

Motor Control

Instruction Manual

Models
C880800-00

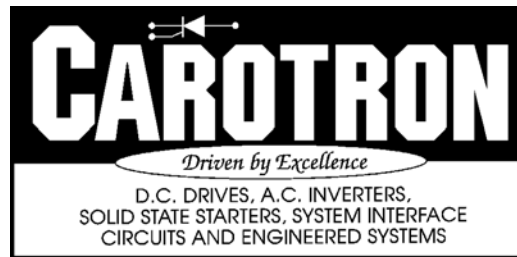
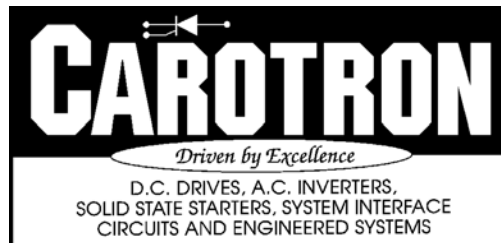


Table of Contents

1. General Description	2
2. Specifications and Technical Data	2
2.1 Electrical	2
2.2 Physical	2
3. Installation	3
3.1 Circuit protection	3
3.1 Connection information	3
4. Programming & Adjustments.	4
4.1 Programming jumpers	4
4.2 Potentiometers	4
4.3 Adjustment procedure	4
5. Prints	6
C10433-Connection	6
C10355-Schematic	7
C10356-Assembly	8



1

General Description

The Carotron Model C880800-00 motor controller provides full range speed control of permanent magnet D.C. motors from 1/8 to 1/4 horsepower. Some standard features of this model are as follows:

- Armature voltage feedback
- On board relay to control starting and stopping.

- A hard firing gating circuit.
- Inner current loop for fast stable response under varying load conditions.
- Metal film resistors and cermet potentiometers for stable operation with fluctuations in temperature.

2

Specifications and Technical Data

1. Electrical A.C. Input

A.C. Input

115 VAC $\pm 10\%$, 50/60 ± 2 Hz

Armature Output

0 – 90 VDC

Adjustments

- Min: 0 to 25% of full speed
- Max: 80 to 110% of full speed
- Current Limit: 0 to 150% of current range (HP jumper)
- IR Compensation: Range set by current range (HP jumper)

Horsepower Range

1/8 – 1/4 HP

Speed Regulation

Armature feedback: $\pm 2\%$ of base speed

Speed Range

20 to 1

Temperature Range

0 - 50°C

2. Physical

Refer to print C10356 in section 5 for mounting dimension information

1. Circuit Protection

Wire size and fusing should be based on local electrical codes at each installation. Input requirements with recommended fuse size and type per horsepower are listed in the following table.

<u>HP</u>	<u>Input Voltage</u>	<u>Input A.C. Current @ F.L.</u>	<u>Recommended Fuse</u>
1/8	115 VAC	2.4 AMPS	3 AMP, FLM
1/4	115 VAC	4.5 AMPS	5 AMP, FLM

NOTE: Fuses shown are manufactured by Littelfuse.

2. Connection Information

Reference the Model C880800-00 Connection Diagram C10433 in Section 5.

Wiring Precautions

WARNING:

Circuit common on the Model 880800-00 is not earth ground. High voltage potentials can be present between earth ground and any point in the circuit. All test instruments should be isolated from earth ground to prevent damage to the instrument or the control. Any instrument connected to the circuit is floating at potentials that approach the A.C. line voltage, and should be handled with care.

Use shielded cable for speed pot circuit wiring. These wires should be routed away from all A.C. power, armature, and relay coil wiring. Insulate shield at both ends.

WARNING:

Any relays, contactors, motor starters, solenoids, etc., located in close proximity to or on the same A.C. line as the Model C880800-00 control should have a transient suppression device in parallel with the coil to minimize interference with the control.

Terminal Connections

- **TB1 – 1 and TB1 – 2 (L and N – A. C. Input):** These terminals are used for 115 Volts A.C. line input.
- **TB1 – 3 and TB1 – 4 (A1 and A2 – Armature):** The motor armature leads, A1 and A2, connect to these terminals. These connections will produce CCW motor rotation when viewed from the commutator end. The armature leads should be switched if reverse rotation is desired.
- **TB1 – 5, TB1 – 6, and TB1 – 7 (Speed Pot.):** A potentiometer with a resistance value of 5,000 Ohms connects to these terminals. The CCW lead connects to terminal 7, the wiper connects to terminal 6, and the CW lead connects to terminal 5.
- **TB1- 8 and TB1 – 9 (S1 and S2):** Sourcing 115 Volts A.C. to these terminals allows the output to accelerate to a level set by the speed pot. Removing the source immediately resets the drive to zero output.

