RCP200 Series Motor Controls

Instruction Manual

Model RCP202-000
Model RCP205-000
Model RCP202-BC1
Model RCP202-BC2
Model RCP205-BC2

CAROTRON
Driven by Excellence
D.C. DRIVES, A.C. INVERTERS,
SOLID STATE STARTERS, SYSTEM INTERFACE
CIRCUITS AND ENGINEERED SYSTEMS

You’ve just purchased the best!

Congratulations! You’ve just purchased one of the industry’s finest motor controls.

With the RCP200 Series, you get a number of standard features that help simplify installation and eliminate, in many cases, the need to purchase expensive add-on options. You also get quality components for consistent performance and long term reliability.

The RCP200 Series is just one of the products we’ve developed since 1984, when we pulled together people experienced in product design, manufacturing, quality control and customer service to provide quality motor control products to the industrial market. Today, through our innovative design and quality workmanship, we are proud that we have become one of the industry’s most trusted names in industrial control products.

We hope that your new RCP200 Series Motor Control gives you years of trouble-free service. We promise to provide the quality and service that will make us a valuable resource for your industrial control needs. Thank you for selecting Carotron.

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3204 Rocky River Road
Heath Springs, SC 29058
Phone: (803) 286-8614 Fax: (800) 286-6063

MAN1006-00 Rev. F

1 General Description

The Carotron RCP200 Series controllers provide full range, four quadrant speed control or torque control of shunt wound or permanent magnet D.C. motors from 1/4 to 5 horsepower. Many features are standard on the RCP200 Series.

- ✓ Isolated Control Circuit
- ✓ Operation from 115 or 230 VAC input for 90 or 180 VDC motor armatures.
- ✓ Switch selectable armature voltage or tachometer voltage feedback.
- ✓ 7 or 50 VDC per thousand RPM feedback tachometer input selectable by programing jumper.
- ✓ Independently adjustable Forward Acceleration, Forward Deceleration, Reverse Acceleration and Reverse Deceleration. Each direction has two time ranges selectable by programing jumper.
- ✓ Single contact stopping by any of three methods:
    1. Coast to stop
    2. Controlled deceleration to stop
    3. Rapid stop (in current limit)
- ✓ A hard firing, high frequency multipulse gating circuit.
- ✓ I.C. regulated power supplies, metal film resistors and cermet potentiometers for stable operation under varying conditions of temperature and line voltage.
- ✓ On board A.C. line fuses.
- ✓ Oversized power handling components.
- ✓ Line transient suppression by MOV and RC snubber.
- ✓ Inner current loop type control circuit for fast and stable response under varying load conditions.

2 Specifications & Technical Data

2.1 Electrical

A.C. Input
115 VAC ± 10%, 50/60 Hz ± 2%
230 VAC ± 10%, 50/60 Hz ± 2%

Armature Output
0 – 90 VDC for 115 VAC input
0 – 180 VDC for 230 VAC input

Field Output
100 VDC @ 1 Amp for 115 VAC input
200 VDC @ 1 Amp for 230 VAC input

Horsepower Range
Model RCP202: 1/4 – 1 HP @ 90 VDC
1/2 – 2 HP @ 180 VDC

Model RCP205: 1/4 – 1 HP @ 90 VDC
1/2 – 5 HP @ 180 VDC

Isolated Control Circuit

Adjustments
The first four adjustments are duplicated for each direction, forward and reverse, and each only affects operation when running in its respective direction.

- **Maximum: forward and reverse**
  Speed Mode: -45 to +10% of rated armature voltage
  Torque Mode: -50 to +20% of rated armature current
- **Current limit – forward and reverse**
  Speed Mode: 0 to 190% of Current Range selected
  Torque Mode: 0 to 120% of Current Range selected
- **Acceleration – forward and reverse**
  Independently adjustable over either of two selectable ranges, 1 – 5 seconds or 4 – 20 seconds.
- **Deceleration – forward and reverse**
  Independently adjustable over either of two selectable ranges, 1 – 5 seconds or 4 – 20 seconds
  Note: Although the Accel and Decel pots are independently adjustable, both pots for a particular direction will have the same time range as programed by J4 or J5.
- **Deadband**
  Zero to .2 volts of Velocity Loop Integrator output
- **I.R. Comp**
  Range set by Arm Amps jumper, J1

Speed Regulation
20 to 1 Speed Range

- Armature Feedback: ± 1% of base speed
- Tachometer Feedback: ± .5% of base speed

Torque Regulation
± 1% of range selected

Temperature Range

- 0 – 55 degrees C for chassis units
- 0 – 40 degrees C for enclosed units

2.2 Physical

Refer to drawing C10216 in Section 6 for complete dimension information.

3 Installation

3.1 Circuit Protection

Wire size and fusing should be based on local electrical codes at each installation. The drives are supplied from the factory with line fuses sized to allow use at the maximum horsepower rating. Wiring should be based on this rating unless the fuse sizes are reduced per the actual horsepower of the motor in use. Input requirements with recommended fuse size and type per horsepower are listed in the following tables.

Control Model RCP202

HP	Input Voltage	Input A.C. Current @ F.L.	Recommended Fuse
1/4	115 VAC	4.3 AMPS	5 AMP, TRM
1/2	115 VAC	7.9 AMPS	8 AMP, TRM
3/4	115 VAC	11.7 AMPS	15 AMP, TRM
1	115 VAC	15.0 AMPS	20 AMP, TRM
1/2	230 VAC	4.3 AMPS	5 AMP, TRM
1	230 VAC	7.9 AMPS	8 AMP, TRM
1 1/2	230 VAC	12.2 AMPS	15 AMP, TRM
2	230 VAC	15.0 AMPS	20 AMP, TRM

NOTE: Fuses shown are manufactured by Gould. Littelfuse type FLM may be used as a substitute.

Control Model RCP205

HP	Input Voltage	Input A.C. Current @ F.L.	Recommended Fuse
3	**230 VAC**	**22 AMPS**	**35 AMP, SC**
5	**230 VAC**	**34 AMPS**	**40 AMP, SC**

NOTE: Fuses shown are manufactured by Bussman. Littelfuse type SLC may be substituted.

3.2 Connection Information

Refer to the RCP200 Series connection Diagram C10217 in section 6.

Wiring Precautions

- **WARNING!** Although the RCP200 Series Control Circuits are isolated, high voltage potentials can be present between earth or chassis ground and any point in the circuit (depending on external control circuit connections). All test instruments should be isolated from ground to prevent damage to the instrument or control.
- Grounding the control is not required. When used, ground wires should connect only to the heatsink under one of the mounting screws.

- Use shielded cable for all speed pot, tachometer, reset and enable wiring. Connect the shield to circuit common at the control end only. Insulate from ground at both ends. These wires should be routed away from all A.C. power, armature, field and relay coil wiring.
- Any relays, contactors, motor starters, solenoids, etc. located in close proximity to or on the same A.C. line supply as the RCP200 control should have a transient suppression device in parallel with the coil to minimize interference with the control.

Terminal Connections

- **Power Board Terminals**
  L1 and L2 (A.C. INPUT): These terminals are used for the A.C. line input. Either 115 VAC or 230 VAC can be connected to these terminals.
  NOTE: Jumpers J1, J2 and J3 on the Power Board must be placed in the positions corresponding to the A.C. line voltage used.
  F1 and F2 (FIELD): The motor field leads, F1 and F2, connect to these terminals. No connections are required when a permanent magnet (P.M.) type motor is used.
  A1 and A2 (ARMATURE): The motor armature leads, A1 and A2, connect to these terminals. These connections will produce CCW motor rotation as viewed from the commutator end and with the field connected as shown on the connection diagram. The armature leads should be reversed if reverse rotation is desired.
  NOTE: When operating in tachometer feedback, the tachometer leads must be reversed when the armature leads are reversed.

- **Control Board Terminals (TB1)**
  TB1 – 1 (COM): This terminal is the common connecting point for all reference input signals and reference wiring shields. Any reference input signals can be disabled by connecting them to this point.
  WARNING! Shield leads connected to COMMON must be insulated at both ends.
  TB1 – 2 (REF IN): A signal applied here will have its rate of change controlled by the ACCEL and DECEL pots. A positive signal rate of change is controlled by the Forward direction pots and negative signals are controlled by the Reverse direction pots.
    ± 10 VDC is the maximum voltage to be applied to this terminal.
    Shorting this terminal to COMMON, TB1-1, will cause the motor to decelerate to stop at the rate determined by the DECEL pot for the respective direction of rotation.
    These input signals are internally reset to zero instantly upon closure of a reference reset contact at TB1-6 & 7.
  TB1 – 3 (SUMMING IN): This terminal connects directly to the Velocity Loop input. Input signals should not exceed ± 10 VDC and should be disabled by shorting Terminal 3 to COMMON. These signals are summed with the Terminal 2 reference signals (after their rates have been modified) and have approximately the same input scaling as the Terminal 2 signals. Like polarity signals at Terminals 2 & 3 will add together and opposite polarity signals will subtract or offset each other.
  NOTE: The Reference Reset contact will have no affect on signals connected to TB1-3, SUMMING INPUT.
  TB1 – 4 (REV REF): The negative 10 VDC reference supply here is current limited for protection during reference shorting operations. Normal load resistance should be 2K ohms or higher.

TB1 – 5 (FWD REF): The positive 10 VDC reference supply is also short protected and should normally be loaded by 2k ohms or higher load resistance.

