

IPC Junior Operation and Installation Manual





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This manual covers the basic installation and operation of the IPC Junior (P/N 806-0001).

Contents

Overview	1
Introduction	1
Features	2
Installation	3
Field Wiring	3
System Description	5
Set Point Control Buttons.....	5
Cut-Out Button	5
Cut-In Button	6
Pressure Offset	6
Target Temperature (Optional).....	6
Display Temperature (If Temperature Sensor is Installed)	6
Eight-Position Dip Switch.....	6
Number of Compressors (Switch #1)	6
System Type (Switch #2).....	7
Cut-in Time Delay (Switch #3).....	7
Floating Set Point (Switch #4) (Optional).....	7
Defrost Operation/High Discharge Cut-Out (Switch #5)	8
Bypass (Switch #6).....	8
Unloader Setup	9
JU1 Jumper	9
Pilot Relay.....	9
Alarms.....	9
Types	9
Alarm Reset	9

Overview

Introduction

The IPC Junior, shown in **Figure 1**, is a microprocessor-based controller designed to control either one or two compressors, or one compressor with an unloader. The IPC Junior allows user definition of compressor cut-in and cut-out pressures, and adjustment of pressure transducer offset. In addition, the IPC Junior has a floating set point option that allows the user to develop a customized compressor usage strategy.

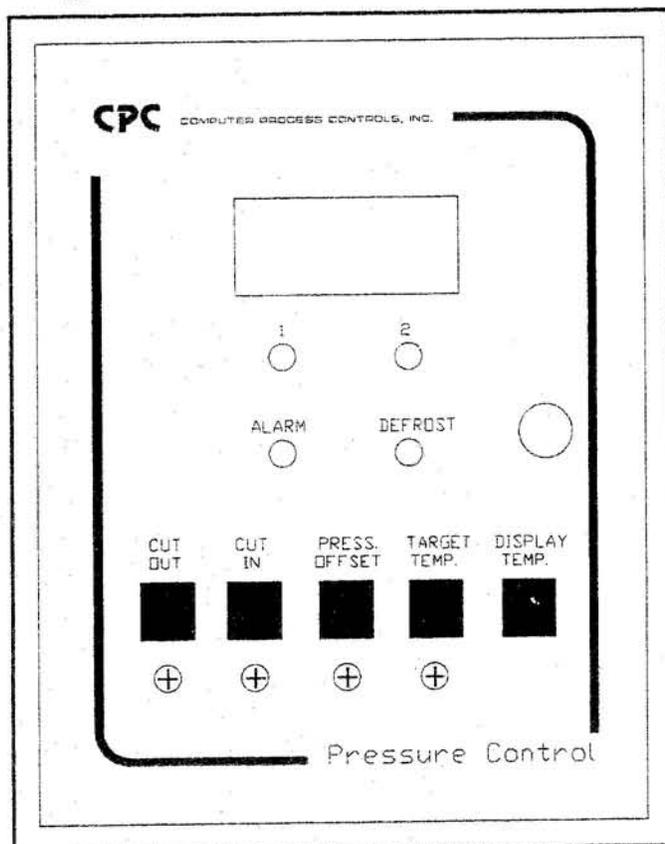


Figure 1 - IPC Junior

Features

- Controls one or two compressors, or one compressor with an unloader.
- Dip switch settings take effect without cycling IPC Junior power.
- Allows user-defined settings for cut-out and cut-in pressures, pressure offset, and target temperature.
- Floating set point feature provides user customization.
- All user-defined settings, including actual case temperature, can be viewed on the IPC Junior display screen.
- User-defined settings are easily bypassed, if required.

Installation

Field Wiring

The IPC Junior requires a 5VDC, four-wire pressure transducer for basic operation. In addition, a temperature sensor may be connected to make use of the floating set point feature described below. A shielded cable should be used if a temperature sensor is connected. The power input of the unit requires 208VAC. Input is fused at 1 amp. A ground wire is required. **Figure 2** shows the typical field wiring diagram.

If mechanical pressure switches are used, the control contacts of the IPC Junior should be placed in series with the mechanical low pressure controls of the compressor. These mechanical controls should be set at a higher cut-in temperature and lower cut-out temperature than the IPC Junior, to allow the IPC Junior to control the system.

