

1200[°]C TUBE FURNACE



SH-FU-50/80/100/120STG

SH-FU-50/80/100/120LTG

Table of Contents

Keep this manual on-hand so it can be used by all operators of the unit.
Use the unit only in the way described in this manual.
Failure to follow the instruction in this manual may cause wrong operation.

1. General Description.....	3
2. Graphic Symbols.....	4
3. The Outward	5
4. Key Feature.....	6
5. Installation	7
6. Setting and Operation.....	9
7. Specification.....	13

1. General Description

Thank you for purchasing our product. We know that in today's competitive marketplace, customers have many choices when purchasing laboratory equipment. We appreciate your choosing our quality product. We stand behind our products and want to let you know we are here if you need us.

Before you use the unit, read this entire manual carefully to understand how to install, operate and maintain the unit in a safe manner.

Your satisfaction with the unit will be maximized as you read this manual thoroughly.

Our capable products will satisfy you by the best performance with easy operation.

2. Graphic Symbols

BE SURE THAT YOU UNDERSTAND ALL OF THESE SYMBOLS BEFORE OPERATING THE UNIT.



Important operating and / or maintenance instruction.
Read the accompanying text carefully.



This symbol indicates items and procedures that are **STRICTY PROHIBITED** with regards to the unit.



Potential electrical hazards.



Explosive.



No disassemble.

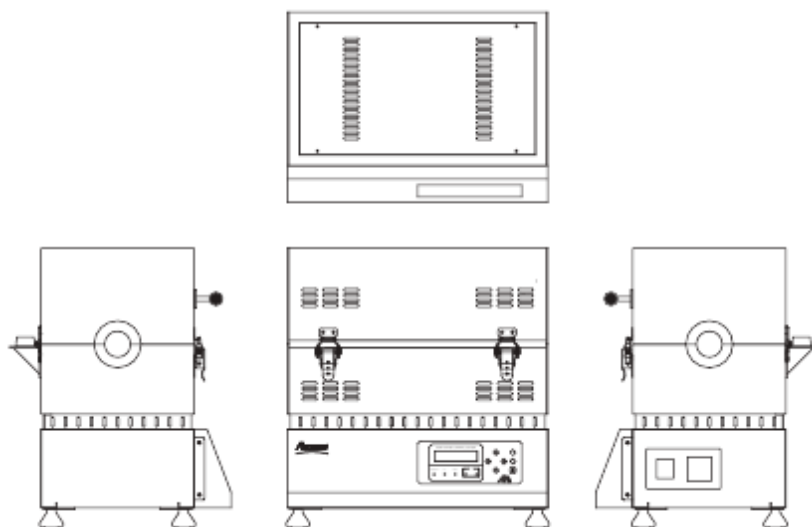


Flammable.

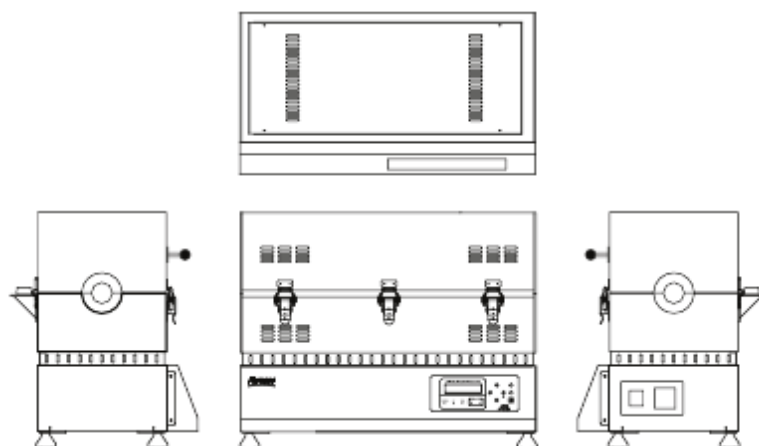


Hot surface or steam.