TB1 – 6 & 7 (REF RESET): Closing a contact across these terminals will instantly reset the ACCEL/DECEL circuit output to zero and cause the motor to regeneratively brake to a stop at a rate determined by the C.L. (CURRENT LIMIT) pots. This stopping method (while normally faster than the quickest controlled deceleration to stop) may subject the motor and A.C. line supply to higher than normal peak currents. Also, the time to stop in "Current Limit" may not be consistent due to variables such as motor speed, load level and load inertia.

NOTE: The Reference Reset contact will have no affect on signals connected to TB1-3, SUMMING INPUT.

TB1 – 8 & 9 (ENABLE): Closing a contact across these terminals opens electronic clamps at five places in the control circuitry and "ENABLES" the drive to function normally. Opening this contact while running will shut off the control circuit and cause the motor to coast to stop.

TB1 – 10 (+ TACH): Operation of the control in tachometer feedback requires connection of a 7 or 50 VDC-per-thousand RPM tachometer to terminal 10. When motoring in the Forward direction (Positive reference voltage), the terminal 10 tachometer voltage should be positive.

NOTE: Use jumper J2 on the Control Board to select tachometer voltage corresponding to the motor feedback tachometer rating.

TB1 – 11 (- TACH): This terminal is also circuit common. The second tachometer lead and tachometer wiring shield should connect here.

4 Programing and Adjustments

4.1 Programing Jumpers – Power Board

J1 (A.C. input voltage)

J1 selects the armature feedback voltage level according to the A.C. line voltage to be used. Position at 115V for 115 VAC input or 230 V for 230 VAC input.

J2 and J3 (A.C. input voltage)

The J2 and J3 jumper wires program the power supply transformer according to the A.C. line voltage to be used. Position each at 115V for 115 VAC input or 230V for 230 VAC input.

4.2 Programing Jumpers – Control Board

ARM / TACH switch (feedback mode)
Either armature or tachometer feedback is selected by the switch. The TACH position should also be selected when the control is used as a Torque Regulator. Selection of the TACH position disconnects the I.R. COMP pot from the circuit.

J1 (armature amps / torque range)
J1 is used to program the control according to the motor nameplate full load armature current. The CURRENT LIMIT pots have a range up to 190% of the current level selected. Refer to the following table to select the proper jumper location based on motor horsepower and control input voltage.
NOTE: The 15 and 25 AMP ranges appear on the model RCP205 only.

Jumper Position

Input Voltage	3	5	8	10	15	25
115 VAC	1/4 HP	1/2 HP	3/4 HP	1 HP	-	-
230 VAC	1/2 HP	1 HP	1 1/2 HP	2 HP	3 HP	5 HP

J2 (Tachometer voltage)
When operating in tachometer feedback, use J2 to select for 7 to 50 VDC/1000 RPM according to the rating of the tachometer used.

J3 (Operating mode)
J3 selects control operation as a motor Speed Regulator or as a motor Torque Regulator. In the TORQ position, torque is controlled by regulating armature current. For a linear motor torque with respect to the torque reference, the voltage feedback signal should be defeated by placing the ARM/TACH switch in the TACH position with no tachometer connected. Leaving the switch in the ARM position will cause a non-linear torque output but will provide an upper speed limit which may be desirable in the event of web breakage or other “runaway” conditions.

J4 (Reverse direction ACCEL/DECEL range)
The range of time set by the Reverse ACCEL and DECEL pots can be 1-5 or 4-20 seconds as determined by the J4 jumper position.

J5 (Forward direction ACCEL/DECEL range)
The position of J5 determines the time range, 1-5 or 4-20 seconds, set by the Forward ACCEL and DECEL pots.

4.3 Potentiometers

NOTE: The following four potentiometers are duplicated for each direction, forward and reverse, and each only affects operation when running in its respective direction.

MAX (Maximum – forward & reverse)
MAX sets the maximum motor speed when the external Speed pot is set at 100%. Clockwise rotation increases speed. When the control is used in the TORQUE mode, the MAX pot sets the maximum torque level.

C.L. (Current limit – forward & reverse)
C.L. sets the maximum armature current level. Its range is 0 to 190% of the current level selected by jumper J1 on the Control Board. Clockwise rotation increases the Current Limit setting. When the control is operated as a torque regulator, the C.L. pot should be turned full clockwise since the range of current is determined by other adjustments.

ACCEL (Acceleration time – forward & reverse)
J4 sets the reverse ACCEL pot range and J5 sets the forward ACCEL pot range to 1 - 5 seconds or 4 – 20 seconds. Clockwise rotation of the ACCEL pots increases the time to accelerate the motor linearly to full speed. To accelerate to speeds less than full speed will take less time. To accelerate to 50% speed would take 50% of the acceleration time.

DECEL (Deceleration – forward & reverse)
J4 sets the reverse DECEL pot range and J5 sets the forward DECEL pot range to 1 – 5 seconds or 4 – 20 seconds. Clockwise rotation increases the time taken to decelerate the motor linearly to lower speed setting. Controlled deceleration can be initiated by decreasing the speed reference or by shorting the REF IN terminal, TB1-2, to COM, TB1-1.

IR COMP (IR compensation)
The IR COMP pot 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. When tachometer feedback is used and when the control is used as a torque regulator, the IR COMP pot is not operational.

DEADBAND
Deadband is an internal feedback loop adjustment used to minimize the effect of undesirable offset voltages. Clockwise rotation will increase the amount of deadband signal and can affect control response. Rather than increase the amount of input signal required to produce an output, it increases the time for the control to respond to very low input signals.

4.4 Adjustment Procedure: Speed Regulator

STEP 1:
- Visually inspect all connections to check for tightness, proper insulation and agreement with the connection diagram. ONLY the heatsink can be connected to the chassis or earth ground.
- Verify the line voltage level and the positions of jumpers J1, J2 and J3 on the Power Board.
- Note the motor nameplate full load current and select the proper range at jumper J1 on the Control Board. Place the ARM/TACH switch in the ARM position even if tachometer feedback is to be used. Select the desired ACCEL and DECEL time ranges with Control Board jumpers J4 and J5.

- Initially set the potentiometers as follows:
  DEADBAND……………… Mid-range
  IR COMP……… Full counter clockwise
  FWD MAX………………… Mid-range
  REV MAX………………… Mid-range
  FWD C.L……………… Full clockwise
  REV C.L………………. Full clockwise
  FWD ACCEL……………… Mid-range
  REV ACCEL………………. Mid-range
  FWD DECEL……………… Mid-range
  REV DECEL………………. Mid-range

STEP 2:
With no load on the motor or machine, apply line voltage and close the ENABLE contact to start the control. Apply maximum forward (positive) reference input. Measure the motor speed or armature voltage and adjust the FWD MAX pot for base speed or rated armature voltage.

STEP 3:
Repeat the Step 2 procedure for the reverse direction by applying maximum reverse (negative) reference and adjusting the REV MAX pot.

STEP 4: (Armature feedback only – Omit this step if tachometer feedback is used.)

- Adjust the speed (either direction) 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 load to the motor. The speed will usually drop a small percentage. Increase the IR COMP pot rotation clockwise until the loaded speed matches the unloaded speed. Recheck the unloaded speed level and repeat this step until there is no difference from no load to full load.
- **NOTE:** The IR COMP signal may affect the maximum speed settings. After setting the IR COMP, recheck each direction's MAX level and readjust if necessary.

STEP 5: (Tachometer feedback only – Omit this step if armature feedback is used.)

- With the control in Armature feedback, run the motor forward (positive reference) and measure the tachometer voltage at TB1 – 10 & 11. Verify that terminal 10 is positive with respect to terminal 11 and reverse the leads to correct if necessary.
- Remove power from the control and switch from the ARM to TACH position.
- **NOTE:** The maximum speed settings may change slightly because of variations in the tachometer voltage. Recheck and readjust the MAX pots if necessary.

STEP 6:

- The C.L. (CURRENT LIMIT) pots are normally adjusted to full clockwise to allow 190% of the amperage level selected by jumper J1 on the Control Board. The RCP200 Series controls can safely handle this current level on an intermittent basis, i.e. during rapid accelerations and decelerations or upon application of a cyclic or stepped load. If desired, the maximum current levels can be limited to a lower level by rotating the C.L. pots counter clockwise.
- **NOTE:** Precise setting of the Current Limit setpoints requires the insertion of a D.C. ammeter in series with the motor armature.

STEP 7:
Adjust the ACCEL and DECEL pots as required to achieve the desired rate of speed change. Clockwise rotation increases time.

4.5 Adjustment Procedure: Torque Regulator

STEP 1:

- Visually inspect all connections to check for tightness, proper insulation and agreement with the connection diagram. ONLY the heatsink can be connected to chassis or earth ground.
- Verify the line voltage and positions of jumpers J1, J2 and J3 on the Power Board.
- Note the motor nameplate full rated armature current and select the proper range at jumper J1 on the Control Board.
- Place the ARM/TACH switch in the TACH position since neither armature nor tachometer feedback is used in the Torque Regulator mode.
- Place jumper J3 on the Control Board in the TORQ position.
- Select the desired ACCEL/DECEL ranges with Control Board jumpers J4 and J5.
- Initially set the potentiometers as follows:
  DEADBAND………………. Mid-range
  IR COMP……… Full counter clockwise
  FWD MAX………………… Mid-range
  REV MAX…………………. Mid-range
  FWD C.L……………… Full clockwise
  REV C.L………………. Full clockwise
  FWD ACCEL……………… Mid-range
  REV ACCEL………………. Mid-range
  FWD DECEL……………… Mid-range
  REV DECEL………………. Mid-range
- **NOTE:** Motor full rated torque is produced at full rated armature current. In the following steps, motor torque should be monitored directly by use of a D.C. ammeter connected in series with the motor armature. The motor shaft must be mechanically locked to prevent rotation.
- **DO NOT** operate the motor stalled at full load for more than several seconds to prevent overheating.