1. Programming Jumpers

- **HP (Horsepower Range):** Two horsepower ranges (1/8 and 1/4 HP) are selectable for different motors. The Current Limit pot. has a range equal to 150% of the value selected.

2. Potentiometers

- **MIN SPEED (Minimum Speed):** MIN sets the minimum motor speed when the speed pot. is set to zero. Clockwise rotation increases the output speed.
- **MAX SPEED (Maximum Speed):** MAX sets the maximum motor speed when the speed pot. is set for 100%. Clockwise rotation increases the output speed.
- **IR COMP (IR Compensation):** IR provides a signal proportional to armature current to compensate for motor losses as the motor load increases. This improves speed regulation in armature feedback. Clockwise rotation increases the compensation.
- **CURRENT LIMIT:** CURRENT LIMIT sets the maximum armature current level. Its range is 0 to 150% of the current range (HP jumper). Clockwise rotation increases the current limit setting.

3. Adjustment Procedure

Step 1

Visually inspect all connections to check for tightness, proper insulation and agreement

with the connection diagram C10433.

- 1.) Verify the line voltage (115 VAC at 60 Hz.)
- 2.) Note the motor horsepower rating and select the proper HP range.
- 3.) Initially set the potentiometers as follows:

MIN SPEED.....Full counter-clockwise

MAX SPEED.....Mid-range

IR COMP.....Full counter-clockwise

CURRENT LIMIT.....Full clockwise

Step 2

- 1.) With no load on the motor or machine and with the speed pot. at zero, apply power to the control. Apply 115 Volts A.C. to TB1-8 and TB1-9 (S1 and S2) to start the drive.
- 2.) Increase the MIN pot. CW until the motor just begins to rotate and then CCW until motor just stops.

Step 3

Rotate the speed pot. to maximum. Measure the motor speed or armature voltage. Adjust the MAX pot. for base speed or full rated armature voltage.

Step 4: IR Compensation

Adjust the speed pot. to mid-range, or if known, the speed at which the motor will be run most often. Closely note the motor or line speed. Apply rated or normal machine load to the motor. The speed will usually drop off a small percentage. Increase the IR pot. clockwise until the loaded speed matches the unloaded speed. Recheck the unloaded speed level and repeat this step until there is no difference in speed from no load to full load.

NOTE: The signal from the IR pot. may affect the MIN and MAX pot. settings. Recheck min. and max. speed after adjusting the IR pot. and readjust if necessary.

