

# INSTALLATION & OPERATION

## V SERIES LOAD CONTROLS AND POWER CELLS FOR VARIABLE FREQUENCY AND DIRECT CURRENT POWER



Power Cells Sense Motor Power From Variable Frequency  
And DC Drives — V Series Load Controls Use This Signal  
To:

- Adjust Machines and Processes
- Signal Beginning or End of Process
- Detect Trouble
- Protect Machines and Processes

 **LOAD CONTROLS  
INCORPORATED**

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# POWER CELLS

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Various models of the Power Cell are used to sense variable frequency and DC power. They utilize Hall effect sensors that are not affected by wave shape or frequency.

## MODEL NUMBER

PH-3 For Variable Frequency Power to 350 Amps  
PH-1000V For Variable Frequency Power to 1000 Amps  
PH-1 For DC Power to 350 Amps  
PH-1000DCV For DC Power to 1000 Amps

## HOOKUP ON

Page 5  
Page 6  
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These Power Cells are matched to the load with plug-in voltage and current networks. (See Page 14)

The output of the Power Cell goes to a V series load control.

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# FEATURES ON ALL V SERIES CONTROLS

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## ADJUSTABLE SET POINTS

When power reaches your selected SET POINT a built-in Relay Output is activated (tripped). Relay stays tripped (latched). You choose when to reset.

## ANALOG OUTPUT

Hook to the Load Meter for monitoring load, easy setup and adjustment.

## EASY SETUP WITH SET READ SWITCHES

Press the SET READ Switch and the SET POINT for that Channel is displayed on the LOAD METER.

- You **know** where the SET POINT is
- Easily verify proper operation

## BUILT-IN STARTUP TIMER

Adjustable Timer eliminates false trips while the Motor is starting.

## FILTER OUT NUISANCE TRIPS

Adjustable On-Delay Timer. Trip won't activate until the selected delay time is exceeded.

## RESET

The Control can be Reset

- Automatically — when the overload is gone
- Remotely — with switch, relay or programmable controller
- Manually

## TRIP INHIBIT

The Control can be remotely bypassed during any part of the cycle when not required.

## Also Available

Remote Set Point Adjustment for All Models

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## STANDARD LOAD CONTROLS

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The relays trip when a Set Point is reached. Set Points can be:  
High Trip — Trips when the power goes above the Set Point  
Low Trip — Trips when the power goes below the Set Point

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## STANDARD LOAD CONTROL MODEL NUMBERS

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**PFR-1500V Single Set Point**  
One Set Point — High Trip

**PFR-1500VL**  
One Set Point — Low Trip

**PFR-1700V Dual Set Points**  
Two Set Points — Both High Trip

**PFR-1700VHL High-Low Set Points**  
Two Set Points — One High Trip, One Low Trip

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## COMPENSATOR™ LOAD CONTROLS

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For machine tool applications the IDLE or BASELINE power of a machine tool drifts because of changes in:

- Temperature
- Lubricant Viscosity
- Mechanical Clearance
- Idle Speed

For accurate dull or broken tool detection, grinder gap elimination, this drift should be zeroed out.

- A limit switch or programmable controller signal tells the COMPENSATOR™ each time the machine is in the idle or "BASELINE" position.
- The COMPENSATOR™ samples this power level and retains it as a reference.
- The SET POINTS are related to this BASELINE.

In other words, the COMPENSATOR™ zeros out the BASELINE power for each cycle. The absolute trip point changes as conditions change but always remains a fixed amount away from the BASELINE. This means no constant fine tuning. It adjusts itself.

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## COMPENSATOR™ LOAD CONTROL MODEL NUMBERS

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**PCR-1800V COMPENSATOR™**  
Single Set Point Above the Compensating Baseline

**PCR-1810V COMPENSATOR™**  
Two Set Points: One Compensating, One Standard

**PCR-1820V COMPENSATOR™**  
Two Set Points, Both Compensating

# INSTALLATION

## MOUNTING

The Load Control should be mounted in a control cabinet or in a protected area. The four phillips head screws on the Control should be removed and used for attaching the mounting brackets to the Control.

The Power Cell should be mounted so that the motor supply leads can pass through the holes. Direction is important. The Load side (the Load Controls Label) must face the load.