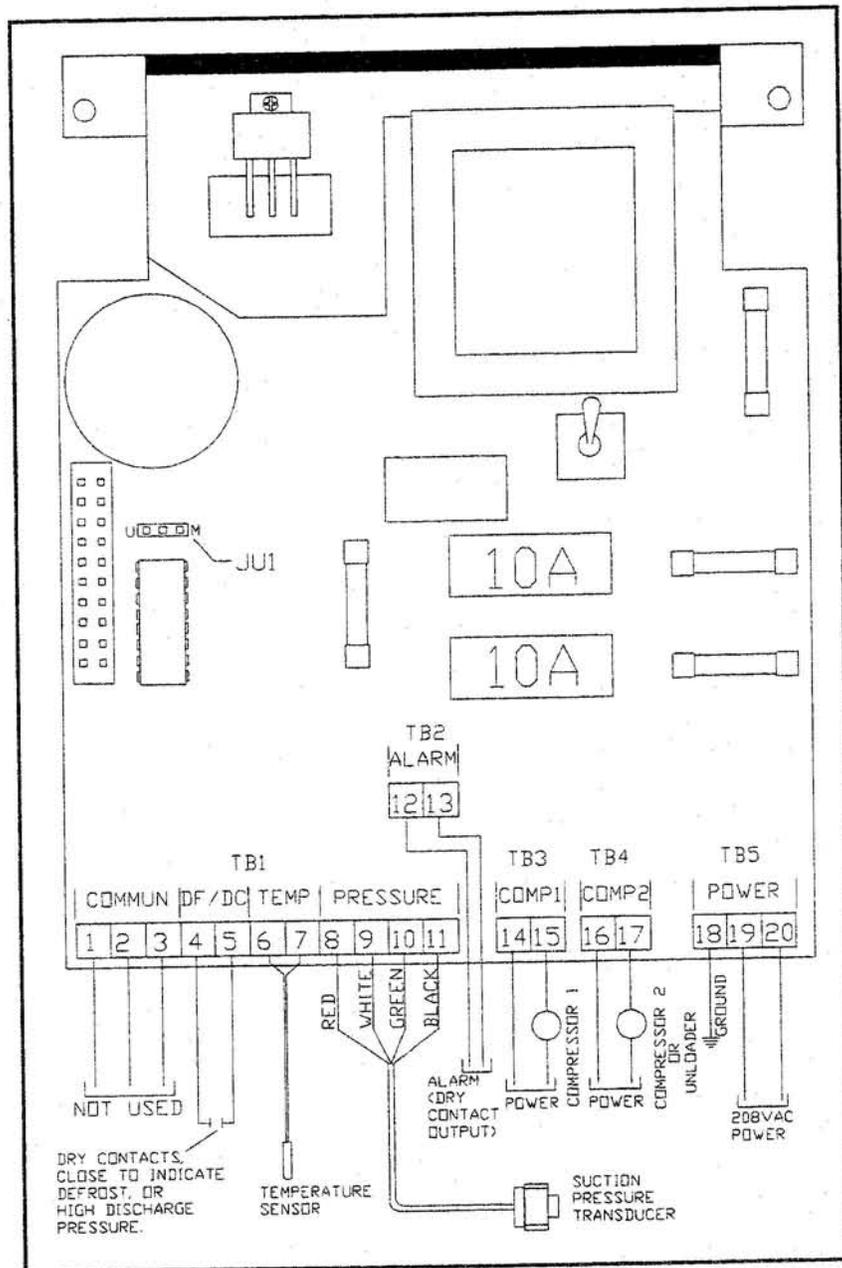


Figure 2 - Typical Field Wiring Diagram

System Description

Basic operation of the IPC Junior requires that only the cut-in and cut-out pressures be defined, and, if necessary, an adjustment made to the pressure offset. However, if customization of the system is desired, the optional floating set point procedures should also be followed.

Set Point Control Buttons

Five set point control buttons are located on the front panel of the IPC Junior:

1. CUT-OUT
2. CUT-IN
3. PRESS. OFFSET
4. TARGET TEMP. (Optional)
5. DISPLAY TEMP. (If temperature sensor is installed)

All set points are programmed--and settings can be observed on the display screen--by pressing any of the buttons. To change the set points, press the appropriate button and adjust the recessed dial located directly underneath. **Table 1** shows the ranges for each of the set points.

Dial	Low	High	Units
Cut-out	0	99	lb/in ²
Cut-in	0	99	lb/in ²
Offset	-16	16	lb/in ²
Target	-54	73	°F

Table 1 - Set Point Ranges

Cut-Out Button

Set the cut-out pressure by pressing the CUT-OUT button and adjusting the recessed dial to a desired pressure within the range shown in **Table 1**. If the floating set point option is in operation, this setting is used to establish the minimum cut-out pressure, and define a window within which compressor pressures are "floated."

Cut-In Button

Set the cut-in pressure by pressing the CUT-IN button and adjusting the recessed dial to a desired pressure within the range shown in **Table 1**. If the floating set point option is in operation, this setting is used to establish the maximum cut-in pressure, and define a window within which compressor pressures are “floated.”

Pressure Offset

Caution! Do not allow pressure on the transducer to exceed 100 psi. Damage can occur.

The 5VDC, four-wire pressure transducer of the IPC Junior should be calibrated to match the offset written on the transducer to be used. To set the pressure offset, press the PRESS. OFFSET button and turn the recessed dial until the display matches the offset number on the transducer. This number must fall within the range shown in **Table 1**. The transducer is now calibrated with the controller.

Target Temperature (Optional)

The target temperature is used by the floating set point option to maintain the desired case temperature. To set the target temperature, press the TARGET TEMP. button and adjust the recessed dial to the desired case temperature setting.

Display Temperature (If Temperature Sensor is Installed)

Actual case temperature can be viewed by pressing the DISPLAY TEMP. button.