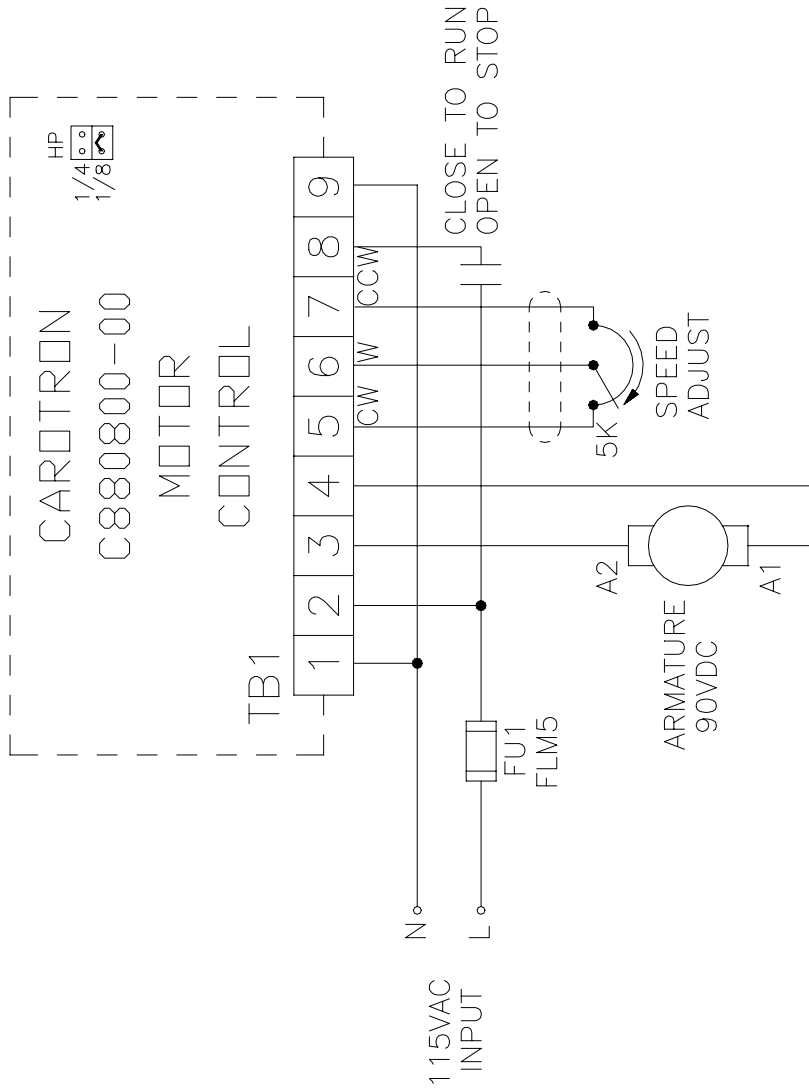
Step 5

The CURRENT LIMIT pot. is factory adjusted for 150% of rated current in the 1/4 HP range when the motor is stalled.

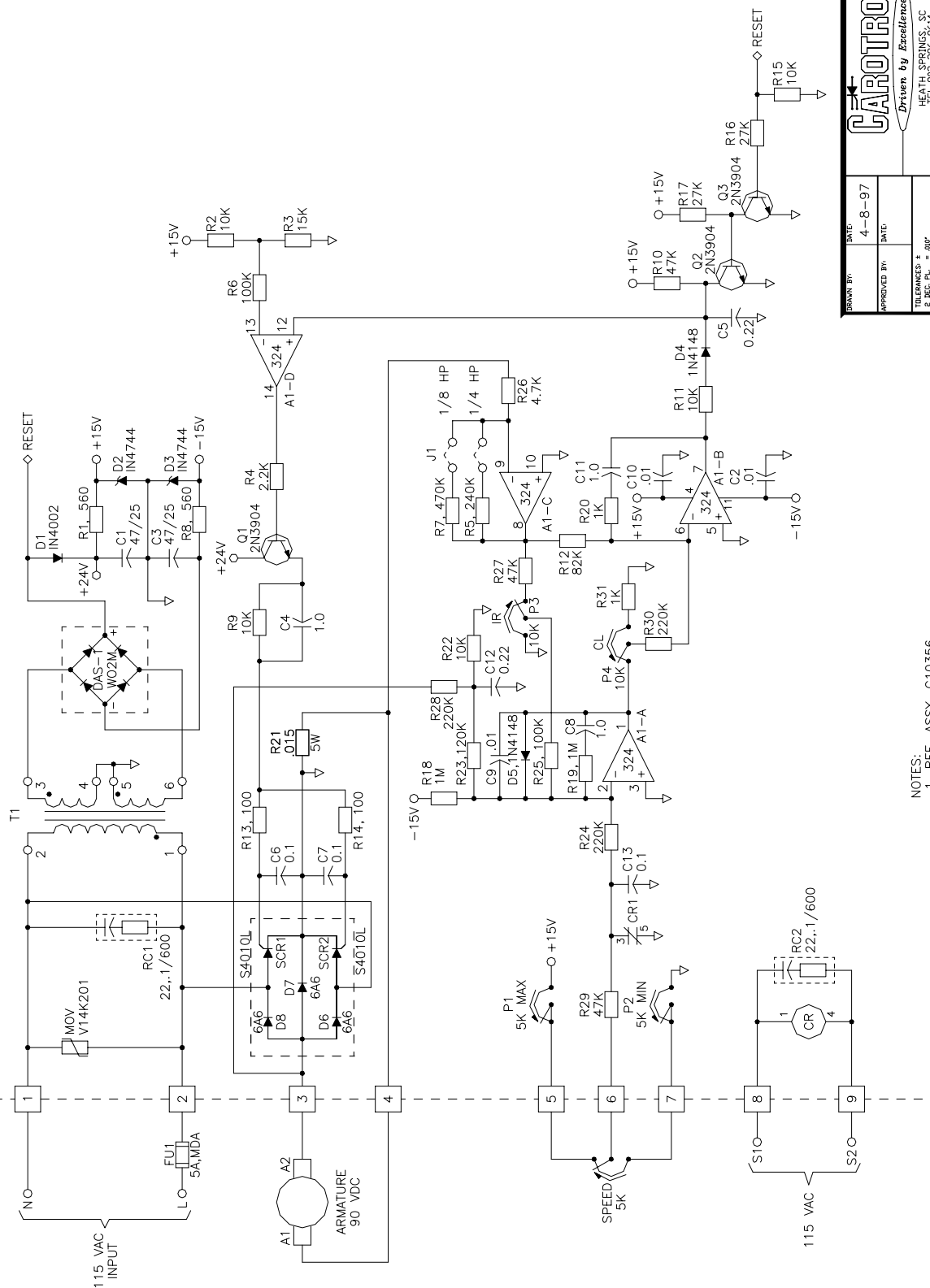
NOTE: The motor armature should never be energized at stall for more than a few seconds to prevent the chance of overheating the windings and degrading the insulation.

