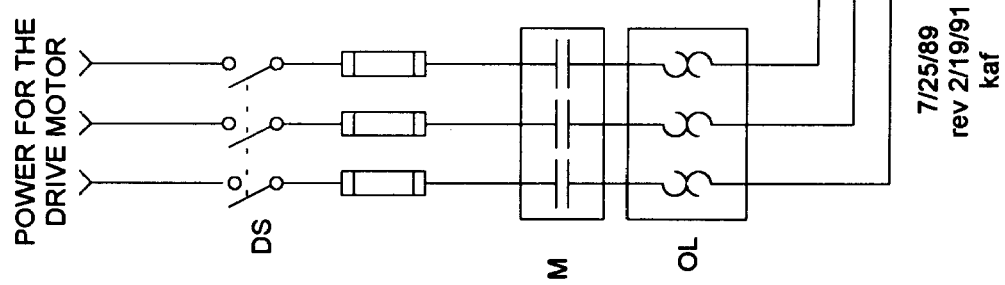
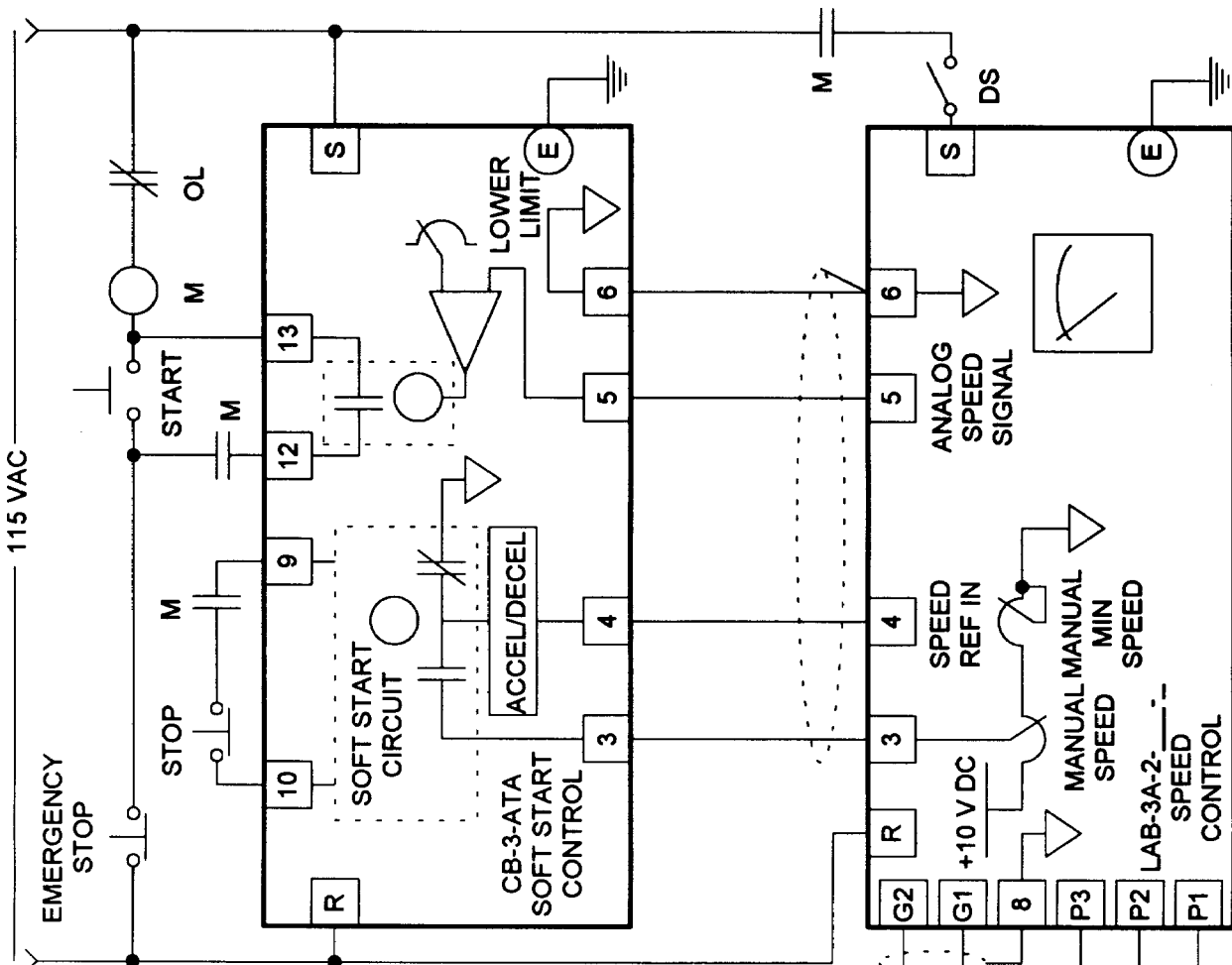
Mounting Dimensions, Door Mount Style, Model Numbers Beginning with CB