3. The Outward

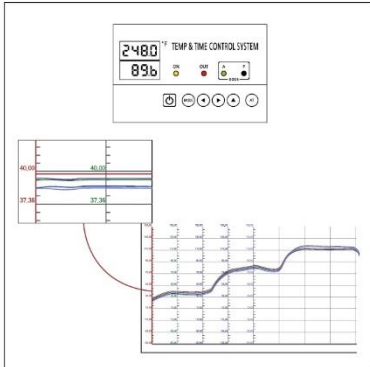


< 50/80/100/120STG >



< 50/80/100/120LTG >

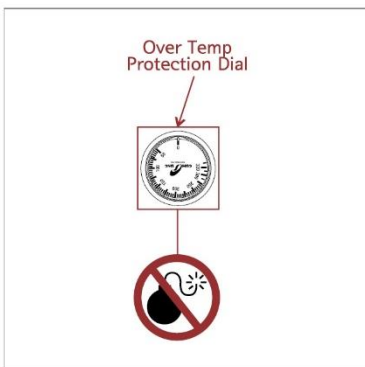
4. Key Feature



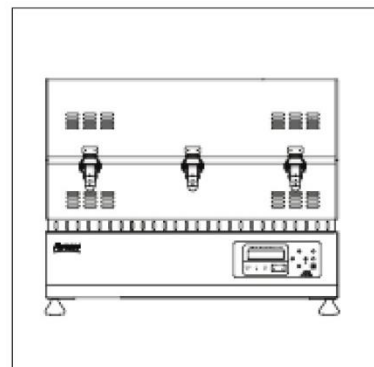
- Digital display of temp and time
- Multi key-in (100Ω(DIN Pt100Ω), KPt100Ω(JPt100Ω), K(CA))
- Precise temperature control
- Alarm when timer ends



- Auto back up

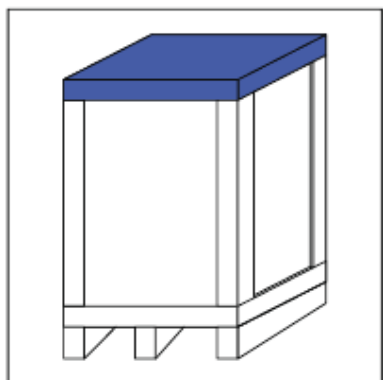


- Over-temperature protection function(FU-xxTG)

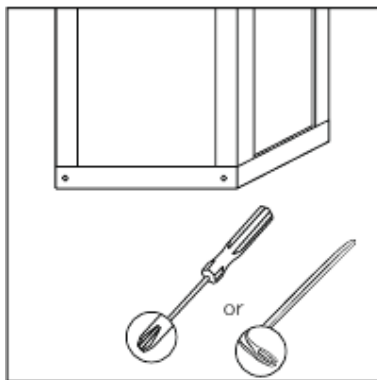


- Separated body and control box design protecting from thermal shock(FU-xxTG)

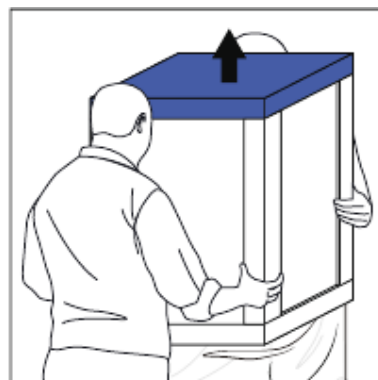
5. Installation



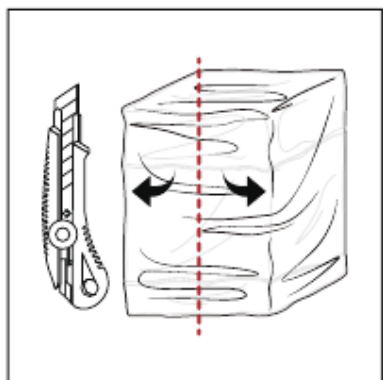
⊖ Once the product is delivered, place the package on a flat location.



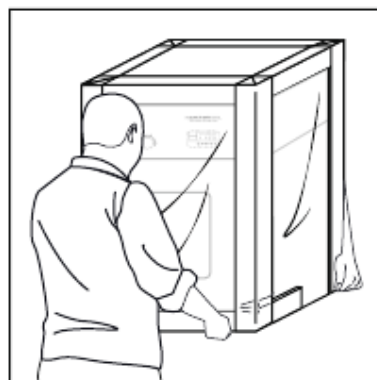
⊖ Unscrew the bottom of the box.



