



AMP-3000.v21

Metal & spark diverter

User manual

(Version 2.**)

AMPE TECHNOLOGY CO.,LTD

www.ampecn.com

P r e l u d e

Thanks for using new models AMP series of high performance metal & spark diverter produced by Ampe Technology Co., Ltd. AMP series products are manufactured with high quality units, materials and with the utilization of latest microcomputer technology. Ampe Technology Co., Ltd. continuously practices the design and innovation of the product and provides excellent products with professional attitude. Furthermore, it responds to the customers with professional service and benefits each other with the customers.

The manual provides cautions about the installation, parameter setting, troubleshooting and daily maintenance of metal & spark diverter to the user. In order to assure the proper installation and usage of the product, please read this manual in detail before installation. Please keep the manual well and give it to the operator of the machine.

Welcome to visit the website of Ampe Technology Co., Ltd. : www.ampecn.com. The website provides the download of the operation instructions and technical BBS service.

The following are the cautions that need special attention:

▲ Caution !

1. First please carry out the delivery inspection and check whether there is damage caused by transportation process.
 2. After unpacking, please compare with the packing list and check the type, specification and components of the product. If it does not conform to your order documents or if you have any questions regarding the product, please contact to the dealer or the service office of our company.
 3. Ampe Technology Co., Ltd. provides services of the three guarantee period 18 months from the delivery date.
 4. Troubles due to lightening strike, water invasion and obvious artificial miss or damage etc. are not in the range of repair guarantee.
 5. Metal & spark diverter series products are important products of the fore-spinning procedure in cotton spinning mill. But the users in cotton spinning mill should also take integrated measures in fire protection equipments, selection of material, management regulations etc. to assure the safety production.
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▲ Caution !

1. The power supply must first be shut down before the electric wiring.
 2. Wiring, repairing & maintenance of the machine should be carried out by electric professionals.
 3. Do not carry out compression test toward the inner components because the semiconductor units are easy to be broken down by the high voltage and are easy to damage.
 4. The circuit board CMOS integrated circuit is apt to static electricity damage. So you should take the static electricity prevention measure before touching the circuit board with hand.
 5. As the machine is installed to the pipe in high place, installation personnel should take safety measures. Suspending or bracket should be solid to prevent the machine from dropping down.
 6. Select safety area to install the equipment, prevent the high temperature & direct shinning and avoid humidity and splashing of the water drops.
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Contents

A. Overview	1
1. Use and structural characteristics	1
2. Technical parameter.....	1
B. Electrical wiring and installation	2
1. Installation	2
1.1 The installation of the spark and metal detector	2
1.2 The installation of control box.....	3
1.3 The installation of diverter unit	3
1.4 The standard installation	4
2. Electrical wiring	7
2.1 Control box power and interlock signal terminal P7	7
2.2 Electrical wiring of P1 terminal.....	7
2.3 Electrical wiring of P4 terminal.....	8
2.4 Electrical wiring of P8 terminal.....	8
3. Grounding and safety	8
C. Using of the control panel.....	9
1. The instruction of LCD displayer and function of the control panel	9
1.1 Explanation of the panel	9
1.2 The fire alarm page.....	9
1.3 The metal alarm page.....	10
1.4 The description of key	10
2. Parameter setting	10
2.1 Real time setting	11
2.2 System setting.....	11
2.3 Function setting	12
2.4 History	13
2.5 Communication setting.....	14
2.6 Configuration.....	14
2.7 About machine page	15
3. Communication protocol.....	15
3.1 Communication format.....	15
3.2 Communication protocol RTU mode.....	15
3.3 Local communication protocol parameters address definition	16
D. Debugging and usage maintenance	17
1. Fire alarm simulation test	17
2. Metal diverting function test and adjustment	17
3. Maintenance and inspections.....	18
4. Debugging	19

A. Overview

1. Use and structural characteristics

AMP-3000.v21 type metal & spark diverter is directly installed on the cotton pipeline, it effectively detects metallic particles and sparks, mixed or generated in the production process. So that ensure the safety of blowing-carding production line in spinning mills or other fiber processing production lines.

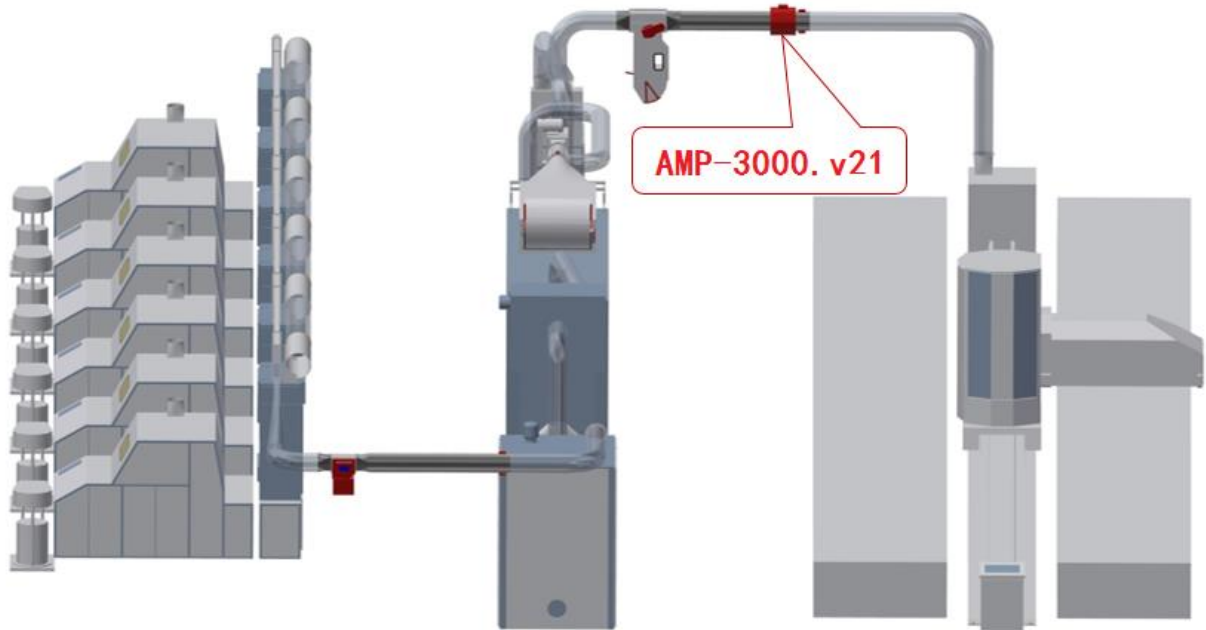


Figure1. The installation of AMP-3000.v21 on the blowing-carding line

Features

- a. Highly sensitive to small metal particles.
- b. Highly sensitive to infrared radiation emitted by fast moving small spark in pneumatic transport systems for textile fibers.
- c. Strong anti-interference ability, adapt to complex electromagnetic environment of textile mill and other industrial production.
- d. RS-485 Serial interface, communicate on Modbus networks.
- e. Effectively diverter ensures the fast response time and shorter installation distance.
- f. Automatic simulation and testing of spark detection system.

