INSTRUCTIONS FOR USE

Labocult

CE

INCUBATOR REF H7 70

SUMMARY

It is applied in laboratories, in industrial and mining, universities and colleges, research institutions, medicine & health and other units for storage and culturing.

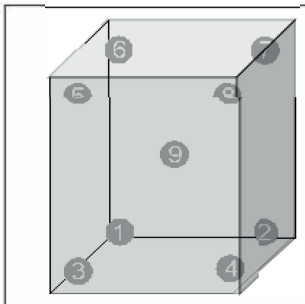
STRUCTURE FEATURES

1. High quality cold rolling steel electrostatic spraying exterior.
2. Stainless Steel inner chamber, semicircular arcs at corners for easy cleaning.
3. Intelligent PID temperature controller, with timing, alarm indicates, Temperature deviation trimming, self-tuning and etc. Cut off the power automatic, when over-temperature limited, ensure the safety of experiments and personnel.
4. Equipped with a magnetic door seal to ensure the door stay closed.
5. Heat insulation for preventing the loss of heat too quickly. Energy efficient, low carbon and environmental protection.

TECHNICAL PARAMETERS

Voltage	220-240V , 50 Hz
Power consumption	300 Watt max
Typical consumption	88 Watt
Temperature range	Room temperature +5 °C – 70 °C
Environmental temperature	0 °C – 40 °C
Humidity	≤80% RH / non condensing
Accuracy	±0.5 °C
Inner chamber size	230×200×200 mm
Exterior size	300×330×330 mm
Timing	0-9999min

TEMPERATURE DISTRIBUTION



Temp. Point	Temperature	Temp. Point	Temperature
❶	37,26 °C	❺	36,50 °C
❷	36,30 °C	❻	37,21 °C
❸	36,07 °C	❼	36,40 °C
❹	35,95 °C	❽	36,41 °C
		❾	36,63 °C

Note: the measured value has a little difference because of different models

ENVIRONMENTAL CONDITIONS

Environment temperature:	5 ~40
Relative humidity:	≤80%RH
Pressure:	80-106Kpa

SAFETY INFORMATION

1. In order to ensure the safety of equipment and experiment, please install external grounding protection and supply power according to requirement of equipment specifications.
2. Don not use with inflammable and explosive materials, noxious goods and strong corrosive articles by this equipment.
3. Ensure the horizontal installation.
4. Service and maintaining only by authorized specialist.
5. Don't make compulsory startup, must eliminate the alarm reminder.
6. Read this instruction carefully before operate this equipment.

OPERATION CAUTIONS

1. For the initial startup, don't modify internal parameter of program controller except the permission in the instruction.
2. The workroom adopts vertical ventilation cycle. Each tray can not place too much, total test load should not be bigger than 1/2 of tray.
3. The environment temperature must 5ºC lower than setting temperature, then it can work in normal.
4. Don't use acid, alkali and other corrosive articles to scrub the internal surface and external surface. The neutral washing detergent could be used for regular cleaning, then wipe by dry cloth.
5. When the equipment stops, cutoff the power and keep interior and exterior dry and clean.

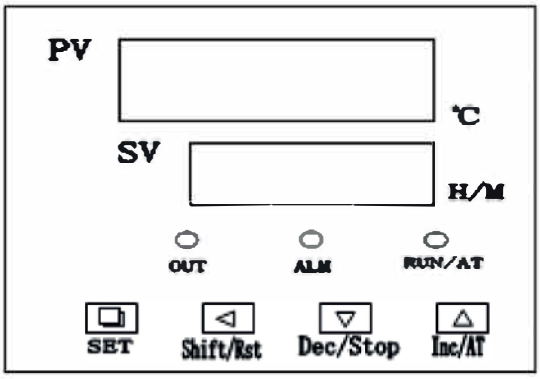
CONTROLLER OPERATION

The series of TS-1000 temperature controller adapt to laboratory and analysis instrument operate very easy. Temperature controller adapt to "super fuzzy PID control" much better than traditional PID control.

PANEL BRIEF INTRODUCTION

1	Shape size:	109 mm x 125 mm
2	Temp. Range:	TS - 10xx, 0 °C – 100 °C
	Time range:	0 – 9999 Minutes
3	Accurracy:	< 0,5 °C
4	Environment:	Mainboard 220 V ~, ± 10 % AC
	Temperature:	0 ° – 50 °C
	Relative Humidity:	< 85 % RH

PANEL INSTRUCTIONS



INDICATOR DEFINITION

1. RUN/AT is bright when the controller is running, when the runtime is over, this indicator turns off. When the controller enters the auto-tuning of P.I.D this indicator is flashing.
2. OUT is on when heater turns on else this indicator is off.
3. ALM when the over-temperature alarm occurs, this indicator turns on.