STEP 2:
In the Torque Regulator mode, the reference signal applied to TB1-2 becomes the torque reference. Apply A.C. power, zero volts reference and close the ENABLE contact. Gradually increase the reference (FWD or REV) to maximum and adjust the corresponding MAX pot to set the armature current to 100% of motor rated current.

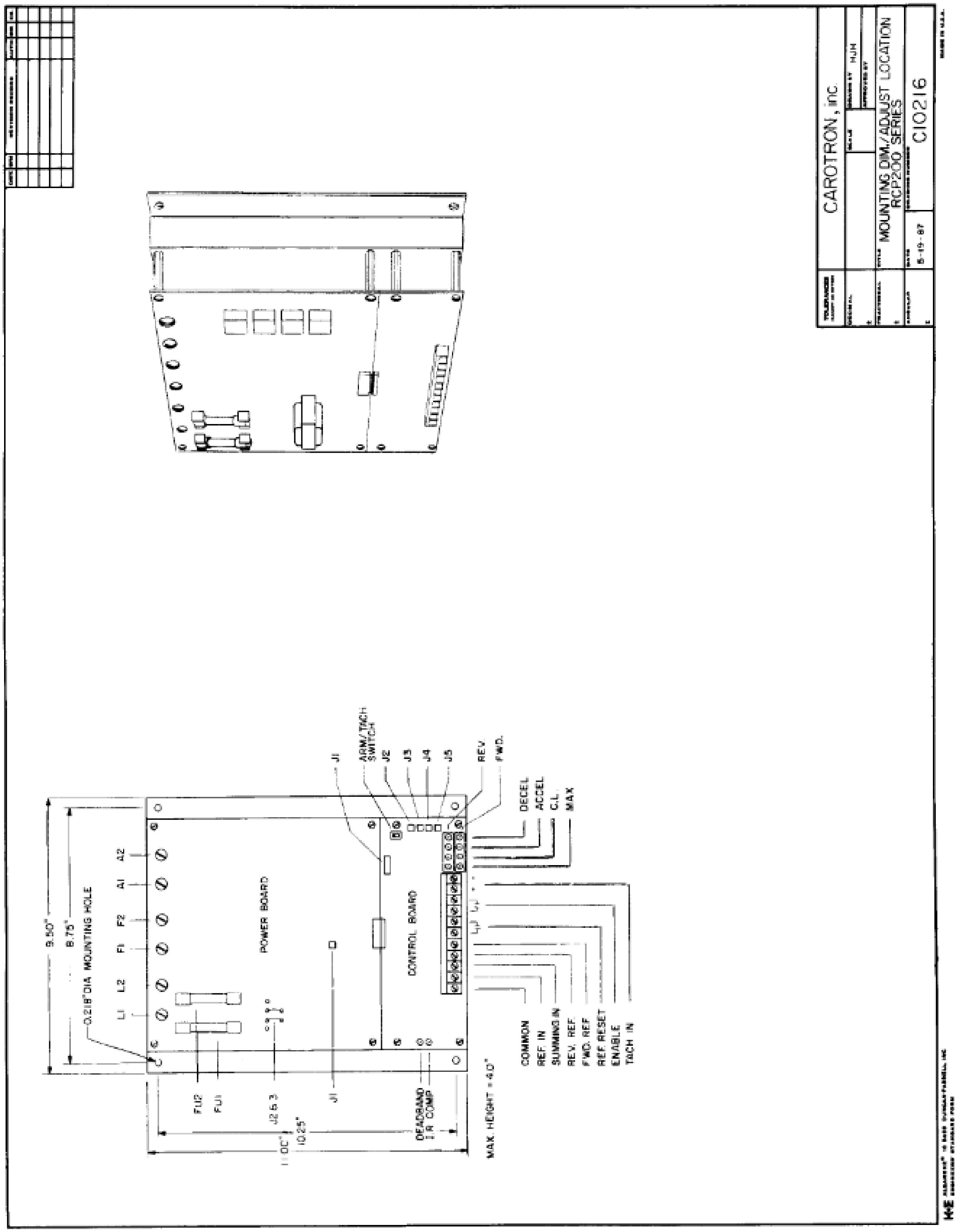
STEP 3:
Adjust the ACCEL and DECEL pots for the desired rate of change in torque because of a reference change. Opening the ENABLE contact will turn off the current instantly.

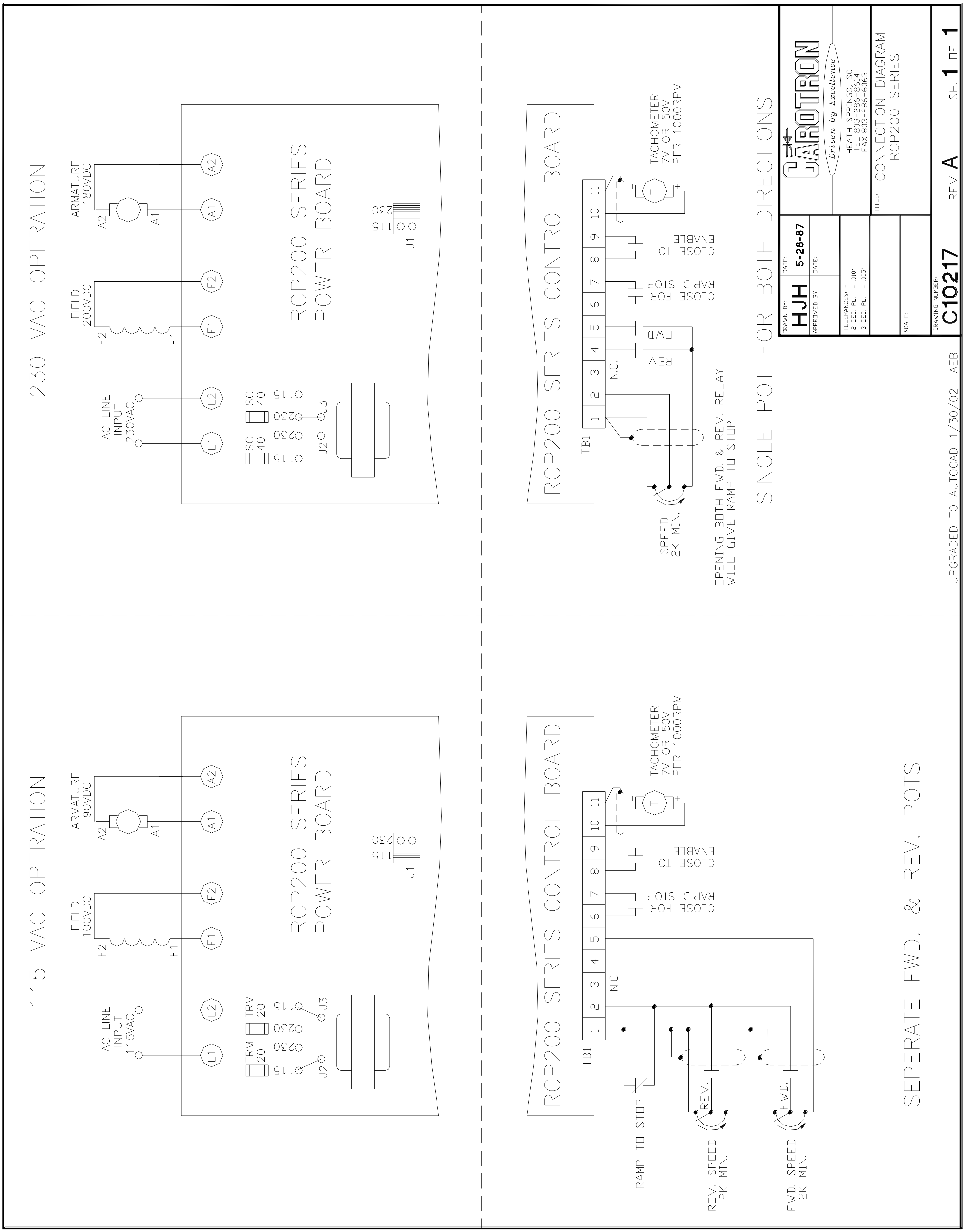
STEP 4:
Turn off the power and remove the mechanical lock from the motor shaft. The Torque Regulator is now ready for use. Check the torque/speed range of the motor to determine the lowest operating speed at full torque without overheating.

