Safe Cut Off

The Series 610.DG; 800.DG; 900.DG has additional safety as follows:

The unit has independent temperature sensors for display and other for "Hot top" warning, the secondary temperature sensor also acts as a safety mechanism to the digital control.

The unit has a programmable upper temperature safety limit. When the On Off Light is blinking To set up the value press plate/probe simultaneously press the jog dial. You will see safe cut written in display, you can alter this value by rotating the knob to lower or higher value. (Note : To operate the unit with probe it is recommended that you keep this value 400°C). Always keep this value 50°C or more higher than maximum heat up value you wish to keep for plate heating. After this value is set, the unit automatically return for setting up Heat, Stir, Time, Values. Note that this Safe cut value can only be altered when the unit is in stand-by, not in active running mode. i.e. when On Off light is blinking.

°C or °F Key. Press this key to display the temperature measured in desired units. The display will be in °C or °F as selected and a light toggles on the front panel to indicate this.

Plate/Probe Key. You can select Probe or Plate temperature to use on the hotplate. If probe is not connected Display will Show Err 1 on selection of probe. The unit in mid of a cycle if toggled with this Key will stop after 5-10 seconds if the probe is not connected. Tolerances in the temperature of sample via probe will be more as compared to plate temperature control.

STIRRER SPEED

For setting Speed of the stirrer the rotary knob can be pressed once and again till the highlight selects the "STIR". Once selected the set speed in rpm may be altered by rotating the knob, the Series 610.DG; 800.DG; 900.DG automatically saves the select value and exits the selection mode. At this point the highlighted function "STIR" also glows off.

The Stir RPM can be varied from 50 to 1500 RPM in steps of 50 RPM, the recommended speeds are 200-800 rpm. Lower speeds for more viscous mediums.

Once turned on from the On Off Key on the front panel the Series 610.DG; 800.DG; 900.DG Stirrer starts from 0 and slowly ramps up to the set value to maintain locking of the stirring bar with the magnets below. It is recommended to use strong magnet stirring bars of approx 2 inches length with this Series 610.DG; 800.DG; 900.DG.

TIMER

Please note that Timer values are variable, i.e. the time continuously increases as the experiment/process proceeds, therefore, you can change time values any time during the cycle. For setting time of the Series 610.DG; 800.DG; 900.DG the rotary knob can be pressed once and again till the highlight selects the "TIME". Once selected the set time in Hours:minutes HH:MM may be altered by rotating the knob, the Series 610.DG; 800.DG; 900.DG automatically saves the select value and exits the selection mode. At this point the highlighted function "TIME" also glows off.

The Set values remain stored in unit even when powered off. These are loaded as default values when the unit is powered ON.

When the unit is operated the time keeps on increasing as the cycle progresses. The unit automatically shuts down with a long beep on the time reaching set value, after the cycle is complete.

At this point the Red light close to On/Off button on the front panel goes off. The unit can be restarted with the same program by pressing the On/Off button twice.

Auto-Off

A time-out of the timer automatically turns off the heater and the stirrer. This provides a convenient way to preset the length of time a sample is to be heated without the need for anyone to be present at the end of the period.

Maintenance

TEMPERATURE (°C) TOLERANCE 1.5% for entire range.

The probe may not be used at temperatures below 0°C since the readout will not respond in that region.

Use on a level surface when stirring, especially when stirring violently. If the unit is not levelled, the sample container will "walk", and could walk right off the plate!

Stirring thicker solutions may require using a powerful stir bar. Generally, with the more viscous solution. For best operation overall, it is recommended that the stir bar match the magnet poles in the stirrer. These are 2 inches apart.

Temperature targets may overshoot, at start to stabilize, especially with large liquid volumes . Temperature overshoot is generally less than 5°C.

Entering a new program into memory, always clears the previous program.

BATTERY REPLACEMENT

The battery used is a 9 volt rechargeable battery which should have a useful lifetime of at least 5 years if the unit is used regularly and is kept connected to power ON. The replacement battery can be done by qualified personnel only.

Troubleshooting

1. The RPM display shows Err 2	Failure of motor due to heavy load or something is stuck up to stop motor
2. The sample temperature reading remains higher than the target temperature.	Check the ambient temperature. The target temperature may be below room temperature.
3. The probe temperature reads Err 1	The probe is disconnected
4. The stir bars are revolving erratically.	Check to see that the sample containers are centered over the stir bar motors. The stir bars may not be able to maintain proper coupling to the motor magnets due to the viscosity of the sample.
5. The plate temperature reads Err 1	Refer to qualified service personnel.

TECHNICAL SPECIFICATIONS:

Operating Voltage: 230VAC or 115VAC 50/60 Hz depending upon model.

Power: 450/650 Watts ± 10%

Weight: Approx 3.3 Kgs

Dimensions of hot plate: Diameter 150mm

Over all dimensions: 270 mmX160mmX110mm

External probe connection: DIN plug

Fuse internal : 5 Amps./ 8 Amps depending on 230V AC / 115V AC

Vill. Manglai, P.O Khudda Kalan, Ambala Cantt 133004(INDIA)
Website: glasscolabs.in, glasscolabs.com
E-mail: info@glasscolabs.in, support@glasscolabs.in,
techinfo@glasscolabs.com

ISO 9001:2008 Certified Co.

