OPERATING MANUAL

English

Infrared Hot Plate /Stirrer

WH220-R/WH240-R

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Congratulations!

You have made an excellent choice.

WIGGENS thanks you for the trust you have placed in us.

This operating manual has been designed to help you gain an understanding of the operation and possible applications of our instruments. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Declaration of conformity EN
We declare under our sole responsibility that this product corresponds to the directives ……. and conforms to the following standards or normative documents: EN ISO ……

The WIGGENS Quality Management System

ISO 9001

Certificate Registration No. 01 100084841

Unpacking and Inspecting

Please unpack the device carefully. Inspect them for possible damage. In the case of any damage a damage report should be requested immediately. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

Printed in China Changes without prior notification reserved

Important: keep operating manual for future use

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1. Intended Use

The WH220-R/WH240-R is a magnetic stirrer with heating function with the purpose to control the temperature of a solution and to reach equal temperatures at each point inside the solution. The WH220-R/WH240-R features an accurate and stable heating capacity and a unique liquid drainage above the control board in order to prevent liquids from accessing the system. It also features a memory function for the stirring speed and temperature settings, which helps to enhance the effectiveness of repetitive processes. The round top plate of the stirrer is made of glass ceramic, which has optimal heat conductivity and temperature shock resistance characteristics. The WH220-R/WH240-R features an LCD display for convenient monitoring and parameter settings.

2. Operator Responsibility

Use

- For mixing and/or heating liquids

Range of use

- Laboratories
- Schools
- Pharmacies

This device is suitable for use in all areas except:

- Residential areas
- Areas that are connected directly to a low-voltage supply network that also supplies residential areas.

The safety of the user cannot be guaranteed if the appliance is operated with accessories that are not supplied or recommended by the manufacturer or if the appliance is operated improperly contrary to the manufacturer's specifications.

The products of *WIGGENS* ensure safe operation when installed, operated, and maintained according to common safety regulations. This section explains the potential dangers that may arise when operating the instrument and also specifies the most important safety precautions to preclude these dangers as far as possible.

- The operator is responsible for the qualification of the personnel operating the instrument.
- The personnel operating the instrument should be regularly instructed about the dangers involved with their job activities as well as measures to avert these dangers.
- Make sure all persons tasked with operating, installing, and maintaining the instrument have read and understand the safety information and operating instructions.
- When using hazardous materials or materials that could become hazardous, the instrument must be operated only by persons who are absolutely familiar with these materials and the instrument. These persons must be fully aware of possible

risks.

- Only qualified personnel are authorized to perform configuration, installation, maintenance and repairs of the instrument.
- Routine operation can also be carried out by untrained personnel who should however be instructed by trained personnel.

If you have any questions concerning the operation of your instrument or the information in this manual, please contact us.

2.1 Disposal

At the end of its service life the instrument is to be disposed of in accordance with the local regulations specified for the disposal of electronic industry waste in an environmentally friendly manner.

2.2 CE Conformity

The products described in the operating instructions conform to the requirements of the following European guidelines:

Low voltage regulations with respect to legal harmonization of the member countries concerning electric devices for use within certain voltage limits.

EMC guideline with respect to legal harmonization of the member countries concerning electromagnetic compatibility.

2.3. Technical Specifications

Model	WH240-PLUS	WH240-HT	WH220-R	WH240-R
Display Mode	LCD			
Top Plate Dimensions	180*145 mm	190*150 mm	Ø135mm	Ø135mm
PT100 Sensor Length	170mm			

(standard configuration)				
Top Plate Temperature Range	0 - 380 ℃	0 - 500 ℃	0 - 500 ℃	0~500°C
Solvent Temperature Range (Pt 100 Sensor)	0~200°C	0~300°C	0~300°C	0~300°C
Safety temperature Range	+50~370°C	+50~550°C	550°C	+50~550°C
PID	2 sets	2 sets	1 set	2 sets
Temperature Stability (PT100 Sensor)	±2°C			
Rotating Speed	100-1200rpm			
Interface type	USB			
Electrical Output	AC 220 Volts, 60 Hz, 4A			
Max power	500W	600W	600W	600W
Maximum Volume	20 L (5.3 US Gallons, 4.2 UK Gallons)			
Timer(min)	1-999 / continuous			
Housing	Splash Proof			
Order No.	400400	400401	400500	400501

All measurements have been carried out at the stated voltage, frequency, and an ambient temperature of 25°C.

Technical changes without prior notification reserved.

WIGGENS Order Numbers consist of the Basic Order Number (BON) and the Order Number Addition (ONA) which explains different characteristics of the product that can vary from country to country. Order Numbers as stated on the product label and box label are stated as Full Order Numbers (FON), consisting of the BON followed by the ONA. For a full explanation of the ONA of your product, please ask your local WIGGENS support or refer to the Order Number Guide in the *WIGGENS* General Catalog.

3. Safety Instructions

3.1. Explanation of Safety Notes

In addition to the safety warnings listed, warnings are posted throughout the operating manual. These warnings are designated by an exclamation mark inside an equilateral triangle. “Warning of a dangerous situation (Attention! Please follow the documentation).”

