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# *OPERATION MANUAL*

# *PCR2007-6 AUTOMATIC HEAT TREATMENT CONSOLE*

# *INDEX*

## PCR2003-6 AUTOMATIC HEAT TREATMENT CONSOLE

# PCR2007-6 Automatic Heat Treatment Console:

## DESCRIPTION:

**The PCR2007-6 automatic heat treatment console is designed to control various heat treatment processes by closely monitoring and adjusting the temperature rate of rise and fall, the soak temperature, set point and duration, on up to 6 zones. Each zone can be used either in the fully automatic or manual mode. It incorporates the latest microprocessor based technology and is simple to set up and operate. Control setting is by means of push switches and an LCD screen provides visual indication of program position and output status at any time.**

**The PCR2007-6 is equipped with a 12 channel strip chart recorder to provide permanent records of the heating operation in either digital or analog trend mode, or a combination of both. In addition, it is equipped with a digital amp meter and a 6 position selector switch, which is the utmost importance for checking the current to the ceramic pad heaters to make sure they are all operating.**

## SPECIFICATIONS – PCR2007-6 Heat Treatment Console:

**Length:** 33”
**Width:** 27”
**Height:** 44” to the top of the lifting lug
**Weight:** Approx. 980 lbs
**Material:** 12 gauge stainless steel painted cabinet
**Wheels:** 900 lbs capacity each with brake (4) (SS mounting brackets available upon request)
**Handling:** Two top lifting eye lugs and forklift access.

## Inputs:

- **Voltage:** 380-415-440-480-575, 3 Phase
- **Current:** 100 amp or optional 125 amps for 380/415 VAC
- **Power:** 75 KVA Isolated Copper Wound
- **Frequency:** 60 Hz / 50 Hz

## Output Per Zone:

- **Zones:** 6
- **Voltage:** 65 or 85 VAC, single phase
- **Current:** 192 amps @ 65 V or 156 amps 85V
- **Power:** 12.5 KVA
- **Activation:** 200 amp contactor
- **Control per zone:** Digital temperature control via 6 Channel Programmer/ Controller

## Control Circuit:

- **Voltage:** 110 VAC, single phase
- **Current:** 5 amp circuit breaker
- **Power:** 1.2 KVA winding on power transformer
- **Auxiliary:** 110 VAC supply, single phase

**6 Channel Temperature Programmer/Controller (P256):**

- **Temperature Range:** **0-2000°F or 0-1200°C**
- **Thermocouple:** **Type "K"**
- **Resolution:** **Measurement 0.1 degrees / Display 1.0 degree**

**Digital Recorder:**

- **Accuracy:** **Type "K" +/- 0.2% +/- 1 digit**
- **Chart:** **Fan-fold type, 180mm**

**Digital Amp Meter:**

- **Primary Amperage:** **Up to 200 amps**
- **Secondary Amperage:** **5 amps**

**Protection:**

- **120-VAC Control Circuit:** **5 amp circuit breaker**
- **Heater Power:** **Isolation contactor for each zone**
- **Console Power:** **100 amp main circuit breaker**
- **Power Transformer:** **392°F (200°C) over temperature thermostat per phase**
- **Cooling fan:** **340 CFM - Thermally protected**

## Maintenance Requirements:

### Inspection and Cleaning:

| ITEM | INSPECTION | FREQUENCY | ACTION |
|---|---|---|---|
| | | | |
| Contactors | Burned or Pitted | Every 6 months | Clean or replace contacts |
| Temperature Controllers/ P256 Programmer/Controller | Calibration | Every 12 months | Check accuracy and adjust if required |
| Recorder | Calibration | Every 12 months | Check accuracy and adjust if required |
| Recorder | Main shaft Lubrication and cleaning | Every 6 months | Refer to page 19-2 in AH3000 Series manual |
| System Cleanliness | | Every 6 months | Vacuum with power disconnected |
| System Electrical | Loose connections | Every 6 months | Tighten all terminal connections |
| Air Vents and fan | Dust or dirt build up | Every 3 months | Clean with vacuum with power disconnected |
| Check bolts and screws | Loose | Every 6 months | Tighten |

## PCR2007-6 Operating Instructions:

1. Switch 100 or 125 amp main circuit breaker to the "ON" position.

2. Turn the recorder on by pressing the recorder "on/off" button and then press "enter" button.

3. Make sure zones used are indicating the actual temperature on the recorder/programmer prior to start and then turn rocker switches to the "ON" position.

4. Decide on the heat treatment specification program and set as follows:
   a.) On start up. The display shows "Logo 256" and version number. It then reverts to the "Controller Overview". The large number on the left hand side of each box shows the zone number. The small letter "a" or "m" on the right hand side indicates if the zone is in AUTO of MANUAL mode. The larger number below shows the temperature of the thermocouple in that zone.

   b.) By pushing the zone button once that display shows the manual set point for that zone. (It is recommended that this is set at about 10°C if no manual operation is required). The value is altered by use of the up - down buttons.

   c.) Push the zone button a second time, the display will show if the zone is in AUTO or MANUAL mode, this again can be altered by use of the up-down button. Set the zone in the "AUTO" mode.

   d.) Pushing the button a third time reverts the screen back to "Controller overview" (if no button is pushed for 20 seconds the screen automatically reverts to "Controller overview"). Set each zone to be used in the Automatic mode.

   e.) While in the "Controller Display" mode – push the "down" button once and the display will change to show the "Profile overview".

**Note:** The six numbered buttons have now changed their function

5. Push No. 1 button to display heating rate, adjust to requirements with up – down buttons. Push No. 1 again to revert to "Profile".

6. Push No. 2 button to display "Soak Temperature", adjust to requirements with up – down buttons. Push No. 2 again to revert to "Profile".

7. Push No. 3 button to display "Soak Time", adjust to requirements with up – down buttons. Note this display indicates dwell time in hours i.e.: 1.1 = 1 hour 6 minutes, 1.5 = 1 hour 30 minutes. Etc. Push No. 3 again to revert to "Profile".

8. Push No. 4 button to display "Cooling Rate", adjust to requirements with up – down buttons. Push No. 4 again to revert to "Profile".

9. Push No. 5 button to display program "End Temperature", adjust to requirements with up – down buttons. Push No. 6 button to display "Ready" and then press the "up" button to start the program.

***Note:*** P256 Programmer has a reverse thermocouple alarm feature which will turn off the zone if a thermocouple is accidentally reversed (this is a safety feature built-in to the P256 programmer/controller).

***Note:*** Any zone in "manual" mode will control to its set point regardless of the program profile.

Starting the program will cause any zone set in "automatic" to follow the profile. The start temperature will be from the highest actual temperature of any zone in automatic. Any zone heating too slowly for the set heating profile will cause the program to go into a hold mode until that zone has caught up with the profile setting.

