

Meet the Needs of the SMT Age

Please read this user manual in detail before the startup

S-168 Automatic PCBA Brush Cleaning machine



Thank you for using the energy-saving fully automatic PCBA brush cleaning machine!

catalogue

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I. Overview

S-168 series automatic PCBA cleaning machine function automatically complete the PCB board from the board, cleaning, dry cleaning, air drying, out of the board, mainly used for surface mounting components, short foot straight plug components and mixed PCB board cleaning operation.

The PLC programmable controller is the control core, simple and easy to operate, with multiple protection measures, high degree of automation, strong reliability and excellent performance. The cleaning system of this machine adopts advanced technology design, which can achieve high quality cleaning effect.

Main features of this machine:

- The overall organization layout design is reasonable, simple operation, convenient maintenance, can be connected with other related equipment online;
- The whole process of the transportation visualization, can clearly observe the operation of the PCB board inside the machine
- Four-level cleaning are using stepless electronic frequency conversion technology, independent control, suitable for various types of PCB board cleaning;
- Cleaning agent coating using the filtration system with automatic circulation, simple maintenance, long service life;
- The cleaning agent does not contact with the outside world and is not volatile.
- Cleaning cylinder are made of special stainless steel, corrosion prevention, long service life;
- The transportation system adopts the stepless electronic speed regulation system, closed-loop control, stable speed;
- The special structure of the rod can prevent the deformation and pollution of the rod;
- Has the economic operation function, to minimize the volatile amount of cleaning agent;
- With liquid shortage of sound and light alarm and emergency braking system.
- It has two kinds of ordinary and economic operation modes;

Warning: Operators must be trained pre-use and read this manual carefully

2. Main technical parameters

1. Technical parameters of the whole machine

● S -168-200

Technical parameters: (customizable)	
1. Maximum size of PCB board:	200mm (W) x 200mm (L)
2. External dimensions	L 1660*W 710*H 1160±2mm
3. Coated roller size	φ 90*L 200mm
4. Disc brush dimensions	φ 200*H 40mm
5. Spindle rotation speed	0-500 rpm (without variable)
6. Operating voltage:	220V 50HZ
7. Power:	0.9 (KW)
8. Transfer speed:	.050~1.8m / min (variable speed)

● S -168-300

Technical parameters: (customizable)	
1 . Maximum size of the PCB plate:	300mm (W) x 300mm (L)
2. External dimensions	L 1860*W 810*H 1160±2mm
3. Coated roller size	φ 90*L 300mm
4. Disc brush dimensions	φ 300*H 40mm
5. Spindle rotation speed	0-500 rpm (without variable)
6. Operating voltage:	220V 50HZ
7. Power:	0.9 (KW)
8. Transfer speed:	.050~1.8m / min (variable speed)

● S -168-460

Technical parameters: (customizable)	
1. Maximum size of PCB board:	460mm (W) x 460mm (L)
2. External dimensions	L 2180*W 970*H 1160±2mm
3. Coated roller size	φ 90*L 460mm
4. Disc brush dimensions	Φ 460*H 40mm
5. Spindle rotation speed	0-500 rpm (without variable)
6. Operating voltage:	220V 50HZ
7. Power:	1.5 (KW)
8. Transfer speed:	.050~1.8m / min (variable speed)

●structure of equipment:

Including feeding connection mechanism, transportation mechanism, brush cleaning system, circulation filtration system, air drying system, PLC program controller, and other automatic control system. Each system is an independent modular design, simple operation, convenient maintenance.

The whole machine is controlled through PLC, with complete functions, and has automatic and manual operation modes

three. Cleaning process flow and process parameters:

●Cleaning process

Feed one brush washing disc washing secondary brush washing disc washing air drying

●process parameters

Item	Process name	Cleaning medium	Cleaning time	Cleaning method	Cleaning box material	remarks
1	Level 1	abluent	Adjustable	Roller brush	SU S	
2	Second level cleaning	abluent	Adjustable	Roller brush	SU S	
3	Secondary dry	---	Adjustable	Disk brush	SU S	

	washing					
4	Level 3 cleaning	abluent	Adjustable	Roller brush	SU S	
5	Level 4 dry washing	---	Adjustable	Disk brush	SU S	

4. Machine installation and adjustment

1. Working environment and conditions

- 1) The equipment shall be placed in a flat, dry and ventilated workshop; there is no fire source and indirect fire around
- 2) The working environment temperature should be between 5 and 45°C;
- 3) The working environment humidity should be between 20 and 95%;
- 4) Use a two-phase three-wire power supply with 220V (30A) stable voltage (ensure good grounding);
- 5) Use the 0.5~0.8MPa industrial gas source after purification treatment (optional).
- 6) Both ends of the top of the cleaning machine must be strengthened, and the air flow of the suction pipe should be more than 15 cubic meters / minute.