2. Technical parameter

- a. Sensitivity: Metal detection: Steel ball diameter more than $\Phi 2\text{mm}$
 Aluminum ball diameter more than $\Phi 5\text{mm}$
 Spark detection: spark diameter more than $\Phi 0.5\text{mm}$ spark
 (The angle of view is no less than 90 degrees)
- b. Response time: $\leq 100\text{ms}$.

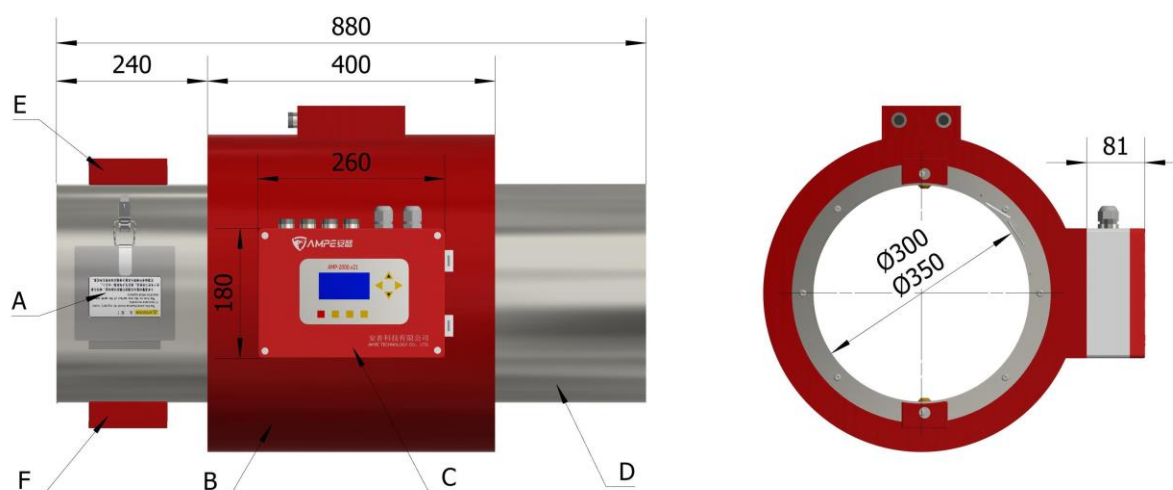
- c. Power supply: 100-240V AC.
- d. Compressed air pressure range: 600~800Kpa
- e. Sound level of alarm: >100db
- f. Power: <100VA
- g. Requirement of the environment: temperature -10℃—70℃, relative humidity (20-75) %RH

B. Electrical wiring and installation

Please be sure to read this “User manual” carefully before installation, and measure and evaluate the installation environment and conditions.

1. Installation

1.1 The installation of the spark and metal detector



- A Observation window B Metal detector C Control box D Stainless steel pipe
 E Spark detector SD1 F Spark detector SD2

Figure2 The spark and metal detector unit

- 1) The connection part between stainless steel pipe and metal detector is made of insulating material. In order not to affect the performance of metal detector, the main body of metal probe shall not be directly connected with hanger;

▲ ATTENTION

The metal probe shall be firmly installed to avoid misoperation due to shaking of the probe during use.

- 2) Make sure the shielded cables for signal receiving and transferring between the metal detector and control box is connected reliably, then fix it without

vibrating . Connector cables are part of the sensor and have to be protected against interferences.

- 3) Metal detector should keep a certain distance from the things that generate the electromagnetic radiation such as electric motor, transformer and fluorescent lamp etc. Furthermore, it should keep a certain distance from big moving metal object. The cables with big current should be also kept a distance from the detector.

1.2 The installation of control box

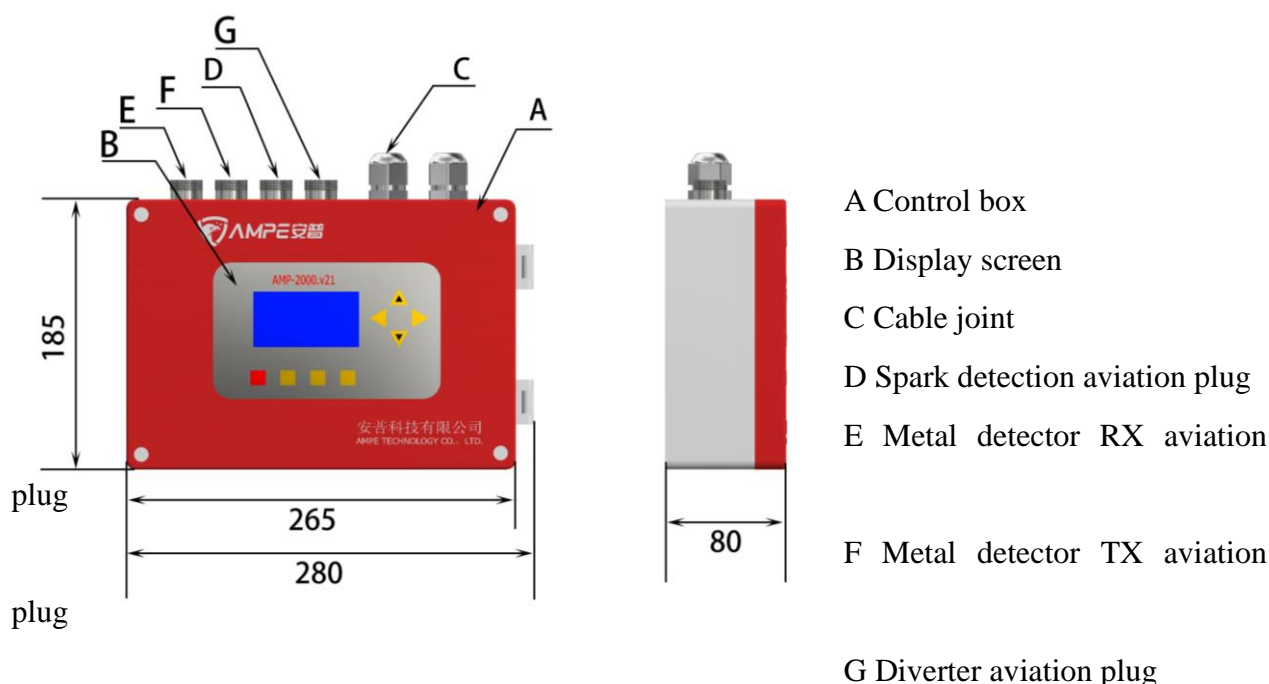
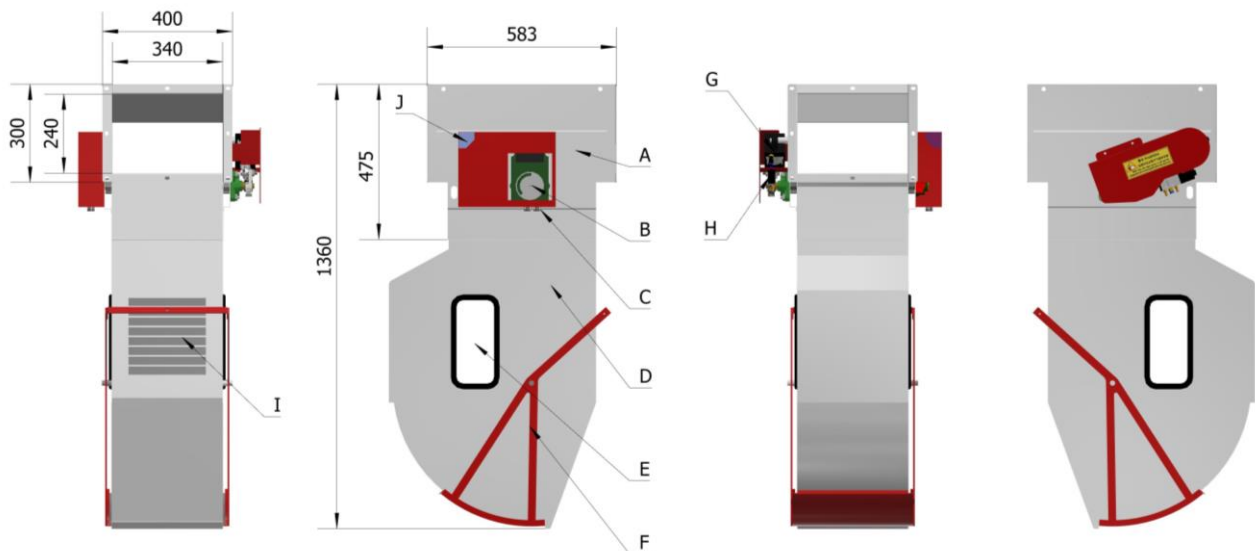


