

# CL-JGDF-400 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-400	
Effective Puller travel distance	mm	550	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	3	√
Scale display resolution	mg	10	√
Power	Kw	0-10	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	150	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm	0-20	○
Chamber size	mm	Φ400×700	√
Overall size (L×W×H)	mm	2800×1000×2700	
Overall weight	Kg	600	

Note: Installation dimensions do not include optional systems



# CL-JGDF-400 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 15Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥3m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 40L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 1 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-400	√
Furnace chamber size	Φ400×700	√
Control cabinet	CRY-K- I	√
Power supply	ATECD10	√
Pulling mechanism	CRY-TL-500	√
Frame	CRY-LJ-400	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-3	√
Rotating mechanism	CRY-R- II	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX70	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-520	√
Seed rod	Ø8×700	√
Mechanical pump	RVP-4	√



# CL-JGDF-400 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).



# CL-JGDF-500 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-500	
Effective Puller travel distance	mm	550	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	5	√
Scale display resolution	mg	10	√
Power	Kw	0-20	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	150	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm	0-20	○
Chamber size	mm	Φ500×800	√
Overall size (L×W×H)	mm	3000×1100×2900	
Overall weight	Kg	700	

Note: Installation dimensions do not include optional systems



# CL-JGDF-500 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 25Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥3m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 40L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 1 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-500	√
Furnace chamber size	Φ500×800	√
Control cabinet	CRY-K- I	√
Power supply	ATECD20	√
Pulling mechanism	CRY-TL-550	√
Frame	CRY-LJ-500	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-5	√
Rotating mechanism	CRY-R- II	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX70	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-620	√
Seed rod	Ø8×700	√
Mechanical pump	RVP-9	√



# CL-JGDF-500 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).



# CL-JGDF-600 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-600	
Effective Puller travel distance	mm	550	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	10	√
Scale display resolution	mg	10	√
Power	Kw	0-40	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	150	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm	0-20	○
Chamber size	mm	Φ600×1000	√
Overall size (L×W×H)	mm	3200×1300×3000	
Overall weight	Kg	1400	

Note: Installation dimensions do not include optional systems



# CL-JGDF-600 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 60Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥3.4m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 80L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 3 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-600	√
Furnace chamber size	Φ600×1000	√
Control cabinet	CRY-K- I	√
Power supply	ATECD40	√
Pulling mechanism	CRY-TL-550	√
Frame	CRY-LJ-600	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-10	√
Rotating mechanism	CRY-R- I	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX-90	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-620	√
Seed rod	Ø8×700	√
Mechanical pump	DT40	√





# CL-JGDF-600 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).

## ACCEPTANCE

Equipment acceptance is divided into pre-acceptance and final acceptance. Each acceptance is divided into equipment index acceptance and process performance acceptance.



# CL-JGDF-600 type pulling single crystal furnace

## ACCEPTANCE

	Item	Projected Spec	Measurement	Remark
Basic Specification	Effective travel distance of upper puller	550 mm		
	Effective stroke of crucible lifting	\		
	IF generator power	40Kw, 6-16KHz		
	Scale measurement range	10Kg		Net weight 6Kg
	Furnace chamber size	φ600mm×1100mm		
	Mechanical pump	12L/S		
	Pulling rate	0.1-6000mm/h		
	Crucible lifting speed	\		
	Rotating rate	0-40r/min		
	Crucible rotation rate	\		
	Grating/encoder	1μm		
	Other	As specified in Contract		
Accuracy	Pulling system jump	1μm		as per jump value measured with dial indicator (at 1mm/h pulling rate)
	IF resolution	1‰		The fluctuation of fixed power shall prevail
	Scale display	10mg		
	Vacuum limit	10Pa		Vacuum gauge measurement as standard
	Min. pulling rate	0.1mm/h		
	Min. crucible pulling rate	\		
Process control index	Use Party B's sapphire or pure YAG material and temperature field to pull A-direction Φ50×100mm crystals. The error between the crystal and set sizes is not greater than 1mm, and the internal quality is not used as an assessment index.			In case of any conflict between the contract and this provision, the contract shall prevail



# CL-JGDF-800 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-800	
Effective Puller travel distance	mm	550	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	20	√
Scale display resolution	mg	10	√
Power	Kw	0-60	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	150	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm	0-20	○
Chamber size	mm	Φ800×1100	√
Overall size (L×W×H)	mm	3500×1700×3400	
Overall weight	Kg	2200	

Note: Installation dimensions do not include optional systems



# CL-JGDF-800 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 70Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥3.6m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 80L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 3 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-800	√
Furnace chamber size	Φ800×1100	√
Control cabinet	CRY-K- I	√
Power supply	ATECD60	√
Pulling mechanism	CRY-TL-550	√
Frame	CRY-LJ-800	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-20	√
Rotating mechanism	CRY-R- I	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX-90	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-620	√
Seed rod	Ø8×700	√
Mechanical pump	DT40	√



# CL-JGDF-800 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).

## ACCEPTANCE

Equipment acceptance is divided into pre-acceptance and final acceptance. Each acceptance is divided into equipment index acceptance and process performance acceptance.