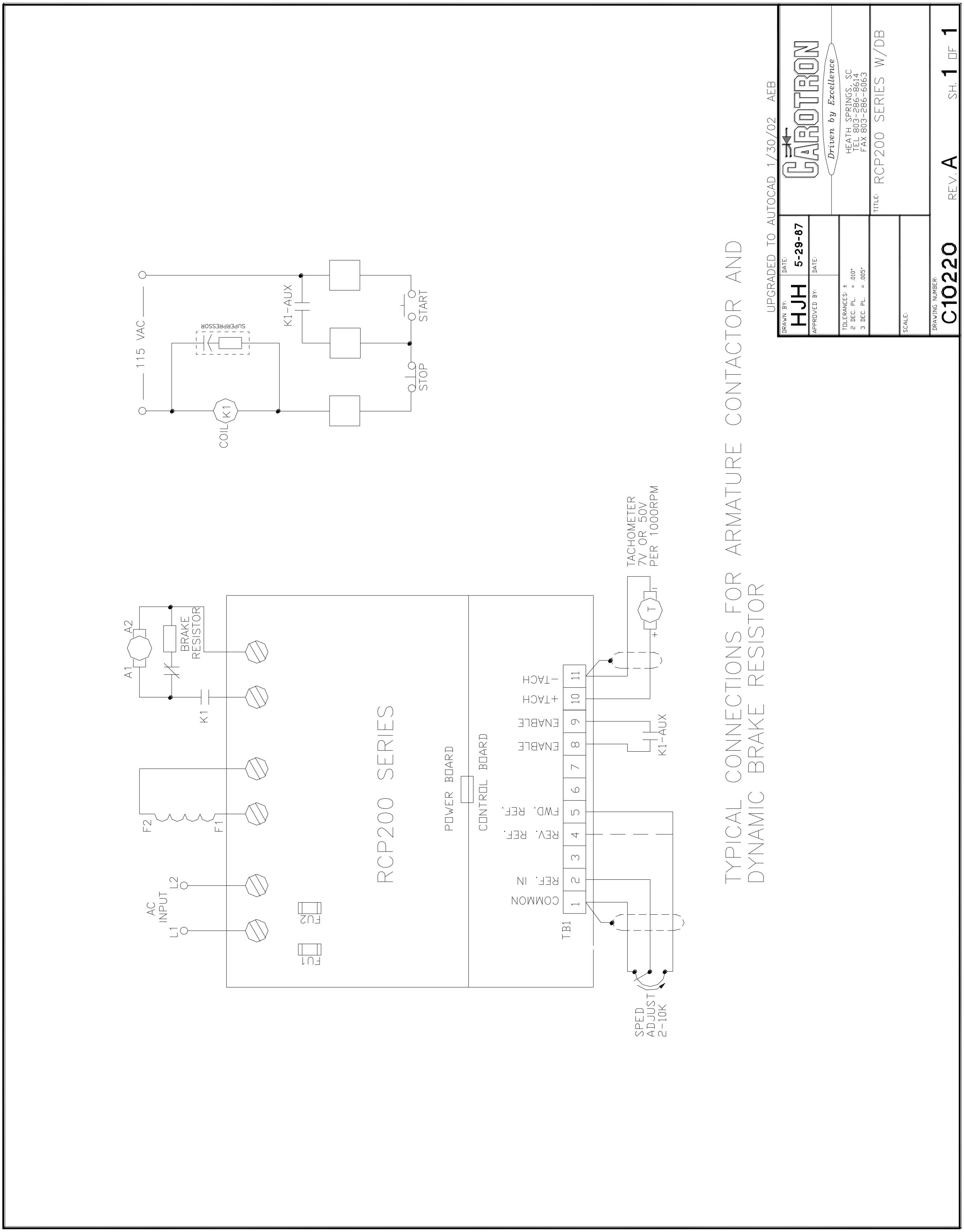
5 Spare Parts List

Part #	Description
D10182-00	RCP202 Power Board Assembly
D10182-01	RCP205 Power Board Assembly
C10184-00	RCP202 Control Board Assembly
C10184-01	RCP205 Control Board Assembly
PMD1005-00	25A/600V SCR Module for RCP202
PMD1006-00	40A/1200V SCR Module for RCP205
FUS1001-03	TRM 20 Fuse for RCP202
FUS1002-01	SC 40 Fuse for RCP205

6 Prints


CAROTRON, inc.
HJH
MOUNTING DIM./ADJUST LOCATION RCP200 SERIES
C10216
5-19-87
POWER BOARD
CONTROL BOARD
0.218" DIA MOUNTING HOLE
9.50"
8.75"
11.00"
10.25"
L1
L2
F1
F2
A1
A2
FU2
FU1
J2 & 3
J1
DEADBAND
I.R. COMP
MAX. HEIGHT = 4.0"
J1
ARM/TACH SWITCH
J2
J3
J4
J5
REV.
FWD.
DECEL
ACCEL
C.L.
MAX
COMMON
REF. IN
SUMMING IN
REV. REF.
FWD. REF.
REF. RESET
ENABLE
TACH IN


230 VAC OPERATION
AC LINE INPUT 230VAC
FIELD 200VDC
ARMATURE 180VDC
RCP200 SERIES POWER BOARD
RCP200 SERIES CONTROL BOARD
TACHOMETER 7V OR 50V PER 1000RPM
CLOSE TO ENABLE
CLOSE FOR RAPID STOP
FWD.
REV.
N.C.
TB1
SPEED 2K MIN.
OPENING BOTH FWD. & REV. RELAY WILL GIVE RAMP TO STOP.
SINGLE POT FOR BOTH DIRECTIONS
115 VAC OPERATION
AC LINE INPUT 115VAC
FIELD 100VDC
ARMATURE 90VDC
RAMP TO STOP
REV. SPEED 2K MIN.
FWD. SPEED 2K MIN.
SEPERATE FWD. & REV. POTS
CAROTRON
Driven by Excellence
HEATH SPRINGS, SC
TEL 803-286-8614
FAX 803-286-6063
TITLE: CONNECTION DIAGRAM RCP200 SERIES
DRAWN BY: HJH
DATE: 5-28-87
APPROVED BY:
DATE:
TOLERANCES: ±
2 DEC. PL. = .010"
3 DEC. PL. = .005"
SCALE:
DRAWING NUMBER: C10217
REV. A
SH. 1 OF 1
UPGRADED TO AUTOCAD 1/30/02 AEB



UPGRADED TO AUTOCAD 1/30/02 AEB
CAROTRON
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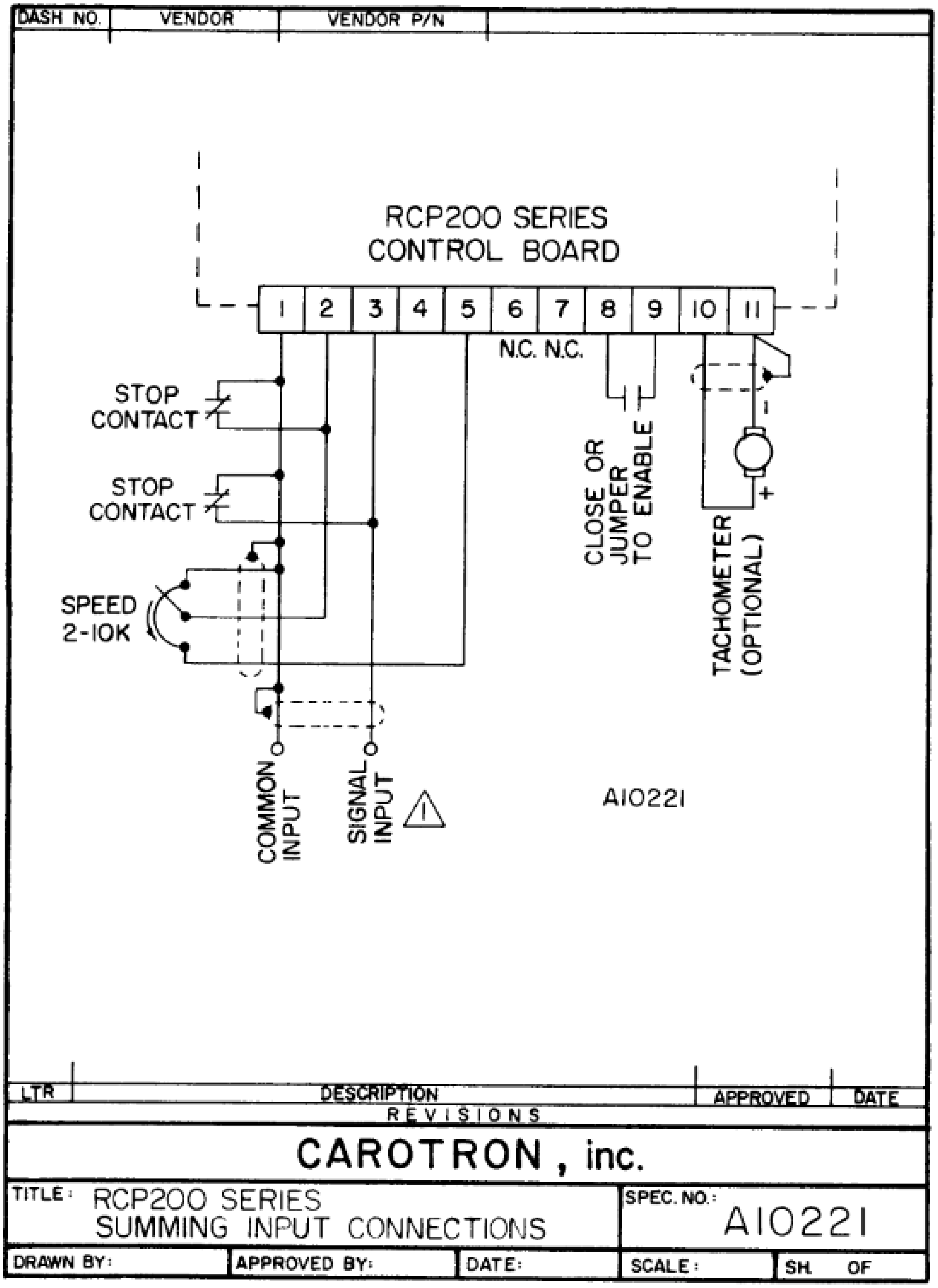
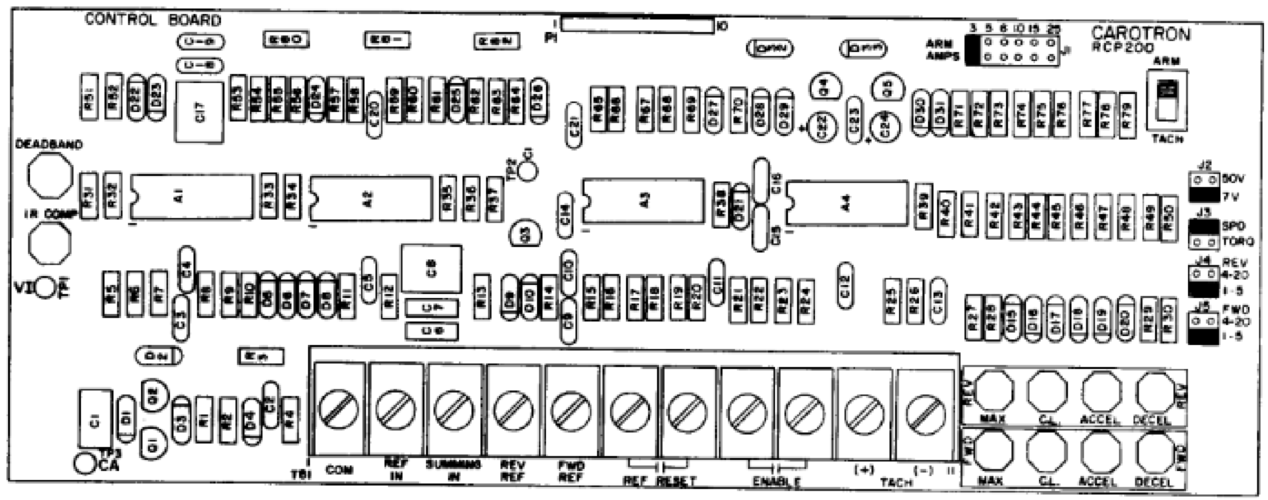
HEATH SPRINGS, SC
TEL 803-286-8614
FAX 803-286-6063
DRAWN BY: HJH
DATE: 5-29-87
APPROVED BY:
DATE:
TOLERANCES ±
2 DEC. PL. = .010"
3 DEC. PL. = .005"
TITLE: RCP200 SERIES W/DB
SCALE:
DRAWING NUMBER: C10220
REV. A
SH. 1 OF 1
TYPICAL CONNECTIONS FOR ARMATURE CONTACTOR AND
DYNAMIC BRAKE RESISTOR
115 VAC
SUPPRESSOR
K1-AUX
COIL K1
STOP
START
AC INPUT
L1
L2
F2
F1
A1
A2
BRAKE RESISTOR
K1
RCP200 SERIES
POWER BOARD
CONTROL BOARD
FU1
FU2
TB1
COMMON
REF. IN
REV. REF.
FWD. REF.
ENABLE
ENABLE
+TACH
-TACH
1
2
3
4
5
6
7
8
9
10
11
K1-AUX
TACHOMETER
7V OR 50V
PER 1000RPM
T
SPED
ADJUST
2-10K