Symbol	Additional term / Description
Warning signs 	The danger is classified using a signal word. Read and follow these important instructions for averting dangers. **Warning!** Describes a **possibly** highly dangerous situation. If these instructions are not followed, serious injury and danger to life could result.
	Caution! Describes a **possibly** dangerous situation. If this is not avoided, slight or minor injuries could result. A warning of possible property damage may also be contained in the text.
	Notice! Describes a **possibly** harmful situation. If this is not avoided, the product or anything in its surroundings can be damaged.
	**Note!** Draws attention to something special.
	**Important!** Indicates usage tips and other useful information.

3.2. For your protection

- Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your instrument.
- Keep the operation instructions in a place where they can be accessed by everyone.
- Ensure that only trained staff work with the appliance.

- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- Socket must be earthed (protective ground contact).
- Make sure the product is checked for proper condition regularly (depending on the conditions of use). Regularly check (at least every 2 months) the proper condition of the mandatory, warning, prohibition and safety labels.
- Connect the instrument to a power socket with earthing contact (PE-protective earth).
- The power supply plug serves as a safe disconnecting device from the line and must always be easily accessible.
- Do not stay in the area below the instrument.
- Never operate damaged equipment.
- Never operate instruments with damaged mains power cables.
- Observe all warning labels.
- Never remove warning labels.
- Be aware of tripping. Never route the connection cable in highly frequented areas.
- Be aware of possible cable damage.
- Repairs are to be carried out only by qualified service personnel
- Always turn off the instrument and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the instrument.
-  Warning ! This is not an explosion proof instrument. Do not use with any highly flammable or explosive materials.
-  Warning ! Risk of burns!

  Exercise caution when touching the housing parts and the heating plate. The heating plate can reach temperatures in excess of 500 °C. Pay attention to the residual heat after switching off.
- Please make sure that the mains cable does not contact the heating plate.
-  Warning ! Effects of the magnetic field have to be taken into account.(e.g. data storage media, cardiac pacemaker…)
- The hot plate / stirrer must only be operated in the presence of an exhaust system!

  （When heating with volatile samples, e.g. silicone oil）

- Never operate the hot plate/stirrer in wet areas!
- Be aware of the danger of electric shocks!
-  Warning ! Be aware of the potential danger of a fire outbreak due to overheating!
-  Warning ! Wear your personal protective equipment in accordance with the hazard category of the media to be processed. Otherwise there is a risk from:
  - Splashing and evaporation of liquids
  - Ejection of parts
  -Release of toxic or combustible gases.
-  Warning ! When in an emergency, disconnect the main power plug.
- Gradually increase the speed.
- Reduce the speed if:
  - The medium splashes out of the vessel because the speed is too high
  - The appliance is not running smoothly
  - The container moves on the base plate.
- **Caution!** Only process and heat up any media that has a flash point higher than the adjusted safe temperature limit that has been set (550 ℃).
- The safe temperature limit must always be set to at least 25℃ lower than the fire point of the media used.
- Beware of hazards due to:
  - Flammable materials
  - Combustible media with a low boiling temperature
  - Glass breakage
  - Incorrect container size
  - Overfilling of media
  - Unsafe condition of container.
- The base plate can heat up due to the action of the drive magnets at high motor speeds, even if the heater is not operational.
- Process pathogenic materials only in closed vessels under a suitable extractor hood.

- Only process media that will not react dangerously to the extra energy produced through processing. This also applies to any extra energy produced in other ways, e.g. through light irradiation.
- Please observe the operating instructions for any accessories used.
- Ensure that the external temperature sensor (PT 100) is inserted in the media to a depth of at least 30 mm.
- The PT 100 external temperature sensor must always be inserted in the media when connected.
- Safe operation is only guaranteed with the accessories described in the “Accessories” chapter.
- Accessories must be securely attached to the device and cannot come off by themselves. The center of gravity of the assembly must lie within the surface on which it is set up.
- When using PTFE-coated magnetic bars, the following has to be noted: Chemical reactions of PTFE occur in contact with molten or solute alkali metals and alkaline earth metals, as well as with fine powders of metals in groups 2 and 3 of the periodic system at temperatures above 300 ℃ –400 ℃ . Only elementary fluorine, chlorotrifluoride and alkali metals attack it; halogenated hydrocarbons have a reversible swelling effect.

3.3. For protection of the equipment

- You have received a product designed for industrial and experimental use. Nevertheless, avoid strikes to the housing, vibrations, damage to the operating-element panel, and contamination.
- Make sure that the mains power supply has low impedance to avoid any negative effects on instruments being operated on the same mains.
- Do not expose the unit to sunlight
- Sudden drops may cause damage in the interior of the instrument.
- Transport the instrument with care.
- The device can be damaged when sucking in aggressive gases or vapor through the installed ventilator.
- Press the power button to interrupt the stirrer, rather than disconnect the main power

plug directly.

