

Operating & Maintenance Instructions

V30 Vacuum Forming Machine

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1. Introduction

The V30 will produce high definition vacuum formings on a smaller scale as required by model makers and students.

The machine is fitted with quartz heating elements, which provide almost instant heat. This eliminates the inconvenient warm-up period of other heater types, and also allows the heaters to switch to a lower powered "Park" setting when not heating material. This reduces energy consumption and casing temperatures.

The top plate of the machine is removable, allowing different sheet sizes to be formed without the inefficient seal arrangements associated with normal reducing plates.

When forming on other machines visibility of the sheet is restricted while it is being heated. This has been overcome on the V range with windows that allow the sheet to be viewed from below. This assists the teaching of plastic behaviour at the various stages of the heating cycle and also assists the user to always form at the correct time, reducing material wastage.



2. Health & Safety Information

The V30 Vacuum Former is built to comply with current European legislation. The following points should be observed for safe operation of the machine:

- Some working surfaces may become hot in use. Always wear protective gloves
- This machine has been designed to vacuum form un-reinforced thermoplastic sheet up to 6mm (0.25") in thickness. It should not be used for any other purpose.
- There is a pressure outlet fitted to the right hand side of the machine, which provides a 4 bar (60psi) compressed air supply with a free air-flow of 2cfm. The outlet is fitted with a push-in connector for 8mm (5/16") diameter pipe. Any device attached to this outlet must be checked for compatibility.
- Do not cover or place items on the heater hood or canopy while the machine is switched on.
- Do not leave the machine unattended while in use.

3. Specifications

Mechanical specification

Maximum material thickness	6mm (0.25")
Sheet Size (maximum)	305 x 305mm (12 x 12")
Aperture Size (maximum)	280 x 280mm (11 x 11")
Maximum Mould Height	115mm (4.5")

Weights and Dimensions

Width x Depth x Height (mm)	520 x 860 x 480
Width x Depth x Height (in)	21 x 34 x 19
Weight	40kg (88lb)

Electrical specification

Voltage	220-240
Frequency	50-60Hz
Current - max	8.0A

Noise Emissions

Noise Level	<80dB
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4. Positioning & Location

Two people can lift the V30. Locate the machine on a workbench at a suitable height. Ensure that there is a minimum 125mm (5") air gap all around the machine.

5. Electrical Supply & Connection

The electrical specification of your new machine is as follows: -

Voltage	240V AC 50Hz (standard)
Current (max)	8.0A
Watts (max)	2300W

Electrical supply to the machine must be in accordance with the details shown on the rating label. As the colours of the wires in this mains lead may not correspond with the coloured markings identified in your plug appliance, proceed as follows if the plug needs to be changed: -

