Pilot Scale Glass Reactor

The jacketed glass reactor is a common piece of equipment used in chemical experiments and industrial production. Jacket will be used for heating/cooling medium. The inner layer of glass is used to hold the reactants, while the outer layer serves to protect and reinforce the inner layer.

Structure

The reactor body is usually made of high borosilicate glass. The shape of the reactorbody is generally cylindrical, with a hemisspherical or flat bottom.

Jacket: It is placed on the outside of the reactor body and is used to introduce heating or cooling media to achieve temperature control of the materials inside the reactor.

Agitator: Installed inside the reactor, it is driven by a motor to cause the materials inside the reactor to rotate, thereby achieving uniform mixing of the materials and mass and heat transfer.

Sealing device: It is used to ensure the sealing between the reactor cover and the pot body, preventing the leakage of the medium. Commonly used sealing materials include polytetrafluoroethylene, rubber, etc.

Safety devices: including pressure gauges, safety valves, etc., are used to monitor and control the pressure and temperature inside the reactor, preventing dangerous situations such as overpressure and overtemperature.

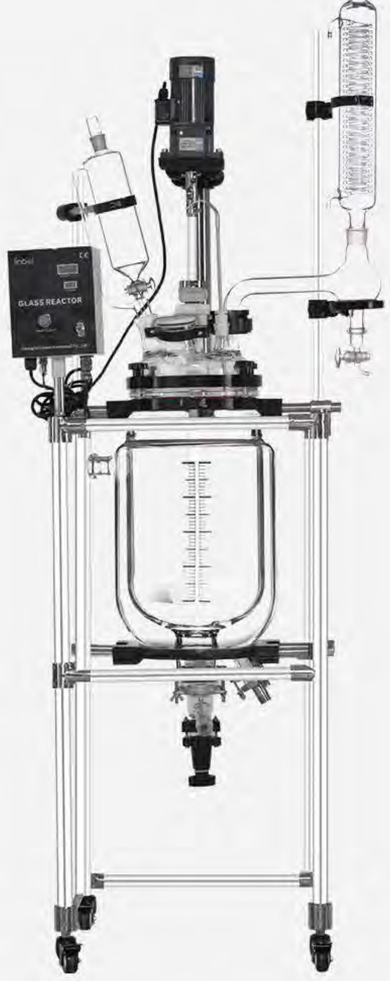
GR-10L

Characteristics

- The complete set of glassware is made of 3.3 high borosilicate glass.
- It can be used within the range of low temperature (-120°C) to high temperature (200°C).
- The interface of the glass interlayer can be used for heating reactions as well as low-temperature reactions.
- It can operate under normal pressure and negative pressure conditions, and the vacuum degree can reach 0.095MPa.
- Glass accessories are available for customization, such as PH drop addition, etc.
- An insulation cover for the reactor body can be added (for the insulation of the glass reactor body to enhance the reaction efficiency).
- Plug or discharge valve made of Teflon +FV rubber;
- For explosive environments of Class IIB, the equipment adopts explosion-proof products of EXd II BT4 Gb grade to meet the requirements of safe use.

Multiple Volumes

GR-10L



GR-20L

GR-50L

GR-100L

EX-GR-200L

Installation Case

Optional

Flameproof Control Box

Adopt EXd II BT4 Gb grade positive pressure explosion-proof products

Flameproof Motor

Adopt EXd II BT4 Gb grade positive pressure explosion-proof products

Thermal Clothing

Used to wrap glass kettle for insulation and reduce heat exchange

Stirring Paddle

Made of PTFE-wrapped stainless steel, optional propeller type, anchor type

Precautions

Maximum operating temperature: The maximum operating temperature is 200°C, and the maximum allowable temperature deviation between the inside and outside of the reactor is 80°C.

Lift Type Glass Reactor

The lifting glass reactor is a chemical equipment that integrates the lifting function with the reactor vessel. It is mainly used in chemical reaction scenarios that require flexible adjustment of the reactor vessel position or height (such as material mixing, heating, cooling, distillation, etc.).