On delivery, the hold band is set to 20°C so any zone running a profile that lags the set point by 20°C will start the hold. Once the program has started, the 'down' button can be used to alternate between program "Profile Overview" or the "Controller Overview". If a hold situation arises it will be displayed on either screen.

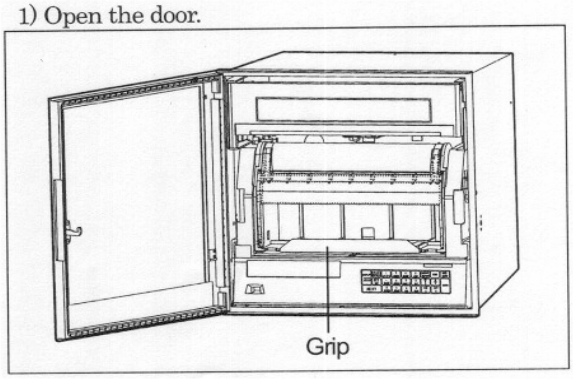
*For more detailed instructions refer to User Manual for 256 Programmer.*

# 5. INSTALLATION

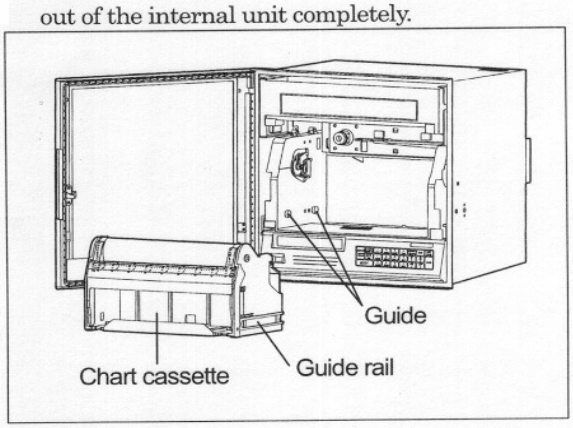
## 5.1. Chart Loading ⚠

### 1. Chart cassette removal

1) Open the door.




3) Remove the chart cassette.
①Pull the grip of chart cassette and take the chart cassette out of the instrument slightly.
②Pull the grip slowly to take the chart cassette out of the internal unit completely.

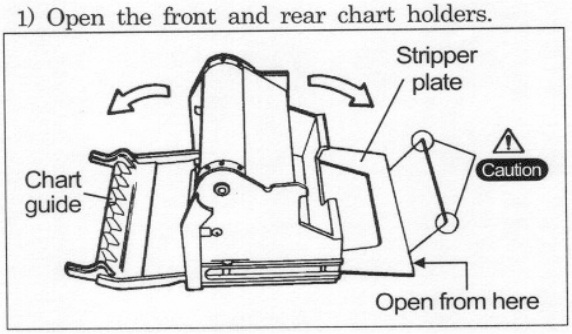



⚠ **Caution** **Be careful with the corners of rear stripper plate.**

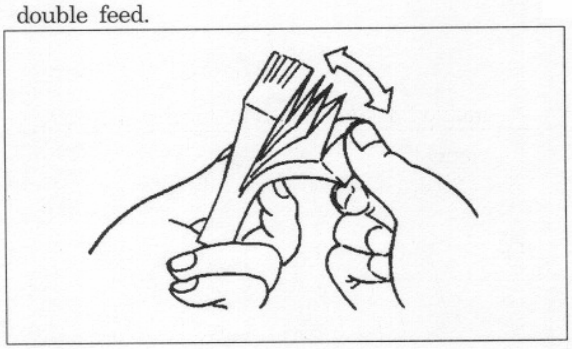
The corners of the rear stripper plate are acute for smoothing the chart feed.
Be careful not to cut your fingers when **loading** or replacing the chart.

### 2. Chart loading

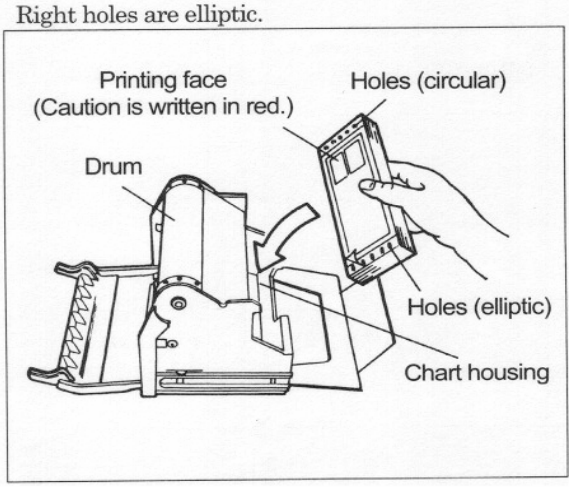
1) Open the front and rear chart holders.




2) Prepare a chart.
Shuffle both ends of the chart for preventing double feed.

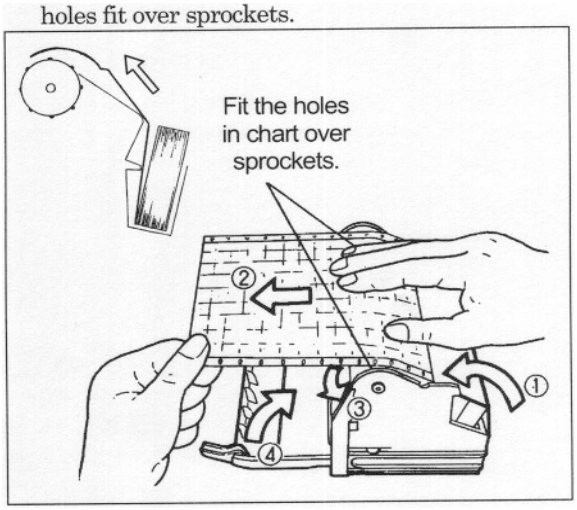


3) Put it into the chart housing.
Holes are different on the right and left sides.
Right holes are elliptic.



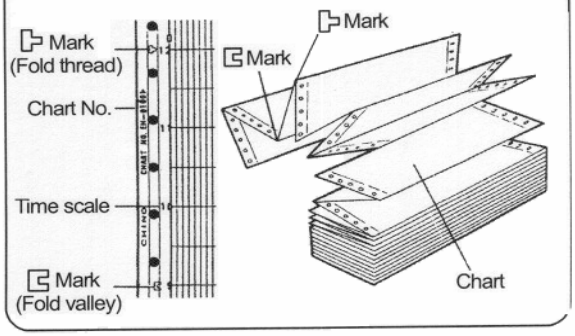
## 3. Sprocket

①Draw out the chart about 50cm and close the rear stripper plate.
②Fit the holes in chart over sprockets at both ends of the drum.
③Use thumb wheel to advance chart 2 to 3 folds into chart tray.
④Close the front chart guide. Make sure that the holes fit over sprockets.