Eight-Position Dip Switch

The eight-position dip switch (only six positions are used), located on the inside of the front panel, is used together with the set point control buttons to configure the IPC Junior and control unit operation. It is not necessary to cycle the power to the unit to store the dip switch settings; the operation of the IPC Junior changes as the dip switches are changed.

Number of Compressors (Switch #1)

	On	One Compressor
	Off	Two Compressors One Compressor With an Unloader

The IPC Junior can be configured to control either a one or two compressor system, or one compressor with an unloader. Set switch #1 to ON for one compressor. Set switch #1 to OFF for two compressors, or one compressor with an unloader.

System Type (Switch #2)

<input type="checkbox"/>	On	Even
<input checked="" type="checkbox"/>	Off	Uneven

In a two-compressor system, if the horsepower of the two compressors is matched, set switch #2 to ON. If the horsepower is unmatched--or for a one compressor system--set switch #2 to OFF. The IPC Junior will always assume that the first compressor in the system is the larger compressor. Therefore, if switch #2 is set to OFF, the IPC Junior will cycle the second compressor more often to compensate for the mismatch.

Cut-in Time Delay (Switch #3)

<input type="checkbox"/>	On	60 sec
<input checked="" type="checkbox"/>	Off	120 sec

The Cut-in Time Delay helps ensure that the IPC Junior will not activate compressors based on intermittent pressure spikes. Set switch #3 to ON for a 60 second time delay, or OFF for a 120 second time delay.

Floating Set Point (Switch #4) (Optional)

<input type="checkbox"/>	On	Float
<input checked="" type="checkbox"/>	Off	No Float

The floating set point option uses case temperature to maximize system efficiency by monitoring a temperature sensor wired to the temperature input of the IPC Junior, and mounted in the discharge air stream of the case. To use the floating set point option, do the following:

1. Set switch #4 to the OFF (No float) position.
2. set the initial cut-in pressure by pressing the CUT-IN button and adjusting the recessed dial to the desired pressure.
3. Set the initial cut-out pressure by pressing the CUT-OUT button and adjusting the recessed dial to the desired pressure.
4. Set switch #4 to the ON (Float) position.

All pressure and temperature settings must be made with switch #4 in the OFF position.

The IPC Junior subtracts five (5) pounds from the cut-out pressure setting and adds five (5) pounds to the cut-in pressure setting, and uses those values (not less than 0) as the minimum cut-out and maximum cut-in pressure. However, these settings will only float within the minimum cut-out and maximum cut-in settings. The IPC Junior will maintain the selected target temperature by moving the cut-in and cut-out settings of the system either up or down one (1) pound when the case temperature fails to match the target temperature within a 10 minute period.

Defrost Operation/High Discharge Cut-Out (Switch #5)

<input type="checkbox"/>	On	Defrost Operation
<input checked="" type="checkbox"/>	Off	High Discharge Cut-out

The Defrost Operation/High Discharge Cut-Out setting determines the function of terminal 4 and 5 of the IPC Junior. When switch #5 is set to ON, a dry contact closure will indicate when the hot gas defrost cycle has begun. The unit will ensure that at least one compressor is running during defrost. When switch #5 is set to OFF, all compressors will be shut off immediately when there is a closure from the high pressure switch. This will cause an alarm on the unit which must be reset manually. To reset the alarm, see **Alarms** below.

Bypass (Switch #6)

<input type="checkbox"/>	On	Bypass
<input checked="" type="checkbox"/>	Off	Normal

The Bypass switch overrides all user-defined settings, and turns on all compressors defined by switch #1. To bypass the IPC Junior, set switch #6 to ON, otherwise switch #6 should remain in the OFF position.

Unloader Setup

Configuring the IPC Junior to operate with a compressor/unloader combination may require two additional steps: 1) the JU1 jumper may need to be changed, and 2) a pilot relay may need to be installed.

JU1 Jumper

When the JU1 jumper--located on the left side of the Power Interface Board (PIB) (**Figure 2**)--is set to U (left side of jumper), the action of the #2 relay is reversed causing it to open during normal operation. However, in the event of power loss, both relay #1 and #2 close.

Pilot Relay

A pilot relay should be installed if the unloader being used loads the compressor when the IPC Junior relay #2 is open. This pilot relay is required to bypass the #2 relay, which closes during power loss, regardless of jumper setting. The pilot relay should be wired to the #16 and #17 connectors, labeled as CMP 2, TB4 on the PIB, shown in **Figure 2**, and should be configured to open in the event of power loss.

Alarms

Types

Table 2 describes the four IPC Junior alarms.

Alarm	Cause/Effect	Delay
Pump Down	Immediate shut-down of compressors	None
Low Suction	10 lb. less than cut-out	60 minutes
High Suction	10 lb. greater than cut-in	60 minutes
High Discharge	Immediate shut-down of compressors	None

Note: All alarms must be reset manually.

Table 2 - IPC Junior Alarms

Alarm Reset

To reset any of the four alarms, open the unit door, and press the black button located in the lower left-hand corner of the processor board (located on the unit door).