## INPUT CONNECTIONS TO THE LOAD CONTROL

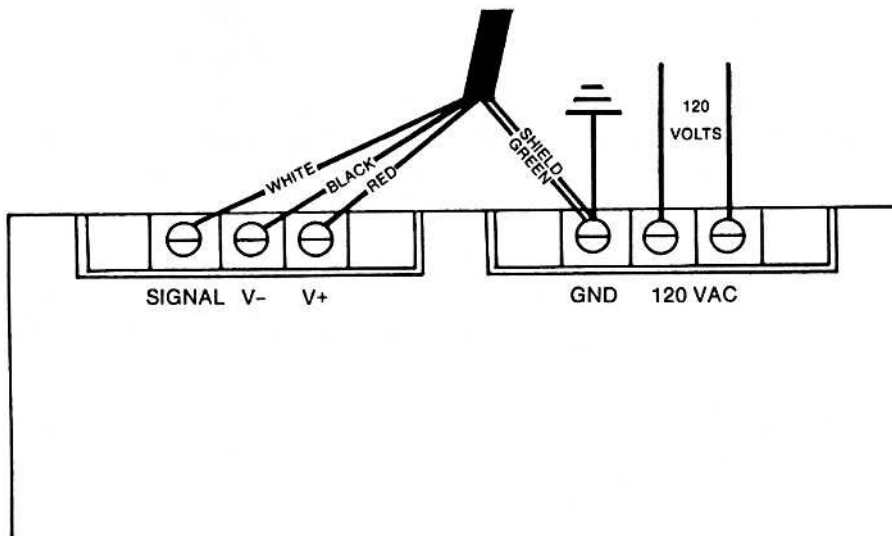
A 3 foot 4 wire shielded cable is provided to connect the Power Cell to the V Series Control. If more length is needed, use shielded cable.

White	SIG
Red	V+
Black	V-
Green	GND

Shield Wire - Connected to "Chassis GND" on Load Control NOT connected at Power Cell.

## 120 Volt Power

Connect to the 120VAC terminals on the Load Control. Ground the Load Control Chassis.



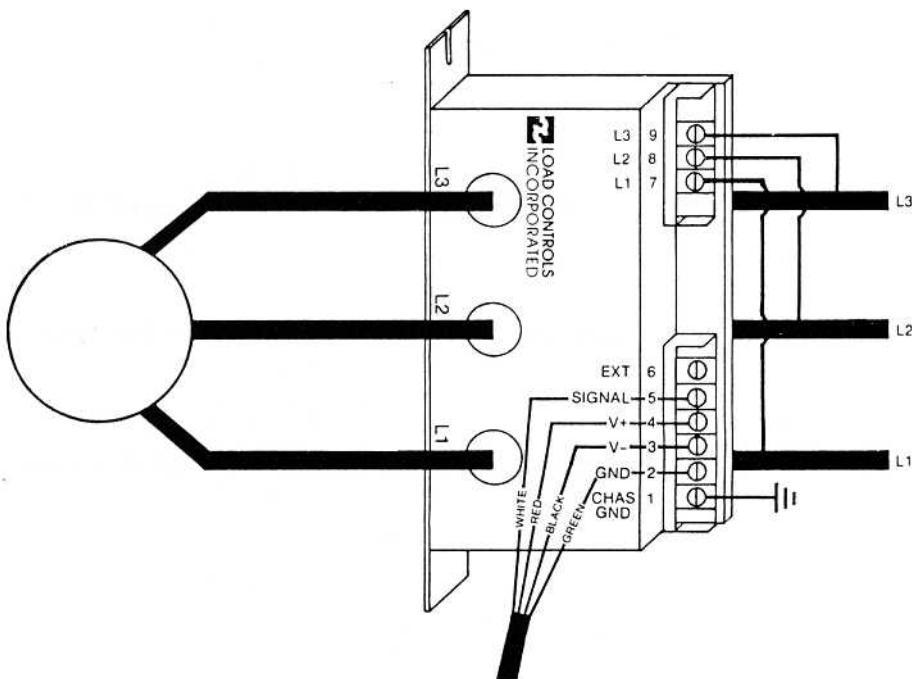
# PH-3 POWER CELL

*For Variable Frequency Power to 350 Amps*

Pass each of the phases through the L1, L2, L3 holes in the Cell. Be certain that **DIRECTION** is correct. The LOAD side of the Cell should face the load. The Power Cell should be on the output side of the drive.

From a convenient location provide a voltage signal for each phase with 20 gauge or larger wire. The voltage signal should also come from the output side of the Drive.

- L1 to Terminal 7
  - L2 to Terminal 8
  - L3 to Terminal 9
- Make sure that the voltage samples don't get switched