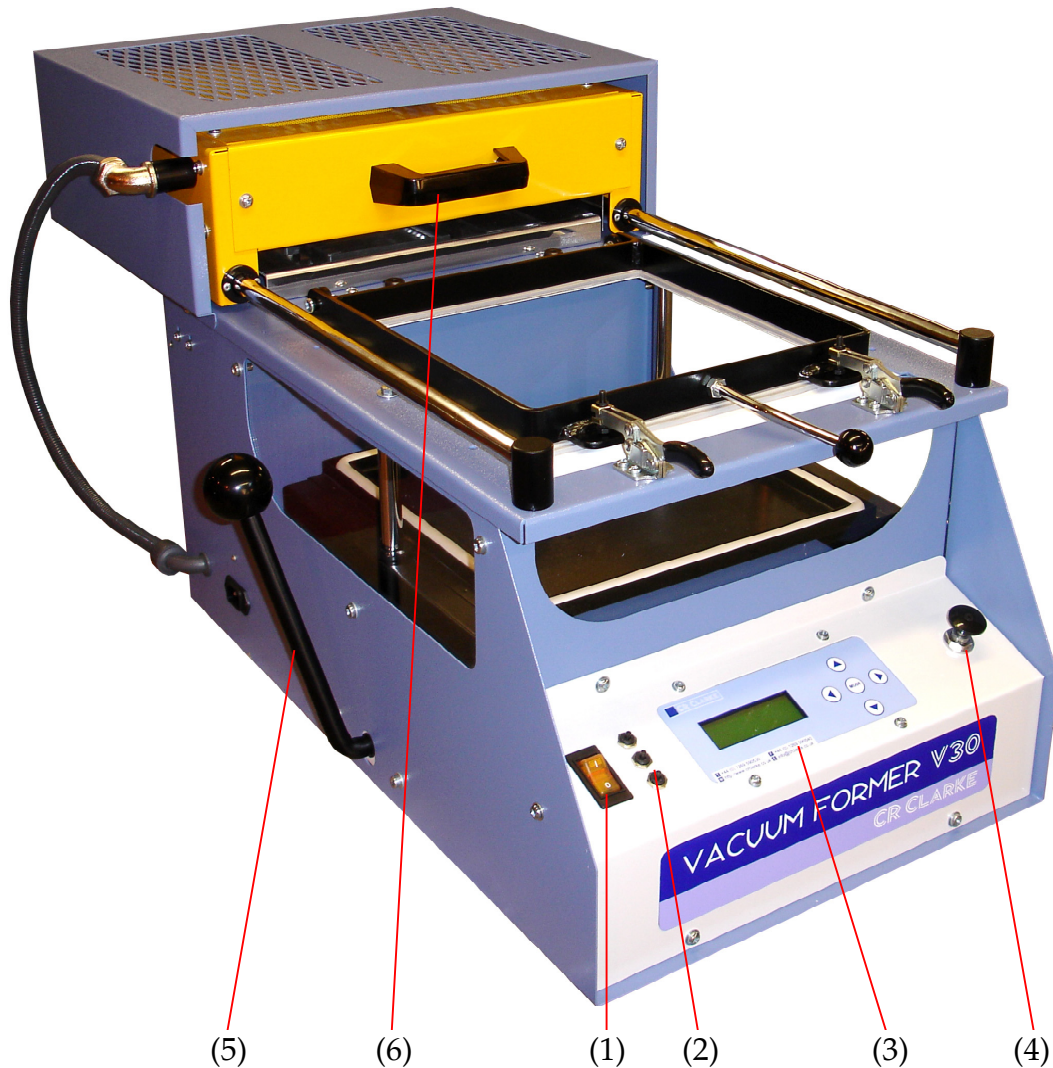
The wire that is coloured green and yellow must be connected to the terminal that is marked with the letter E or by the earth symbol or coloured green and yellow or green.

The wire that is coloured blue must be connected to the terminal that is marked with the letter N or coloured blue or black.

The wire that is coloured brown must be connected to the terminal that is marked with the letter L or coloured brown or red.

Should there be any queries regarding the electrical requirements of the V30 please refer back to the manufacturer or their nominated distributor.

6. Machine Controls



1. Mains No Volt Release switch (marked with I and O). Press I to switch the machine on. Press O to switch the machine off. N.B. if the power supply fails this switch will automatically move to the O (Off) position.
2. Circuit Protection. Three circuit breakers protecting the circuits for the heaters, vacuum pump and control circuits. In the event of an overload the breakers will pop out. Push in to reset.
3. PLC Control and display. See the following section for detailed operation instructions.
4. Vacuum / Blow switch. Default position gives vacuum at the platen. Pressing the switch gives blow at the platen.
5. Platen Handle. Pull forwards and down to raise the platen. The platen clicks into place at the top of its stroke. Push up and back to lower the platen.
6. Heater Hood handle. Pull and push to move the heater system back and forth.

7. Control Operation

The V30 is fitted with a PLC to control the machine functions and give the operator visual feedback.

The control consists of a set of cursor buttons, and a central MODE button. The operator receives feedback from the machine via the LCD display.