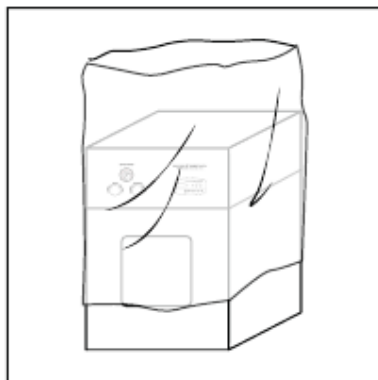
⊗ Lift the box as shown in the picture.



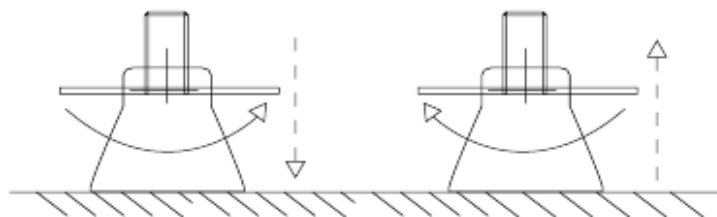
④ Unwrap the bag.



⑤ Place the equipment on your desired location.

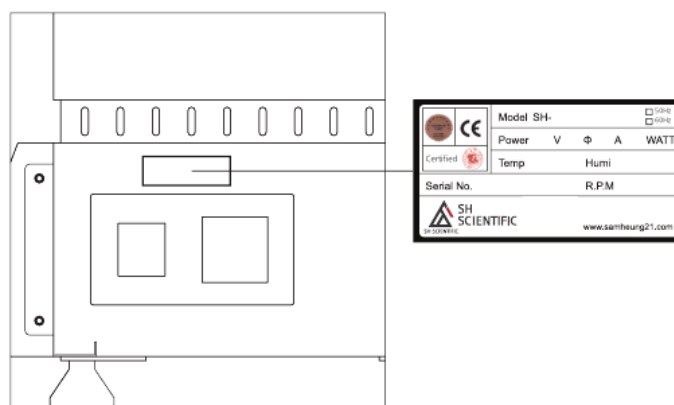


⑥ Lift the remaining plastic up.



<Fig-1>

Refer to above fig-1, level the equipment by adjusting the feet.



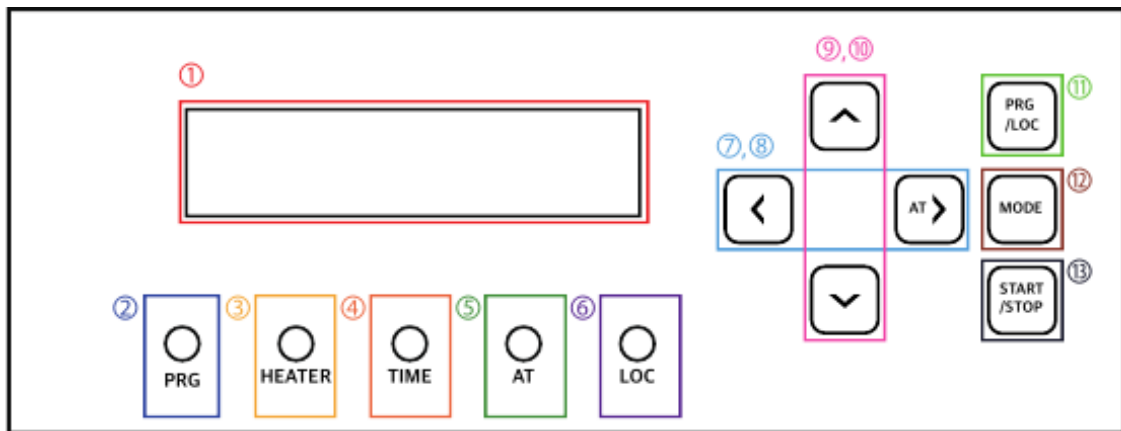
Serial label shows the electric power specification of the unit.
Connect power and turn on the main switch(E.L.B).