**Remarks** Chart folds

mark for fold thread parts and mark for fold valley parts are printed on both ends of the chart.
Don't insert the chart folds reversely when inserting the chart into the chart tray, otherwise a folding failure results.




**Reference** Chart end mark

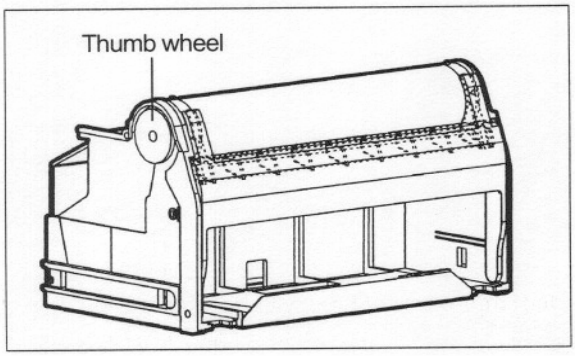
When the chart comes to an end, a red message "Prepare the new chart" appears on the right side.

## 4. Check

1) Manual check
Turn the thumb wheel by hand to make sure that the chart is feeding properly.

**Remarks** Turning direction of thumb wheel

Don't turn the thumb wheel inward, otherwise the chart cannot return and it causes a chart feed failure.




2) Chart cassette installation
Push the chart cassette loading the chart into the instrument.
・Chart cassette guides are mounted on the right and left sides of the internal unit. Push the chart cassette until a click is heard.

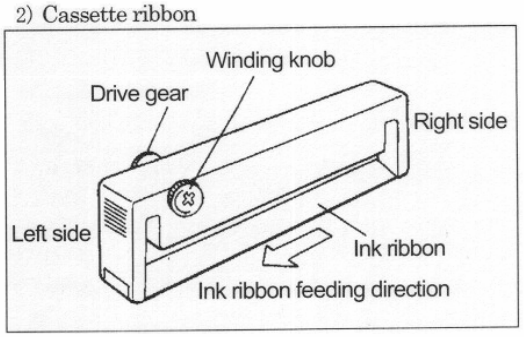
3) Chart feeding check
①Turn on the power supply.
②Press RECORD ON/OFF → ENTRY keys if RECORD ON is not illuminated.
③Press FEED key slightly and make sure that the chart feeds smoothly.
④Repeat the above procedure, if the chart does not feed smoothly.

# 5.2. Cassette Ribbon Installation

## 1. Preparation

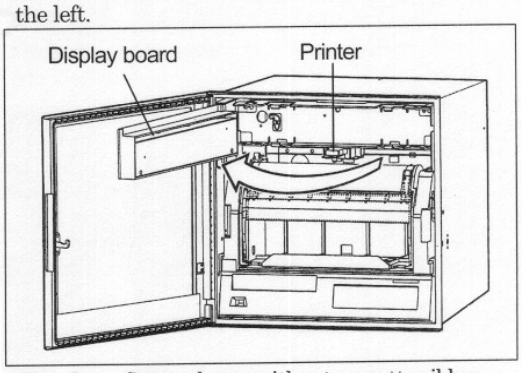
1) Move the printer to the center.
①Turn on the power supply.
②After initial operation, measured values are displayed.
③When the RECORD ON does not illuminate, it shows that the printer stops at about the center.
④If the RECORD ON illuminates, press RECORD ON/OFF → ENTRY keys not to illuminate. The printer stops at about the center.

2) Cassette ribbon



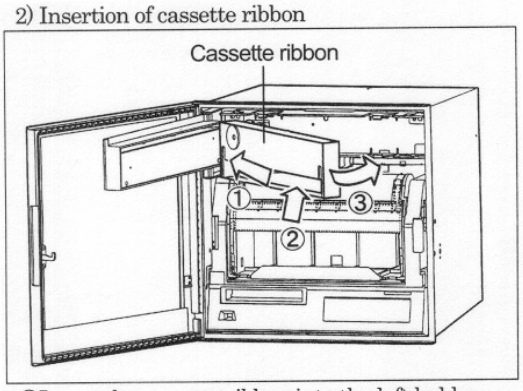

## 2. Mounting

1) Open the display board
After opening the door, open the display board to the left.

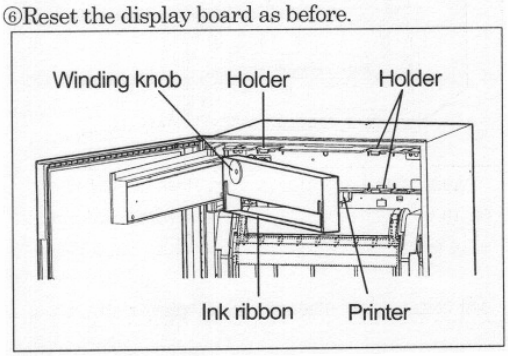



The above figure shows without cassette ribbon loaded for the first installation.

2) Insertion of cassette ribbon




①Insert the cassette ribbon into the left holder.
②Push the right side of the cassette ribbon so that the ink ribbon is inserted to the lower side of the printer.
③Insert the right side of cassette ribbon into the right holder.
④Make sure that the cassette ribbon is securely inserted into the claws of the right and left holders.
⑤ Turn the ribbon winding knob lightly counterclockwise.
⑥Reset the display board as before.



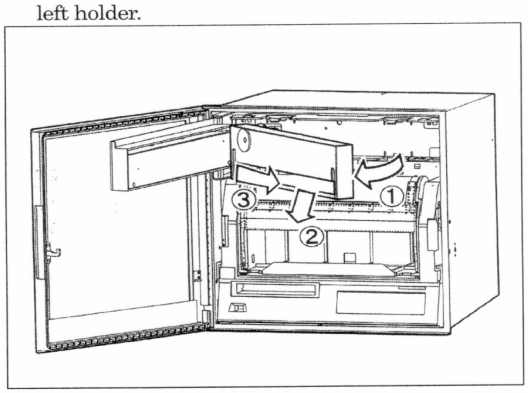

3) Ink ribbon feeding check
①By pressing RECORD ON/OFF → ENTRY keys, the RECORD ON illuminates and the ink ribbon feeds several centimeters.
②Press RECORD ON/OFF → ENTRY keys several times. The ink ribbon feeds several centimeters when the RECORD ON illuminates.

## 3. Replacement

1) Preparation
①Move the printer to the center referring to 1.-1) on the last page.
②Prepare a new cassette ribbon.

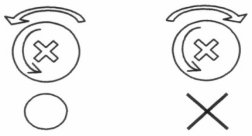
2) Open the display board.
After opening the door, open the display board to the left. For the figure, refer to 2.-1) on the last page.

