ELECTROL

K-TROL/ K-LINE

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INSTRUCTION MANUAL

This IMPL is to be used with ELECTROL models:
C-MH-23-787B-CM and C-MH-A/X-787B-E

WARRANTY

ELECTROL controls are warranted by ELECTROL CO., INC. to the original user against defects in workmanship or materials under normal use (rental excluded) for one (1) year after purchase.

Any part which is determined to be defective in material or workmanship must be returned to ELECTROL headquarters, or an authorized service center, as ELECTROL designated, shipping costs prepaid. Contact Factory for RMA (Return Material Authorization) number. The control will be repaired or replaced at ELECTROL'S option. Expenses incurred by buyer in repairing or replacing any defective product will not be allowed except where authorized in writing and signed by an officer of the company.

INTRODUCTION

Congratulations on your purchase of one of the finest motor speed controls available in today's market. The K-TROL motor speed control is designed using state-of-the-art technology to bring you years of unparalleled performance.

In the following manual, we will cover all of the information necessary to install, operate, and repair a K-TROL motor speed control. When used in accordance with this manual, the K-TROL motor speed control will provide years of trouble free operation.

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GENERAL SPECIFICATIONS

The K-TROL DC motor speed control is capable of driving either PM or Shunt Wound motors. There are two (2) main components to the K-TROL drive; the mother board, and the plug in module. The mother board handles all main driving functions, and the plug in module "programs" the control for specified input and output voltages and horsepower.

Your K-TROL CM-H-23-787B-CM drive comes equipped with a 5K MASTER SPEED POT and a screw terminal for all interface connections. An optional knob and dial plate for the MASTER SPEED POT are also available, please specify when ordering.

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THEN 5000 RMS SYMMETRICAL AMPERES 240 V MAXIMUM WHEN PROTECTED BY A 20A r-USE.

INSTALLATION

1) WIRING

Your K-TROL motor speed control can be wired to any 50/60 Hz power source. Connect AC power to L1 and L2. "Power on" LED on board will illuminate when power is applied. Proper fusing of the AC line is mandatory for safety purposes. Use a normal blow type fuse rated at approximately 1.7 times the motor's nameplate rated current. Proper fusing must also be incorporated in the motor's armature, terminals A1 and A2. Connect the MASTER SPEED POT to "P", "O", and "T". "P" is the "full speed" side of the POT. "O" is the POT's wiper. Use only 12 gauge or heavier wire for the line and motor connections when installing the control.

C1 and C2 can be connected together through a set of dry contacts for low voltage start-stop. This must also be used to reset the acceleration ramp when reversing the output of drives to motor.

INSTALLATION

2) MOUNTING

Your K-TROL should be mounted in a clean, dry environment where water, dust, or other contaminates will not affect the control. Vibration and extreme temperatures should also be kept to a minimum. The K-TROL is capable of operating in ambient temperatures of up to 45 degrees Celsius (113 degrees Fahrenheit). If higher ambients are required, please consult the factory.

NOTE: CONTROLS RATED 115V - 3/4 HP, or 230V - 1 HP or above, must be mounted on an external heatsink having a total surface area of over 300 square inches. Heatsink may be supplied from factory; please specify when ordering.

ADJUSTMENTS

1) GENERAL INFORMATION

As per your specifications at the time of ordering, a plug in module was selected to allow the K-TROL to operate within the limits of your application. The plug in module selects both the input/output voltages and the horsepower ranging resistor (I.R. Comp). All trim pots on the K-TROL mother board have been factory set for maximum performance and should not need adjustment. If, however, these adjustments are inadequate for your custom application, the following section will help you "fine-tune" your K-TROL to your requirements.

TRIM ADJUSTMENTS

1) ACCELERATION/DECELERATION

This adjustment will allow adjustment of the acceleration and deceleration from .5 to 4 seconds. Turning this control CCW will increase the time or CW will decrease the time.

2) MAXIMUM SPEED ADJUSTMENTS

To adjust the maximum RPM of your motor, turn your MASTER SPEED POT fully clockwise (full speed) and use the trim pot labeled "MAX" to adjust motor RPM to desired maximum speed.

TRIM ADJUSTMENTS (cont'd)

3) MINIMUM SPEED ADJUSTMENTS

To adjust the minimum RPM of your motor, turn your MASTER SPEED POT fully counter-clockwise (zero speed) and use the trim pot labeled "MIN" to adjust motor RPM to desired minimum speed.

4) TORQUE (current Limit)

The amount of torque, or current the K-TROL will deliver, can be adjusted using the trim pot labeled "Torque". This feature's main function is to protect both the motor and control from instantaneous and continuous overloads. The "Torque" trim pot is factory set so the control will deliver 1.3 times the motor's nameplate rated full load current. This adjustment should not be altered before consulting the factory.

