



INSTALLING, OPERATING AND MAINTAINING

THE MODEL D196

TWO-SPEED AC MOTOR

TORQUE CONTROL

INSTRUCTION MANUAL # 910-7222-009

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SECTION ONE

GENERAL INFORMATION

INTRODUCTION

Thank you for purchasing an *IPC Automation* elevator control.

At *IPC* we are committed to designing and manufacturing high quality controls that meet or exceed our customers needs. This manual provides the information you will need in order to properly install, operate and troubleshoot the **Model D196 Two-Speed AC Motor Torque Control**. It provides a general overview of the operation of the control, along with detailed descriptions of the adjustments and connections. Also included is a step by step start-up procedure and troubleshooting information. Please read this manual completely before attempting to install or operate the **Model D196**.

Please feel free to call *IPC Automation* with any questions you may have **BEFORE** performing installation or start-up.

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Safety

There are certain fundamental warnings, which must be kept in mind at all times. These include:



THE MODEL D196 TWO SPEED AC TORQUE CONTROL SHOULD BE INSTALLED, ADJUSTED AND SERVICED BY QUALIFIED ELECTRICAL MAINTENANCE PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF ALL EQUIPMENT IN THE ELEVATOR SYSTEM; PERSONAL INJURY AND/OR EQUIPMENT DAMAGE MAY OCCUR IF INDIVIDUALS ARE NOT FAMILIAR WITH THE HAZARDS RESULTING FROM IMPROPER OPERATION.



THE USER IS RESPONSIBLE FOR CONFORMING WITH THE NATIONAL ELECTRICAL CODE WITH RESPECT TO MOTOR CONTROLLER AND OPERATOR DEVICE INSTALLATION, WIRING AND START-UP. THE USER IS ALSO RESPONSIBLE FOR UNDERSTANDING AND APPLYING ALL OTHER APPLICABLE LOCAL CODES WHICH GOVERN SUCH PRACTICES AS WIRING PROTECTION, GROUNDING DISCONNECTS AND OVERCURRENT PROTECTION.

Warranty

Standard conditions of sale for the company include a Statement of Warranty, which covers the control equipment. This Statement of Warranty covers all new equipment.

The Model D196 Two-Speed AC Torque Control has been designed as a standard product to meet the general criteria for controlling an AC Hoist Motor in conjunction with an elevator. IPC does not warrant that the control will meet all application requirements, codes and safety standards.

Q.C. Testing

Quality is an important factor of each phase of the manufacturing and development process. Each unit must pass rigorous quality tests as well as static and dynamic performance checks and a final inspection for quality of workmanship. A unit is allowed to ship only after acceptance of all aspects of Q.C. testing and inspection. This assures that you receive only those controls that meet our demanding quality standards

STORAGE

Please take the following precautions if it should become necessary to store the control for any length of time.



Store the control in a clean, dry (non-corrosive) location that is protected from sudden variations in temperature, and high levels of moisture, shock and vibration.



The ambient temperature where the control is stored should be maintained between zero and 65 degrees Centigrade.



The control should be stored in the original package to protect from dust and dirt contamination.

SECTION TWO

GENERAL DESCRIPTION

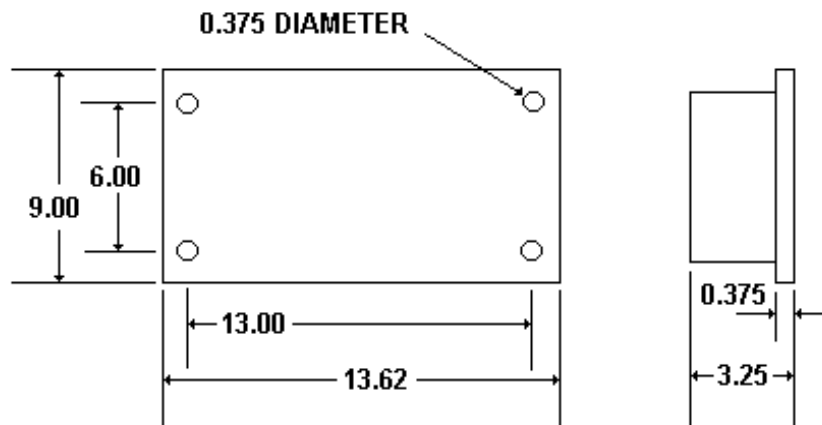
Introduction

The Model D196 Two-Speed AC Motor Torque Control was designed to provide a controllable AC voltage between the incoming power line and a two speed AC Hoist Motor. Initial torque as well as acceleration is independently controllable for both speed windings on the Hoist Motor. The AC motor voltage is utilized as feedback to provide consistent performance over the entire spectrum of load conditions. Digital control circuitry provides highly reliable performance with zero drift.

