

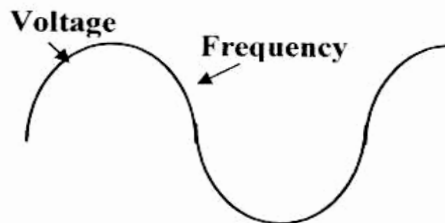
United Community Services of America  
3002 State Route 23 North  
Newfoundland, NJ 07435  
973-208-7097

## Power Controller

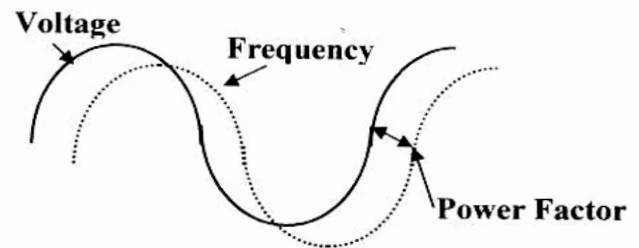
115/220 VAC – 13/7 amps  
Up to 3 HP Single Phase AC Inductive Motor

The Power Controller was a technology originally developed by NASA for use on the space shuttle motors, to reduce the amount of power the shuttle used. The P.C. saves in 2 ways, the first way it controls the power usage by acting as a brain for the motor. A way to illustrate that is by the muscles in your arm, they are in a way motors, and your brain acts as a power regulator for the muscles in your arm, telling them to apply little power on a light object or load, and full power on a heavy load. Without your brain your muscles would apply full power all the time in doing so your arms would wear out very fast, that is basically what is wrong with today's motors they have no brain to regulate, and therefore are applying full power all the time. Another problem is when those motors are using full power when idling, it must get rid of the excess energy somehow, so it turns into heat and wears out the windings in the motors, that is why motors get hot. By using the Power Controller, the motor doesn't get hot, and therefore extends the life of the motor.

The second way the P.C. saves is it corrects power factor, bringing it closer to unity. Power factor in simple terms is the delay between the voltage wave and frequency wave. In a light bulb you get a power factor of 1, in which the voltage and frequency are in line, however in most motors today the power factor is anywhere from .1 to .8, which causes a lot of power loss.



Power Factor of 1



Power Factor of .1

What the Power Controller does, is it brings the voltage and frequency waves closer to unity, therefore reducing the amount of power loss. **Overall the Power Controller reduces the temperature of the motor, extending the life; reducing power usage by acting as a brain; and improving power factor, reducing the power loss.**

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## Recommended Application

115/220 VAC – 13/7 amps  
Up to 3 HP Single Phase AC Inductive Motor

The PC-1.1 light duty power control system (3 HP and under) is designed to work with rotating single phase AC inductive motors that are **not otherwise power-factor corrected**. Capacitor Run motors will not function with this PC-1.1 system; Universal motors (brush type) will not benefit from the system either. The system cannot be used on 3 phase motors or electronic devices such as clocks, radios or computers.

Types of motors recommended for use with the PC-1.1 are machine shop motors, swimming pool pump motors, air-conditioning compressor motors, convenience store compressor motors, bowling alley pin setter & ball return motors and any rotating single phase AC inductive motor that is **not otherwise power-factor corrected**. (See Typical PC-1.1 Power Savings at the end of this document.

**NOTE:** The PC-1.1 must be connected directly into the input of the AC Motor and should **ONLY** be installed by qualified personnel! The PC-1.1 can be wired for 110 or 220VAC and is NOT grounded to the printed circuit board.

## Power Controller 1.1 Operational Information

The PC 1.1 has 16 different profiles that you set by removing or inserting the 4 different jumper pins. Profiles 1 through 6 are for **Normal Start** motors (**any motor that requires full power instantly**) such as air conditioning motors. Profiles 7 through 13 are for **Smooth Ramp-Up** motors (**any motor that must gradually build up speed**). Profile 13 is used when there are constant load changes, such as the pin setters in a bowling alley. 14 through 16 are rarely used, but if all the other profiles don't work, then try 14-16, however you will get less of a savings.

For Normal Start motors begin with profile 1 and if you get an error light unplug the unit, the set to profile 2 and so on until you find a profile that works. For Smooth Ramp-Up motors, start with profile 7, if you get an error light unplug and set the next profile and so on until you find a profile that works. Once you have adjusted the jumper pins plug the PC in, and you will see a solid RED light, turn on the motor and the light on the PC will turn from RED to GREEN, which means it is determining how much power it can save. When it has determined how much power it can save the light will be a flashing GREEN showing that it has locked in. If you get a flashing RED light, which is an error code, you must unplug the PC to reset and change profiles.