Figure3 The dimension diagram of control box

1.3 The installation of diverter unit

The diverter unit consists of diverter and collector box (figure 4). The collector box is installed under the diverter.



A Diverter B Display of action time C Aviation plug D Collector box
 E Observation window F Draw-bar G Solenoid valve H Cylinder
 I Air supplement board J Operating status indicator

Figure4 The dimension diagram of diverter unit

The diverter is connected with square joint pipe to the conduct duct. The install method is the use of hanger. Please pay attention to the direction of cotton incoming and output. The diverter utilizes rapid response gas driving structure, so it is necessary to provide clean and stable 600~800Kpa gas supply.

The red light of the working status indicator on the trash remover (Fig. 4-J component) flashes, indicating that the spark probe alarms; Blue green is displayed when the equipment is in normal status.

▲ATTENTION

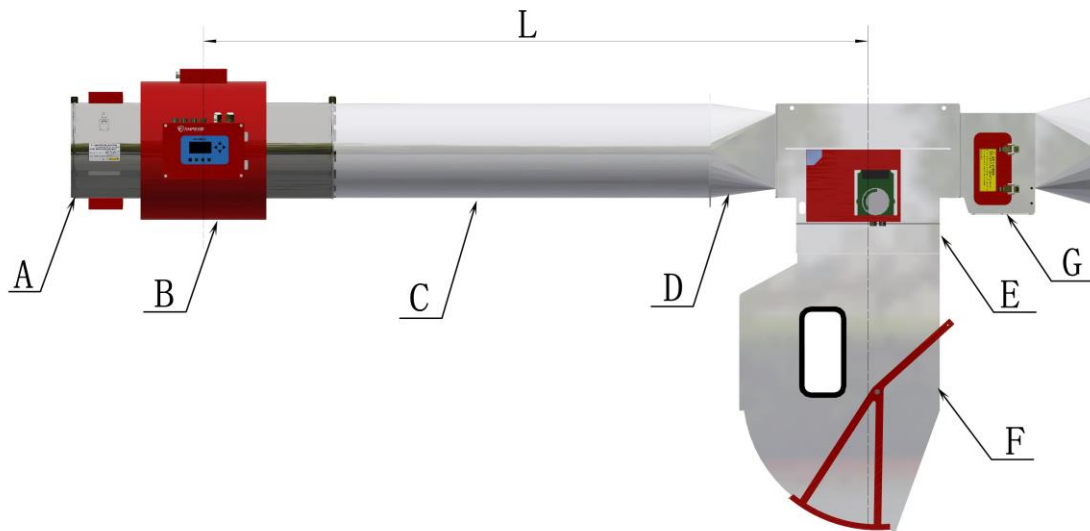
As for the install position, you should avoid the problem that cotton containing sundries dropped to the hopper or other machines when the collect door opens.

▲WARNING

Do not clean or touch the diverter in case of danger when the equipment is running on.

