



**INTERNATIONAL
WORLD CLASS CONTROL
SERIES 790, 790A**

**ELECTROL COMPANY, INC. • 321 DEWEY STREET • YORK, PA 17404
PHONE: (717) 848-1722 • FAX: (717) 848-4514**

INSTRUCTION MANUAL

This IMPL is to be used with ELECTROL models:
C-MH-18-790-CM or C-MH-18-790A-CM

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 designates, 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 World Class motor speed control is designed using state-of-the-art technology to bring you years of unparalleled performance.

This drive is designed for all International Applications - one (1) unit has all the adjustments for dual voltage 120/240V AC, single phase, 50/60 Hz input and selected multiple horsepower ratings 1/50 - 2 HP.

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

TABLE OF CONTENTS

| PAGE | TITLE |
|-------------|----------------------------|
| 1 | WARRANTY |
| 2 | INTRODUCTION |
| 3 | TABLE OF CONTENTS |
| 4 | GENERAL SPECIFICATIONS |
| 5 | INSTALLATION |
| 6 | MOUNTING |
| 7 | GENERAL INFORMATION |
| 10 | ACCELERATION |
| 10 | DECELERATION |
| 10 | MAXIMUM SPEED ADJUSTMENTS |
| 10 | MINIMUM SPEED ADJUSTMENTS |
| 11 | TORQUE (CURRENT LIMIT) |
| 11 | I.R. COMPENSATION |
| 12 | OPTIONS |
| 13 | FUSE TABLE |
| 14-18 | TROUBLE SHOOTING PROCEDURE |
| 19 | CONNECTION DIAGRAM |

GENERAL SPECIFICATIONS

The World Class DC motor speed control is capable of driving either PM or Shunt Wound motors.

Your World Class C-MH-18-790-CM drive comes equipped with a 5K MASTER SPEED POT and a "Plugable" Screw Terminal for all interface connections. An optional knob and dial plate for the MASTER SPEED POT are also available, please specify when ordering.

If you have chosen to purchase the World Class C-MH-18-790A-CM drive, it is equipped with a non-plugable screw terminal.

INSTALLATION

1) WIRING

Your World Class 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 World Class Control should be mounted in a clean, dry environment where water, dust, or other contaminants will not affect the control. Vibration and extreme temperatures should also be kept to a minimum. The Control 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 120V - 3/4 HP, or 240V - 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

Your new World Class Control is both dual voltage and multi-horsepower. The control is shipped from the factory set up for 240V AC Input and 2 HP, 180V DC Output (12 Amps Maximum). If you desire another voltage or horsepower, please use the following setup procedures:

A) INPUT VOLTAGE

The input voltage is selectable with J3 Plug. J3 is located in the upper left corner of the control. For 240V AC operation, turn the 240 labeled side of plug outward. For 120 V AC operation, turn the 120 labeled side of plug outward.

B) OUTPUT VOLTAGE

The output voltage is selectable for 90V DC or 180V DC if the control has a 240V AC input. With 120V AC input, only 90V DC output is available. To select

output voltage, use dip switch SW1, position number four (4) OFF for 180V DC output, ON for 90V DC output. There is a LED (D16) located in the middle of the circuit board to indicate the presence of armature voltage.

C) HORSEPOWER (CURRENT)

The horsepower selection is calibrated with the selection of the proper dip switch to select the correct current. Fine trim adjustments are made with the IR Comp & Torque Pots.

| HORSEPOWER | 90 VOLT | SWITCH ON | 180 VOLT | SWITCH ON |
|-------------|---------|--------------|----------|-----------|
| 1/50 - 1/25 | 0.6 | 4 | | |
| 1/25 - 1/10 | 1.0 | 4 | 0.5 | 0 |
| 1/8 - 1/4 | 2.6 | 1 & 4 | 1.3 | 0 |
| 1/3 - 1 1/2 | 5.4 | 1, 2, & 4 | 2.6 | 1 |
| 3/4 | 8.12 | 1, 3, & 4 | 3.5 | 2 |
| 1 | 10.6 | 1, 2, 3, & 4 | 5.4 | 1 & 2 |
| 1.5 | | | 8.2 | 1 & 3 |
| 2 | | | 11.6 | 1, 2 & 3 |

Switch 1, 2 & 3 open unless instructed to close.

Some motors with the same horsepower may have different current draw. Set control switches for optional performance with applied motor.

TRIM ADJUSTMENTS

1) ACCELERATION

This adjustment will allow adjustment of the acceleration from .5 to 10 seconds. Turning this control CW will increase the time or CCW will decrease the time.

2) DECELERATION

This adjustment will allow adjustment of the deceleration time from .5 to 6 seconds. Turning this control CW will increase the time or CCW will decrease the time.

3) 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.

4) 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.

5) TORQUE (current Limit)

The amount of torque, or current the control 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.**

6) 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 World Class Control.

- 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.

FUSE TABLE

| VOLTAGE/HORSEPOWER | LINE FUSE |
|---------------------------|------------------|
| 120V: | |
| 1/50 - 1/25 HP | AGC 1 |
| 1/20 - 1/10 HP | AGC 3 |
| 1/8 - 1/4 HP | MTH 5 |
| 1/3 - 1/2 HP | ABC 10 |
| 3/4 HP | ABC 15 |
| 1 HP | ABC 20 |
| 240V: | |
| 1/25 - 1/10 HP | AGC 1 |
| 1/8 - 1/6 HP | AGC 3 |
| 1/4 - 1/3 HP | AGC 3 |
| 1/2 HP | MTH 5 |
| 3/4 HP | MTH 5 |
| 1 HP | ABC 10 |
| 1 - 1/2 HP | ABC 15 |
| 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 is on Control) | <ol style="list-style-type: none">1. Power disconnect "off"2. Blown fuse3. Incorrect power source4. Power disconnect device is defective5. Defective control | <ol style="list-style-type: none">1. Move to "on" position2. Replace fuse3. Check control specifications4. Replace power disconnect5. Consult factory |

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|--------------------|---|---|
| Motor does not run | <ol style="list-style-type: none">1. Master pot at zero2. Worn brushes3. Loose motor connections4. Defective control | <ol style="list-style-type: none">1. Turn knob CW to start motor2. Replace brushes3. Inspect connections4. Consult factory |

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|--|---|--|
| Motor stalls or runs very slowly with pot fully CW | <ol style="list-style-type: none">1. Incorrect input voltage2. Motor overload3. Worn brushes4. Loose connections5. Improper HP selection6. Defective control | <ol style="list-style-type: none">1. Check input voltage against controls specs.2. Reduce load3. Replace brushes4. Check all connections5. Check control specifications6. Consult factory |

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|----------------------------|--|---|
| Repeated fuse blowing | <ol style="list-style-type: none">1. Overload conditions2. Loose connections3. Worn brushes4. Defective motor bearings5. Defective control | <ol style="list-style-type: none">1. Reduce load2. Check all connections3. Replace brushes4. Replace bearings5. Consult factory |
| Motor runs wrong direction | <ol style="list-style-type: none">1. Reversed armature | <ol style="list-style-type: none">1. Reverse A1 and A2 connections |

MODEL
C-MH-18-790-CM
ASSEMBLY #
9000-0074

MODEL
C-MH-18-790A-CM
ASSEMBLY #
9000-0075