Features

- The flange connection with good sealing performance is adopted to ensure no leakage under high pressure environment.
- It can work under normal pressure and negative pressure conditions, and the vacuum degree can reach 0.095MPa.
- The lifting mechanism is responsible for the vertical movement of the reactor body, which is convenient for adding and removing materials.
- The flipping mechanism enables the reactor body to switch freely between horizontal and vertical states.
- The operating temperature range is -120°C~200°C.

GR-50L

Customizable Reactors

For different chemical reactions, such as reactions with highly corrosive materials, high temperature and high pressure etc., customizable reactors can be precisely planned in terms of material selection, structural design, and accessory configuration. When the reaction material requires a pressure that a glass reactor cannot reach or is used for reactions that are generally not corrosive and have moderate temperature and pressure requirements, common stainless steel materials (such as 304, 316L) can be selected; when the reaction material is highly corrosive and has extremely high requirements for the chemical stability of the material, fluoroplastic materials such as polytetrafluoroethylene (PTFE) and perfluoroalkoxy resin (PFA) can be used to make the reactor lining or the entire reactor body.

316L stainless steel reactor

Crystallization reactor

304 stainless steel reactor

Features

- Strong corrosion resistance: stainless steel or PTFE-lined reactors can effectively resist corrosion from a variety of chemicals, reducing equipment maintenance costs.
- High pressure bearing capacity: after reasonable design and manufacturing, it can withstand high pressure reactions at higher pressures.
- Good heat transfer performance: stainless steel has a certain thermal conductivity, which can effectively transfer heat between the heating or cooling medium and the material in the reactor.
- Hygienic and clean: The surface is smooth and easy to clean, meeting the hygiene standards of production equipment in the pharmaceutical industry.

Other Types

Due to the specific requirements of different production needs, the functions of the reactor are also required. For example, glass crystallization reactors are widely used in the preparation of drug crystals in the pharmaceutical industry; in some organic synthesis reactions, ultrasound can reduce the activation energy of the reaction; multifunctional reactors are more suitable for various reaction requirements in the chemical industry, such as polymerization reactions, esterification reactions, condensation reactions, cyclization reactions, etc.

Glass crystallization reactor

Ultrasonic Reactor

Multifunctional Reactor

Glass Accessories

Customized glass reaction accessories can be designed for specific chemical reaction characteristics. For example, customized condensers can be customized in serpentine, straight or spherical shapes according to the required cooling efficiency and space layout, and the diameter, length and structure of the cooling medium channel can be adjusted. In addition, various glass valves, joints, pipes and other accessories can be customized according to customer requirements.

Parameters

Model	GR-5L	GR-10L	GR-20L	GR-50L	GR-100L	GR-150L	GR-200L
Temp. range (°C)	-120°C～300°C						
Power supply	220V/110V，50/60Hz						
Effective volume in reactor (L)	5	10	20	50	100	150	200
Jacket volume (L)	2	3	6	16	30	50	60
Condenser heat exchange area (m^2)	0.01	0.1	0.1	0.3	0.6	1.5	
Feeding bottle volume (L)	0.5	1	1	2	2	2	2
Recovered bottle volume (L)	1	2	2	5	10	20	20
Stirring insertion hole	50#Flange				60#Flange		
Thermometer socket	24#	43#Flange					
Condenser return port	35#	50#Standard Ball					
Spare port	24#	34#Standard ground					
Constant pressure funnel connection	29#	40#Standard ground					
Solid feed port	N/A	80#Flange				120#Flange	
Glass assembly	High borosilicate glass 3.3						
Body frame	SUS304						
Stirring paddle	Paddle type impeller, stainless steel inside, PTFE outside						
Motor	For viscous materials, high power motors are available						
Temp. difference limit (°C)	⩽60						
Tank pressure (MPa)	-0.1～0.1						
Jacket withstand pressure (MPa)	⩽0.1						
Vacuum system boost rate	⩽2kPa/h						
Stirring motor power (W)	120W/180W-EX				200W/370W-EX	400W/750W-EX	750W/750W-EX
Range of rotation(rpm)	Frequency/0~600						
Temp. sensor Type	Pt100						
Insulation pipe interface	4 points external thread			6 points external thread			
Seal material	PTFE						
Discharge valve height (mm)	≈205	≈450				≈330	≈330
Overall size (mm)	520*500*1510	600*570*2050	660*620*2150	660*620D*2400	800*710*2600	1240*1140*3100	1240*1140*3100
Weight (kg)	60	70	82	97	128	175	190

