

## CG-1990-14 Analog Hot Plate Stirrer



**CHEMGLASS**

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### Guarantee

You have purchased an original Chemglass machine which meets the highest engineering and quality standards.

In accordance with Chemglass guarantee conditions, the guarantee period is 24 months. For claims under the guarantee please contact Chemglass Technical Service Dept to obtain a Return Authorization Number (RA#). You will be liable for freight costs.

### Safety Instructions

Caution: Never heat up any medium with ignition point higher than the fix adjusted safety temperature limit. Value for safety temperature limit is listed under "Technical data" on page 7.

The instrument may not be operated in rooms with explosion hazard.

Furthermore, it must be placed upon a fireproof surface that is not able to burn.

Please make sure that the main cable does not contact the heating plate! **Attention - Magnetism!** Effects of the magnetic field have to be taken into account (e.g., data carriers, cardiac pacemakers).

When using PTFE-coated magnetic bars, the following has to be noted: Chemical reactions of PTFE occur in contact with molten or dissolved alkaline and alkaline earth metals, as well as with fine-particled powders of metals of the 2. and 3. group of the periodical system at temperatures above 300-400°C.

Only elementary fluorine, chlorine trifluoride and alkaline metals do attack PTFE, halogen hydrocarbons have a reversible swelling effect. *Source: Rompps Chemie-Lexikon and "Ullmann" Bd.19.*

Exercise caution when touching the housing parts and the heating plate! Risk of burns! The heating plate can reach temperatures in excess of 300°C. Please beware of possible danger due to release of toxic or flammable gases caused by heated medium.



### Proper Use

The Chemglass Analog Hot Plate Stirrer is a stirring instrument with heating function. It is used in the chemical industry, in laboratories, in schools, as well as in pharmacies. The instrument is suitable for tempering substances which are placed on the heating plate in vessels. By means of a built-in stirring drive and with the help of a magnetic bar within the vessel, the substances can be stirred at the same time. The mixing intensity is dependent on the motor speed and on the size of the magnetic bar.

## Unpacking

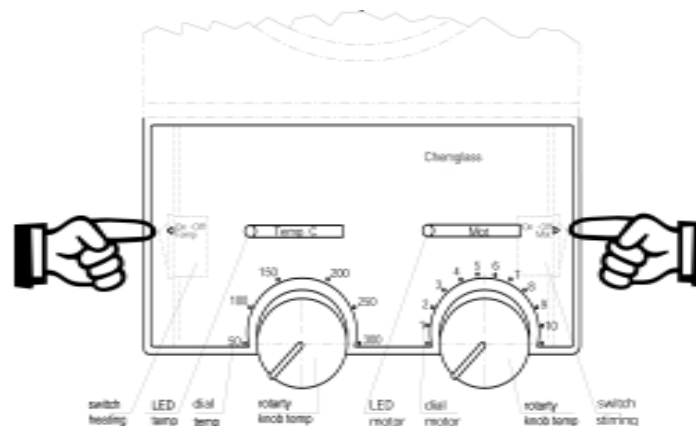
Please unpack the equipment carefully and check for any damage. It is important that any damage which may have occurred during transport be ascertained when unpacking. If applicable, a fact report must be faxed immediately to 800-922-4361.

The delivery scope covers Chemglass Analog Hot Plate Stirrer and operating instructions.

## Commissioning

Check whether the voltage specified on the type plate matches the main voltage available. The power socket used must be grounded (protective earth conductor contact). If these conditions are met, the device is ready to operate after plugging in the main plug. If these procedures are not followed, safe operation cannot be guaranteed and/or the equipment may be damaged. Observe the ambient conditions (temperature, humidity, etc.) listed under "Technical Data."

## illustration1



## Starting

After the instrument has been switched on, it is in standby operation. The functions of heating and stirring are started with the help of switches on the left and right bottom of the housing (see illustration 1).



## Function Heating

The temperature of the heating plate is kept constant by a control circuit. In addition, it is monitored by a safety circuit. The required temperature sensor - a thermocouple - is installed in the heating plate.