GLASSCO
Digital Hot Plate Magnetic Stirrer

OPERATING MANUAL

610.DG; 800.DG; 900.DG

Congratulations on your purchase of a Glassco Digital Hot Plate/Stirrer.

Introduction

The unit is designed to do a number of jobs within your laboratory. Please read the instructions carefully to ensure that you receive the maximum benefit from it. Also, be sure to fill out and return the enclosed warranty registration card. We would like to receive the information requested, and it will help us assure you of proper warranty coverage.

Important Information

This manual contains important operating and safety information. You must carefully read and understand the contents of this manual prior to using this equipment.

Safety Information

Glassco Digital Hot Plate/Stirrer has been designed with function, reliability, and safety in mind. It is the user's responsibility to install it in conformance with local electrical codes. For safe operation, please pay attention to the alert boxes throughout the manual.

Warnings:

REFER SERVICING TO QUALIFIED PERSONNEL NO USER SERVICEABLE PARTS INSIDE THE EQUIPMENT USE AT PROPER VOLTAGE INDICATED ON THE EQUIPMENT. USE PROPER EARTHING.

Cautions

⚠ **Heater Plate Surface**

Glassco Hot Plate/Stirrer series 610.DG; 800.DG; 900.DG is capable of temperatures in excess of 370°C, ± tolerance, at the plate surface. Touching the heated surface will cause

severe burns.

⚠**USE EXTREME CAUTION AT ALL TIMES.** Never leave your Hot Plate/Stirrer accessible to others while it is hot. Although the unit is equipped with a "Hot Top" warning indicator on the front panel, do not rely on this alone. Never touch the heating surface unless you are absolutely sure that it is cool.

⚠**Temperature Probe**

When attempting to control PROBE TEMPERATURE, it is necessary to plug in a temperature probe and to place it in the sample AT ALL TIMES. If the probe is not placed into the sample, the unit will not be able to sense the rising temperature of the sample as heat is applied. This will result in driving the heater to its maximum and could result in ruining the sample.

The optional temperature probe is made of stainless steel and can be attacked by some chemicals. Coating the probe with Teflon spray or Teflon tubing may help. However, this coating may slow the probe response time and result in temperature errors until it equilibrates.

⚠**Electrical**

Hot Plate/Stirrer Series 610.DG; 800.DG; 900.DG is made in models that operate at 115 and 230 volts AC. Be certain that your voltage matches the unit that you receive. Check the plate on the side sticker for the voltage setting on your unit. Take the normal care and precaution one would use with any electrical appliance. Be very careful to keep the AC line cord away from the hot plate.

Note:- Please do not run hotplate without load.

General Description

Hot Plate/Stirrer Series 610.DG; 800.DG; 900.DG is a set able, general purpose, digital laboratory hot plate with stirrer. All functions are settable from a digital front panel keyboard and display. Both the plate temperature and the stirrer speed are controllable.

The Hot Plate/Stirrer Series 610.DG; 800.DG; 900.DG contains a program memory to use the last operation without reprogram. The user may enter a program with temperature, stir speeds and time delays which may then run by pressing a single button. The program memory is retained in the unit so the program remains in the unit indefinitely when it is turned off.

The hot plate warning on the unit has a battery backup for enhanced safety. The warning light remains on for some time even after the power off till hot plate cools substantially, for safety.

Heater

Either the plate surface temperature or the actual sample temperature may be set by the user. A sensor in the plate is used to monitor surface temperature or alternatively a temperature probe may be connected to the rear of the unit and inserted into the sample. An optional temperature probe is available with a 7" stainless steel jacket. When a temperature is set by the user, power is applied to the heater to precisely control the temperature at the plate surface or at the sample, as directed. A Built in electronic control causes the temperature to approach the target value at a controlled rate of temperature change. Temperature may be displayed in either ^{0}C or ^{0}F as set by a front panel button.

Stirrer

The stirrer is a motor-driven magnet which revolves directly under the center of the heater plate. It is common practice, when heating solutions, to spin a "stir bar" (Teflon-coated bar magnet) which is placed in the solution. This assures a more uniform temperature throughout the solution. The stirrer speed is set from the front panel keyboard in the steps of 50 rpm, the unit has rpm settable from 50 till 1500.

Timer

The unit has a built-in timer. That is also visible on the front panel. The timer counts up in hours and minutes, sounding an alarm when it reaches set value. In that case heater turn off but motor continuously running. The timer may be used independently of the heater for stirrer action. For such case the temperature may be set below ambient or at zero and stirrer may be used. In conjunction with the "Auto Off" function to shut off the stirrer after a preset length of time.

Front & Rear Panels

The front panel of the Glassco Series 610.DG; 800.DG; 900.DG has a digital keyboard a rotary knob and display for monitoring and controlling hot plate functions.