Should it become necessary to readjust the CURRENT LIMIT pot., use the following procedure:

- Insert a D.C. ammeter in series with the motor armature. A.C. or D.C. clamp-on meters are not recommended since they will not give an accurate indication of armature current.
- Mechanically lock the motor shaft to prevent it from turning.
- Set the CURRENT LIMIT pot. to 25% CW.
- Set the SPEED pot. to 50% CW.
- Select the proper HP range.
- Apply 115 Volts A.C. to the control.
- Apply 115 Volts A.C. to TB1-8 and TB1-9 (S1 and S2) to start the drive. Increase the CURRENT LIMIT pot. to allow 150% of motor nameplate full load current.
- Remove the power and the mechanical lock on the motor shaft.

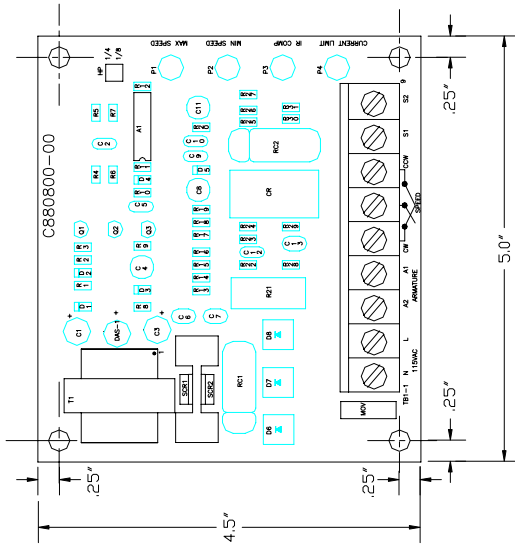
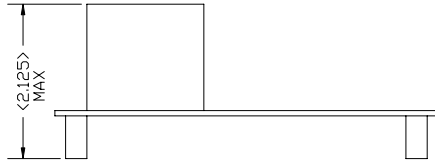
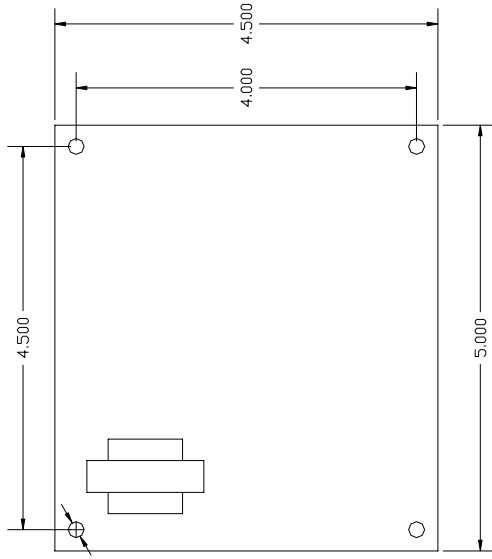


DRAWN BY SJG	DATE 06/17/02	 Driven by Excellence
APPROVED BY	DATE	
REVISIONS: 1 2 DEC. PL. = 400' 3 DEC. PL. = 400'		HEATH SPRINGS, SC TEL. 803-286-6663 FAX 803-286-6663
SCALE		TITLE CONNECTION DIAGRAM MODEL C880800-00
DRAWING NUMBER C10433		REV. - SH. 1 OF 1



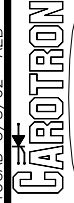
NOTES:
 1. REF. ASSY. C10356.
 2. R17 AND D9 NOT USED.