# PH-1000V POWER CELL

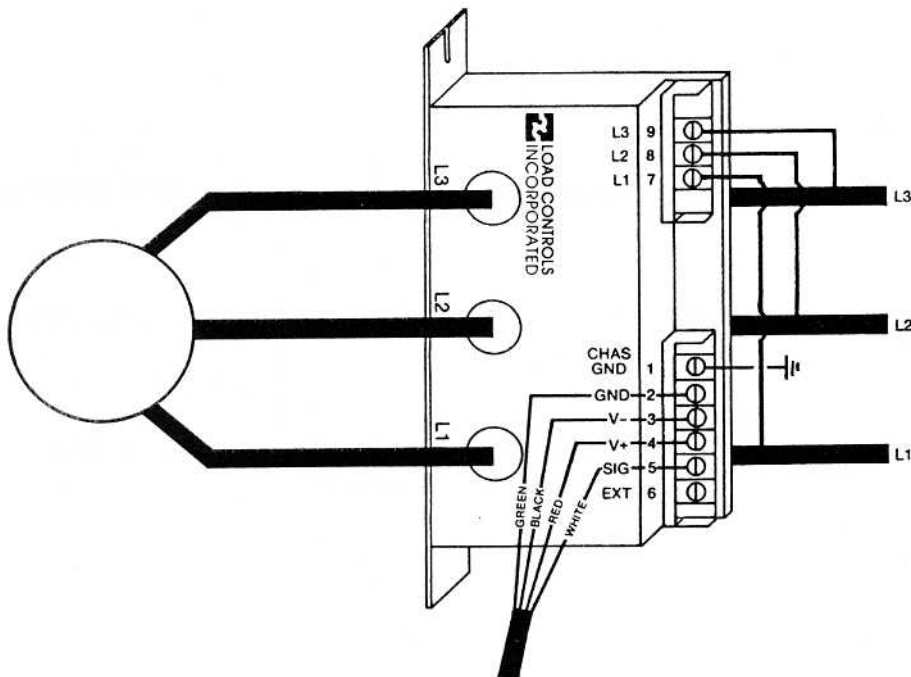
*For Variable Frequency Power to 1000 Amps*

Pass each of the phases through the L1, L2, L3 holes in the Cell. Be certain that **DIRECTION** is correct. The LOAD side of the Cell should face the load. The Power Cell should be on the output side of the drive.

From a convenient location provide a voltage signal for each phase with 20 gauge or larger wire. The voltage signal should also come from the output side of the Drive.

- L1 to Terminal 7
- L2 to Terminal 8
- L3 to Terminal 9

Make sure that the voltage samples don't get switched



# PH-1 POWER CELL

For DC Power or Current to 350 Amps

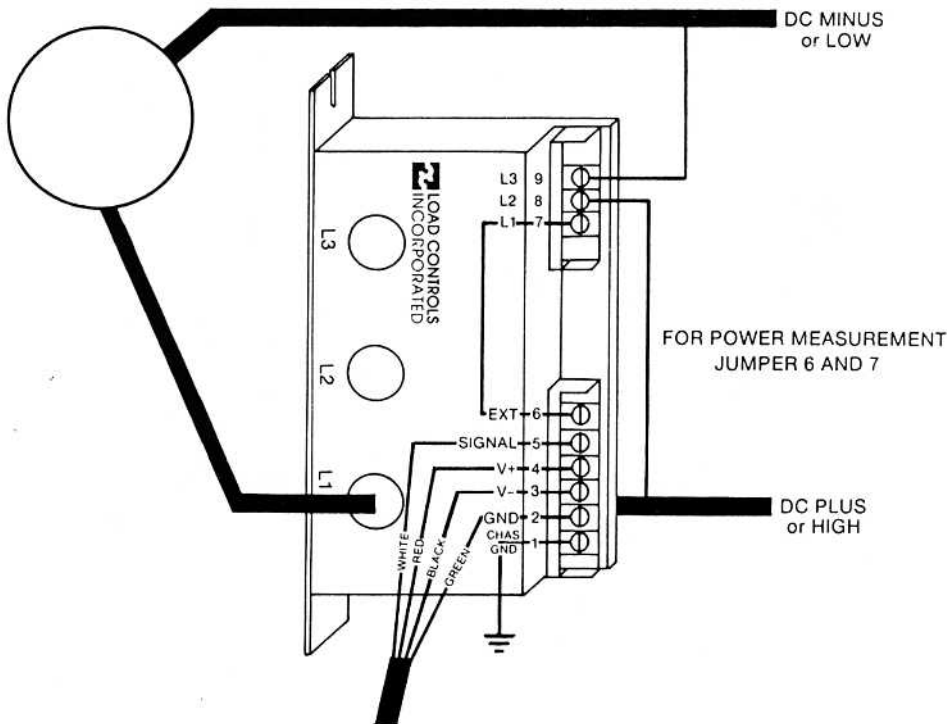
Pass the DC Plus or High through the L1 hole in the Cell. Be certain that **DIRECTION** is correct. The LOAD side of the Cell should face the load.

From a convenient location provide a voltage signal from each DC line with 20 gauge or larger wire.

DC Plus or High to Terminal 8  
DC Minus or Low to Terminal 9

For DC Power Measurement, Jumper Terminal 6 and 7 on the Power Cell.

For DC Current Measurement, remove the Jumper and remove the voltage connections to Terminal 8 and 9.