The ON/Off electrical switch is located on the right side of the equipment. When the unit is on, the display of the unit will be lighted. The display is a three set of four-digit LED type with a colon between the middle two digits. It is used to display the temperature, stirrer speed and timer value. There are other indicative lights for selection between ^{0}C or ^{0}F, Plate or Probe Temperature, Set or Actual temperature displayed.

The keyboard has 3 pushbutton keys and one rotary knob. The keys are On Off Key, Plate/ Probe select, ^{0}C or ^{0}F Select. Functions of these are described below

The On Off Key is Round & Red in colour and on the left side. It also has a Green Light adjacent to it to indicate the function or the process cycle of the unit. When the unit is powered on the Light starts blinking, the values displayed on the unit are set values of the program last executed on the unit. Pressing the On Off key will immediately start the unit. At this moment the blinking Light stops blinking and glows steady. You may chose anytime to stop the cycle by pressing the Red button again. When the cycle is stopped the heater and the stirrer stops and the Light close to On Off button again goes in blinking mode. After a program cycle is complete the Unit gives a long beep and stops, the Light also goes Off.

When the unit is powered on, the unit is in ready mode to commence operating. The values of the temperature, Speed and Time displayed are program set values.

At this point you can set the values of the program, Choose between ^{0}C or ^{0}F by pressing the key, similarly if you wish to use a probe for samples temperature or if you wish to set the hotplates temperature select by Plate/Probe key.

Now you can set the desired temperature, speed and the time by using the rotary knob in the following manner.

Press the rotary knob the Selection of the parameter temperature, speed or time gets highlighted

At this point you can set the temperature or speed or time to desired value by rotating the knob in clockwise or counter clockwise directions. The knob is sensitive to speed of rotation, if you rotate with high speed the readings change too fast.

After a value is set as desired the knob may be pressed again to move to the next variable say the speed of stirring or the time. The values are set in the same fashion.

The Temperature may be set to the highest value 350 ^{0}C, speed can be set from 50 to 1500 rpm setting 0 will stop the stirring but hot plate will only heat. Time can be set to maximum 100 hours, theoretically i.e. 99:59 hours: minutes, the cycle stops after the time elapses. The elapse in time is visible on the display.

Rear Panel

The AC power connector jack is located on the rear panel. The AC power jack is a three-prong, international-style IEC inlet. The AC power supply is fused inside as there are no user serviceable parts inside/outside and a blown fuse will require attention qualified personnel from the company. The unit is not supposed to be reused with a fuse from outside for safety reason. The AC type i.e. 115 or 230V 50/60Hz is indicated on a sticker on the left side of Hot Plate.

The back side has a DIN type 5 pin Female connector for using remote temperature sensor probe. The probe is provided with a male DIN connector for attachment.

Note: Only Glassco Temperature probes are suitable for use in Glassco Series 610.DG; 800.DG; 900.DG models.

Another I/O port in the centre is provided for connection of the unit with computer for service and program purposes. (TO BE USED FOR SERVICING ONLY).

Operating Instructions

The Glassco Digital Hot Plate/Stirrer Series 610.DG; 800.DG; 900.DG is simple to use.

Set-Up

1) Place the unit on a level, dry bench or surface.

2) Plug the unit into a properly grounded, three wire outlet of proper voltage.

3) Plug the temperature probe (if used) into the jack on the rear of the unit.

4) Place the sample on the heater plate and put the temperature probe and stir bar into the sample. Be sure the vessel is centered and that the stir bar is centered in the vessel. Also be sure that the temperature probe will not obstruct the rotation of the stir bar. Try to match the stir bar to the sample and container size to optimize mixing. Generally, larger stir bars are needed to mix in larger beakers with slower speeds. However, two-inch long bars match the magnet in the stirrer best.

5) Set up the safe cut Off value first (factory set is 400°C)

6) Turn the unit ON by the rocker switch on the side panel. Note that the unit will beep once and will be in the PLATE TEMPERATURE mode. At this point you can change the display modes by touching Plate/Probe, °C or °F, set up STIRRER RPM, TIMER HR:MIN, and TEMPERATURE. Note that the display indications will change as you touch the different keys.

7) Set the target temperature, stirrer speed, timer according to the instructions.

8) The Set values are stored in unit even when powered off. These are loaded as default values when the unit is powered ON next time.

Display Functions

HEAT

The unit continuously displays during operating cycle the ACTUAL temperature of the plate or the probe as selected.

For SET temperature the rotary knob can be pressed once and again till the highlight selects the “HEAT”. Once selected the set temperature may be altered by rotating the knob, the Series 610.DG; 800.DG; 900.DG automatically saves the select value and exits the selection mode. At this point the highlighted function “Heat” also glows off. The maximum settable temperature is 350 ^{0}C

The Yellow HOT TOP warning indicator located to the left top in the front panel will blink if the plate temperature is above approx. 55 ^{0}C (131 ^{0}F) as a safety reminder. It will continue to blink even after the unit completes the cycle till it is hot. Please keep the unit connected to AC supply for the indication to be available as long as the plate is hot. The warning light is also supported by a Battery inside which keeps on recharging as the unit remains connected to power. In the event of a partial power failure/power off in between cycle or a cycle finish the battery powers the indication for safety.