Goldleaf Scientific

Digital Heating Mantle
Instruction Manual

Includes:

- Digital Heating/Stirring Mantle
- Heated Jacket Top
- External Thermocouple
- Electrical Plug

General Information

Unpack your item carefully and inspect for damage and report such damage or missing parts to Goldleaf Scientific right away.
Read your instruction manual carefully.
Make sure that every user has read the understood the instruction manual.
Please store the instruction manual in a place easily accessible to every user.

Safety Information

Please comply with all safety and accident-prevention regulations.
Use extra care when working with flammable substances; refer to safety data sheets.
When connecting your item with your local power supply, please make sure your item is designed for your local supply voltage; go by data plate on the item.
Turn your power switch OFF whenever the item is not used, or before disconnecting the plug.
Use extra care when working in the vicinity of flammable and explosive substances. Motor are non-sparking type, however, the item itself is not explosion proof.
Please do not connect your instrument without a protective ground outlet.
Your item requires a solid stand.

Warning

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from power supply before servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials: fire or explosion may result. This item contains components which may ignite such materials.
2. Keep the item clean. Use non-abrasive cleaner. Alkali spills, hydrofluoric acid spills, etc. may damage the item and lead to thermal failure. Unplug unit and clean spills promptly. Do not immerse unit for cleaning.
3. Do not remove or modify grounded power plug. Use only properly grounded outlets to avoid shock hazard. Not rated for use in hazardous atmospheres.
4. Use appropriate hand and eye protection when handling hazardous chemicals.
5. Do not use in highly corrosive atmohpheres; corrosive fumes and spills may damage your item and internal components.

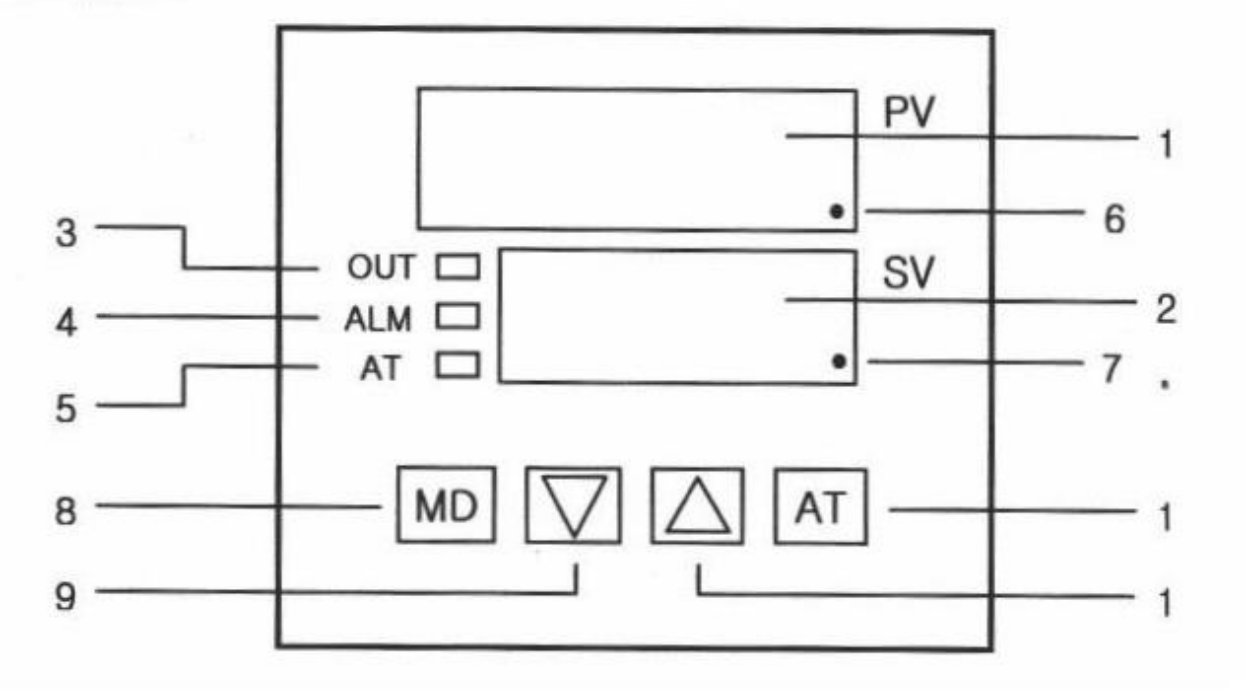
Caution

Space instrument 12 inches away from combustible materials under any conditions.

