PER-CAST
VACUUM CASTING MACHINE

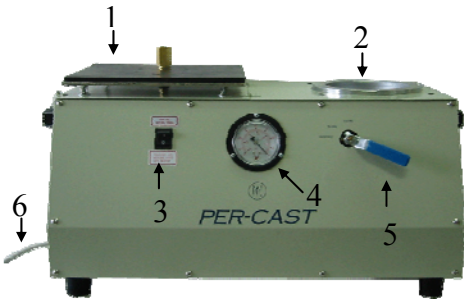
No.0132　120V
No.0133　240V

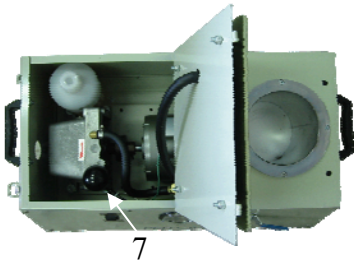
Feature *：This vacuum investment machine can also be used as a vacuum casting machine.*

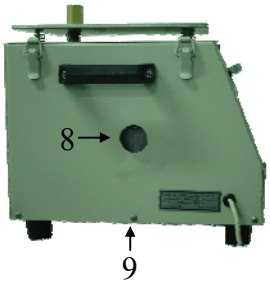
Specifications：

	0132	**0133**
Voltage	120V	240V
Amperage	6A	3A
Cycle	60Hz	50Hz
Speed	1720 rpm	1420 rpm
Horse power	¼ HP	
Phase	Single	
Dimension (Bell jar not included)	26⅜"×14 3/16"×13¾" (67×36×35cm)	
Investment table	10⅜"×10⅜" (27×27cm)	
Vacuum chamber	Φ5 5/16"×7¼" (13.5×18.5cm)	
Vacuum pump	65 liter / min	
Net weight	89.1Lbs(40.5kgs)	
Shipping weight	93.5Lbs(42.5kgs)	

Parts name

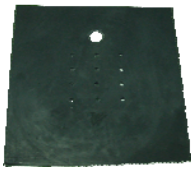
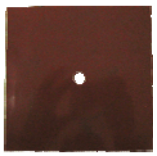






1	Investment table	4	Vacuum pump gauge	7	Oil filler cap
2	Vacuum chamber	5	Control handle	8	Sight glass
3	ON/OFF switch	6	Power line cord	9	Oil drain plug

Accessories：

A-1  No.0490 9"Bell jar：1pc.	A-2  No.0130-038 Investment table rubber pad：1pc.	A-3  No.0130-039 Silicone rubber pad：1pc.	A-4  No.0130-042 Vacuum pump oil：600cc
A-5  No.0160 15"Perforated flask tong：1pc.	A-6  No.0155-002 Handle for crucible：1pc.	A-7  No.0155-001 Crucible：1pc.	A-8  No.0225 3⅜"×4" Perforated flask：1pc.
A-9  No.0264 3⅜"Tree sprue base：1pc.	A-10  No.0225-001 3⅜"Flask sleeve：1pc.	A-11  No.3303 4"Adapter ring：1pc.	A-12  No.3304 3⅜"Adapter ring：1pc.
A-13  No.3302 ½"Adapter ring：1pc.	A-14  No.3501 5"Silicone seal：1pc.	A-15  No.3503 4"Silicone seal：1pc.	A-16  No.3504 3⅜"Silicone seal：1pc.

SET-UP INSTRUCTION

1. Read instructions for Set-Up and Operation before beginning.

2. Remove unit and accessories from shipping carton and check packing list.
   NOTE：Bell Jar (A-1) is shipped separately and Vacuum pump oil (A-4) is packed inside cabinet of machine.

3. Open cabinet by releasing two claspers on top left of cabinet and raising hinged panel. This allows access to remove Vacuum pump oil bottle and to the Oil filler cap (7). Remove Oil filler cap and fill pump with oil until oil appears in center of pump Sight glass (8). Replace Oil filler cap.

4. Lower hinged panel and replace claspers.

5. Place Investment table rubber pad (A-2) on top of investment table (1) which is a top hinged panel.

6. Place Bell jar on Investment table rubber pad.
   CAUTION：*Do not pressure on the dome of the Bell jar, because extra pressure at this point can cause an implosion.*
   TIP：*Be sure to keep Investment table rubber pad clean. Moistening rubber with water helps complete vacuum seal. Press gently around the edge to assure good seal.*

7. ON/OFF Switch (3) should be in〝OFF〞position.

8. Plug power line cord (6) into a 120V outlet. NOTE：If unit is 240V, it will be shipped without a plug because of variations in 240V outlets.

9. Place control handle (5) in〝RELEASE〞position and then turn Switch (3) to〝ON〞position；motor and pump will operate.

10. Turn control handle (5) to〝INVESTMENT〞position. Vacuum pump gauge (4) needle should advance to 29 inches Hg at sea level.
    NOTE：It may be necessary to apply hand measure to lip of Bell jar to get good seal.

