克瑪里能源科技股份有限公司

GREEN POWER ENGINEERING CORPORATION

KAVAS Turbo Blower Operation Manual

MTB-5HP Series:

K005-120, K005-130, K005-10H, K005-110

ADDRESS: No.6, Luke 3rd Road, Luzhu Dist., Kaohsiung City, 82151, Taiwan
TEL: +886-7-6955216 FAX: +886-7-6955218 Website: www.gpe.com.tw

KAVAS TURBO

INDEX

1. Safety Instruction

1-1. Safety Regulation:

Before setting up or operating the KAVAS turbo blower, be sure to read the blower manual thoroughly to understand its operating characteristics. This will help prevent unexpected shutdowns, operator injuries, or malfunction risks.

All electrical components and mechanical assemblies in the KAVAS turbo blower have undergone safety inspection and testing. Do not modify or alter them on your own. If the user changes the power components or installs them incorrectly against the instructions, resulting in blower failure or electrical damage, such issues will not be covered under the product warranty.

1-2. Warning Plate:

	**『Electric Shock』Sign:** Please be aware of the danger of electric shock.

	**『Hot Surface』Sign:** High temperature surface, do not touching it.
	**『Up』Sign:** This arrow must point upwards. This is a requirement for the handling and installation of the machine.

1-3. NamePlate:

1-3-1. Nameplate of Standard Type Blowers

KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -110	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.1 BAR(A)	MAX. INPUT CURRENT	12 A
RATED AIR FLOW	14 CMM	MAX. WORKING SPEED	21,000 RPM
DIMENSIONS	L592×W465×H560 MM	WEIGHT	57.5 KG
SERIAL. NO.			CE
MFG. DATE			
GREEN POWER ENGINEERING CORPORATION No. 6, Luke 3rd Road, Luzhu Dist., Kaohsiung City, 82151, Taiwan		TEL: +886-7-6955216 FAX: +886-7-6955218 E-MAIL: gpe@gpe.com.tw	

KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -120	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.2 BAR(A)	MAX. INPUT CURRENT	12 A
RATED AIR FLOW	7.4 CMM	MAX. WORKING SPEED	24,000 RPM
DIMENSIONS	L592×W455×H560 MM	WEIGHT	57.5 KG
SERIAL. NO.			CE
MFG. DATE			
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KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -130	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.3 BAR(A)	MAX. INPUT CURRENT	12A
RATED AIR FLOW	5.2 CMM	MAX. WORKING SPEED	24,000 RPM
DIMENSIONS	L592×W455×H560 MM	WEIGHT	57.5 KG
SERIAL. NO.			CE
MFG. DATE			
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KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -10H	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	0.9 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.013 BAR(A)	MAX. INPUT CURRENT	12A
RATED AIR FLOW	10 CMM	MAX. WORKING SPEED	21,000 RPM
DIMENSIONS	L592×W455×H560 MM	WEIGHT	57.5 KG
SERIAL. NO.			CE
MFG. DATE			
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1-3-2. Nameplate of Advanced Type Blowers

KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -120	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.2 BAR(A)	MAX. INPUT CURRENT	12 A
RATED AIR FLOW	7.4 CMM	MAX. WORKING SPEED	24,000 RPM
DIMENSIONS	L880×W710×H570 MM	WEIGHT	127 KG
SERIAL. NO.			CE
MFG. DATE			
GREEN POWER ENGINEERING CORPORATION No. 6, Luke 3rd Road, Luzhu Dist., Kaohsiung City, 82151, Taiwan		TEL: +886-7-6955216 FAX: +886-7-6955218 E-MAIL: gpe@gpe.com.tw	

KAVAS TURBO	TURBO BLOWER		
MODEL	K005 -130	MAX. POWER	3.7 KW
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ
RATED OUTPUT PRESSURE	1.3 BAR(A)	MAX. INPUT CURRENT	12A
RATED AIR FLOW	5.2 CMM	MAX. WORKING SPEED	24,000 RPM
DIMENSIONS	L880×W710×H570 MM	WEIGHT	127 KG
SERIAL. NO.			CE
MFG. DATE			
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KAVAS TURBO	TURBO BLOWER			
MODEL	K005 -10H	MAX. POWER	3.7 KW	
RATED INPUT PRESSURE	0.9 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ	
RATED OUTPUT PRESSURE	1.013 BAR(A)	MAX. INPUT CURRENT	12A	
RATED AIR FLOW	10 CMM	MAX. WORKING SPEED	21,000 RPM	
DIMENSIONS	L890×W710×H570 MM	WEIGHT	127 KG	
SERIAL. NO.			CE	
MFG. DATE				
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KAVAS TURBO	TURBO BLOWER			
MODEL	K005 -110	MAX. POWER	3.7 KW	
RATED INPUT PRESSURE	1.013 BAR(A)	RATED INPUT VOLTAGE/ FREQUENCY	3Φ 220 VAC 50/60HZ	
RATED OUTPUT PRESSURE	1.1 BAR(A)	MAX. INPUT CURRENT	12A	
RATED AIR FLOW	14 CMM	MAX. WORKING SPEED	21,000 RPM	
DIMENSIONS	L880×W720×H570 MM	WEIGHT	127 KG	
SERIAL. NO.			CE	
MFG. DATE				
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2. Specification

2-1.KAVAS Turbo Blower Specification:

K005-110 Advanced Type Blower

ITEM		
Dimensions	L880×W720×H570 mm	
Weight	175 kg	
Rated Input Voltage	3Φ220 VAC	3Φ380 VAC
Max. Working Speed	21000 RPM	
Max. Power	3.7 kW	
Max. Input Current	12A	8.5A
Rated Input Pressure	1 .013 bar(a)	
Rated Output Pressure	1.1 bar(a)	
Rated Air Flow	14 CMM	
Rated Efficiency	73 %	

K005-120 Advanced Type Blower

ITEM		
Dimensions	L880×W710×H570 mm	
Weight	127 kg	
Rated Input Voltage	3Φ220 VAC	3Φ380 VAC

Max. Working Speed	24000 RPM	
Max. Power	3.7 kW	
Max. Input Current	12A	8.5A
Rated Input Pressure	1 .013 bar(a)	
Rated Output Pressure	1.2 bar(a)	
Rated Air Flow	7.4 CMM	
Rated Efficiency	80 %	

K005-130 Advanced Type Blower

ITEM		
Dimensions	L880×W710×H570 mm	
Weight	127 kg	
Rated Input Voltage	3Φ220 VAC	3Φ380 VAC
Max. Working Speed	24000 RPM	
Max. Power	3.7 kW	
Max. Input Current	12A	8.5A
Rated Input Pressure	1 .013 bar(a)	
Rated Output Pressure	1.3 bar(a)	
Rated Air Flow	5.2 CMM	
Rated Efficiency	76 %	

K005-10H Advanced Type Blower

ITEM		
Dimensions	L890×W710×H570 mm	
Weight	127 kg	
Rated Input Voltage	3Φ220 VAC	3Φ380 VAC
Max. Working Speed	21000 RPM	
Max. Power	3.7 kW	
Max. Input Current	12A	8.5A
Rated Input Pressure	0.9bar(a)	
Rated Output Pressure	1.013 bar(a)	
Rated Air Flow	10 CMM	
Rated Efficiency	60 %	

2-2. Function of the Turbo Blower:

The KAVAS blower is available in two housing designs: Standard Type and Advanced Type, allowing users to choose the blower which best suits the characteristics of their application.

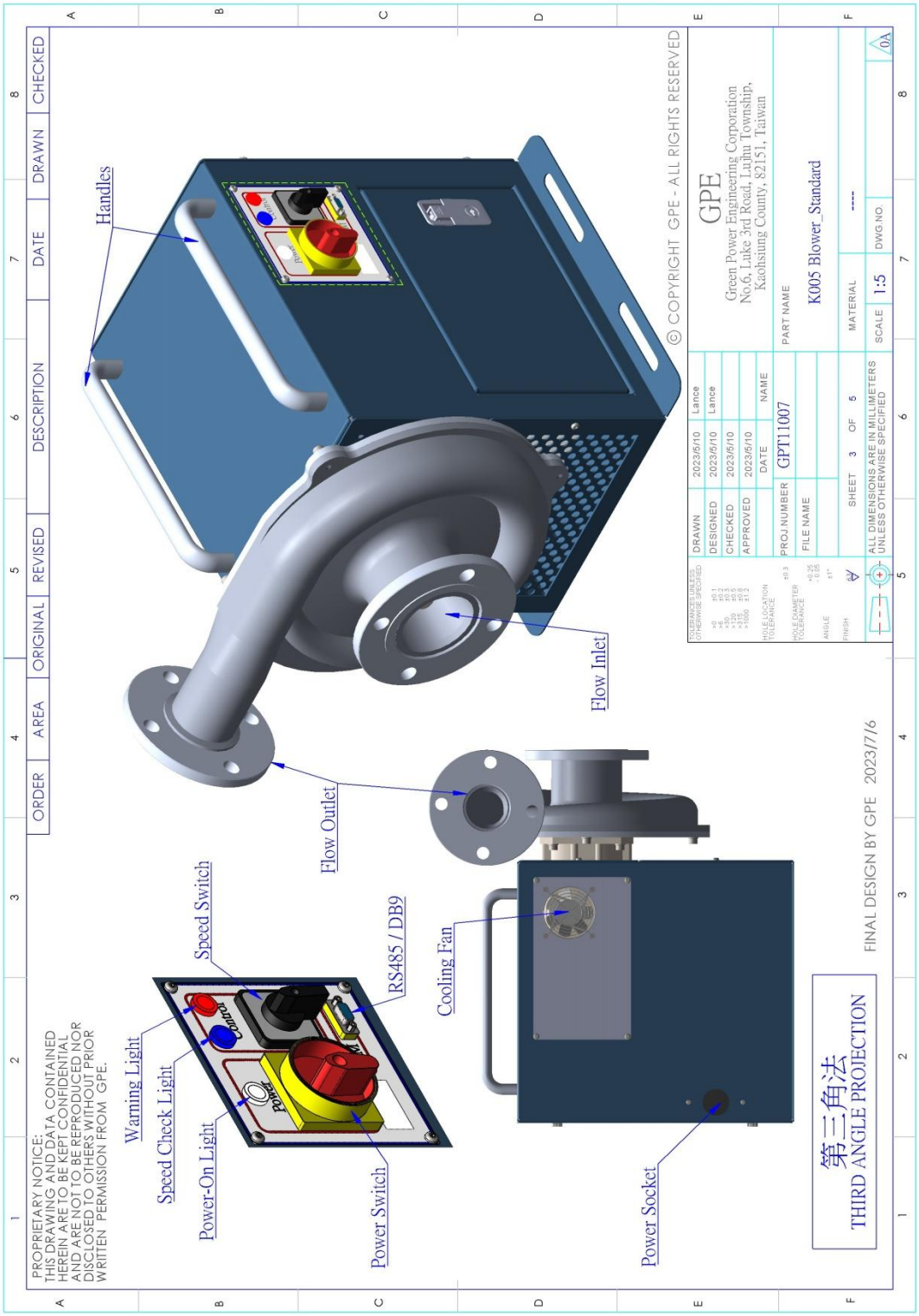
The KAVAS blower is suitable for long-duration continuous operation scenarios, such as the S1 duty cycle. For intermittent operation needs, to extend the blower's service life, it is recommended to set the blower's standby mode to a low-speed no-load state, such as the S6 duty cycle.

