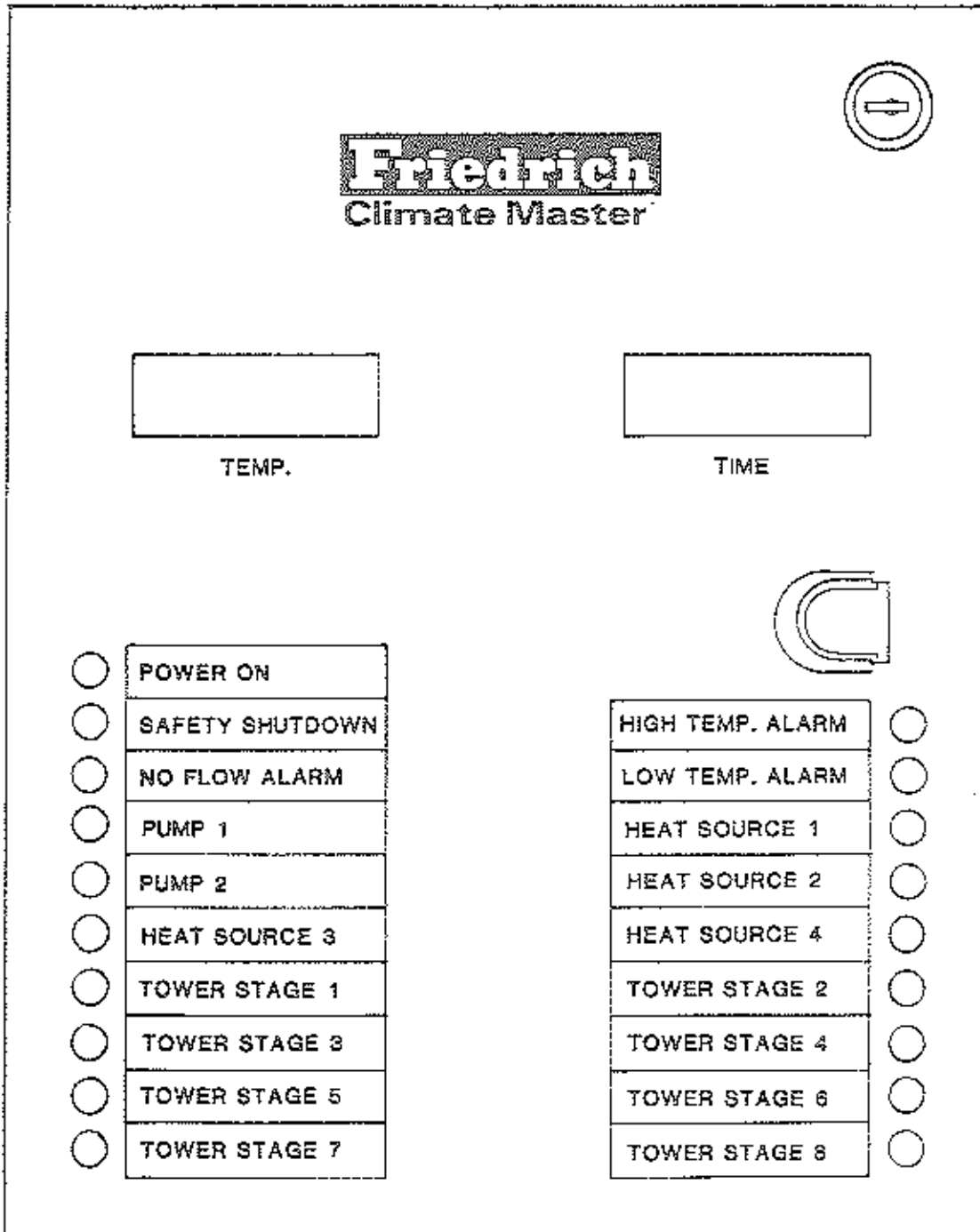


# INSTALLATION INSTRUCTIONS

PSCP-6 PSCP-12

## PROGRAMMABLE SYSTEM CONTROL PANEL



## FEATURES

1. Programmable temperatures - both turn-on and turn-off.
2. All temperatures including high and low alarms and high and low system shutdown are programmable.
3. Heat source 1 is interlocked so that the last two or eight stages cannot be on if HSI is on.
4. Automatic pump alternation.
5. Manually selectable lead pump.
6. Programmable times for:
  - A. Time Of Day
  - B. Pump Off Time
  - C. Pump On Time
7. Loss of flow if:
  - A. Pump on:
    1. Immediate Alarm
    2. After 10 seconds alternate pump
    3. After an additional 20 seconds (30 total) system shutdown, turns off all programmable outputs
  - B. Pump off (always happens):
    1. All programmed outputs turned off
8. All outputs selectable as NO or NC
9. Battery back-up saves programmed times and temperature for at least 12 hours.
10. Auxiliary sensor provided (outdoor or space) to override pump off mode.
11. All programmed outputs cannot be turned back on until flow is proven.
12. All outputs are relays with 10 amp 277 volt ratings on contacts.
13. Terminal strip provided for remote panel.
14. Lockable cover.
15. Switch to disable audible alarms.

## INSTALLATION

1. Mount panel to wall or other surface being very careful not to damage electronics.
2. Connect the input sensors:
  - A. Loop Temperature
  - B. Auxiliary Temperature
  - C. Flow Switch (field supplied)

The input terminal strip can be unplugged to simplify wiring connections.

3. Connect the outputs to the output terminal strip, refer to both the schematic (ladder) and the panel layout.