- The voltage stated on the nameplate must correspond to the mains voltage.
- Do not cover the device, even partially e.g. with metallic plates or film. This results in overheating.
- Protect the appliance and accessories from bumps and impacts.
- Ensure that the base plate is kept clean
- Observe the minimum distances between devices, between the device and the wall and above the assembly (min. 800 mm).

4. Operating Procedures

4.1. Environmental Operating Conditions

The Infrared Hotplate / Stirrer must operate in the following conditions:

- Indoors
- Altitudes up to 2000 meters
- Temperatures from +5°C to +40°C
- Maximum relative humidity 80% for temperatures up to +31°C, linear decrease down to 50% relative humidity at a temperature of +40°C
- Max. mains fluctuation of ±10 % are permissible
- Protection class according to EN 60 529: IP31
- The unit corresponds to Class I
- Overvoltage category II

4.2. Installation

4.2.1. Installing the Infrared hot plate /stirrer

Place the hot plate/ stirrer on a stable, flat surface and proper environment for operation.

- If a PT100 temperature sensor package was ordered:

- Install the sensor holder into the screw inlet on the back of the hot plate / stirrer

- Place the clamp onto the holder and tighten the screw connecting the holder and the clamp

- Mount the Pt100 temperature sensor on clamp and tighten the screw connecting the temperature sensor and the clamp

- Connect the PT100 temperature sensor cable to the corresponding connector in the back of the hot plate / stirrer

- Connect the stirrer to the power supply. The power supply voltage, frequency and current are respectively AC 220V、60Hz、4A.
- Connect the power supply to a power socket with earthing contact.

4.2.2.The dimensions of the infrared hot plates/stirrer （after connect PT100Teperature sensor）

Caution!

- Do not use voltages that are higher or lower than 10% of the voltage specified on the label, which is on the backside of the instrument.
- Keep the power cord and temperature sensor cable off of the hot plate while heating.
- Put the solution on the top plate before operating the instrument.
- Heating corrosive liquids under poor ventilation hoods will shorten the life of the electronic components inside the instrument.
- Upon the first heating operation, a particular smell and white smoke can appear. This is normal. Put the instrument under a fume hood and moderately heat for about one hour until the smell and smoke fully disappear.
- If toxic gases are released, air circulation must be kept.

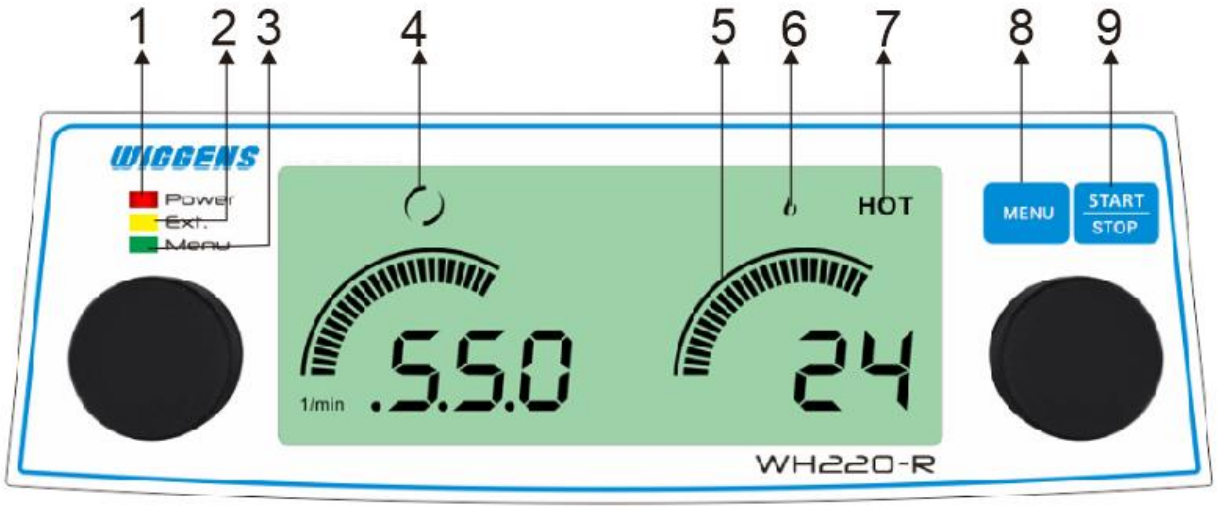
- The safe temperature limit must always be set to at least 25℃ lower than the fire point of the media used.

4.3. Operation

4.3.1. Overview of the Infrared Hot Plate / Stirrer

No.	Description
1	Installation rod for Temp. Sensor
2	PT100 Temp. Sensor
3	Heating Top Plate Clamp for Temp. Sensor
4	Heating Block (if ordered)
5	Instrument Housing
6	Right Control Knob
7	Main Switch
8	Left Control Knob
9	Operation Panel

4.3.2. Indicators and Functional Elements



1	Power	**Power Indicator** indicates that the power switch is turned on
2	Ext.	**External Temperature Sensor Indicator** Indicates that an external temperature sensor is connected
3	Menu	**Menu Indicator** Indicates that the menu is opened
4		**Stirrer Indicator** Indicates that the stirring function is on
5		**Bar graph** Indicates the control activity of the stirring function, heating function, or timer.
6		**Heater Indicator** Indicates that the heating function is on.
7	HOT	**Residual Heat Indicator** Warning sign stating that the heating zone is hot.