USAGE

1. When the controller is switched on, display windows show “InP”” and the value of temperature range for 3 seconds, then it starts running.
2. Temperature and time settings.

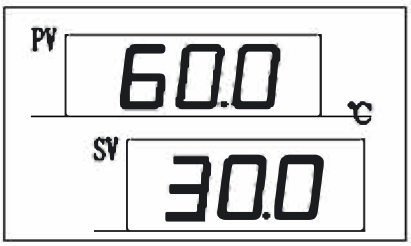
   Press the “Set” button, the controller runs into the temperature setting state. Re-press the “Set” button, the controller runs into the time setting state.

   In setting state, you can use the “◀”, ”▼” and ”▶” buttons to get the required settings. Press the “set” button again, it returns from the setting state and the settings are saved automatically.

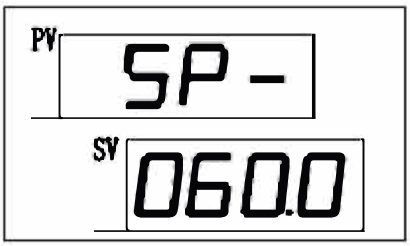
   If the time is set as “0”, the controller will run continuously, the display window of “SV” will display the set point temperature. If the time set value is not equal “0”, timers start time when the measuring temperature reaches the set point temperature, the display window of “SV” will display the runtime.

   When the runtime is over, the “sV” window will display “End”, the buzzer will sound for 30 s, Press the button “▼” for 3 s to restart.

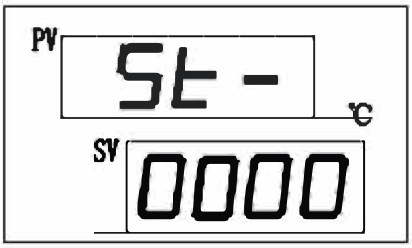
(1) The normal display



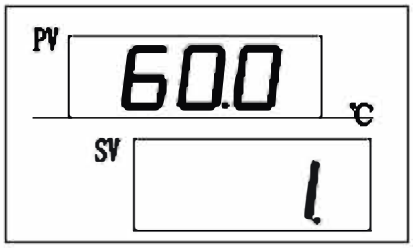
(2) The temperature setting state



(3) The time setting state



(4) Timing Display



3. When temperature alarm, the buzzer will sound,“ ALM“ lights. If a change in temperature setting and over-temperature alarm,“ ALM“ lights up, but no songs buzzer.
4. When the buzzer sounds, it can be muted by pressing any button.
5. “◀” button: In the setting state, it can shift the set value by pressing the button.
6. “▲” button: In the setting state, it can reduce the set value by pressing the button. If press and hold the button, the set value will reduce continuously. The timing state, long press the button for 3 seconds and can make the program stop.
7. ”▲” button: In the setting status, it can increase the set value by pressing the button. If press and hold the button, the set value will increase continuously.
8. In setting state, the controller will return to run status if without any key press in one minute.
9. If the display window shows “----“, it indicates the fault of temperature.

SYSTEM AUTO TUNING (AT)

If the temperature control result is not perfect, auto-tuning can be performed. Auto-tuning may cause the temperature to increase more. The user should consider this factor before auto-tuning. When auto-tuning is completed, it is not possible to return to the manufacturer‘s original setting.

Autotuning can be performed only when the door of the product is closed.

Autotuning must be performed when the device has been switched on just before. The room temperature should be about 25 C.

If the unit has already reached a higher temperature or the room temperature is too low or too high, all these factors will affect the result of the autotuning. The result of the temperature control will then not be optimal.

Now you can start setting the autotuning:

In the non-set state, press the „“ button for 6 seconds, the „AT“ indicator will flash, it will turn off automatically when the autotuning process is completed. The auto-tuning process takes about half an hour. During the auto-tuning, better PID parameters are automatically set, so that the temperature control result is optimized. The new PID parameter is automatically stored in the system and the unit automatically returns to normal operation mode.

During the autotuning process, if the user wants to stop this process, he must press the „◀“ key for 6 seconds to interrupt the autotuning process. When the autotuning is finished, it is not possible to delete the new PID parameter.

If an overtemperature alarm occurs during the autotuning process, the „ALM“ indicator will not light up and no beep will sound. The heater alarm relay will still be turned off automatically.

During the auto-tuning process, the „SET“ key has no function. If a time is set before auto-tuning starts, the display of „SV“ does not show the time but the temperature setting value.

INTERNAL PARAMETERS SETTINGS

Note: All the internal parameter has been adjusted when factory test.

Forbidden to modify them except Sensor Correction parameter.

