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PRODUCT CATALOGUE

Anhui Kemi Instrument Co., Ltd

1 July 2024 Revised

Company Introduction

Anhui Kemi Instrument Co. Ltd (Chem-n) was founded by a creative team from University of Science and Technology of China (USTC) in 2014, aiming to design and provide high-quality and customized synthesis equipment for global R&D users. After a decade of development, we have launched a series of reactors, including high-pressure autoclaves, high-temperature furnaces, fixed-bed reactor system, continuous flow reactors, and photosynthesis products. Our reactors can meet the requirement from lab to pilot scale, and from gram-scale synthesis to ton-scale production. The company holds China production license of special equipment (Pressure Vessel of A2 Grade), and has obtained the certification of SGS, ISO9001 and CE. Our company is committed to design and provide "safe, convenient, accurate and efficient" equipment, and accelerate R&D progress with our professionalism and product quality. Up to 2024, we have over 300 clients from over 35 countries, and our products have helped R&D users to publish over 800 papers in top-tier journals.

HONOR

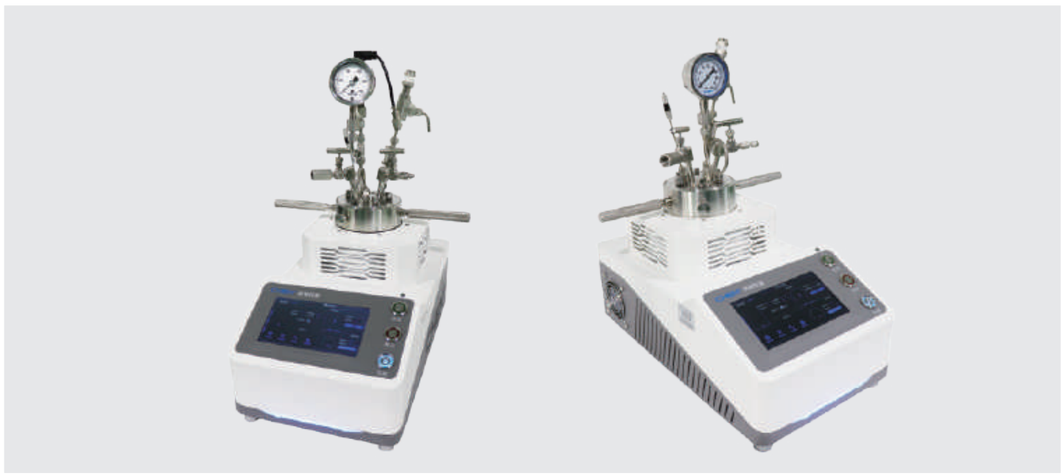
CONTENTS

NS Series Magnetic Stirring Reactor

Magnetic Stirring Reactor series:

Magnetic Stirring Reactor				
Model	Type	Volume(mL)	Maximum operating pressure (bar)	Maximum operating temperature(℃)
NSI	Intelligent	10~1000	345	550
NSG	Universal	10~1000	345	550
The differences of the NSI and NSG: They equipped with different valves and NSI equipped with the pressure sensor				
NSV	Photocatalytic	25~500	100	300

NSI Intelligent Quick-Opening Magnetic Stirring Reactor



Product model: NSI/NSG100-P5-T3-SS1-R-SV

NSI intelligent quick-opening magnetic stirring reactor integrates magnetic stirrer, high-performance heating module and intelligent temperature controller. The reactor head can be easily opened and tightened with clamp-type design. A nice and easy-to-use HMI in 7-inch HD touch screen is designed for the control of the temperature and stirring speed, and also monitoring the inner pressure of the reactor. The real-time temperature and pressure curve can be recorded and downloaded via USB interface. Comprehensive interlock protection is also designed to cut the heating power and give sound alarm when the pressure or the temperature exceeds the limit value.

NSG universal quick-opening magnetic stirring reactor has a built-in magnetic stirrer and intelligent temperature control module, realizing accurate stirring and temperature control.

Product features

Safety

- Reactor head and body are machined from soild metal bars without welding.
- Tenon jointing seal construction to provide stable sealing under high pressure.
- Interlock protection of heating power-off and sound alarm when over temp or over pressure.
- Swagelok brand high performance valves for gas inlet and exhaust.
- FITOK brand high performance relief valve and customized rupture valve to provide double protection for over pressure.

Convenience

- Integrated moulding design.
- V-stem portable needle valve with customized coating.
- Minimize the weight of the reactor on the premise of ensuring safety.

Efficiency

- Quick-opening structure.
- Power-assisted disassembly tools.
- 7-inch sensitive touch screen.
- Concise and intuitive UI man-machine interface.
- USB interface for data download.

Accurate

- Intelligent PID temperature control mode.
- Stepless speed regulation.
- Embedded heating module with faster heat transfer.

Technical parameters

Design volume	10 mL, 25 mL, 50 mL, 100 mL, 300 mL, 500 mL, 1000 mL
Maximum operating temperature	Standard 300 °C
Heating mode	Embedded stainless steel heating module with high performance heat transfer
Heating power	1 kW
Stirring speed	400- 1,400 rpm (stepless speed regulation)
Stirring method	Built-in magnetic stirrer
Design pressure	Standard 207 bar
Material of reactor	316 L stainless steel, Hastelloy C-276, etc. (optional)
Intelligent Micro Reactor Controller	Over-temperature automatic power-off, over-pressure buzzer alarm 7-inch touch screen, displaying the temperature, rotation speed, pressure and operating time USB interface, supporting data export Power supply configuration: 200 - 240 V/AC 50 - 60 Hz Outline dimension: About 250 mm*300 mm*410 mm
Personalized options	Various alloy materials, stirring forms, sampling and cooling, etc. optional configurations
Controller dimension	100mL:260*470*260mm(L*D*H)

NVG General Photocatalytic Magnetic Stirring Reactor

Product model: NVG100-P3-T2-SS1-R-SV

NVG photocatalytic quick opening magnetic stirring reactor adopts double caliper quick-opening structure, providing a convenient and comfortable operation experience.

Product features

Innovative sapphire window

- Sapphire crystal light-transmitting lens.
- Effective transmission diameter up to 26 mm (25-50 mL).
- Effective transmission diameter up to 35 mm (100-500 mL).
- Radial + axial sealing.
- DuPont™ Kalrez® FFKM o-ring.

Safety

- Adopt integrated machine shaping structure.
- Tenon-groove type main sealing structure.
- Over-temperature automatic power-off.
- American Swagelok needle valve for air inlet and outlet control.
- Fitok import relief valve and customized rupture valve, providing double protection.

Efficiency

- Quick-opening structure.
- Power-assisted disassembly tools.

Convenience

- V-stem portable needle valve with customized coating.
- Minimize the weight of the reactor on the premise of ensuring safety.

Accurate

- Intelligent PID temperature control mode.
- Digital display stepless speed regulation.
- Embedded heating module with faster heat transfer.

• Model List of Magnetic Stirring Reactor

☆ - P☆ - T☆ - ☆ - ☆ - ☆					
Volume	**Max Pressure**	**Max Temperature**	**Material**	**Standard Configurations**	**Optional Interface and Configuration**
10：10mL	P2：5MPa	T1：100℃	SS1：Stainless Steel 316L	R：Rupture valve	S: Sampling valve
25：25mL	P3：10MPa	T2：200℃	HC1：Hastelloy C-276	SV：Safety valve	BS: Balanced Return Sampling
50：50mL	P4：15MPa	T3：300℃	TA2：Titanium TA2		PI: Pressure sensor
100：100mL	P5：20MPa	T4：350℃	ZR1：Tantalum702		DP: Digital Pressure Gauge
300：300mL	P6：25MPa	T5：400℃	Others (customisable)		T: Temperature sensor
500：500mL	P7：30MPa	T6：450℃			IC: Cooling Coil
1000：1000mL	P8：35MPa	T7：500℃			CD: Kettle cooling
		T8：550℃			ET: Other

MS Series Mechanical Stirring Reactor

High-Pressure Mechanical Stirring Reactor Series:

High-pressure Mechanical Stirring Reactor				
Model	Type	Volume(mL)	Maximum operating pressure (bar)	Maximum operating temperature(℃)
MSI	Intelligent	25~1000	345	550
MSG	Universal	25~1000	345	550
MSL	Automatic	1L~30L	345	550

Remarks: MSL series: the product with a volume over 500 mL (exclusive) bears a maximum pressure of 207 bar.
The differences of MSG and MSI:They equipped with different valves and MSI equipped with the pressure sensor.

MSI Intelligent Quick-Opening Mechanical Stirring Reactor

Product model: MSI/MSG50-P5-T3-SS1-R-SV

MSI intelligent quick-opening mechanical stirring reactor integrates mechanical stirrer, high-performance heating module and intelligent temperature controller. The reactor head can be easily opened and tightened with clamp-type design. A nice and easy-to-use HMI in 7-inch HD touch screen is designed for the control of the temperature and stirring speed, and also monitoring the inner pressure of the reactor. The real-time temperature and pressure curve can be recorded and downloaded via USB interface. Comprehensive interlock protection is also designed to cut the heating power and give sound alarm when the pressure or the temperature exceeds the limit value.
MSG universal quick-opening mechanical stirring reactor integrates mechanical stirrer, high-performance heating module and intelligent temperature controller. A nice and easy-to-use HMI in 7-inch HD touch screen is designed for the control of thetemperature and stirring speed.

