SMS

Metal Detecting Separators

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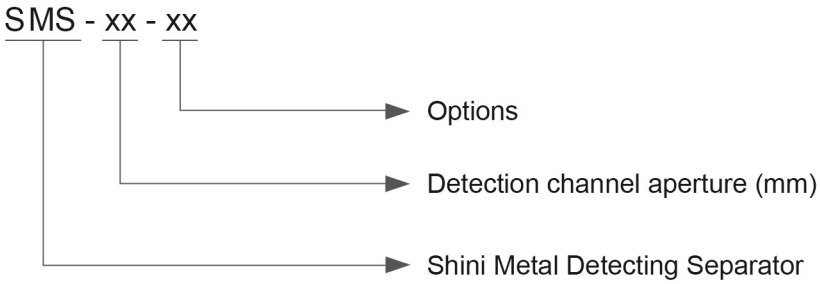
1. General Description

Read this manual carefully before operation to prevent damage of the machine or personal injuries.

SMS series metal detecting separators are highly sensitive and accurate in detecting and separating metal grains, such as steel, iron, copper, aluminum, lead, tin, etc. Its principle is when metal impurities passing through it, electrical detector can send a signal to control board to open the valve to discharge the impurity materials. Pneumatic discharging system takes little space and ensures good performance. It can be installed directly on injection molding machine or (extruders) hoppers to protect the screw of machine from the damage caused by hard metals. Its processing capacity is ranging from 600L/hr to 3,000L/hr to meet any specific requirements.

Model: SMS

1.1 Coding Principle



1.2 Feature

- Fast separating all the metals from the material.
- The minimum detectable diameter of the metals can be as small as 0.5mm.
- Compact design, easy to install and simple to operate.
- Standard equipped with a 12 liters hopper.
- Germany metal detector.

1.3 Options

- For models optional with the floor stand, and add “F” at the end of the model code.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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+86 (0)23 6431 0898

1.4 Safety Regulations

Operate the machine according to the safety regulations below to avoid personal injuries or damage of the machine.

1.4.1 Safety Signs and Labels

Electrical installation should be done by qualified electricians. It is a must to cut off power supply during maintenance and repair of the machine

Warning! High voltage!

This sign is attached on the cover of control box!

Warning! Be careful!

Be more careful where this sign appears!

Attention!

No need for regular inspection because all the electrical parts in the control unit are fixed tightly!

1.5 Exemption Clause

The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

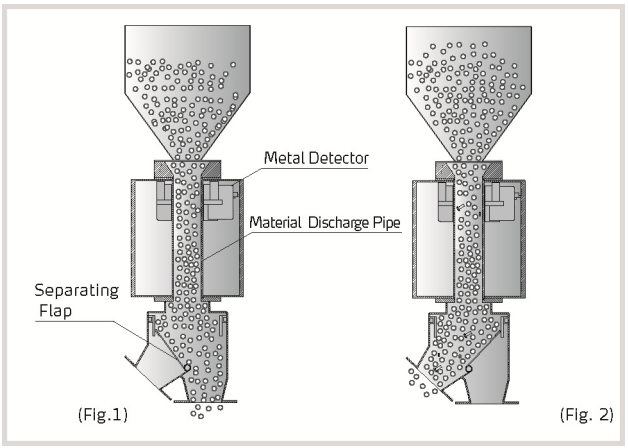
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3. Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
4. Employing consumables or oil media that are not appointed by Shini.

2. Structure Characteristics and Working Principle

2.1 Working Principle

Material discharge pipe has a ring-type metal detector sleeved on and when material with no metal comes through it, no signal will be sent out from the detector to activate the separating flap from its standby position. Thus material will flow out via the passage showed in Fig. 1.

However when material with metal comes through it, signal will be sent out from the detector to move the separating flap to another position. Thus material will flow out via the passage showed in Fig. 2.



Picture 2-1：Working Principle Illustration

3. Installation and Debugging

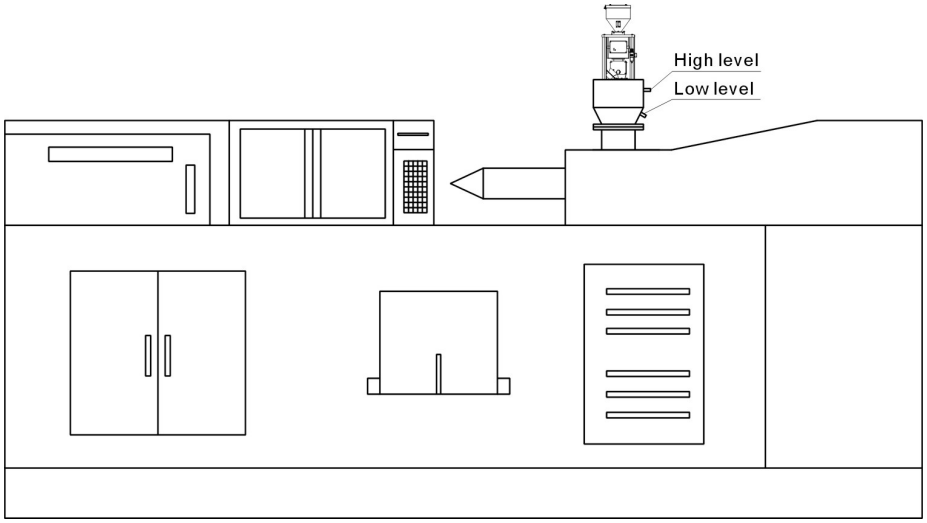
Read this chapter before installation. Install the machine according to following steps!