TRIM ADJUSTMENTS (cont'd)

5) I. R. COMPENSATION:

Optimum load regulation may be obtained by utilizing the following procedure:

A. Set the "I.R." trim pot as roughly 30% of travel. Run motor to normal running speed without load and observe RPM..

B. Apply full load to the motor and adjust the trim pot labeled "I.R." until the motor RPM equals the RPM observed in Step #1.

C. Unload the motor and again observe the motor RPM. If unloaded motor RPM does not match the RPM observed in Step #1, then repeat Step #2 until a more exact regulation can be seen.

OPTIONS

ELECTROL offers several option kits to complement the K-TROL.

A. Option A-19 — Dynamic Braking
B. Option A-20 — Manual Reversing/Dynamic Braking.
C. Option A-55 — Isolation Amplifier Voltage Follower (0 - 10V DC signal) or 4 - 20/2 - 40 Ma signal.
D. Option A-65 — Ramp Down Reversing

Kits are shipped loose for customer mounting.

For installation, consult factory.

If other options are required, we recommend the D-TROL C-MH-W-754-E.

MODEL NUMBERS

Horsepower/Voltage Selection Module Model Numbers:

Model Number	Voltage/Horsepower	Line Fuse
	115V:	
9000-0020	1/50 - 1/25 HP	AGC 1
9000-0021	1/20 - 1/10 HP	AGC 3
9000-0022	1/8 - 1/4 HP	MTH 5
9000-0023	1/3 - 1/2 HP	ABC 10
9000-0024	3/4 HP	ABC 15
9000-0025	1 HP	ABC 20
	230V:	
9000-0026	1/25 - 1/10 HP	AGC1
9000-0027	1/8 - 1/6 HP	AGC 3
9000-0028	1/4 - 1/3 HP	AGC 3
9000-0029	1/2 HP	MTH 5
9000-0030	3/4 HP	MTH 5
9000-0031	1 HP	ABC 10
9000-0032	1 - 1/2 HP	ABC 15
9000-0033	2 HP	ABC 20

TROUBLE SHOOTING PROCEDURE

SAFETY PRECAUTIONS:

CHECK ALL TERMINAL BOARD CONNECTIONS.

When controller is opened to make running adjustments, electrically "live" components are exposed. Be sure power is disconnected or shut off at fuse box or circuit breaker when installing controller and making adjustments except running adjustment. WHEN MAKING RUNNING ADJUSTMENTS, BE VERY CAREFUL NOT TO TOUCH ANY COMPONENT EXCEPT ADJUSTING SCREWS.