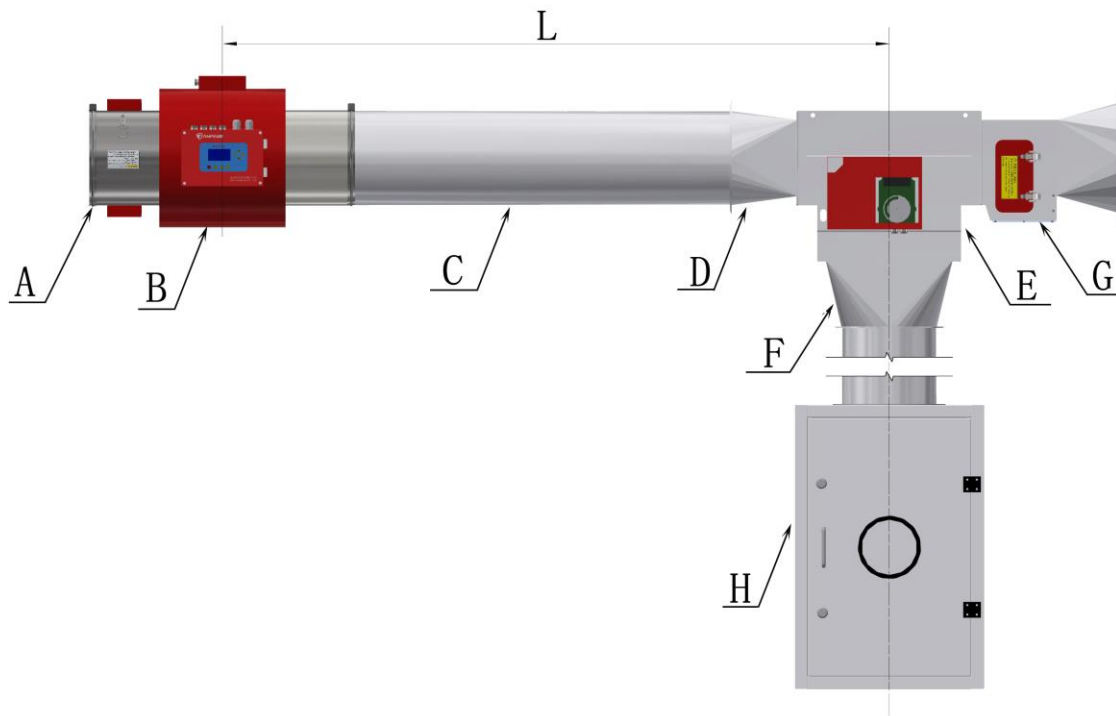
1.4 The standard installation

The distance between metal detector and diverter “L” is the most important parameter in the process of installation. The detailed “L” is shown in table1. Parameter “L” determines the efficiency of metal diverter.



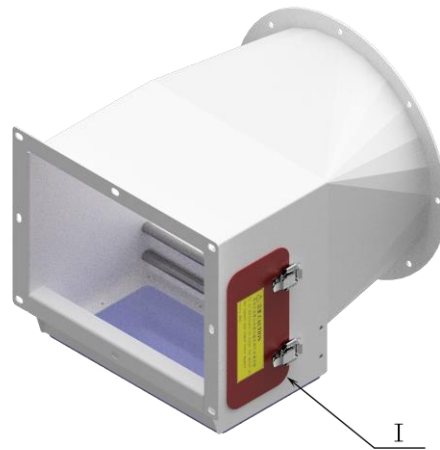
A Clamp B Spark and metal detector C Pipe D Square to circular
 E Diverter F Collector box G Heavy sundries separation square to circular

Figure5 The standard installation of AMP-3000(negative positive pressure)



A Clamp B Spark and metal detector C Pipe D Square to circular E Diverter
 F Square to circular 2 G Heavy sundries separation square to circular H Collector box

Figure6 The optional installation of AMP-3000(negative pressure, H is optional)



Part G is a heavy sundries separation square to circular. It is recommended to open window “I” regularly to clean up impurities.

▲ ATTENTION

a) During the installation, the center distance between the metal detector and diverter L is the most important parameter of the installation process. If the installation distance L is too long, the metal diverter rate will obviously decrease. The most near distance that satisfies the simulation experiment L is most ideal.

b) After finishing the installation, if you can't get ideal diverting effect through the adjustment of parameters in the parameter unit, you must confirm through tests and adjust the L distance.

Air speed v (m/sec)	Installation distance 'L' (m)
$v < 15$	2m
$v > 20$ (high wind speed)	2m~3m (Adjust according to the actual situation)

Table1: The installation distance from metal detector to the diverter

2. Electrical wiring

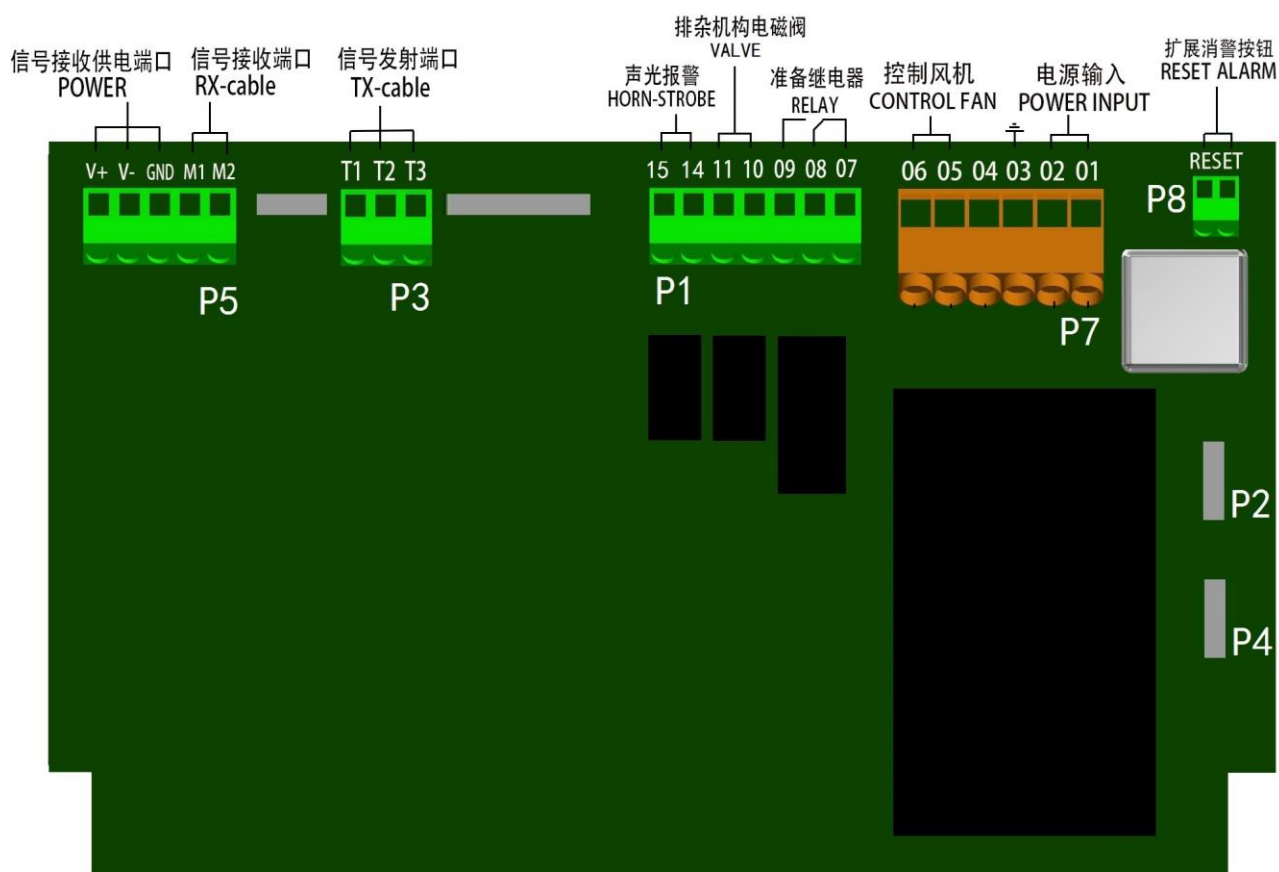


Figure7 Wiring description of main board

2.1 Control box power and interlock signal terminal P7

- a. Terminal 01 and 02 are power input, terminal 3 is ground electrode

▲ ATTENTION

1. The power supply should be avoided being cut off when spark alarm stopping happens;

2. The power supply wiring should come from power distribution cabinet in the workshop, do not use AC 220V from control transformer of the electrical control cabinet. We shall avoid the share of power supply with other equipment that may produce interference radiation, such as high-power inverter and motor's frequent start-stop. Please provide separate power supply if possible.

