



DC MOTOR ADJUSTABLE SPEED CONTROL INSTALLATION AND OPERATING INSTRUCTIONS



**THIS BOOK COVERS LOW VOLTAGE CONTROL CATALOG NUMBERS
175135.00REV1 and 175136.00REV1**

**INSTALLATION and OPERATING INSTRUCTIONS
FOR CATALOG NUMBERS 175135.00REV1 AND 175136.00REV1
SPEEDMASTER™ ADJUSTABLE SPEED CONTROLS for
BATTERY POWERED EQUIPMENT UP TO 60 AMPS**

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STANDARD FEATURES

- Provides smooth variable speed capability for mobile equipment.
- Maintains variable speed control as batteries discharge.
- Adjustable min speed, max speed, i.r. compensation, current limit, and accel.
- Inhibit terminal permits optional start-stop without breaking battery lines.
- Speed potentiometer, knob, and dialplate included.
- Increases range OR running time of battery operated equipment through high efficiency.
- Automatic current limit foldback decreases current limit to 50% of setpoint when heatsink temperatures reach 80° C. - provides protection from overheating.

DIMENSIONS

MODEL	WIDTH	LENGTH	DEPTH	WEIGHT
	INCHES (CENTIMETERS)			OZ. (g.)
175135	6.7 (17.1)	9.0 (22.9)	2.27 (5.77)	34.0 (962)
175136	6.7 (17.1)	9.0 (22.9)	2.27 (5.77)	34.0 (963)

MODEL SELECTION

CONTINUOUS CURRENT	MODEL NUMBER
(12VDC INPUT \pm 15%)	(0 - 12VDC OUTPUT)
60	175135
(24/36VDC INPUT \pm 15%)	(0 - 24/36VDC OUTPUT)
60	175136

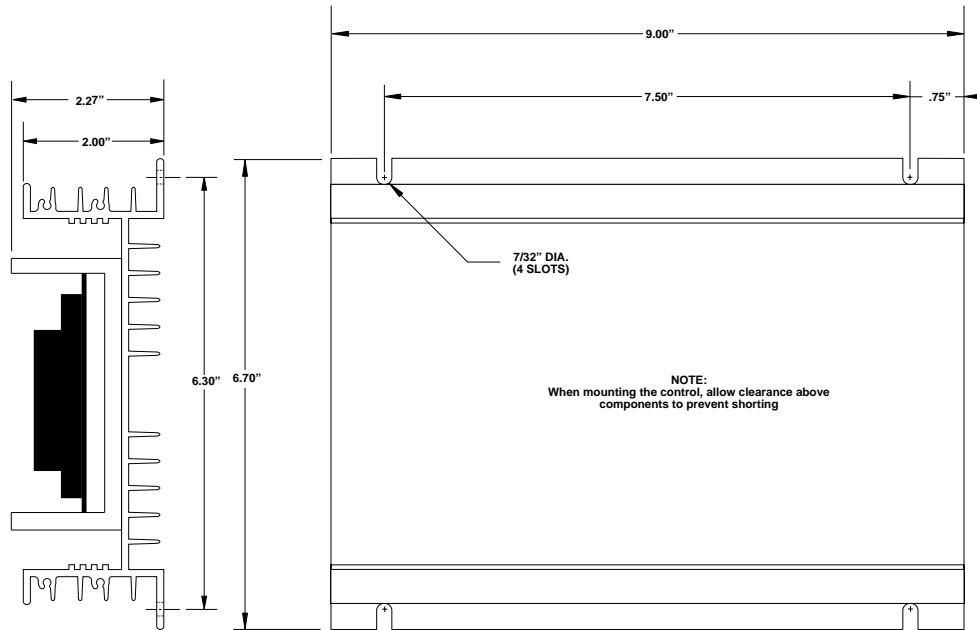
WARNING:

MAKE CERTAIN THAT THE POWER SUPPLY IS DISCONNECTED BEFORE ATTEMPTING TO SERVICE OR REMOVE ANY COMPONENTS!!! IF THE POWER DISCONNECT POINT IS OUT OF SIGHT, LOCK IT IN DISCONNECTED POSITION AND TAG TO PREVENT UNEXPECTED APPLICATION OF POWER.

