

Snap-Trol 183 Nema 1 Series

11/03/05

Instruction Manual

Model P1837-0530 183-TN1

Model P1837-0540 183-TN1R

1.0 Introduction

Extron has been a leader in producing quality variable speed controls for over 20 years. Extron continues to lead the industry in innovation and performance in DC drives.

Extron controls meet the most demanding applications and performance specifications through the use of solid state components and state-of-the-art design.

2.0 Theory of Operation

Extron's Model 183 is a solid state, variable voltage DC motor control. The power conversion is done through a fullwave semi-conductor bridge. AC voltage is converted to DC by the bridge and the DC voltage level is controlled by controlling the phase angle firing of the SCR's. A commutating (free wheeling) diode provides a path for current, during phase back operation as well as helping to minimize DC output ripple.

The SCR firing circuit controls the phase angle firing of the SCR's response to signals from the regulator circuitry. The regulator circuit compares the speed command (from the speed setting potentiometer) with the actual motor armature voltage level. The resulting error signal is amplified and used to control the firing circuit.

A signal proportional to armature current is fed into the regulator to compensate for speed change due to load. A signal proportional to armature current is also used in the current limit circuit. The current feedback signal is compared against a current set point signal. If the current rises above the current limit set point, the SCR's are phased back to limit the current to the set point.

An optional manual reversing switch allows reversing of the direction of rotation of the DC motor by reversing the armature leads.

Manual M183002B.DOC

EXTRON

5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419

www.extroncompany.com

3.0 Performance Specifications

Extron Snap-Trol DC Motor Controls are designed to operate shunt wound or permanent magnet motors. Extron's "Dual Voltage" feature allows the control to operate on either 115 VAC or 230 VAC input without any internal reconnection.

Speed Range.....	30:1
Load Regulation.....	+2%
Control Linearity (speed vs. command voltage).....	+2%
Current Limit torque range.....	0-120%
Min. Speed trimpot range.....	0- 30% full speed
Max. Speed trimpot range.....	70-120% full speed
I.R. Comp. trimpot range.....	0-25% of Arm. Voltage Rating
Accel/Decel adjustable ramp time.....	0-15 seconds
Tachometer input.....	50v/100v/1000 RPM (7v/1000 RPM factory modification)

3.1 Maximum AC and DC Load Current

Part #	Input Voltage	Max AC Current	Max DC Load Current	Max DC Field Current	Maximum Horsepower 115vac/230vac
P1837-0530 P1837-0540	115/230	9	6	1.5 amps	.5 Hp/1 Hp
with aux. heatsink (P1838-0585)	115/230	14	9	1.5 amps	.75 Hp/1.5Hp

3.2 Manual Reversing

Extron Model 183-TN1R includes a manual reversing switch with center pause. This option should only be used to reverse the intended direction of the motor when restarted. It should not be used to dynamically reverse the motor under load and power. Reversing the motor under load can cause premature failure of the drive power circuit.

4.0 Installation

The Extron Model 183-TN1, 183-TN1R should be mounted in an area such that it will not be subject to corrosive contaminants, water, heavy dust, or restricted air flow. The maximum allowable ambient at full rated output is 120 degrees F (50 degrees C).

4.1 Wiring

WARNING:

Do not connect power to the drive until it has been confirmed that the drive nameplate voltage and incoming AC voltage are the same (120VAC or 230VAC).

NOTE: The National Electric Code requires an N.E.C. approved fused disconnect or circuit breaker be used ahead of control. This is necessary to prevent serious damage or personal injury. The fusing provided by Extron is for short circuit protection on the control only and should not be considered branch circuit protection.