⚠ The Summing Input Signal should not exceed ±10 VDC. Signal connected to TB1-2. Both Input signals are referenced to Circuit Common at TB1-1. Like Polarity Signals will add together and unlike Polarity Signals will subtract or offset each other.	**Example:** +5 VDC at TB1-2 and +5 VDC at TB1-3 would cause approximately the same output as +10 VDC at either single input. +10 VDC at TB1-2 and -5 VDC at TB1-3 would cause approximately the same output as +5 VDC at either single input.

REV	REVISION RECORD
A	ECO 37
B	ECO 120
C	ECO 121



NOTES:

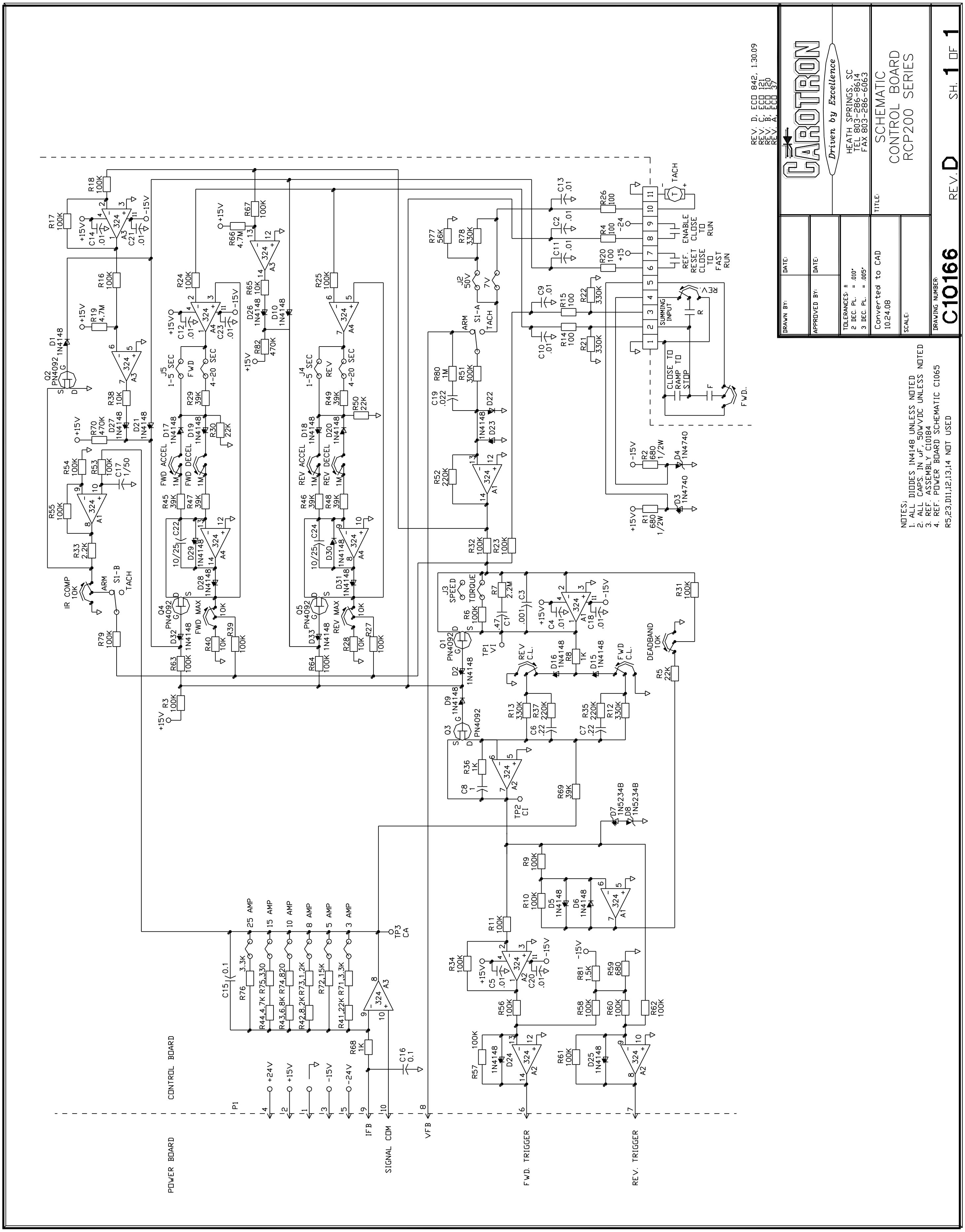
1. REFER TO SCHEMATIC C10166.
2. REFER TO BILL OF MATERIALS A10184-00 FOR RCP202, AND A10184-01 FOR RCP205. ON -00 ASSEMBLY J1 IS 4 POSITION ONLY AND R44, R75 AND R76 ARE NOT USED MODEL RCP202 DOES NOT HAVE THE 15 AND 25 AMP RANGES