ONLY A QUALIFIED ELECTRICIAN OR SERVICEMAN SHOULD PERFORM ANY ELECTRICAL TROUBLESHOOTING OR MAINTENANCE.

AT NO TIME SHOULD CIRCUIT CONTINUITY BE CHECKED BY SHORTING TERMINALS WITH A SCREWDRIVER OR OTHER METAL DEVICE.

175135.00REV1 / 175136.00REV1 MOUNTING



CAUTION: DO NOT MOUNT CONTROLLER WHERE AMBIENT TEMPERATURE IS OUTSIDE THE RANGE OF -10° C (15° F) TO 45° C (115° F).

INSTALLATION & HOOK-UP

Before attempting to wire the control, make sure all power is disconnected. Recheck code designation to assure proper voltage is present for the control. Caution should be used in selecting proper size of hook-up wire for current and voltage drop. Note: The battery and armature wire size on 175135.00REV1 and 175136.00REV1 models must be a minimum of 12 gauge.

Warning:

Do not reverse positive or negative battery leads, this will damage the control. To change motor direction, interchange the positive and negative Armature leads.

Refer to the following wiring diagrams for proper location when connecting **DC Voltage**, **Armature**, and **Speedpot wires** to the control.

CAUTION !! TURN POWER OFF WHILE MAKING CONNECTIONS.

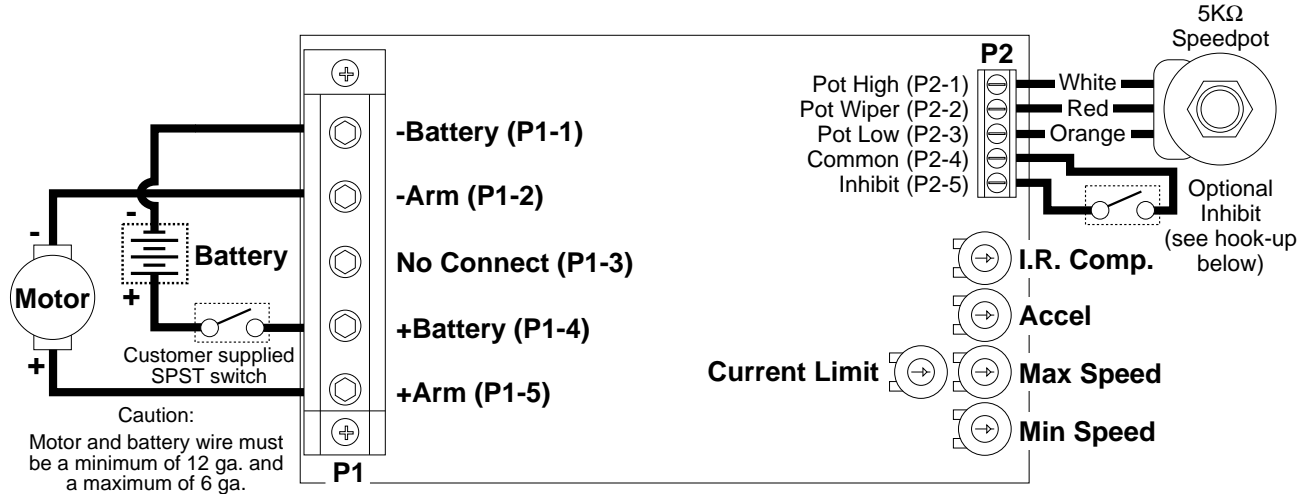
To properly adjust the CURRENT LIMIT setting, a DC ammeter should be placed in series with the armature line. This meter can be removed after the control is adjusted.