# CL-JGDF-800 type pulling single crystal furnace

## ACCEPTANCE

	Item	Projected Spec	Measurement	Remark
Basic Specification	Effective travel distance of upper puller	550 mm		
	Effective stroke of crucible lifting	\		
	IF generator power	60Kw, 6-16KHz		
	Scale measurement range	20Kg		Net weight 16Kg
	Furnace chamber size	φ800mm×1100mm		
	Mechanical pump	12L/S		
	Pulling rate	0.1-6000mm/h		
	Crucible lifting speed	\		
	Rotating rate	0-40r/min		
	Crucible rotation rate	\		
	Grating/encoder	1μm		
	Other	As specified in Contract		
Accuracy	Pulling system jump	1μm		as per jump value measured with dial indicator (at 1mm/h pulling rate)
	IF resolution	1‰		The fluctuation of fixed power shall prevail
	Scale display	10mg		
	Vacuum limit	10Pa		Vacuum gauge measurement as standard
	Min. pulling rate	0.1mm/h		
	Min. crucible pulling rate	\		
Process control index	Use Party B's sapphire or pure YAG material and temperature field to pull A-direction Φ50×100mm crystals. The error between the crystal and set sizes is not greater than 1mm, and the internal quality is not used as an assessment index.			In case of any conflict between the contract and this provision, the contract shall prevail



# CL-JGDF-1000 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-1000	
Effective Puller travel distance	mm	550	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	30	√
Scale display resolution	mg	10	√
Power	Kw	0-80	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	150	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm	0-20	○
Chamber size	mm	Φ1000×1500	√
Overall size (L×W×H)	mm	3800×2000×3800	
Overall weight	Kg	4000	

Note: Installation dimensions do not include optional systems



# CL-JGDF-1000 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 90Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥4m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 80L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 3 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF1000	√
Furnace chamber size	Φ1000×1500	√
Control cabinet	CRY-K- I	√
Power supply	ATECD80	√
Pulling mechanism	CRY-TL-550	√
Frame	CRY-LJ-1000	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-30	√
Rotating mechanism	CRY-R-III	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX-90	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-620	√
Seed rod	Ø12×700	√
Mechanical pump	DT60	√





# CL-JGDF1000 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).

## ACCEPTANCE

Equipment acceptance is divided into pre-acceptance and final acceptance. Each acceptance is divided into equipment index acceptance and process performance acceptance.



# CL-JGDF-1000 type pulling single crystal furnace

## ACCEPTANCE

	Item	Projected Spec	Measurement	Remark
Basic Specification	Effective travel distance of upper puller	550 mm		
	Effective stroke of crucible lifting	\		
	IF generator power	80Kw, 6-16KHz		
	Scale measurement range	30Kg		Net weight 26Kg
	Furnace chamber size	φ1000mm×1500mm		
	Mechanical pump	16L/S		
	Pulling rate	0.1-6000mm/h		
	Crucible lifting speed	\		
	Rotating rate	0-40r/min		
	Crucible rotation rate	\		
	Grating/encoder	1μm		
	Other	As specified in Contract		
Accuracy	Pulling system jump	1μm		as per jump value measured with dial indicator (at 1mm/h pulling rate)
	IF resolution	1‰		The fluctuation of fixed power shall prevail
	Scale display	10mg		
	Vacuum limit	10Pa		Vacuum gauge measurement as standard
	Min. pulling rate	0.1mm/h		
	Min. crucible pulling rate	\		
Process control index	Use Party B's sapphire or pure YAG material and temperature field to pull A-direction Φ50×100mm crystals. The error between the crystal and set sizes is not greater than 1mm, and the internal quality is not used as an assessment index.			In case of any conflict between the contract and this provision, the contract shall prevail