Power supply of the machine should be connected by professional electricians!

Note: Please read this chapter before installation, and install the machine according to the following steps!

Note: Power connection must be done by qualified electricians. In order to ensure the normal functions of detector and sensor, the ambient temp. needs to be in the range from -10~+50℃.

3.1 Mount on Injectors/Extruders



Picture 3-1：Mount on Injectors/Extruders

3.2 Power Supply

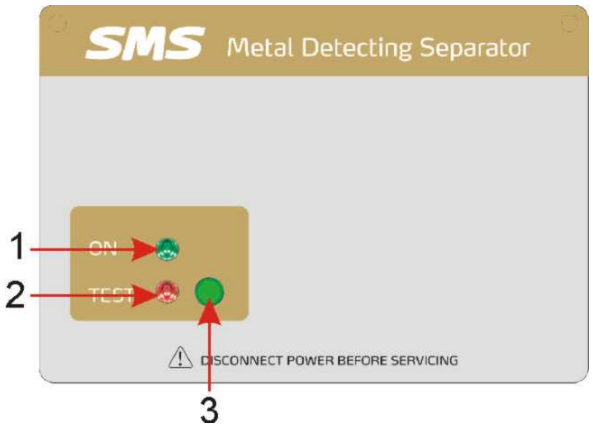
Connect the machine with 1Φ 230VAC 50/60Hz or 1Φ 115VAC 50/60Hz power supply and earth wire.

3.3 Connect the Machine with Air Supply

Connect to compressed-air filter and regulator. (The compressed-air filter and regulator refers to chapter 6.2.1 for detailed description). Adjust compressed air pressure to about 3kgf/cm^2.

4. Application and Operation

4.1 Operation



Picture 4-1：Operation

4.2 Control Panel

No.	Name	Function description	Remarks
1	ON	Power indicator	This indicator turns bright after power supply is switched on.
2	TEST	Metal detecting indicator and test indicator	The red indicator turns bright when metal is detected. It also turns bright when pressing button 3.
3	Machine performance test	It is used to do machine performance test.	Press this button to activate metal separating plate no matter there is metal or not.

4.3 Machine Start / Stop

1. Turn on power supply to start the machine.
2. Turn off power supply to stop the machine.

4.4 Operation Guide

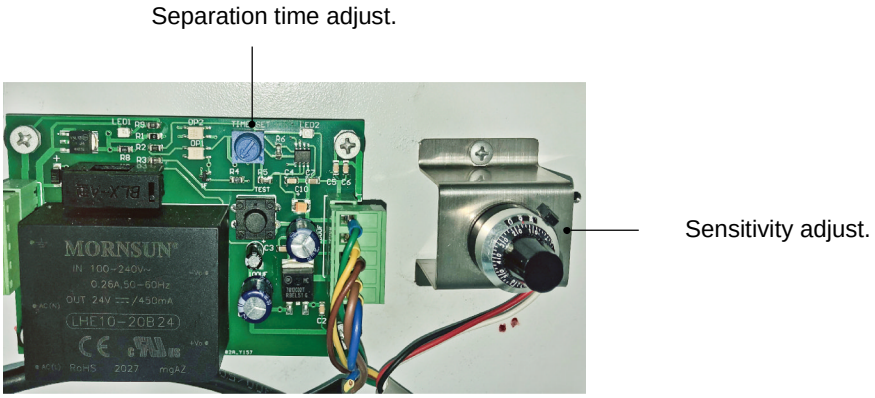
1. Connect the machine with compressed air supply. After several seconds, the machine is ready to work.
2. Test if the machine can work properly.

Press "TEST" button on control panel to check that the rod of the cylinder acts accordingly and material separating plate can be opened.

3. If the rod of cylinder can’t move and material separating plate can’t be opened, please refer to chapter 8 to solve the trouble.
4. Load the material into material hopper to start the process.

4.5 The Adjustment of the Metal Detecting Separators’ Sensitivity and Separation Time

1. The sensitivity refers to the minimum metal detecting ability of the metal detecting separator (The factory default value is 9). The detecting sensitivity can be adjusted on the circular sensor, which can be adjusted according to different plastics.
2. The separation time refers to the material fender's retaining time flipping to the metal separation side after the sensor detected the metal object. The time will determine the volume of materials separated with the metal object during the separation (The factory default is the leftmost position, that is, the position indicated by the blue arrow button in the picture).