- b. Terminal 4 “NC”, 5 “COM” and 6 “NO” are a group of passive relay contact output. The relevant equipment can be shut off when spark alarm happens.

2.2 Electrical wiring of P1 terminal

a. Terminal 07, 08 and 09 are passive relay contact output. It detects the performance of this equipment, the relay contact works if there is a fault.

b. Terminal 10 and 11 are connected to solenoid valve coil of diverter. The specification of solenoid valve coil is DC20-24V.

c. Terminal 14 and 15 are connected to sound and light alarm signal, terminal 14 is connected to positive pole, terminal 15 is connected to negative pole.

2.3 Electrical wiring of P4 terminal

P4 is the 485 communication interface

2.4 Electrical wiring of P8 terminal

P8 is connected to the external alarm elimination key.

3. Grounding and safety

1. All the units must be grounded directly to a common ground terminal according to the safety standard of local government.

2. This equipment needs to be separately grounded and it is prohibited to be grounded together with others. It is suggested that the grounded wire be as short as possible.

3. While overhauling, please first shut down the power supply and interrupt the compressed air supply. The temperature of the radiator is very high, don't touch it to avoid burn.

4. When spark alarm happens, first shut down the general power, then extinguish the fire.

5. Please conduct it with more than two persons when the spark alarm test or climbing maintenance is required.

C. Using of the control panel

1. The instruction of LCD displayer and function of the control panel

1.1 Explanation of the panel

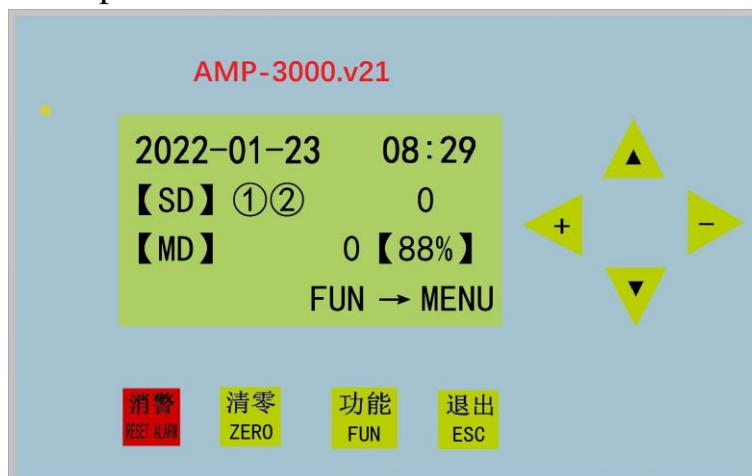


Figure8 Diagram of control panel and main display

Display		Explanation
2022-01-23 08:29		The time now is 08:29 on Jan.23,Year 2022
SD	0	There are 0 fire alarm messages
	【SD】 ①②	The normal working status of spark sensor: “[SD] ①②”
MD	0	The metal count of metal detector is 0
	【88%】	The sensitivity parameter of metal detecting is ‘88%’
FUN→MENU		①Indicates you press the key ‘FUN’ to shift the main menu page to parameter settings. ②‘Locked’ will be displayed after the keyboard locked.

Table2. Instructions of the main page

If the LED is always on, it means that the device has been powered on to the normal working state. If the LED flashes, it means that there is new alarm information. Press the "ALARM RESET" key to restore the original state.

1.2 The fire alarm page

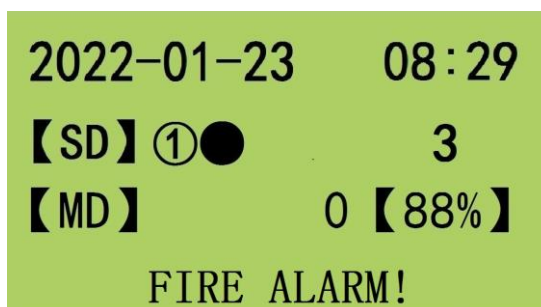


Figure9. LCD displays content when spark alarm happens

The alarm sounds intermittently. The alarm page is shown in figure9. Figure 9 shows "【SD】①●", indicating the spark detector SD2 alarm. Press the key "ALARM RESET", alarm page will turn to working page.

1.3 The metal alarm page

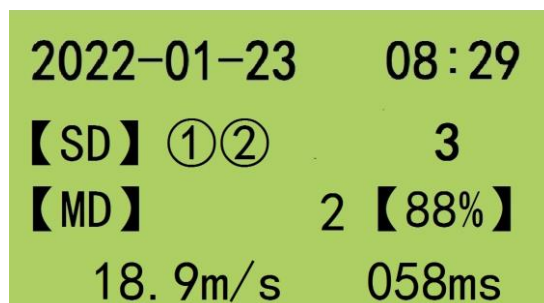


Figure10. LCD displays content when metal alarm happens

When the metal has been detected, there will be a presentation at the fourth line of the main page. e.g.: '18.9m/s 058ms', it means 'the speed of the removing metal is 18.9m/s'. The action time of the diverter flap is 58ms. The speed here is just for reference and it is not the actual speed. Because the size and the kinds of metal are different, compared with the actual speed, there may be errors.

1.4 The description of key

Enter into parameter setting page by pressing "FUN+▲" key.

The description of key

- 1) "RESET ALARM" :Reset fire alarm key. After pressing the key, the alarm status will be eliminated and the instrument returns to the normal working state..
- 2) "ZERO" Counter clear key. The key is used to clear the counter of metal detector's action.
- 3) "FUN" Function key. The key is used to switch the menu page (refer Figure13). If the keyboard is locked, you can enter the menu page by pressing the 'FUN' and '▲' keys simultaneously.
- 4) "ESC" Exit key. After pressing the key, you will return to the main page.
- 5) "▲"Up key, "▼"Down key, "+"Left key, "-"Right key, These keys have the functions of shifting parameter settings and changing the data.

2. Parameter setting

After pressing the key 'FUN' on the main menu page, you will turn to the menu page of Parameter setting.

