

Operating & Maintenance Instructions Model 120 Blower / Suction Unit

The Model 120 is a blower/suction unit designed to operate in conjunction with our 150 / 300 / 360 range of fluidised baths. The unit is of rugged construction, compact and easily portable. The machine is available in 110-115V and 220-230V versions - please check the rating label on your machine to ensure compatibility with your electrical supply. All electrical components are contained within the main enclosure and are fully earth bonded and fused as necessary.

Introduction

The 120 is available in two electrical specifications:-

| | |
|----------|---------|
| 220-230V | 50-60Hz |
| 110-115V | 50-60Hz |

Appropriate plug tops are supplied to suit 220-230V electrical supplies. 110-115V machines will need to be fitted with a suitable plug for your electrical supply.

The voltage and frequency requirements for your machine are stated on the rating label affixed to the left hand side of the control enclosure.

| | |
|-----------------------------------|-------------|
| Power consumption (all machines): | 1.0kW (max) |
| Weight (all machines): | 6kg / 13lb |

This machine complies with the European EMC Directive and Low Voltage Directive, as detailed in the Declaration of Conformity in this Manual, and carries a CE Mark.



Specifications

The 120 is fitted with a mains lead appropriate for the supply voltage / market area. Moulded on plugs are supplied where appropriate. The wires in the mains lead are coloured in accordance with the following code:-

| UK / European Machines | | American Machines | |
|------------------------|---------|-------------------|---------|
| Green & Yellow | Earth | Green | Earth |
| Blue | Neutral | White | Neutral |
| Brown | Live | Black | Live |

As the wires in this mains lead may not correspond with the coloured markings identified in your plug appliance, proceed as follows:-

Electrical Supply & Connection

| | |
|--|---|
| <p>UK / European Spec Machines - 220-230V & 110-115V</p> <p>The wire which is coloured green & yellow must be connected to the terminal which is marked with the letter E or by the earth symbol or coloured green and yellow or green.</p> <p>The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.</p> <p>The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.</p> <p>American Spec - 110-115V</p> <p>The wire which is coloured green must be connected to the larger pin which is coloured green.</p> <p>The wire which is coloured white must be connected to the silver coloured pin.</p> <p>The wire which is coloured black must be connected to the brass coloured pin.</p> <p>American Spec - 220-230V</p> <p>The wire which is coloured green must be connected to the larger pin which is coloured green.</p> <p>The wires which are coloured white and black must be connected to the two smaller pins. Polarity of these wires is unimportant.</p> | Electrical Supply & Connection (cont...) |
| <p>Ensure the mains switch is off (Symbol I = On, Symbol 0 = Off), plug in, set the control knob to zero and switch on. The clear neon should glow and the blower should be just audible, but producing very little air flow. Rotation of the control knob clockwise will increase power smoothly up to the maximum, positive pressure being produced out of the side entry and vacuum at the rear inlet pipe stub. When used in conjunction with applications other than a Fluidised Bath, it is important to ensure that air flow takes place through the unit to provide motor cooling. Intermittent use only is permissible if used to pressurise or evacuate a fixed or 'dead end' volume.</p> | Machine Operation |
| <p>In the event of non-operation of the blower unit check the fuse in the plug and the resettable circuit breaker on the control panel. When the circuit breaker trips the amber section will pop out, giving the impression of illumination. To reset simply push back in. Should the machine be fitted with a plug other than the original moulded-on unit check terminals for security. If these checks do not reveal any faults, a competent electrician should be consulted. With the exception of obvious faults such as open circuits and poor connections, the component most prone to failure is the power regulator. A failed power regulator may produce full power at all times with no regulation or no motor response at all. Access is gained by removing the control panel. The power regulator is a solid state device with 3 tails identified numerically and terminated in a terminal block. Check security of the terminal block connections, but if these are in order it can be assumed that the regulator is at fault and it must be replaced. This is a simple operation. All other major components mounted behind the control panel are generally very reliable and are unlikely to fail in general use. If motor failure is suspected, apply mains voltage (or 110-120V if low voltage unit) directly to the motor leads and this will establish the serviceability, or otherwise, of the motor unit.</p> | Fault Diagnosis |

With the control panel removed, adjustment of the low speed running is possible by adjusting a small pre-set, mounted by solder connections, to the control knob potentiometer at the rear of the facia panel. The unit is tested and set during assembly so that, with the control knob set at zero, the motor is just audible. Variations in local supply conditions and possible rough handling during transit may, on occasion, necessitate resetting of the pre-set by the customer.