When the machine is switched on, the display shows the following parameters:

Power Setting-Outer Zone

Power Setting-Inner Zone

Timer Setting

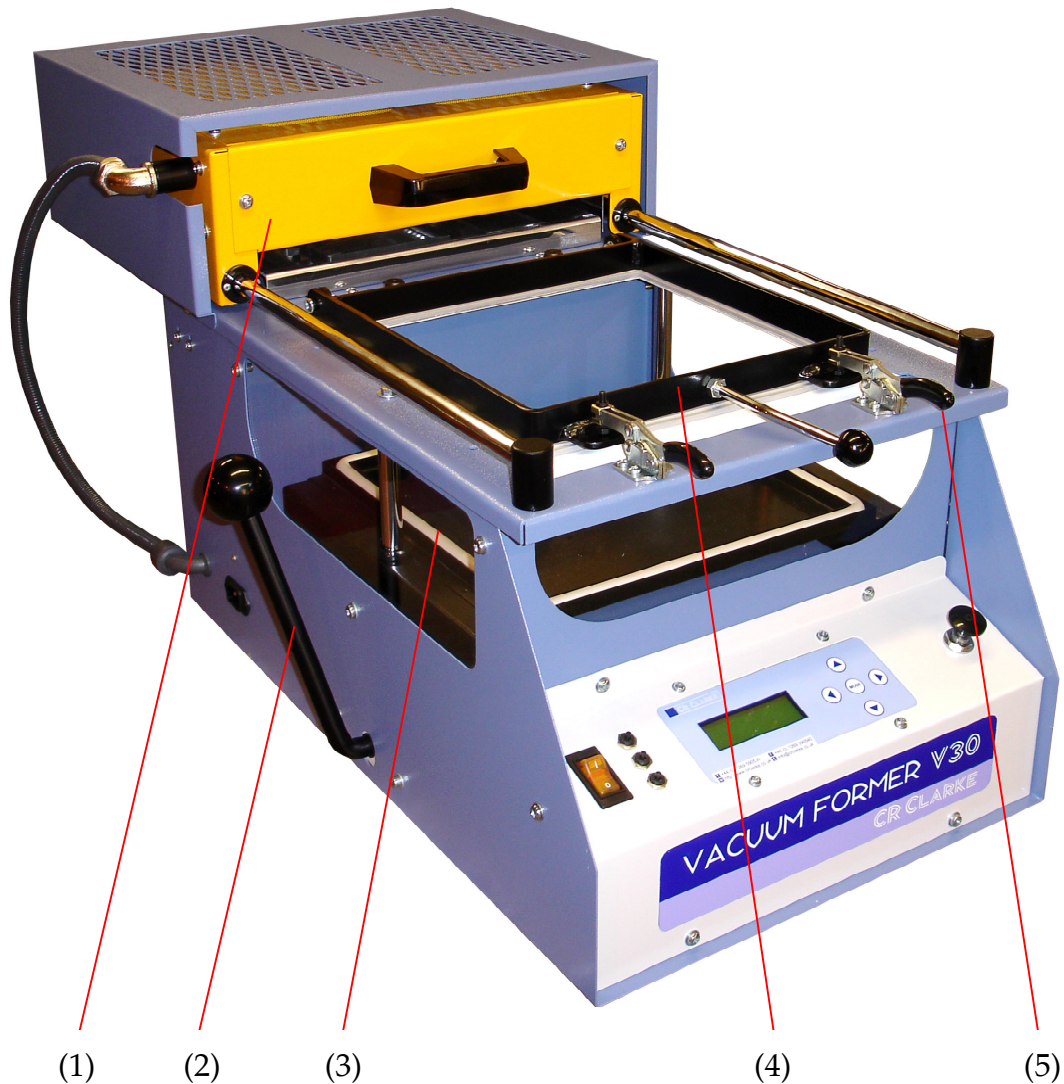
Part Counter

A selection cursor (> <) shows the currently active parameter. To adjust a setting, use the Up and Down cursor buttons to select the desired parameter. Press the MODE button, and the editing cursor (flashing * *) appears. Use the Up and Down buttons to adjust the parameter to the desired setting. When the adjustment has been completed, press MODE to return to the selection cursor.

When the MODE button is pressed on the Part Counter line, the Part Counter is reset to 0.

Heater power settings are adjustable from 0 to 100%, and are only active when the hood is pulled forward and the timer is counting down. At all other times, the hood is operated between 0 and 25% power. To adjust the rest power setting, select the desired heater zone using the selection cursor. Press and hold the MODE button for 10 seconds. The display changes to Dwell Power, and again the Up and Down buttons can be used to adjust the setting. Pressing the MODE button exits this screen and returns the user to selection mode.