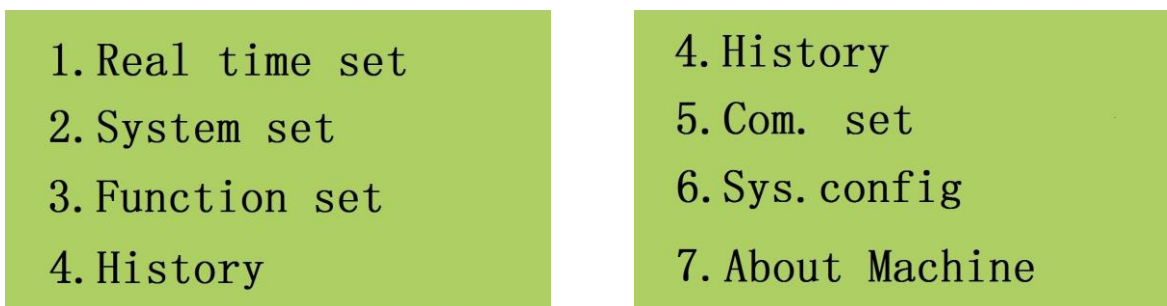


Figure14 Parameter settings main menu

When the cursor is flashing in the '1. Real time set' item, press the key 'FUN' to enter into time settings, use the key '▲ , ▼' to switch positions of the cursor. Press the key 'FUN' entering into the page where the cursor stayed.

2.1 Real time setting

After you enter into the time setting menu page, press '▲ , ▼' turning to switch among the month, date, year, hour, minute. Through pressing the key '+, -', we can change the value of the data. After finishing the setting of the time, press the 'ESC' key to return to the main page.

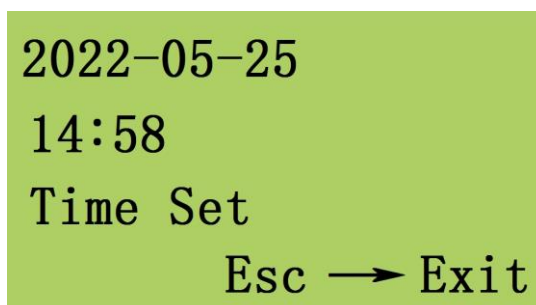


Figure15 Time settings menu

2.2 System setting

After you enter into the system setting menu page , press the two keys '▲ , ▼' can change for the up and down item shifting.

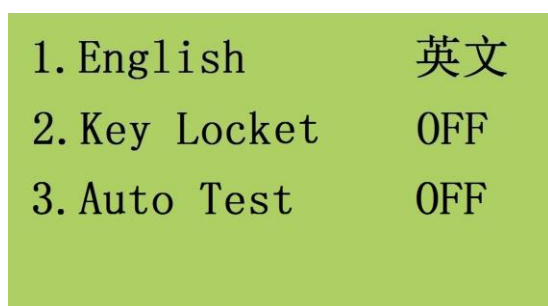


Figure16.a System settings menu

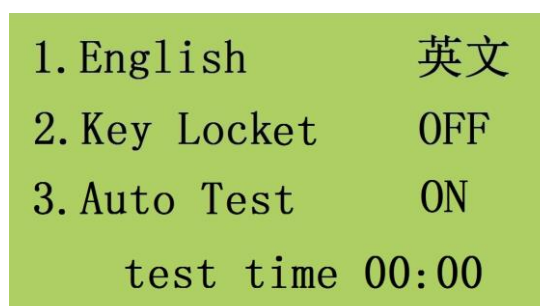


Figure16.b System settings menu

1) The cursor is flashing in the '1. CHINESE 中文' item, shows that we can choose according to the language, press '+ , -', then we can select the system's language between Chinese

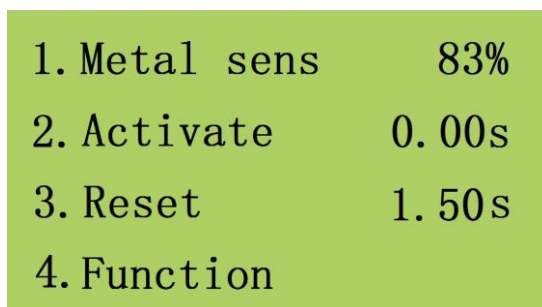
and English.

2) The cursor is flashing in the '2.key locket' item, shows that we can lock the keyboard now, pressing the key '+ , -' to select 'ON' or 'OFF'.

3) When the cursor is flashing in the '3.Auto Test' item, shows that we can press the key '+ , -' to enable or disable the 'Auto Test'. When the 'Auto Test' shows 'ON' (refer to Figure 16b) , there will be an order as 'Test Time 00:00' appeared at the bottom of the page .You can use the key '▲,▼' to shift the flashing items. Press "+ , -" in a 24-hour time automatically test time settings. If the auto test function is enable, the spark sensor will be tested at the specified time everyday.

2.3 Function setting

After entering function setting menu, press '▲, ▼' can change for the up and down item shifting.



1. Metal sens	83%
2. Activate	0.00s
3. Reset	1.50s
4. Function	

Figure17 Function setting menu

Parameter	Settings	Factory setting
1.Sensitivity	0-99 %	69%
2.Activate	0.00s-3.00s	0.00S
3.Reset	0.50s-3.00s	1.50S

Table3 Function parameter value table

1) Sensitivity

①The metal detecting Sensitivity Parameter range is 0-99%, the lowest is 0 and the highest is 99%. The percentage is higher, the sensor is more sensitive.

②You can set the 'Sensitivity' parameter according to the actual requirement. The value in the range 40-65% can satisfy most of the users in spinning mills.

2) Activate

'Activate' parameter refers to the additional time by the software from detects the metal is detected to the diverter is actuated. Use the key '+, -' can set the parameter. The setting precision of the activate parameter is 0.01s and the setting range is 0.00s-3.00s. If press '+, -'for 3 seconds

simultaneously, the data would change continuously.

⚠ Warning:

The parameter is closely related to the length of connection pipe and the Transport, so if it was set improperly, that might cause the diverter acts incorrectly.

3) Reset

'Reset' parameter refers to the additional time by the software from the activated position to the normal position of the movable flap. Use '+, -' to set the parameter of 'Reset', the range is 0.50S-3.00S and the setting precision is 0.01s. If press '+, -' simultaneously for 3 seconds, the data would change continuously.

⚠ Warning:

If the parameter is set too low, maybe that material including the metal can not be diverted, but if the parameter is set too high, more contaminated material will be diverted.

4) Function test

When the cursor flashes at '4. Function Test', press the key 'FUN' entering into the testing page, then you can take the simulation test with the fire alarm function and diverter function of the machine.