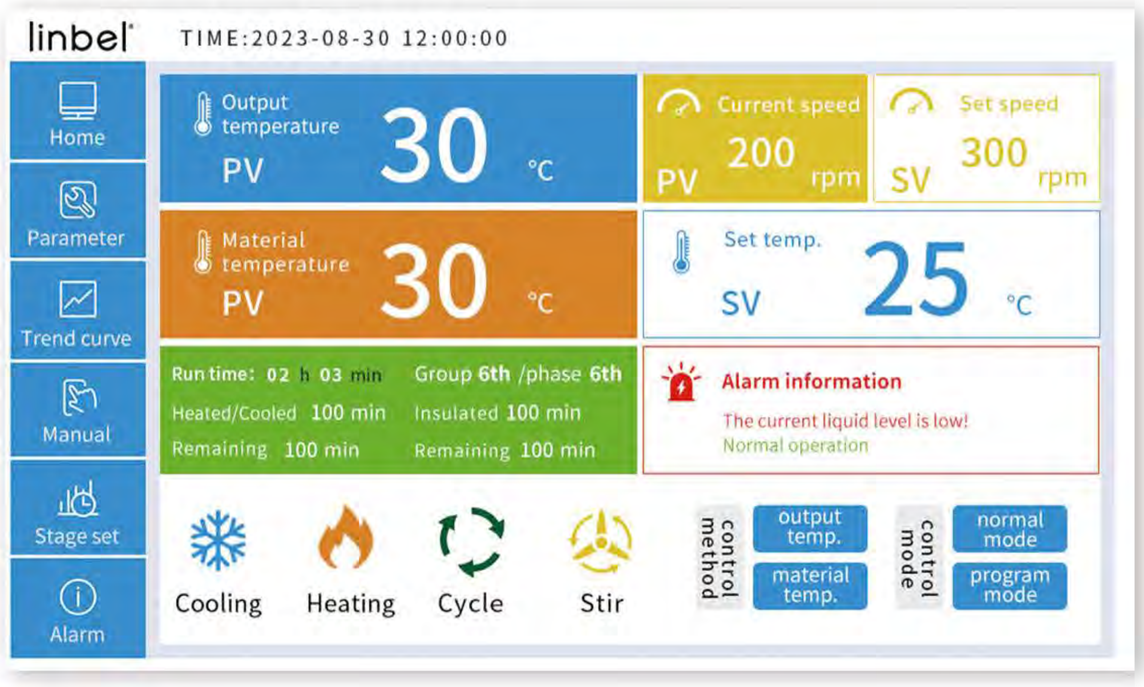
LBGR Operating System:

The integrated reactor system can integrate the operation interface of the existing laboratory equipment, use PLC to control the operation of the basic functions of all equipment, and integrate all equipment operations into one touch screen through the communication interface. It can realize the material temperature control and speed control of the touch screen operation reactor. This operating system can also record the operation of the equipment, and support the USB Flash Disk to export the equipment operation data of the entire production process, and the data collection is once a minute.

1. One screen can control high and low temperature, reactor and vacuum pump (multiple sets of equipment can be selected according to the on-site control situation)

2. The operation process is traceable and support data export.

3. Free the operator and realize remote monitoring.

4. Perfect alarm function, real-time feedback.

5. Modular customization, the system can be customized according to the site conditions and process flow.