2. Equipment installation

- 1) After opening the box, place the machine and install the entrance connection device (two pieces should be divided into about);
- 2) Adjust to the appropriate position according to the connection between the machine and the front and rear station equipment;
- 3) Raise and adjust the fixed cup at the bottom of the frame to make the frame horizontal;
- 4) Adjust the width of the guide rail. So that the chain claw can hold the PCB board, but not too tight, by hand to push the PCB board should be able to slide freely along the transport direction;
- 5) Access to the power supply (2P, 220V, 30A) and gas source (optional): (adjust the air pressure to 0.4MPa);
- 6) Pour the cleaning agent into the cleaning agent box, add it to the overflow position of the sedimentation tank, and cover the box.

3. Commissioning:

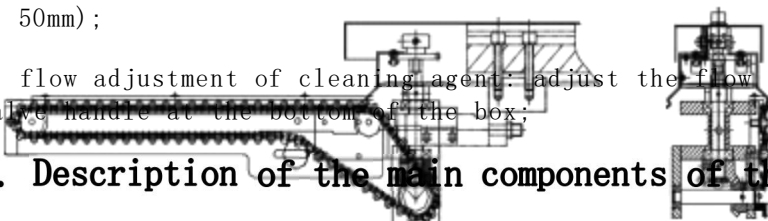
- 1) Adjust the height of the four sets of cleaning brushes: there are eight plum handles before and after the support beam of each group of cleaning tank. By adjusting the height of the handle, the height of the height of the whole cleaning tank can be lifted. The depth of the brush board is generally two-thirds of the PCB board;
- 2) Guide rail width adjustment: manually shake the guide rail widening device at the upper inlet end of the machine, adjust the width of the guide rail to reach the required PCB plate width (note: the minimum width of the guide rail is generally 50mm);
- 3) flow adjustment of cleaning agent: adjust the flow of cleaning agent by cleaning a ball valve handle at the bottom of the box;

5. Description of the main components of the body

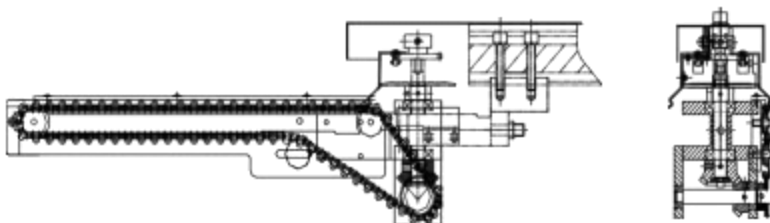
1. Entrance access device

- 1) Function of the inlet connection device

The inlet feeder is located at the inlet plate end of the washer. There are two symmetrical parts. Its main function is to work with the upper station (manual, belt line or connection Barges, etc.) online connection, and PCB into the cleaning machine at a certain rate of direction and speed. The entry board mechanism supporting this machine is the chain drive.2)



This method has the characteristics of high strength, heavy bearing, no skid, good synchronization and no running side.



Chain transmission inlet connection device is mainly composed of transmission chain, fixed angle iron, chain guide rail, active chain sprocket, driven chain sprocket and chain tensioning wheel.

3) Daily maintenance and maintenance

Chain transmission mechanism, although the structure is simple, but whether its operation is stable and smooth, directly related to the performance of the whole machine. So to the access connection device

Daily maintenance and maintenance work should be given the necessary attention.