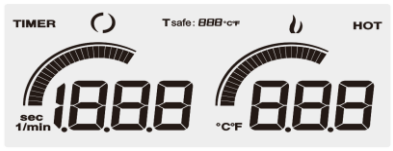
8	MENU	**MENU Button** Press the MENU Button to access the following functions: overheating protection temperature(must connected a temperature sensor), Timer, PID, and BACKLIGHT Note: The BACKLIGHT function cannot be set for WH220-R/WH240-R model
9	START / STOP	**START / STOP Button** Press the START / STOP Button to start or stop the instrument.

4.3.3. Explanation about The safety temperature and setting temperature

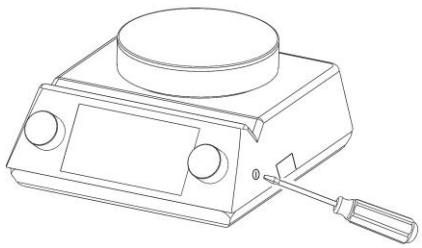
If the safety temperature has been set, the setting temperature of the hot plate or the setting temperature of the solution (with the external temperature sensor) can only be set to a temperature 15℃lower than the safety temperature. The actual maximum hot plate temperature can only reach a temperature15℃ lower than the safety temperature also.

	**Note!** 1. The maximum setting temperature can be adjusted with the “T safe “screw. 2.The safety temperature must always be set at least 25℃ lower than the flash point of the media to be processed!

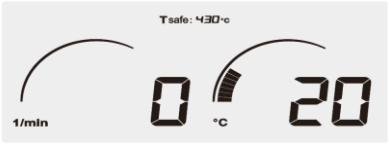
Operation of the Safety temperature Function



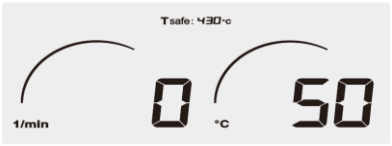
- Switch the hot plate / stirrer on by pressing the main switch on the right side of the instrument
- The display lights up



- Rotating the Knob (near the main switch) by screwdriver to set the safety temperature (turn clockwise to increase the value anti-clockwise to decrease the vale). The Safety temperature can be set from 50 to 550℃).



e.g. actual temperature

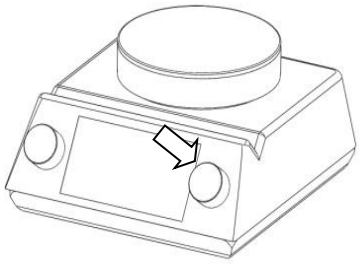


e.g. set temperature 50

- The set temperature and actual temperature will be displayed alternately at the right side of the LCD screen.
- Once the heating temperature reaches the safety temperature, the heating element will stop working and sound an alarm (the stirring function will not affected and continue to work).

4.3.4. Operation of the Heater without a Temperature Sensor

1.Switching the Heater on



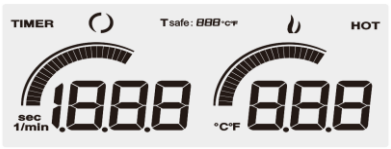
- Plug in power.
- Switch the hot plate / stirrer on by pressing the main switch on the right side of the instrument

e.g. The model of the instrument

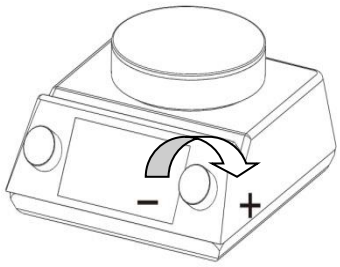
- The display lights up and shows the model and software version of the instrument(e.g. 240.R and v11)

e.g. the software version

- If no heating temperature is selected, The display shows the last set temperature;

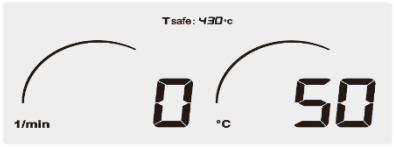


2.Selecting a Heating temperature



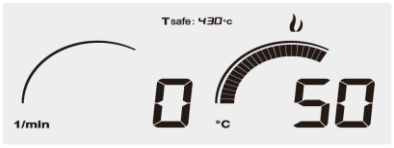
e.g. Right Control Knob

- If the instrument is operated without a temperature sensor, then the instrument will enter the internal temperature control mode (The temperature sensor will detect the internal temperature of the top plate).
- Select the desired heating temperature using the Right Control Knob (turn clockwise to increase the set value, turn anti-clockwise to decrease the set value).
- The set temperature will be displayed on the LCD screen and the bar graph indicate the heating state. (E.g. Set temperature is 50℃).



e.g. Set temperature is 50℃

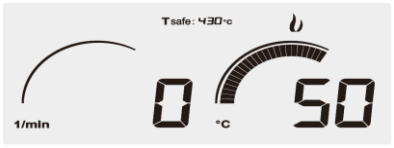
- After set a higher temperature, the heating temperature will continue to rise until reach the set value.
- The display now alternates between the set temperature and actual temperature (the set value display 3 seconds and the actual temperature display 5 seconds).