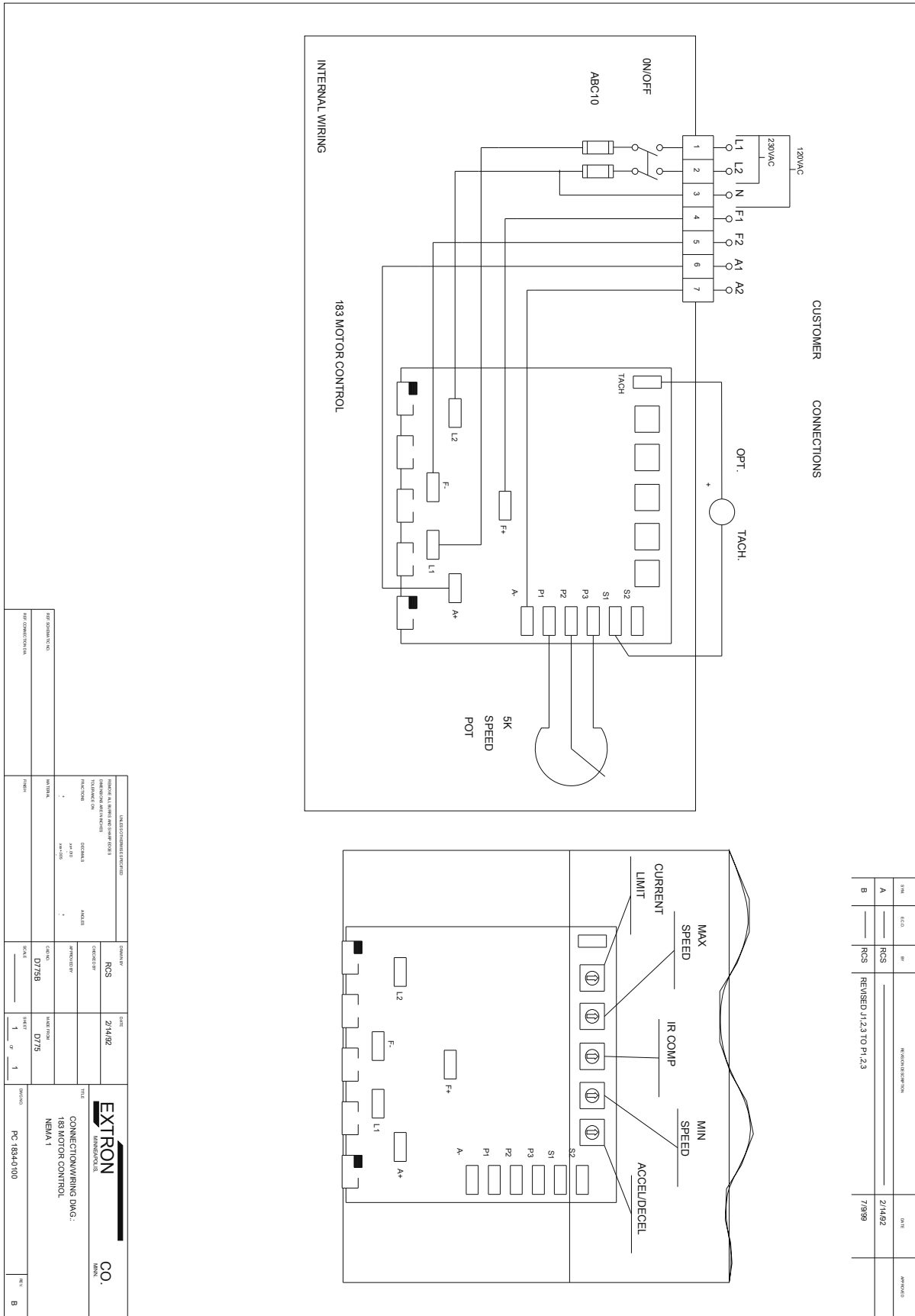
4.2 Minimum Wire Size Recommendations

Motor Current (DC amps)	Max. 50 Ft. Run	Max. 100 Ft. Run
To 3 Amps	#18 AWG	#16 AWG
To 5 Amps	#16 AWG	#14 AWG
5 Amps and over	#14 AWG	#12 AWG

4.3 Wiring the Control

Follow the interconnection diagram for proper connection of the control.