4) Daily maintenance and maintenance of the chain transmission inlet connection device

A. The teeth occurs when it meet between the sprocket and the chain. This situation is generally due to the chain tension or sprocket and chain wear seriously. As long as the adjustment of the "tension wheel", appropriate increase the tension (but not too tight) or replace the sprocket and chain can be;

b . Drop the sprocket pin shaft every two days

C. The chain guide rail is not parallel. If this situation is serious, it will also cause PCB entry board or card board. Release the pull screw, then carefully adjust the adjusting screw to keep the guide rails parallel.

d. When the chain guide rail and PCB width are not suitable, the stuck plate will be dropped. According to the width of the PCB, loosen the "fixed screw", move the "fixed Angle iron", the two sides cooperate to adjust, so that the width of the guide rail is 0.5~1MM wider than the PCB (determined by the size tolerance of the PCB) is appropriate.

2. Transmission system

1) System action

The transmission system consists of the transmission motor, the chain, and the control part. Its function is to smoothly transport the PCB, to complete a series of welding processes

rule. The control part is composed of the governor, speed measuring parts, PC, etc., to realize the speed adjustment and monitoring function of the transport chain.

3) Replacement of the chain claw

Remove the chain shield from the PCB delivery device part of the transmission and guide rail, start the transmission motor, and transfer the chain claw to be replaced to your convenient operation

When located, turn off the transmission motor.

A. Remove the spring blade with the tip mouth pliers, remove the replaced claw, and replace the new claw;

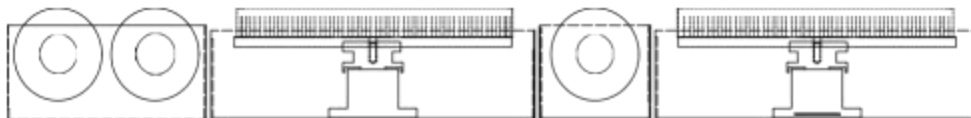
B, install the spring sheet in turn to adjust the transport chain;

C. Install the chain shield

3. Clean the structure and function

.13. Cleaning structure: including four groups of independent cleaning boxes, including two groups of roller brushes and two groups of disc brushes. (See the following picture), the disk brush and roller brush on the PCB board bottom at the same time on the front and back left and right comprehensive cleaning, cleaning without blind area;

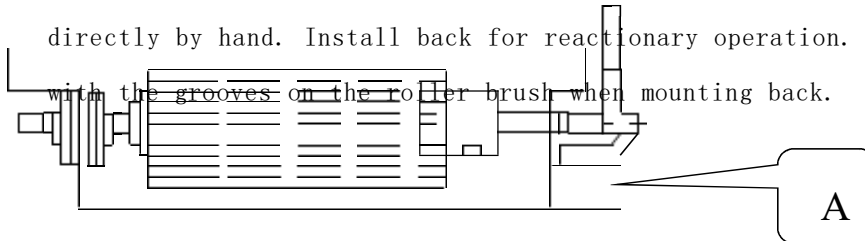
- 1) Level 1, secondary level 1 wool brush wet washing module: including two groups of drum brushes, one set of spray lines, reverse rotation of PCBA, board washing, and return the cleaning fluid to the circulation system.
- 2) Secondary dry cleaning module: including a set of disk brown brushes, rotate clockwise to dry clean the PCB board.
- 3) Three-level wet washing module: including a set of drum brushes, a set of spray lines, reverse rotation to wash the PCBA board, and the cleaning liquid is returned to the circulation system.
- 4) Level 4 dry cleaning module: contains a group of disk brown brushes, and rotates counterclockwise to dry clean the PCB board.



23. Disassembly and assembly of the brush:

●disassembly of drum brush: under the shutdown state, adjust the track width to the maximum, remove the protective plate of the upper part of the cleaning box with a cross screwdriver,

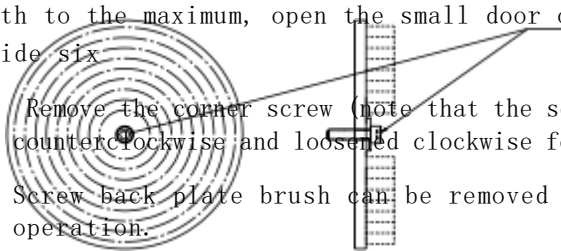
Open the small door on the upper front side of the machine, and pull the handle out of (below) A. The roller brush will automatically fall off, and remove it directly by hand. Install back for reactionary operation. Pay attention to align with the grooves on the roller brush when mounting back.