Warning:

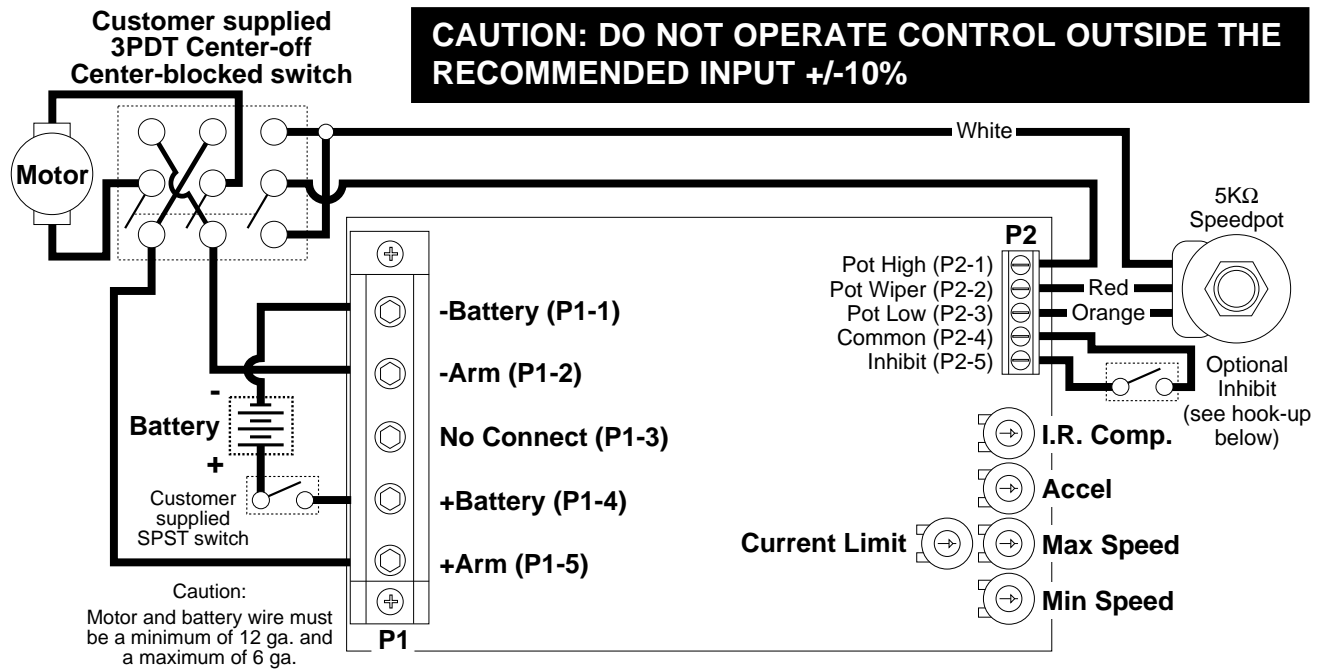
Improper installation or operation of this control may cause injury to personnel or control failure. The control must be installed and grounded in accordance with local, state, and national safety codes.

175135.00REV1 / 175136.00REV1 HOOKUP DIAGRAMS

175135.00REV1 / 175136.00REV1 HOOKUP



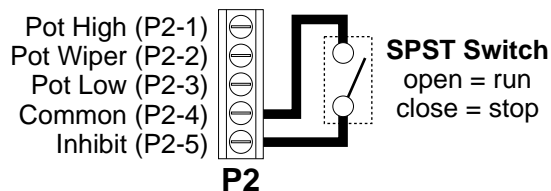
175135.00REV1 / 175136.00REV1 REVERSING HOOKUP



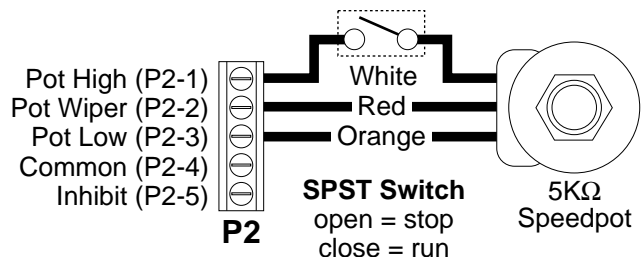
Relays may be used in place of switch, but a neutral position must be provided to prevent plug reversing. DO NOT ENGAGE OPPOSITE DIRECTION UNTIL MOTOR HAS COME TO A COMPLETE STOP. Failure to do so may result in damage to the control.