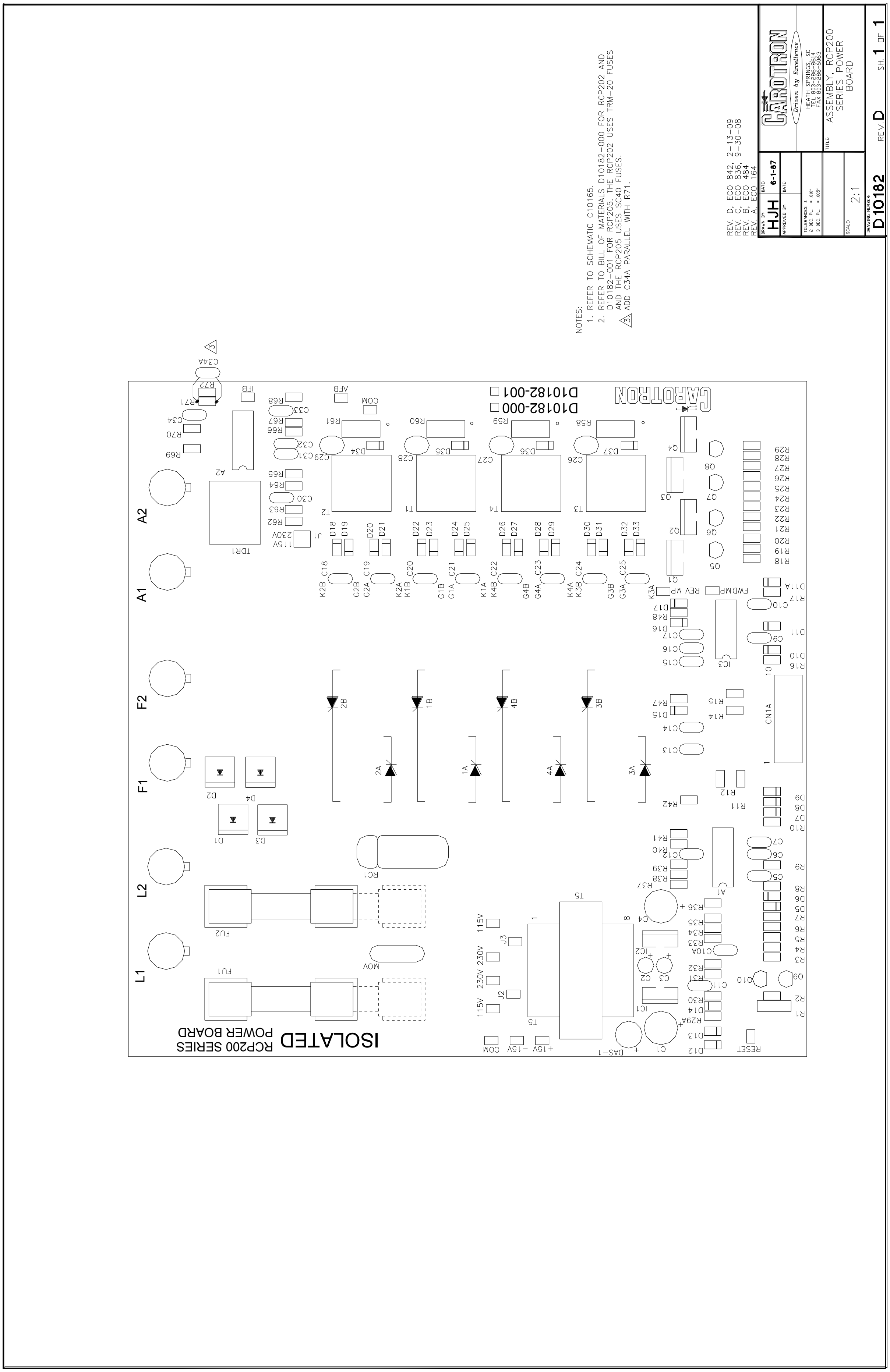
CAROTRON, inc

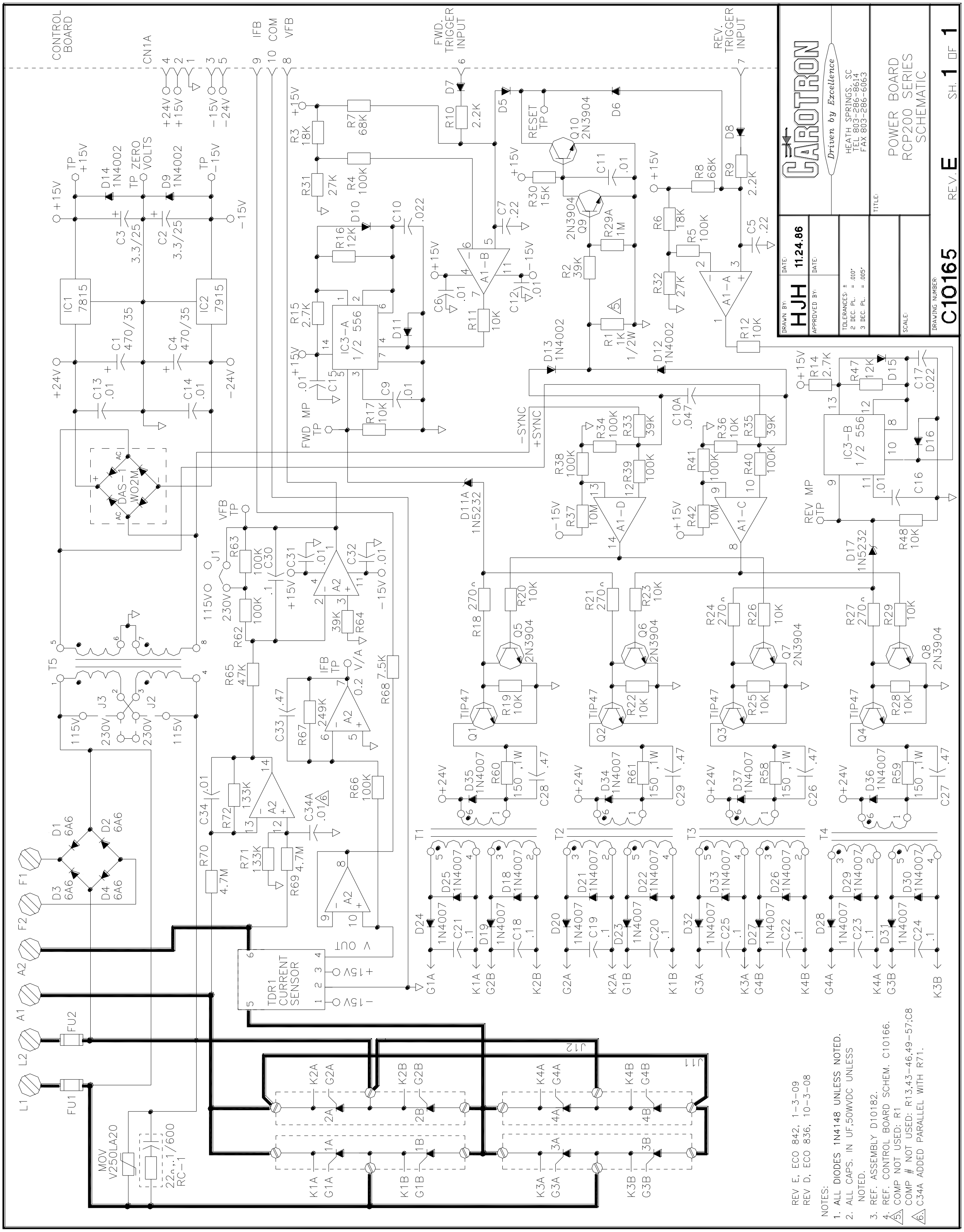
TITLE: ASSEMBLY RCP2 0 SERIES CONTROL BOARD