●disassembly and assembly of the disk brush: under the shutdown state, adjust the track width to the maximum, open the small door on the upper front of the machine, will (below) B inside six

Remove the corner screw (note that the secondary dry cleaning brush is loosened counterclockwise and loosened clockwise for four dry cleaning times)

Screw back plate brush can be removed and cleaned. Install back for reactionary operation.



B

Note: Protective equipment must be brought when removing and assembling the brush to prevent the cleaning agent from causing harm to the human body and eyes!!

3.3 The motor of the wet washing module and the dry cleaning module are independent and can adjust the speed independently. Adjust the height independently. Suitable for a variety of PCB plate cleaning process

4. Air drying mechanism:

●Wind the tail of the machine on the cleaned PCB plate to dry the surface quickly.

5. Circulation and filtration system

Cleaning tank storage tank primary filtration secondary filter tank sedimentation tank circulating pump returned to the cleaning tank for repeated circulation.

Equipped with a fully closed three-level automatic circulation filtration system, uninterrupted filtering after cleaning stains, so that the cleaning liquid is always maintained at a high level

Active state, and the cleaning solution is recycled.

- 1) The cleaning tank is the core part of the cleaning. The rotation of the brush in the washing tank evenly coats the cleaning liquid to the PCB board, passes through the liquid storage tank, and then flows back to the filter recycling box through the pipeline.
- 2) After the reflux liquid enters the first filter, through the first sponge and net plate coarse filtration, enters the bottom adsorption pool, and industrial activated carbon can be added to the pool. Carefully sorb impurities and increase the activity of the cleaning liquid.
- 3) Then the cleaning fluid enters the second filter tank, which is a sedimentation tank, and the solid substances will precipitate in the pool, and the extra cleaning fluid will enter the next liquid storage tank through the overflow port
- 4) The cleaning agent entering the storage tank is pumped back to the cleaning tank through a chemical pump. At the end of the pipe entering the cleaning tank, there is a valve to adjust the flow rate. The flow rate of the cleaning fluid can be controlled by adjusting the flow handle.



6. Water level control device:

- The cleaning tank is equipped with low level alarm and over-limit level alarm function. When the liquid level in the storage tank drops to the low level cordon,

The three-color light will turn on red and send an alarm signal to prompt manual fluid replenishment.

Vi. Operation instructions of the control system:

1. Control panel (as shown below)



2. Start-up and operation:

1. Check before power-on

- 1) Check whether the power supply is the rated two-phase three-wire power supply;
- 2) Check whether the equipment is well grounded;
- 3) Check whether the capacity of the cleaning agent in the liquid storage tank meets the requirements (when static, the cleaning agent surface is normal and parallel to the overflow port);
- 4) Check whether the air pressure is adjusted to the required value (normal is 0.4Mpa) (optional);
- 5) Check whether the emergency zhi (on the front control panel, red button in the upper right corner of the machine) has bounced;
- 6) Check the description of the warnings and precautions in the user manual to confirm that the whole machine adjustment has been completed;
- 7) Check all pipes for leakage.
- 8) Check for foreign matter on the track and chain claws.

2. Power on power on:

- 1) Close the main power switch in the power box and press the power switch "POWER" button on the panel when the power indicator is on.
- 2) Press the automatic / manual Auto / Man to the manual gear.
- 3) Turn the governor to spin and twist to the appropriate position. (First adjust the middle gear) 4) Turn on the transport / Transport switch and the transport starts running.
- 5) Open in turn, (cleaning First cleaning) (cleaning cleaning three cleaning) drum brush starts to move, and the pump begins to work.
- 6) Open in turn, (four-level cleaning Four cleaning) press. The disc brush starts to run,
- 7) At this time, the PCB board can be test run, adjust each gear to the appropriate position.
- 8) After each function is running normally, please use (manual / automatic Auto / Man) mode (automatic mode is economic operation, it is recommended to use this gear to save the amount of cleaning agent)
- 9) Intelligent economic operation mode: when there is no PCB board passing in the machine, the system will automatically judge. At this time, the brush is cleaned and the pump enters the stop state. The cleaning fluid circulation system enters into a fully closed state.

7. Daily maintenance and maintenance

1) Daily maintenance

●**The top ventilation system must be opened before each startup, otherwise the boot is not allowed**

● Pay attention to the machine fluid shortage alarm at any time, found that the three-color light alarm immediately stop to add cleaning agent

● Check the brush cleanliness every day and remove it as appropriate.