3) Removal of old cassette ribbon
①Remove the old cassette ribbon from the right holder by pulling its right side.
②Pull the old cassette ribbon so that the ink ribbon is pulled out from the printer.
③Pull the cassette ribbon to remove it from the left holder.



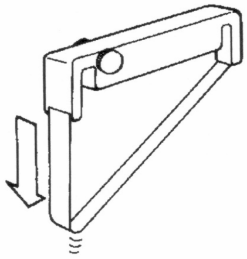

**Remarks** Winding knob direction

Don't turn this knob clockwise, otherwise a ink ribbon winding failure occurs.



**Reference 1** If a winding failure occurred

After pulling out the left side of ink ribbon once, take up it by turning the winding knob.



**Reference 2** Cassette ribbon replacement time

Cassette ribbon can be used for about 3 months under the standard conditions.
(Temperature: 23 ± 2°C, Humidity: 55 ± 10% RH)
The replacement time may become shorter depending upon the temperature, humidity, and operation methods (chart speed, periodic data printing interval time, etc.).

# ***P256 PROGRAMMER CALIBRATION INSTRUCTIONS:***

The P256 programmer has one common measuring circuit, which is used by all six of its thermocouple inputs. The measuring circuit is factory calibrated by the adjustment of two numbers that are held in the 256s non-volatile memory. One of the numbers, the zero constant, adjusts the measuring and cold-junction circuits zero offset. The other number, the span constant, adjusts the measuring circuits gain.

The measuring circuit uses high-stability components and so should not need any further adjustment for many months. From time to time, however, it will be necessary to perform routine calibration checks and make adjustments to the instruments calibration. The following procedure should be used to make these adjustments.

To calibrate the instrument on the bench you should connect a calibrator to thermocouple input 1 using type K compensating or extension wire. To calibrate the instrument in-situ you should disconnect thermocouple 1 and output 1 from the installation and connect the calibrator in its stead, again using type K wire.

In both cases, switch the instrument on and leave it energised for about fifteen minutes to reach its operating temperature. Then briefly switch the instrument off for a few seconds and then switch back on. It will then show the opening logo on the screen for twenty seconds. During these twenty seconds you must enter the password using the front-panel buttons. The password is a fixed, five digit number that cannot be changed by the user. It would be wise to keep this password secret from all unauthorised persons. The password at this time is 1 1 1 7 2 (using the up arrow button for 7). If you have entered this correctly the logo will immediately disappear and be replaced with the calibration mode-opening screen. If you enter the wrong password there will be no effect and you will have to start over by switching the instrument off briefly again.
The calibration mode-opening screen shows the following prompt:

CALIBRATION MODE
Connect calibrator to I/P1
Use comp cable. Repeat zero
And span cal till both are OK

Use V to exit cal mode.
Use 1 for more....

To exit calibration mode press the down arrow button and normal instrument operation will resume. To continue with the calibration procedure press button 1 whereupon the screen changes to:

**ZERO CALIBRATION**

| Value | Zk |
|---|---|
| 00.7 | 05918 |

Set calibrator to 0 deg and
Use ^v unit value = 0000.0
Use 1 for more...

This shows the zero calibration screen for an instrument with a zero constant of 5918, which reads a temperature of +0.7 degrees for a calibrator input of 0.0 degrees. If this error is unacceptable it may be corrected by using the up or down buttons to change the zero constant until the value is shown as 0000.0. Note that the zero constant can only be set within the range 5700 to 6100. When you are sure that the zero calibration is correct then press button 1 and the screen will change to:

***SPAN CALIBRATION***

| Value | Sk |
|---|---|
| 999.1 | 33862 |

Set calibrator to 1000 deg and
Use ^v until value = 1000.0
Use 1 for more...

This shows the span calibration screen for an instrument with a span constant of 33862, which reads a temperature of 999.1 degrees for a calibrator input of 1000 degrees. If this error is unacceptable it may be corrected by using the up or down buttons to change the span constant until the value is shown as 1000.0. Note that the span constant can only be set within a range 32250 to 35650. When you are sure that the zero calibration is correct then press button 1 and the screen will change back to the operating screen.

You should repeat the above sequence at least once since any changes that you make to the zero constant will alter the value displayed at span. Similarly any changes made to the span constant may have a small effect on the value displayed at zero. Before you make any changes to the constants you must leave sufficient time for the value to settle after you have set the calibrator. The 256 takes several seconds to achieve a steady reading after a step change to its input. Note that the above values of 0 and 1000 are for instruments set for degrees C, instruments set for degrees F use the corresponding values of 32 and 1800.

When you are sure that the calibration is correct it is wise to make a note of both constants; a record is kept of the original constants at FGH. You may then leave calibration mode by going to the opening screen and then pressing the down button whereupon normal operation will resume. Note that there is no time-out in calibration mode so the instrument will remain in this mode indefinitely until you deliberately exit from it.

# 16. ADJUSTMENT

## 16.1. Adjustment of Measuring Values

### Kinds of adjustment

Adjustment comprises three kinds shown below. ① and ③ have been already adjusted. However, it is recommended for maintaining the measuring and printing accuracy to adjust them once every year.

| Calibration | Contents | Method |
|---|---|---|
| ①Measured value adjustment | Adjustment for maintaining measuring values corresponding inputs to be within accuracy rating. | par.16.1 |
| ②Shift programming of measured value | Programming to shift a measured value. | par. 16.2 |
| ③Adjustment of trace printing position | Adjustment to set the trace printing range to zero and span of the chart. | par. 16.3 |

### 1. Adjustment of measured values

It is recommended for maintaining the measuring and printing accuracy to adjust them once every year.
①Adjust measured values for each input channel.
②Adjust measured values under the reference condition.
(See the right table)

Reference conditions

| Items | Reference conditions |
|---|---|
| Ambient temperature | 23± 2°C |
| Ambient humidity | 55± 10%RH |
| Power voltage | 100VAC ± 1% |
| Power frequency | 50 or 60 Hz ± 0.5 |

### 2. Preparation

1) Preparation of tools

| Tools | Input types | | | Remarks |
|---|---|---|---|---|
| | DC voltage | Thermocouple | Resistance thermometer | |
| DC standard voltage/current generator | ○ | ○ | | Accuracy: Shall be better than ±0.05% |
| Reference junction compensator | | ○ | | 0°C ± 0.2°C |
| Thermocouple for test | | ○ | | Same type of thermocouple as input type |
| Standard variable resistor | | | ○ | Accuracy: Shall be better than ±0.05% |
| 3-core copper wire | | | ○ | Three copper wires shall have the same resistance value. |

2) Connections
Connections depend upon the input types. See the next page.

3) Before starting adjustment
①Mount the terminal board cover and turn on the power supply.
②Warm up the instrument for longer than 30 minutes until it is stabilized before starting adjustment.
(It is recommended to warm up the instrument for longer than one hour.)