Attention!

Initial heating of the unit will cause materials used in the manufacturing process to vaporize away. This is normal and will take around 30 minutes to completely finish. It is recommended to heat the unit up while under a fume hood or in a ventilated environment. After the initial heating and burn off of materials the unit should not smoke. If it does, discontinue use and contact Goldleaf Scientific immediately.

1. Functional Description (TIC)



1) Displays processing value (PV): Displays processing value in controlling and each kind of parameters in parameter set
2) Displays set value and parameter set (SV): Displays set value in controlling and parameter set value. Press key No. 9 to display the remaining time.
3) Output control (OUT).
4) Warning light of highest and lowest (ALM).
5) Auto-tuning lamp (AT): Press key No. 11, then it starts PID auto-tuning with flickering of the lamp and the lamp turns off when it is finished.
6) Timer lamp (TIME): Press No. 10 key of the Timer during controlling, the lamp will be flickered. After a set time, the light will be on: at a time, tENd will be appeared on SV.
7) LBA control lamp (LBA): It will be on when control loop disconnection alarm appears.
8) Mode set key (MD): Press it more than 2 seconds, the system will be changed to parameter set.
9) Down key (remaining time display key) (▼): Press it, set value decreases: Press more than 2 seconds, set value decreases consecutively. Press it for several seconds during timer ON, remaining time will be flickered.
10) Up key (Time ON/OFF key) (▲): If you press it, the set value goes up one by one, press it more than 2sec, the set value goes up consecutively. If you press it during controlling, you can turn on/off the timer.
11) Auto tuning key (AT): After parameter set, press AT more than 2 sec, AT lamp (5 times) will be flickered and calculating PID automatically.

2. How to set parameter

1) Parameter Set

Turned on, then PV displays the current temp; SV displays a set valve.
If you press the MODE key at this stage more than 2sec, parameter set is available.
If you press the MODE key, kinds of parameter will be changed one by one.
(See the following table.)

No.	Symbol	Setting Date	Description	Initial Value
1	**Su**	Set Value	Set of the temperature required	30
2	**tIm**	Control ending	*H.m display → Hours, Minutes Unit:00H01m~99H59m - Up key can modulate ON/OFF.	0
		Time set	The Timer begins working after current temp reaches set temp. After a set time reaches, it stops ending Control output.*The TIMER does not work in case of "0 set".	
3	**ALS**	Alarm mode set	9 Alarm modes display in picture form. You can set appropriate alarm mode by using up/down keys. See Alarm mode variables (option).	-------
4	**ALH**	High alarm	It sets the highest alarm limit.	0
5	**ALL**	Low alarm	It sets the lowest alarm limit.	0
6	**P**	Proportional band	Possible to set a 0.1% unit within 0.1-999.08% range.	Automatically set for Auto Tuning
7	**I**	Integral time	Possible to set a 1 sec-unit within 5-9998 sec. range.	
8	**d**	Derivative time	Possible to set a 1 sec-unit within 0-2500 sec. range.	
9	**LbA**	Control loop break alarm	Possible to set a 1 sec-unit within 0-998 sec. range.	
10	**InS**	Input value	Possible to set a 0.1°C-unit within -100.0°C-100°C	0.0 or 1.0
11	**LOC**	Set data lock	LOCK →Preventing from changing set value ON → Impossible to change parameter set OFF →Possible to change parameter set	Off
12	**PASS**		Manufacturer Mode	

