

Display and Controls.

- 1) Display: 16/2 alphanumeric display
- 2) Temperature range: 0 to 150 degree.
- 3) Resolution: 1 degree.
- 4) Accuracy: +/- 1 degree.
- 5) Temperature control setting: 0 to 150 degree in step of 1 degree.
- 6) Rate of heating / cooling is adjustable from: 0.5 to 9.5 degrees/per minutes in step of 0.5 degree.
- 7) Process hold time display: 1 to 99 minutes in steps of 1 minute.
- 8) Forward and reverse time display: 1 to 99 minutes in step of 1 minute.
- 9) Alarm time display: 1 to 180 seconds in steps of 1 second.
- 10) Power supply: Input range 160-260 VAC.
- 11) Size of the panel cutout: 92x92.
- 12) Program memory: Up to 50 programs can be stored in the internal memory of DP-01.

13) Memory bank no. 1:

This memory bank contains 50 programs from program no.1 to 50. In each program the user can provide maximum 25 steps. The parameter of the program can be changed as per the requirement of the user. These programs are stored in the memory even when the power is switched OFF. They can also be altered as and when required.

14) Output relays:

- A) Heat In.
- B) Cool In.
- C) Forward direction
- D) Reverse direction.
- E) Air In.
- F) Air Out.
- G) Alarm.











15) Power Consumption : 7.5 W

16) Weight: 1.5 kg:

17) Operating ambient temperature: 0 to 60 degree.

18) Temperature sensing probe: PT 100:

19) Keys and It's Function:

- a)  key: This key is used to increase the value of the parameter whenever required or to check the temperature and its PT100 input when the instrument is in idle mode.
- b)  key: The function of this key is to decrease the value of the parameter whenever required and to check the serial number, logged data and last technical error when the instrument is in idle mode.
- c)  : key enables to make a new program and to change the position of the cursor while editing the parameter.
- d)  : This key allows the user to enter the password while saving a program. OPC is used to set the operator call whenever required and to acknowledge the same during the process.
- e)  : This key enables the user to read and edit the special setting no.1, read the program and to change the step while editing a program.
- f)  : This key acknowledges the alarm and read & edit the special setting No.2 when the instrument is in idle mode.
- g)  : This key is used to select a program, acknowledge the password and operator call.
- h)  : This key is used to delete a stage during the process and cancel an executed program. INCH is used to move the direction of beaker in an appropriate position after the process.
- i)  : It is used to start a new program or previous executed program and put on hold the program during the process.
- j)  It is used to cancel any mode and stop an executed program.

20) Special setting No.1.

Special setting can be edited by pressing the  key.

The following items can be set with the help of the same.

a) FORWARD TIME: 0-99 minutes.

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Forward Time
03 Minutes (0-99)

b) REVERSE TIME: 0-99 minutes:

PRO. STEP GRA. TIME TEMP.

Reverse Time
03 Minutes (0-99)

c) MOTOR OFF TIME: 0-99 seconds.

PRO. STEP GRA. TIME TEMP.

Motor OFF Time
10 Seconds (0-99)

These three parameters control the direction of the motor such as forward, reverse and pause time in between the directions. It is also possible to run the motor in a single direction if the parameter of the opposite direction is set at zero.

d) AIR PRESSURE: 30-130 degree.

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Air Pressure
080 Deg. (30-130)

This set parameter opens the air pressure valve when this parameter matches with the current temperature.

e) RESTART TIME: 0-180 Seconds.

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Restart Time
0-10 Secs. (0-180)

This setting enables the automatic restart of the program in case of power failure. If the setting is kept at zero then the program has to be restarted manually during a power failure.

f) Duration of the Alarm: 0-180 seconds.

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Alarm Time
010 Secs. (0-180)

This setting controls the duration of the alarm when the programs advance to the next stage. The duration of the alarm for the operator call and the end of the program is fixed at 30 seconds.

21) Special Setting No. 2. With help of key.

a) Over shoot control: (ON / OFF).



PRO. STEP GRA. TIME TEMP.

Over Shoot Ctrl
OFF (ON/OFF)

b) Over shoot Offset: 0-10

PRO. STEP GRA. TIME TEMP.

Over Shoot Offset
05 (0-10) Degrees.

This facility enables to control the temperature by switching ON the Cool In valve whenever overshoot takes place during the hold time. First select the overshoot control setting ON / OFF by pressing   key and then select the offset of the same which is the set parameter of the Cool In valve to be operated. For example if the over shoot control is ON and the offset is set at five then whenever the temperature overshoots the set point by 5 degree during the hold time , the Cool In valve is set ON and brings down the temperature.

c) Proportional Band: 0-20 degree

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Proportional Band

00 (0-20) Degrees.

d) Proportional Time : 5-30 Seconds

PRO. STEP GRA. TIME TEMP.