# CL-JGDF-1200 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-1200	
Effective Puller travel distance	mm	700	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-40	√
Weight measurement range	kg	50	√
Scale display resolution	mg	10	√
Power	Kw	0-100	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm	700	○
Crucible lifting speed	mm/min	0.1-100	○
Crucible rotation rate	rpm		○
Chamber size	mm	Φ1200×1500	√
Overall size (L×W×H)	mm	4000×2400×4200	
Overall weight	Kg	4800	

Note: Installation dimensions do not include optional systems



# CL-JGDF-1200 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 110Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥4.4m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 100L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 5 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-1200	√
Furnace chamber size	Φ1200×1500	√
Control cabinet	CRY-K- I	√
Power supply	ATECD100	√
Pulling mechanism	CRY-TL-700	√
Frame	CRY-LJ-1200	√
VMB	CRY-Q- I	√
Weighing platform	CRY-CZ-50	√
Rotating mechanism	CRY-R-III	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86HS45	√
Rotating motor and driver	LCX-90	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	XT70×50-800	√
Seed rod	Ø12×700	√
Mechanical pump	DT60	√



# CL-JGDF-1200 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).

## ACCEPTANCE

Equipment acceptance is divided into pre-acceptance and final acceptance. Each acceptance is divided into equipment index acceptance and process performance acceptance.



# CL-JGDF-1200 type pulling single crystal furnace

## ACCEPTANCE

	Item	Projected Spec	Measurement	Remark
Basic Specification	Effective travel distance of upper puller	700 mm		
	Effective stroke of crucible lifting	\		
	IF generator power	100Kw, 6-16KHz		
	Scale measurement range	50Kg		Net weight 45Kg
	Furnace chamber size	φ1200mm×1500mm		
	Mechanical pump	16L/S		
	Pulling rate	0.1-6000mm/h		
	Crucible lifting speed	\		
	Rotating rate	0-40r/min		
	Crucible rotation rate	\		
	Grating/encoder	1μm		
	Other	As specified in Contract		
Accuracy	Pulling system jump	1μm		as per jump value measured with dial indicator (at 1mm/h pulling rate)
	IF resolution	1‰		The fluctuation of fixed power shall prevail
	Scale display	10mg		
	Vacuum limit	10Pa		Vacuum gauge measurement as standard
	Min. pulling rate	0.1mm/h		
	Min. crucible pulling rate	\		
Process control index	Use Party B's sapphire or pure YAG material and temperature field to pull A-direction Φ50×100mm crystals. The error between the crystal and set sizes is not greater than 1mm, and the internal quality is not used as an assessment index.			In case of any conflict between the contract and this provision, the contract shall prevail



# CL-JGDF-1500 type pulling single crystal furnace

## DESCRIPTION

CL-JGDF series single-crystal furnaces produce high-quality oxide solid single-crystal materials (such as LN, LT, YAG, YSO, LYSO, sapphire, etc.). It can operate in a vacuum atmosphere filled with oxygen and inert gases and under controlled local pressure.

This equipment series adopts the up-weighing method, through the crystal growth up or the crucible pot position down method, to achieve crystal growth.

This series of equipment lifting systems adopts high-precision motor drive control and direct drive stepper motor, which can realize a wide range of variable speed adjustment and ultra-low speed operation; A torque motor with high-speed stability drives the rotating system. This equipment series can ensure smooth operation, uniformity, reliability, and long-term operation without crawling or small vibrations.



## EQUIPMENT PARAMETERS ("√" IS STANDARD, "○" IS OPTIONAL)

Modle	Unit	CL-JGDF-1500	
Effective Puller travel distance	mm	900	√
Pulling rate	mm/h	0.1-6000	√
Pulling system jump (pulling rate 1mm/h)	mm	0.001	√
Rotating rate	rpm	0-20	√
Weight measurement range	kg	70	√
Scale display resolution	mg	10	√
Power	Kw	0-120	√
Power accuracy		1‰	√
Air filling pressure	Mpa	0-0.05	√
Vacuum	Pa	≤10	√
Vacuum	Pa	≤5×10 <sup>-3</sup>	○
Crucible travel	mm		○
Crucible lifting speed	mm/min		○
Crucible rotation rate	rpm		○
Chamber size	mm	Φ1500×2200	√
Overall size (L×W×H)	mm	3900×3800×5100	
Overall weight	Kg	8500	

Note: Installation dimensions do not include optional systems



# CL-JGDF-1500 type pulling single crystal furnace

## ENVIRONMENT REQUIREMENT

1. Power supply: Power supply: three-phase five-wire 50Hz 380V±10%, 130Kw and 10Kw circuit breaker each group; Two groups of 220V 10A power bars;
2. Mounting space height: ≥5.5m;
3. The main body of this equipment should be installed on a vibration-isolated foundation and surrounded by anti-vibration trenches. The vibration transmitted to the device from the outside should not exceed 5µm;
4. Equipment cooling water: deionized water, water flow rate is not less than 120L/min, water pressure is not less than 0.3MPa, temperature 22±1.5°C, temperature fluctuation speed is not more than 1°C/H;
5. The ambient temperature of the equipment is 22±1.5°C, the temperature fluctuation rate is not greater than 1°C/H, and the ambient humidity is less than 70%.
6. Equipment unpacking and handling requirements: The buyer shall prepare forklifts and manual hydraulic trucks with a load of 10 tons.

## EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

	CL-JGDF-1500	√
Furnace chamber size	Φ1500×2200	√
Control cabinet	CRY-K- II	√
Power supply	ATECD120	√
Pulling mechanism	CRY-TL-900	√
Frame	CRY-LJ-1500	√
VMB	CRY-Q- II	√
Weighing platform	CRY-CZ-70	√
Rotating mechanism	CRY-R-III	√
Vacuum gauge	ZDF series	√
Bellows	KF series	√
Pulling motor and driver	86CME-120	√
Rotating motor and driver	LCX-90	√
Encoder	ZKH58	√
IPC	IPC820 series	√
UPS power supply for control	C1LKRS	√
Welded bellow	ST85*63	√
Seed rod	Ø12×900	√
Mechanical pump	DT60	√





# CL-JGDF-1500 type pulling single crystal furnace

EQUIPMENT CONFIGURATION ("√" IS STANDARD, "○" IS OPTIONAL)

Diffusion pump	TK-150 / KT-200 / KT-300 / KT-400 / KT-500	○
Mechanical pump	RVP-4 / RVP-6 / RVP-9 / RVP-14 / RVP-18	○
Plug valve (pneumatic)	CCQ-100A / CCQ-150A / CCQ-200A / CCQ-250A	○
Molecular pump	JTFB-150 / JTFB-250 / JTFB-300 / FF200 / FF250	○
Dry pump	GWSP series/ISP series	○
Continuous feeding system	Cry-JL1	○
Crucible movement system	Cry-DM1	○
Temperature controller	3500 series	○
Mass flowmeter	MFC series	○
PLC	DVP-EH3	○
Emergency battery	CRY-P series	○
Chilled water	AYD series	○
Gas purification system	HSD series	○
Pouring structure	CRY-GDL1	○
Pneumatic pre-valve/low valve/bleed valve	GDQ series	○
Other functional modules	CCD/pyod ...	○

## TECHNICAL SUPPORT

1. Offer training courses on equipment operation and installation to operator and maintenance personnel;
2. Offer equipment control and structural principle training, software training;
3. Offer necessary text materials such as equipment instruction manuals and qualification certificates;
4. Offer training on the troubleshooting of common equipment failures and special failures;
5. One year warranty and 5 years free software upgrade.
6. Other requirements are subject to the contract;
7. Provide life-long maintenance service (on-site service location is within mainland China).

## ACCEPTANCE

Equipment acceptance is divided into pre-acceptance and final acceptance. Each acceptance is divided into equipment index acceptance and process performance acceptance.



# CL-JGDF-1500 type pulling single crystal furnace

## ACCEPTANCE

	Item	Projected Spec	Measurement	Remark
Basic Specification	Effective travel distance of upper puller	900 mm		
	Effective stroke of crucible lifting	\		
	IF generator power	120Kw, 6-16KHz		
	Scale measurement range	70Kg		Net weight 65Kg
	Furnace chamber size	φ1500mm×2200mm		
	Mechanical pump	16L/S		
	Pulling rate	0.1-6000mm/h		
	Crucible lifting speed	\		
	Rotating rate	0-40r/min		
	Crucible rotation rate	\		
	Grating/encoder	1μm		
	Other	As specified in Contract		
Accuracy	Pulling system jump	1μm		as per jump value measured with dial indicator (at 1mm/h pulling rate)
	IF resolution	1‰		The fluctuation of fixed power shall prevail
	Scale display	10mg		
	Vacuum limit	10Pa		Vacuum gauge measurement as standard
	Min. pulling rate	0.1mm/h		
	Min. crucible pulling rate	\		
Process control index	Use Party B's sapphire or pure YAG material and temperature field to pull A-direction Φ50×100mm crystals. The error between the crystal and set sizes is not greater than 1mm, and the internal quality is not used as an assessment index.			In case of any conflict between the contract and this provision, the contract shall prevail