GAROTRON <i>Driven by Excellence</i>	
HEATH SPRINGS, SC TEL 803-286-8614 FAX 803-286-6063	TITLE
SCHEMATIC	MODEL C880800-00
SCALE	1/8 - 1/4 HP
DRAWING NUMBER	REV. C10355
DATE: 4-8-97	SH. 1 OF 1
APPROVED BY:	
TOLERANCES & DEC. PL. = .005"	
DEC. PL. = .005"	



REV. B, UPGRADED TO AUTOCAD, 3/8/02, AEB

DRAWN BY:	DATE:
APPROVED BY:	DATE:
TELEPHONE: # 007	
FAX: 803-586-6614	
3 DEC. PL. = 2007	
SCALE:	



HEATH SPRINGS, SC
 TEL: 803-586-6614
 FAX: 803-586-6693

TITLE: ASSY. MODEL
 C880800-00

DRAWING NUMBER
C10356

REV. B

SH. 1 OF 1

- NOTES:
1. REFER TO BILL OF MATERIALS A10356.
 2. REFER TO SCHEMATIC C10356.
 3. MAX. HEIGHT INCLUDING STANDOFF= 2.1"
 4. USE #6-32 MOUNTING HARDWARE.

Notes:

Standard Terms & Conditions of Sale

1. General

The Standard Terms and Conditions of Sale of Carotron, Inc. (hereinafter called "Company") are set forth as follows in order to give the Company and the Purchaser a clear understanding thereof. No additional or different terms and conditions of sale by the Company shall be binding upon the Company unless they are expressly consented to by the Company in writing. The acceptance by the Company of any order of the Purchaser is expressly conditioned upon the Purchaser's agreement to said Standard Terms and Conditions. The acceptance or acknowledgement, written, oral, by conduct or otherwise, by the Company of the Purchaser's order shall not constitute written consent by the Company to addition to or change in said Standard Terms and Conditions.

2. Prices

Prices, discounts, allowances, services and commissions are subject to change without notice. Prices shown on any Company published price list and other published literature issued by the Company are not offers to sell and are subject to express confirmation by written quotation and acknowledgement. All orders of the Purchaser are subject to acceptance, which shall not be effective unless made in writing by an authorized Company representative at its office in Heath Springs, S.C. The Company may refuse to accept any order for any reason whatsoever without incurring any liability to the Purchaser. The Company reserves the right to correct clerical and stenographic errors at any time.

3. Shipping dates

Quotation of a shipping date by the Company is based on conditions at the date upon which the quotation is made. Any such shipping date is subject to change occasioned by agreements entered into previous to the Company's acceptance of the Purchaser's order, governmental priorities, strikes, riots, fires, the elements, explosion, war, embargoes, epidemics, quarantines, acts of God, labor troubles, delays of vendors or of transportation, inability to obtain raw materials, containers or transportation or manufacturing facilities or any other cause beyond the reasonable control of the Company. In no event shall the Company be liable for consequential damages for failure to meet any shipping date resulting from any of the above causes or any other cause.

In the event of any delay in the Purchaser's accepting shipment of products or parts in accordance with scheduled shipping dates, which delay has been requested by the Purchaser, or any such delay which has been caused by lack of shipping instructions, the Company shall store all products and parts involved at the Purchaser's risk and expense and shall invoice the Purchaser for the full contract price of such products and parts on the date scheduled for shipment or on the date on which the same is ready for delivery, whichever occurs later.

4. Warranty

The Company warrants to the Purchaser that products manufactured or parts repaired by the Company, will be free, under normal use and maintenance, from defects in material and workmanship for a period of one (1) year after the shipment date from the Company's factory to the Purchaser. The Company makes no warranty concerning products manufactured by other parties.

As the Purchaser's sole and exclusive remedy under said warranty in regard to such products and parts, including but not limited to remedy for consequential damages, the Company will at its option, repair or replace without charge any product manufactured or part repaired by it, which is found to the Company's satisfaction to be so defective; provided, however, that (a) the product or part involved is returned to the Company at the location designated by the Company, transportation charges prepaid by the Purchaser; or (b) at the Company's option the product or part will be repaired or replaced in the Purchaser's plant; and also provided that (c) the Company is notified of the defect within one (1) year after the shipment date from the Company's factory of the product or part so involved.

The Company warrants to the Purchaser that any system engineered by it and started up under the supervision of an authorized Company representative will, if properly installed, operated and maintained, perform in compliance with such system's written specifications for a period of one (1) year from the date of shipment of such system.