Product features

Safety

- Reactor head and body are machined from soild metal bars without welding.
- Tenon jointing seal construction to provide stable sealing under high pressure.
- Interlock protection of heating power-off and sound alarm when over temp or over pressure.
- Swagelok brand high performance valves for gas inlet and exhaust.
- FITOK brand high performance relief valve and customized rupture valve to provide double protection for over pressure.

Efficiency

- Integrated moulding design.
- V-stem portable needle valve with customized coating.
- Minimize the weight of the reactor on the premise of ensuring safety.

Convenience

- Quick-opening structure.
- Power-assisted disassembly tools.
- 7-inch sensitive touch screen.
- Concise and intuitive UI man-machine interface.
- USB interface for data download.

Accurate

- Intelligent PID temperature control mode.
- Digital display stepless speed regulation.
- Embedded heating module with faster heat transfer.

Technical parameters

Design volume	25 mL, 50 mL, 100 mL, 300 mL, 500 mL
Maximum operating temperature	Standard 300 °C
Heating mode	Embedded stainless steel heating module with high performance heat transfer
Heating power	1 kW
Stirring speed	400- 1400 rpm (stepless speed regulation)
Stirring method	High-torque magnetic coupling stirring
Design pressure	Standard 207 bar
Material of reactor	316 L stainless steel, Hastelloy C-276, etc.(optional)
Intelligent Micro Reactor Controller	Over-temperature automatic power-off, over-pressure buzzer alarm 7-inch touch screen, displaying the temperature, rotation speed, pressure and operating time USB interface, supporting data export Power supply configuration: 200 - 240 V/AC, 50 - 60 Hz
Personalized options	Various alloy materials, stirring forms, sampling and cooling, etc. optional configurations
Controller dimension	100mL:260*470*260mm(L*D*H)

• Model List of Magnetic Stirring Reactor

☆ - P☆ - T☆ - ☆ - ☆ - ☆					
Volume	**Max Pressure**	**Max Temperature**	**Material**	**Standard Configurations**	**Optional Interface and Configuration**
10：10mL	P2：5MPa	T1：100℃	SS1：Stainless Steel 316L	R：Rupture valve	S: Sampling valve
25：25mL	P3：10MPa	T2：200℃	HC1：Hastelloy C-276	SV：Safety valve	BS: Balanced Return Sampling
50：50mL	P4：15MPa	T3：300℃	TA2：Titanium TA2		PI: Pressure sensor
100：100mL	P5：20MPa	T4：350℃	ZR1：Tantalum702		DP: Digital Pressure Gauge
300：300mL	P6：25MPa	T5：400℃	Others (customisable)		T: Temperature sensor
500：500mL	P7：30MPa	T6：450℃			IC: Cooling Coil
1000：1000mL	P8：35MPa	T7：500℃			CD: Kettle cooling
		T8：550℃			ET: Other
					● This column defaults to the standard interface if not selected. ● This column can be selected repeatedly ● 25, 50, 100mL without internal cooling coil ● 500mL or less (inclusive) without solids charging portr

MA Series Automatic Reactors

1L Desktop（Reference Picture）

2L/5L/10L Floor-standing（Reference Picture）

Product features

MA Series

MA series reactors are equipped with high torque magnetic coupling mechanical stirring, and automatic lift and down of the reactor body. The control is based on an industrial-grade touch screen and to provide real-time display and recording of reactor temperature, pressure, stirring speed and torque, and other data. Over pressure and temperature interlock is also designed to cut the heating power and give alarm under excessive conditions. The volume of MSL series reactors are designed for pilot experiments or small-scale productions, the volume range is from 1 to 30 liters, and the maximum design temperature and pressure are 550°C and 350bar respectively.

Technical parameters

Design volume	1/2/5/10L/30L
Maximum operating temperature	550 ℃
Heating mode	Embedded stainless steel heating module
Heating power	1 kW
Stirring speed	1200rpm (1L) , 800rpm (2L) 500rpm (5L, 10L)
Stirring method	High-torque magnetic coupling stirring
Design pressure	350bar
Material of reactor	316 L stainless steel, Hastelloy C-276, etc.(optional)
Pressure sensor	MEAS
Pressure gauge	ASHCROFT
Inlet/Outlet valve	Swagelok

• Model List of Magnetic Stirring Reactor

☆ - P☆ - T☆ - ☆ - ☆ - ☆					
Volume	**Max Pressure**	**Max Temperature**	**Material**	**Standard Configurations**	**Optional Interface and Configuration**
1L: 1L	P2：5MPa	T1：100℃	SS1：Stainless Steel 316L	R：Rupture valve	S: Sampling valve
2L:2L	P3：10MPa	T2：200℃	HC1：Hastelloy C-276	SV：Safety valve	BS: Balanced Return Sampling
5L:5L		T3：300℃	Others (customisable)	PI:Pressure sensor	J: Kettle jacket heating
10L:10L					T: Temperature sensor
30L:30L					IC: Cooling Coil
					CD: Kettle cooling
					ET: Other

Parallel Series Reactors

Two-Station Multiple Parallel Reactor

Four-Station Multiple Parallel Reactor

Six-Station Multiple Parallel Reactor

The six-station parallel reactors are suitable for rapid catalyst screening, optimization of reaction conditions and parallel experiments of micro-samples. The reactors can be operated under the same or different conditions. It integrates the stirrer, heating furnace and intelligent temperature controller and adopts a 10-inch HD touch screen to control the temperature and rotation speed and monitor the inner pressure. The six reactors are controlled independently. Equipped with a USB interface,the changes in temperature, rotation speed, pressure and other parameters in the reaction process recorded in real-time can be downloaded with a USB flash disk.

Product features

Multiple Parallel Reactor

Independent control, Suitable for rapid catalyst screening, optimisation of reaction conditions and parallelisation of trace samples.

Technical parameters

Design volume	25 mL, 50 mL, 100 mL(optional)
Design pressure	Standard 207 bar
Design temperature	Standard 300 ℃
Material of reactor head	316 L stainless steel, Hastelloy C-276, etc.(optional)
Intake and exhaust valve	American Swagelok needle valve for air inlet and outlet control
Rupture valve	Customized rupture valve
Relief valve	Fitok import Relief valve
Load cell	American Ashcroft pressure gauge and MEAS pressure transmitter
Stirring method	High-torque magnetic coupling stirring or built-in magneton stirring
Heating mode	Embedded stainless steel heating module
Stirring speed	400-1400 r/min
Control mode	10-inch touch screen, displaying the temperature, rotation speed, pressure and operating time
Adaptive power supply	200 - 240 V/AC 50 - 60 Hz
Personalized options	Various reactor vessel materials, stirring forms, sampling, cooling, and reflux condensation
Outline dimension	1050*600*650 mm

• Model List of Magnetic Stirring Reactor

☆ - P☆ - T☆ - ☆ - ☆ - ☆ - ☆

Volume	Max Pressure	Max Temperature	Material	Standard Configurations	Optional Interface and Configuration
10：10mL	P2：5MPa	T1：100℃	SS1：Stainless Steel 316L	R：Rupture valve	S: Sampling valve
20：20mL	P3：10MPa	T2：200℃	HC1：Hastelloy C-276	SV：Safety valve	BS: Balanced Return Sampling
25：25mL	P4：15MPa	T3：300℃	TA2：Titanium TA2		PI: Pressure sensor
50：50mL	P5：20MPa	T4：350℃	ZR1：Tantalum702		DP: Digital Pressure Gauge
100：100mL	P6：25MPa	T5：400℃	Others (customisable)		T: Temperature sensor
300：300mL	P7：30MPa	T6：450℃			IC: Cooling Coil
500：500mL	P8：35MPa	T7：500℃			DV: Discharge Valve
		T8：550℃			LF: Liquid Filling Tank
					SF: Solid Filling Tank
					ET：other

24-Station Parallel Photoreactor

Product model：SCD-PCRS-24-L

24-station photocatalytic reactor with multi-reaction site design for high throughput parallel reaction. Mainly used in photocatalytic research fields, such as: photocatalytic organic synthesis, photocatalytic degradation, etc.

Product features

- High throughput reaction, can achieve 1-24 groups of parallel experiments.
- Bottom illumination mode, magnetic stirring.
- Single wavelength, single power about 9W.

Technical parameters

Wavelength	1, Single LED chip package; 2, 365,370,390,410,420nm optional; (±5nm accuracy)
Electric power	9W / Position
Reaction station	24
Reaction tube type	Φ17*65mm, standard test tube (optional for customers)
Constant temperature system	Independent air-cooled + water-cooled, to achieve the light source heat dissipation, to maintain the room temperature
Magnetic stirring drive form	Motor independent direct drive, rare earth permanent magnet rotary stirring, a total of 6 groups, 1 group control 4 reaction tubes
Stirring speed	300,600,900r/min adjustable in three gears.
Control system	1, magnetic stirring control; 2, reaction tube jacket temperature monitoring.