# PH-1000DCV POWER CELL

For DC Power or Current to 1000 Amps

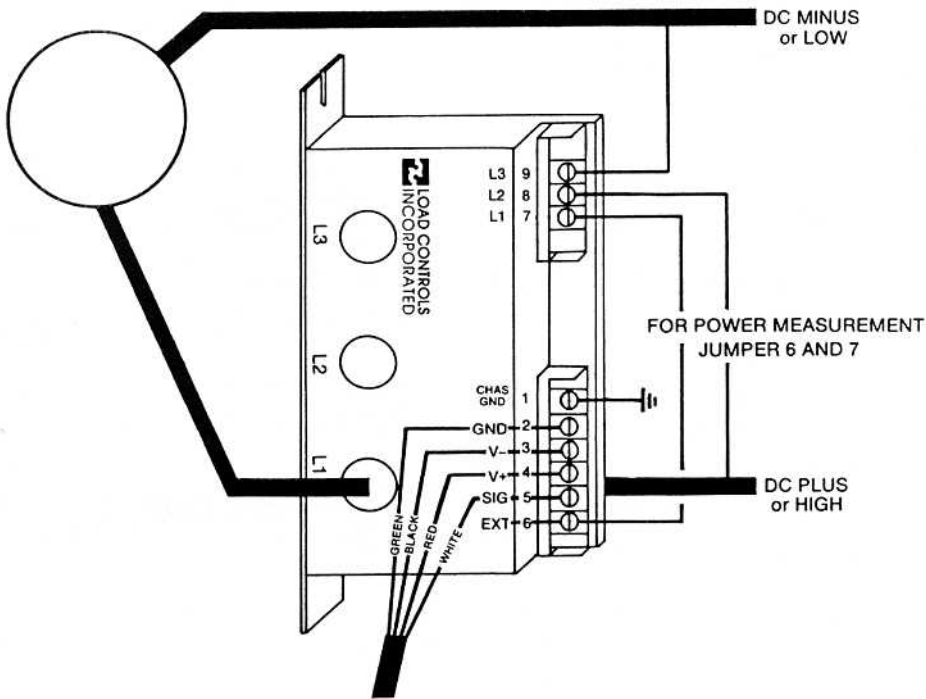
Pass the DC Plus or High through the L1 hole in the Cell. Be certain that **DIRECTION** is correct. The LOAD side of the Cell should face the load.

From a convenient location provide a voltage signal from each DC line with 20 gauge or larger wire.

DC Plus or High to Terminal 8  
DC Minus or Low to Terminal 9

For DC Power Measurement, Jumper Terminal 6 and 7 on the Power Cell.

For DC Current Measurement, remove the Jumper and remove the voltage connections to Terminal 8 and 9.

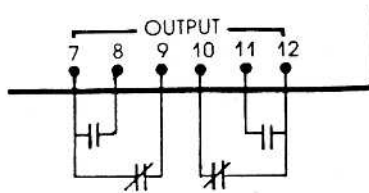




## OUTPUT CONNECTIONS (Terminals 7-12)

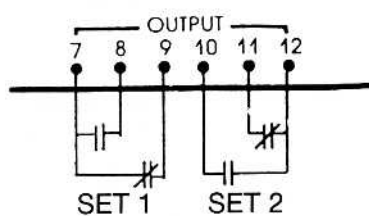
### RELAY OUTPUTS — SINGLE SET POINT CONTROLS

PFR-1500V  
PFR-1500VL  
PCR-1800V



### RELAY OUTPUTS — TWO SET POINT CONTROLS

PFR-1700V  
PFR-1700VHL  
PCR-1810V  
PCR-1820V



- **Relays Shown Normal Operation**
- **Power On**
- **Not Tripped**

- Specifications: .01 Amps to 3 Amps at 120 Volts AC 1/20 HP at 120 Volts AC

(Set 1 is the low set point for model PFR-1700VHL)

## CONTROL CONNECTIONS (Terminals 1-6)

### ANALOG OUTPUT AND SET READ SWITCHES

**Always use a Load Meter! It greatly simplifies setup, adjustment and trouble shooting.**

The ANALOG OUTPUT (0-1 milliamp) proportional to motor power is on Terminal 6 (Positive) and Terminal 5 (Common). The Percent Load Meter is connected to this output.

- The Meter shows the Motor Load.
- When the Set Read switches are pressed, the Set Point is displayed.

The ANALOG OUTPUT can also be used to drive a chart recorder or as an input to a computer or controller.

The output can be factory modified for a 0-10V or 4-20 milliamp output. To convert the 0-1 milliamp output in the field to 0-10 volts, use a 10K ohm 1% resistor across Terminals 5 and 6.

### HOOKUP

**Terminal 6 Positive**

**Terminal 5 Common**

Use #20 AWG or larger. For lengths of 10-100 feet, use shielded cable with the shield grounded at the Control, but not at the Meter.