INHIBITING THE CONTROL - There are two methods that may be used to shut down the output without having to break the battery supply (ie. inhibit the control).

Using inhibit input - provide fast start-stop by bypassing accel/decel circuit



Inhibit via speedpot - provides starting and stopping through accel/decel parameters



TRIMPOT ADJUSTMENTS

Before power is applied, the speed potentiometer and trimpots should be preset as follows:

TRIMPOT PRESET

1. Rotate Speedpot fully CCW.
2. Rotate Max trimpot CW 1/2 way.
3. Rotate Current Limit trimpot fully CW.
4. Rotate Min trimpot fully CCW.
5. Rotate Accel trimpot CW 1/2 way.
6. Rotate I.R. trimpot fully CW.

DC power can now be applied to the system and the control adjusted as follows:

TRIMPOT ADJUSTMENT

7. Increase the **MIN** trimpot in a CW direction until the desired minimum speed is reached.
8. Turn the Speedpot fully CW and adjust the **MAX** trimpot until the desired maximum speed is reached.
9. Adjust the **ACCEL** trimpot to achieve the desired soft start time. CW rotation will increase accel time.
10. Rotate the **CURRENT LIMIT** trimpot fully CCW until the motor begins to stall. Apply a full load to the motor and adjust the trimpot until a desired current setting is obtained.
11. Adjust **I.R.** trimpot CW 1/2 way. If motor RPM is inconsistent (jumpy), rotate I.R. trimpot CCW until rotation is stable.

IMPORTANT: DO NOT EXCEED CURRENT LIMIT AMPERAGE RATING. (see below)

LEESON SPEEDMASTER™ low voltage controls = 60 AMP MAX

Adjustment is now complete for the 175135.00REV1 and 175136.00REV1 models and the ammeter may be removed.

IN CASE OF DIFFICULTY

If a newly installed control will not operate, it is likely that a terminal or connection is loose. Check to make sure connections are secure and correct. If the control is still inoperative, refer to the following chart for reference:

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
MOTOR DOESN'T RUN	<ul style="list-style-type: none"> * INCORRECT OR NO POWER * SPEEDPOT SET AT ZERO * WORN MOTOR BRUSHES * CURRENT LIMIT SET TOO LOW 	INSTALL PROPER SERVICE ROTATE SPEEDPOT FULLY CW REPLACE MOTOR BRUSHES ADJUST CURRENT LIMIT POT CW
MOTOR "HUNTS"	<ul style="list-style-type: none"> * MOTOR SPEED IS ABOVE RATED SPEED * I.R. COMP. TRIMPOT SET TOO HIGH 	SEE TRIMPOT ADJUSTMENTS ON PAGE 5 SEE TRIMPOT ADJUSTMENTS ON PAGE 5
MOTOR RUNS AT "FULL SPEED" UNCONTROLLABLE	<ul style="list-style-type: none"> * LOOSE SPEEDPOT CONNECTIONS * MIN OR MAX TRIMPOTS NOT PROPERLY ADJUSTED * POSSIBLE CONTROL FAILURE 	SECURE ALL CONNECTIONS SEE TRIMPOT ADJUSTMENTS ON PAGE 5 SEND TO LEESON ELECTRIC CORP.
MOTOR ROTATES IN WRONG DIRECTION	<ul style="list-style-type: none"> * MOTOR ARMATURE HOOKED UP BACKWARDS 	REVERSE ARMATURE + AND - LEADS
MOTOR STALLS UNDER A LIGHT LOAD	<ul style="list-style-type: none"> * CURRENT LIMIT TRIMPOT IMPROPERLY ADJUSTED 	SEE TRIMPOT ADJUSTMENTS ON PAGE 5