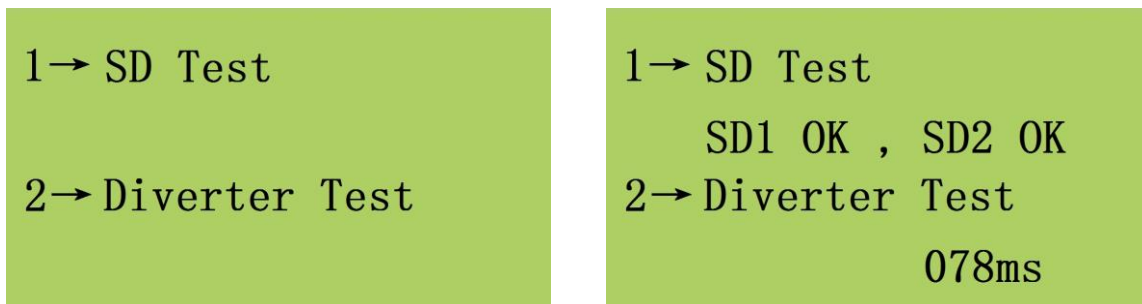


Figure18 Spark testing page

When the cursor flashes in the item of "1 -> SD test", press the key '-', and then the test lamp in the spark detector junction box will light up. If the spark SD1 and SD2 worked normally, the LCD will display "OK".

When the cursor flashes in the second item of "2 -> Diverter test", press '-' key, and the test lamp will be light up in the same way. The system will test the flap activation time. When it's normal, the LCD will display the time between 70 and 150ms.

2.4 History

In the menu setting page, when the cursor flashes at '4. History' item, you can press the key

‘FUN’, then enter into the History inquiring page.

Read the recent records of metal detected and spark alarming.

Date	Time
22-04-09	15:14
Count Alarm:	05
SD: 1	→

Figure19 History inquiry page

1) 120 ms, → 6.4 m/s ", this message tells you how long the diverter took to move from the normal to the activated position and the metal transport velocity just detected is 6.4 m/s . The arrow symbols “← , →” show you which kind of the metal detected(ferrous or non ferrous)

2) 08 / 21 / 2019 09 : 26 records the time of the latest fire alarm , press the key ‘-’ , you can turn to the previous fire alarm history.

3) Press ‘ESC’ return to the main page.

2.5 Communication setting

There is a RS-485 communication interface on the control board.(as shown in figure 7.)

When the cursor flashes in NO.5 “5.com set” item in parameter setting menu, you can enter into to the Communication setting page by press ‘FUN’ .

1. Com. addss	01
2. Baudrate	9600
3. Modbus network	
	(8, N, 2 RTU)

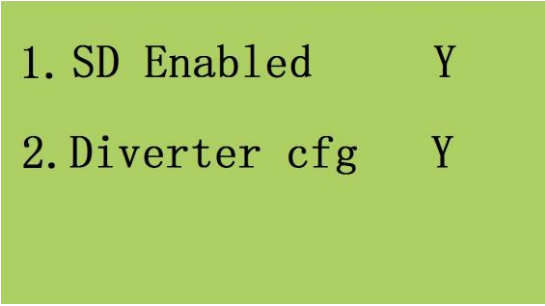
Figure20 Communication setting menu

1) Press ‘+, -’ can select the communication address which can be set from No1 to No.32. The default communication address is 1.

2) RS-485 can be set up to communicate on Modbus networks,the baud rate can be selected between 9600bit/s, 19200bit/s, and 38400bit/s. The initial setting is 9600bit/s. The communication protocol uses Modbus RTU mode, protocol (8, N, 2 , RTU).

2.6 Configuration

In the menu setting page, when the cursor flashes at ‘6. Configuration ’ item, you can press the key ‘FUN+▲’, then enter into the configuration page.



```

1. SD Enabled      Y
2. Diverter cfg   Y

```

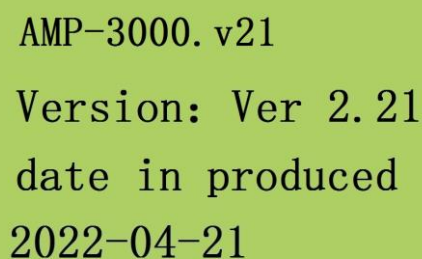
Figure21 : Configuration

Press the key ‘+ , -’ to enable or disable the ‘SD Enabled’ and ‘Diverter cfg’ function. When the ‘SD Enabled’ shows ‘Y’, it means that the function of spark detection is on.

When the ‘Diverter cfg’ show ‘Y’, it means that the function of diverter’s all sensors is on, the diverter is in working order. On the contrary, when the ‘SD Enabled’ show ‘N’, it means that the function of spark detection is off. When the ‘Diverter cfg’ shows ‘N’, it means that the detection function of most of sensors of diverter is off, except the diverter function of diverter’s flap.

2.7 About machine page

When the cursor flashes in NO.7 “7. About Machine” item in parameter setting menu, you can enter into to the About machine page by press “FUN” get the equipment model, production date and version information.



```

AMP-3000. v21
Version: Ver 2.21
date in produced
2022-04-21

```

Figure16. about machine page

3. Communication protocol

3.1 Communication format

11-bit character frame (for RTU)

Start bit	0	1	2	3	4	5	6	7	Stop bit	Stop bit
-----------	---	---	---	---	---	---	---	---	----------	----------

3.2 Communication protocol RTU mode

START	Keep no input signal greater than or equal to 10ms
address	Communication address
Function	Function code
DATA (n-1)	Contents of data :

.....	n×8-bit data n≤40
DATA 0	
CRC CHK Low	CRC check sum 16-bit CRC check code consists of two 8-bit combinations
CRC CHK High	
END	Keep no input signal greater than or equal to 10ms

3.3 Local communication protocol parameters address definition

a) function code 03, 06

Register data read write (function code 03, 06)	0001H	velocity of metal	R
	0002H	Sensitivity parameter	R/W
	0003H	Metal counts	R
	0004H	Delay action time parameter	R/W
	0005H	Reset time parameter	R/W
	0006H	Action time parameter	R
	0007H	Communication address	R/W
	0008H	Baud rate	R/W
	0009H	Hardware version	R
	000AH	Number of faulty spark sensor	R
	000BH	Number of alarm spark sensor	R
	000EH	Total Metal Count	R

b) function code 01

Coil data read (function code 01)	Bit1	--
	Bit2	SD1 Alarm
	Bit3	SD2 Alarm
	Bit4	--
	Bit5	Diverter Flap E5
	Bit6	Pressure low E6
	Bit7	Spark sensor auto test (auto:1)
	Bit8	Chinese/English menu(english:0)
	Bit9	Fire alarm
	Bit10	SD1 is faulty E10
	Bit11	SD2 is faulty E11
	Bit12	--
	Bit13	Function of spark and metal detection (standard:0)
	Bit14	Function of diverter (standard:0)

c) function code 05

Coil data write (function code 05)	Bit1	--
	Bit2	--
	Bit3	--
	Bit4	--
	Bit9	Fire alarm
	Bit12	SD Test

Force coil bit 9 to ON state

Function: Reset fire alarm/ Reset part of the fault alarm content

Force coil bit 12 to ON state

Function: The function of spark detector simulation test

D. Debugging and usage maintenance

1. Fire alarm simulation test

a. You can use the fire alarm testing function brought by the machine itself .See Chapter C Using of the control panel/2.3 Function setting/ 4Spark test.

b. There is an active window on the pipe beside the spark diverter. You can also shine the spark detector through the window by torch. If the controller can carry out normal action, the spark diverter function is good. (The tungsten filament of the torch is a hot body and includes infrared ray) When the fire alarm function is activated, it is necessary to reset manually.

c. Spark sensor can be tested automatically, as shown is figure 16. Auto test time can be set.