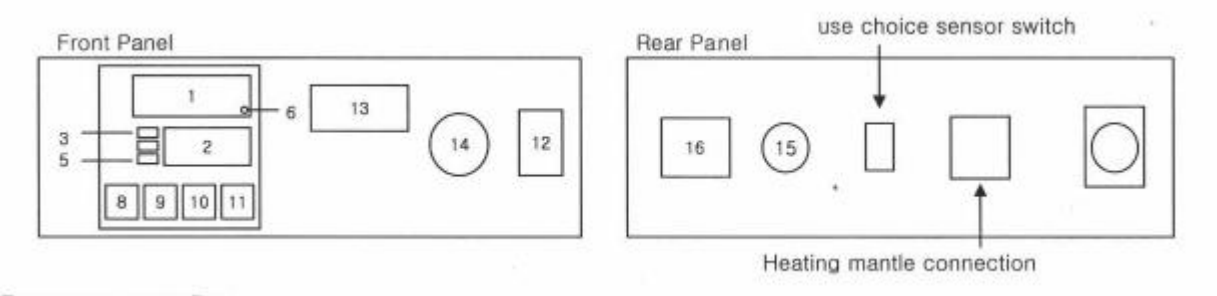
A. After completing parameter set, press the MODE key longer than 2 sec., you can finish parameter set. PV displays current temperature, SV displays set temperature then controlling begins.
B. Press AT key more than 2sec, then the modulating system process automatically Auto-Tuning.

2) Constant value on warehouse

	P	I	d	LbA
250mL	1.0	431	108	862
500mL	0.8	691	173	1382
1L	1.5	695	173	1390
2L	0.8	606	227	1212
3-5L	0.8	803	200	1606

*Constant value could be changed on auto-tuning.
*Use auto-tuning in case on big difference on the temperature.

3) How to use



To use temp. controller

1. A) Connect the sensor on No. 15 terminal of the rear side (use external sensor.)
   B) If sensor is connected on No. 15 terminal on the rear side, take it out and use internal sensor.
2. Connect No. 16 of the rear side with an electrical outlet and switch on the instrument by No. 12 of the rear side.
3. Press No. 8 key of the front side, then the parameter to set temperature will be appeared.

Press No. 9 (downturn) and No. 10 (upward) to set the required temperature.

4. After setting of the temperature, press No. 8 key on the front side for 2 seconds, then the temperature controller runs on initial condition.

To use Timer

1. Press No. 8 key on the front side for 2 seconds, then the parameter to set temperature will appear.

Press No.8 key again

→ Set the time using No. 9 and 10 key.

2. After setting the time, press No. 8 key on the front side, then it return to the initial condition.
3. Press No. 10 key on the front side for 2 seconds on timer run, then No. 6 lamp will be switched on and off. In case that time is not set, it does no run.
4. Press No. 10 key for 2 seconds on timer run, then it stop to run.
5. Press No. 9 key for 2 seconds, then the temperature display shows the remaining time. Press the No. 9 key again for 2 seconds, then the temperature display shows the setting value.
6. In case that the set of time is finished, “tENd” is showed and press No. 10 key to back to the initial condition.

1. Use without auto-tuning but do it in case of a big temperature difference.
2. Press No. 11 key, then it starts with switching on and off.
3. Temperature error could be happened on auto-tuning but it is controlled correctly when auto-tuning is finished.
4. Temperature go higher than the setting value first time but it is returned to normal condition immediately (over-shoot condition.)
5. In case that temperature goes down, it is differ as per the charater of the liquid and the ambient condition.
6. Be careful so that the contents are overflowed from the vessel. It makes the malfunction and damage of the instrument.
7. In case that the replacement of the sensor or the switch of internal and external sensor are needed, switch off the power and make it. If it is made under power ON, it cause a wrong operation.

To use the speed controlller

1. Turn No. 14 dial on the rear side to set the required speed (front No. 13). Speed is controlled from 100 to 1500 rpm by the dial.
2. To stop the speed, turn dial counter clockwise till end end.
3. Set the required speed by dial, then it will arrive at the setting value in a few seconds and keep the constant speed by arithmatic logic (smooth start function).
4. In initial operating, if the motor does not run, give the motor output fast and make it run until speed is arrive at 10 rpm so that the motor runs.

When “Err” is shown on the display

a. Check if the temperature is connected correctly.
b. Check if the wire of the temperature sensor is not down.
c. Check if the temperature sensor is broken.
d. Check the position of the sensor in the sensor switch, internal or external sensor.