The temperature up to 50℃

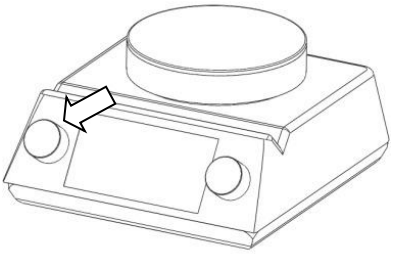
- Both bar graph and digits appear together, that indicates the actual temperature; when Digits appear alone that indicates the set temperature.
- After reaching the set temperature, the heating element will be working intermittently, to ensure the temperature stability.

3.Setting the Stirring Speed

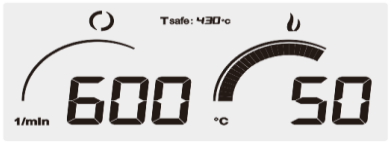


e.g. The last set point of RPM is “0”

- The display will shows the last set point of RPM



- By using the left Control Knob to set the stirring speed (turn clockwise to increase the set value, turn anti-clockwise to decrease the set value)
- The stirring speed can be set from 100 to 1200 rpm.



e.g. The Set “RPM” is 600

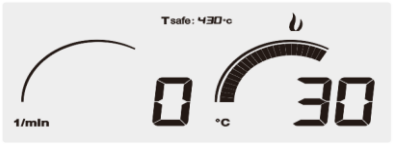
- After press the start/stop button, the stirring function will be started
- Then The bar graph will indicate the stirring state simultaneously

e.g. The current “RPM” up to 600

4.Switching off the Heater

e.g. Display Indicates“0”

- Press the start/stop button again, and respectively twist the two Control Knobs anticlockwise until the display Indicates“0”
- The heater is now switched off.



e.g. The Residual Heat Indicator continues to light up

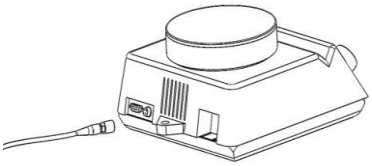
- The Residual Heat Indicator continues to light up as long as the glass-ceramics heating zone is still hot
- The installed ventilator continues to operate until the heating zone has cooled down completely.

	**CAUTION!** Residual heat! Do not touch the heating zone! Risk of overheating! Do not pull out the mains plug! Do not unplug and turn off the mains of the hot plate before the heating zone has completely cooled down, then turn off the mains switch and pull out the mains plug.

4.3.5 Operation of the Heater with a Temperature Sensor

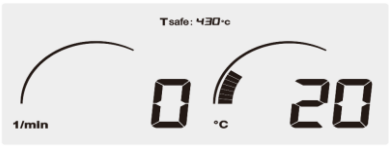
	Note! **In contrast to operation without temperature sensor, the laboratory hot plate now features:** ● Automatic temperature control instead of fixed heating temperature controlled by the heating power. ● Temperature display alternating between set temperature and actual temperature instead of showing the heating stage

1.Connecting the Temperature Sensor



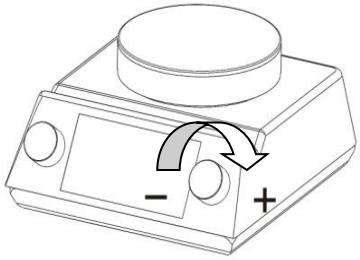
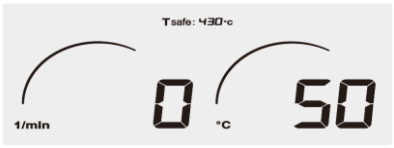
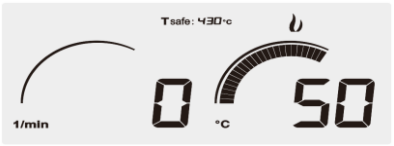
- Make sure that the hot plate / stirrer is completely switched off.
- Be sure to use the correct temperature sensor
- Connect the temperature sensor at the rear of the hot plate / stirrer
- Make sure that the cable of the temperature sensor is routed so that it cannot touch the heating zone.
- Immerse the temperature sensor into the liquid min.30 mm in depth.