In the event of any difficulty in respect of spares or more elusive faults please refer back to the manufacturer.

Low Speed Running Adjustment

To use the Model 120 Blower Suction Unit with the Model 300 Fluidised Bath, connect the outlet of the Blower Unit (side pipe stub) to the inlet of the Fluidised Bath using one of the hoses supplied with both units. No clips are necessary as the hoses are a gentle push fit and will not become detached during normal use. Fill the Fluidised Bath with suitable plastic powder allowing a minimum of 150mm (6") clear at the top for the powder to rise when the blower is operating. Set blower control to zero, plug in and switch on. Gradually increase blower speed until the powder is seen to rise and adjust so that sufficient air is passing to keep powder fluid but not blowing out of the top of the tank. When the blower is operating, the tank lid should be removed but replaced immediately after use to keep the contents clean. When changing the type or colour of powder, it is important that all traces of previous powder are removed using a vacuum cleaner, paying particular attention to the porous membrane in the bottom of the bath. Always ensure that the protective mesh is fitted in the bottom of the bath. This protects the porous membrane from damage should a hot item be dropped into the tank while dip coating.

The 150R connects to the 120 in the same way as the 300. Leave the flow regulator on the 150R in the open (fully anticlockwise) position and use the speed control of the 120 to control fluidisation.

Operation with 300 / 150R Fluidised Baths

Introduced to enable use of nylon and similar expensive powders without the prohibitive cost which would be involved if filling a 50 litre (M300) tank. The other option is to use the smaller tank for an alternative colour of Low Density Polyethylene which can be purchased in smaller quantities than that required for the 50 litre tank. Having a capacity of only 5 litres the unit operates on the same principles and will fluidise any of the powders in general use.

Mounting of the tank is straight forward by following the instructions on the legend plates adjacent to the cam clamping handles. The Model 150 Fluidised Bath must be used in conjunction with an existing Model 300, or alternatively a separate plenum box can be purchased to allow independent operation. Do not overtighten the cam clamp handles, light pressure is all that is required to create the necessary air seal. In operation, always switch on the blower unit with the speed control knob set to zero, the amount of flow required to operate the Model 150 is considerably less than a Model 300 and in operation the lower tank will become slightly pressurised before fluidisation of the upper tank takes place. There is no need to remove powder from the main tank prior to using the Model 150. Always ensure that the protective mesh is fitted in the bottom of the bath. This protects the porous membrane from damage should a hot item be dropped into the tank while dip coating.

Operation with 150 Fluidised Bath

To use the Model 120 Blower Suction Unit with the Model 360 Fluidised Bath, place the 120 on the shelf provided on the right hand side of the bath. Connect the outlet of the Blower Unit (side pipe stub) to the inlet of the Fluidised Bath using the 1m (39") length of flexible hose supplied with the bath. No clips are necessary as the hoses are a gentle push fit and will not become detached during normal use. Fill the Fluidised Bath with suitable plastic powder allowing a minimum of 150mm (6") clear at the top for the powder to rise when the blower is operating. Set blower control to zero, plug in and switch on. Gradually increase blower speed until the powder is seen to rise and adjust so that sufficient air is passing to keep powder fluid but not blowing out of the top of the tank. When the blower is operating, the tank lid should be removed but replaced immediately after use to keep the contents clean. When changing the type or colour of powder, it is important that all traces of previous powder are removed using a vacuum cleaner, paying particular attention to the porous membrane in the bottom of the bath. Always ensure that the protective mesh is fitted in the bottom of the bath. This protects the porous membrane from damage should a hot item be dropped into the tank while dip coating.