Mounting Dimensions

Length	13.62 inches
Width	9.00 inches
Height	3.25 inches (with cover)

Use four (4) 3/8" bolts for mounting.



Acceleration

Two potentiometers are provided to control the acceleration rate for the low and high-speed windings of the hoist motor. Both acceleration potentiometers control the time it takes for the selected speed winding to reach full voltage. The low and high-speed acceleration rates are independently adjustable with a range of 6 seconds (full counterclockwise) to 0.5 seconds (full clockwise).

Torque

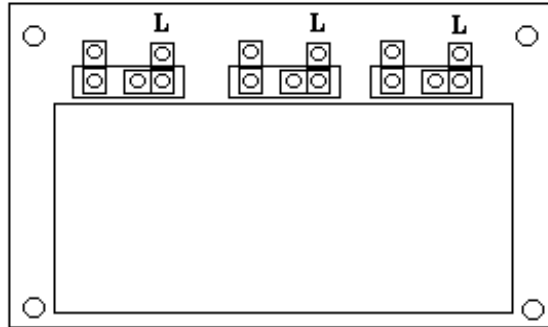
Two potentiometers are provided to control the instantaneous torque for the low and high-speed windings of the hoist motor. Both Torque potentiometers control the instantaneous torque of the motor for the appropriate speed winding when their respective contacts are closed. The instantaneous torque is independently adjustable from 0% (full counterclockwise) to 50% (full clockwise) for each speed winding.

SECTION THREE

INSTALLATION INSTRUCTIONS

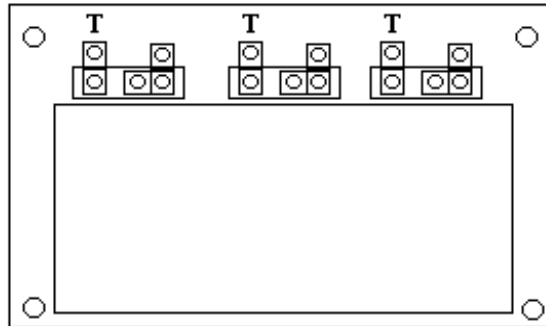
Input Voltage (L)

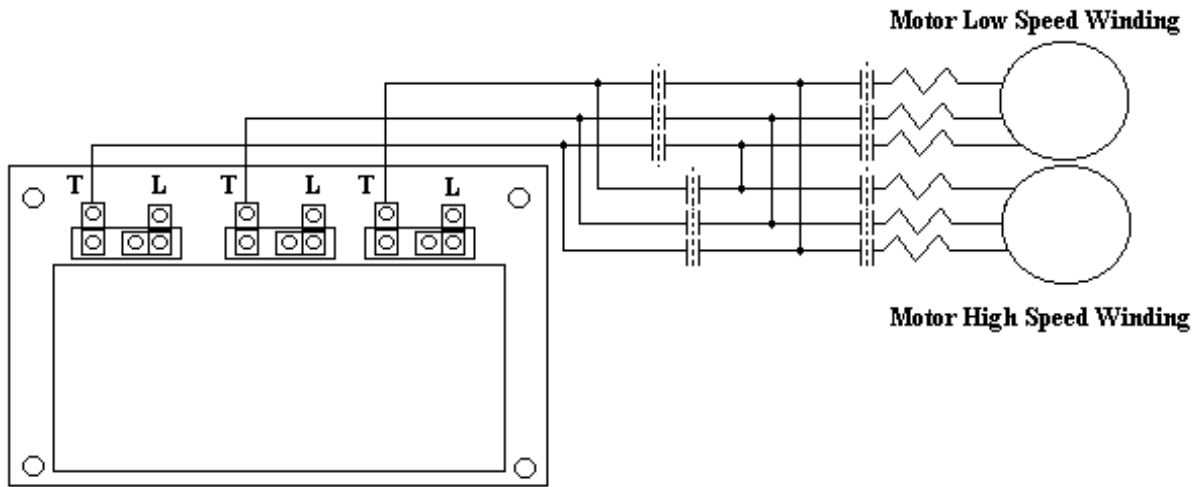
Connect a balanced three-phase 208 or 220 volt AC line to the three terminals marked "L" at the front of the panel. The control is not phase sensitive, so the input lines may be connected in any order.



Output Power (T)

Connect the motor leads to the three terminals marked "T" at the front of the panel.





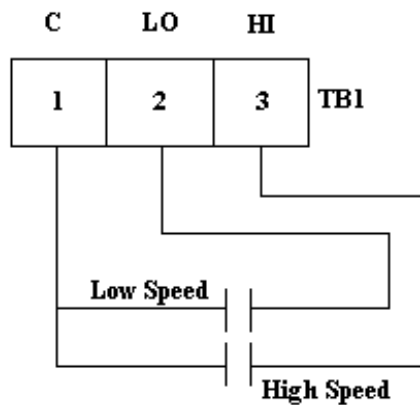
Suggested arrangement for low and high speed motor connections:

Speed Selection Contacts

The speed and torque settings for each Motor speed winding are selected by closing a contact connected between "C" and the appropriate contact ("LO" or "HI") for the desired speed. An open transition of 8 milliseconds is required when transferring from Hi to Lo speed control in order to permit the resetting of the ramp rate circuit. During the transition from Hi to Lo speeds, maintaining an open transition of longer duration will maintain zero torque on the low speed winding for that interval.

The D196 control connections (C to LO, C to HI) should be dropped before the high power directional and speed contactors drop. As a result, the control will turn off the motor current before the contactors drop, resulting in longer contact life.

A suggested contact arrangement is shown below:



SECTION FOUR

SETUP PROCEDURE

Potentiometers

Set all of the acceleration and torque potentiometers fully counterclockwise. This sets the acceleration to the minimum setting of approximately six (6) seconds and the instantaneous torque to zero.

TORQUE HI

Position the empty elevator car at the top floor. Initiate a run in the down direction: if motion in the down direction does not occur as the brake lifts, slowly rotate the TORQUE HI pot clockwise until motion occurs the instant the brake has lifted. Turn the TORQUE HI pot slightly counterclockwise from the current position. This should result in a soft but prompt start of the car when the brake has lifted

ACC HI

Rotate the ACC HI pot until the car is accelerating at a satisfactory rate. The car should accelerate smoothly and quickly up to speed with no bumping or shuddering.

TORQUE LO

Observe the initiation of slow down. Turn the TORQUE LO pot clockwise until a slight lurch is noticed. This lurch indicates that the LO speed initial torque is too high. Turn the TORQUE LO pot slightly counterclockwise until the initiation of slow down is smooth.

ACC LO

Observe the rate of slow down. Turn the **ACC LO** pot clockwise until a smooth, rapid transition to low speed occurs. It may be necessary to adjust the selector or shaftway vane slowdown distances in order to achieve satisfactory operation for both empty and full car conditions. Typical slow down distances are:

100 FPM	36 inches
150 FPM	48 inches

NOTE: IF A DELAY IS INTRODUCED IN THE MAKING OF THE CONTACT FOR THE LO SPEED SELECT, ZERO TORQUE WILL BE DEVELOPED IN THE MOTOR UNTIL THE CONTACT IS ACTUATED (MADE).

SECTION FIVE TROUBLESHOOTING

The problems listed on the following pages represent typical problems that may be encountered during operation of the equipment. The probable cause indicates the most likely reason for the malfunction. The corrective action contains procedures and steps which may be utilized to correct the malfunction.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Card does not move when the Lo/Hi speed contact is closed	No AC Line Voltage	Check the AC line connections at the L,L,L terminals. Verify with an AC volt meter across each L to L combination, meter should read 208/220 VAC.
	Improper Load Wiring	Check the motor load connections at the T,T,T terminals
	Blown Control Fuse	Measure the F1 fuse with an Ohmmeter. Replace if necessary.
	Faulty Control Wiring	Verify the connections to TB1 (C, LO, HI) make sure all connections are proper.
	TORQUE HI setting too low	Turn the TORQUE HI pot clockwise until the car starts to move as soon as the brake is lifted.
Car Bumps/Lurches when making transition from HI to LO speed winding	TORQUE LO setting too high	Turn the TORQUE LO pot counterclockwise until the transition is satisfactory
	Off transition between the HI/LO speeds is too short	Lengthen the time between the HI speed contact dropping and the LO speed contact making.
Car Bumps/Lurches when the brake lifts	TORQUE HI setting is too high	Turn the TORQUE HI pot counterclockwise until the problem clears.
Car passes floor/enters floor too fast.	ACC LO setting too low	The control is not phasing on the LO speed winding quickly enough. Turn the ACC LO pot more clockwise.