●Often pay attention to whether the power supply voltage is normal, too high voltage will cause the motor and water pump overheating and burn out;

● Often pay attention to the bearing and other moving parts are not smooth and stuck, too high load will lead to too high current, causing the insurance pipe circuit break and electricity

The damage of the machine.

●Check whether the wire is aging regularly to prevent electricity leakage. The aging wire should be replaced in time;

●Regularly clean up the tin beads and impurities at the bottom of the deposit cleaning box (clean up when removing the brush);

●The photoelectric switch for counting (located under the inlet end) should be kept clean frequently. Every day after work, soak in a soft cloth with a little alcohol

Wipe the surface of the photoelectric switch lens, so as not to accumulate too much scale, affect the detection;

●Apply grease to the transmission drag chain and guide rail once a month

●More often check the wear degree of the brush, when the brush surface and the PCB board contact surface is reduced, to adjust the brush height in time. Otherwise will

Affect the cleaning effect, when the cleaning brush is worn when it should be replaced in time

●Clean the sediment and impurities at the bottom of the filter box and the cleaning box regularly.

2) Maintenance of the cleaning tank

●Disassembly and assembly of brush press (5.3. 3.2) Step.

● After the brush is removed, unscrew the screws on both sides of the water box at the bottom of the cleaning tank, take out the water box, and then pass the water box

Take out the sundries above the filter screen and install them back as reactionary. It is recommended to clean it up once a week.

3) Maintenance of the filter box

●When shutdown, cut off the power, open the arc door in front of the face,

●Open the top cover of the filter box, remove the impurities on the sponge of the primary filter tank, and replace a new sponge. Remove the filter basket out of the box and prepare a plastic box larger than the filter box. The height should not exceed the height of the barrel at the bottom of the filter box. Place under the filter box below●

Beat three waves, gently stir the cleaning liquid in the filter box with a small spoon, let the bottom of the sediment along with the cleaning liquid flow to the prepared plastic box, put the reaction operation can be. It is recommended to clean it up once a week

4) Notes

● Do not change the flow regulating valve after the cleaning fluid. Non-local operators do not operate the machine, so as not to cause poor cleaning.● When the transmission system is running, do not put the hands or sundries into the chain to affect the normal transportation;

●In case of emergency, immediately press the "emergency Zhi" button to stop the operation to prevent dangerous accidents.

Viii. Problems and countermeasures related to cleaning

Clean the problem	cause	the way to deal with a situation
The cleaning is not clean	Insufficient contact surface with the PCB board	Raise the height of the cleaning tank
	The detergent is not suitable for such PCB plates	Remix the cleaning agent
	PCB board placed for too long, rosin hardening	Gain-up the PCB plates
	The rosin layer is too thick	The transport slows down and the brush is faster
	Clean the hair brush without touching the cleaning agent	Check the pipeline valve and the pumping pump for operation
	The brush reaches the use limit	Replace the new brush
	The brush speed is too slow	Adjust the brush rotation speed
Line board warping	The PCB is too wide or too thin and thick	Use the governing tool to pass the board
	The brush is too high	Adjust the cleaning tank height

9. Typical faults and troubleshooting

Troubleshooting principle: When faulty, please refer to the following method or the electrical schematic diagram!

hitch	The cause of the failure	How to troubleshoot the problems	machine state
The power input light is not on	1. Air switch at main power connection is not on 2. Main power supply failure 3. There is a fault with the lamp	1. Turn on the power supply air switch 2. Rechanging the switch	state of rest
The cleaning machine cannot start after the startup	1. Control box fuse fuse 2. The leakage switch is disconnected	1. Replace the insurance pipe 2. Close the leakage switch	state of rest
Transfer motor is abnormal	1. Overloaded or stuck 2. The insurance pipe of the motor is fused	1. Check the mechanical transmission part of the transmission system 2. Check and replace the corresponding insurance pipe	