Please do not raise up it high temp at once.
It case to decline durability.
We recommend raise temp under 15 °C/min

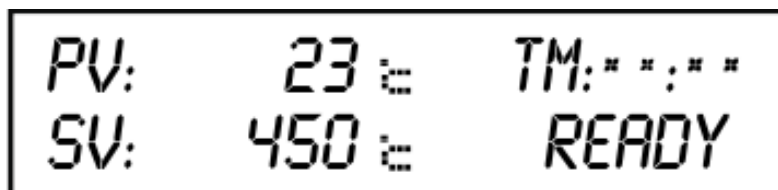
6. Setting and Operation

1) Controller



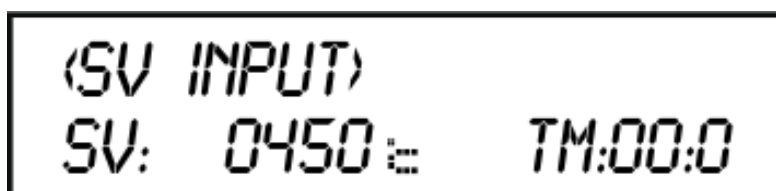
- ① LCD display
- ② Program mode lamp
- ③ Heater lamp
- ④ Timer lamp
- ⑤ Auto tune lamp
- ⑥ Local mode lamp
- ⑦, ⑧ Shift button (Mute)
- ⑨, ⑩ Setting
- ⑪ Program ↔ Local
- ⑫ Mode
- ⑬ Start/Stop

(1) Stand by

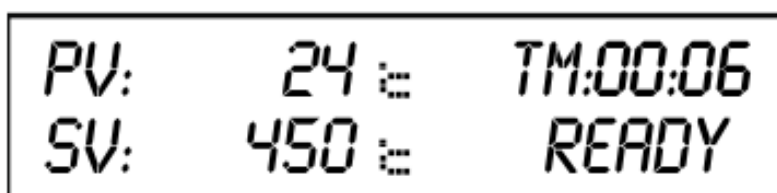


[**PV:** current temp. **SV:** Target temp. **TM:** Holding time at target temp.]
00:00 (hour : minute)

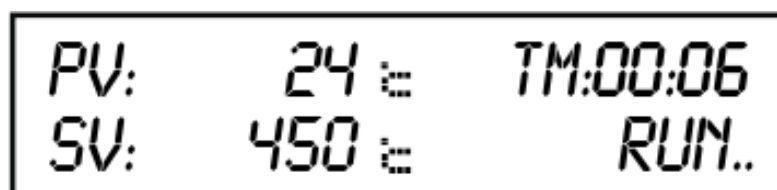
(2) Local mode



1. Press ⑫ to set temp. and holding time



2. Set Temp. and Time with ⑦,⑧,⑨,⑩ and save it with pressing ⑫.



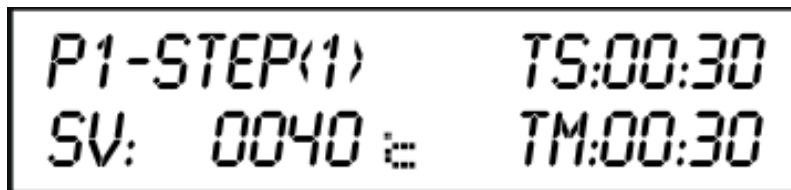
3. Push ⑬ to start running.

③ Heater lamp is on and ④ Timer lamp will blink until PV reaches to SV and be on when PV reaches to SV.

(3) Program mode

Program mode provides 5 Pattern settings and 9 Step settings for each pattern.

In program mode, it can be set not only TM (holding time at target temp.) but also TS (ramp up time to target temp.).



[**P1-Step1** : Pattern no.1 and Step no.1 **TS**: Ramp up time to target temp.]

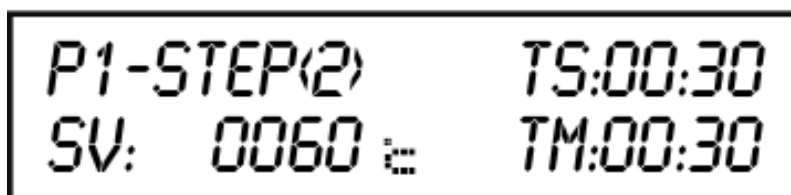
[**SV**: Target temp. **TM**: Holding time at target temp.]

1. Press ⑪ for 5 sec and to change to Program mode.

When it shift to Program mode, ②PRG lamp is on.

(If you want to shift to Local mode, just press ⑪ for 5 sec again.)

2. Set SV, TS and TM with ⑦,⑧,⑨,⑩ in Step no.1 and save it with pressing ⑫. It goes to next Step no.2 setting page.

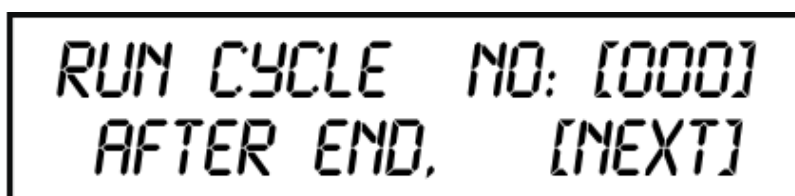


3. Set SV, TS and TM with ⑦,⑧,⑨,⑩ in Step no.2 and save it with pressing ⑫.

Repeat this Step. Setting process as much as you want till Step no.9.