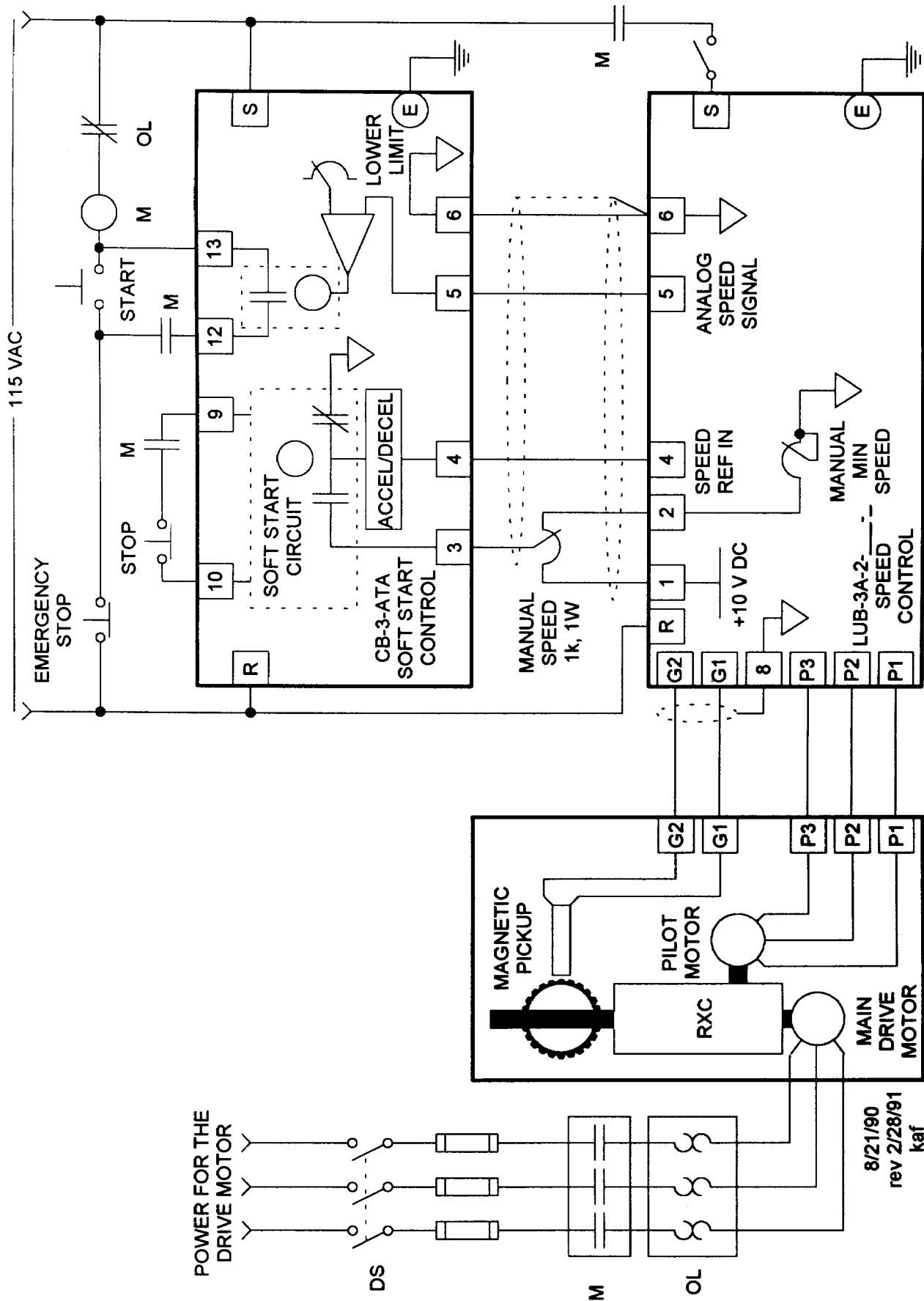


Mounting Dimensions, Chassis Mount Style, Model Numbers Beginning with CU



All dimensions are in inches.
Subject to change without notice.