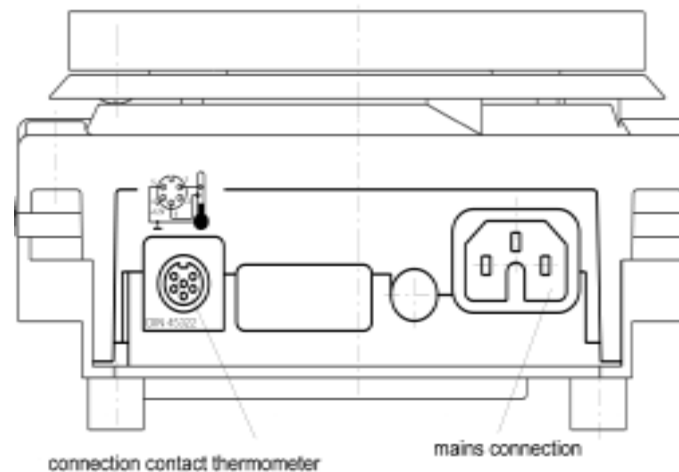
The instrument is equipped with a silumin heating plate with a heating power of 600 watts. The surface of the heating plate is polished in order to facilitate cleaning. This surface gets coated rather quickly with an aluminum oxide protective layer which is chemically resistant.

The heating function is switched on or off by its corresponding switch. When the heating function is switched on, the temperature LED shines green. The temperature of the heating plate is set on the rotary knob temperature with its corresponding dial (0-300°C). The heating plate is heated to the temperature set on the rotary knob. During the heating phase, the color of the temperature LED changes from green to orange (orange = supply of energy to heating plate; green = set temperature is reached).

In the event of a disturbance in the control circuit, the heating plate is permanently cut off by the safety circuit.

PLEASE NOTE! The heating plate only heats up if the contact plug has been plugged in (the contact plug is permanently attached to the instrument), or if an ETS-D and/or a contact thermometer has been connected. (see illustration 2)

illustration2



### Controlling the Medium Temperature via ETS-D or Contact Thermometer

The control of the medium temperature via ETS-D or contact thermometer is preferred. Its advantages are: a short heating-up phase after setting the rated temperature, practically no temperature drift, and only a minor temperature waviness. The medium temperature is optimized with the aid of a **FUZZY Logic Controller**, which means, that in a steady state any overshooting of the temperature is reduced to a minimum.

The rear of the instrument houses the diode bushing for connection to the ETS-D or contact thermometer, or for plugging the contact plug (see illustration 2).

**The electronics of the instrument supply a test current that has to flow over plug pins 3 and 5 of the diode bushing in order for the heating plate to heat.**

#### Safety contact thermometers

acc. to DIN 12 878 class 2 or acc. Gerstel are connected with a three-wire cable, the test current flows through the contact thermometer.

#### Safety function:

If the test current is interrupted due to breakage of the contact thermometer or disconnection of the cable plug, the heating cuts off. The required plug allocation is indicated on a reference plate above the diode bushing.

#### Contact thermometer without safety circuit:

acc. to DIN 12 878 class 0. The instrument only heats if the test current circuit is closed by an electrical connection of the plug pins 3 and 5.

#### 2-wire connecting cables:

Connect plug pins 3 and 5 of the instrument plug.

#### 3-wire connecting cables:

Here the test current circuit can also be produced in the terminal head of the contact thermometer (connect plug pins 2 and 3). A 3-wire cable with the required bridge is available (See Accessories).

The **rated temperature** is set on the **contact thermometer** by means of the rotary magnetic head, whereby the upper edge of the traveling nut is the reference point on the rated value scale. The required **surface temperature of the heating plate** is preselected on the temp rotary knob of the instrument. If the **temp rotary knob** is set to the maximum adjustable temperature, the heating takes place as rapidly as possible, yet the medium temperature overshoots the rated value set on the contact thermometer. If the temp rotary knob is set to twice the rated value (e.g. with a rated value of 60°C the temp-rotary knob is set to 120°C), the result is a good compromise between rapid heating and overshooting.

If the temp-rotary knob is set precisely to the rated temperature, the medium does not reach the rated temperature owing to a drop in temperature between heating plate and medium.

The **rated temperature** is set on the **ETS-D**. When using the ETS-D, there is no overshooting of the medium temperature.

### Function Stirring

The stirring function is started and stopped by its corresponding switch. The motor speed is set on the rotary knob with its dial from 1 to 10. If the motor is switched on, it runs to the speed set on the rotary knob, and the LED beside the imprint turns green.

The dial from 1 - 10 conforms with a speed range from 50 -1100 1/min. When idling, the speed is 1100 1/min at maximum setting of the rotary knob (right-hand stop).

If the viscosity increases during the process, the speed drops a little. If the viscosity decreases, e.g., due to adding fluid media, the speed increases a little. By resetting the rotary knob, both of these cases can be balanced, as long as the torque does not exceed its maximum.