As the Purchaser's sole and exclusive remedy under said warranty in regard to such systems, including but not limited to remedy for consequential damages, the Company will, at its option, cause, without charges any such system to so perform, which system is found to the Company's satisfaction to have failed to so perform, or refund to the Purchaser the purchase price paid by the Purchaser to the Company in

regard thereto; provided, however, that (a) Company and its representatives are permitted to inspect and work upon the system involved during reasonable hours, and (b) the Company is notified of the failure within one (1) year after date of shipment of the system so involved.

The warranties hereunder of the Company specifically exclude and do not apply to the following:

a. Products and parts damaged or abused in shipment without fault of the Company.

b. Defects and failures due to operation, either intentional or otherwise, (1) above or beyond rated capacities, (2) in connection with equipment not recommended by the Company, or (3) in an otherwise improper manner.

c. Defects and failures due to misapplication, abuse, improper installation or abnormal conditions of temperature, humidity, abrasives, dirt or corrosive matter.

d. Products, parts and systems which have been in any way tampered with or altered by any party other than an authorized Company representative.

e. Products, parts and systems designed by the Purchaser.

f. Any party other than the Purchaser.

The Company makes no other warranties or representation, expressed or implied, of merchantability and of fitness for a particular purpose, in regard to products manufactured, parts repaired and systems engineered by it.

5. Terms of payment

Standard terms of payment are net thirty (30) days from date of the Company invoice. For invoice purposed, delivery shall be deemed to be complete at the time the products, parts and systems are shipped from the Company and shall not be conditioned upon the start up thereof. Amounts past due are subject to a service charge of 1.5% per month or fraction thereof.

6. Order cancellation

Any cancellation by the Purchaser of any order or contract between the Company and the Purchaser must be made in writing and receive written approval of an authorized Company representative at its office in Heath Springs, S.C. In the event of any cancellation of an order by either party, the Purchaser shall pay to the Company the reasonable costs, expenses, damages and loss of profit of the Company incurred there by, including but not limited to engineering expenses and expenses caused by commitments to the suppliers of the Company's subcontractors, as determined by the Company.

7. Changes

The Purchaser may, from time to time, but only with the written consent of an authorized Company representative, make a change in specifications to products, parts or systems covered by a purchase order accepted by the company. In the event of any such changes, the Company shall be entitled to revise its price and delivery schedule under such order.

8. Returned material

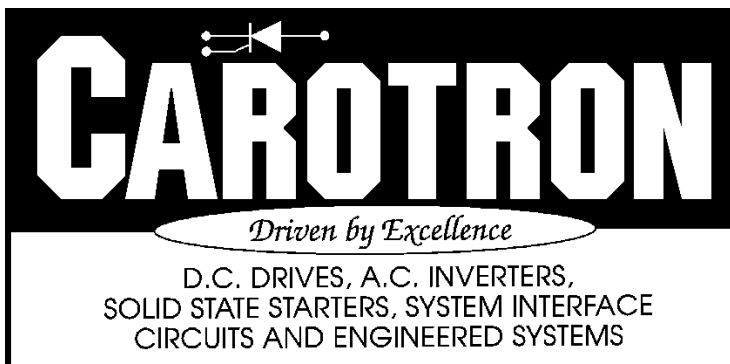
If the Purchaser desires to return any product or part, written authorization thereof must first be obtained from the Company which will advise the Purchaser of the credit to be allowed and restocking charges to be paid in regard to such return. No product or part shall be returned to the Company without a "RETURN TAG" attached thereon which has been issued by the Company.

9. Packing

Published prices and quotations include the Company's standard packing for domestic shipment. Additional expenses for special packing or overseas shipments shall be paid by the Purchaser. If the Purchaser does not specify packing or accepts parts unpacked, no allowance will be made to the Purchaser in lieu of packing.

10. Standard transportation policy

Unless expressly provided in writing to the contrary, products, parts and systems are sold f.o.b. first point of shipment. Partial shipments shall be permitted, and the Company may invoice each shipment separately. Claims for non-delivery of products, parts and systems, and for damages thereto must be filed with the carrier by the Purchaser. The Company's responsibility therefor shall cease when the carrier signs for and accepts the shipment.



3204 Rocky River Road
Heath Springs, SC 29058
Phone: (803) 286-8614
Fax: (803) 286-6063
Email: saleserv@carotron.com
Web: www.carotron.com
MAN 1002-0B
Issued 10-05-2004