Press the “Set” button for 3 seconds, controller will display the password prompt “Lc”. Adjust the password to the required value, then press the “Set” button again, it will run into the internal parameter setting state. if press the “Set” button for another 3 seconds, it will return to the running state.

PARAMETER LIST-1:

IMPORTANT! Please leave adjustment to a trained service person.

Parameter indicator	Name	Instruction of the Parameter’s function	(Setting range) factory set value
Lc-	Password	when Lc=3 ,then we can see and modify parameters	0
AL-	Alarming setting	When temperature is beyond “SP+AL”, the Alarm indicator turns on. The buzzer sounds and the heater output turns off.	(0 ~ 100 °C) 5
T-	Control cycle	The heat control cycle of temperature	(1 ~ 60S) 5S
P-	Proportional band	Adjustment of proportional parameter	(1.0 ~ rH) 26.5
I-	Integration time	Adjustment of integration parameter	(1 ~ 1000S) 415
d-	Differential time	Adjustment of differential parameter.	(0 ~ 1000S) 415
Pb-	Zero point adjust	When the zero error comparatively larger, to update this value should be needed. Pb = measure value – actual value	(-12.0 ~ 12.0 °C) 0.0
PK-	Full point adjust	When the full point error also comparatively larger, to update this value should be needed. PK = 1000 × (measure value –actual value) actual value	(-999 ~ 999) 0
Et-	Timing function	When ET = 0, no timing function; 1 electric start timing, 2 to the value set start timing.	(0 ~ 2) 2

PARAMETER LIST-2:

IMPORTANT! Please leave adjustment to a trained service person

Parameter indicator	Name	Instruction of the Parameter's function	(Setting range) factory set value
Lc-	Password	when Lc = 9, then we can see and modify parameters	0
Co-	Turn off the heat output deviation	when "PV ≥ SP + Co" Turn off the heating output	(0.0~50.0 °C) 5.0
Hn-	Constant temperature time mode	0, minutes time, 1, hours time	(0~1) 0
En-	End of operation temperature	En = 0 end of run off output; En = 1 end run to constant temperature;	(0~1) 1
rH-	Range of temp setting	The value of temperature setting.	(0~100.0 °C) 70.0
SPL-	Lower limit	Temperature set value minimum value.	(0 to highest limit) 0
SPH-	Highest limit	Temperature setting value maximum value.	(lower limit to highest limit) 70.0

ENGLISH NAME AND PARAMETER INDICATING THE SYMBOL TABLE

Parameters indicating	SP	St	Lc	AL	T	P	I	d
English Name	SP	St	Lc	AL	T	P	I	d
Parameters indicating	Pb	Pk	Co	Hn	oP	rH		
English Name	Pb	Pk	Co	Hn	oP	rH		

WIRING

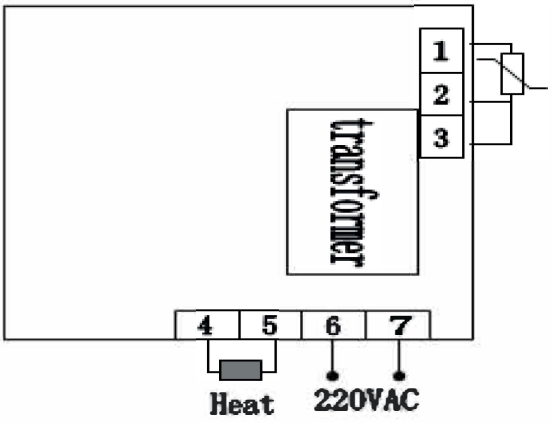


Figure 1 (TS-1xx0)

PROBLEM ANALYSIS

Fault site	Cause analysis	Treatment method
Power indicating lamp is not working.	No power	Check the outlet
The temp. controller displays “0000”	The fuse is fused	Replace the fuse
The temp. cannot go down	The sensor is not work	Contact the service
The evenness degree is not good	The controller is not work	Contact the service
The control sometimes good and sometimes bad	The environment temp. is too high	Reduce the environme nt temp.
The temperature can not go up	The sample is heating	Reduce the supply quantity of sample
The temperature over shot is too large	The supply power doesn’t need the demand	Adjust the power
	The voltage is unstable	Steady the power input.
	The instrument setting is too low	Set the temperature correctly
	The heating light of instru-ment is light but no output	Contact the service
	The heating has output but the heater has no heating	Contact the service
	The sensor is not work	Contact the service
	The related parameter’s setting of instrument is not correct.	Read the instructions for use and adjust again
	The heater output is not stop	Contact the service
	The internal PID is not cor-rect.	Start self-tuning

Electromagnetic Directive 2014/30/EU
Low Voltage Directive 2014/35/EU CE

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