Single-Wavelength LED Light Source

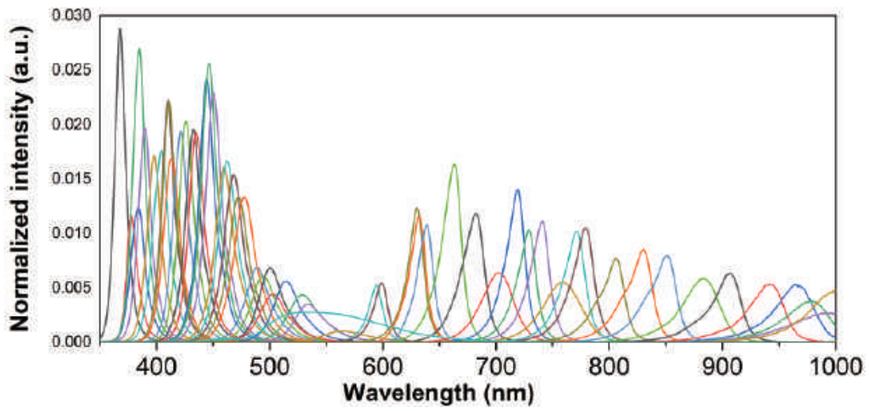
Product model: KL100

It is mainly used in photocatalysis study, such as photocatalytic organic synthesis and photocatalytic degradation.

Product features

- The full spectrum of 255 nm- 1650 nm is available for customization
- High-density matrix LED chip offers uniform and widely covered illumination
- Special lamp cap reflective tile and lens are developed based on the characteristic of ultraviolet, visible and near-infrared spectra to minimize the loss of light intensity and enhance the penetrating power

Light-emitting spectrum

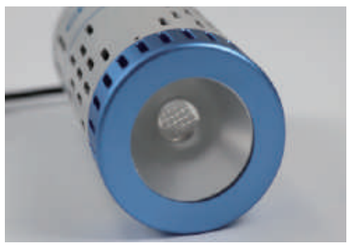


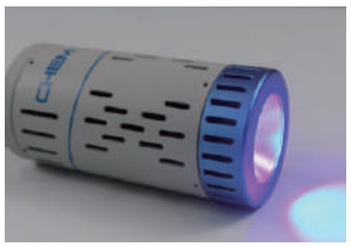
Technical parameters

Parameter	KL100
Frequency adjustment	50 Hz- 100，000Hz grading adjustment (optional)
Electric power	Max 40 W
Input voltage	220 V
FWHM	16 nm (wavelength of 418 nm), inquire Kemi sales staff for other wavelengths
Maximum optical power	9920 mW
Intensity	6.75 mW/mm2 (wavelength of 418 nm, measured at 1 cm distance) inquire Kemi sales staff for other wavelengths
Photoelectric efficiency	24.8%(wavelength of 418 nm), inquire Kemi sales staff for other wavelengths
Operating temperature	0-45 ℃
Outline dimension	ϕ63*135 mm
Simple light intensity regulation	① 10-grade light intensity regulation, profitable for the study of the relationship between light intensity and reaction. ② Concise LED screen
Multiple wavelength options for accurate adjustment	① Nine precise conventional wavelengths: 365 nm, 390 nm, 400 nm, 420 nm, 455 nm, 460 nm, 520 nm, 630 nm, 730 nm ② Customized wavelength range: 255 nm- 1,650 nm (optional for every 5 nm, except for some special wavelengths), enhancing the accuracy and perfecting the reaction to save the screening time and cost.

Product specification

S/N	Peak wavelength (nm)	Arrangement	FWHM (nm)	Current (mA)	Voltage (V)	Electric power Pe (W)	Optical power Po (mW)	Photoelectric efficiency (%)	Light intensity (mW/mm2) (at 1 cm distance)
1	365	5*5	11	1950	20.51	40	9760	24.4	700
2	390	5*5	13	2000	20	40	8400	20.1	725
3	400	5*5	14	2000	20	40	7840	19.6	520
4	420	5*5	16	2000	20	40	9920	24.8	650
5	455	5*5	20	2150	18.6	40	11200	28	787
6	460	5*5	20	2250	17.8	40	11440	28.6	712
7	520	5*5	33	2500	16	40	4800	12	316
8	630	5*5	15	2500	12.64	31.6	3950	12.5	402
9	730	4*4	20	2500	10	25	3942	15.8	401





LED Solar Light Source Simulator

Product model: SLS-LED-80B

SLS-LED-80B is a compact AA-level LED solar light source simulator which can replace the traditional Xenon lamp solar simulator.

Product features

- The lamp base integrates LED surface light source, optical system, heat dissipation system and power control system, which are flexibly installed.
- Remote non-contact on/off and light intensity regulation are realized by the remote controller.
- The service life of the light source exceeds 10,000 h, more than 10 times that of the xenon lamp.
- It provides rotated lights from upper, lower, left and right directions.
- With a small size, it can be placed inside the glove box, and the light intensity can be regulated outside.

Product Application

it has incomparable advantages in solar cell test, aging,photocatalysis, photohydrolysis, photoreaction, photoluminescence, biological cultivation, health illumination, medical treatment and other fields.

HT Series Hydrothermal Reactor

Hydrothermal Reactor				
Model	Type	Volume(mL)	Maximum operating pressure (bar)	Maximum operating temperature(°C)
HTG	Universal	300/500/1000	30	220
HTS	Enhanced	25~200	30	260
HTF	Flanged	25~1000	49	500

HTG Universal Hydrothermal Reactor

Design volume: 300/500/1,000 mL
Maximum allowable operating pressure: 30 bar
Sealing form: groove type self-sealing
Material of liner: Pure PTFE

The reactor liner is made of high quality PTFE material to provide good chemical inertness. The outer cylinder is made of non-magnetic 0Cr18Ni9（SS304）stainless steel. It is widely used in the hydrothermal synthesis of nanomaterials or the pretreatment of dissolved samples in atomic absorption spectrometry and plasma emission spectrometry.

HTS Enhanced Hydrothermal Reactor

Design volume: 25/50/100/200 mL
Maximum operating pressure: 30 bar
Maximum allowable operating temperature: 260 °C
Sealing form: groove face combined with self-sealing and stepped positioning
Material of liner: PTFE

It adopts an innovative stepped positioning structure of the liner, effectively reducing the cold deformation of the liner caused by rapid cooling from the high temperature, avoiding volume reduction of the liner, and prolonging its service life.

HTF Flanged Hydrothermal Reactor

Design volume: 10/25/50/100 mL
Maximum operating pressure: 49 bar
Maximum operating temperature: 500 °C
Sealing form: line-type self-seal
Material of liner: None

Using metal line-type seal, the bolts are tightened symmetrically to form a sealed vessel, thus creating a high-temperature hydrothermal reactor.

• Model List of Hydrothermal Reactor

HT☆	- ☆ -	SS	- ☆
Model	**Volume**	**Material of reactor**	**Material of liner**
HTG	25：25mL	SS：Stainless steel 304	Nil: Normal PTFE
HTS	50：50mL	SS1：Stainless steel 316L	H: High standard PTFE
HTF	100：100mL	Other (Customizable)	Other (Customizable)
	300：300mL		
	500：500mL		
	1000：1000mL		
	Remarks: 1, HTG: 10/300/500/1000mL 2, HTS: 25/50/100/200mL 3, HTF: 10/25/50/100mL	Remarks: 1、HTG/HTS standard with 304 stainless steel; 2, HTF standard with 316L stainless steel.	

Model	HTG	HTS	HTF
Volume	10/300/500/1000mL	25/50/100/200mL	10/25/50/100mL
Max pressure	30bar	30bar	49bar
Max temperature	220℃	260℃	500℃
Reactor material	304 Stainless steel	304 Stainless steel	316L Stainless steel
Liner material	Normal/High standard PTFE	Normal/High standard PTFE	—

Hydrothermal Reactor

Also known as sample dissolver, pressure dissolver, digestion tank, or PTFE high-pressure tank, utilizes the strong acid or strong alkali in the tank and the high-temperature and high-pressure sealing environment to rapidly dissolve the insoluble substances. It is a helpful method to carry out sample digestion in the determination of micro elements and trace elements. It is mainly used for the digestion of heavy metals, agricultural residues, foods, sludge, rare earth, aquatic products and organic matters in the sample pretreatment stage. Also, the reactors are widely used in the hydrothermal synthesis of various nanomaterials..

The Company provides hydrothermal reactors with the volume of 10 mL, 25 mL, 50 mL, 100 mL, 200 mL, 300 mL, 500 mL and 1,000 mL. The tanks have a safe temperature of 260 °C and the highest pressure of 3 MPa. With the dual protection of high-quality stainless steel outer structure and PTFE liner, it can bear the acid and alkali liquid. It is an ideal product for sample digestion in the university laboratory, environmental monitoring, sanitation and epidemic prevention and quality supervision. With the operating pressure of no more than 3 MPa, various heating temperatures and heating times can be set according to the technical indexes of different samples.

Precautions in Use of Hydrothermal Reactor

1、Before using the hydrothermal reactor, please carefully check the saturated vapor pressure of the solvent at the reaction temperature, and confirm that the maximum allowable operating pressure of the hydrothermal reactor will not be exceeded.

2、For the HTG/HTS series hydrothermal reactor, as the liner is made of PTFE, which is compressible under the high-temperature and high-pressure, the reactor lid and set screw should not be overtightened, so as to avoid severe deformation of the liner caused by thermal expansion under high temperature and high pressure

3、In case the operating temperature of the hydrothermal reactor exceeds 150 °C, it is recommended to apply a layer of high-temperature lithium base grease on the thread before tightening the reactor lid to prevent the stainless steel thread from galling.