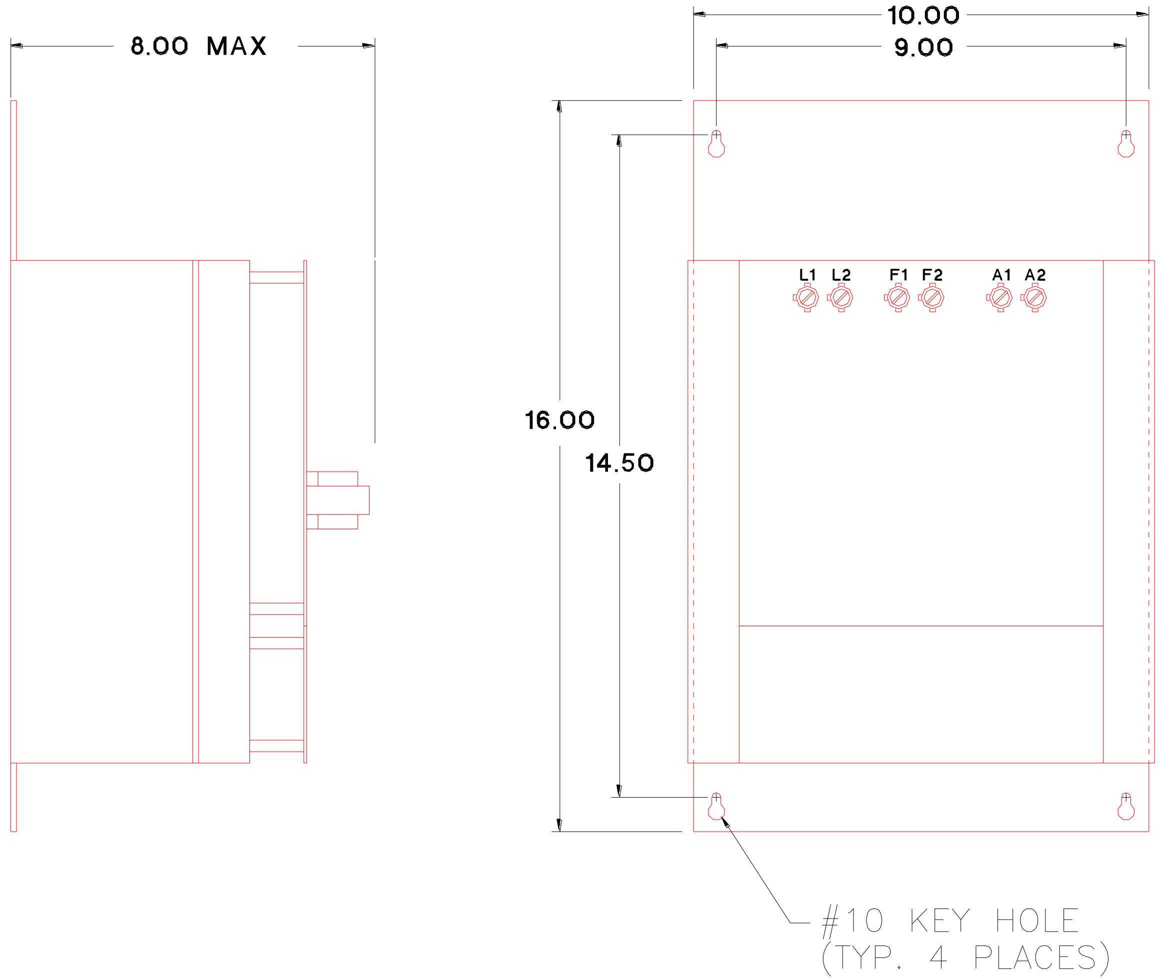
DATE: 6-1-87

DRAWING NUMBER: C10184


REV. D, ECO 842, 1.30.09
REV. C, ECO 121
REV. B, ECO 120
REV. A, ECO 37
CAROTRON
Driven by Excellence
HEATH SPRINGS, SC
TEL 803-286-8614
FAX 803-286-6063
TITLE: SCHEMATIC CONTROL BOARD RCP200 SERIES
TOLERANCES: ± 2 DEC. PL. = .010" 3 DEC. PL. = .005"
Converted to CAD 10.24.08
DRAWING NUMBER: C10166
REV. D
SH. 1 OF 1
NOTES:
1. ALL DIODES 1N4148 UNLESS NOTED
2. ALL CAPS. IN uF, 50WVDC UNLESS NOTED
3. REF. ASSEMBLY C10184
4. REF. POWER BOARD SCHEMATIC C1065
R5,23,D11,12,13,14 NOT USED
CONTROL BOARD
POWER BOARD
IFB
SIGNAL COM
VFB
FWD. TRIGGER
REV. TRIGGER

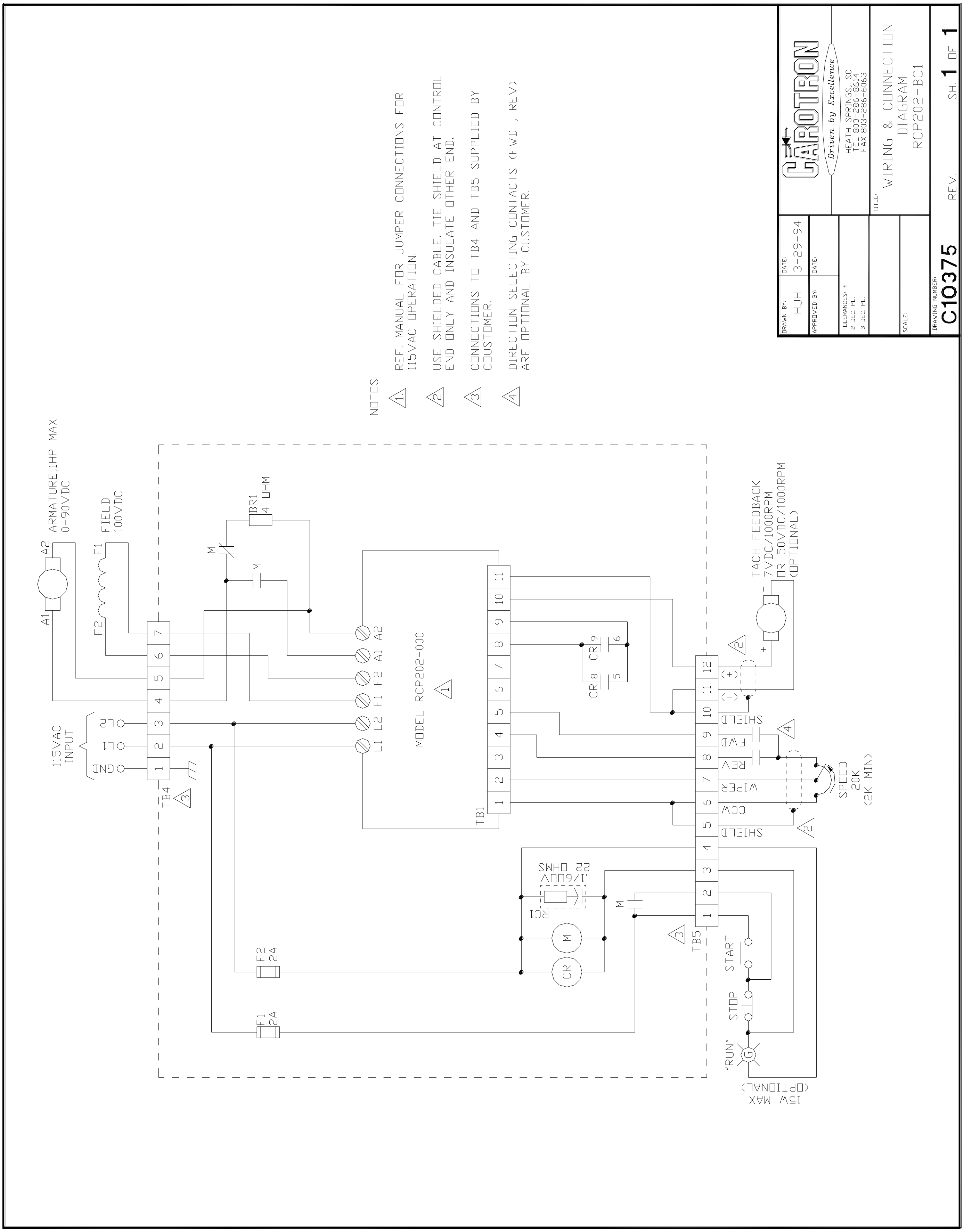

NOTES:
1. REFER TO SCHEMATIC C10165.
2. REFER TO BILL OF MATERIALS D10182-000 FOR RCP202 AND D10182-001 FOR RCP205. THE RCP202 USES TRM-20 FUSES AND THE RCP205 USES SC40 FUSES.
3 ADD C34A PARALLEL WITH R71.
REV. D, ECO 842, 2-13-09
REV. C, ECO 836, 9-30-08
REV. B, ECO 484
REV. A, ECO 164
HJH
6-1-87
CAROTRON
Driven by Excellence
ASSEMBLY, RCP200 SERIES POWER BOARD
2:1
D10182
REV. D
SH. 1 OF 1
ISOLATED
RCP200 SERIES POWER BOARD
D10182-000
D10182-001

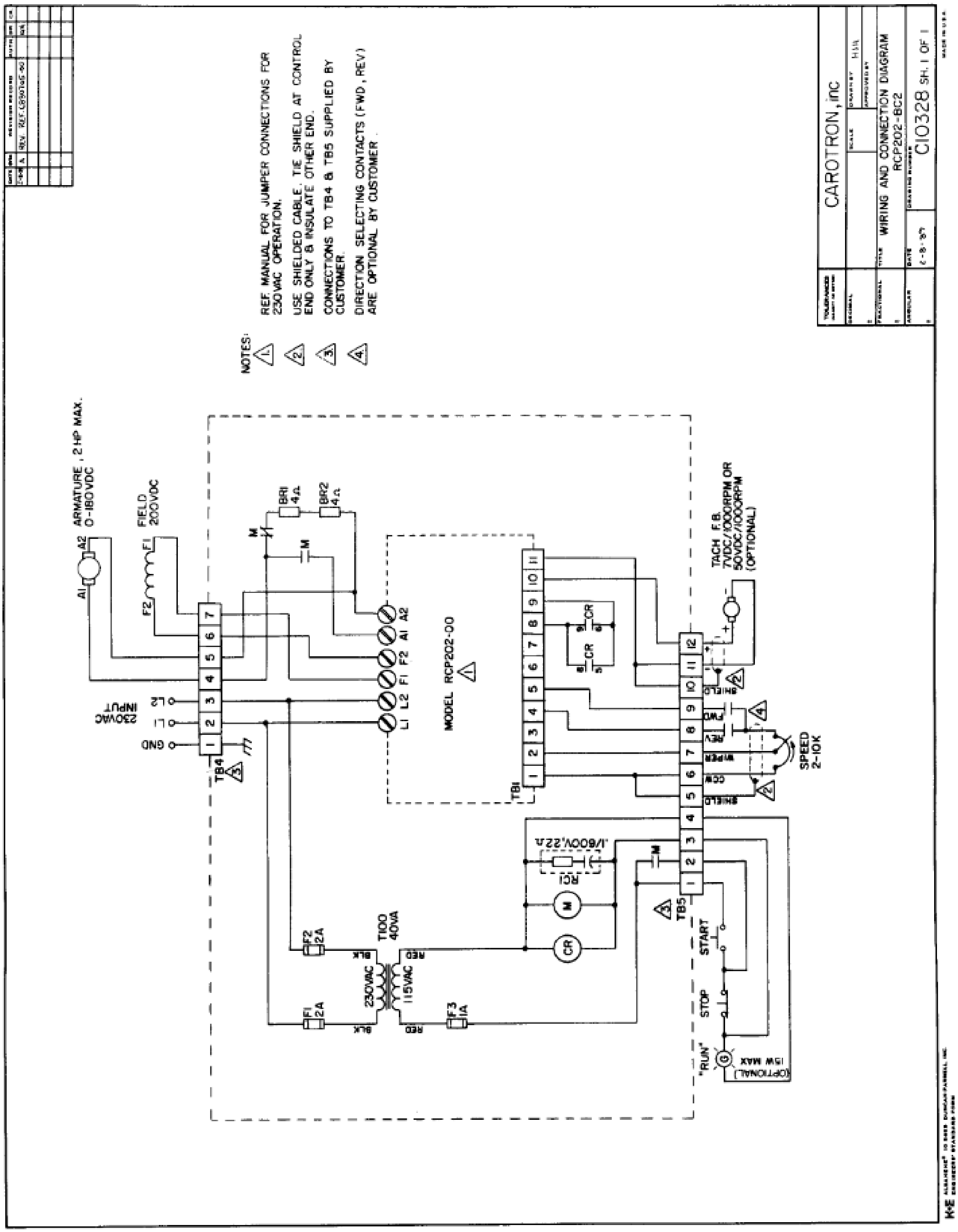

CAROTRON
Driven by Excellence
HEATH SPRINGS, SC
TEL 803-286-8614
FAX 803-286-6063
POWER BOARD
RCP200 SERIES
SCHEMATIC
DRAWN BY: HJH
DATE: 11.24.86
TOLERANCES: ±
2 DEC. PL. = .010"
3 DEC. PL. = .005"
DRAWING NUMBER: C10165
REV. E
SH. 1 OF 1
UPGRADED TO AUTOCAD 1/18/02 AEB
REV E, ECO 842, 1-3-09
REV D, ECO 836, 10-3-08
NOTES:
1. ALL DIODES 1N4148 UNLESS NOTED.
2. ALL CAPS. IN UF,50WVDC UNLESS NOTED.
3. REF. ASSEMBLY D10182.
4. REF. CONTROL BOARD SCHEM. C10166.
5 COMP NOT USED: R1
COMP # NOT USED: R13,43-46,49-57;C8
6 C34A ADDED PARALLEL WITH R71.