Warning:

① **The spark alarm function should be checked regularly with simulation test to assure that they are in the good working status. It is suggested that the test be carried out at least once every two weeks.**

② **The dust and fibres on the surface of lens in spark detectors must be regularly checked and cleaned.**

2. Metal diverting function test and adjustment

In the meantime of metal diverting function test, it is necessary to do the setting of parameters such as sensitivity, activate, reset and so on.

a. 'Sensitivity' setting on the control panel can control the sensitivity of detecting metal

scraps. The higher the sensitivity is, the more sensitive the metal sensor has. You can set the sensitivity according to the actual needs.

b. 'Activate' parameter can adjust the delay time from the metal detector detects the metal to the diverter activated. Thus the parameter is adjusted to minimum 0.00S, and after many times of testing, it is proved to be able to discharge metal scraps correctly. This status indicates that the distance from the metal detector to the diverter is the shortest and it is the most ideal.

c. 'Reset' parameter refers to the delay time of resetting after the action of the diverter. The parameter can directly affect the contaminated material volume. It is best to assure that the metal scraps can be properly discharged but the contaminated material volume is the minimum.

d. While you are carrying out the metal test, please be observant to avoid the metal from entering the blower in the next procedure. You can use spreader tinfoil not less than 1cm², otherwise 3mm or smaller screw washer with obvious identification. Then wrap it with cotton and let it be plucked by bale plucker or directly put it into the transport pipe. When the indicator of the control box lights and the diverter actuated, that indicates that the metal detection function of this machine is normal.

e. If the diverter actuated, but you can't find the test metal in the collector box, you should carefully observe and repeatedly adjust Activate and reset parameter until you can reliably divert the test metal. In the meantime, you should assure the dropped volume is the minimum. After repeat test, if you still can't divert properly, it is necessary to reconsider the install distance from metal detector to diverter.

3. Maintenance and inspections

a. The user should make regular check on the functions of the spark detectors and metal detector to assure they are in good working state.

b. The material diverted in the collector box should be emptied timely, or it may damage the diverter.

c. The diverter should also be checked regularly to make sure in the good state.

d. All wire connection and bolt fastener should be checked regularly.

Warning:

The power supply and the Compressed air supply should be shut off while overhauling the diverter. It can insure the user from unexpected hurt by the movable flap.

4. Debugging

Fault phenomenon	Fault analysis	Checkpoint
The panel does not light up	<ol style="list-style-type: none"> 1. Power supply circuit 2. The motherboard is damaged or the power transformer is damaged 3. The plug on the circuit board is loose 	<ol style="list-style-type: none"> 1. AC220V power input 2. Main board output voltage and transformer output voltage 3. Is the wiring or plug loose on the plug
Metal detector action, with action indication, but the impurity removal mechanism does not operate	<ol style="list-style-type: none"> 1. Low air supply pressure 2. The solenoid valve is damaged 3. The display board is damaged 4. The solenoid valve connection line is broken or the relay is damaged 5. The flip board is stuck, or the cylinder is stuck 	<ol style="list-style-type: none"> 1. The air source pressure shall not be less than 0.6MPa 2. Valve 3. Determine if there is AC220V to the solenoid valve 4. After the air source is disconnected, can the flap move flexibly
The flipping action of the diverter is not in place or slow	<ol style="list-style-type: none"> 1. Flip board stuck 2. Flap deformation 3. Valve and cylinder malfunctions can also cause slow action 4. Low compressed air pressure 	<ol style="list-style-type: none"> 1. Is there any foreign object in the gap around the flip board 2. Whether the flip plate is bent or deformed 3. Electromagnetic valve and cylinder failure 4. The compressed air pressure should not be less than 0.6MPa
Misoperation of metal detection function	<ol style="list-style-type: none"> 1. The power supply is heavily polluted 2. Metal detector vibration 3. Space electromagnetic field interference 4. The motherboard is damaged 5. The metal rod or bracket hanging the detector collides with the detector 6. There is metal trapped inside the detector or metal objects are too close to the probe 7. Sensitivity set too high 8. Loose signal wire connector 9. Damaged metal detector 	<ol style="list-style-type: none"> 1. The power supply should be taken from the incoming line of the distribution cabinet as much as possible 2. The metal detector and non-metallic cotton pipeline must be naturally suspended and cannot be filled with foreign objects to prevent vibration transmission 3. There should be no power line circuit within 2 meters around the metal detector 4. Check if the grounding is reliable
The metal detection is normal, and the actuator operates, but metal objects cannot be ruled out	<ol style="list-style-type: none"> 1. The flap board is stuck or unable to move in place or the flap board movement is slow 2. Incorrect parameter settings 3. There is an issue with the installation distance 	<ol style="list-style-type: none"> 1. Check the trash remover and compressed air 2. Check the delay on and delay off parameters 3. Check the installation distance

spark detector self check alarm	1. Spark detector damaged 2. Spark detector not installed	1. Use a flashlight to simulate the spark detection function and determine the cause of the malfunction 2. Check if all spark detectors inside the control box are installed 3. Identify the faulty detector and replace it
Spark detector false alarm	1. Sparks do occur frequently 2. Light interference detection area 3. Detector damage	1. Determine if there is a real spark false alarm fault 2. Determine whether there is light interference in the detection area, and ensure that the detector operates in a dark environment 3. Replace the spark detector
When the spark alarm occurs, the fan does not stop	1. The relay contact for the spark alarm is not connected to the fan control circuit 2. Circuit board failure	1. Check the interlock control circuit for spark parking 2. Replace the board

◆ E4

Act timeout: The flap did not arrive at the activated position in the set time

- 1) Check whether the components such as the electromagnetic valve, cylinder .etc are working normally; check whether the pressure of compressed air is in the demand range.
- 2) Check whether the flap had been jammed.

◆ E5

Diverter Flap: The flap is not at proper position when it's working.

Check whether the flap had been jammed in the abnormal position.

◆ E10

SD1 error

- 1) SD1 is not installed
- 2) The sensitivity of SD1 is too low.

◆ E11

SD2 error

- 1) SD2 is not installed
- 2) The sensitivity of SD2 is too low.



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