SPECIFICATIONS

	175135.00REV1 and 175136.00REV1 Models	
Load current (continuous)	60 amps continuous	
Input Voltage	12VDC \pm 10% (model 175135)	24/36VDC \pm 10% (model 175136)
Output Voltage	0-12VDC (model 175135)	0-24/36VDC (model 175136)
Speed adjustment	5K Ω potentiometer or 0 to +10VDC input signal	
Speed range	30 : 1	
Overload capacity	200% for 10 seconds; 150% for one minute	
Current limit	adjustable 100% to 200% of full motor load, up to continuous current rating (page 5)	
Acceleration	adjustable - 0 to 10 seconds	
Deceleration	non-adjustable - 0.5 seconds	
Maximum speed	adjustable - 50 to 100% of base speed	
Minimum speed	adjustable - 30% of max speed	
Connections	barrier terminal block	
Speed regulation	1% of base speed	
Package configuration	black anodized aluminum extrusion	
Internal operating frequency	approximately 1.6K Hertz	
Thermal protection	Current foldback at 80° C. heatsink temperature	

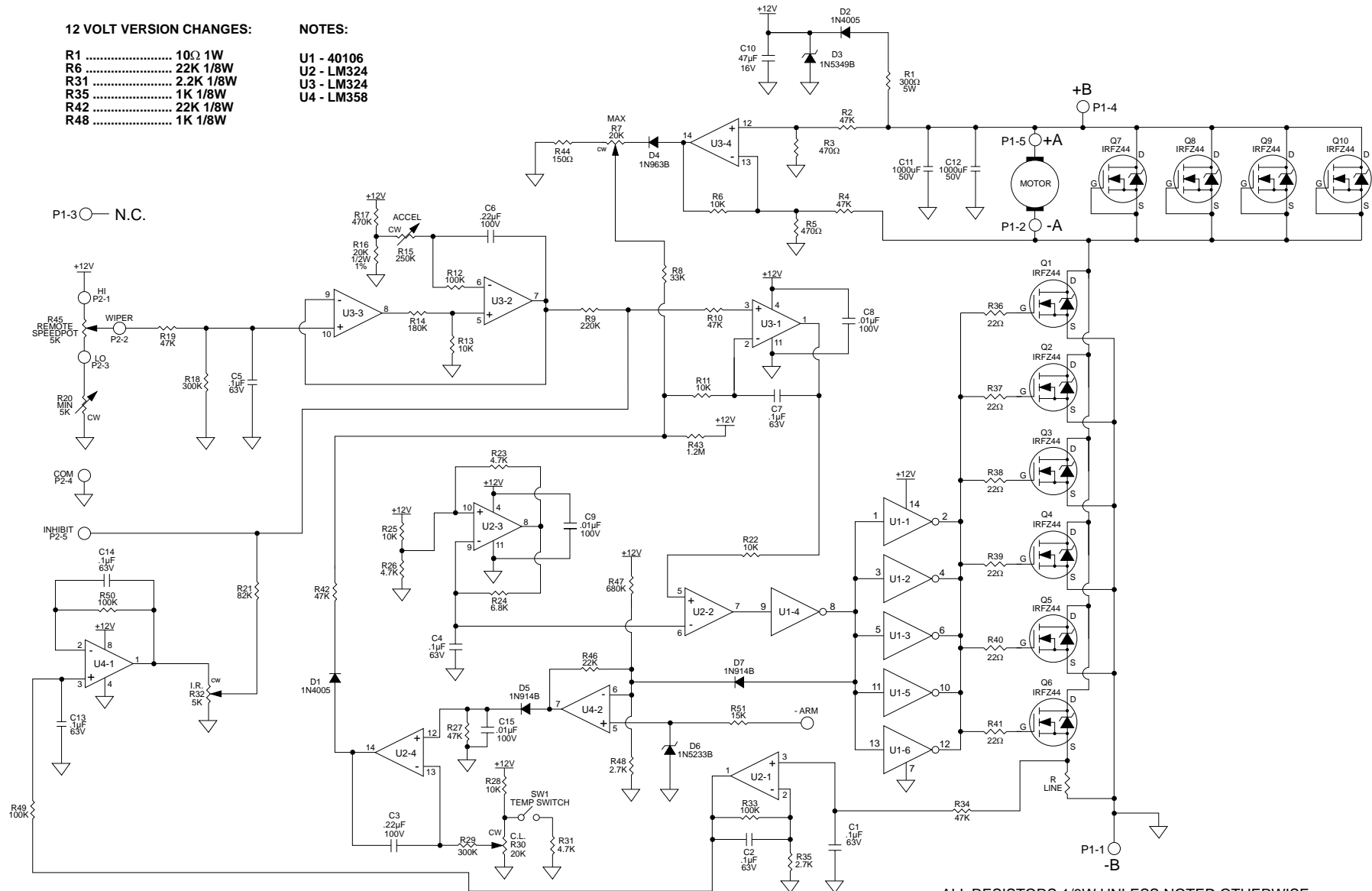
175135.00REV1 / 175136.00REV1 SCHEMATIC

12 VOLT VERSION CHANGES:

R1 10 Ω 1W
 R6 22K 1/8W
 R31 2.2K 1/8W
 R35 1K 1/8W
 R42 22K 1/8W
 R48 1K 1/8W

NOTES:

U1 - 40106
 U2 - LM324
 U3 - LM324
 U4 - LM358



ALL RESISTORS 1/8W UNLESS NOTED OTHERWISE

DISCLAIMER

The information and technical data in this manual are subject to change without notice. LEESON Electric Corporation and its Divisions make no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. LEESON Electric Corporation and its Divisions assume no responsibility for any errors that may appear in this manual and make no commitment to update or to keep current the information in this manual.



LEESON ELECTRIC CORPORATION

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LIMITED WARRANTY

A. WARRANTY: LEESON Electric Corporation warrants that their products will be free from defects in material and workmanship for a period of one (1) year from date of shipment thereof. Within the warranty period LEESON Electric will repair or replace such products which are returned to LEESON Electric or to the nearest Branch Office, with shipping charges prepaid. At our option, all return shipments are F.O.B. LEESON Electric or its Branch Office. This warranty will not apply to any product which has been subjected to misuse, negligence; or misapplied; or repaired by unauthorized persons; or improperly installed. LEESON is not responsible for removal, installation or any other incidental expenses incurred in shipping the products to or from the repair point.