8/21/90
rev 2/28/91
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OPERATION

The C₋₃-ATA uses three operator's controls. These are a **START** push button, a **STOP** push button and an **EMERGENCY STOP** push button.

The drive motor's starter is activated by pressing the **START** push button. The drive will then accelerate to the desired speed at the preset acceleration rate. This rate is set by using the ACCEL TIME potentiometer and the LONG T switch.

Under normal conditions, the drive is stopped by pressing the **STOP** push button. This causes the drive to decelerate at the preset deceleration rate. This rate is set independently from the acceleration rate. This rate is set by using the DECEL TIME potentiometer and the LONG T switch. When the preset **LOWER LIMIT** speed is reached, the motor starter will be deactivated, stopping the drive. In addition to providing a smooth stop, this also allows the drive to be restarted smoothly with maximum available torque.

In an emergency, it may not be possible to allow the drive to decelerate before stopping the drive motor. Pressing the **EMERGENCY STOP** push button will cause the motor starter to open immediately. When the drive is restarted, it will be at the same speed as it was when the **EMERGENCY STOP** push button was pressed.

DESCRIPTION OF TERMINALS

TB1, NC

No connection is made to this terminal.

TB2, NC

No connection is made to this terminal.

TB3, INPUT SIGNAL

The 0 to 10 V DC input speed reference signal is supplied to this control through this terminal. This is generally provided through the wiper of a speed potentiometer or from terminal 3 of an L_{-A}0- speed control. Common for this signal is TB6.

TB4, OUTPUT SIGNAL

This is the 0 to 10 V DC output speed reference signal which is used to control the speed of the RXC Adjustable Speed Drive. It is generally wired to terminal 4 on the L_{-A}0- speed control. Common for this signal is TB6.

TB5, SPEED FDBK

This is generally a 0 to 10 V DC signal which is provided by the L_{-A}0- speed control. It is proportional to the actual output speed of the RXC. It is generally wired to terminal 5 on the L_{-A}0-0 control. Common for this signal is TB6.

TB6, 0 V

This is circuit common for the signals at terminals TB3, TB4, and TB5.

TB7, NC

No connection is made to this terminal.

TB8, NC

No connection is made to this terminal.

TB 9 and TB10, SOFT STOP

Momentarily opening the connection between these two terminals will cause the drive to begin decelerating at its preset rate until it reaches the preset **LOWER LIMIT** speed. When the drive reaches this speed, the power to the motor starter will be removed, stopping the drive motor. The **STOP** push button is generally wired to these terminals in series with a normally open auxiliary contact from the motor starter.

TB11 NC

No connection is made to this terminal.

TB 12 and TB13

Holding contacts for the motor starter coil are provided at these terminals. These contacts keep the motor starter ON during normal operation and allow the control to automatically stop the drive motor during soft stop operation. These contacts are rated for 250 V AC, 2 A. This is protected by fuse F2, a 2 A fuse.

R, POWER SUPPLY

AC power source for the control. The control's power switch switches this leg of the power, but the control's internal fuse is not in this power leg.

S, POWER SUPPLY

This is for connecting one lead of the 115 V AC power source for the control. The control's power switch switches this leg of the power and fuse F1 is also in this power leg.

DESCRIPTION OF CONTROLS AND INDICATORS

ACCEL TIME

This potentiometer allows the acceleration rate of the control to be set. Turning this clockwise increases the acceleration time and so reduces the rate of acceleration. Full range acceleration times are either 1 to 60 seconds or 3 to 180 seconds, depending on the position of the **LONG T** switch.

Although this can be set for an acceleration time as short as 1 second, the actual acceleration time of the RXC Adjustable Speed Drive may longer than this. The fastest acceleration rate will normally be limited by the capabilities of the RXC's electric speed control.