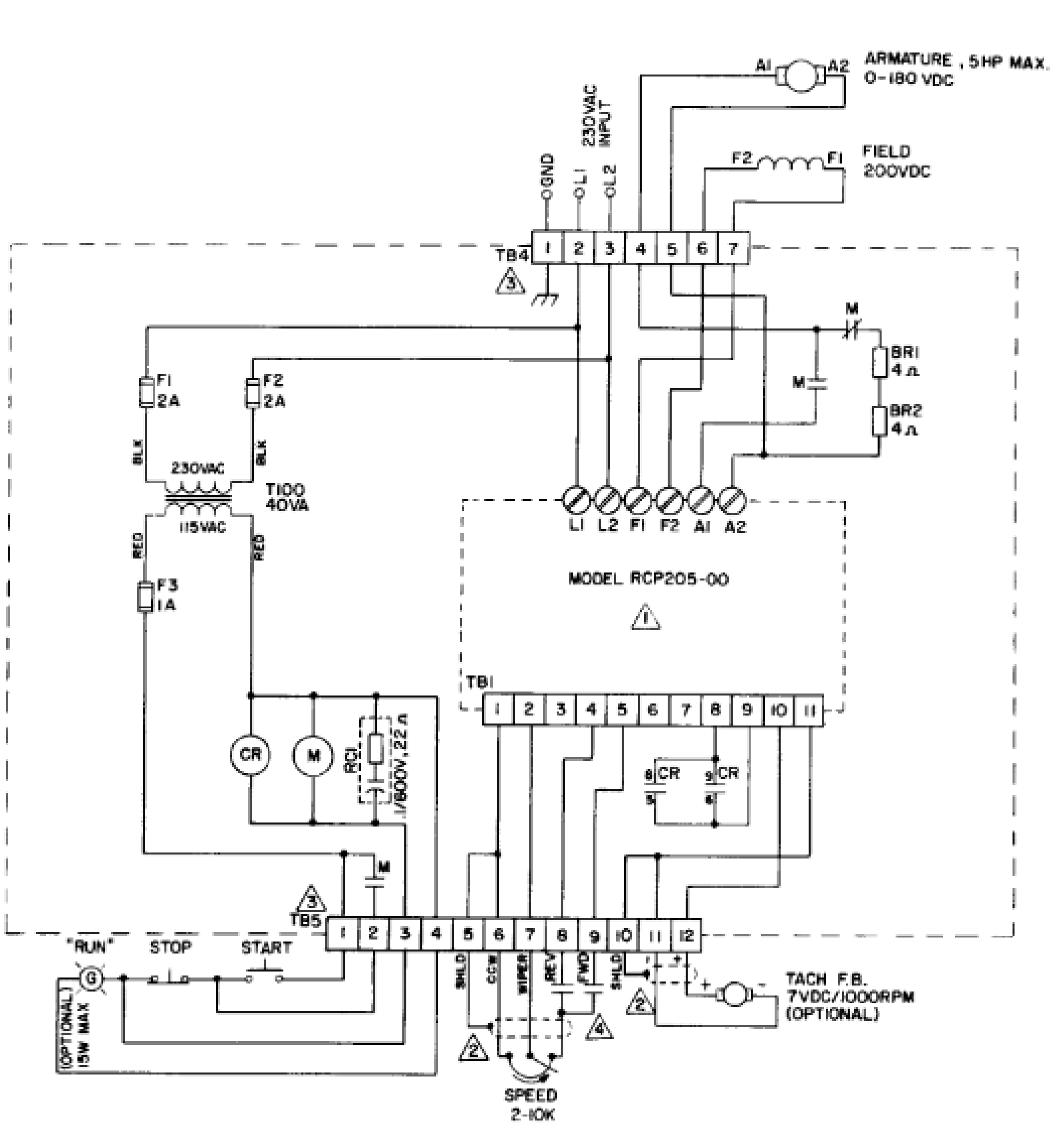


DIMENSIONS SHOWN APPLY FOR
RCP202-BC1 RCP202-BC2 AND
RCP205-BC2

DRAWN BY: HJH	DATE: 5-3-91	CAROTRON Driven by Excellence HEATH SPRINGS, SC TEL 803-286-8614 FAX 803-286-6063
APPROVED BY:	DATE:	
TOLERANCES: ± 2 DEC. PL. 3 DEC. PL.		TITLE: DIMENSION DRAWING RCP200 SERIES RUN / BRAKE MODELS
SCALE: 2 / 1		
DRAWING NUMBER: C10707	REV.	SH. 1 OF 1


NOTES:
1. REF. MANUAL FOR JUMPER CONNECTIONS FOR 115VAC OPERATION.
2. USE SHIELDED CABLE. TIE SHIELD AT CONTROL END ONLY AND INSULATE OTHER END.
3. CONNECTIONS TO TB4 AND TB5 SUPPLIED BY COUSTOMER.
4. DIRECTION SELECTING CONTACTS (FWD , REV) ARE OPTIONAL BY CUSTOMER.
CAROTRON
Driven by Excellence
HEATH SPRINGS, SC
TEL 803-286-8614
FAX 803-286-6063
TITLE: WIRING & CONNECTION DIAGRAM RCP202-BC1
DRAWN BY: HJH
DATE: 3-29-94
APPROVED BY:
DATE:
TOLERANCES: ± 2 DEC. PL. 3 DEC. PL.
SCALE:
DRAWING NUMBER: C10375
REV.
SH. 1 OF 1
MODEL RCP202-000
115VAC INPUT
GND
L1
L2
TB4
TB1
TB5
ARMATURE,1HP MAX 0-90VDC
FIELD 100VDC
BR1 4 OHM
TACH FEEDBACK 7VDC/1000RPM OR 50VDC/1000RPM (OPTIONAL)
SHIELD
FWD
REV
WIPER
CCW
SPEED 20K (2K MIN)
.1/600V 22 OHMS
RC1
F1 2A
F2 2A
START
STOP
"RUN"
15W MAX (OPTIONAL)


NOTES:
1. REF. MANUAL FOR JUMPER CONNECTIONS FOR 230VAC OPERATION.
2. USE SHIELDED CABLE. TIE SHIELD AT CONTROL END ONLY & INSULATE OTHER END.
3. CONNECTIONS TO TB4 & TB5 SUPPLIED BY CUSTOMER.
4. DIRECTION SELECTING CONTACTS (FWD, REV) ARE OPTIONAL BY CUSTOMER.
ARMATURE, 2 HP MAX. 0-180VDC
FIELD 200VDC
230VAC INPUT
GND
L1
L2
TB4
BR1 4Ω
BR2 4Ω
MODEL RCP202-00
TB1
TACH F.B. 7VDC/1000RPM OR 50VDC/1000RPM (OPTIONAL)
SPEED 2-10K
SHIELD
FWD
REV
WIPER
CCW
TB5
RC1
.1/600V,22Ω
T100 40VA
230VAC
115VAC
F1 2A
F2 2A
F3 1A
BLK
RED
START
STOP
"RUN"
15W MAX (OPTIONAL)
CAROTRON, inc
WIRING AND CONNECTION DIAGRAM RCP202-BC2
C10328 SH. 1 OF 1



NOTES:

1. REF MANUAL FOR JUMPER CONNECTIONS FOR 230VAC OPERATION.
2. USE SHIELDED CABLE. TIE SHIELD AT CONTROL END ONLY & INSULATE OTHER END.
3. CONNECTIONS TO TB4 & TB5 SUPPLIED BY CUSTOMER.
4. DIRECTION SELECTING CONTACTS (FWD, REV) ARE OPTIONAL BY CUSTOMER.

CAROTRON, inc.

TITLE: WIRING & CONN. DIAG. MODEL RCP205-BC2

DATE: 1-25-88

DRAWING NUMBER: C10282 SH. 1 OF 1

CAROTRON
Driven by Excellence
D.C. DRIVES, A.C. INVERTERS,
SOLID STATE STARTERS, SYSTEM INTERFACE
CIRCUITS AND ENGINEERED SYSTEMS

3204 Rocky River Road
Heath Springs, SC 29058
Phone: (803) 286-8614
Fax: (803) 286-6063
Email: saleserv@carotron.com
Web: www.carotron.com
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Issued 12-03-2013