The standard type blower has a noise level of approximately 85 dBA (this value does not include airflow noise inside the piping connected to the inlet and outlet). The standard type blower omits noise reduction and sound absorption features, offering a housing design that is easy to maintain and repair. The total weight is kept under 60 kilograms to facilitate handling. When both the inlet and outlet of the standard type blower are equipped with ducting, the on-site noise level can be reduced to below 80 dBA.

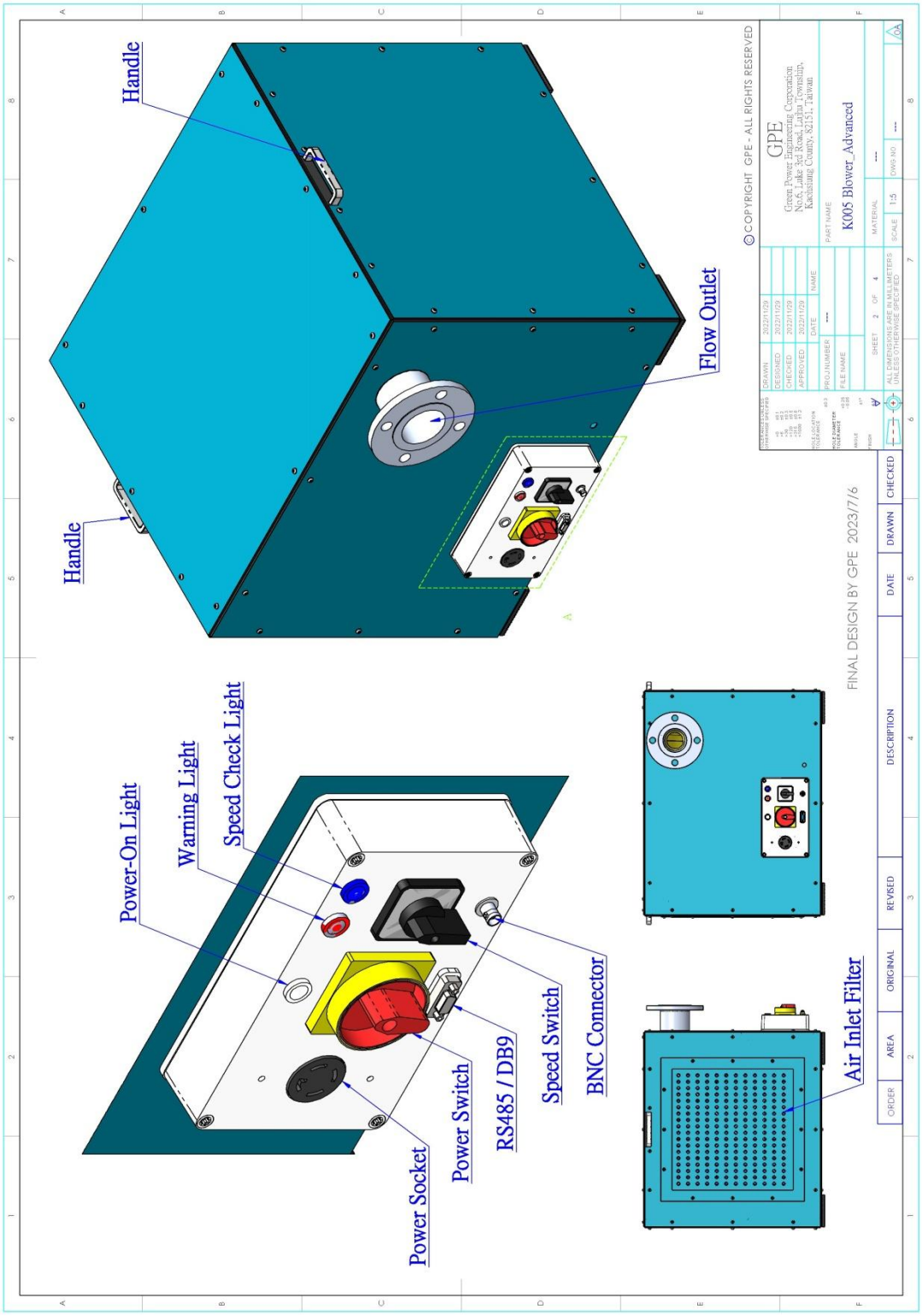
The advanced type blower has a noise level below 75 dBA (this value does not include airflow noise inside the piping connected to the inlet and outlet). This blower housing includes specially selected sound-absorbing materials, allowing the blower to meet safety regulations for noise levels even when installed in environments where personnel are present. This also reduces the complexity of duct configurations and minimizes pressure losses.

2-3. Legend of the Machine:

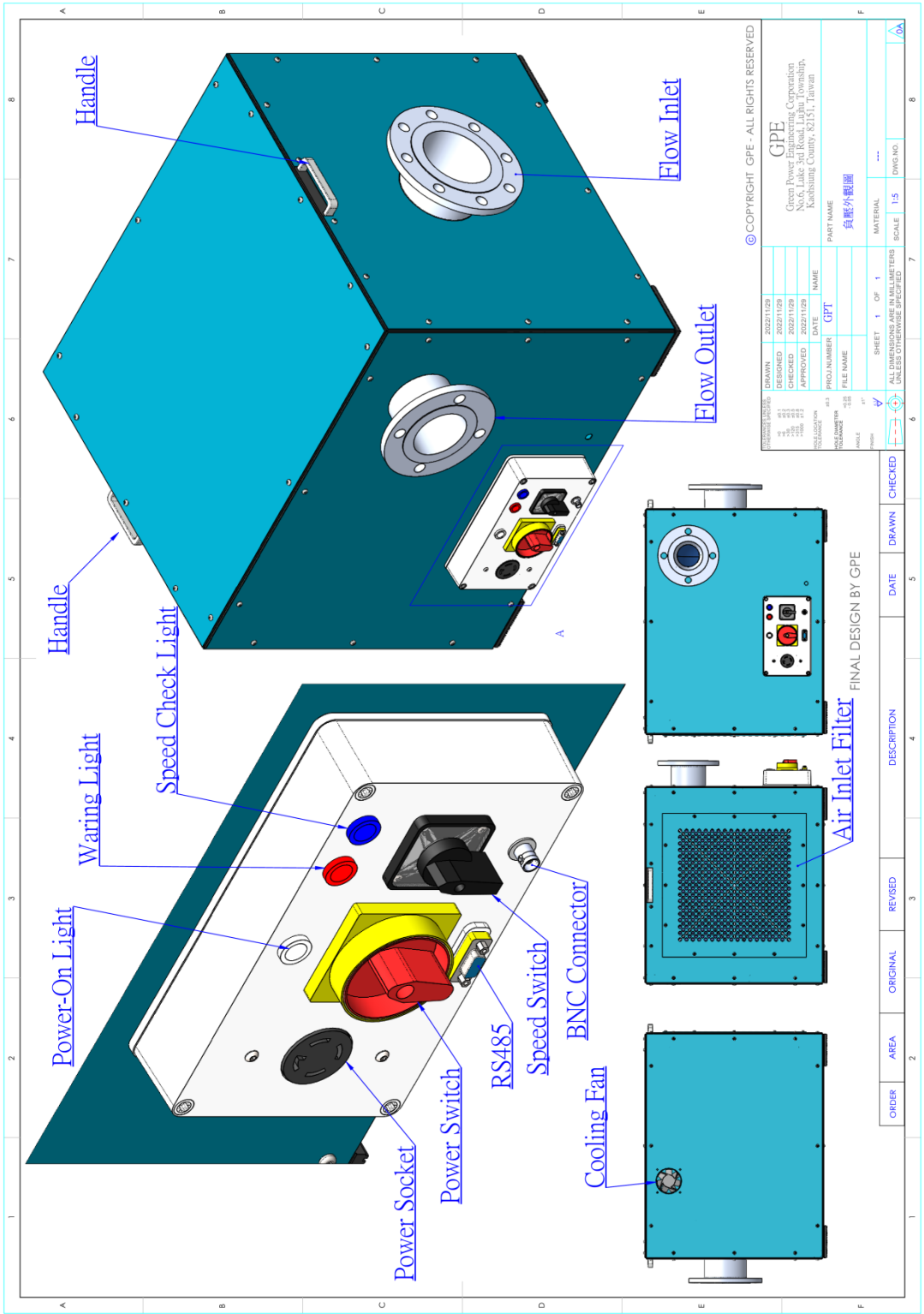
- KAVAS Turbo Blower—Standard Type



➢ KAVAS Turbo Blower—Advanced Type

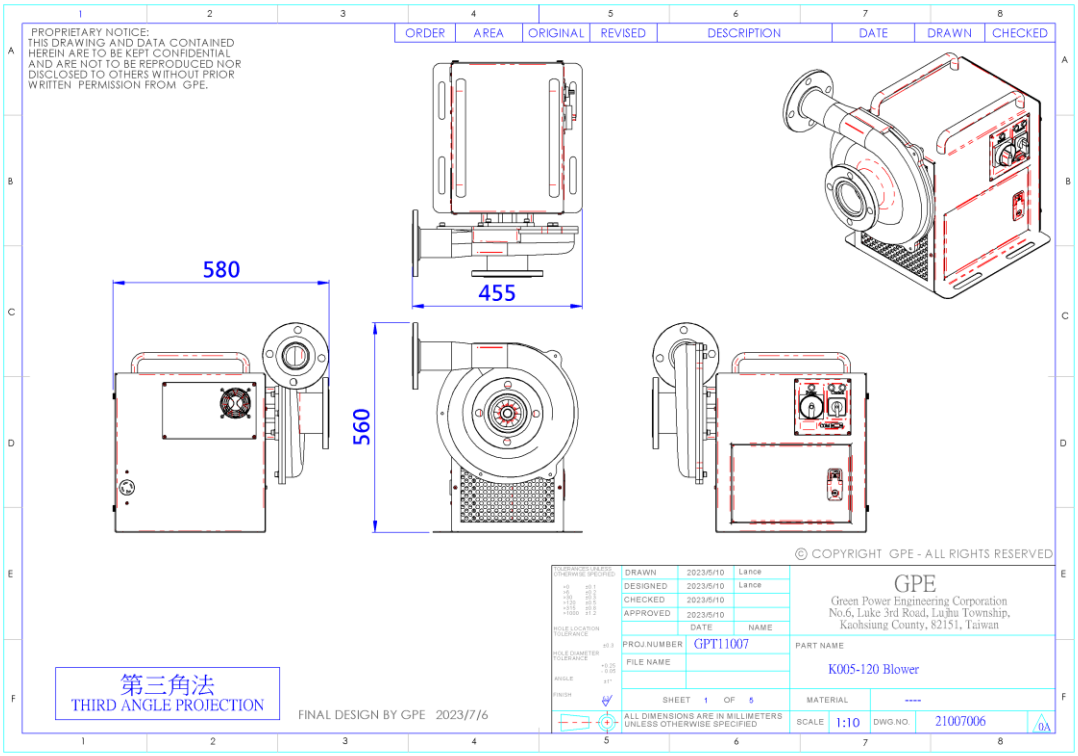


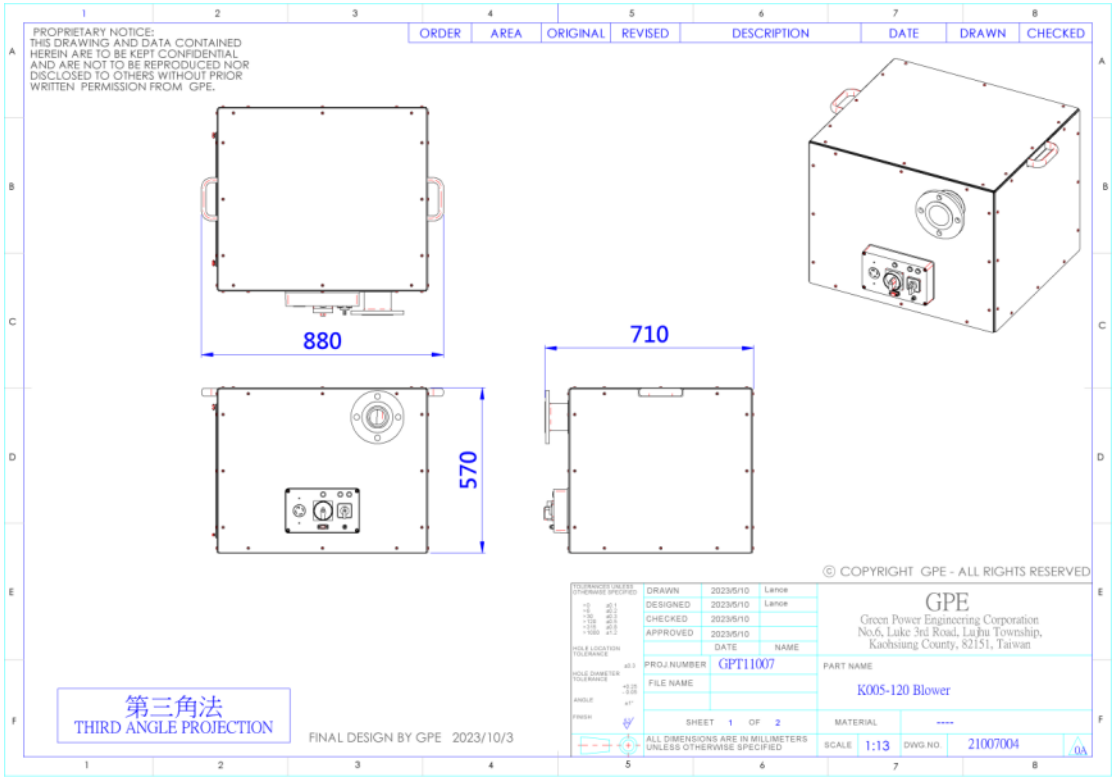
➢ KAVAS Turbo Blower—Advanced Type

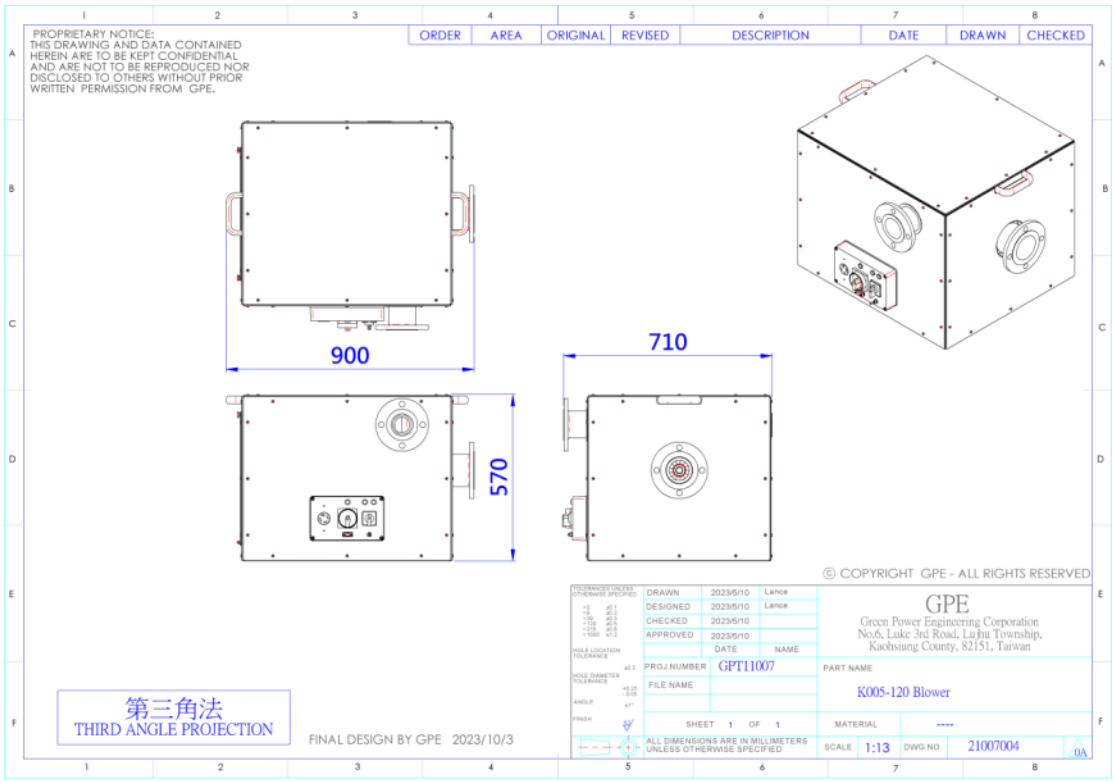


2-4. Turbo Blower Dimension:

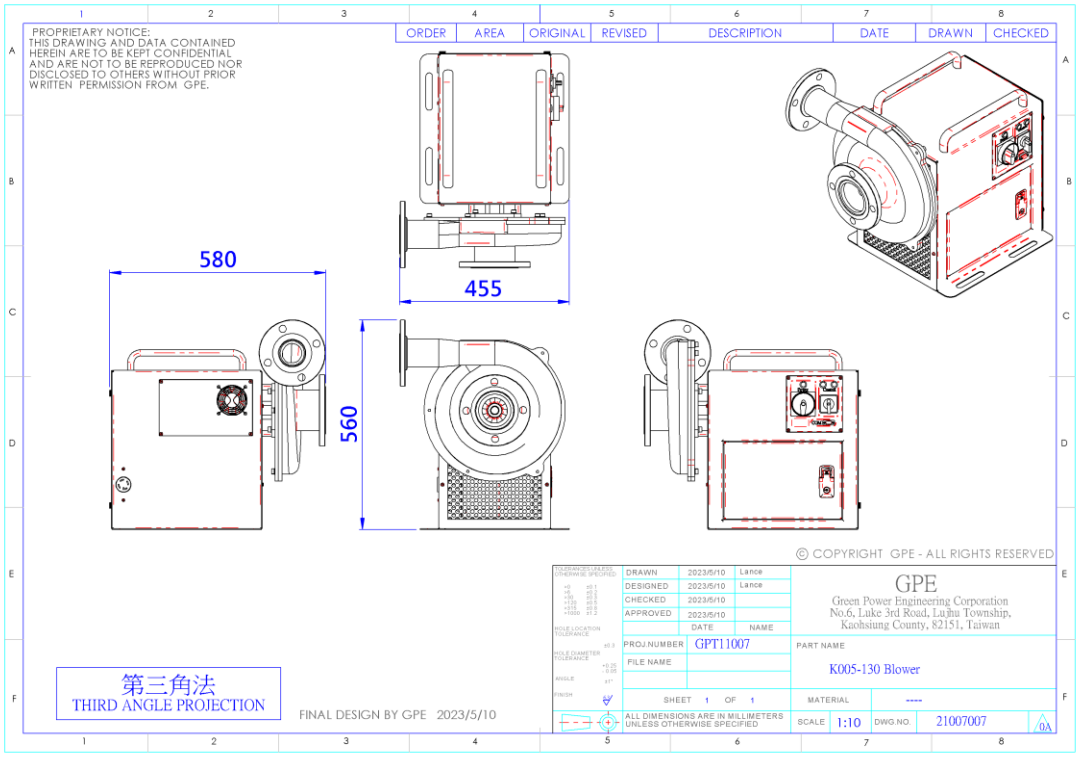
- K005-120 Blower Core

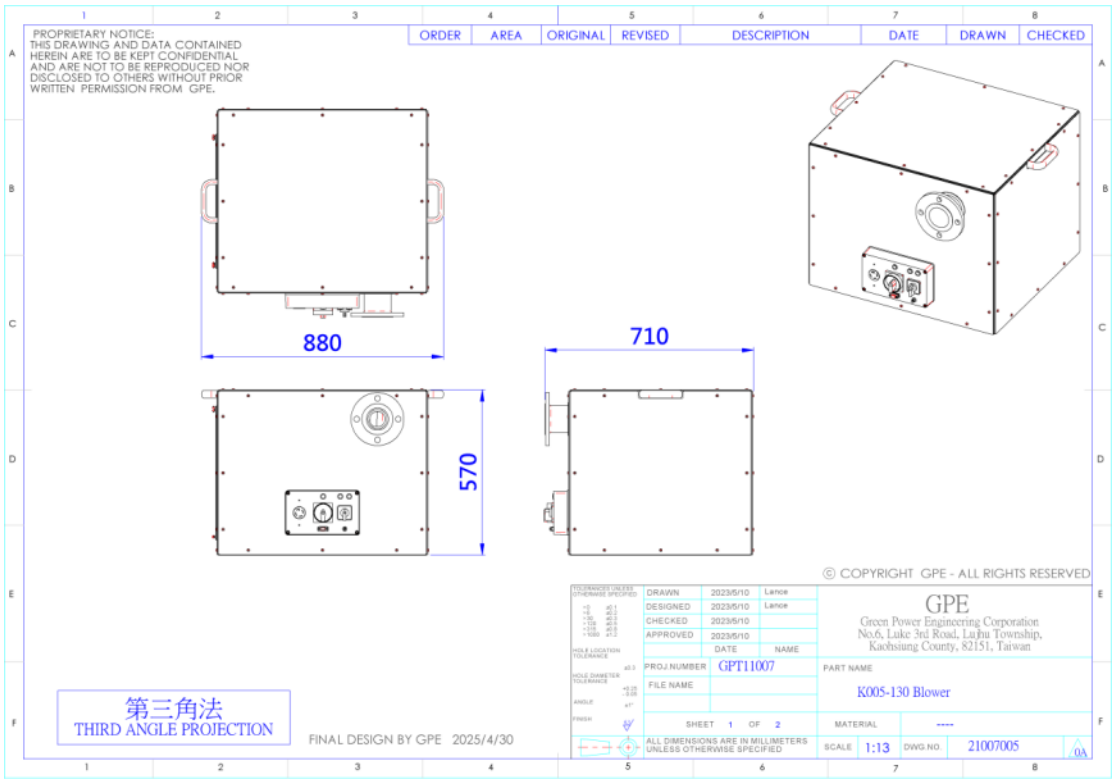


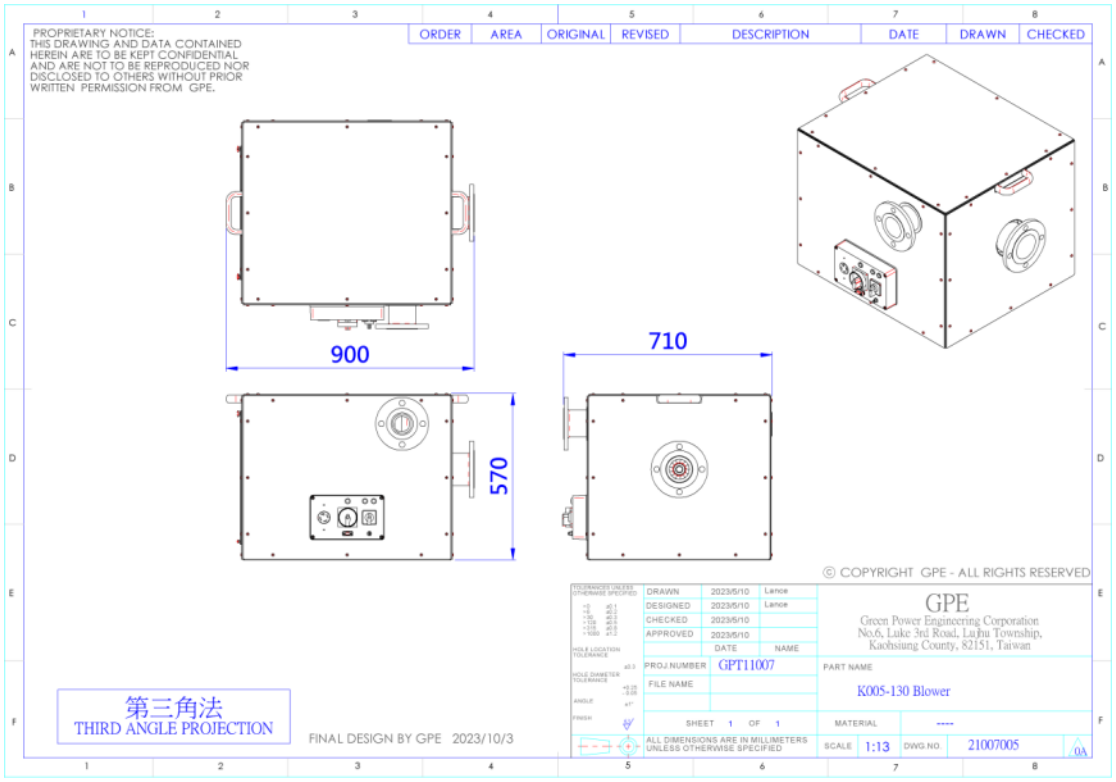




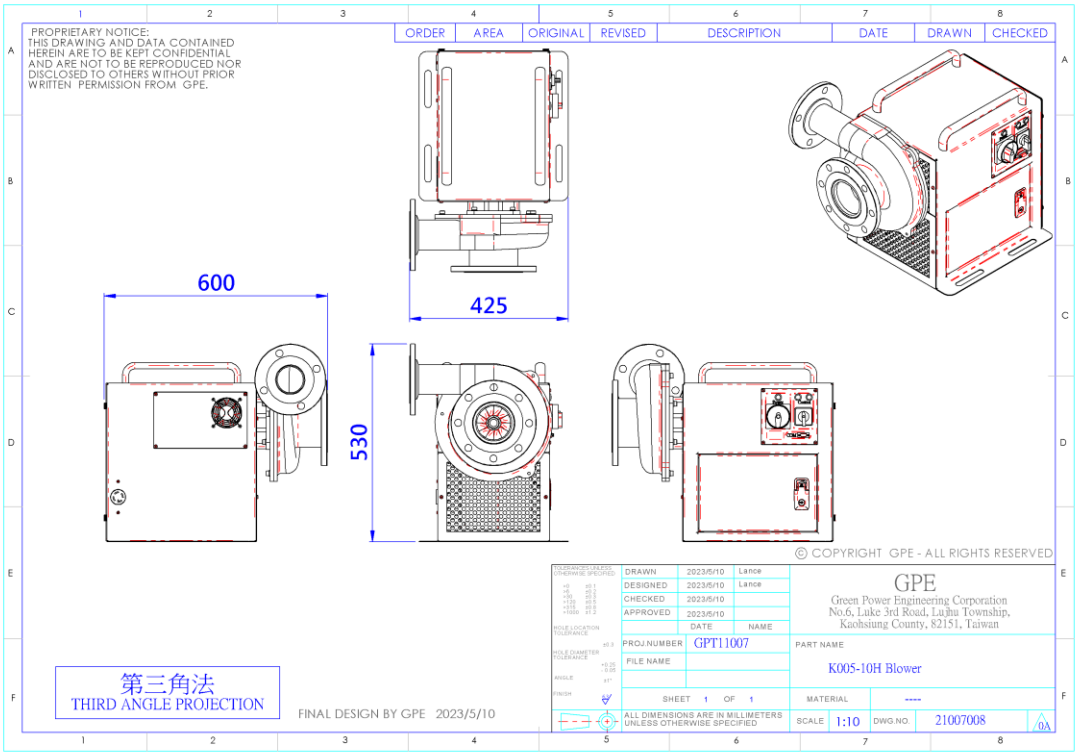
➢ K005-130 Blower Core

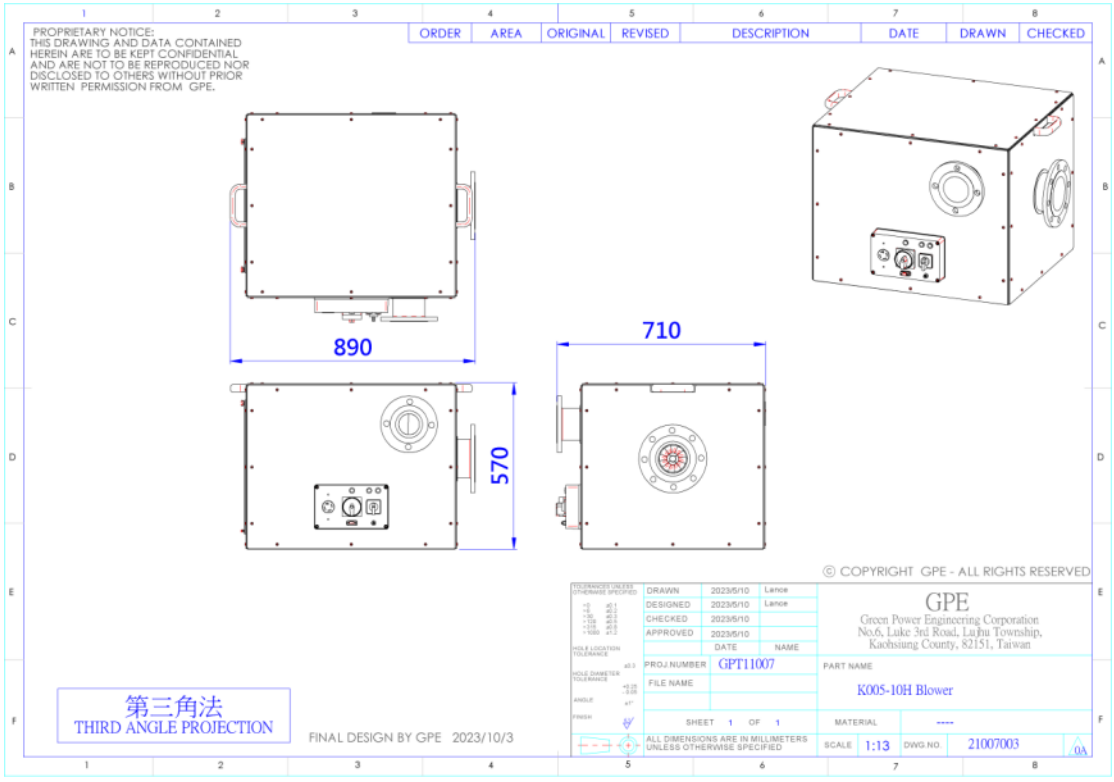




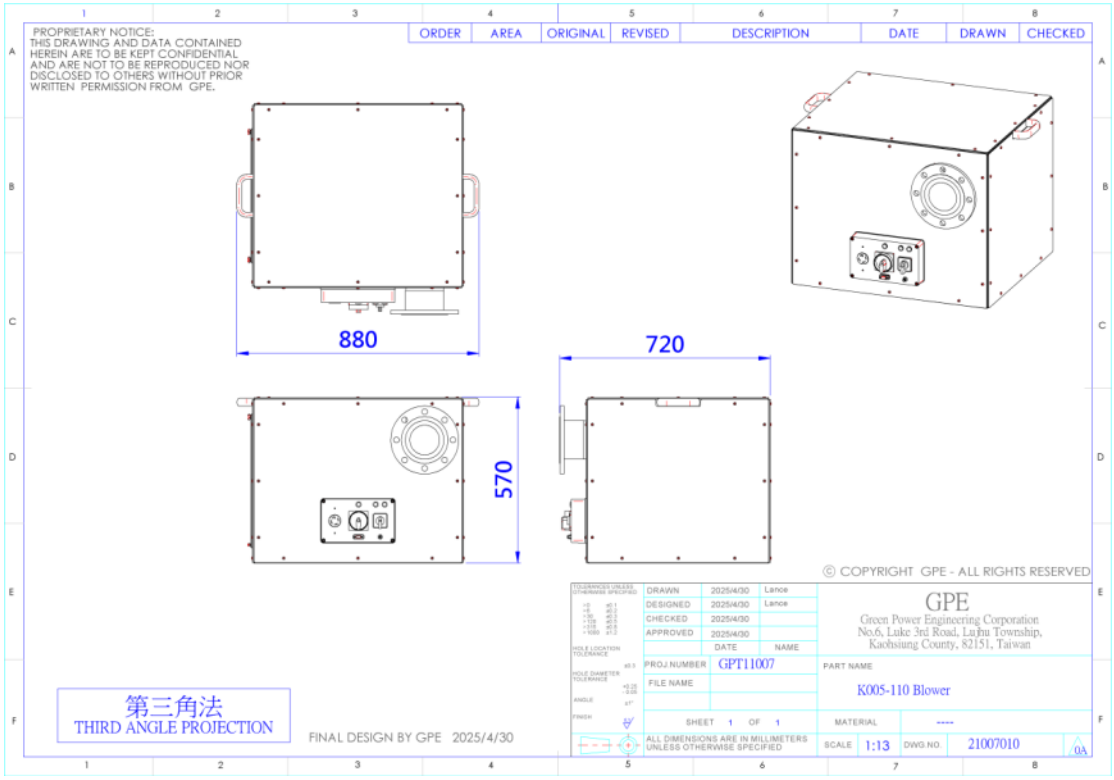


➢ K005-10H Blower Core



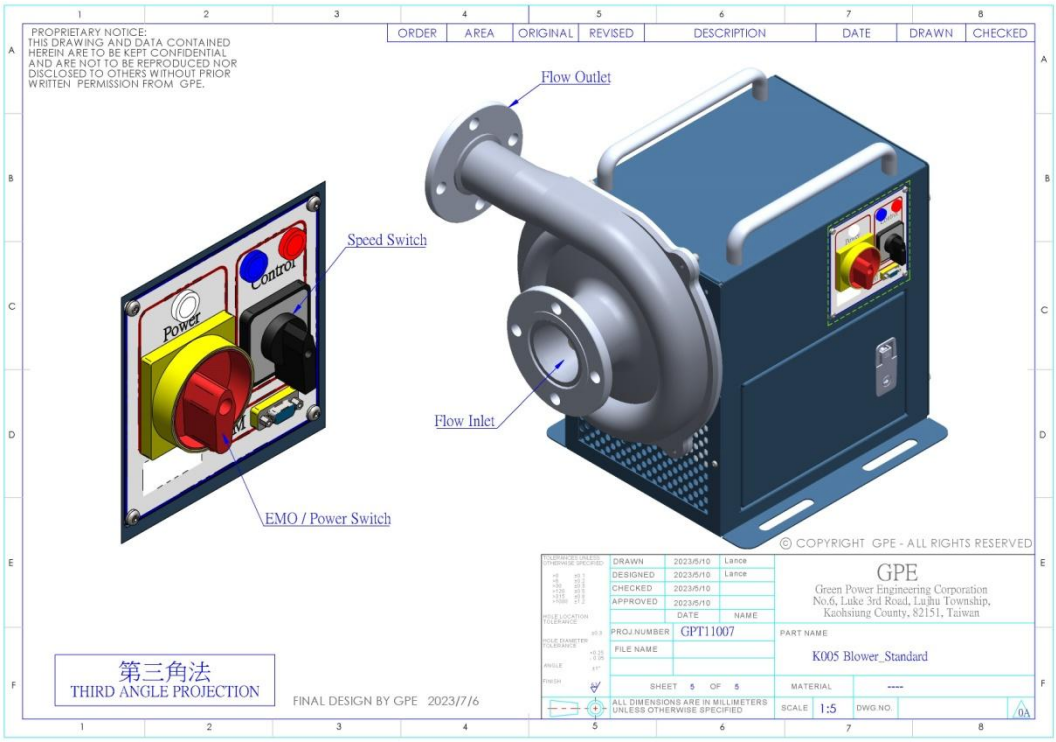


K005-110 Blower Core

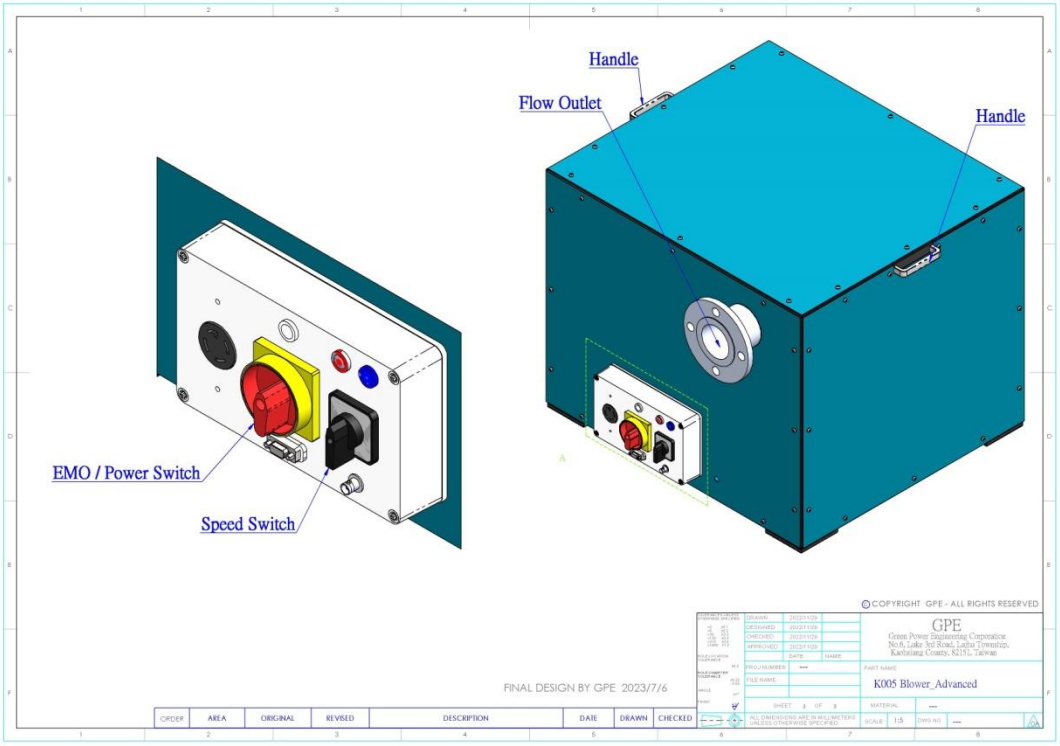


2-5.Safety device location:

EMO of the Standard Turbo Blower



EMO of the Standard Turbo Blower



3. Installation

The KAVAS Turbo blower is suitable for long-duration continuous operation scenarios, such as the S1 duty cycle. For intermittent operation needs, to extend the blower's service life, it is recommended to set the blower's standby mode to a low-speed no-load state, such as the S6 duty cycle.

3-1. Lifting the Machine:

When moving or transporting the turbo blower, please make sure that the machine is disconnected from the power source and it is recommended to use a pallet truck or lifting/stacking equipment as needed.