7. To Produce a Forming



- Select a suitable mould and load it onto the machine platen (3). The mould should be fitted with a baseboard of 6-10mm (0.25 – 0.375”) in thickness, and the full size of the platen. Please refer to our Introduction to Thermoforming datasheets should you require more information about mould making techniques.
- Switch on the machine at the Mains No Volt Release switch.
- Set the Heater Powers and Timer appropriately for the material being formed.
- Raise the clamp frame (4) and load a suitable piece of thermoplastic material onto the machine. Note that the material should completely cover the grey seal on the top of the machine.
- Lower the clamp frame (4) and lock with the toggle clamps (5). The clamps should lock firmly. Should the clamps need adjustment for different material thicknesses

this can be done by slackening the nuts on the clamp screw, adjusting the screw up or down and re-tightening.

- Pull the heater hood forward (1). The heaters will begin to heat the material within a few seconds. The timer on the display will begin to count down.
- Observe the material being heated through the viewing windows. It goes through three distinct stages¹:
 - Rigid but expanding. As the material is heated it expands. However it is constrained by the clamp frame around its edges. Therefore it tends to buckle slightly.
 - Elastic range. When the material softens it initially goes elastic. In this condition its behaviour is similar to an elastic band. The sheet stretches tightly at this stage. The transition from rigid to elastic can take a few seconds and can often be seen spreading across the sheet.
 - Plastic range. As heating continues, the material becomes plastic. It is now like dough, with no elasticity. The material begins to fall under its own weight. Once the material has dropped around 20mm (0.75") in its centre, it is ready to form.
- When the set time has elapsed, the heaters will switch back to their rest power setting, and the display will ask you to retract the hood (should you need to heat the sheet further, push the hood all the way back, and then forward again. This action will restart the timer.)
- Once the hood has been retracted, the display will ask you to raise the platen (2) (if this is not done within 5 seconds, the control assumes that you do not wish to raise the platen and reverts to selection mode). When the platen is raised, the vacuum pump is switched on automatically.
- When the platen clicks into position at the top of its stroke, the seals are made and the material will be vacuumed over the mould.
- Allow the material to cool for 10 seconds or so.
- Press the blow control to release the material from the mould. Alternate this cycle until the forming has cooled.
- On the final cycle, lower the platen as the forming releases.
- Lower the platen. When the platen reaches its lower position, the vacuum pump will automatically switch off.

Should you wish to run the vacuum pump for any other reason (maybe to use the pressure outlet for an accessory), the right cursor button will switch it on, and the left cursor button will switch it off.

¹ This information is based on polystyrene material, but is applicable to most thermoplastics. For a fuller description of materials and properties please refer to our Introduction to Thermoforming datasheets, which are available upon request.

8. Fitting Reducing Plates

The V30 has been designed so that the sheet size can be easily changed without the compromise of a conventional reducing plate. To change the sheet size, proceed as follows:

1. The top plate is secured by a single screw, which can be removed using a 4mm hexagon key. The screw is located on the rear flange of the top plate, and can be accessed through the aperture where the material is loaded.
2. Slide the top plate forward around 12mm, until the notches in the casing align with the securing lugs of the top plate. Lift the top plate out.
3. Place the required top frame onto the machine.
4. Refit the front securing screw.

Using this system, different sheet sizes can be easily accommodated. These can be ordered as required.

9. Maintenance

The V30 requires little in the way of routine maintenance.

Always ensure that the machine is stored with the platen lowered and the clamp frame rested on top of the toggle clamps. This maximizes seal life.

Apply some silicone oil to the heater and platen slide bars periodically.

Seals may need to be changed periodically and can be ordered from the manufacturer or distributor.

The platen seal compression can be adjusted using the external adjusters.

For replacement, the platen seal simply lifts out.

The upper seal must be secured in place with primer and adhesive – full instructions for this procedure are supplied with each seal.

Should there be any queries relating to the maintenance of your V30 Vacuum Forming Machine, please do not hesitate to contact our Technical Department or local distributor.