



HIGH HEAT OIL TYPE MOLD TEMPERATURE CONTROLLER

Model HH16

Item #121008 / Item #121009

INSTRUCTION MANUAL



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INSERTS

Pump Manual	Insert
Warranty Information	Insert

SAFETY SUMMARY

This manual uses the following signal words to call attention to the safety sign and to designate a degree or level of hazard seriousness.

1. **DANGER:** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.
2. **WARNING:** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
3. **CAUTION:** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Also used to alert against unsafe practices or property-damage-only accidents.
4. **NOTE:** indicates general safe practices, machine use instructions and information, property damage only hazards, temporary hazards, precaution to avoid a hazard, results of not avoiding a hazard, or any combination of these messages.
5. **SYMBOL/PICTORIAL:** conveys a message without words.
6. **SAFETY ALERT SYMBOL:** indicates a potential personal injury hazard; an exclamation point inside a triangle.

SAFETY SUMMARY (continued)

The following are examples and type of general alerts that could apply to this machine:

DANGER

LIVE ELECTRICAL PARTS could cause DEATH or SHOCK.

LOCK OUT AND TAG OUT power before working on any electrical wiring.

Only QUALIFIED ELECTRICIANS are to do electrical work.

WARNING

HOT PARTS and HOT WATER could BURN YOU.

Avoid contact.

Let system cool and vent pressure before you loosen water fittings.

Inspect hoses and connections often. Repair leaks immediately.

WARNING

WATER and HOT OIL could EXPLODE.

Do not use any water in fluid circuit with hot oil.

Be sure fluid circuit is water-free before heating above 200°F.



DESCRIPTION

Overall

The Model HH16 oil circulator controls mold temperature in the 250°-550°F range by circulating heat transfer fluid (oil) through channels in the mold. For temperatures below 250°F, consider a water circulator.

The Model HH16 consists of an insulated fluid tank, air-cooled pump and motor, dual heaters, oil-to-water heat exchanger for cooling, and electrical controls, all mounted on a welded steel, powder coated finished frame with casters for portability.

SPECIFICATIONS

Temperature Range.....	550°F maximum; minimum depends on process temperature and cooling water temperature
Voltage.....	230/60/3 or 460/60/3; see serial # tag on machine
Amps.....	39.4 @ 230V; 19.7 @ 460V
Controls:	
Type.....	Self-tuning PID-Type MicroProcessor
Voltage.....	120 VAC
Accuracy.....	Within 1% of setpoint
Pump/Motor.....	½-hp, 1725-rpm centrifugal pump rated at 35 gpm @ 10' head; coupled to AC motor; air-cooled.
Heaters.....	Two @ 8000 watts each, with steel sheath for use with oil
Tank.....	8-gallon cold-filled level, welded steel, insulated on 4 sides and top
Mold Connections.....	1" NPT
Mold Supply Outlet.....	1" NPT
Cooling Supply Connections.....	¾" NPT
Cooling Drain Connections.....	¾" NPT
Overall Size.....	24 ½" W x 36" D x 3d7" H
Shipping Weight.....	415 lbs (uncrated)

INSTALLATION

1. Inspect Shipment

Inspect carton containing unit. Remove machine from carton. Inspect machine for damage. Report any damage to carrier.

2. Move Circulator into Position

Position the circulator as close to mold as possible; shorter hoses lose less heat. Make sure heat from this unit will not damage any other machine or material.

3. Connect Discharge Line

Run a hose to mold from 1" NPT pump discharge. (See photo on page 14 to identify parts.)

Hose must be rated for hot oil at 65 psi at the highest temperature where you will be running. For temperatures up to 450°F, IMS stocks Teflon hoses that work well. For temperatures up to 550°F, stainless steel hose is needed; it is also available from IMS. For additional information concerning a hose that suits your needs, contact an IMS customer service representative at 1-800-537-5375 (U.S.A. & Canada).

If mold has more than one inlet, use a manifold near mold and a single line to feed manifold. This will help prevent heat-loss. IMS also stocks manifolds or cluster valves for this purpose; for further information, contact an IMS customer service representative.

4. Connect Return Line

Run the same type of hose used on the discharge line between 1" NPT tank inlet and mold outlet or manifold.

5. Connect Coolant Lines

Connect clean, cold water supply to 3/4" NPT cooling water inlet. Ideal cooling water temperature is 55° F. Connect drain line to 3/4" NPT cooling water outlet.

CAUTION

FITTINGS that are too tight could
DAMAGE PUMP.

WEIGHT OF PIPES could
DAMAGE PUMP.

Do not overtighten fitting on
pump discharge.

INSTALLATION (continued)

Adjust water pressure to approximately 10 gpm. Use a good grade of hose on the drain line. The cooling water outlet can get very hot.

6. Fill Tank

- A. The oil or heat transfer fluid must be made for the temperatures you will be running. IMS stocks PG-1 heat transfer fluid rated at 600°F; and HF-50 rated at 450°F.
- B. Remove fill cap and pour in 8 to 9 gallons of oil (the tank already has about a gallon of PG-1 heat transfer fluid in it from testing; this does not need to be removed, regardless of which oil is being added. When running temperatures above 450°F, only use heat transfer fluid rated at 600°F.)

WARNING: AVOID MIXING WATER OR ANY OTHER FLUID WITH HIGH-HEAT FLUIDS.

NOTE

Tank capacity is 8 gallons of hot oil. Since oil expands 30% when hot, never use more than 9 gallons cold. Always use at least 8 gallons cold so you are sure the heaters are covered even when some of the fluid is in the mold and hoses.