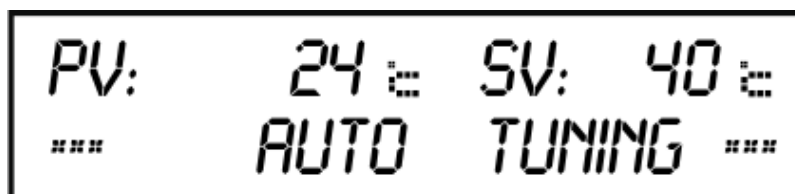


4. If you want to finish setting of pattern, set TM with 00:00 in last Step. Setting page and save it with pressing ⑫. Then it completes setting of pattern no.1.



5. Set number of cycling for the saved Pattern with ⑦,⑧,⑨,⑩.
(* 999 cycles can be set. *000 means infinite cycling.)
6. You can set next operation mode after running pattern no.1.
Press ⑪ to set next operation mode.
 * STOP : It stops the operation after completing the saved pattern.
 * MANU: It shift to Local mode after completing the saved pattern.
 * NEXT : It moves to next pattern operation mode after completing the saved pattern.
7. Press ⑫ to save and start to run.

(4) Auto Tuning

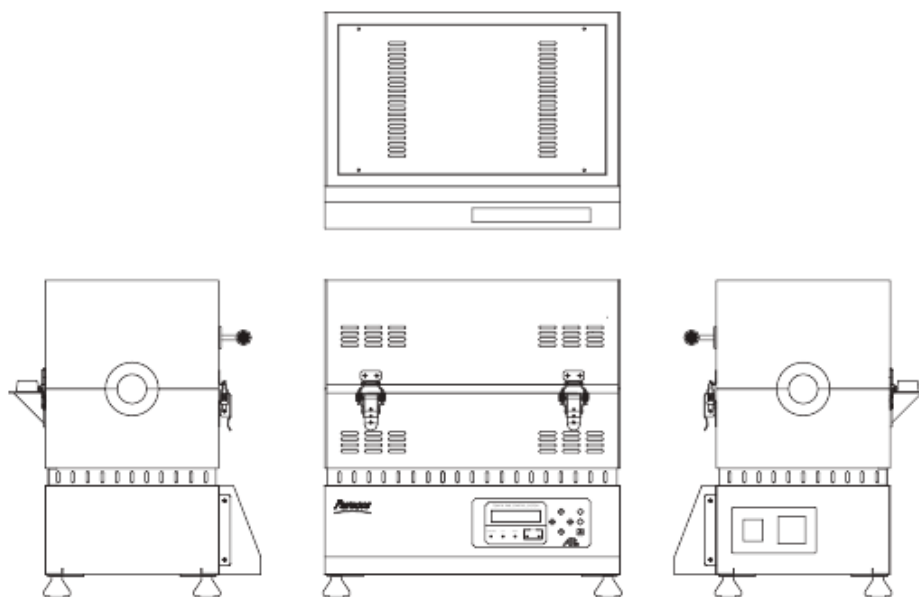


Auto Tuning is to sophisticatedly tune the output of heater when furnace reaches around SV for better temperature uniformity and minimal temperature fluctuation.

1. Wait till PV reaches around SV and then press AT button.
2. Auto Tuning will be carried out and stopped automatically.
3. ⑤ AT lamp will blink during Auto Tuning and will be off when it is done.