11. Turn control handle to〝RELEASE〞position. After vacuum pump gauge (4) needle retreats to about 16 inches Hg, turn Switch (3) off.
    NOTE：*Always〝RELEASE〞vacuum before turning off pump, otherwise, oil can be sucked onto the investment table from the pump.*

12. Remove Bell jar. NOTE：Bell jar (A-1) must be removed when using casting side.

13. Seal Vacuum Chamber (2). Turn control handle to〝CASTING〞position. Turn Switch (3) to〝ON〞position and observe vacuum gauge again. Needle should rise to 29"Hg.

14. Turn Control handle to〝RELEASE〞and then turn unit off.

15. If both sides of unit performed as described above, your PER-CAST is ready to go to work.

OPERATION

INVESTING

1.Follow manufacturer's instructions exactly as to proportion of water and powder.
Add powder to water (never water to powder) and mix with spatula for 3 minutes or more.

2.Place under vacuum jar and vacuum until all air is released from the slurry.
This should not require more than 1-2 minutes. Release vacuum and turn pump off.
WARNING：*Never turn pump off unless control handle is in the "RELEASE" position.*

3.Pour slurry slowly down the side of flask (not over patterns) until patterns are covered by 3/8" or more of slurry.

4.Place the Flask under the Bell jar and repeat step 2 to be certain air has not been trapped during the pouring operation. This will require no more than 2 minutes.

5. "Top off" the Flask with remaining investment until level with lip of Flask.
Do not remove flask from table until 15 minutes has elapsed from step 1.

6.Carefully set the flask or flasks aside for at least 2 hours before "burnout" procedure is started.
NOTE：*The set-up time on most investments in usually 9 -10 minutes. Before beginning, know the set-up time in the investment process；otherwise water rise or premature set-up might occur.*

CASTING PROCESS

The casting process is a simple operation. After burnout, proceed as follows：

1.Melt the metal in the Crucible (A-7) provided.

2.Using Flask tongs (A-5) provided, place the heated flask in the Vacuum chamber (2). For casting chamber to be properly sealed and vacuumed, place Silicone seal (A-14), Adapter Ring (A-11,A-12 or A-13)and Silicone seal (A-15 or A-16) on top of chamber in order and then put .

3.Flask into Vacuum chamber(2).

HELPFUL HINTS ON CASTING

1.Pre-weigh metal.

2.Line crucible with borax by making a paste of alcohol and granular borax and heat with a torch until a glaze appears in the crucible. This will prolong the life of the crucible and very little if any flux will be required when using clean metal.

3.Preheat crucible and metal before removing flask from furnace to cast.

4.With the tongs, place flask on silicone pad；turn vacuum pump on with control handle in "CASTING" position. Check the flask to see if it is seated firmly and vacuum is being pulled.

5.Flood pour (dump) the melted metal as rapidly as possible. One of the great advantages of vacuum-assist casting is that it eliminates turbulence from the casting process.

CARE OF PUMP

1.The oil level should be constant at all times. Check the sight glass from time to time and maintain proper oil levels. Use only vacuum pump oil in pump.

2.Oil is easily drained from the drain plug (9)；change oil after every 50 casts.

3.Always be sure control handle is in "RELEASE" position before turning the pump off.

4.Check filter trap (glass jar inside cabinet) periodically to make sure investment has not been building up. If so, remove filter material, wash out with water and replace.

5.A simple test to check performance of the pump is to fill a water glass ½ full, place under bell jar and start pump. Water should bubble violently within 60 seconds.
NOTE：*Water must come from the faucet and be between 75-80º F*

Troubleshooting

Problems	Possible Causes	Remedy
Power on, But motor not run	· UN-plug · Damaged power switch · Damaged motor · Damaged bearing · Shaft of pump stuck	· Plug in socket · Fix or change power switch · Fix or replace motor · Replace bearing · Fix or replace pump
On〝INVESTMENT〞position, But vacuum gauge not run	· Power off · Loose connection in motor and pump · Loose connection in three way valve and three way assembly · Damaged motor · Damaged pump · Damaged three way valve	· Turn Power on · Adjust or replace new belt · Connect it · Fix or replace motor · Fix or replace pump · Replace three way valve
On〝INVESTMENT〞position, but vacuum gauge under 29inch/Hg	· Leaking in between vacuum pump and three way valve · Leaking in between three way valve and three way assembly · Leaking in bell jar · Damaged three way valve	· Tighten the clamp or replace new hose · Tighten the clamp or replace new hose · Clean the rubber pad and platen or slightly damp the bottom of bell jar · Replace three way valve
Loud noise when vacuum	· Leaking hoses · Pump runs noisy	· Tighten or replace hoses · Fix or replace pump
On〝CASTING〞position, but vacuum gauge under 29inch/Hg	· Leaking in between vacuum pump and casting tank · Damaged vacuum pump · Damaged vacuum gauge	· Tighten the clamp or replace hose · Fix or replace vacuum pump · Replace vacuum gauge