Always keep powders dry and free from contamination. Damp powder (most thermoplastics are hygroscopic) will cause the grains to cling together and result in poor fluidisation. Contamination by different colours or powder types will produce a "speckled" effect on the finished component. This effect can, sometimes, be quite attractive even if achieved by accident. As the powder becomes fluid it will rise and occupy approximately 10-20% more volume, tanks should not, therefore, be completely filled. The following data on two of the common powders in general use may be helpful:-

| | Polyethylene (LD) | Nylon |
|------------------------------|-------------------|-------------|
| Density (Static) | .40Kg/Litre | .55Kg/Litre |
| Density (Fluidised) | .325Kg/Litre | .49Kg/Litre |
| Max. working temperature | 60°C | 100°C |
| Coating temperature | 300-400°C | 280-350°C |
| Post Heat Temp.(if required) | 170°C | 165°C |
| Coating thickness | 0.30 - 0.90mm | 0.20-0.75mm |

Typical weight of powder for a 200 litre tank (360) = (Vol - 20%) x Density (static)
 = (200 x 0.80) x 0.4 (LD Polyethylene)
 = 64kg

Typical weight of powder for a 50 litre tank (300) = (Vol - 20%) x Density (static)
 = (50 x 0.80) x 0.4 (LD Polyethylene)
 = 16kg

Typical weight of powder for a 5 litre tank (150 / 150R) = (Vol - 20%) x Density (static)
 = (5 x 0.80) x 0.4 (LD Polyethylene)
 = 1.6kg

Workpiece temperatures for plastic coating are critical to within + or - 20°C for the easier materials, but for good results using the more difficult powders, temperature control may become critical to within + or - 5°C. Whilst satisfactory results can be obtained using hot plates, high temperature gas fired ovens and blow torches, consistent and reliable results can only be guaranteed using a temperature controlled oven capable of attaining 400°C. Whilst it is accepted that the majority of coating plastics fuse at temperatures well below this figure, allowance must be made for heat losses in transfer from oven to the fluidised bath and absorption of work heat by the coating powder upon contact and also further loss of workpiece heat during the flow period of up to 60-90 seconds after coating.

Exact temperature required will be dependent upon the mass of the metal component to be coated. Thin sheet metal will lose temperature quickly, but a substantial component made from 1/2 " diameter bar will hold sufficient heat for the complete process if heated to just 20-30°C above plastic melting point. Exact temperatures at which the oven should be set for each component must be established by trial and error and often a balance obtained between the two. The following temperatures are quoted for guidance:-

| | |
|-------------------|-------|
| 16SWG Wire Mesh | 400°C |
| 22SWG Sheet | 380°C |
| 18SWG Sheet | 350°C |
| 10mm diameter Bar | 300°C |

Where a single component comprises two or three different gauges of material, it will be difficult to find a common temperature at which complete flow will occur. The thinner sections will have an "orange peel" effect and the heavier sections may be overheated and discoloured. The solution is to pick up powder at the highest temperature possible without discolouration and then "post heat" to create flow at a setting equal to the flow temperature of the material. (LDPP and Nylon about 165 - 170°C).

| | | |
|--------------------|-------------------------------|--------------------------------|
| Voltage | 220-240 | 110-120 |
| Current (running) | 4.5A | 8A |
| Hz | 50-60 | 50-60 |
| Circuit Protection | 5A Resettable Circuit Breaker | 10A Resettable Circuit Breaker |
| Vacuum (Max) | 127mm Hg (5in.Hg) | 127mm Hg (5in.Hg) |
| Pressure (Max) | 0.16 bar (2.5lb/in.sq) | 0.16 bar (2.5lb/in.sq) |
| Weight | 7kg | 7kg |