## Installation In-line PC-1.1

(#117)

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Operating Supply Voltage  
115/220 VAC – 13/7 amps  
Up to 3 HP Single Phase AC Inductive Motor

### Tools:

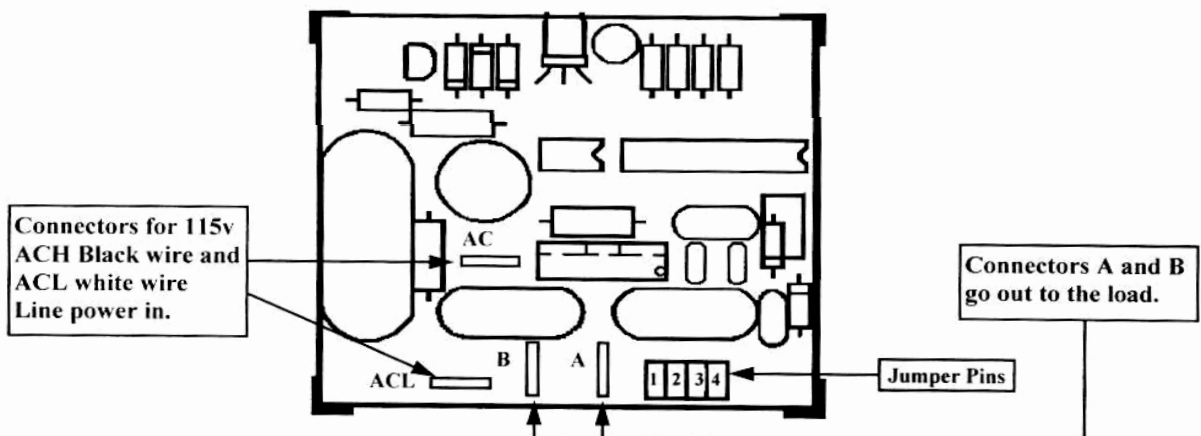
- Wire cutter
- Wire stripper
- Screwdriver (for tightening wire clamps)
- Extra wire (to use if wiring directly to circuit)
- Needle nose pliers (or something small to pull out Jumper pins)

### Installation:

1. Turn off power from circuit breakers or disconnect plug from wall outlet.
2. \*Cut lines going into motor or load after the switch at appropriate location.
3. Strip wire ends and crimp on the yellow female disconnects.
4. Attach cable connectors that come with PC-1.
5. Insert wires into each side of PC-1 metal enclosure.
6. Connect power in wires from source to ACL and ACH to appropriate male Spade on PC board. (SEE Diagram)
7. Connect A and B leads to motor or load.
8. Clamp wires in cable pins.
9. Set jumper pins to proper profile. (See following pages,
10. \*\*Mount PC.
11. Turn power on and observe LED display. (Use LED chart)

\* In the case that a business would need to replace their motor if there were an emergency, then you should wire into the circuit or after the plug.

\*\* Before mounting, thoroughly examine the PC and make sure nothing has fallen into the PC circuit or box, such as small pieces of copper from cutting wire, which can cause damage to the PC.



### Warning

**Do Not** touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this device. **Do Not** use on non motorized appliances, including digital clocks, transformer-powered appliances, shop or garden tools, or computers.

### Warranty

The manufacturer, warrants to the original consumer purchaser, the PC-1 control units to be free from defects in material and workmanship for up to 10 years from the manufactured date. The manufacturer will repair or replace, at its option and free of charge during the warranty period, any system component that proves defective in material or workmanship under normal use, and service, provided the product is returned to our factory, transportation charges prepaid. In the absence of such purchase receipt, the warranty period shall be one (1) year from the date of manufacture. Any damage to the product(s) as a result of misuse, abuse, neglect, accident, incorrect wiring, improper installation, destruction, repair or alteration outside our factory, or any use volatile of instructions furnished by us will void the warranty. This warranty is limited to the defective parts and specifically excludes any incidental or consequential damages connected therewith.

