riton®

Instruction Manual

Dust Cleaning system

Model: RTX-150



Please read the manual before using. To improve the quality of the product, the outlook and specifications might change without informing the consumer. Our company reserves the right of final interpretation of this manual. Metal 3D printing produces work pieces by laser sintering powder molding. The finer the powder, the better the performance and appearance of the work pieces printed. The diameter of metal powder consumables is only a few microns to several tens of microns, which is flammable and explosive during cleaning.

Thank you for using our product, this machine aims to cleaning and dusting what is caused by 3D printing. The manual provides you the information needed for the dust cleaning system, before using, please read through this manual to make sure using it correctly.

Please put the manual somewhere noticeable so that it could be read in anytime.

Before you read all the installation manual, please abide by the following:

□ Please check whether the equipment is damaged, whether the accessories are complete, and see the product parameters and accessories.

 $\hfill \square$ The power supply of the equipment is 220 / 380V 50Hz, and the power supply plug is well grounded.

□ Do not directly disassemble the used filter docking pipeline or transport.

 \Box Do not use this equipment without filter element or when the filter element is loose.

 \Box Do not disassemble the equipment or change the wiring.

If you still have problems in use, please consult the seller or our customer service center. This product keeps improving. Please consult the agent or visit our website (www.riton.com) for the latest information when the content specifications are modified.

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During inspection, installation, operation and maintenance, the following safety precautions shall be paid attention to at any time.

Precautions for use:



Please read the safety instructions carefully before use.



Do not disassemble the equipment, otherwise it may cause electric shock or personal injury.



□ please confirm that the use voltage of the equipment is consistent with the external power supply voltage, and the external power supply is well grounded, otherwise it will cause fire or equipment failure;

 \Box the electrostatic line requires a grounding point below 100 Ω , and poor grounding may cause explosion or fire;

 \Box the purified air inlet is the air inlet and the purified air outlet is the air outlet. The wind direction of the fan must be correct;

 \Box the interfaces must correspond to each other one by one, and no wrong connection is allowed;

 \Box the internal pressure of the system shall not be greater than 50mbar, and the program shall be prepared with overpressure protection;

no compressed gas is allowed in the air bag under non back blowing condition;
 the machine must be shut down for back blowing, and the exhaust solenoid valve must be opened during back blowing;

 \Box the working gas pressure must be within the range of 0.5-0.6mpa;

 \Box after use, the filter can only be opened after humidification;

□ the used filter shall not be directly disassembled or transported. Such operation can be carried out only after the filter element is replaced and the material barrel is cleaned and maintained;

□ after the filter element is replaced, the bolts of the high-efficiency filter door must be fastened symmetrically. It is forbidden to tighten one side at a time. The sealing strip shall not occupy sundries. The bolt strength shall be moderate to avoid air leakage of the filter due to improper installation;

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 \Box the process of replacing the filter element must be carried out in strict accordance with the process requirements;

Measurement and structure :



 The system integrates cyclone filtration, high-efficiency filtration and secondary purification to ensure the quality of printing environment.
 The pipeline pair interfaces outside the chassis are: Φ 38 quick loading chuck interfaces, which are purification air inlet, air outlet, (back blowing) exhaust gas outlet.

3. The main pipeline in the equipment is 38 all metal pipeline and the tail gas pipeline is Pu Φ 16.

4. The electrical adapter board includes one power aviation plug-in interface, one quick plug electrostatic line interface and one working air inlet.

5. Medium efficiency is equipped with atomization system and differential pressure detection function.

6. Filter element specification ϕ 200x380, filter area of 1.8 square meters, filter life of about 1000 to 1500 hours.

External wiring diagram			
(1) Fan line	AC 380V 50Hz	1. (U) 、2. (V) 、 3. (W) 、4. (PE)	
(2) Differential pressure switch	DC24 4-20mA 0- 5000pa	 (positive electrode), (negative electrode) 	
(3) Pulse valve	DC 24V	7 (positive electrode), 8 (negative electrode)	
(4) Intake valve	DC 24V	9. (positive electrode), 10 (negative electrode)	
(5) Exhaust valve	DC 24V	<pre>11. (positive electrode), 12 (negative electrode)</pre>	
(6) Purge valve	DC 24V	<pre>13. (positive electrode), 14 (negative electrode)</pre>	
(7) Fan	DC 24V	<pre>15. (positive electrode), 16 (negative electrode)</pre>	

External wiring diagram:



Wiring aviation plug



The positive and reverse rotation of the fan must not be connected incorrectly, that is, the cleaning air inlet is the air inlet and the cleaning air outlet is the air outlet.