4、It is prohibited to use the hydrothermal reactor under the following circumstances:

a. The solvent has a boiling point lower than 60 °C (e.g., ether, acetone, and dichloromethane)

b. Gas will be generated in the reaction

c. Materials with flammable, explosive or highly or extremely toxic properties

HR Series Homogeneous Reactor

Hydrothermal Reactor				
Model	Type	Volume(mL)	Maximum operating pressure (bar)	Maximum operating temperature(℃)
HR-4C	Four-station	25~200	30	260
HR-8C	Eight-station	25~200	30	260
HRD-4C	Desktop type	25~100	30	260
HRD-8C	Floor type	25~100	30	260

Homogeneous Reactor

Product model: HR-8C

Product model: HRD-8C

The homogeneous reactor is a hydrothermal reactor heating and rotating equipment. Unlike conventional hydrothermal reactors that do not support stirring, this product fixes the hydrothermal reactor to a drive shaft, which drives the hydrothermal reactor to perform stirring so as to mix well the reaction materials.

Product size

HR-4C	Internal dimension: 430*390*460mm	Outline dimension: 850*572*1550mm
HR-8C	Internal dimension: 430*390*460mm	Outline dimension: 850*572*1550mm
HRD-4C	Internal dimension: 430*390*460mm	Outline dimension: 850*572*984mm
HRD-8C	Internal dimension: 430*390*460mm	Outline dimension: 850*572*984mm

Note: HR refers to the product model of the Company, and XX refers to the quantity of mounted hydrothermal synthesis reactors. For example: HR-8C represents that 8 (4 groups of) hydrothermal synthesis reactors under 200 mL can be mounted in the box.

TF Series Tube Furnace Equipment

Hydrothermal Reactor			
Model	Type	Model	Type
TFH	Horizontal type	TFC	CVD
TFV	Vertical type	TFE	PECVD
TFR	Rotary type	TFG	Atmosphere calcination type
TFM	Multi-station type	TFD	Custom type
TFP	High pressure type		

TFH Horizontal Tube Furnace

Micro Power-Assisted Tube Furnace

Product model: TFH-1200-30-I-220

TFH-1200-30-I-220 micro power-assisted tube furnace is integrated with intelligent temperature control system. The furnace incorporates 30 heating and cooling curve settings, providing a temperature control precision of ±1 ℃. The chamber is made of alumina polycrystalline fiber with good heat insulation effect. The double-layer shell design combines with the air cooling system to provide a surface temperature lower than 60 ℃, allowing the operation of the furnace under multiple atmospheres. The furnace is widely applied to various scientific research and production fields such as atmosphere sintering, reduction and vacuum annealing.

Technical parameters

Maximum temperature	1200 ℃ (short-term)
Rated temperature	1100 ℃
Heating rate	M10 ℃/min
Temperature control precision	±1 ℃
Size of fabricated furnace tube	ϕ30*500 mm (maximum: ϕ50 mm)
Size of furnace chamber	ϕ80*220 mm
Heating zone length	220 mm
Constant temperature zone length	60-80 mm
Heating element	Beijing SHOUGANG HRE
Rated power	1.5 kW
Adaptive power	AC220 V50/60 HZ
Outline dimension	340*320*380 mm
Weight	16 kg

Product features

- Characterizedby quick warming-up, low surface temperature and energy saving, etc.
- Supporting over-temperature protection and power failure protection.

Experimental Power-Assisted Tube Furnace

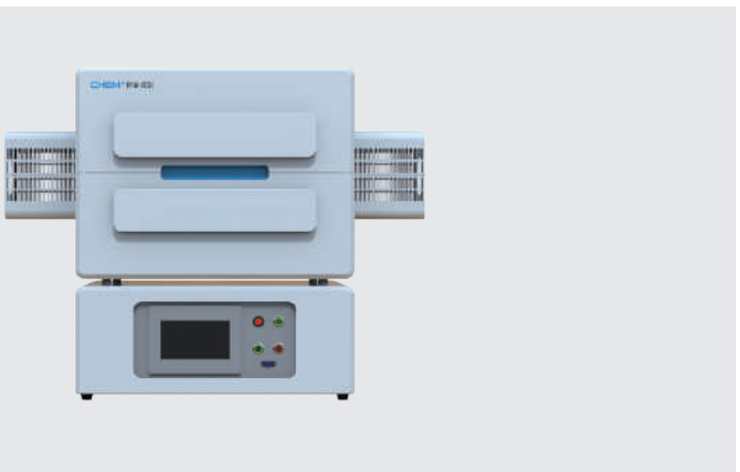
Product model: TFH-1200-50-I-440

The experimental power-assisted tube furnace adopts integrated control unit and furnace chamber. The overall double-layer air cooling structure keeps the surface temperature under 60 °C. The chamber is made of high purity alumina microcrystallite fiber subject to vacuum forming under high temperature. The heating element is resistance wire. The cooling system adopts double-layer air cooling structure, providing a surface temperature ⩽60 °C. The vacuum chamber is made of quartz tubes that run through the whole body. Both ends of the furnace tube are sealed with stainless steel flanges so that the furnace can work in a vacuum or atmosphere environment. The heating elements are parallel to the furnace tube and uniformly distributed outside the furnace tube to effectively guarantee the uniformity of the thermal field. With Yudian AI-3756P touch screen type temperature controller/AI-516P intelligent controller and K-type thermocouple, temperature control through 30 programmable segments with a temperature control precision of ±1 °C is realized.

Technical parameters

Maximum temperature	1,200 °C (short-term)
Rated temperature	1,100 °C
Size of furnace tube (tube furnace)	ϕ50 (OD) *1,000 mm (customizable)
Heating zone length	440 mm
Control system	Touch button
Heating element	Beijing SHOUGANG HRE
Heating rate	⩽10 °C/min
Rated power	3 kW
Adaptive power	AC220 V50/60 HZ
Outline dimension	580*500*520 mm
Weight	45 kg

1500 °C Open-Type Single-Zone Tube Furnace



Product model: TFH-1500-50-I-390

1500 °C open type single-zone tube furnace adopts silicon carbide rod as heating element, providing a rated temperature of 1,400 °C and a maximum temperature of 1,500 °C. With Yudian AI-3756P touch screen type temperature controller and S-type thermocouple, temperature control through 30 programmable segments with a temperature control precision of ±1 °C is realized. With a set of 316 L stainless steel open-quick flanges that adopt double-ring sealing technology, the equipment can be applied to various experiment environments such as sintering and substrate coating in vacuum or atmosphere. The built-in double-layer air cooling structure provides a surface temperature ⩽60 °C. Both ends of the flanges are supported to lighten the load of the furnace tube, thereby guaranteeing the service life of the furnace tube.

Technical parameters

Maximum temperature	1500 °C (short-term)
Rated temperature	1400 °C
Size of corundum furnace tube	ϕ50/ϕ60*1,000 mm (customizable)
Heating zone length	390 mm
Recommended heating rate	10 °C/min (⩽1,400 °C)
Heating element	1500 grade silicon carbide rod
Rated power	6 kW
Adaptive power	AC220 V50/60 HZ
Outline dimension	670*580*750 mm
Weight	75 kg
Control system	Fuzzy PID control and self-tuning regulation Intelligent control through 30 programmable segments Supporting alarm for over-temperature and for open circuit of thermocouple

1500 ℃ Single-Zone Tube Furnace

Product model: TFH-1500-50-I-260

1500 ℃ single-zone tube furnace adopts silicon carbide rod as heating element, providing a rated temperature of 1,400 ℃ and a maximum temperature of 1450 ℃. With Yudian electronic type temperature controller and S-type thermocouple, temperature control through 30 programmable segments with a temperature control precision of ±1 ℃ is realized. With a set of 316 L stainless steel open-quick flanges that adopt double-ring sealing technology, the equipment can be applied to various experiment environments such as CVD experiment, phosphor preparation, sintering and substrate coating in vacuum or atmosphere.