**Remarks** Adjustment

Checking and adjustment of measured values require careful work with a standard tool and other tools employed under the reference conditions. For asking us for the checking and adjustment work of measured values, please contact our sales agent.

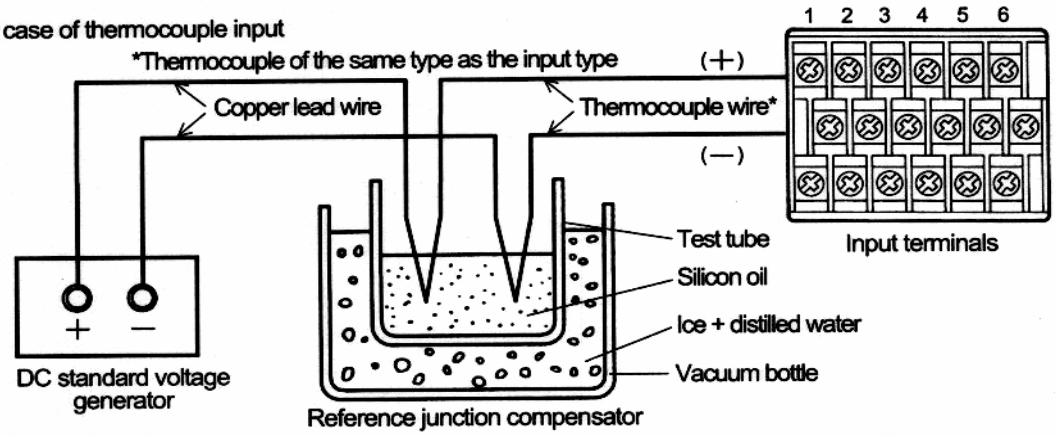
## 3. Connections

Connections depend upon the input types.

**Caution**

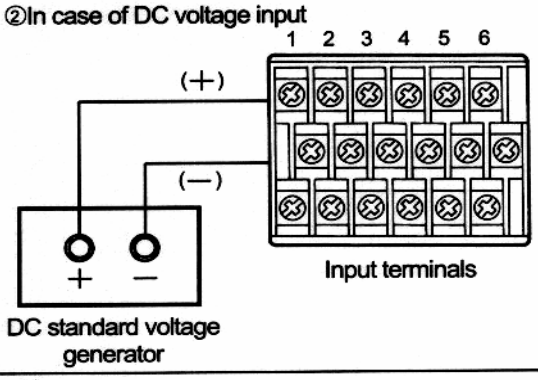
Turn off the source power supply before starting connections for the purpose of preventing an electric shock accident.

①In case of thermocouple input

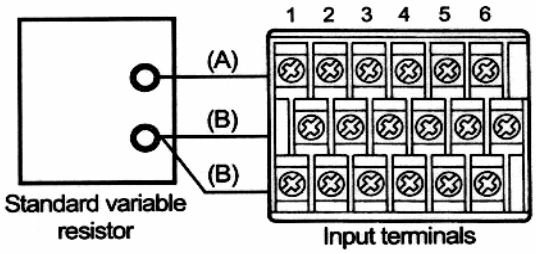



The electromotive force of the thermocouple input becomes small by the electromotive force equivalent to the temperature at terminals. The instrument itself compensates for the electromotive force equivalent to the temperature at terminals. This is called reference junction compensation. Accordingly, the reference junction compensator is necessary for reducing the electromotive force compensated.

②In case of DC voltage input

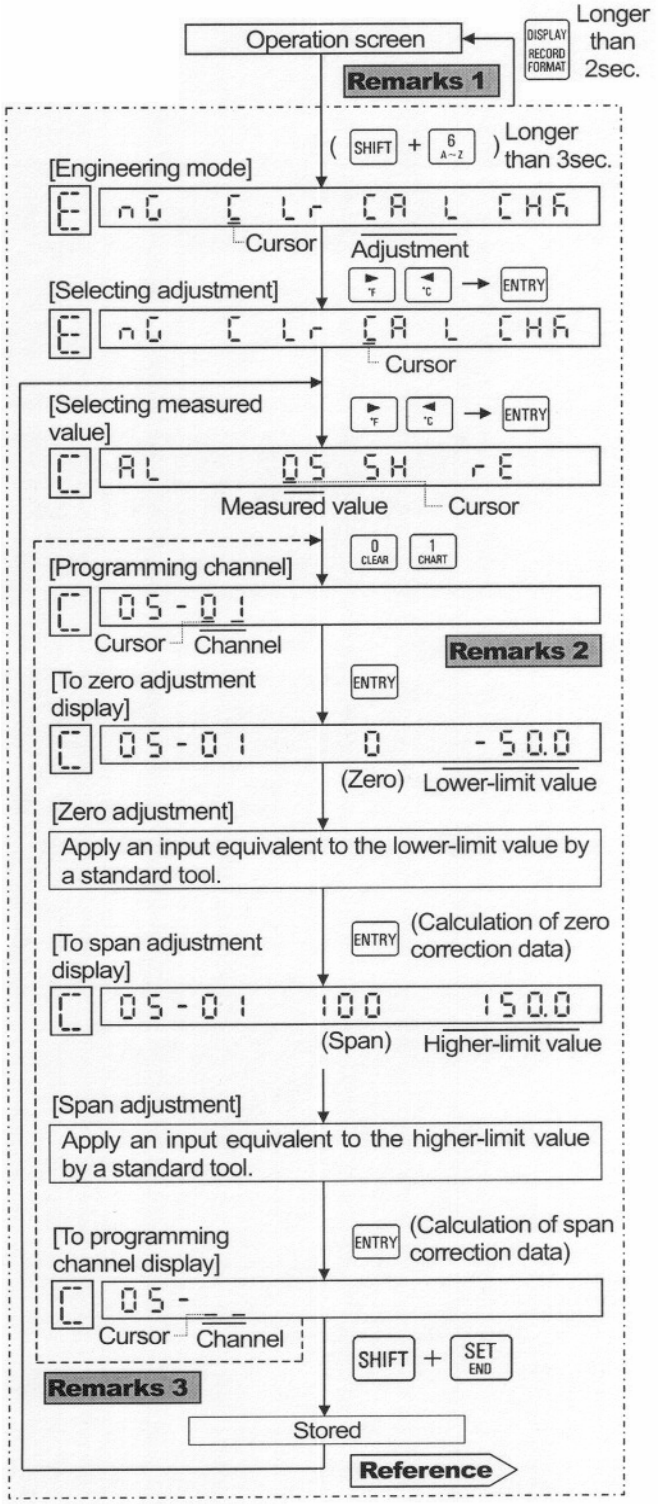



③In case of resistance thermometer input



## 4. Programming flow chart

<Example> Adjustment of channel 01 (printing range -50 to + 150)




**Remarks 1** For returning to operation screen

Calculated correction data are canceled by returning to the operation display at the procedure before [storing].