4. Select each output to be normally open (NO) or normally closed (NC). Usually, the system safety shutdown (SSD) will be NC and the heat source(s) (HS) and cooling tower steps (CT) will be NO. The selection is made as follows: each set of output terminals has a small pair of jumpers located adjacent to the output terminals. Clip the unwanted output to select the desired output configuration, eg., if SSD is desired to be NC, then clip the NO jumpers at U3 (3rd pair of terminals from the top). The jumper can be clipped with a razor knife or penknife; bend the small foil pieces away from one another to prevent accidental contact.
5. Display must be seated - The displays may loosen in shipping which can cause erroneous readings. Before turning the panel on, check that the two displays (time and temperature) are securely plugged in.
6. Connect the line cord to the AC input terminal block (see panel layout). This block can be unplugged to simplify the connection.
7. Connect the RED battery lead.
8. Plug the AC line cord into a 120 volt grounded outlet.
9. The panel is now ready to be programmed. Before the program is entered, decide the actual temperatures that you want. For example, if you have one heat source and four steps of cooling tower, you might decide to turn the heat source on at 65 degrees F and turn it off at 68 degrees F. The cooling tower might be staged so that the damper opens at 85 degrees and closes at 83 degrees, the spray pump starts at 88 degrees and stops at 85 degrees, the first stage blower starts at 92 degrees and stops at 90 degrees and the 2nd stage blower starts at 93 degrees and

4. **6** **8** enters new temperature "off" 68 degrees F.
5. **STOR** stores the new temperature, completes program step. Each temperature function can be programmed in the same way, eg., to set the first stage of the cooling tower (output channel 6), at 85 degrees turn on (code 6) and 83 degrees turn off (code 22), the following key strokes are required:

**TEMP** **6** **STOR** **8** **5** **STOR** **TEMP** **2** **2** **STOR** **8** **3** **STOR**

#### TIME PROGRAMMING

The time programming is very similar to the temperature programming. To set the pump "off" time of 8:00 p.m. (20:00 military time):

**TIME** code displays 00

**1** enters code 1

**STOR** stores the code

**2** **0** **0** **0** enters the "off" time

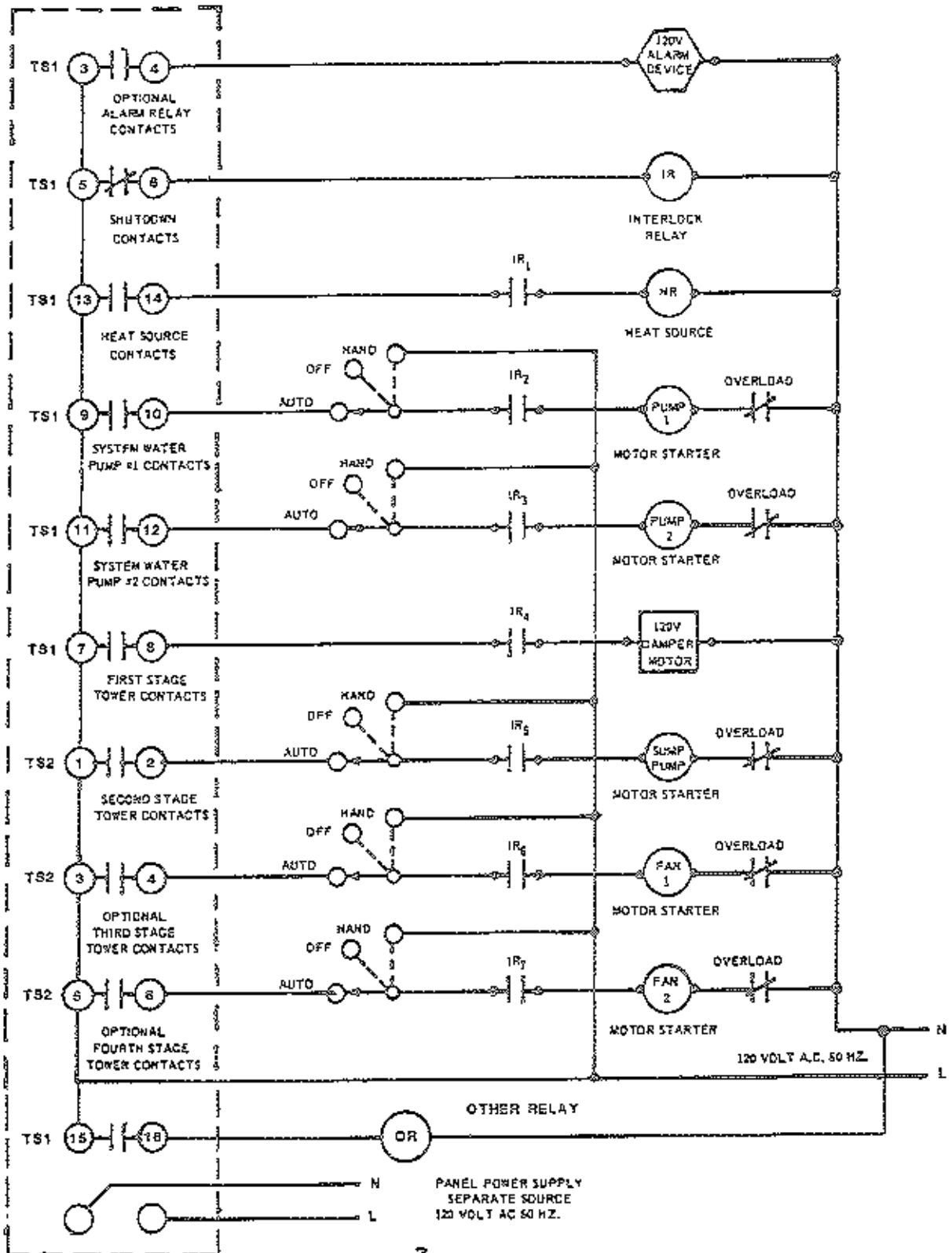
**STOR** stores the "off" time completes the programming step. The "on" time is entered and stored similarly using code 2.

The final step in programming is to enter the time of day. This is done in the same way as the setting of the other times, using code 0 and the current time. Remember to use military (24 hour) time.

Any setting (time or temperature) can be reviewed by entering either **TIME** or **TEMP** entering the code number, eg., **6** **STOR**. To return to the operating mode **STOR** again.

# TYPICAL PSCP FIELD WIRING DIAGRAM

PANEL CONNECTIONS - CONTACTS 1 THRU 28 RATED AT 277 VOLTS 10 AMPS



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Continuing engineering research results in steady improvements. Therefore, these specifications are subject to change without notice.

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12/83

**Friedrich**  
Climate Master®

PSCP TROUBLESHOOTING

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PROBLEM

POSSIBLE CAUSE

CHECK AND CORRECT

No flow light on

At some time since the last pump reset, the flow switch had detected a loss of flow for at least a moment.

Verify that both pumps are functioning properly and that there is flow in the system. Then hit the PUMP RST (Pump Alarm Reset) key.

Large number of no flow alarms or no flow warnings

The panel activates the no flow warning whenever there is a loss of flow, even if the loss of flow lasts less than one second. A large number of warnings would indicate that the flow switch was seeing a number of flow-no flow-flow conditions. This could be due to air in the system, an incorrectly sized flow switch, or the flow switch being installed too close to a tee or elbow.

To determine if the problem is being caused by the PSCP simulator, with the switch in the "flow" position there should not be any no flow alarms or warnings. If there is a problem with the PSCP, please contact the factory.

High or low temperature light on

At some time since the last temperature reset the temperature in the water loop has been higher than the high temperature warning setting or lower than the low temperature warning setting.

Check that the heat rejection and heat addition equipment is working properly. Then hit the LT RST (Low/High Temperature Alarm Reset) key.

INDUCTIVE PICKUP FROM POWER cables next to flow sensor cable.

Run FLOW sensor cables in separate trough or conduit.

Safety shutdown light  
is on

The loop temperature went above the high temperature shutdown setting or below the low temperature shutdown setting.

Check heat rejection and addition equipment. Then hit the SSD RST (Safety Shutdown Reset) key to clear the Safety Shutdown Alarm. Then hit the LT RST (Low/High Temperature Reset).

Power light off

A no flow condition existed for both the main and standby pumps.

PUMP RST (Pump Reset) key to clear the alarm that caused the shutdown.

Loss of 115 VAC power to the PSCP.

Check if the time and loop temperature are displayed. If they are, the battery is operating the panel. If the time and temperature are not displayed, the battery has been run down and the panel must be reprogrammed.

Stages operating at incorrect temperatures

All the control outputs have default settings. If the panel completely loses power, both 115 VAC and battery, the programmed settings will be lost and the defaults will be used.

Check the battery. With the battery disconnected it should be at 8 volts DC. Reprogram the panel.

Unused stages being activated

All the control outputs have default settings that are used if no value is entered for a particular setting. If the default value is reached the stage will be activated whether that stage is connected or not.

Program all stages that are not being used to an On-value greater than the high temperature shutdown value (125F, for example). This will prevent these stages from ever coming on.

Audible alarm does not sound

(1) The Alarm Disable switch could be keeping the alarm off,

Check that the Alarm Disable switch, located directly below the keypad on the relay panel, is switched to the right to enable the alarm.

(2) The alarm may become disconnected,

Check that the alarm, located below the relay panel, is wired to the outputs of relay K1 (a red and black wire from terminals 1 & 2 on TS1 (terminal strip) to the alarm buzzer].

(3) The alarm relay may have failed, or

To check if relay K1 has failed swap relay K1 with another relay known to be working on the relay panel. If the relay has failed contact the factory for a replacement.

(4) The PSCP could be malfunctioning.

Try a complete reset (see PSCP "Lock-up" on page 5) and then contact the factory.

A controlled stage is always activated or never is activated

(1) The NO/NC (normally open/normally closed) junipers may not be set properly,

Check that the NO/NC juniper is set properly, as shown in the installation instructions.

(2) The relay could have failed, or

Swap the suspect relay with another relay on the panel that is known to be working. If the relay has failed contact the factory for a replacement.

(3) The panel could be malfunctioning.

Try a complete panel reset (see "lock-up" on page 5). If all of the above have not fixed the problem, please contact the factory.

The water loop temperature sensor is not reading accurately

Sensor not wired properly.

Check and correct sensor wiring.

Battery run down.

Disconnect battery leads and check voltage across battery. It should be 8 volts DC or higher. If it is too low see "Battery Dead" (page 6).

Sensor failure.

Check the sensor output against the sensor voltage chart in Appendix F. To check the voltage use a voltmeter set on a 10 volts DC scale. Put the black lead (-) on the (W)hite terminal and the red lead (+) on the (B)lack terminal. If it does not agree contact the factory.

Power supply failure.

$\pm 6,000_v \pm 2mv$

Check DC voltage to the sensor. Using a DC voltmeter, measure the voltage across the (W)hite to (R)ed leads of the sensor. This must be  $X + \text{Y}$  volts DC. If the voltage is out of range, please contact the factory.

PSCP out of calibration.

The sensor calibration procedure should only be performed by servicemen who are familiar with calibrating electronic devices.

This procedure is in Appendix E.

If the PSCP cannot be calibrated using this procedure contact the factory.

Panel "locks-up" and does not respond to the keypad

Power surge into panel via low voltage wiring.

Check that all low-voltage wiring to the panel (temperature sensors and flow switch) is isolated from line voltage wiring.

Power surge into panel via line voltage wiring.

Check that the line voltage power supply to panel is an isolated circuit and is not powering other loads.

To correct:

The panel must be completely reset and reprogrammed.

Disconnect the red lead from the battery and turn the power switch off. Wait 15 seconds and the panel will be completely reset. Turn the power back on and reconnect the battery.

Reprogram the panel, remembering also to program the outputs that are not used.

If this problem persists, please contact the factory.

Battery failure (during short power failure, program is lost)

Dead battery

$$\frac{1}{2} \times 4 = 4.8 \text{ volts}$$

Dead battery  $\leq 4.8 \text{ volts}$

A fully discharged cannot be completely recharged. A dead battery has a  $\text{0}$  volt DC output across the terminals when disconnected from the panel.

Slow recharge

$$\begin{aligned} \frac{C}{20} \text{ rate} &\Rightarrow 20 \text{ hrs} + 2.3 \text{ charge voltage time (52)} \\ &= 20_{\text{hr}} + 52_{\text{hr}} = 72 \text{ hrs} \\ &= 3 \text{ days} \end{aligned}$$

A partially discharged battery will take  $3X$  days to fully recharge. With the line voltage on the unit, wait for this time to pass and check the battery voltage again.

Recharge circuit failure

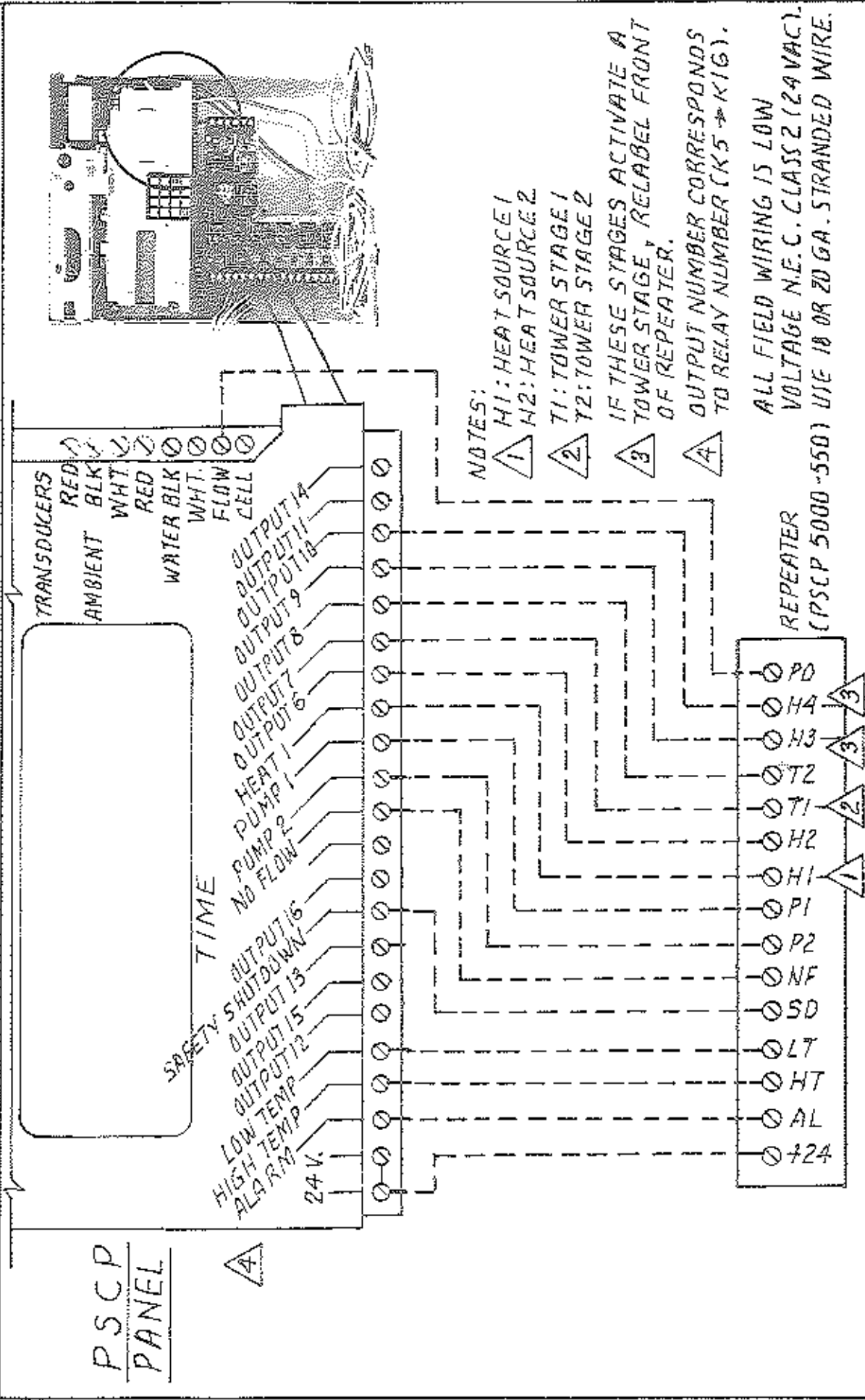
The recharge circuit calibration procedure should only be performed by a serviceman who is familiar with calibrating electronic devices.

This procedure is in Appendix.

If the PSCP cannot be properly calibrated using this procedure, please contact the factory.

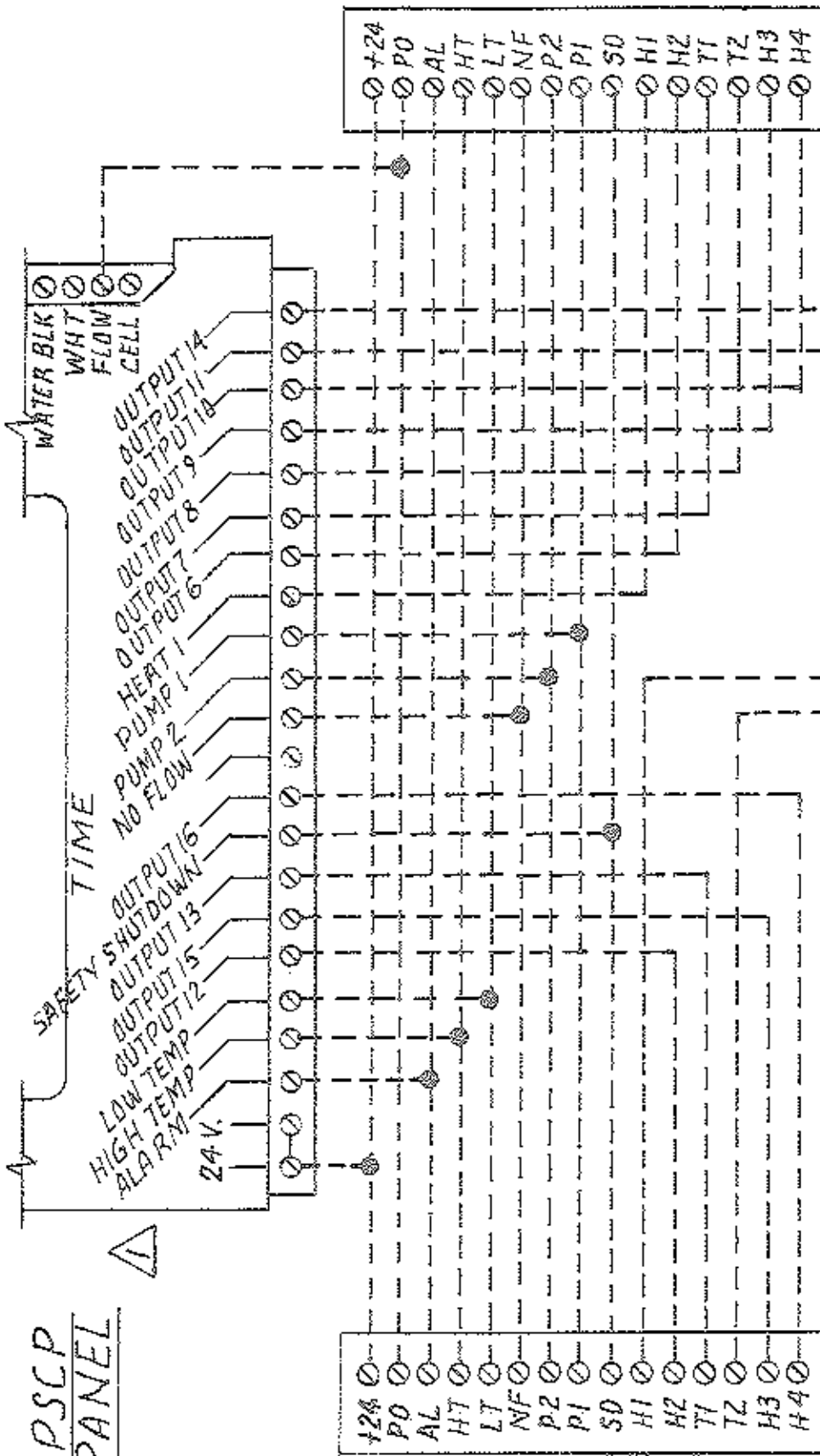
# FIELD WIRING DIAGRAM

## PSCP REPEATER (REMOTE ANNUNCIATOR) FOR PSCP-6



# FIELD WIRING DIAGRAM

## PSCP REPEATER (REMOTE ANNUNCIATOR) FOR PSCP-12



REPEATER #2 (PSCP 5000-550)  
 NOTES: ALL FIELD WIRING IS LOW VOLTAGE NEC. CLASS 2 (24VAC).  
 USE 18 OR 20 GA. STRANDED WIRE.  
 REPEATER #1 AND REPEATER #2 ARE IDENTICAL.  
 MOUNT REPEATERS SIDE BY SIDE.  
 REPEATERS MAY REQUIRE RE-LABELLING.

REPEATER #1  
 (PSCP 5000-550)  
 OUTPUT NUMBER CORRESPONDS TO  
 RELAY NUMBER (K5 → K16)

Continuing engineering research  
 results in steady improvements.  
 Therefore, these specifications are  
 subject to change without notice.

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