Control flow graph :



1. Docking:

Connect the purified air inlet, air outlet, tail gas outlet, working gas (0.5-0.8mpa), aviation plug-in wire and electrostatic wire according to the equipment identification

2. Gas washing function: (reduce the oxygen content of the system to meet the requirements for printing)

(1) Gas washing of powder tank: the butterfly valve D1 of powder tank is closed, the exhaust valve Q3 of ball valve is opened, and the ball valve Q1 of powder tank is opened. After gas washing, close the cleaning inlet balloon valve Q1 and then close the exhaust balloon valve Q3.

② Main body gas washing: the gas washing valve C1 is opened to make up the working gas, and the exhaust valve C3 is opened to exhaust (must be opened or closed) to reduce the oxygen content of the system. The gas washing speed can be adjusted by manually adjusting the throttle valve, and the gas washing flow is recommended to be about 40L / min.

3. Cleaning function: (Cleaning of printing dust)

The gas enters from the air inlet and flows back to the printer through cyclone cleaning and double filtration by the filter (the butterfly valve D1 of the powder tank is opened). That is, the fan is started. The cleaning air inlet is the air inlet and the cleaning air outlet is the air outlet. The wind direction must be correct.

4. Back blowing function: (prolong the service life of filter element) It must be in the shutdown state (the butterfly valve D1 of the powder tank is opened) and click back blowing. First, the air inlet valve C2 inflates the air bag for more than 9 seconds, then the exhaust solenoid valve C3 is opened, then the pulse valve is opened for 4S, and finally the exhaust valve and the pulse valve are closed at the same time to complete a back blowing. Back blowing shall be conducted four to five times in a cycle. After the back blowing, the exhaust valve shall be opened for 5 seconds or the internal pressure detection value of your equipment shall be compared. The valve shall be closed after the pressure is hours. Compressed gas shall not be stored in the air bag.

5. Cleaning of high-efficiency powder tank: (clean the powder tank and close the butterfly valve D1 of the powder tank)

① Humidification of high-efficiency tank: the ball valve Q3 is opened for exhaust, the ball valve Q1 is opened for air replenishment of the water tank, and the ball valve Q2 is opened for humidification of the powder tank. After the humidification is completed (the water tank has no water for about 2min), the ball valve Q1 of the water tank is closed for 30s, then the ball valve Q2 of the powder tank is closed for 30s, and finally the ball valve Q3 is closed. Repeat 3-5 times.

(2) Remove the powder tank, clean it, and install the powder tank after wiping it.
(3) High efficiency tank gas washing: the ball valve Q3 is opened for exhaust, and the ball valve Q1 is opened for powder tank cleaning. After cleaning, close the powder tank cleaning ball valve Q1, and then close the ball valve Q3 after 30s.
(6) High efficiency filter element humidification and filter element replacement process: (prevent spontaneous combustion during filter element replacement)
Class A: stainless steel, die steel, tungsten alloy and other high-temperature alloy metal powders;

Class B: aluminum alloy, titanium alloy and other metal powders;



Slowly open the filter door

Caution:

1. The filter door must be opened slowly to prevent obvious air flow.

2. If there is a faint spark in the filter element, it is forbidden to use the fire extinguisher. Slowly close the filter door and stand for 1-3 hours, which will naturally oxidize the spark and extinguish it spontaneously. After removing the filter element, refer to "attachment 2" for maintenance equipment.

3. In case of open fire and spontaneous combustion on the surface of the filter element, spray it to the fire source with a water spout or a dry powder fire extinguisher on the premise of ensuring safety. Refer to "Annex 3" for the use of fire extinguisher, and refer to "Annex 2" for maintenance equipment after the filter element is removed.