**Remarks 2** Skipped channel does not accept any ENTRY key

When a skipped channel is programmed, it does not accept the ENTRY key.

**Remarks 3** Other channels adjustment

After reconnecting to input terminals to be adjusted, repeat the same procedure line from the programming channel display (indicated by a dotted line).

**Remarks 4** Initialization of correction data

By pressing ENTRY key after clearing (by pressing SHIFT + 0 CLEAR keys) in zero adjustment or span adjustment display, the correction data of the channel becomes the initial value.

**Reference** Storing

Store the calculated correction data into memory.

# 16.2. Shift Programming of Measured Values

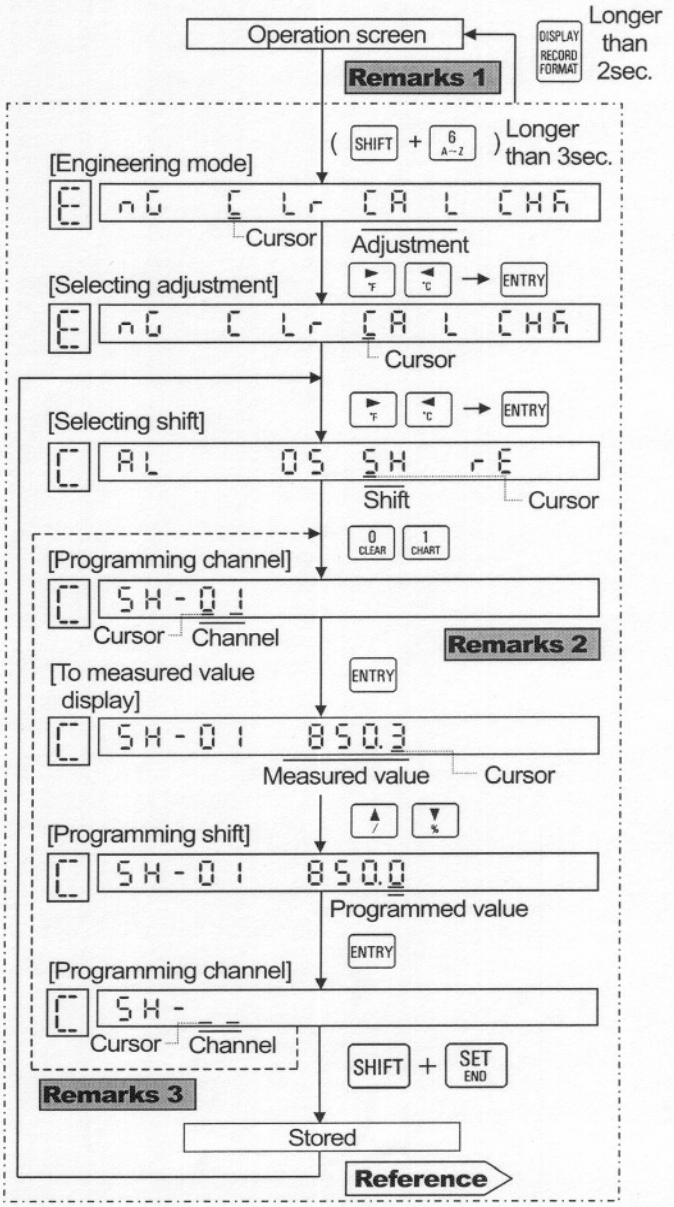
This programming is executed when it is desired to change a measured value slightly and the subsequent measured values become the shifted values.

## 1. Shift programming

①This programming is executed for each channel.
②The cursor shifts to the least significant digit. Perform this programming by [▲/7], [▼/%] keys.

## 2. Programming flow chart

<Example> Shift measured value 850.3 in channel 01 to 850.0




16-4

**An example of shift programming**

Measured value ------ 850.3 (Cursor)
▼/% ×3 times
Programming ------ 850.0 (Cursor)
Shift value = 850.0-850.3 = -0.3

**Before programming**

Wait for longer than 30 minutes before starting this programming after turning on the power supply.

**Remarks 1** For returning to operation screen

Shift value is canceled by returning to the operation display at the procedure before [storing].

**Remarks 2** Skipped channel does not accept any ENTRY key

When a skipped channel is programmed, it does not accept the ENTRY key.

**Remarks 3** Other channels adjustment

After reconnecting to input terminals to be adjusted, repeat the same procedure line from the programming channel display (indicated by a dotted line).

**Remarks 4** Initialization of shift value (0)

By pressing ENTRY key after clearing (by pressing SHIFT + 0 CLEAR keys) at the procedure after channel programming, the channel shift value becomes 0.

**Reference** Storing

Store the programmed shift value into memory.

# 16.3. Adjustment of Trace Printing Position

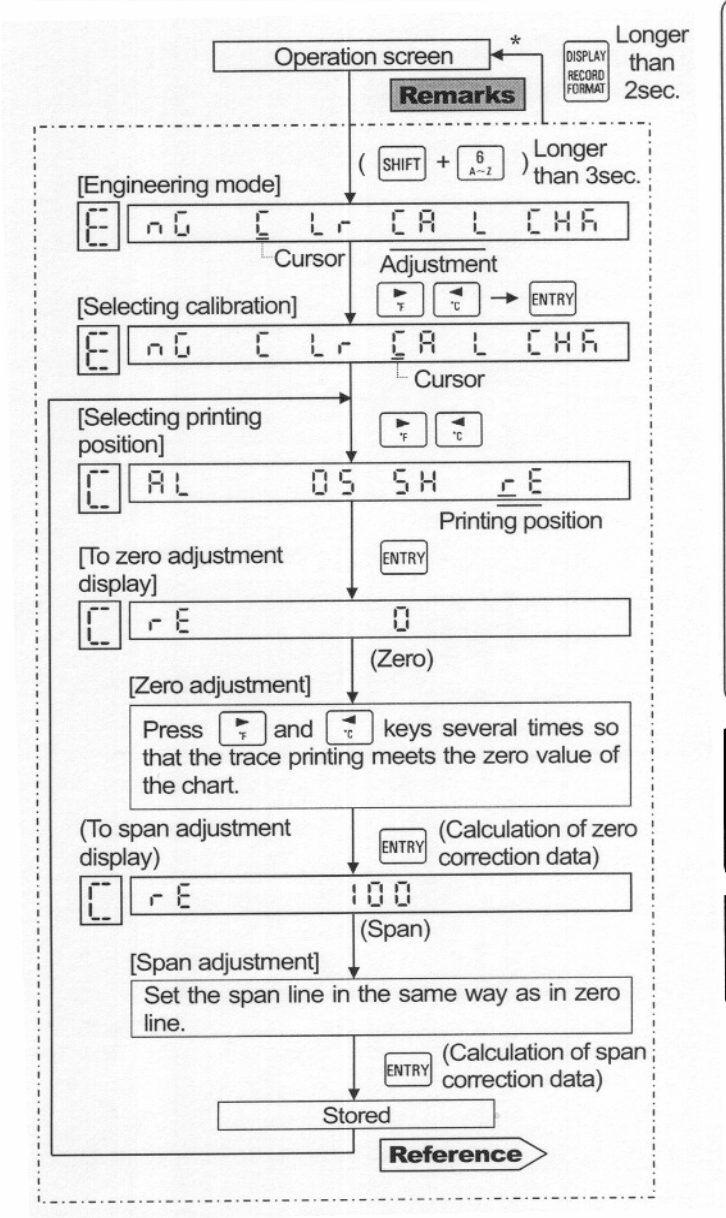
Zero and span adjustment at trace printing position can be done. It is recommended for maintaining the printing accuracy to adjust the trace printing position once every year.