B. DISCLAIMER: The provisions of paragraph 'A' are LEESON'S sole obligation and exclude all other warranties of MERCHANTABILITY or use, express or implied. We further disclaim any responsibility whatsoever to the customer or to any other person for injury to person, or damage to or loss of property of value, caused by any product which has been subjected to misuse, negligence or accident; or misapplied; or modified or repaired by unauthorized persons; or improperly installed.

C. LIMITATION of LIABILITY: In the event of any claim for breach of any of LEESON'S obligations, whether express or implied, and particularly in the event of any claim of the warranty contained in paragraph 'A', or any other warranties, express or implied, or claim of liability, which might, despite paragraph 'B', be decided against us by any lawful authority, LEESON Electric shall under no circumstances be liable for any consequential damages, losses or expenses arising in connection with the use of, or inability to use, our product for any purpose whatsoever. An adjustment made under the warranty does not void the warranty, nor does it imply an extension of the original one (1) year warranty period. Products serviced and/or parts replaced on a no charge basis during the warranty period carry the unexpired portion of the original warranty only.

If for any reason any of the foregoing provisions shall be ineffective, the Company's liability for damages arising out of its manufacture or sale of equipment, or use thereof, whether such liability is based on warranty, contract, negligence, strict liability in tort or otherwise, shall not in any event exceed the full purchase price of such equipment.

Any action against the Company based upon any liability or obligation arising hereunder or under any law applicable to the sale of equipment or the use thereof, must be commenced within one year after the cause of such action arises.



NOTES: