

## 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 customer's needs. This manual provides the information you will need in order to properly install, operate and troubleshoot the **Model C218 Hoist Motor Field/Brake Control**. Please read this manual completely before attempting to install or operate the **Model C218**. Please feel free to call **IPC Automation** with any questions you may have **BEFORE** performing installation or start-up.

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## SECTION ONE GENERAL INFORMATION

### 1.1 SAFETY

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

**WARNING THE HOIST MOTOR FIELD/BRAKE 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.**

**WARNING CONTROLLER EQUIPMENT IS AT LINE VOLTAGE WHEN AC POWER IS CONNECTED AND INTERNAL CAPACITORS REMAIN CHARGED AFTER POWER IS REMOVED FROM THE BI-DIRECTIONAL FIELD REGULATOR. IT IS IMPORTANT THAT AC POWER IS REMOVED FROM THE UNIT FOR A MINIMUM OF FIVE MINUTES BEFORE IT IS SAFE TO TOUCH THE INTERNAL PARTS OF THE CONTROL. PERSONAL INJURY MAY RESULT UNLESS POWER IS REMOVED.**

**WARNING 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 OVER CURRENT PROTECTION.**

### 1.2 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 C218 Hoist Motor Field/Brake Control has been designed as a standard product to meet the general criteria for controlling a Hoist Motor Field or Brake in conjunction with an elevator. IPC does not warrant that the Model C218 will meet all application requirements, codes**




**and safety standards.**

### **1.3 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.

### **1.4 STORAGE**

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

-  Store the control in a clean, dry (non-corrosive) environment 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 (0) and 65 degrees Centigrade.
-  The control should be stored in the original package in order to protect from dust and dirt contamination.

## **SECTION TWO PRODUCT SPECIFICATIONS**

### **2.1 GENERAL DESCRIPTION**

The Model C218 Hoist Motor Field/Brake Control was designed to control a the field of a Hoist Motor or the Coil of a Brake for elevator applications. The mode of operation is determined by the connections made during hook up. The Model C218 operates on 208/230 vAC single phase with the capability of adding a third phase which is connected during field forcing in hoist motor field applications.

### **2.2 HOIST MOTOR FIELD CONTROL APPLICATION**

In hoist motor field control applications, a motor field voltage must be present at all times during normal operation or if an input signal failure should occur. When the Model C218 is used as a motor field control (see section 3.1), the output is biased full-on when no input resistance is connected to the control. In other words, as the input reference signal approaches zero, the output voltage increases to its maximum. Typical customer connections may include the following settings:

**FIELD WEAKENING** - The top speed of the motor is increased while the torque is decreased in a constant horsepower range. This is accomplished by increasing the input resistance, which will lower the output voltage, if top speed can not be reached with full output voltage.

**FIELD FORCING** - High torque is provided at low speed and the top motor speed is limited. This is accomplished by introducing the third phase of the input line to boost the output voltage. This feature is typically used during leveling and releveling.

### **2.3 BRAKE CONTROL APPLICATION**

In typical applications, a DC brake is set when no voltage is present on the brake coil and the brake is lifted as voltage is applied to the coil. A dual voltage control is used because a relatively large amount of voltage is required to energize the brake while a lower voltage may be used to hold the brake, once it has been lifted.

The Model C218 was designed for failsafe operation when connected as a brake control (see section 3.2). If no input reference signal is present, the output will be zero volts.