## 1. Zero and span adjustment

Adjustment can be done by pressing [ENTRY] key at the position where the trace-printing position has been met.

·This adjustment does not interfere with the adjustment of measured values.

## 2. Adjustment flow chart

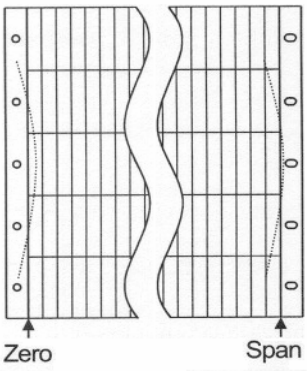



**Adjustment procedure**

①Perform trace printing while feeding the chart.

②Trace printing shifts rightward bit by bit, each time [▶°F] key is pressed once. Trace printing shifts leftward bit by bit, each time [◀°C] key is pressed once.

③Press [ENTRY] key when trace printing meets zero or span line.




**Remarks** For returning to operation screen

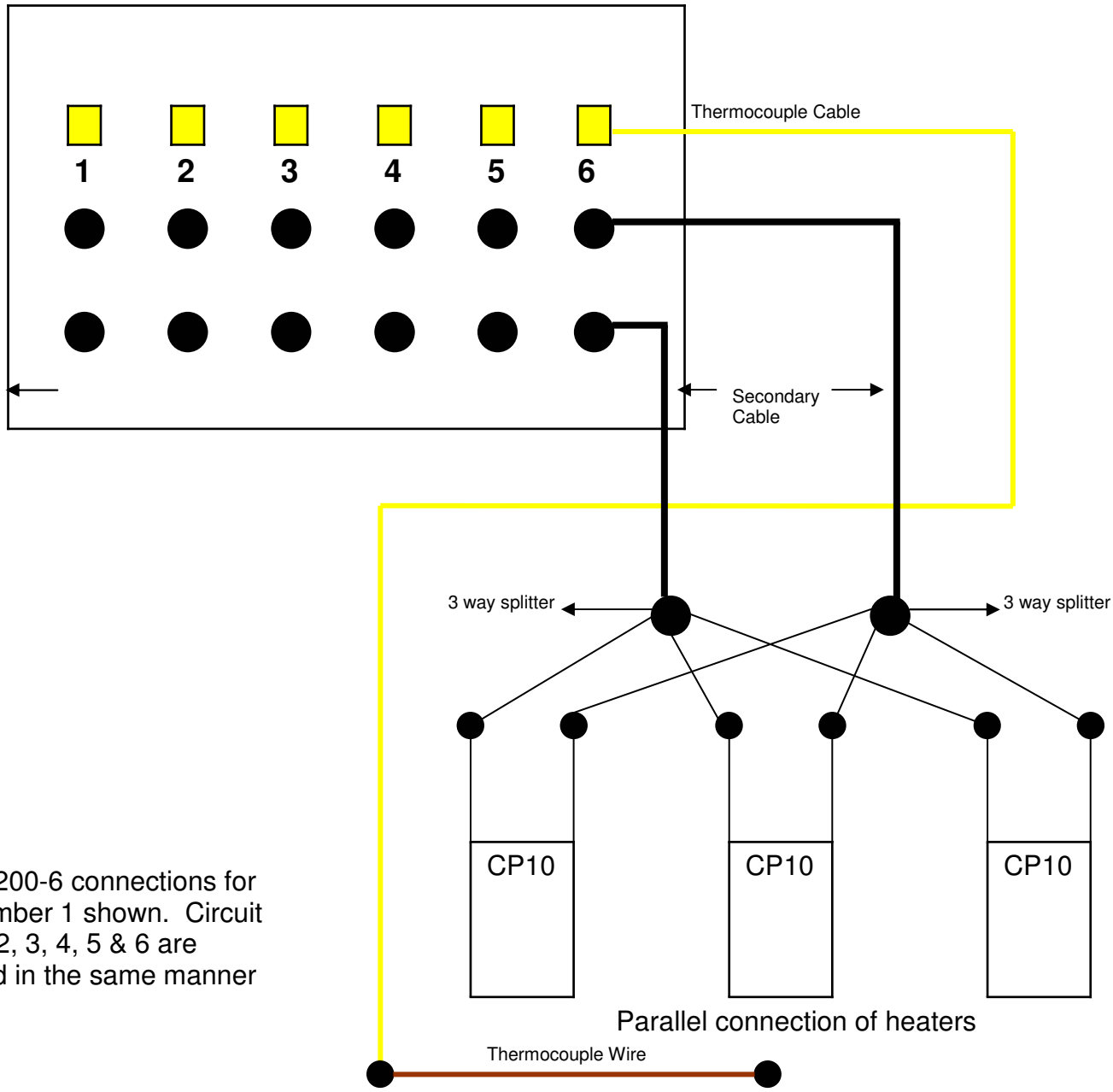
Calculated correction data are canceled by returning to the operation display at the procedure before [Storing].

**Reference** Storing

Store the calculated correction data into memory.

* [DISPLAY RECORD FORMAT] key is not acceptable during zero.span adjustment is displayed.