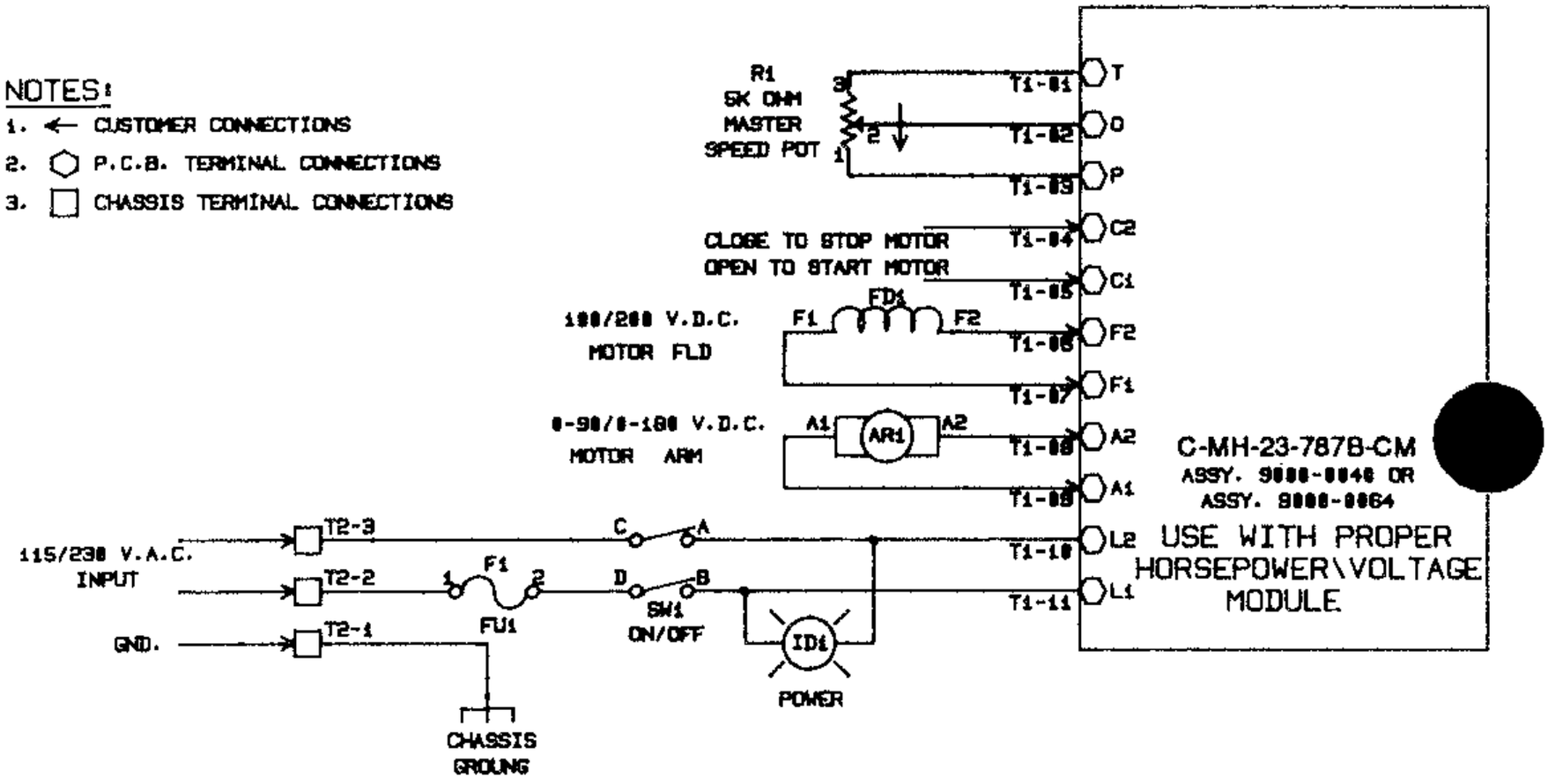
WARNING: Make certain that the power supply is disconnected before attempting to service or remove any components! If the power disconnect point is out-of-sight, lock it in the open position and tag to prevent unexpected application of power. ONLY A QUALIFIED ELECTRICIAN OR SERVICE PERSON SHOULD PERFORM ANY ELECTRICAL TROUBLE SHOOTING OR MAINTENANCE.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor does not run (Power applied)	1. Power disconnect "off"	1. Move to "on" position
	2. Blown fuse	2. Replace fuse
	3. Incorrect power source	3. Check control specifications
	4. Power disconnect device is defective	4. Replace power disconnect
	5. Defective control	5. Consult factory

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor does not run	1. Master pot at zero	1. Turn knob CW to start motor
	2. Worn brushes	2. Replace brushes
	3. Loose motor connections	3. Inspect connections
	4. Defective control	4. Consult factory

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor stalls or runs very slowly with pot fully CW	1. Incorrect input voltage	1. Check input voltage against controls specs.
	2. Motor overload	2. Reduce load
	3. Worn brushes	3. Replace brushes
	4. Loose connections	4. Check all connections
	5. Improper HP selection	5. Check control specifications
	6. Defective control	6. Consult factory

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Repeated fuse blowing	1. Overload conditions	1. Reduce load
	2. Loose connections	2. Check all connections
	3. Worn brushes	3. Replace brushes
	4. Defective motor bearings	4. Replace bearings
	5. Defective control	5. Consult factory
Motor runs wrong direction	1. Reversed armature	1. Reverse A1 and A2 connections


NOTES:
1. ← CUSTOMER CONNECTIONS
2. ⬡ P.C.B. TERMINAL CONNECTIONS
3. □ CHASSIS TERMINAL CONNECTIONS
R1
5K OHM
MASTER
SPEED POT
T1-01
T1-02
T1-03
T
O
P
CLOSE TO STOP MOTOR
OPEN TO START MOTOR
T1-04
T1-05
C2
C1
180/200 V.D.C.
MOTOR FLD
FD1
F1
F2
T1-06
T1-07
F2
F1
0-90/0-180 V.D.C.
MOTOR ARM
A1
AR1
A2
T1-08
T1-09
A2
A1
C-MH-23-787B-CM
ASSY. 9000-0040 OR
ASSY. 9000-0064
USE WITH PROPER
HORSEPOWER\VOLTAGE
MODULE
115/230 V.A.C.
INPUT
GND.
T2-3
T2-2
T2-1
C
A
D
B
F1
FU1
SW1
ON/OFF
T1-10
T1-11
L2
L1
ID1
POWER
CHASSIS
GROUND

To Request Schematic
Please call or write:

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