## 2.4 CONTROL SPECIFICATIONS

CONTROL INPUT SUPPLY: 208/220 VAC Single Phase 50/60HZ  
 Three Phase (for increased output voltage)

INPUT REFERENCE RESISTOR: 5 K Ohm, 1 W slide resistor with taps

CONTROL CURRENT RATING: 15 Amps DC continuous

OUTPUT VOLTAGE

MOTOR FIELD MODE

(208 VAC SINGLE PHASE INPUT): 35 to 185 VDC nominal

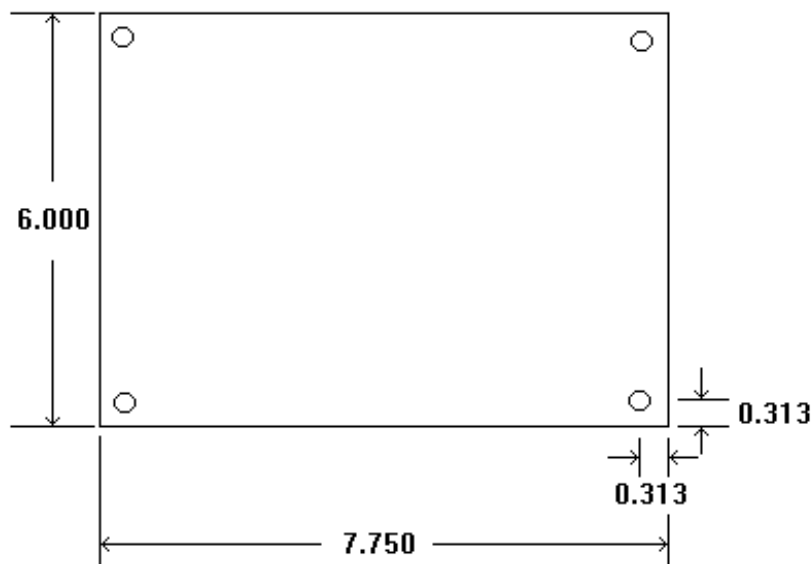
(208 VAC THREE PHASE INPUT): 200 to 280 VDC nominal

BRAKE CONTROL MODE

(208 VAC SINGLE PHASE INPUT): 0 to 185 VDC nominal

ACCELERATION/DECELERATION: 0.6 seconds fixed.

## 2.5 MOUNTING DIMENSIONS



Length 7.00"

Wid

All mounting holes are sized for #6 hardware.

## 2.6 CURRENT SENSE RELAY

The model C218 provides a set of normally open relay contacts for customer use. These contacts are rated at 5Amps, 240 VAC and 5 Amps 28 VDC. The relay is designed to energize when the output current is equal to a field current setpoint. The setpoint is adjusted by R26 as follows:

R26 full counter clockwise	1 Amp (min. setting)
R26 full clockwise	10 Amp (max. setting)

## SECTION THREE INSTALLATION AND START UP

### 3.1 INTRODUCTION

The following section contains hook-up notes and drawings for the Model C218 Hoist Motor Field/Brake Control. Section 3.2 and figure 2 should be used when the Model C218 is used as a Hoist Motor Field Control. Section 3.3 and figure 3 should be used when the Model C218 is used as a Brake Control.

**WARNING:**

**THE HOIST MOTOR FIELD/BRAKE 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.**

**WARNING:**

**CONTROLLER EQUIPMENT IS AT LINE VOLTAGE WHEN POWER IS CONNECTED AND INTERNAL CAPACITORS REMAIN CHARGED AFTER POWER IS REMOVED FROM THE HOIST MOTOR FIELD/BRAKE CONTROL. IT IS IMPORTANT THAT AC POWER IS REMOVED FROM THE UNIT FOR A MINIMUM OF FIVE MINUTES BEFORE IT IS SAFE TO TOUCH THE INTERNAL PARTS OF THE CONTROL. PERSONAL INJURY MAY RESULT UNLESS POWER IS REMOVED.**

**WARNING:**

**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.**

## 3.2 HOOK-UP NOTES - HOIST MOTOR FIELD CONTROL

### 1.) CONTROL POWER

Connect a *single phase* 208/230 VAC line to the **L1** and **L2** terminals. The control's output voltage range will be 30 to 185 VDC for a 208 VAC single phase input.

If the third phase of the input line is connected to the **L3** terminal, the adjustable output voltage will increase to 200 to 270 VDC for a 208 VAC input line. This feature is useful for motor field forcing at leveling speed when higher torque and limited speed is required.

### 2.) MOTOR FIELD

Connect the Motor Field leads to the **F+** and **F-** terminals observing proper polarities.

### 3.) FAILSAFE OPERATION

When failsafe operation is enabled, the control will continue to produce a full (**HI**) motor field voltage in the event of an input signal loss. To enable failsafe operation, install a jumper from the **+15** terminal to terminal **11**.

### 4.) INPUT REFERENCE RESISTOR

The typical input reference resistor used is a 5 K Ohm, 1 watt slide resistor with taps. Connect the resistor as follows:

HIGH (left side)	Connect to the <b>F+</b> terminal
LEFTMOST TAP (HI)	Connect to terminal <b>9</b> through a contact
RIGHTMOST TAP (LO)	Connect to terminal <b>9</b> through a contact
LOW (right side)	Connect to terminal <b>-15</b>

The contacts marked **HI** and **LO** represent two possible settings that may be selected during hoist motor field control operation. A **HI** contact closure would result in nearly full output or full field. A **LO** contact closure would produce a weakened field or lower output voltage for higher motor speed.



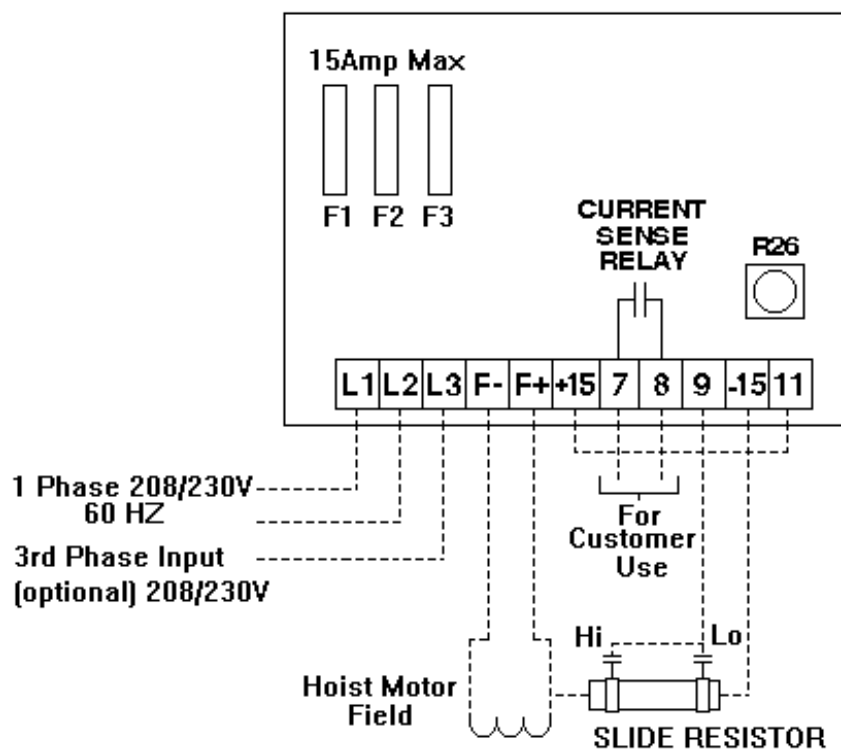
## 5.) CURRENT SENSE RELAY

This is a set of normally open contacts that will pull in when the field current is greater than or equal to the setpoint selected by the R26 potentiometer. Terminals 7 and 8 are typically used by customers to indicate that a safe operating condition exists. A closed current sense relay contact in a hoist motor field control application indicates that a field is present on the motor and it is safe to operate.

## 6.) R26 SETTINGS

The R26 potentiometer sets the pull in point of the current sense relay as follows:

R26 fully counter clockwise      1 Amp (min. setting)



R26 fully clockwise

10 Amp (max. setting)

## HOIST MOTOR FIELD CONTROL HOOK UP DIAGRAM

### 3.3 HOOK-UP NOTES - BRAKE CONTROL

#### 7.) INPUT LINE VOLTAGE

A *single phase* 208/230VAC line should be connected to the **L1** and **L2** terminals. The output range of the control will be from zero to 185 VDC for a 208 VAC single phase input.