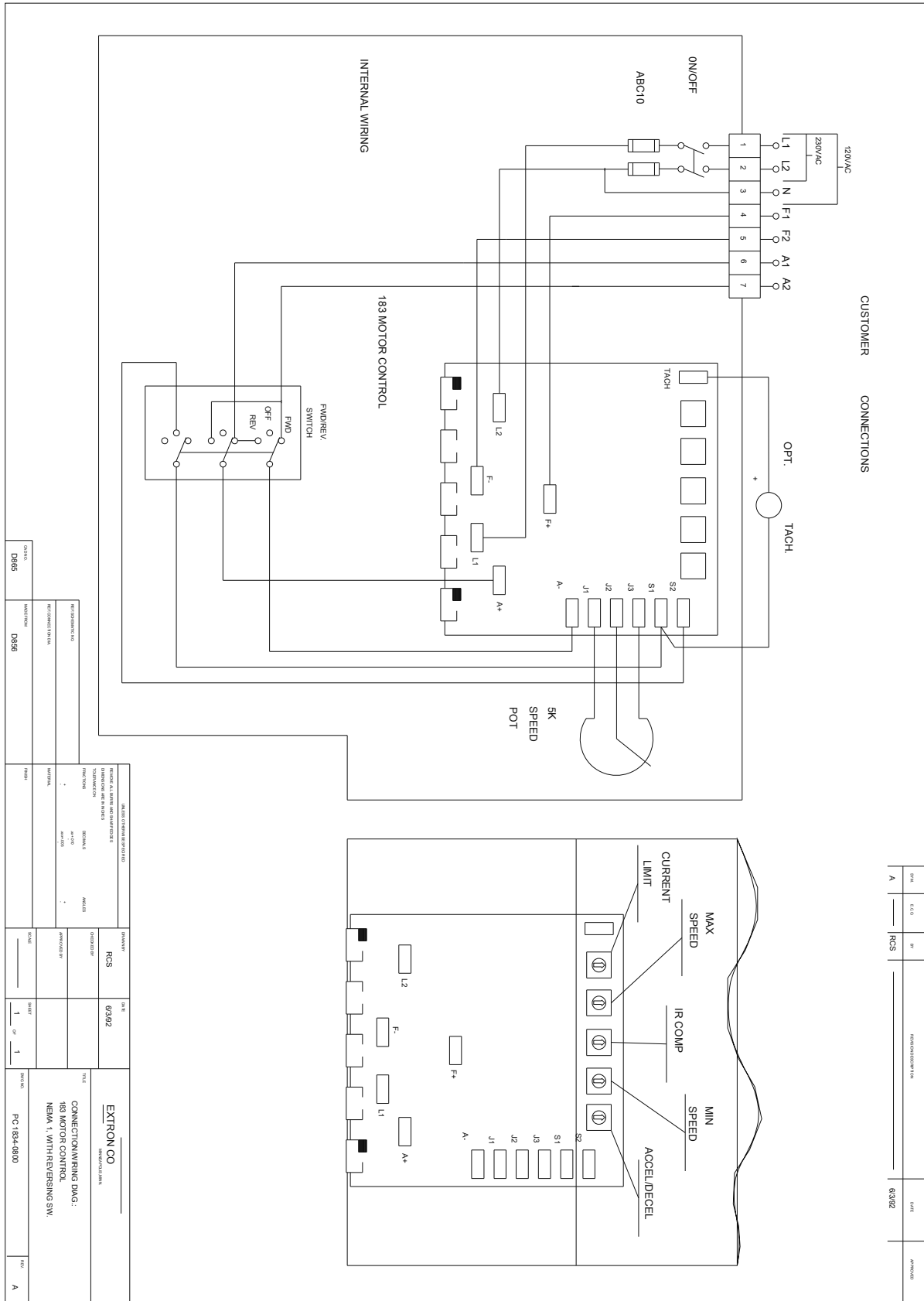
4.3.1 183-TN1 Non-Reversing



EXTRON

5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419
www.extroncompany.com

4.3.2 183-TN1R Manual Reversing



EXTRON

5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419
www.extroncompany.com

5.0 Drive Set-up

Extron's Model 183 has five (5) standard performance adjustments.

5.1.1 Minimum Speed Trimpot

The minimum speed adjustment trimpot is utilized to set the minimum speed setting for the motor.

Adjustment procedure:

- 1) Turn the external speed pot to its minimum setting.
- 2) Adjust the Minimum Speed trimpot up to the desired speed.
- 3) Operate control as required.

5.1.2 Maximum Speed Trimpot Adjustment

The maximum speed trimpot is utilized to set the maximum speed setting for the motor.

Adjustment procedure:

- 1) Turn the external speed pot to its maximum setting.
- 2) Adjust the Maximum Speed trimpot up to the desired speed.
- 3) Operate control as required.

5.1.3 Current Limit Trimpot Adjustment

Current limit or torque adjustment is designed to protect both the motor and the control against overloads. The current limit adjustment limits the amount of current that the motor can draw under full load.

Adjustment procedure:

- 1) Connect an AC Ammeter in series with the AC line or a DC Ammeter in series with the armature leads.
- 2) Apply the maximum load to the motor that will normally be encountered.
- 3) Turn the Current Limit pot down until the motor speed begins to drop off.
- 4) Increase the Current Limit 1/8 turn.
- 5) If the current observed in step 3 is above motor nameplate rating, the motor is too small for the application.
- 6) If the current observed in step 3 is above the controller rating, the control is not properly sized.

NOTE: The current limit is factory preset for approximately 50% of the maximum setting (6 amps)

EXTRON

**5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419
www.extroncompany.com**

5.1.4 I.R. Compensation Trimpot Adjustment

I.R. compensation is provided to improve the load regulation of a drive in armature feedback mode.