3-2. Selection of Location:

i. Indoor installation ;

ii. Ensure there is sufficient clearance on the inlet side of the blower (such as a walkway) ;

iii. A sturdy and stable placement surface or platform ;

iv. No concerns about machine sliding, no intermittent or continuous external vibration ;

v. The unit is elevated to prevent possible fluid accumulation ;

vi. No flammable gases in the environment ;

vii. The concentration of corrosive gases and other VOC gases in the environment has not reached a level that can harm the human body. Please refer to the general labor work environment regulations for this concentration value.

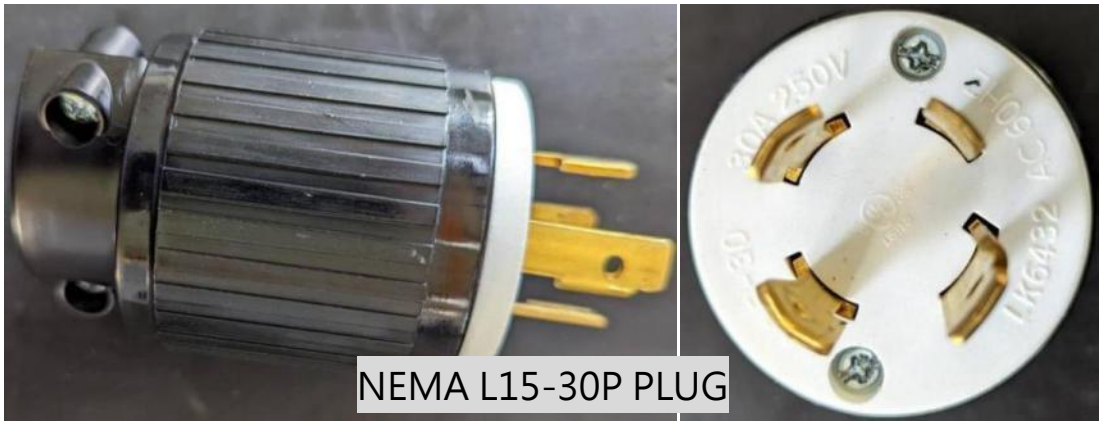
3-3. Installation:

Please position the machine according to the marked upward direction and place it on a stable platform or flat surface. The deviation between the platform and the ground should be no more than 5 degrees, and precise leveling is not required.