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# PC Profiles

## Profile 1 Through 4

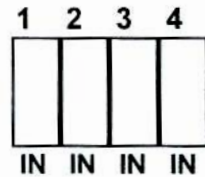
*Normal Start:*  
*No Lock To Minimum Setting:*  
*No Hold On Full Load:*  
*Adjust To Load:*

N  
O  
R  
M  
A  
L  
S  
T  
A  
R  
T

### Profile 1

All Jumpers in position: *Set Point Saving Level 4*

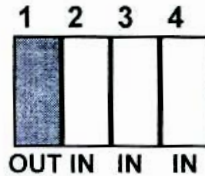
This is the starting program. Use this profile on fixed load applications with normal start (blowers, pumps) this is the most efficient setting. The first eight profiles contain Error codes for diagnostic purposes. If there is an abnormal motor load condition the PC will Error out and flash-out a trouble code from one to five pulses.



### Profile 2

Jumper 1 removed: *Set Point Saving Level 5*

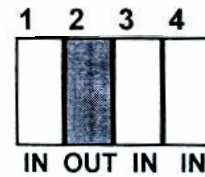
Will set the power level up to the next saving mode in the PC program for a more moderately loaded motor.



### Profile 3

Jumper 2 removed: *Set Point Saving Level 6*

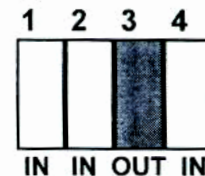
Will set the power level up to the next saving mode in the PC program for moderately loaded motor.



### Profile 4

Jumper 3 removed: *Set Point Saving Level 7*

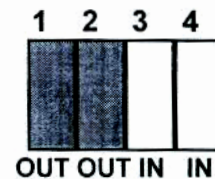
Will set the power level up to the next saving mode in the PC program for moderately loaded motor.



### Profile 5: Give full power if load changes

Jumper 1 and 2 removed: *Set Point Saving Level 4*

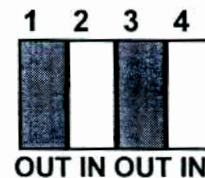
Will set the power level up to the next saving mode in the PC program for moderately loaded motor.



### Profile 6: Give full power if load changes

Jumper 1 and 3 removed: *Set Point Saving Level 5*

Will set the power level up to the next saving mode in the PC program for moderately loaded motor.

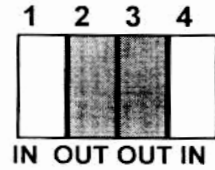


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**Profile 7: Smooth Ramp-up Start Engagement : Adjust To Load**

Jumper 2 and 3 removed: *Set Point Saving Level 4*

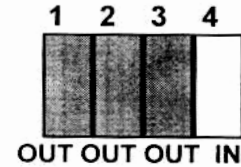
Will set the power level to its most efficient saving mode in the PC program with Smooth Ramp-up Engagement for fixed load application and adjust to slight load changes.



**Profile 8: Smooth Ramp-up Start Engagement : Adjust To Load**

Jumper 1, 2, and 3 removed: *Set Point Saving Level 5*

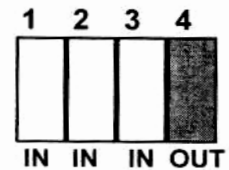
Smooth Ramp-up Engagement for fixed load application and adjust to slight load changes.



**Profile 9: Smooth Ramp-up Start Engagement : Adjust To Load**

Jumper 4 removed: *Set Point Saving Level 6*

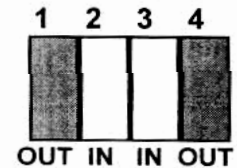
Smooth Ramp-up Engagement for fixed load application and adjust to slight load changes.



**Profile 10: Smooth Ramp-up Start Engagement : Give full power if load changes**

Jumper 1 and 4 removed: *Set Point Saving Level 4*

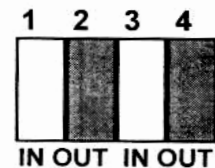
Smooth Ramp-up Engagement for fixed load application and adjust to load changes.



**Profile 11: Smooth Ramp-up Start Engagement : Give full power if load changes**

Jumper 2 and 4 removed: *Set Point Saving Level 5*

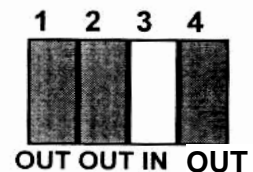
Smooth Ramp-up Engagement for fixed load application and adjust to load changes.



**Profile 12: Smooth Ramp-up Start Engagement : Give full power if load changes**

Jumper 1, 2, and 4 removed: *Set Point Saving Level 6*

Smooth Ramp-up Engagement for fixed load application and adjust to load changes.