#### 8.) COMMON

The **F+** terminal on the Model C218 is the common or ground terminal of the control. The low end of the input slide resistor should be connected to this point.

#### 9.) INPUT REFERENCE RESISTOR

The typical input reference resistor used is a 5 K Ohm, 1 watt slide resistor with taps. Connect the resistor as follows

LOW (left side)	Connect to the <b>F+</b> terminal
LEFTMOST TAP (LO)	Connect to terminal <b>9</b> through a contact
RIGHTMOST TAP (HI)	Connect to terminal <b>9</b> through a contact
HIGH (right side)	Connect to terminal <b>+15</b>

The contacts marked **HI** and **LO** represent two possible customer connections for selecting dual voltage brake operation. The **HI** contact is used to energize the brake at a high output level. The **LO** contact is used to maintain the energized brake at a reduced output level.

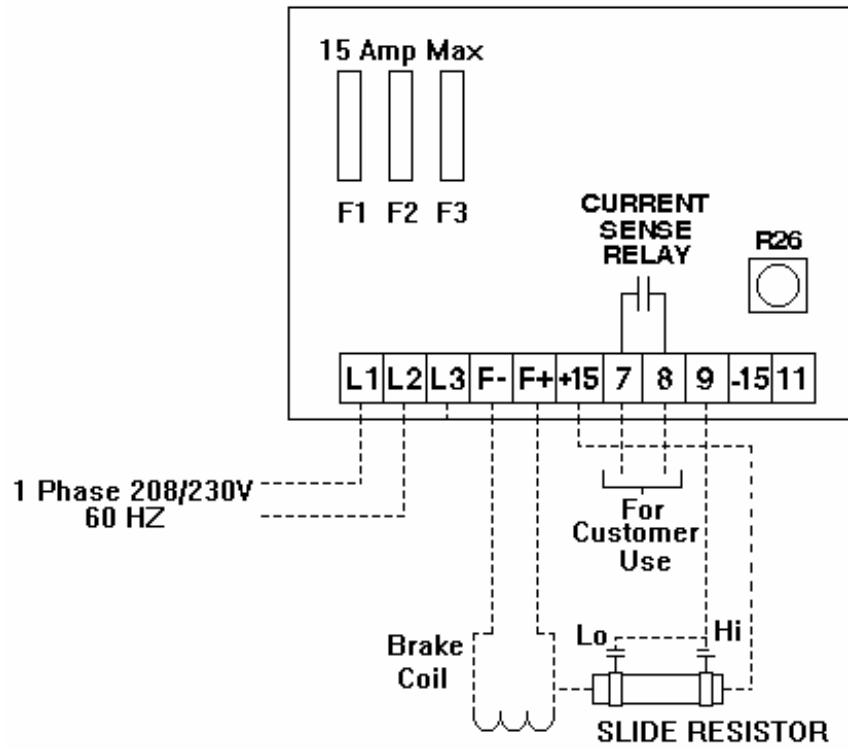
#### 10.) CURRENT SENSE RELAY

This is a normally open contact that will pull in when the field current is greater than or equal to the set point selected by pot **R26**. Terminals **7** and **8** are typically used by customers to indicate that a safe operating condition exists. A closed current sense relay contact in a brake control application indicates the brake is being energized.

#### 11) R26 SETTINGS

The R26 pot sets the pull in of the current sense relay as follows:

R26 full counterclockwise	1 Amp (min. setting)
R26 full clockwise	10 Amp (max. setting)



**BRAKE CONTROL HOOK UP DIAGRAM**

**INSTALLING, OPERATING AND MAINTAINING**

**THE MODEL C218**

**HOIST MOTOR FIELD**

**OR BRAKE CONTROL**

REVISION: 2.0

MARCH 1997

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