3-4. 220VAC Power supply requirements:

The machine must be connected to a three-phase 15A circuit

breaker with a proper ground wire for the blower. The power supply specification is 220 V AC, three-phase. The blower unit uses either a 'NEMA L15-30R' or 'IEC 60309: 16A 220V 3P+E' power socket. Please use the corresponding plug to avoid poor contact or socket damage.



NEMA L15-30P PLUG

IEC 60309：16A 400V 3P+N+E PLUG

IEC 60309：16A 220V 3P+E PLUG

3-5. 400VAC Power Supply Requirements:

The machine's power supply must use a three-phase 10A circuit breaker without a fuse, and have a proper grounding wire connected to the blower. The power supply specifications are AC 380–415VAC, three-phase. The blower unit uses an 'IEC 60309: 16A 400V 3P+N+E' power socket (400V, 16A, three-phase five-wire). Please use a matching 'IEC 60309: 16A 400V 3P+N+E' plug to avoid poor electrical contact or socket damage.

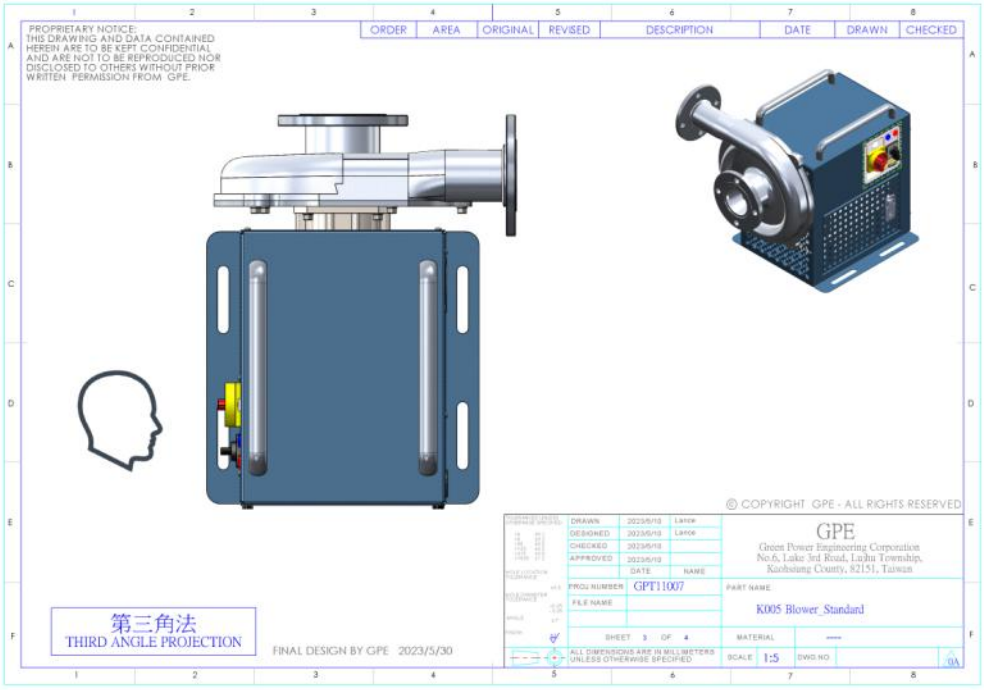
3-6. Safety device check:

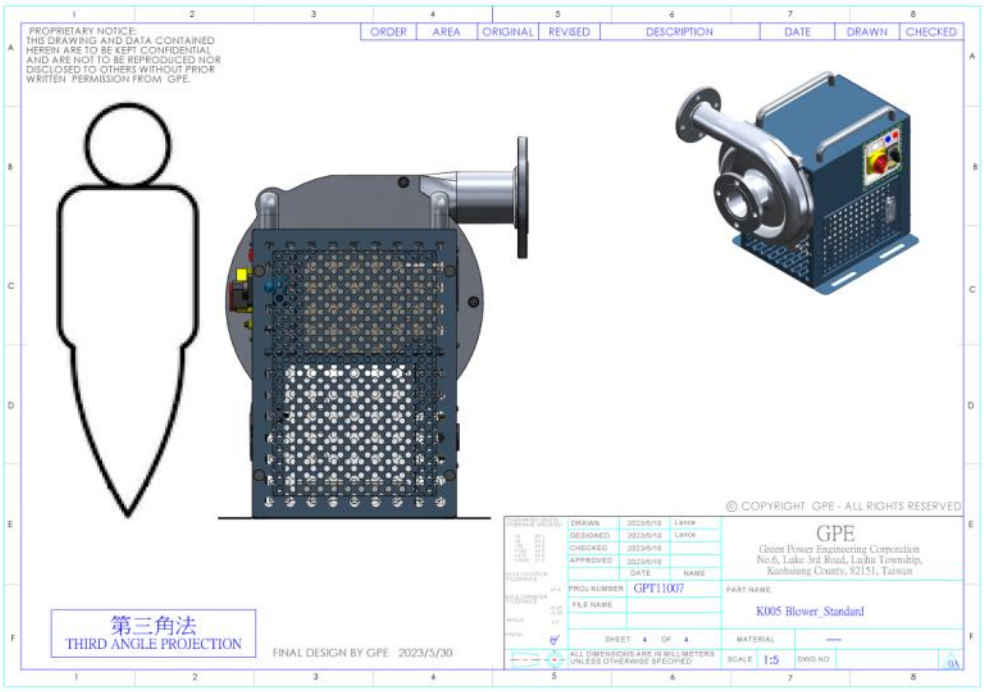
The blower is equipped with a "power switch" as an emergency stop for the entire blower. After initial installation and positioning of the blower, please test the power switch to ensure that the power to the machine is properly on and off.

4. Operation

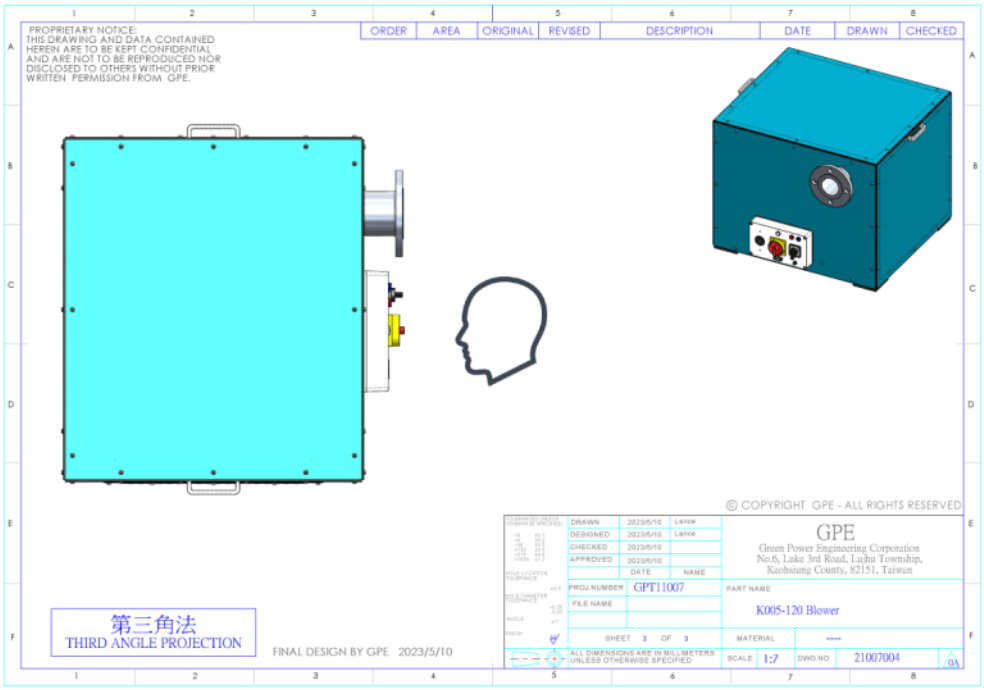
4-1. Operator Position:

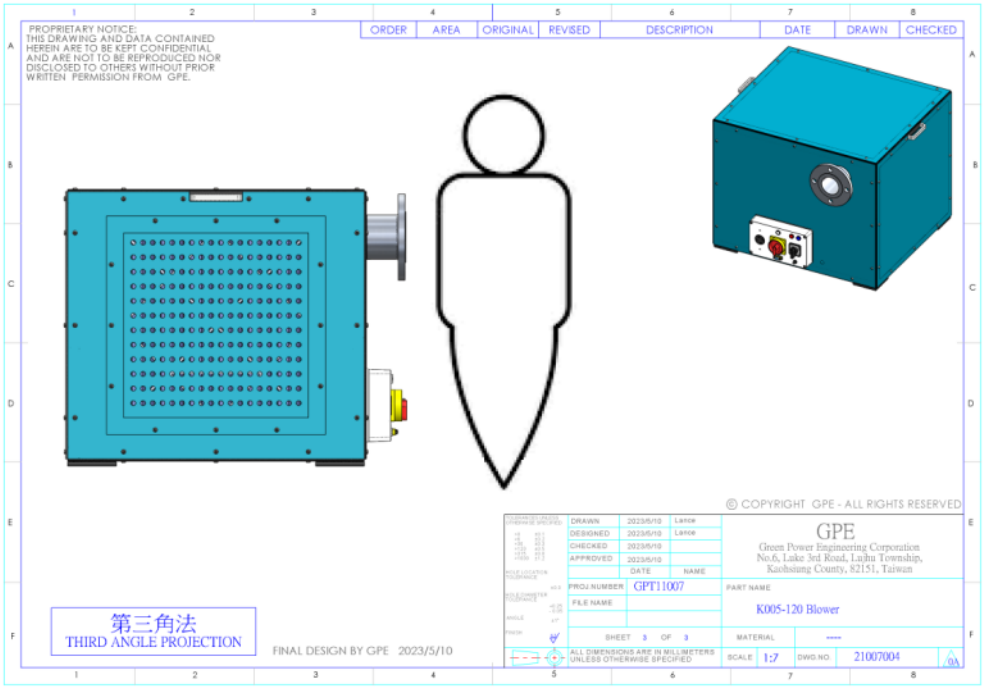
i. Operator Position of the Standard Type Turbo Blower