Proportional Time

10 Seconds (5-30)

This proportionate controller decreases the average power supplied to the heater as the temperature approaches set point. This ensures that it will not overshoot the set point and therefore will maintain a stable temperature.

For example, if the PB is set at 5 degrees and PT is fixed for 20 seconds and target temperature is 100 degrees, the PB & PT will activate at 95 degrees. At this point, the ON time of the heating is 60% of PT and OFF time is 40%. This means an ON period of 12 seconds and off time of 8 seconds. When the temperature reaches 99 degrees, the ON time of the heating will be 40% and off time 60%.

e) RS 485 address: 1-32.


PRO. STEP GRA. TIME TEMP.

RS485 Address

01 (1-32)

This facility is used for the RS 485 communication with PC. This is an address code for the computer. 32 instruments can be connected to one computer. For example, if this parameter is set at five then the computer easily communicates with this instrument by selecting the same value set in the computer.

22) Log Parameter

Log parameter can be read by pressing  key.




- a) Digital serial no: Each instrument has separate 16 digital serial numbers.
- b) Total executions started: It indicates the total number of programs executed so far.
- c) Total executions finished: It indicates the total number of programs finished.
- d) Total exec.time: It indicates the total execution time of the programs.
- e) Current ON time: This shows the ON time after currently switching ON this instrument.
- f) Total ON time: This indicates the total ON time of the instrument.
- g) Chip temperature: This enables to check the temperature inside the microcontroller.
- h) Chip DC voltage: This enables to check the input DC voltage of the microcontroller.
- i) Last program ended at: This indicates total time taken by the last executed program.
- j) Last error: This indicates the last technical error during the program such as power failure, PT100 open and short.
- k) Firmware: This shows the version number and the date of the same.
- l) Total power fail: It displays the total number of power failures during the process.

23) How To Make A New Program

Whenever a new program is to be fed, the  key is to be pressed.



PRO. STEP GRA. TIME TEMP.

01	0.0	00	000
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Wherever the cursor key is positioned that particular parameter is changeable. Edit the parameter by pressing ,  /  key.

PRO. STEP GRA. TIME TEMP.

01	0.0	05	060
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After completing the first step press  key to go to the next step. Change the parameter as mentioned at the first step .Complete the entire steps as per your program and press  key to save.




PRO. STEP GRA. TIME TEMP.

SELECT PROGRAM & ENTER : 01			
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Select the program no. through  /  key in between 1 to 25 and press  key.

PRO. STEP GRA. TIME TEMP.

ENTER PASSWORD 996

Password of this instrument is 999 and selects the same value through  /  key and press  key to save.

PRO. STEP GRA. TIME TEMP.


PROGRAM [01] SAVED.....

24) How To Read A Program

Press  key and select the desired program through  /  key

PRO. STEP GRA. TIME TEMP.

SELECT PROGRAM & ENTER : 05

After selecting the program No. press  key again.

PRO. STEP GRA. TIME TEMP.

05 01 1.5 05 080

Read the parameter by pressing  key one by one.

25) How To Read A Program

Press  key and select the desired program through  /  key

PRO. STEP GRA. TIME TEMP.

SELECT PROGRAM & ENTER : 05




After selecting the program No. press  key again.

PRO. STEP GRA. TIME TEMP.

05 01 1.5 05 080

Read the parameter by pressing  key one by one.

26) How To Start A New Program

Press the  key and select the program through  /  key.



PRO. STEP GRA. TIME TEMP.

SELECT PROGRAM & ENTER : 05

After selecting the program No. press the  key. The display will be as shown below.

PRO. STEP GRA. TIME TEMP.

05 01 1.5 05 080


Then press  key to start the program. It is also possible to start the previously executed program by pressing the  key when instrument is in idle mode.

26) How To Cancel An Executed Program

Press the  key. The display will be as follows.

PRO. STEP GRA. TIME TEMP.

PROGRAM [05] WAS HALTED AT 00:00

Press the  key to cancel the program

PRO. STEP GRA. TIME TEMP.

A.P.U ENTERPRISES MODEL DP-02

27) Wiring Diagram:

SIX PINS CONNECTOR:

- 1) PHASE
- 2) NEUTRAL
- 3) EARTH
- 4) NIL
- 5) SENSOR S1
- 6) SENSOR S2

EIGHT PINS CONNECTOR:

- 1) HEAT IN
- 2) COOL IN
- 3) FORWARD
- 4) REVERSE
- 5) AIR IN
- 6) AIR OUT
- 7) ALARM
- 8) RELAY PHASE

FUSE: 1 AMP.