2.Switching on the Heater



e.g. actual temperature is 20 ℃

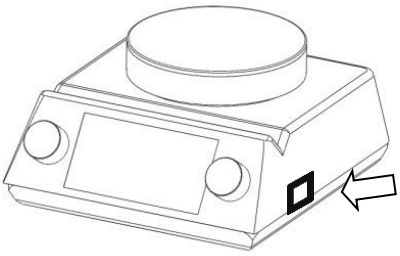
- Refer to 4.3.4 for how to turn on the heater, except for the following two points.
- If the temperature sensor is correctly connected, the External Temperature Sensor Indicator is lit up
- The display lights up and shows the actual temperature measured by the temperature sensor at that time

3.Setting the Temperature	
	Select the desired temperature using the Right Control Knob (turn clockwise to increase the temperature). The maximum set temperature is 300°C
 e.g. set temperature is 50 ℃	Now the instrument will enter the external temperature control mode(to measure and control the temperature of the solution accurately) The maximum set temperature is 300°C
 e.g. The actual temperature up to 50℃	
4.Setting the Stirring Speed	Please refer to 4.3.4
5.Switching off the Heater	Please refer to 4.3.4

4.4 The MENU Function

	**Note!** ● The following functions in addition to the Timer Function are only available if a temperature sensor is connected. ● The timer function can only be accessed when both the stirrer function and the heater function are on

1.Switching the hot plate / stirrer on



- Switch the hot plate / stirrer on by pressing the main switch on the right side of the instrument

2.Setting of the MENU Function

a. Timer Function

- The timer function can only be accessed when both the stirrer function and the heater function are off
- Press the MENU Button, turn the right Control Knob until the right display shows “tm”
- Turning the Left Control Knob to set the required time ,turn clockwise to increase the set value and anti-clockwise to decrease ,the residual time can be set by 1 minute（The timer setting range can be from 1min to 999min ）.
- Press the “MENU” Button again to exit the Menu function
- Make sure the Menu Indicator is not lit anymore
- Proceed with the setting of other parameters
- Press the START / STOP Button to start the stirring / heating process (Please note that the timer only starts as soon as the heater has reached the set temperature)
- The Timer can be stopped by pressing the MENU Button and turning the Left Control Knob counter-clockwise until it reaches “0” (Zero).

The “timer” interface

e.g. the set “timer” is 10 min

b. Overheating Protection Temperature Range

- Turn the right Control Knob until the right display shows “dt” (ΔT).
- Turn the Left Control Knob to select the desired temperature value (The “dt” (ΔT) can be set from 10 to 50).

- Turn the Left Control Knob to select the desired temperature value
- An alarm will activate when the actual temperature exceeds the set temperature and the gap is larger than “dt” (ΔT), the heating element will stop working and sound an alarm but the stirring function will not affected and continue to work.

c. PID Function(only for 240 model)

Note:

For the best temperature control performance, two sets of PID parameters are provided, in order to heat different volume of the solution in a short time and an optimized stability. The PID can be selected based on the following data

1) 200ml - 1000 ml silicon oil, or 100ml -300ml water, used for heating small amount of media.

2) More than1000ml silicon oil, or more than 500ml water, used for general heating purpose.

The default setting is PID 1.

e.g. the set “PID” is 1

- Turn the right Control Knob until the right display shows “PID” (1)
- By turning the Left Control Knob to select the PID1 or PID 2

e.g. the set “PID” is 2

d. BACKLIGHT Function

e.g. the set “bl” is 10

- Turn the right Control Knob until the right display shows “bl”
- The function is adjusted by turning the Left Control Knob (turn clockwise to increase the brightness anti-clockwise to decrease, the “bl” can be set from 1 to 10).

3.Proceed with the setting of other parameters

- Press the MENU Button again to exit the Menu function
- Make sure the Menu Indicator is not light anymore
- Press the START / STOP Button to start the stirring / heating process

4.4.1. Pt100 Temperature Sensor Calibration

The Pt100 temperature sensor can be connected to measure and control the heated liquid temperature. The sensor has been initially calibrated in the factory. If the measured temperature is slightly different from the temperature standard you are using, a follow-up calibration is also possible with the following steps.

Calibration Procedure

e.g. the measured temperature is 24 ℃

- Plug the PT100 temperature sensor into the designated input and turn on the main power switch
- Put the PT100 sensor and third-party thermometer in the temperature environment of T1, (e.g. 300 ml silicone oil, the temperature stability at 24 degree, this value should be measured by the third-party thermometer)

The display Indicates“0”

- twist two Control Knobs anticlockwise until the display Indicates“0”

- Press the right control knob 5 times to enter the calibration mode, then LCD screen light up and the right side digital display shows “S1”, “S1” means Set 1(The first setting temperature for calibration).

	◆ the left side display shows its corresponding AD read value
 e.g. the “T1” is 24℃	◆ Wait for the temperature to reach and equilibrium(24℃) ◆ refer to the shows value on third-party thermometer and twist the right side control knob to set the actual value of T1 (e.g. Set to 24)
	◆ Press the right control knob again, the display shows “S2” “S2” means Set 2(The second setting temperature for calibration).
	◆ Put the PT100 sensor and third-party thermometer in the temperature environment of T2, (e.g. 300 ml silicone oil, the temperature stability at 151 degree, this value should be measured by the third-party thermometer) ◆ the left side display shows its corresponding AD read value
	◆ Wait for the temperature to reach an equilibrium ◆ refer to the shows value on third-party thermometer and twist the right side control knob to set the actual value of T2 (e.g. Set to 151)
 e.g. The model of the instrument  e.g. the software version	◆ Press the right side control knob to complete the calibration，then the LCD screen will show the model and software version again,

4.5. The USB interface

The instrument can be connected to a PC trough the COM port which is using the USB connection, it can be plug directly to the PC's available USB connection.