ii. Operator Position of the Advanced Type Turbo Blower

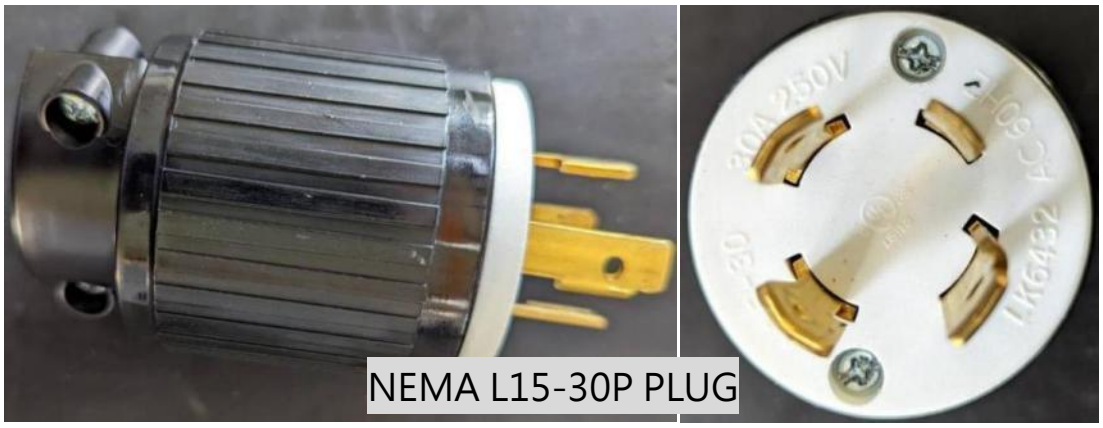




4-2. Control Panel:

The power supply specifications for the three-phase AC power required by the unit are divided into two types: 220V and 400V.

For the 220VAC blower unit, the power outlet can be either a "NEMA L15-30R (locking type, 250V, 30A, three-phase four-wire)" or an "IEC 60309: 16A 220V 3P+E." Please use the corresponding plug type to avoid poor electrical contact or damage to the outlet.



NEMA L15-30P PLUG

For the 400VAC blower unit, the power outlet uses an "IEC 60309: 16A 400V 3P+N+E" socket (400V, 16A, three-phase five-wire). Please use the matching "IEC 60309: 16A 400V 3P+N+E" plug to prevent poor electrical contact or outlet damage.

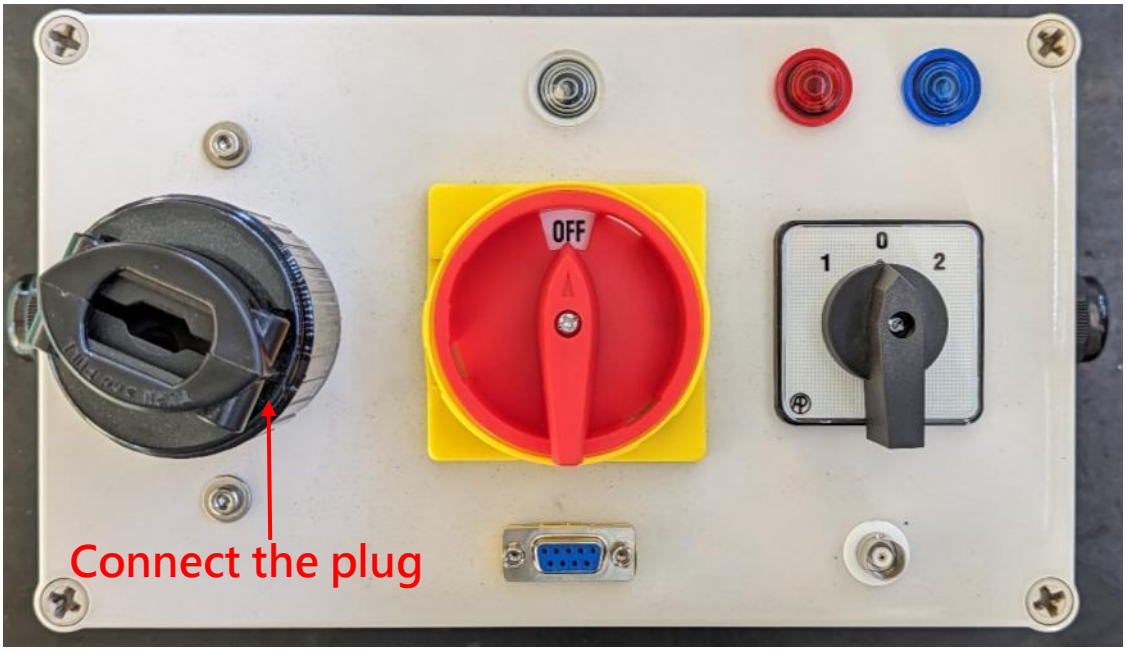
IEC 60309：16A 400V 3P+N+E PLUG

IEC 60309：16A 220V 3P+E PLUG

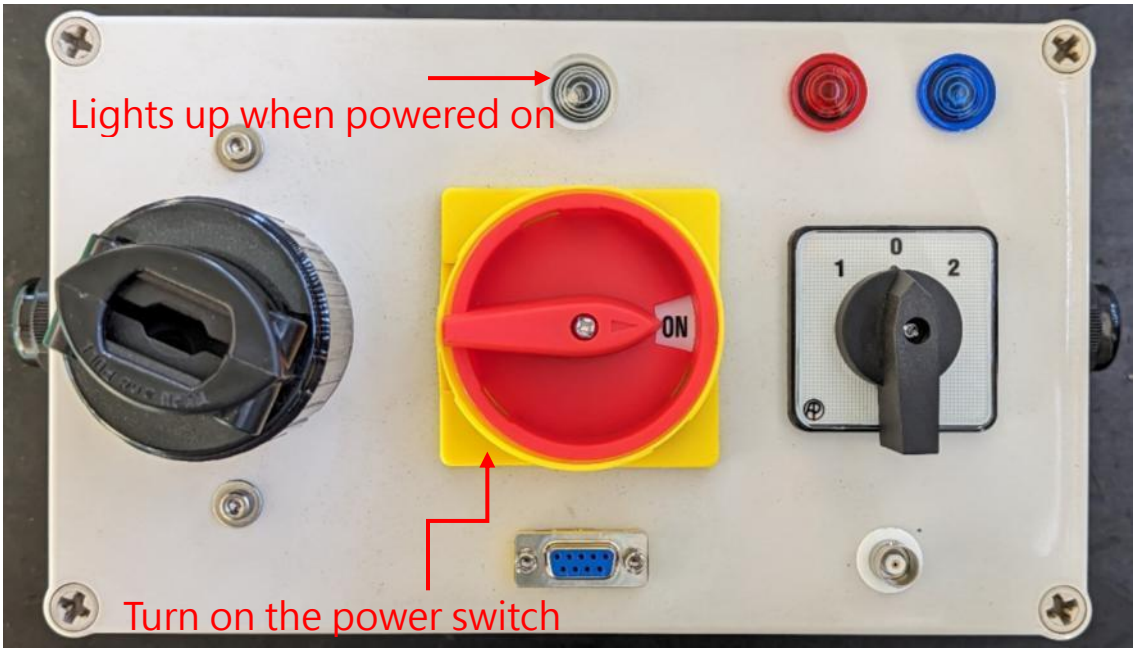
4.2.1. Turbo Blower Startup Procedure

（1） Check that the speed switch is at "0" and the power switch is at "OFF"

(2) Connect the plug.



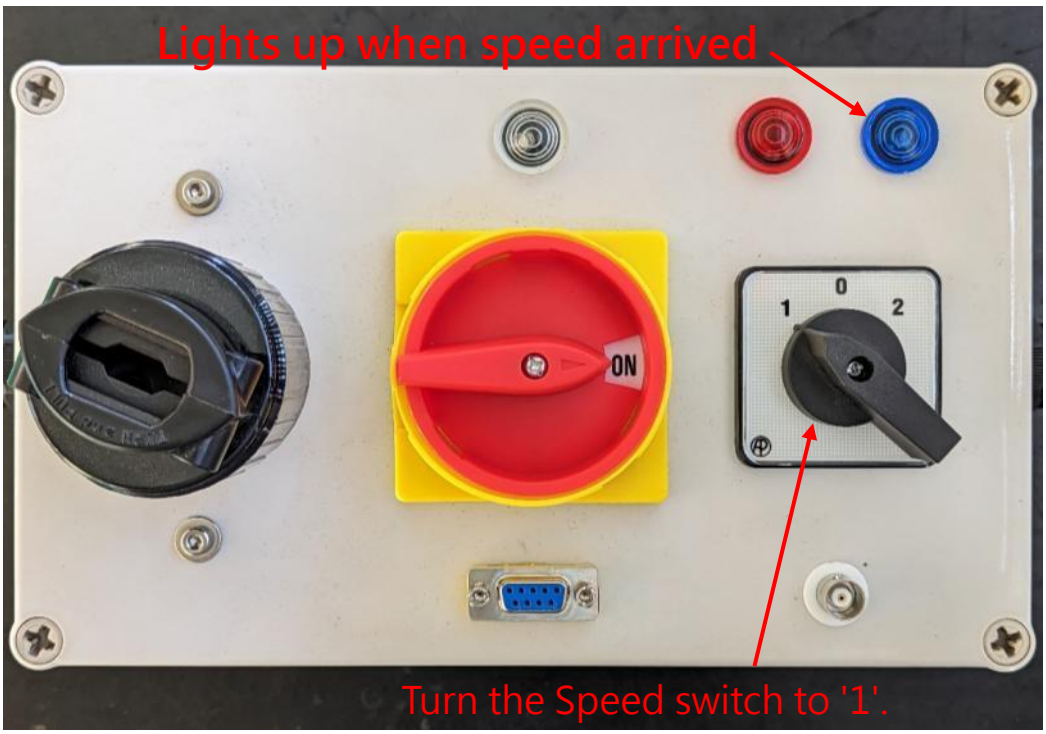
(3) Turn on the power switch. (Turn the red knob to the "ON" position.) After the unit is successfully powered on, a white LED will light up.



(4) After the white LED comes on, wait 10 seconds before starting the turbo blower.