Adjustment procedure:

- 1) Turn the I.R. Comp. trimpot to the minimum setting (counterclockwise).
- 2) Set the external potentiometer to approximately 1/3 to 1/2 speed.
- 3) Connect an AC ammeter in series with the AC line or a DC ammeter in series with the armature leads.
- 4) Run motor with maximum load.
- 5) Adjust I.R. trimpot so that motor speed under load is the same as the unloaded speed. Excessive I.R. Comp. input will cause the motor to oscillate in speed.

5.1.5 Acceleration/Deceleration Trimpot Adjustment

The Snap-Trol has a one adjustment for the acceleration and deceleration function. The adjustment has an approximate range of 0 to 15 seconds. The rate of acceleration and deceleration follows the logarithmic charge curve of an RC (resistive, capacitive) network. The motor speed will follow those settings.

Adjustment procedure:

- 1) Turn the Accel/Decel potentiometer clockwise to increase the accel/decel time.
- 2) Max speed adjustment will need to be reset.

EXTRON

**5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419
www.extroncompany.com**

EXTRON COMPANY

WARRANTY

Extron warrants to the original purchaser all equipment and products manufactured by it and bearing its name to be free of defects in material and workmanship under normal use and service for a period of thirty-six (36) months from date of purchase from Extron. This warranty is applicable only if the Extron product and/or equipment is installed, operated and maintained in accordance with factory recommendations and procedures.

In the event the Extron product and/or equipment is found to be defective within the above-stated thirty-six (36) month period, Extron will repair or replace defective parts if the product or equipment is shipped prepaid to Extron's factory and if such product and/or equipment is found by Extron's inspection to be truly defective in workmanship or material. Extron will return-ship such repaired product and/or equipment prepaid within the continental United States. If Extron's inspection does not disclose any defect in workmanship or material, repairs will be made at a reasonable charge.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE AND THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO HIM OR RELIED UPON BY HIM WITH RESPECT TO THE QUALITY AND FUNCTION OF THE GOODS HEREIN SOLD.

LIMITATIONS OF LIABILITY

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY OR TORT (INCLUDING NEGLIGENCE), SHALL EXTRON OR ITS SUPPLIERS BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING FOR PURPOSES OF ILLUSTRATION, BUT NOT FOR LIMITATION, LOSS OF PROFITS OR REVENUES, LOSS OF USE OF EQUIPMENT FURNISHED OR SERVICED BY EXTRON, DAMAGE TO, OR LOSS OF USE OF, ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE OR REPLACEMENT PRODUCTS, FACILITIES, SERVICE OR POWER, DOWN TIME COSTS, OR CLAIMS OF THE CUSTOMER'S CUSTOMER FOR SUCH DAMAGES. IF THE CUSTOMER TRANSFERS TITLE TO OR LEASES THE PRODUCTS SOLD OR SERVICED HEREUNDER TO ANY THIRD PARTY, THE CUSTOMER SHALL OBTAIN FROM SUCH THIRD PARTY A PROVISION AFFORDING TO THE COMPANY AND ITS SUPPLIERS THE PROTECTION OF THE PRECEDING SENTENCE, AND THE CUSTOMER WILL DEFEND AND HOLD EXTRON HARMLESS FROM ANY CLAIMS OF SUCH THIRD PARTIES.

EXTRON'S LIABILITY ON ANY CLAIM OF ANY KIND (INCLUDING NEGLIGENCE) FOR ANY LOSS OR DAMAGE ARISING OUT OF OR RESULTING FROM THIS AGREEMENT, OR FROM THE PERFORMANCE OR BREACH THEREOF, OR FROM THE PRODUCTS OR SERVICES FURNISHED HEREUNDER, SHALL IN NO CASE EXCEED THE PRICE OF THE SPECIFIC PRODUCT OR SERVICE WHICH GIVES RISE TO THE CLAIM ALL SUCH LIABILITY SHALL TERMINATE UPON THE EXPIRATION OF THE WARRANTY PERIOD OF THIRTY-SIX (36) MONTHS, AS HEREINABOVE STATED.

The furnishing of advice or other assistance without separate compensation therefore will not subject the company to any liability, either in contract, warranty, tort (including negligence), or otherwise.

Each of the foregoing paragraphs in this article will apply to the full extent permitted by law. The invalidity, in whole or part, of any paragraph will not affect the remainder of such paragraph or any other paragraph.

EXTRON

**5735 Lindsay St Minneapolis, MN 55422 Phone: (763) 544-4197 FAX: (763) 544-4419
www.extroncompany.com**