DECEL TIME

This potentiometer allows the deceleration rate of the control to be set. Turning this clockwise increases the deceleration time, and so reduces the rate of deceleration. Full range deceleration times are either 1 to 60 seconds or 3 to 180 seconds, depending on the position of the **LONG T** switch.

Although this can be set for an deceleration time as short as 1 second, the actual deceleration time of the RXC Adjustable Speed Drive may longer than this. The fastest deceleration rate will normally be limited by the capabilities of the RXC's electric speed control.

REAR

Turning this switch ON activates the **ACCEL TIME** and **DECEL TIME** potentiometers next to the terminal strip. When this is OFF, these potentiometers have no effect on the circuit. In this case, the **FRONT** switch should be ON, activating the operator's control panel **ACCEL TIME** and **DECEL TIME** potentiometers on the door-mount version of this control.

FRONT

Turning this switch ON activates the **ACCEL TIME** and **DECEL TIME** potentiometers on the operator's panel of the door-mount version of this control. When this is OFF, these potentiometers have no effect on the circuit. In this case, the **REAR** switch should be ON, activating the **ACCEL TIME** and **DECEL TIME** potentiometers next to the terminal strip.

LONG T

When this switch is OFF, the full-range acceleration and deceleration times can be set from 1 to 60 seconds. When this switch is ON, the full-range acceleration and deceleration times can be set from 3 to 180 seconds.

X10 MAG

This switch adjusts the sensitivity of the **LOWER LIMIT** potentiometer. When it is OFF, the lower limit can be set from 1.2% to 12% of the maximum operating speed. When it is ON, the lower limit can be set from 1.2% to 100% of the maximum operating speed.

TG IN

This switch is OFF when the input speed feedback signal is a 0 to 10 V DC voltage. This switch is ON when a higher speed feedback voltage is used. It puts a 3:1 voltage divider into the circuit.

1:4

This sets the minimum output speed signal to 1/4th of the maximum output speed signal. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

1:18

This sets the minimum output speed signal to 1/18th of the maximum output speed signal. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

1:30

This sets the minimum output speed signal to 1/30th of the maximum output speed signal. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

1:60

This sets the minimum output speed signal to 1/60th of the maximum output speed signal. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

1:N

This sets the minimum output speed signal to a value which is set by the **N** potentiometer. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

N

When the 1:N switch is ON, this potentiometer controls the minimum value of the speed output signal. This is adjustable from 0 to approximately 24% of the maximum output speed. If the input speed signal is lower than this, the output speed signal will remain at this level until the input speed signal is above this minimum.

OPERATION LED

This green LED lights to indicate that the control is operating. It is lighted whenever the motor starter holding contact between terminals TB12 and TB 12 is closed. It will stay ON after the **STOP** push button is pressed until the drive's speed reaches the lower limit speed and the motor starter's holding contacts are opened.

SOFT STOP LED

This red LED lights to indicate that the **STOP** push button has been pressed and the drive is being decelerated to the preset **LOWER LIMIT** speed. Once the **LOWER LIMIT** speed is reached and the drive motor has been stopped, this LED will be OFF.

LOWER LIMIT POTENTIOMETER

This potentiometer is used to set the lower limit speed. This is the speed to which the drive will decelerate when the **STOP** push button is pressed. Once this speed is reached, the motor starter's holding contacts between terminals TB12 and TB13 will open, stopping the drive. When the **X10 MAG** switch is OFF, the lower limit can be set from 1.2% to 12% of the maximum operating. When it is ON, the lower limit can be set from 1.2% TO 100% of the maximum operating speed.

To set this potentiometer, without pushing the **STOP** push button, adjust the speed of the drive to the desired lower limit speed. Turn this potentiometer until the **LOWER LIMIT LED** just turns ON.

LOWER LIMIT LED

This red LED lights when the output speed of the drive is at or below the lower limit speed. This can happen in three situations.

1. If the drive's speed is adjusted to below the lower limit speed. In this case, the drive will continue to operate. If the **STOP** push button is pressed, the drive will stop immediately.
2. After the **STOP** push button is pressed and the drive has decelerated to slower than the lower limit speed. The motor starter will now be OFF. This LED will not be ON while the drive is decelerating and its speed is still above the lower limit speed.
3. After the **EMERGENCY STOP** push button is pressed and the drive has stopped or its speed is less than the lower limit speed. The motor starter's holding contacts between terminals TB13 and TB13 will now be open.