(5) Start the turbo blower. (Turn the black knob to '1'.)

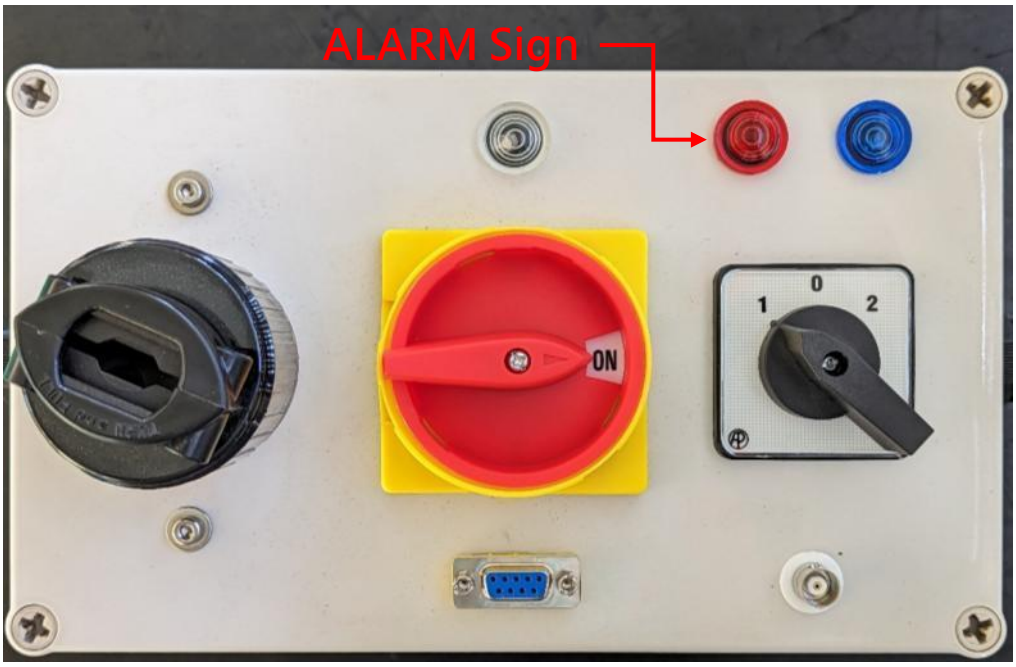
(6) The blue LED will light up, when the turbo blower has accelerated to the operating speed.



4.2.2. Shutdown Procedure During Blower Operation

Turn the speed switch (black knob) to the "0" position.

Then you must wait about 30 seconds for the turbo blower to slow down completely before starting the turbo blower again. Otherwise the turbo blower will not restart.

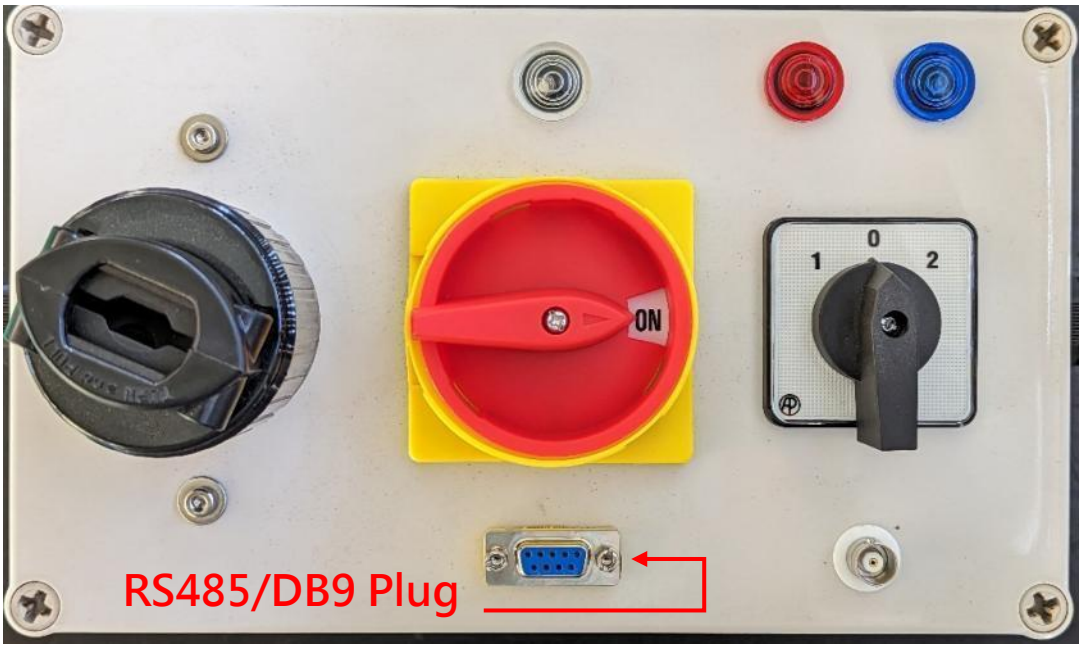


4.2.3. When the Red LED Comes On

Reset the speed control to "0" and the power switch to "OFF". Wait 30 seconds and then restart normally.

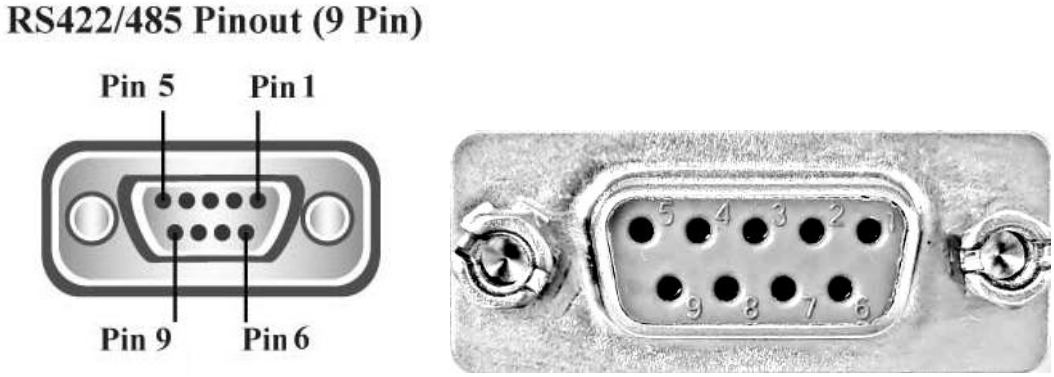
4-3. Communication Interface:

KAVAS Turbo blower uses the RS485 DB9 port to provide the MODBUS protocol for users to monitor the blower status in a general way.



4.3.1 Connector Pin Assignment

PIN	1	2	3	4	5	6
RS-422	T/R+	T/R-	RXD+	RXD-	GND	VCC
RS-485	A+	B-	n/a	n/a	n/a	n/a



4.3.2 Monitor parameters and there address

4.3.2.1 Modbus Communication Rule： RTU、19200bps、8bits、1stop、no parity。

4.3.2.2 Parameters' Description：

Name	Unit	Address(Pr.)
Driver's Output Voltage	V (r.m.s.)	013
Driver's Output Current	Amp(r.m.s.)	213
Actual Power Factor	--	220
Motor's actual speed	RPM	019
Driver's Output Frequency	Hz	030
Temperature of Motor's stator winding	℃	170
Driver's Inside Temperature	℃	140
Driver's Alarm Status	--	035
Setting Driver's Frequency Output	Hz	271
Unit Address	--	71

Additional Information:

The configurable communication address range is 1 to 63. If two or more devices are connected on the same RS485 communication line, each device must be set to a different communication station number; otherwise, connection failures or operational errors may occur.

5. Maintenance

5-1. Maintenance Cycle:

Please contact the blower supplier to carry out the following maintenance operations.

- ☐ Every **3 months of operation**, carry out a blower vibration recording and evaluation. (No shutdown is required.)
- ☐ Every **6 months of operation**, clean the internal ducts of the blower to maintain blower performance. (Shutdown required.)
- ☐ Every **8,000 hours of operation(approximately 12 months)**, check the dynamic balance condition of the turbo blower. (Shutdown required.)
- ☐ Every **8,000 hours or 12 months**, check or replace the turbo blower bearings. (Requires shutdown.)

5-2. Safety Rules:

- Do not arbitrarily change the parameters in the motor controller as this will reduce the performance and life of the turbo blower.
- When the blower unit's power switch is turned **ON**, the blower unit's cooling system will automatically start up and continue to consume power. If the blower is not expected to start for an extended period of time, it is recommended that the power switch is set to the **OFF** position.
- As the KAVAS turbo blower is a high speed blower, there will be a period of acceleration and deceleration when the unit **"starts"** and **"stops"**. Please be patient.
- Due to the characteristics of the motor controller of the KAVAS turbo blower, if the user operates the blower continuously in "stop" and "start", the motor driver will activate the protection (red light will be on). The error code will show **"Overload Error"**.

6. TroubleShooting

Condition 1: Soon after the blower starts (within 5 minutes), the red LED lights up and the blower stops running. And if the blower power is turned off for 30 seconds and then on again, the red LED will not light.

"Blower overload": Check if the back-end or front-end piping is disconnected or damaged, causing changes in pressure and airflow conditions of fan operation.

Condition 2: Whenever the blower runs continuously for a period of time (15 minutes or more), the red LED lights up and the blower stops running. Also, if the power is turned off for 30 seconds and then on again, the red LED will continue to light.

"Blower overheating": First, check the ambient temperature, is it higher than 40℃. Then check the cooling fan, whether the motor and driver are working normally.

Condition 3: After the blower has been running continuously for a period of time (15 minutes or more), the blower will stop

abnormally and turn on the red LED from time to time, and the fault code will be "Overload" via the blower communication interface or motor driver. After resetting the power to the blower, the blower can still be started normally to reach the operating speed and operate normally.

"Continuous start/stop error" : The turbo blower may start again within a very short time (30 seconds) after receiving the stop operation, and then the motor may not be completely stopped, resulting in incorrect start control of the motor driver.

Condition 4: At the moment the fan is powered on, and the blower speed setting is at "0," the power switch at the factory side trips.

"Leakage Protection" : First, check whether the grounding wire at the switch carries voltage. If it does, the leakage issue on the factory side needs to be addressed. If the grounding wire does not carry voltage, then check whether the leakage protection settings on the switch are incorrect, or if the internal circuit insulation of the blower has been damaged.

7. Appendix

appendix A. Electrical Drawing