Technical parameters

Maximum temperature	1450 ℃ (short-term)
Rated temperature	1400 ℃
Recommended heating rate	⩽10 ℃/min
Control precision	±1 ℃
Size of furnace tube	ϕ30/50/60*1,000 mm
Size of furnace chamber	260*130*190 mm
Heating zone length	260 mm
Constant temperature zone length	100 mm
Heating element	High-quality domestic silicon carbide rod
Rated power	6 kW
Outline dimension	510*560*640 mm
Weight	60 kg

• TFH Horizontal Tube Furnace Parameters Selection Guide

	TFH Horizontal Tube Furnace	
Classified by working temperature	1200℃ Series	
Classified by types	Micro Tube Furnaces	Experimental Tube Furnaces
Max temperature	1200℃ (short-term)	1200℃ (short-term)
Rated temperature	1100℃	1100℃
Heating rate	≤10℃/min	≤10℃/min
Temperature control precision	±1℃	±1℃
Furnace tube size	Φ30*500mm Φ50*500mm	Φ50*1000mm Φ60*1000mm Φ80*1000mm Φ1000*1000mm
Chamber size	Φ80*220mm	Φ120*440mm
Heating zone length	220mm	440mm
Length of the constant temperature zone	60-80mm	120mm
Heating element	Beijing Shougang HRE	Beijing Shougang HRE
Rated power	1.5kW	3kW
Adaptive power supply	AC220V 50/60HZ	AC220V 50/60HZ
External Dimension	340*320*380mm	580*500*520mm

	TFH Horizontal Tube Furnace	
Classified by working temperature	1500℃ Series	
Classified by types	1500 Open Single Zone Tube Furnace	1500 Single Zone Tube Furnace
Max temperature	1500℃ (short-term)	1450℃ (short-term)
Rated temperature	1400℃	1400℃
Heating rate	≤10℃/min(≤1400℃)	≤10℃/min
Temperature control precision	±1℃	±1℃
Furnace tube size	Φ50*1000mm Φ60*1000mm Φ80*1000mm	Φ30*1000mm Φ50*1000mm Φ60*1000mm
Chamber size	400*150*150mm	260*190*130mm
Heating zone length	400mm	260mm
Length of the constant temperature zone	120mm	80mm
Heating element	Silicon carbon rod	Silicon carbon rod
Rated power	6kW	6kW
Adaptive power supply	AC220V 50/60HZ	AC220V 50/60HZ
External Dimension	670*580*750mm	510*560*640mm

TFV Vertical Tube Furnace

Micro Vertical Tube Furnace

Product model: TFV-1200-50-I-220

TFV-1200-50-I-220 is a small open type vertical tube furnace with a tube diameter of ϕ30/50 mm. It is applicable to sintering and quenching of samples in vacuum or atmosphere. With different accessories and installations, it can also be used as a fluidized bed vertical tube furnace for CVD experiment on powder surface deposition. In this case, a quartz sand core with a diameter of 5- 15 um is embedded within the high purity quartz tube. The sintered powder is placed on the sand core layer. Deposition experiment shall be carried out by passing the gas to the sand core layer through the flanges at the bottom of the tube and keeping the sample particles suspended in the heating zone under the effect of the gas flow (generally stabilized in the constant temperature zone).

Technical parameters

Maximum temperature	1200 °C (short-term)
Rated temperature	1,100 °C
Thermocouple	K-type thermocouple
Adaptive power	AC220 V 50/60 HZ
Rated power	1.5 kW
Size of furnace tube	Φ30*550 mm/Φ50*550 mm
Heating zone length	220 mm
Heating element	Molybdenum doped aludirome
Temperature control precision	±1 °C
Outline dimension	340*300*1200 mm
Net weight	24 kg
Temperature control system	PID automatic temperature control system Intelligent control through 30 programmable segments
Body structure	· Flange support platforms are designed at the top and bottom of the body · The body is designed as open type for easy replacement of the tube · The chamber is made of high purity alumina

Experimental Single-Zone Vertical Tube Furnace

Product model: TFV-1200-50-I-440

The surface temperature of the body of the experimental vertical tube furnace will not exceed 60 °C. The chamber is made of high purity alumina microcrystallite fiber subject to vacuum forming under high temperature. This product is an ideal equipment specially developed for labs of colleges, universities and scientific research institutions and industrial and mining enterprises to conduct sintering, melting and analysis of metal, nonmetal and other compounds in vacuum and multiple controllable atmospheres.

Technical parameters

Adaptive power	AC220 V50/60 Hz
Heating element	Beijing SHOUGANG HRE
Product size	· Tube OD: 50 mm; ID: 44 mm · Middle air distributor bore diameter: 0.1 mm · Outline dimension: 460*400*890 mm
Operating temperature	· Maximum temperature: 1,200 °C (Inert gas must be loaded to prevent tube deformation) · Rated temperature: 1,100 °C; Recommended heating rate: ⩽10 °C/min · Maximum heating rate: 20 °C/min
Control mode	· PID control and self-tuning regulation · Intelligent control through 30 programmable segments · Supporting alarm for over-temperature and for open circuit of thermocouple · Temperature control precision: ±1 °C · K-type thermocouple · PC control software can be installed for real-time data collection (to be purchased separately)
Sealing system	Quick-open flanges are set at both ends of the tube

• TFV Vertical Tube Furnace Parameters Selection Guide

	TFV Vertical Tube Furnace	
Classified by working temperature	Micro Vertical Tube Furnaces	Experimental Vertical Tube Furnaces
Max temperature	1200℃（short-term)	1200℃（short-term)
Rated temperature	1100℃	1100℃
Heating rate	≤10℃/min	≤10℃/min
Temperature control precision	±1℃	±1℃
Furnace tube size	Φ30*550mm Φ50*550mm	Φ30*1000mm Φ50*1000mm Φ60*1000mm Φ80*10000mm
Chamber size	Φ80*220mm	Φ120*440mm
Heating zone length	220mm	440mm
Length of the constant temperature zone	60mm	120mm
Heating element	Beijing Shougang HRE	Beijing Shougang HRE
Rated power	1.5kW	3kW
Adaptive power supply	AC220V 50/60HZ	AC220V 50/60HZ
External Dimension	340*300*1200mm	460*400*890mm

TFR Rotary Tube Furnace

Micro Rotary Furnace

Product model: TFR-1200-30-I-220

TFR-1200-30-1-220 is a small single-zone rotary furnace adopting double-layer shell and air cooling system. The tube is driven by the motor to rotate at a low and steadier speed. The tube is a special-shaped quartz tube with internally welded lifting board that makes powder sintering more adequately and uniformly.

Technical parameters

Adaptive power	AC220 V 50/60 HZ
Maximum temperature	1200 °C (short-term)
Rated temperature	1,100 °C
Recommended heating rate	⩽10 °C/min
Temperature control precision	±1 °C
Size of furnace tube	Φ30*700 (ϕ50*150) mm (customizable)
Size of furnace chamber	ϕ80*220 mm
Heating zone length	220 mm
Constant temperature zone length	60 mm
Thermocouple	K-type
Heating element	Beijing SHOUGANG HRE
Rated power	1.5 kW
Outline dimension	340*300*380 mm
Weight	20 kg

Experimental Rotary Furnace

Product model: TFR-1200-60-I-440

The experimental rotary furnace integrates the control system with its chamber. The chamber is made of high purity alumina microcrystallite fiber subject to vacuum forming under high temperature. The heating element is resistance wire. The cooling system adopts double-layer air cooling structure, providing a surface temperature not more than 60 °C. The vacuum chamber is made of quartz tubes that run through the whole body. Both ends of the furnace tube are sealed with stainless steel flanges so that the furnace can work in a vacuum or atmosphere environment. The heating elements are parallel to the furnace tube and uniformly distributed outside the furnace tube to effectively guarantee the uniformity of the thermal field. Rotary mechanisms are attached at both ends to make the tube rotate at a uniform speed, so as to ensure the adequate reaction of materials.

Technical parameters

Maximum temperature	1200 °C (short-term)
Rated temperature	1,100 °C
Size of furnace tube	ϕ60/ϕ100*1000 mm (special-shaped)
Heating zone length	440 mm
Recommended heating rate	0 -20 °C/min
Maximum power	3 kW
Adaptive power	AC220 V 50/60 Hz
Outline dimension	880*420*520 mm
Weight	50 kg
Rotary speed	0-10 r/min adjustable
Sealing system	Stainless steel sealing flanges (including 316 L need valve, vacuum mechanical pressure gauge and hose coupling)
Control system	Fuzzy PID control and self-tuning regulation; intelligent control through 30 programmable segments; supporting alarm for over-temperature and for open circuit of thermocouple

• TFR Rotary Tube Furnace Parameters Selection Guide

	TFR Rotary Tube Furnace	
Classified by working temperature	Micro Rotary Tube Furnaces	Experimental Rotary Tube Furnaces
Max temperature	1200℃ (short-term)	1200℃ (short-term)
Rated temperature	1100℃	1100℃
Heating rate	0-20℃/min	0-20℃/min
	±1℃	±1℃
Furnace tube size	Φ30*700mm/Φ50*150mm	Φ60/Φ100*1000mm
Chamber size	Φ80*220mm	Φ120*440mm
Heating zone length	220mm	440mm
Length of the constant temperature zone	60mm	120mm
Rotation speed	0-10r/min (adjustable)	0-10r/min (adjustable)
Heating element	Beijing Shougang HRE	Beijing Shougang HRE
Rated power	1.5kW	3kW
Adaptive power supply	AC220V 50/60HZ	AC220V 50/60HZ
External Dimension	340*300*380mm	880*420*520mm

TF TFG Catalyst Atmosphere Calcination Activator

Product model: TFG-1200-50-I-220

Catalyst atmosphere calcination activator is aimed at problems in catalyst atmosphere calcination/activation process, e.g., difficult loading and transfer of samples; inconsistent treatment effect of particles at different positions; poor repeatability between different batches; powder splashing; delayed discharge of products and solvents; tube wall pollution and difficulty in cleaning; and space occupation. The catalyst calcinator/activator independently researched and developed by Kemi will bring better treatment effect and operation experience. Expensive and important catalysts deserve better equipment.

Technical parameters

Rated temperature	1,100 °C
Sample cell volume	10 mL (customizable)
Sample cell diameter	30 mm
Heating zone length	220 mm
Rotor flow meter range	30-200 mL/min (customizable)
Control system	Dual-channel intelligent temperature control
Rated power	2.0 kW
Adaptive power	AC220 V50/60 HZ
Outline dimension	660*320*580 mm
Weight	35 kg

Product features

Quartz tube and sample cell creatively designed by Kemi

- Aimed at the atmosphere calcination or activation demand of granular catalyst (0.1- 10 mL).
- Innovative and delicate quartz tube and sample cell design.
- Easy to load and transfer a small quantity of catalyst granules.
- Ensure that the atmosphere can uniformly pass through granules at different positions to make the treatment more uniform and repeatable.