Please note that the main fluctuations within the permissible tolerance also affect minor fluctuations of the speed.

### Maintenance and Cleaning

The Chemglass Analog Hot Plate Stirrer is basically maintenance-free. It is subject only to the natural wear and tear of components and their statistical failure rate.

When ordering spare parts, please give the manufacturer number shown on the type plate, the machine type, and the name of the spare part. Please send in equipment for repair only after it has been cleaned and is free of any materials which may constitute a health hazard. To remove, use the following:

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

For materials which are not listed, please request information from Chemglass. Wear the proper protective gloves during cleaning of the devices. Electrical devices may not be placed in the cleansing agent for the purpose of cleaning. Before using a non-recommended method for cleaning or decontamination, the user must ascertain with the manufacturer that this method does not destroy the instrument.

### Associated Standards and Regulations

Construction in accordance with the following safety standards  
 EN 61 010-1 UL 3101-1 CAN/CSA C22.2 (1010-1)

Construction in accordance with the following EMC standards  
 EN 50 082-1 EN 55 014 EN EN 60 555-2; -3  
 EN 50 081

Associated EU guidelines  
 EMC-guidelines: 89/336/EWG  
 Machine guidelines: 73/023/EWG

### Accessories

RS 1	set of stirring bars	H16V	support rod
RSE	PTFE stirring bar remover	H 43	contact safety device
R 380	stand support	H 15	bath top
R 360	holding fork	ETS-D	IKATRON
H 36	holding rod	H 44	cross sleeve

### Recommended IKA-stirrers

TRIKA-stirrers PTFE, triangular lengths 25, 42, 55, and 80 mm

IKAFLO-stirrers PTFE

dia 6mm	lengths 10 and 15 mm
dia 7mm	lengths 20, 25, 30, 40, 50 and 60 mm
dia 10mm	lengths 70 and 80 mm

### Technical Data

design voltage:	VAC	230±10%
	VAC	115±10%
design frequency:	Hz	50/60
motor:	EC-motor with ball bearings, without brushes	
max. power input of motor	W	17
speed range:	1/min	50 bis 1100
	infinitely variable setting	
heating plate:	silumin, GK AISi 12 polished	
diameter of heating plate:	mm	135
heating power:	W	600
max. surface temperature:	°C	300
max. surface temperature under error conditions	°C	370
temperature waviness of heating plate	K	±2,5
temperature setting:	°C	infinitely variable from ambient temperature
control accuracy of medium in ETS-D or contact-thermometer operation	K	±1 FUZZY-optimized
contact thermometer-connection	DIN 12 878 Klasse 2	
permitted ambient temperature:	°C	+5 bis +40
permitted relative humidity:	%	80
permitted duration of operation:	%	100
protection class acc. DIN 40 050:	IP 42	
fuses:	F1/F2	10AT/250V Id-Nr 2755400
	F3	1,025AT/250 Id-Nr 2756300
contamination level:	2	
overvoltage category:	II	
protection class:	1(protective earth)	
dimensions:	mm	160 x 280 x 95
weight:	kg	2,4

### List of Spare Parts

<u>Item</u>	<u>Designation</u>	<u>Item</u>	<u>Designation</u>
2	bushing	40	screwed plug
3	radiating sheet	41	operating knob poti
4	sealing washer	43	contact thermometer label
5	washer	44	contact plug
6	taptite cheese-head screw	45	taptite cheese-head screw
7	ceramic bushing	46	plastic cover
8	sleeve	47	fixing plate
9	foil keyboard	48	sealing washer
10	housing-upper part	102	ceramic stone
11	potentiometer shaft	109	receptacle (gold plated)
12	clamping bushing	110	insulating hose
13	hood	2001	heating plate
14	hexagonal nut	2002	EC-motor
15	cover for Pt 100	3001	poti
17	fixing clip	3002	main plug
18	taptite cheese-head screw	3003	rocker switch
19	toothed washer	3004	bushing plug
20	washer	3005	rocker switch
21	O-ring (Perbunan)	3006	relay
31	bottom part, coated	3007	fuse F1/F2
32	plastite-screw	3008	fuse F3
33	BLP analog	5001	ball bearing
34	bushing	5002	grooved ball bearing
35	magnet		
36	countersunk screw		
37	plastic cover		
38	taptite countersunk screw		
39	cap		

Spare Parts Diagram