# ***PCR200-6 6 Way Heat Treatment Console System Connections:***

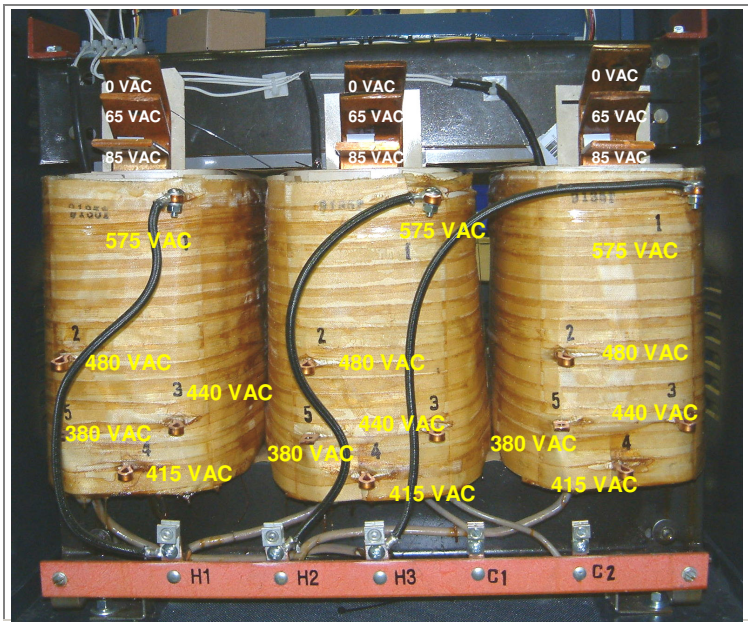



**Note:**

The PCR200-6 connections for circuit number 1 shown. Circuit numbers 2, 3, 4, 5 & 6 are connected in the same manner

***TO CHANGE SECONDARY AND PRIMARY CONNECTIONS FOLLOWS THESE INSTRUCTIONS:***

1. Switch off main breaker and disconnect primary power cable supply.
2. Loosen the primary power cable clamp.
3. Remove panel labelled “Back Panel” to change secondary and primary connections.
4. Change connections as per requirements and make sure the connections are tight.
5. Make sure nothing is left inside the enclosure.
6. Put the “Back Panel” back on.
7. Tighten the primary power cable clamp.
8. Hook up primary power cable supply and then switch on main breaker when ready.




- 75 KVA/60 KW
- Primary 380/415/440/480/575, 3 Phase
- Secondary 0/65/85, Single Phase
- (1 P.H.) 110 volt @ 1200 VA, Single Phase
- Isolation
- Copper wound
- Over temperature thermostat per phase

***Transformer:***

Weight: 660 lbs (approx.)
Dimensions: 24” L x 17” W x 21” H

**Features:**

- All connections in back for easy access.
- Class 220 insulation.
- 150 degrees C. temperature rise.
- CSA certified.
- UL listed.
- Manufactured to ISO9001 quality certification.

ORDERING INFORMATION:

**MSPART#** - 75KVA #7 - 3 phase *isolated* copper wound power transformer. Primary 380/415/440/480/575, 50/60 Hz secondary 0/65/85 (Thermal trips per phase to prevent overload).

**CHANGING TAPPINGS:**

| PRIMARY VOLTAGE | CURRENT | CONNECTION |
|---|---|---|
| 575 VAC | 76 amps | 1-1-1 |
| 480 VAC | 91 amps | 2-2-2 |
| 440 VAC | 99 amps | 3-3-3 |
| 415 VAC | 105 amps | 4-4-4 |
| 380 VAC | 114 amps | 5-5-5 |

| SECONDARY VOLTAGE | CURRENT | CONNECTION |
|---|---|---|
| 65 volts | 384 amps per phase | 65-65-65 as marked |
| 85 volts | 312 amps per phase | 85-85-85 as marked |

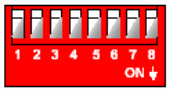
****NOTE:** Optional 125 amp circuit breaker required for 380VAC/415 Primary Voltage

# ***SPARE PARTS FOR PCR2007-6 HEAT TREATMENT CONSOLE***

| MS Part No. | Description Of Part |
|---|---|
| 900Wheel | Wheels Swivel Caster (900 lb Capacity with brake) |
| Simultaneous (12) | 12 Channel Chino Digital Temperature Recorder |
| (P256/°C or °F) | Six channel digital automatic FGH Programmer |
| 75KVA #7 | 75 KVA - 3 Phase *Isolated* copper wound power transformer: Primary 380/415/440/480/575, 50/60 Hz Secondary 0/65/85 (Thermal trips per phase to prevent overload) |
| Amp Meter | Digital Amp Meter 0-200 amps |
| Selector Switch | Six Channel Selector Switch with Plate & Knob |
| CT | Current Transformer 0-200 amps |
| A10 | 300 amp Female Panel Mount Socket Complete |
| PP-20-KX | Thermocouple Extension Cable |
| A37-EL | 200 amp contactor (100% Duty Cycle) |
| A38 | 110 Volt Neon |
| 46F4171 | ON/OFF Rocker Switch |
| Merlin 100 amp | 100 amp - 3 phase Circuit Breaker with 120 volt uv Release |
| Merlin 125 amp | 125 amp - 3 phase Circuit Breaker with 120 volt uv Release |
| 56F874 | 5 amp Circuit Breaker |
| 56F876 | 10 amp Circuit Breaker |
| F-A18 | Female Thermocouple Panel Mount (Type “K”) |
| Fan | 340 CFM Cooling Fan |
| 120 V | 120 V Receptacle |
| 96F4496 | 3 Pole Terminal Block |
| #1 Tinned | #1 Tinned Cable with lugs (please specify length) |
| #4 Tinned | #4 Tinned Cable with lugs (please specify length) |
| 90F7177 | Lug 1/0 - 3/8 Hole |
| AL1/4 | Aluminium Lugs 1/4" Hole |

## ***SETTING FGH PROGRAMMER FOR P256/S256 MODE IN DEGRESS FARENHEIT:***

**P256 (Automatic Programmer):** DIL Switches are selectable on the bottom of the programmer.




| | |
|---|---|
| SW1 | ON |
| SW2 | OFF |
| SW3 | ON |
| SW4 | OFF |
| SW5 | ON |
| SW6 | ON |
| SW7 | OFF |
| SW8 | OFF |

***NOTE 1:*** Make sure switch on back of programmer is in the **"P256"** position

***NOTE 2:*** Wiring connections for communications local port in the back of the programmer must be wired as follows for P256 mode:

| **Local Port** |
|---|
| TX+ = White |
| TX- = Red |
| RX+ = Green |
| RX- = Black |
| Common = ground |

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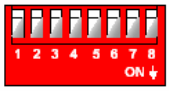
**S256 (Slave)** DIL Switches are selectable on the bottom of the programmer.




| | |
|---|---|
| SW1 | OFF |
| SW2 | ON |
| SW3 | OFF |
| SW4 | OFF |
| SW5 | OFF |
| SW6 | ON |
| SW7 | OFF |
| SW8 | OFF |

***NOTE 1:*** SW3 to SW6 Set for Channel 7 – 12 (other channels can be selected please refer to series 256 user manual)

***NOTE 2:*** Make sure switch on back of programmer is in the **"S256"** position

***NOTE 3:*** Wiring connections for communications local port in the back of the programmer must be wired as follows for S256 mode:

| **Local Port** |
|---|
| TX+ = Green |
| TX- = Black |
| RX+ = White |
| RX- = Red |
| Common = ground |