4. The filter door must be opened slowly to prevent obvious air flow.



Connect with the printer to test the pressure maintaining to conform whether there's an air leak.

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When replacing the filter element, make sure there is no wind flow in the environment, and the above operation procedures must be strictly followed to prevent spontaneous combustion of the filter element.

6. Cyclone material tank: (collect large dust particles)

When the cyclone material tank is more complete, the manual butterfly valve of the material tank must be closed before disassembling the material tank. 7. Cooling fan: (equipment cooling)

It is recommended to open it directly after power on.

8. Differential pressure switch: (monitoring the clogging state of filter element)

Detect the actual pressure difference of the internal filter element. The filter element replacement pressure difference is about 2300pa, and the back blowing pressure difference can be set according to the actual needs of customers.

All basic control logic must be prepared and controlled by the customer according to the above logic. This system does not include PLC and other control units.

Technical indicators :

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model	RTX-150
Size (width * depth * height)	665*670*1360
Total power	0.9KW
Fan power	0.75KW
Maximum air volume	186m³/h
Grade and service life of high efficiency filter element	H13 1000–1500h
pitcher	300mL
Cyclone material tank	500mL
Waste powder box	3. 2L
Circulating pipe diameter	DN38
Power Supply	AC220v/380v 50Hz(Subject to external identification)

Accessories and consumables :

category	ategory name Specificati model		quantity	remarks
equipment	purification system	RTX-150	1 set	
	filter element		1 set	
Consumabl	Vacuum filter	ZFC-100-06	2 sets	
es	Φ 38 metal bellows	100/150	Several sets	

Packaging and transportation :

□ packaging method of equipment: the general technical conditions for packaging of mechanical and electrical products (GB / T 13384-2008), the national standard of the people's Republic of China, shall be implemented, and new wooden cases shall be adopted, which are suitable for long-distance (sea and land transportation), shockproof and rough handling;

□ we provide the necessary packaging for the goods to be transported to the final destination, take necessary protective measures against moisture, sun, rust, corrosion, vibration and other damage, and bear all responsibilities and expenses for the rust, damage and loss of goods due to improper packaging or protective measures.

Appendix 1:



Appendix 2:

	Atomization maintenance mode:				
01d mod e1	Step 1:	Remove the atomizing nozzle with a 10mm sleeve and remove the white filter cotton of the atomizing nozzle.			
	Step 2	Disassemble the nozzle to remove the internal impurities, then assemble it, and install the nozzle.			
	Step 3:	The water tank shall be installed with vacuum filter cotton. After maintenance, the atomization function shall be opened for inspection. The spray nozzle shall be in umbrella shape, and the atomization effect is appropriate (the arrow direction of vacuum filter cotton shall be toward the water tank cover)			
New mod el	Step 1:	Disassemble the nozzle to remove the internal impurities, then assemble it, and install the nozzle			
	Step 2	Replace the vacuum filter cotton in the water tank, and start the atomization function inspection after maintenance. The spray nozzle is umbrella shaped and the atomization effect is appropriate (the arrow direction of the vacuum filter cotton is toward the water tank cover)			

Appendix 3:

Description of dry powder fire extinguisher			
	1. The fire extinguisher shall be stored in an environment without corrosion and heat source;		
	2. pay attention to whether the pressure of the fire extinguisher is normal;		
matters needing attention:	3. pay attention to personal protection to prevent burns when using the fire extinguisher;		
	4. the product adopts internal pressure storage technology, which shall be based on; Adjust the fire extinguishing pressure and distance according to the actual situation;		
	5. It is prohibited to align the metal powder in combustion during injection.		
	1. the portable fire extinguisher shall be turned up and down several times during use;		
	2. pull out the safety pin and unfold the nozzle;		
usage method:	3. Wear fire-fighting protective clothing, pay attention to the safe distance between people and the fire source, and prevent metal fire from splashing;		
	4. press the handle of the fire extinguisher to evenly spray the fire extinguishing agent onto the burning substance (except powder);		
	5. the fire extinguisher shall not be used upside down		
	6. keep a safe distance (about 2-3 meters from the fire source)		

Maintenance records :

DATE	ABNORMALITY	SOLUTION	CLIENT SIGN.	MAINTAINANCE SIGN.