American Super OMEGACLAD™XL thermocouple

- Super stable temperature drift — less than 2.8 °C after 25 weeks.
- The expected service life of the probe is 10 times that of similar competitive products*.

American Dwyer RATE-MASTER rotor flowmeter

- The unique integral fluid guide design controls and maintains flow stably.
- Integrally formed solid, transparent and shatterproof polycarbonate material.

Intelligent temperature control system

- New color touch screen operation.
- Multiple programmable segments for intelligent temperature control with a temperature control precision of ±1 °C.
- Integrating measurement, display, alarm, record and history curve, etc.

Model List of TFG Series Vertical Tube Furnaces

Type	Parameter	Model code	Remarks
Tube parameter (mm)	ϕ8	8	About 10 mL catalyst
	ϕ40	40	
	ϕ50	50	
	Customizable	--	

BF Series Muffle Furnace Equipment

BFC Conventional Muffle Furnace

Product model: BFC-1200- 1L

Product model: BFC-1200-7.2L

The desktop muffle furnace is integrated with intelligent temperature control system. Adopting three-side heating design, the heating elements are distributed at the left, right and top to provide higher heating rate and uniform temperature. Digital display instrument with a higher temperature control precision is adopted to reduce manual operation errors and improve working efficiency. Besides, the equipment is also provided with emergency stop button and over-temperature alarm function to improve the safety of the equipment.

•Muffle furnaces Parameters Selection Guide

	BFC- Conventional
Max temperature	1700℃
Heating rate	≤20℃/min
Temperature control precision	±1℃
Volume	1-36L
Thermocouples	K type, B type, S type
Heating element	Resistance Wire, Silicon Carbon Rods, Silicon Molybdenum Rods
Adaptive power supply	AC220V 50/60HZ
Temperature control	Fuzzy PID control and self-tuning regulation, intelligent 30-segment programmable control, with over-temperature and broken-couple alarm function.

GD Series Gas Distribution Equipment

Gas distribution equipment		
Model	Type	Number of gas paths
GDT	Desktop	2~4
GBF	Floor type	More than 2

Four-Way Gas-Mixing System

Product model: GDT-MFC-4

The gas supply system can regulate the flow of different gases through the mass flow meter and mix them in appropriate proportions. Gas cleaning unit can be also added as needed by the experiment. The mass flow meter shall be installed in sealed pipe box and connected with duplex stainless steel tube and precision double-ferrule fitting. The touch screen control equipment can be used in conjunction with Kemi tube furnaces.

Technical parameters

Adaptive power	AC220 V 50/60 HZ
Standard range of the flow meter	100sccm/200sccm/200sccm/500sccm (Unless otherwise specified, it shall be calibrated with nitrogen. Ranges are selectable)
Operating temperature	5~45 °C
Operating pressure difference	0.1~ 0.5 MPa
Operating pressure	Flowmeter pressure 3MPa, system outlet pressure = <0.3MPa (other non-standard pressure, must be customised)
Precision	±1.5% FS
Measuring range	-0.1~0.15 MPa (0.01 MPa/grid)
Needle valve	316 stainless steel
Stop valve	316 stainless steel needle valve
Size	260*450*450 mm

Model List of GD Series Gas Distribution Equipment		
Type	Parameter	Model code
Flow meter	Glass rotor flow meter	GRF
	Mass flow meter	MFC
Number of gas paths	2	2
	3	3
	4	4
	Customizable	-

Continuous Flow Reactor/Fixed-Bed Reactor

Fixed-bed reactor	
Model	Type
CFRF	Floor fixed-bed reactor
CFRD	Desktop fixed-bed reactor
CFRL	Trickle bed reactor
CFRM	Micro-channel reactor

Multi-Functional Desktop Fixed-Bed Reactor

Product model：CFRF-L1G3-600-100

Desktop fixed-bed is a multi-functional desktop fixed-bed integrating manual control and automatic control. It has a small dead volume and can realize precise control of experiment condition, so as to ensure experiment reproducibility and sensitivity. Adopting distributed control system solution, the device is highly stable and safe. Moreover, the device adopts modular design concept. After a simple expansion or upgrade, it can be used in fields such as catalyst evaluation and membrane performance,and it is well suited to research of dynamics of continuous flow reaction, exploration of reaction conditions and optimization of technological conditions.

Advantages and characteristics

·Modular design: Modular selection and design for materials, equipment, instruments, processes, analytical instruments (such as GC and conductivity meter) can be carried out based on users' actual requirements for flow control, temperature, pressure, corrosion and degree of automation, etc.

·Integrated manual control and automatic control: Germany Siemens PLC module and 10.2-inch MCGS touch screen are adopted for the hardware control system. The in-depth customization and development of operating system makes the operation easier. The DCS interface shall include the display and control screens of process, flow and temperature and data trend chart, etc.

·Multi-safety protection: The range of parameters of the operating system can be set to prevent the misinput of parameters; When the pressure or temperature exceeds the limit, the control system will automatically activate relevant protection measures and send a prompting message to the user for handling. Safety valves are installed.

Technical parameters

Main design parameters	Maximum design temperature (°C)	800
	Maximum design pressure (bar)	100
Reactor parameters	Catalyst loading volume (mL) Constant temperature segment length (mm) Reactor material	0.5~5 As required by the customer Stainless steel 316 L, Hastelloy C-276, Inconel 600, etc. (as required by the customer)
Feed system	Gas/liquid feed flux quantity	1, 2, 4 or as required by the customer
	Gas mass flow controller	Mass flow controller from brands such as Sevenstar/METRON, 5SCCM- 10SLM, precision ±1.5% FS, repeatability precision ±0.2% FS
	High-pressure metering pump	Metering pump from brands such as USA SSI/Shanghai Sanotac/Hangzhou Pupu, 0- 10 mL/min, outlet pressure 0-42 MPa, control precision 2% RD
Post-treatment system	Cooling/warming equipment	Coil type or jacketed type (selected as required)
	Online liquid sampling and compensation	Manual, semi-automatic, full-automatic
	Product analysis	Offline and online gas chromatography or mass spectrometry (optional)
System parameters	System power	200-240 V/AC,50-60 Hz
	System size (cm)	About 65*100*90
	System weight (kg)	About 180
	Control system	Germany Siemens PLC module and 10.2-inch MCGS touch screen are adopted for the hardware control system. The operating system is deeply customized and developed. The DCS interface includes the display and control screens of process, flow and temperature and data trend chart

Design principle of Kemi custom continuous flow reactor/ catalyst evaluation unit:

1. Learn about basic requirements of the customer and relevant key parameters and develop the preliminary design scheme.
2. Discuss the scheme with the customer and identify the risk points.
3. Amend the scheme until it is approved by the customer and create an orde.r

Note: The customer enjoys the right of final decision of the scheme. Kemi will give the customer corresponding advice based on Kemi' s experience and cases.

Fischer-Tropsch Synthesis Catalyst Evaluation Unit

Product model: CFRF-L2G4-600-10

Dynamic Tubular Reactor

D1 small-scale rotary shear micro-flow field tubular reactor

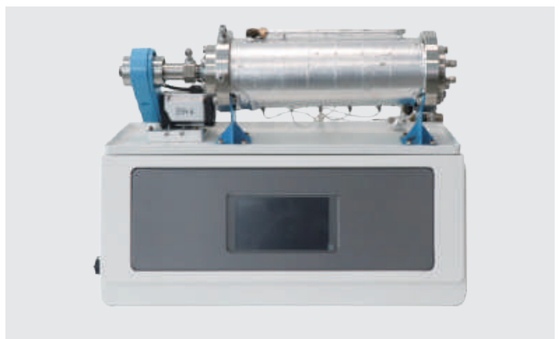
The design concept of D1 small-scale rotary shear micro-flow field tubular reactor is inherited from the traditional plate micro-reactor, which can effectively shear and collide the fluid through the local micro-turbulence field, while the reactor structure is between the tubular reactor and kettle-type CSTR reactor. The rotary shear micro-flow field reactor adopts the inner stirring shaft with unique disturbing structure to generate rotary shear micro-flow field, so that the reacting fluid generates micro-vortex locally, which enhances the mass transfer and mixing effect, and the rotary shear flow is limited in the circumferential direction as much as possible, so as to reduce axial flow along the direction of reaction and to reduce the mixing of the materials with different retention time in the process of reaction.The D1 small-scale pilot reactor adopts the magnetically coupled drive, and the non-dynamic seal design, which eliminates the rotating sealing and the rotating seal design and the rotating seal design. D1 reactor is suitable for homogeneous phase, liquid-liquid two-phase, gas-liquid phase reaction, and allows solid content ⩽ 10%, solid particle size ⩽ 0.2mm suspended solids. In addition, the D1 microreactor can be equipped with a built-in high and low temperature control unit, which can be used to complete continuous flow process development experiments without the need for external high and low temperature circulators.The D1 reactor adopts an outer jacket heat exchange and has five temperature measurement points in the direction of the reaction process, which is convenient for process researchers to obtain real-time reaction temperatures of different reaction sections, so as to control and optimise the reaction conditions in a targeted manner.