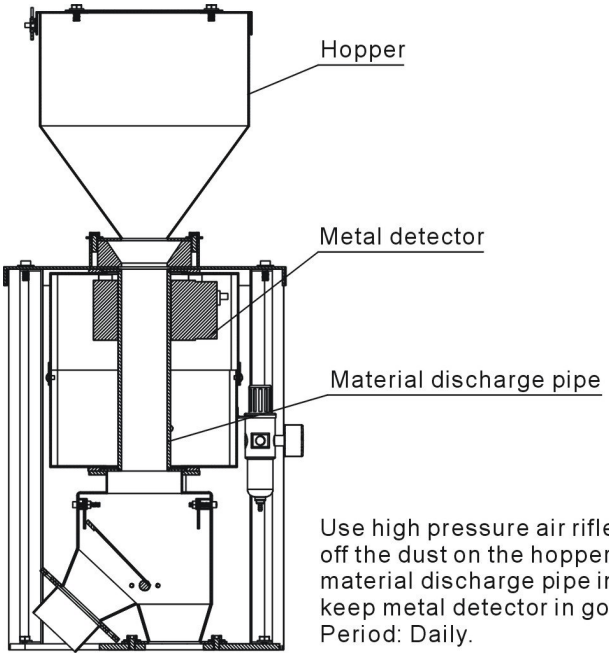
Picture 4-2：Metal Detecting Separator

Note: The adjustment of the separation time and detection accuracy depends on the situation. Generally, the separation time and sensitivity can be set according to the factory settings.

5. Trouble-shooting

Fault	Possible reasons	Solution
Green indicator cannot be turned on after power is switched on.	Fuse melted. If voltage is tested between the wires of the indicator, the indicator is broken.	Replace the fuse. Replace the indicator.
When metal is detected or press performance test button, the red indicator turns bright, but the machine dose not act.	Solenoid valve not connected with air supply. Solenoid valve damaged. Electrical wires of solenoid valve break.	Connect it with air supply. Replace solenoid valve. Fix the electrical wires.
The machine repeats the action continuously since metal separating plate is activated.	There are metal grains left at material inlet.	Clean the metal grains. In the case that the problem can’t be solved by previous step, appropriately lower the ring sensor or prolong the separation time.
Metal separating time too long or too short.	Controller set incorrectly.	Adjust the knob on the controller. If metal separating time can not be adjusted, check and fix terminal No. 5 with terminal "-" of the controller.
No permanent signal after metal separation.	Controller incorrectly connected.	Check and connect terminal No. 3 with terminal "-" of the controller.
Ring shape sensor can not detect metal grains.	Accuracy of the sensor incorrect. Signal wire between the sensor and controller break. Sensor or controller damaged.	Adjust the accuracy of the sensor. Reconnect the signal wire. Replace the sensor or controller.
Electricity leakage.	Electricity leakage through electrical wires onto the floor.	Electricity leakage through electrical wires onto the floor.

6. Maintenance and Repair

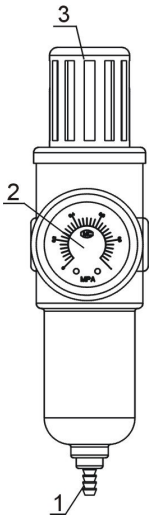


6.1 Maintenance

All the repair work should be done by qualified electricians to prevent personal injuries or damage of the machine.

6.2 Filter and Pressure Regulator

6.2.1 Filter and Pressure Regulator



Names of components

1. Water outlet 2. Pressure meter 3. Pressure regulator

Picture 6-1：Filter and Pressure Regulator

6.2.2 Operating Steps of Filter and Pressure Regulator

1) Connect to the air supply.
2) Pull up the black knob 3 and rotate, watch the variation of the pressure gauge 2 and normally adjust the pressure to about 3-4kg/cm$^{2.}$

Picture 6-2：Operating Steps

6.3 Clean Metal Sensor

Use compressed air to blow away material dusts and fines on the metal sensor to keep a good performance of the sensor.

6.4 Maintenance Schedule

6.4.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.4.2 Check After Installation

☐Check the pipes of air supply.

☐Check the base of the machine.

Electrical Installation

☐Voltage: _____ V _____ Hz

☐Fuse type: 1Φ _____ A 3Φ _____ A

☐Check electrical connections of main power.

6.4.3 Weekly Checking

☐Check main power electrical wires

☐Check fastening screws at machine base

☐Check the pressure of air supply

☐Check ambient temperature

6.4.4 Weekly Checking

☐Check all the electrical wires.

☐Check the solenoid valve.

☐Check the accuracy of the sensor.

☐Check the sensor.

6.4.5 Monthly Checking

☐Check the controller of the sensor.