7. Optional

Make any other connections your application requires. Installing insulating wrap around hoses will help prevent heat loss. For information concerning hose insulation, contact an IMS customer service representative at 1-800-537-5375.

8. Connect to Power

- A. Connect only to voltage listed on machine's serial number tag.
- B. Connect to a fused disconnect or circuit breaker with a minimum amp capacity of 65 amps for 230 volts and 35 amps for 460 volts.
- C. If hard-wiring cord to a circuit, lock out and tag out power to circuit first.

DANGER

LIVE ELECTRIC PARTS could cause DEATH or SHOCK.

Lock out and tag out power before doing wiring.

Only qualified electricians are to do electrical work.

INITIAL START-UP

1. Power must be locked out and tagged out.
2. Check plumbing installation.
3. Check wiring installation.
4. Turn on cooling water supply. Check for leaks. Ensure a secure drain connection, as this water will be very hot during actual operation.
5. Turn on power to circuit. Turn circuit breaker on (P. 14, Figure 1).
6. Check direction of pump rotation. It must be clockwise when viewed from end of motor. To check: Remove side panel and set controller to lowest setting. Press START button and let pump run for a few seconds; then shut if off and observe motor rotation. Have qualified electrician reverse any two power leads if direction is reversed.
7. Press START button again and let unit run.
8. Check for plumbing leaks while machine is running. If there are leaks:
 - A. Stop machine. Lock out and tag out power.
 - B. Correct leaks before starting up again.
9. Check fluid level. Ensure that fluid level reaches at least “min” on sight glass after mold and lines are filled with fluid.

Do not fill to maximum level—fluid will expand when heated.

NOTE

The process controller can be set up to prevent the setpoint from being set above a certain temperature and/or below a certain temperature.

See the controller manual for instructions on changing the Setpoint High Limit and Setpoint Low Limit.

NORMAL OPERATION

1. Circulator must have been installed according to INSTALLATION and must have gone through checks detailed in INITIAL START-UP.
2. Turn on cooling water supply.
3. Turn on power to circuit. Turn circuit breaker on.
4. Press START button. If you are sure there is no water in fluid circuit, set temperature to needed level.

If there may be water in circuit, set temperature controller to 200°F and run unit for an hour. Then set temperature to needed setting.

Keep in mind that the mold temperature does not match the fluid temperature you set. When heating, the mold is usually cooler than the fluid; when cooling, the mold is usually a little hotter. Controller will turn on power to heater or will open cooling solenoid valve to maintain temperature.

5. To adjust the setpoint (see figure 3 on page 15):
 - A. Press the function key. The letters SP will appear on the bottom half of the Process Controller display.
 - B. Press the Increase or Decrease buttons until the top half of the display shows the setpoint you want.
 - C. Press the Function key again to exit the setpoint mode.
6. To verify correct operation, watch temperature indicator and indicator lights while unit is running.

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NORMAL OPERATION (continued)

- A. When the temperature is below the setpoint, the heaters have power and the HEATER light is on.
 - B. When the oil reaches the setpoint, the HEATER light turns off.
 - C. When the oil goes above the setpoint, the cooling light comes on.
7. To shut down circulator:
- A. Turn down temperature, to allow heaters to cool.
 - B. After about 5 minutes, push red stop button.

MAINTENANCE

1. Check tank level often; the oil should show on the sight glass. Always check when oil is cold.
2. See component manuals for repair procedures. All parts are available from IMS.

WARNING

HOT PARTS and HOT OIL could
BURN you.

Avoid contact.

Let system cool and vent pressure
before you loosen oil fittings.

Repair leaks immediately.

TROUBLESHOOTING

1. Motor and Heater Not Working:

- Is main disconnect ON?
- Is machine plugged in?
- Is there power to circuit that machine is plugged into?
- Turn machine circuit breaker OFF then ON.
- Press STOP switch fully. Then press START switch.

2. Oil Not Heating at all—Motor Working—HEATER light OFF:

- Is temperature controller set to high enough temperature?
- Check temperature controller.
- Check heater elements.

3. Heat too high:

- Is temperature controller set too high?
- Check oil temperature with more than one thermometer.
- Watch indicator lights at various temperatures. Are they cycling as described in step 9 on page 5?
- Test temperature controller.
- Check cooling solenoid.

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REPLACEMENT PARTS

<u>DESCRIPTION</u>	<u>OLD IMS #</u>	<u>NEW IMS #</u>
Pump	HT080	138094
Solenoid, Parker Series 22		135788
Oil Cooler, Thermal Transfer		148244
Heating element, ACCU-THERM	240/60/3	129724
	460/60/3	126817
Mercury Contactor, MDI		106192
West Controller, 6100	COC3-N6101FJ-2	119863
Temp Controller, West, 6500	COC3-N6501FJ	119507
Motor Starter Contactor, Carlo Gauazzi		160234
Motor Starter Overload, Carlo Gauazzi	240/60/3	158978
	460/60/3	158872
Button, Start/Stop, Lavato	CIZZ	158874
Contact Element N.O.		158875
Contact Element N.C.		158876
Light, System On, Amber	CIZZ	106263
Cap, Oil Fill		160323
Thermocouple, Tank/Process/High Limit		133184
Oil Level Gage, 1/4, sight glass		160321
Breaker, 240/60/3, 50 AMP (230V)		106124
Breaker, 460/60/3, 30 AMP (460V)		159226
Autonics Temperature Control for Over Temp		158490



NOTES AND SERVICE RECORD