Application Field

With moderate liquid holding capacity, compact reactor design, good sealing, accurate temperature measurement and convenient control, the D1 reactor is particularly suitable for universities, research institutes and R&D departments of enterprises to carry out experimental research on continuous flow reaction and to carry out kilo-scale synthesis.

Technical parameters

Maximum temperature	100mL-500mL
Transparent window material	PTFE, PFA, silicon carbide
Design temperature	Standard: -10°C to +180°C Limit: -40°C to +280°C
Design pressure	1.6MPa/3MPa/10MPa/25MPa
Flux	Liquid Flux: 3-20t/a Production capacity: 0.2-3t/a
Size	850* 550*500mm
Material of reaction flow channel	stainless steel 316L, Hastelloy C-276, Titanium alloy TA2, zirconium alloy 705, monel alloy 400, etc.



Product mode: KM-D1-316L

D2 Pilot Rotary Cutting Microfluidic Tubular Reactor

The D2 pilot-scale rotary shear microfluidic field tubular reactor inherits the design concept and advantages of the D1 reactor, and the liquid holding capacity has been extended to 1000 mL.The stirring shaft of the D2 rotary shear tubular reactor adopts CNC machining and balancing, which effectively reduces the vibration and noise of the high-speed rotation, and prolongs the service life of the supporting elements.The D2 reactor also adopts the outer jacket heat exchanger to control the temperature and can be designed into multiple independent temperature control sections according to the needs of the reaction, for some strong exothermic reactions. According to the reaction needs, the jacket can be designed as multi-segment independent temperature control, for some strong exothermic reaction, can be

The D2 reactor also adopts the outer jacket heat exchanger to control temperature, and can be designed as multi-segment independent temperature control according to the needs of reaction, for some strong exothermic reaction, it can be given a higher temperature to start the reaction in the initial stage, and given a lower temperature heat exchanger medium to take away the heat generated by the reaction.D2 reactor adopts the floor-standing design, and is equipped with the internal integrated high and low temperature integrated temperature control system as standard, and can be customised according to the needs of multi-segment independent temperature control circulatory system.The D2 reactor is equipped with 10 temperature measurement points in the direction of the reaction process, which is convenient for the process developer to grasp the information of reaction in real time. D2 reactor is suitable for homogeneous, liquid-liquid two-phase, gas-liquid phase reaction, and allows the solid content ⩽ 20%, solid particle size ⩽ 0.5mm suspended solids.

Application Field

The annual liquid flux of D2 reactor can be up to one hundred tonnes, and the whole reactor is highly integrated, with good sealing, accurate temperature control and small footprint, which is suitable for R&D departments of enterprises to carry out pilot process research on continuous flow reaction, as well as to carry out trial production of synthesis from one hundred kilograms to one hundred tonnes. Compared with plate microreactor, rotary cutter flow reactor has slightly lower heat transfer coefficient and mixing efficiency, but at the same time, it has the obvious advantages of high cost-efficiency ratio and wide applicability, and it can be flexibly used together with plate microreactor in the actual industrial application to give full play to the advantages of plate microreactor and rotary cutter flow reactor. In the practical industrial application, it can also be used flexibly with plate microreactor to give full play to the respective advantages of plate microreactor and rotary cut tube reactor.

Technical parameters

Nominal liquid capacity	1L-5L
Transparent window material	PTFE, PFA, silicon carbide
Design temperature	Standard: -10°C to +180°C Limit: -40°C to +280°C
Design pressure	1.6MPa/3MPa/10MPa
Flux	Liquid Flux: 10-100t/a Production capacity: 1-15t/a
Size	1500* 750*500mm
Material of reaction flow channel	stainless steel 316L, Hastelloy C-276, Titanium alloy TA2, zirconium alloy 705, monel alloy 400, etc.

Product mode: KM-D2-316L

Custom Products

Material Preparation/Activization Category

Box Furnace with Three Sided Observation Windows

- Reserved specially-made three sided windows
- Real-time observation of the reaction state
- Recording by taking photos with a high-speed camera

BFW-1200-4.5L

Draught Drying and Circulating Box Furnace

Simulating the drying of artificial crystalline mineral:

- Draught drying segment Drying segment
- Circulation + condensate recovery for centralized treatment

BFD-1200- SD-AD

Vacuum Pit-Type Crucible Furnace

The vacuum pit-type crucible furnace is composed of pit-type furnace, corundum crucible and vacuum flanges to realize atmosphere experiment against different requirements. Water-cooled flanges are installed at the top to ensure the sealing.

BFD-1400-100D

Miniature High Flux Four Channel Tube Furnace

Mainly used in universities,research institutes, industrial and mining enterprises high temperature sintering, metal annealing, quality testing.

TFH-1200-60-350-4L

Double-Zone Experimental Tube Furnace

Double zones achieve temperature control independently from each other. The furnace has a longer constant temperature zone of not less than 600mm

TFH-1200-60-II-440

Single Temperature Zone Swing Rotary Furnace

It is mainly applied to the hydrogenation activation of battery cathode materials, with a single treatment volume of not less than 200mL, which solves the problems of uneven activation, inconsistent products and low repeatability in the mass production of cathode materials. Meanwhile, it can be used for material research, including amorphous carbon, nitrogen-doped carbon, phosphorus-doped carbon, etc.

TFR-900-130-300-ET

Electric Horizontal Rail-Type Furnace

The furnace is used for cyclic heat aging experiment of materials and can meet the quick heating and cooling requirements of materials.

TFD-1100-80-200-SR

Ceramic Heating Furnace

The product is used in conjunction with a high-speed camera for analysis of surface characteristics of high temperature ceramic materials after calcination

KM-SH160

Multi-Station Carbonization and Activation Experiment Unit

The product is used for high temperature carbonization and activation experiment of carbon material. It can achieve multi-angle and multi-station automatic control

TFM-1200-60-300-3H

Vertical Carbon Granule Combustion Furnace System

The product achieves efficient utilization of ventilation air methane in the coal-fired boiler by burning a certain concentration of ventilation air methane and coal jointly and measuring the parameters of the mixture and the operating parameters of the device

KM-1500-ET

Quadruple Reactor System

The 1-control 3-measurement reactor control system achieves gas solid reaction at 350 °C and 20 MPa.

NS50-P5-T5-SS1-SV-R-ET

Custom 2 L Kettle-Type High Temperature and Pressure Reactor

For material calcination in ammonia atmosphere at 600 °C and 10 MPa

TFD-600-GH747-2L

Thermogravimetric Analysis Category

Vertical Thermogravimetry Furnace

For determining the material corrosion, pyrolysis, adsorption/desorption and oxidation/reduction reaction by thermogravimetry

TFD-1200-50-200-RZ

Vertical Double-Zone Thermogravimetry Furnace

For studying the dynamic change of weight of materials subject to cyclic adsorption and desorption

TFD-1100-70-RZ

Photocatalytic Thermogravimetric Analysis Unit

For simulating thermal weight loss of materials under sunlight

TFD-700-50-V-RZ

Photo-Catalytic Reaction Category

High-Temperature Photo-Thermal Catalytic Reaction Unit

Applied to methane reforming experiments, to meet the experimental conditions of 800° C, atmospheric pressure and light; equipment integrated with heating, cooling, gas heat recovery system

TFD-900-60-W

Vertical High-Temperature High-Pressure Photocatalysis Furnace

An experiment device used for hydrogen production mechanism and system optimization of optic-thermal coupling system that meets the light conditions of a high temperature of 900 °C and a high pressure of 3 MPa.

TFD-1000-60-W

Biomass Pyrolysis Category

High-Temperature High-Pressure Tube Furnace with Continuous Loading

A continuous pyrolysis reactor used at constant temperature and under constant pressure

TFP-1200-51-440

High-Temperature High-Pressure Tube Furnace for Special Atmospheres

For material pyrolysis and calcination in special (ammonia) atmosphere at high temperature and high pressure

TFP-1200-51-440-NH3

Material Surface Treatment Category

Plasma Cleaner

A precision dry cleaning equipment used forprecision cleaning of semiconductor, thick film circuit and PCB, etc.

KM-PL10S

Single-Evaporating Dish Program Controlled Evaporator

A coating equipment by evaporation designed for electrode preparation and organic LED based on customer requirements. Compared with conventional products, the product has additional specimen rotating holder and programmed temperature control. Precise temperature control: 200 °C- 1,500 °C; maximum diameter of samples that can be coated: 50mm; the product can be used for preparing metal film and organic film.

ECH-1500- I

Molten Salt Furnace

The product is used for studying the process and performance of boronizing by molten salt electrolysis on metal surface. 75% borax and 25% sodium carbonate are adopted for boronizing by molten salt electrolysis on sample surface. External electroplating power supply is used to impose a pulse current in a certain waveform to form an alloyed layer with superior performance on the base performance by electrolysis and solid state diffusion.

BFD-1000-MSF

1400 Series Sample Test Furnace

This equipment is mainly used for the performance test of refractory insulation materials. Double-door independent design to meet the sample test and atmosphere chamber furnace; 7-inch touch screen control, can be 30 programmable temperature control; mobile sample loading platform, the maximum panning distance of 850mm.

BFD-1400-X-D

Powder catalyst roasting field

Powder Catalyst Calcination Field Pilot Powder Material Catalysis and Calcination Device

Hydrogine Technology/ Applied to study the calcination and reduction of electrode materials of fuel cells.