1. We provide USB port COM port driver and installation instructions, the drive can be downloaded from the following address.

Driver download address:

http://www.ftdichip.com/Drivers/VCP.htm

Installation instructions download address:

http://www.ftdichip.com/Support/Documents/InstallGuides.htm

2. RS-232command set

Item	Input / output	Content of "#"	Meaning	Remarks
Set the equipment parameters				
Set temperature unit	set to #↵	0	℃	
Set temperature	out_sp_00 ###↵	Decimal number	——	Unit: ℃ or ℉(set by equipment)
Set speed	out_sp_01 ###↵	Decimal number	——	Unit: RPM
Set state	out_mode_05 #↵	0	stop	
		1	start	

Timing sending once every 3 seconds, Temperature unit: ℃, It has nothing to do with the equipment settings				
internal control	rs ### ### ↵	Decimal number	Internal temperature, speed	eg: rs 1000 120 means current Internal temperature100.0℃, speed 120RPM
External control	prs ### ### ### ↵	Decimal number	External temperature, Internal temperature, speed	eg: prs 800 1000 120 means current External temperature 80.0℃, Internal temperature 100.0℃, speed 120RPM
Send “status” will return the following information				
Current setting temperature	set to_00 ### ↵	Decimal number	——	Unit: ℃ or ℉(set by equipment)
Current setting speed	in_sp_01 ### ↵	Decimal number	——	
Current set temperature unit	setto # ↵	0	℃	
		1	℉	
Current setting status	status # ↵	0	stop	
		1	start	
When the alarm will be sent to the following information				
alarm	status # ↵	03	Internal temperature exceeds the	

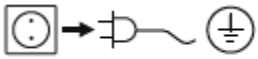
			upper limit	
		04	Control temperature over-temperature	
		06	Motor speed anomaly	
		07	Safety temperature overrun	

5. Cleaning and Maintenance

5.1. Routine Cleaning

The device is maintenance-free.

Cleaning

 For cleaning disconnect the main plug.

Only use cleansing agents which have been recommended by *WIGGENS*

Use to remove:

Dyes	isopropyl alcohol
Construction materials	isopropyl alcohol/water containing surfactant
Cosmetics	isopropyl alcohol/water containing surfactant
Foodstuffs	water containing surfactant
Fuels	water containing surfactant

- Do not allow moisture to get into the appliance when cleaning.
- Wear protective gloves when cleaning the devices.
- Before using another than the recommended method for cleaning or decontamination, the user must ascertain with *WIGGENS* that this method does not destroy the instrument.

Note!

Do not use chlorine bleach, chlorine-based cleanser, abrasives, ammonia, steel wool or scouring pads with metal content or similar harsh solvents or abrasives. These may damage the surface of the instrument.

5.2. Maintenance

Do not attempt to service or repair a *WIGGENS* Infrared hot plate/stirrer. If the Infrared hot plate /stirrer housing is opened the warranty becomes void. Contact *WIGGENS* for return authorization and return instructions.

Ordering spare parts

When ordering spare parts, please give:

- Machine type
- Manufacturing number, see type plate
- Item number and designation of the spare part.

Repair

Please only send devices in for repair that have been cleaned and are free of materials which might present health hazards. For this, use the “certificate of compliance” form which you can obtain from *WIGGENS*. If your appliance requires repair, return it in its original packaging. Storage packaging is not sufficient when sending the device - also use appropriate transport packaging.

6. Transport and Storage

- Clean the hot plate/stirrer so that it is free from any materials which may be harmful to the health. Provide a material safety data sheet where appropriate.
- Place the hot plate/stirrer unit and its parts into the original packing or a container with necessary protection to prevent damage during transport. Seal the original packing or container with packing tape.

- Store the packed unit in a dry place.

CAUTION!

Failure to clean, maintenance, and handle the hot plate / stirrer as outlined can lead to damages or be harmful to the health.

7. Accessories and Spare Parts

7.1 Temperature Sensor and Holder

Model	Description	Order No.
PT100 Temperature sensor, Type I	Length: 170 mm; Diameter: 4 mm; Material: Stainless steel; Admissible temperature: -30 ~ +300°C	PT100-01
PT100 Temperature sensor, Type II	Length: 300 mm; Material: Stainless steel	PT100-02
PT100 Temperature sensor, Type III	Length: 150 mm; Material: Stainless steel, PTFE coated	PT100-03
PT100 Temperature sensor, Type IV	Length: 300 mm; Material: Stainless steel, PTFE coated	PT100-04
PT100 Temperature Sensor, Type VI	Length: 250 mm; Diameter: 4 mm; Material: Glass; Admissible temperature: -30 ~ +300°C	PT100-06
Holder for Temperature Sensor	Holder and clamp for PT100 temperature sensor; Suitable for WH240-PLUS/WH240-HT/WH220-PLUS/WH220-HT/WH220-R/WH240-R	PT100-05