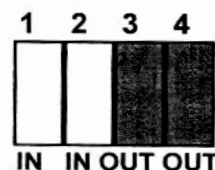


**Profile 13: Smooth Ramp-up Start Engagement : Give full power if load changes:**

**Do not lock out on Error**

Jumper 3 and 4 removed: *Set Point Saving Level 5*

Will set the power level up to the next saving mode in the PC program for moderately loaded motor.

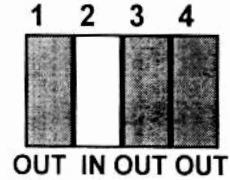


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**Profile 14:** Smooth Ramp-up Start Engagement : Give full power if load changes  
Do not lock out on error : Fix Minimum On Lock

Jumper 1, 3, and 4 removed: *Set Point Saving Level 5*

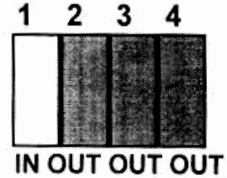
Smooth Ramp-up Engagement for fixed load application and adjust to load changes.



**Profile 15:** Smooth Ramp-up Start Engagement : Give full power if load changes:  
Do not lock out on Error

Jumper 2, 3, and 4 removed: *Set Point Saving Level 5*

Smooth Ramp-up Engagement for fixed load application and adjust to load changes.

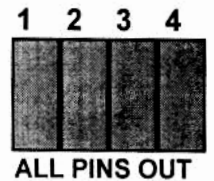


**Profile 16:** Smooth Ramp-up Start Engagement : Give full power if load changes:

Do not lock out on Error : Hold full power on load: Fix minimum on lock

All Jumpers removed: *Set Point Saving Level 5*

Smooth Ramp-up Engagement for fixed load application and adjust to load changes.



**Error Flash out Diagnostic codes**

**Error Code One:** Red LED pulses 1 time with 1 second stop.  
Lowest possible level was reached while searching for cross over point.

**Error Code Two:** Red LED pulses 2 times with 1 second stop.  
Lowest possible level was reached while locating the initial set point.

**Error Code Three:** Red LED pulses 3 times with 1 second stop.  
Lowest possible level was reached during power reduction.

**Error Code Four:** Red LED pulses 4 times with 1 second stop.  
Power Level exceeded maximum.

**Error Code Five:** Red LED pulses 5 times with 1 second stop.  
Low factor code while locating the initial set point.

**NOTE:**  
If all profiles have been tried and the error codes are still coming up, then the specific AC inductive motor is not a good candidate for use with the PC-1.1 Power Control System.

Typical PC-1.1 Power Savings

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Type Motor	Without PC-1.1	With PC-1.1
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**Bench Grinder**

1/2Hp		PC 1.1 56%
Volts	117	65
Amps	5.20	1.6
Watts	167	75

**Energy Efficient  
 pump Mixer 1/2** PC 1.1-Loaded  
 Savings 38%

Volts	117	62
Amps	6.85	3.2
Watts	205	129

**Band Saw** PC 1.1

3/4 Hp Dayton		46%
Volts	117	63
Amps	8.65	3.20
Watts	287	157

**Baldor Drill Press** PC 1.1

1/3hp		48%
Volts	120	99
Amps	6.8	3.65
Watts	247	154

**1/4 Hp Sander** PC1.1 63%

Volts	115	?
Amps	1.2	.08
Watts	124	42

**Bench Grinder** PC 1.1

1/4 hp		52%
Volts	116.7	61.4
Amps	2.87	1.00

Typical PC-1.1 Power Savings

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Type Motor	Without PC-1.1	With PC-1.1
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1/2Hp No load	PC 1	43%
Volts 117	86	
Amps 7.25	4.11	
Watts 185	106	

1/4 hp No load	PC 1	
Test Motor	42%	
Volts 120.3	80	
Amps 3.49	1.5	
Watts 112	65	

GE 1 1/2 Hp loaded Motor W Blower	PC	19%
Volts 112	77	
Amps 7.7	5.8	
Watts 600	490	

?????????	PC	15%
Volts 112.4	85	
Amps 12.16	8.10	
Watts 525	450	

GE 1 1/2 Hp Band Saw	PC	25%
Volts 118	90	
Amps 15.26	9.25	
Watts 745	560	

Dayton 1/2 Hp Drill Press No Load	PC	69%
Volts 120	65	
Amps 10.5	2.9	
Watts 377	119	