CFRFDI-L0G3-800-A

Membrane and membrane material devices

Membrane Preparation Device

Applied to water desalination, petrochemical engineering, hazardous waste gas treatment, etc.

MSL5L-P1-T2-HC1-R-ET

Liquid Phase Hydrogenation and Oxidation Reactor Category

2L Intelligent Reactor

Sinochem International (Shanghai)/ Applied to reactions such as liquid phase hydrogenation under high temperature and high pressure.

RMSI-L0G3-P4-T3-HC

100 mL Liquid Phase Hydrogenation Reactor

Taixing New Materials Research Institute/ Applied to liquid phase hydrogenation reaction in continuous gas flow environment.

RNS-L0G1-P3-T3-SS

100 mL Liquid Phase Oxidation Reactor

Jiangsu Sairuike New Materials/ Applied to liquid phase oxidation reaction in continuous gas flow environment.

RNS-L0G1-P3-T3-HC

Intelligent Continuous Reactor System

REDSUN GROUP/ Applied by the pharmaceutical Company to the study of drug intermediate reaction in semi-batch reaction.

RMS-L1G1-300-50

Intelligent Mechanical Reactor

This equipment is 500mL mechanical stirring reactor, using linear module kettle body can be automatically removed, rapid cooling; design pressure 10MPa, operating pressure 3-5MPa; operating temperature of 150 ° C, design temperature of 260 ° C. On-line is obaric charging, balanced reflux sampling.

MSI500-P2-T3-HC1-SV-R-ET

2L Hastelloy reactor

Mainly used for acid washing sand test, quartz sand crushed under water washing, can remove some impurities; magnetic separation can be more than 99% of the mechanical iron removal acid leaching can remove the remaining impurities.

NSG300-P1-T8-HC1-SV-R-ET

High-temperature kettle coking reaction device

This reaction device is to do the carbonisation reaction reactor, the maximum temperature and pressure is 550 ° C, 2MPa, the reaction material is oil slurry, oil slurry after high temperature carbonisation into needle coke raw coke, need to control the flow rate of the gas flow needs to have gas flow, so that it has a certain orientation when carbonisation.

MSG2L-P5-T3-HC1-SV-R-ET

Material Roasting Direction

Customised 2L kettle type high temperature reactor

Custom 2L kettle type high temperature reactor is a solid state reaction experimental device applied in vacuum state with a design temperature of 600°C. The main body of the reactor is made of austenitic stainless steel 3160, and the heating is made of vacuum adsorption moulding alumina fibre hearth, which is a linear temperature rise, uniform heat transfer, good insulation effect, supplemented by control logic, it can be easily realized in time and time segments of the temperature rise and heat preservation, and it can effectively realize the material reaction requirements at different temperatures. Reaction requirements.

MSL2L-P1-T8-310S-SV-R-ET

Optoelectronic material synthesis direction

Customised 28L kettle reaction device

Customised 28L kettle reaction device is an experimental device for liquid-solid homogeneous reaction, with design temperature of 150°C and design pressure of 1.5MPa. The main body of the kettle is made of 316L material, and the part of the kettle contacting with materials is treated with PFA spraying; MCGS human-machine interface is adopted to display and control all the functions and parameters of the device. Applying the integrated high and low temperature circulating temperature control device researched by Kemi, the temperature inside the kettle can be precisely controlled and the delayed holding time can be set freely.

MSL28L-P2-T2-SS1-SV-R-ET

Biological Fermentation Direction

Customised 4-50L fermenter unit

The whole machine adopts MCGS touch screen to build human-machine interactive interface and realise hand-automatic logic control. Adopt Mettler PH meter to monitor the PH value of reaction materials in real time. During the reaction process, real-time monitoring of various indicators, abnormalities in time alarm; tank cover with lighting, through the kettle window can be visualised reaction state; each fermenter is set up with an independent heating system, can achieve free temperature control; stirring using three-phase motors, can provide high speed stirring.

4-50L

Oxidation reaction catalyst evaluation device

Applied to liquid phase hydrogenation or oxidation reactions.

CFRL-YH-L2G1-300-100

Liquid Phase Oxidation Fixed-Bed Reactor

Taixing New Materials Research Institute/ Applied to evaluation of performance of catalysts for high pressure oxidation.

CFRL-YH-L1G3-300-100

Normal Pressure Four-Gas One-Liquid Fixed-Bed Reactor

South China Agricultural University/ Applied to oxidation or reduction reaction at normal pressure.

CFRD-X-L1G4-1000-A

Continuous Liquid Phase Hydrogenation Fixed-Bed Reactor

Hefei Lifeon Pharmaceutical/ Applied by scientific research department of the pharmaceutical Company to perform liquid phase hydrogenation reaction.

CFRL-YH-L1G1-180-50

Polyester Reactor Category

7 L Polymerization Reactor, Extrusion and Conveying System

Sichuan University/ Applied to study parameters of processes such as synthesis, blanking and conveying of some kind of polymer.

KMPMS-7L-3CC-L3

5 L Intelligent Polyester Reactor

Sichuan University/ Applied to the study of two-step approach polyester reaction.

KMPMS-5L-300-10

10L Polyester Reactor

Process study of Jiangsu Srbang/application to PLA reaction.

KMPMS-10L-300-A

Ternary precursor reactor system

Ternary precursor reactor system

Ternary precursor reaction is used to synthesise precursors, which is mainly achieved by complexing and co-precipitation of salt solution, alkali solution and ammonia solution through metering pumps according to a certain ratio, and the system can accurately regulate and control the parameters such as temperature, PH value, pressure, feeding rate and stirring rate.

MSL50L-P3-T3-HC1-SV-R

Biomass, Fine Chemical Engineering, Functional Materials and Continuous Flow

20 L Hastelloy High-Temperature High-Pressure Reactor

Xi' an Jiaotong University/ Applied to the study of catalytic reaction of biomass.

MSL20L-P4-T3-HC1-R-ET

25 L High-Pressure Mechanical Stirring Reactor

Sinochem International (Shanghai)/ Applied to synthetic reaction of functional materials under high temperature and high pressure.

MSL25L-P1-T3-SS-R-ET

Polyethylene Reactors (Solution Method)

5 L Metallocene Polyethylene Reactor System

CNOOC (Tianjin)/ Applied to the study of metallocene polyester reaction.

RMS5L-L1G2-200-30-SS

2 L Metallocene Polyethylene Reactor System

University of Science and Technology of China/Applied to the study of metallocene polyester reaction.

RMS2L-L1G2-200-30-SS

Fischer-Tropsch, Carbon Dioxide Reduction, and Tail Gas Treatment Fixed-Bed Reactors

Carbon Dioxide Hydrogenation Reduction Fixed-Bed Reactor

University of Science and Technology of China/Applied to the study of catalytic system such as carbon dioxide hydrogenation.

CFRD-L0G4-500-100

Fischer-Tropsch Fixed-Bed Reactor

Fudan University/ Applied to the study of catalytic system such as carbon monoxide hydrogenation.

CFRD-L0G2-600-100

Dual Channel Fixed Bed unit

University of Science and Technology of China/ Applied to the study of gas-liquid-solid three-phase catalytic reactions.

CFRF-2T-L1G3-500-50

Low-Flow Loading Fixed-Bed Reactor

Changji University/ Applied to the study of catalytic reaction system of bubbling carrying low flow.

CFRDGL-L1G3-500-50

Three Channel Fixed-Bed Device

Sinopec Catalysts Corporation/ Catalyst Evaluation Study for Oxidation Reactions of Corrosive Gases at Atmospheric Pressure.

CFRFHCl-L0G3-500-06

VOCs Catalyst Evaluation Device

Yueyang Xingchang Petrochemical / Material evaluation study of VOCs treatment materials applied in the direction of environmental protection field.

CFRFVOC-L2G3-850-2

Dual Channel Ammonia Decomposition Fixed Bed

Hefei Institute of Materials Science, Chinese Academy of Sciences / Applied to the study of ammonia deco mposition reaction at high temperature and atmosphe ric pressure, the dual chan nel can be efficient.

CFRDNH3-2T-L0G2-1000-A

Fixed Bed of Ammonia Decomposition for Ammonia Synthesis

Foshan Xianhu Laboratory / Applied to the catalytic study of ammonia decomposition in ammonia synthesis at high temperature and high pressure.

CFRFNH3-L0G3-500-30/1000-A

Polymer Foaming/Supercritical Carbon Dioxide Extraction Reactor Direction

For the autoclave foaming process, the blowing agent (supercritical carbon dioxide or supercritical nitrogen) is gradually infiltrated into the polymer blank by static diffusion under certain temperature conditions. Nitrogen or carbon dioxide, as the blowing agent, enters the kettle and contacts the polymer through a nitrogen booster pump or a carbon dioxide liquid booster pump.The polymer is contacted by a nitrogen booster pump or a carbon dioxide liquid booster pump to form a homogeneous molten rubber/foaming agent homogeneous system. Applicable polymer systems are thermoplastic elastomer polymer materials, such as polyurethane (TPU), polyether block polyamide (PEBA), ethylene vinyl acetate copoly mer (EVA) and so on. Remarkable advantages, can quickly boost and lower pressure, also can edit the programme to control the pressure boost and pressure relief.

SCFCO2-500-300-250