7.2 Silicone Protective Cover

Model	Description	Order No.
Silicone protective cover Type I	Material: Silicone, square hole on the top surface Suitable for WH240-PLUS/WH240-HT/WH220-PLUS/WH220-HT	400-001

Silicone protective cover Type II	Material: Silicone, round hole on the top surface Suitable for WH220-R/WH240-R/WH240-R	400-002

7.3. Stir Bar and Retriever Examples

Model	Description	Order No.
Cylindrical Stirrer Bars		001.110.6
Plain Stir Bars		001.210.6
Octahedral Stir Bars		001.513-R/B/Y
Micro Stir Bars		001.802
Colored Micro Stir Bars		001.802-R/B/Y
Oval Stir Bars		001.610
Octaoval Stir Bars		001.3319
Cylindrical Stir Bars With a Removable Pivot Ring		001.1712
Tapered Stir Bars		001.1910

Double Ended Stir Bars (Natural)		001.1335
Double Ended Stir Bars (Colored)		001.1335-R/B/Y
Triangular Stir Bars		001.412
Ribbed Triangular Stir Bars		001.1812
Test Tube Wings		001.2201.1
Cross-Shaped Stir Bars		001.2401
Crosshead Stirrer Magnets(Double Sided)		001.1110
Crosshead Stirrer Magnets(Single Sided)		001.1110.1
Hub Stirrer Magnets		001.2301
Tube Stirrer Magnets		001.1609
Disc-Shaped Stirrer Magnets		001.709

Spherical Stirrer Magnets		001.1512
Glass Encased Stir Bars		001.1206
Extra Large Stir Bars		001.0120
Stir Bar Sets (18 Bars)		001.3003
Rare Earth ‘Turbo’ Stir Bars		001.2610.RE
Stir Bar Retrievers		004.150

	For more information about Accessories please contact your local supplier
	**CAUTION!** For safety and guarantee reasons only original accessory parts are to be used!

8. Service

8.1. Trouble-Shooting

Cause	Remedy
After switching on the unit, the display	1. Ensure that the mains electricity plug is plugged into a working socket outlet and check if the main switch is in

shows no light and the hot plate / stirrer does not react to any input.	the “on” position. 2. Open the fuse holder of the power cord, which you can find at the back of the instrument. If the fuse is damaged, replace it with a 4A / 230V fuse. Clean the holder before your replacement. 3. If the fuse is not damaged and the malfunction cannot be determined, please contact the *WIGGENS* support.
After switching on the unit, the power switch is lit up, but the display shows a blank screen.	1. This is probably a malfunction of the control board. Please contact the *WIGGENS* support.

WIGGENS reserves the right to carry out technical modifications with repairs for providing improved performance of the instrument.

8.2. Warranty

In accordance with *WIGGENS* warranty conditions, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs. The warranty does not cover wearing parts, nor does it apply to faults resulting from improper use or insufficient care and maintenance contrary to the instructions in this operating manual.

WIGGENS reserves the right to decide the validity of any warranty claim. In case of faults arising either due to faulty materials or workmanship, parts will be repaired or replaced free of charge.

Any other compensation claims, such as consumables, damages caused by corrosion or accidental breakage, are excluded from this guarantee.

This warranty may only be altered by a specifically published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments.

8.3. Contact /Technical Service

If your device is not working properly:

⇨ Please inform *WIGGENS* Instruments by using our contact information.
You have contacted *WIGGENS* Instruments?

⇨ Copy and complete the Conformation of condition of unit from these operating instructions.

⇨ Please repack the device appropriately for transport and send to *WIGGENS* Instruments together with the Confirmation of condition of unit.

Our contact details

Room 303, Hall C, Office Building M8, No. 1 Jiuxianqiao East Road, Chaoyang District, Beijing 100015, China
Tel: +86 400-809-2068
Fax:+86 400-809-2068-112
info@ wiggens.com
service@wiggens.com
www.wiggens.com

Confirmation of condition of unit

⇨ In the case of repair, copy and complete the Conformation of condition of unit and send it to *WIGGENS* Instruments.

1. Details about the unit

Product number _____

Serial number _____

Reason for repair _____

_____

2. Has the device been cleaned, decontaminated/sterilized?

Yes No

3. **Is the unit in a condition which does not represent any health threats for the staff of our service department?**

Yes No

f not, which substances has the unit come into contact with?

_____

_____

4. Legally binding declaration

The customer is aware of being legally liable to *WIGGENS* Instruments for any damages arising from incomplete and incorrect information.

Date Signature

Company stamp _____

Please note The shipper is responsible for the return of the goods in well packed condition, suitable for the mode of transport.

Sender information

Name, first name _____
Company _____
Department, research group Street _____
Zip code, city _____
Country _____
Phone _____
E-mail _____