Cleaning of the motor is abnormal	<ol style="list-style-type: none"> 1. The motor is overloaded or stuck 2. The governor is set to zero 	<ol style="list-style-type: none"> 1. Check the related parts of the brush 2. Reset the speed governor 	<ol style="list-style-type: none"> 1. Significant noise was noted 2. Motor to stop rotation
Emergency shutdown is not normal	<ol style="list-style-type: none"> 1. The emergency zhi switch did not play up 2. The emergency zhi switch is faulty 	<ol style="list-style-type: none"> 1. Repeat the emergency stop operations 2. Check or replace the emergency zhi switch 	<ol style="list-style-type: none"> 1. Signal lighthouse red light on 2. All drives stop
Inaccurate count	<ol style="list-style-type: none"> 1. The sensing distance of the counting sensor is not required 2. Count the sensor for damage 	<ol style="list-style-type: none"> 1. Adjust the sensing distance of the count sensor. 2. Replace the count sensor 	
Cleaning agent circulation system failure	<ol style="list-style-type: none"> 1. The pumping pump is broken 2. The lightning bolt did not open it 	<ol style="list-style-type: none"> 1. Replace the pump 2. Open the switch switch 	
Cleaning agent odor leakage	<ol style="list-style-type: none"> 1. The air pumping system is not on 	<ol style="list-style-type: none"> 1. Open the external pumping system 	
Air-dried fan turn	<ol style="list-style-type: none"> 1. Fan is bad 2. Switch power failure 	<ol style="list-style-type: none"> 1. Change the fan 2. Replace the switch power supply 	

System communication failure	<p>1. Improper limit setting or mechanical parameter setting in the upper computer system, and the communication exceeds;</p> <p>2. PLC communication line is loose or fall off;</p>	<p>1. Set the parameters again reference to the above parameters; then click reset;</p> <p>2. Check and reconnect;</p>	
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ten. List of vulnerable parts

project	name	Specifications, models	quantity	unit	remarks
1	Chain claw	Double hook claw	250	individual	
2	primary filter	Sponge + SUS filter screen	1	individual	

Xi. Maintenance and maintenance periodic table

order number	project	method of operation	time *
1	scavenger system	Clear the rosin residue on the wool brush	One time per day
2		Replace the cleaning brush	4 Times / year
3		Add detergent	1 visit / 4 h
4		Clean up the debris on the filter screen	1 Time / week
5		Measure the gas concentration inside the machine with a concentration detector	1 visit / 4 h
6		Check the detergent circulation piping and replace the sealing ring	1 visit / three months
7		Check the bearing on the shaft for obvious vibration and noise	1 Time / week
8		Check the pipe for any blockage	1 visit / 4 h
9	filter system	Open the bottom of the box and clean up the sediment	1 Time / week
10		Clean up the impurities in the primary filter tank	1 / 4 hours
11	All sensors	Check all sensors for loose or normal sensing	1 Time / month
12	External exhaust	Before the first start, check whether the unit ventilation system is turned on	1 time / each boot

	system interconnected system		up
13	transmission system	Add lubricating grease to all the bearings	1 Time / month

* This manual gives only the routine maintenance time period, which can be modified by users according to their specific actual situation

XIII. Model and brand of key accessories

Machine model	The FR-7 series
navar	Mitsubishi, Japan

Transport motor, wash plate motor	Tai li
Chain claw	The thickness of the special wash plate is 2.0mm
Internal circulation pump	ShiYuAn
Dry wash hair brush	Imported brown hair (antistatic)
Cover the brush	Alumina (antistatic)
auxiliary relay	Chint
bearing block	T R
bearing	N TN
photoelectric switch	Shanghai feng
U-type speed measuring light eye	OMRO N
Air switch / master switch	Chint
button switch	Chint
Random attachment toolbox / vulnerable parts / instructions / / delivery list	

Xiii. User Notes:

- Please read the user manual carefully before operating the equipment;
- Please maintain and maintain the equipment according to the maintenance instructions in this manual;
- Please do not install this equipment near the electromagnetic interference source;
- Do not change the software and hardware settings in the electric control box of the equipment;
- Please keep this manual for maintenance and maintenance;

warn:

- The equipment can only be operated by professional maintenance and maintenance personnel or qualified personnel
- Before electrification, confirm that the external input power supply is consistent with the rated voltage and current of the equipment
- This equipment contains corrosive liquid and mechanical transmission, and should pay attention to personal safety during operation

● The cleaning agent used in this equipment is flammable, and must be equipped with necessary fire prevention facilities