7. Specifications

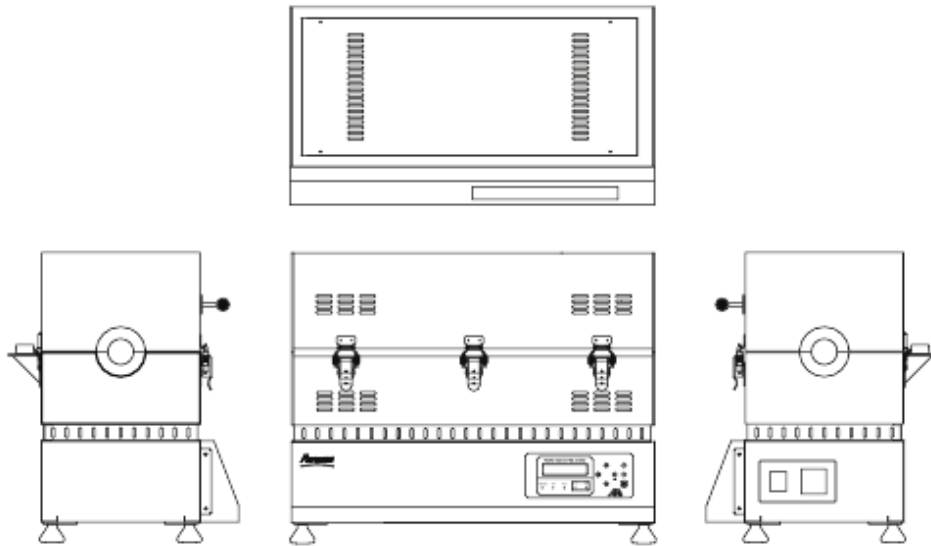
1200 °C Tube Furnace Gas Flow Package – 50/80/100/120STG (300mm Length Hot Zone)



Model	SH-FU-50STG	SH-FU-80STG	SH-FU-100STG	SH-FU-120STG
Max Temp	1200°C (2192°F)			
Temp Controller	Programmable Controller(FC-1000)			
Sensor	K type			
Applicable Tube Diameter	50 Φ	80 Φ	100 Φ	120 Φ
Heater Capa	2000 W	2500 W	3200 W	3600 W
Dimension Hot Zone	Length 300 mm			
Dimension External (WxDxH)	502x357x517mm	502x365x537mm	502x397x557mm	502x455x630mm
	19.76x14.06x20.35"	19.76x14.37x21.14"	19.76x15.63x21.93"	19.76x17.91x24.80"
Weight	27 Kg	32 Kg	48 Kg	70 Kg
Heater Element	Kanthal A-1			
Insulation	Ceramic Board & Wool			
Electrical Requirements 120V ,50/60Hz, 1Φ	17.4 A	21.9 A	28.0 A	33 A
Cat. No.	FU50STG120	FU80STG120	FU100STG120	FU120STG120
Electrical Requirements 230V ,50/60Hz, 1Φ	9.1 A	11.4 A	14.6 A	16 A
Cat. No.	FU50STG230	FU80STG230	FU100STG230	FU120STG230

7. Specifications

1200 °C Tube Furnace Gas Flow Package – 50/80/100/120LTG-WG (600mm Length Hot Zone)



Model	SH-FU-50LTG	SH-FU-80LTG	SH-FU-100LTG	SH-FU-120LTG
Max Temp	1200°C (2192°F)			
Temp Controller	Programmable Controller(FC-1000)			
Sensor	K type			
Applicable Tube Diameter	50 Φ	80 Φ	100 Φ	120 Φ
Heater Capa	3600 W	4400 W	6000 W	7200 W
Dimension Hot Zone	Length 600 mm			
Dimension External (WxDxH)	802x357x517mm	802x365x537mm	802x397x557mm	802x455x630mm
	31.57x14.06x20.35"	31.57x14.37x21.14"	31.57x15.63x21.93"	31.57x17.91x24.80"
Weight	52 Kg	56 Kg	68 Kg	105 Kg
Heater Element	Kanthal A-1			
Insulation	Ceramic Board & Wool			
Electrical Requirements 120V ,50/60Hz, 1Φ	33 A	40 A	N/A	
Cat. No. 50Hz(60Hz)	FU50LTG120	FU80LTG120		
Electrical Requirements 230V ,50/60Hz, 1Φ	16 A	20 A	27 A	33 A
Cat. No. 50Hz(60Hz)	FU50LTG230	FU80LTG230	FU100LTG230	FU120LTG230
Electrical Requirements 230V ,50/60Hz, 3Φ	N/A		15.1 A	18.1 A
Cat. No. 50Hz(60Hz)			FU100LTG230-3	FU120LTG230-3
Electrical Requirements 380V ,50/60Hz, 3Φ			9.1 A	10.9 A
Cat. No. 50Hz(60Hz)			FU100LTG380-3	FU120LTG380-3

[illegible]

[illegible]

