VCTH-4000, 8000
Four Zone and Eight Zone Timer Based Hydraulic Valve Gate Controller

User Manual
D-M-E Company

SAFETY

D-M-E Company products have been designed to be safe and simple to operate. As with any electronic equipment and hot runner system, you must observe standard safety procedures to protect both yourself and the equipment.

To Prevent Injuries:

- To avoid electrical shock or fire hazard, do not apply voltage to a terminal that exceeds the range specified for that terminal.
- To avoid mechanical injury, electrical shock or fire hazard, do not operate this product with covers or panels removed.
- To avoid electrical shock or fire hazard, do not operate this product when wet.
- To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.
- To avoid burn hazards, do not operate valve gates with operator gates open. Correct hookup of valve gates should only be performed with all operator guards in place.
- To avoid burn hazards and possible damage to equipment, do not leave hot runner systems at elevated temperature for extended periods of time. When the mold and machine are not operating, disconnect the molding machines injection unit from the hot runner system so that pressure may discharge through the sprue or manifold extension nozzle. Make sure the molding machines purge guard is in place.
- DO NOT look into the hot runner system when actuating the valve gates with the HAND position. Serious burns could occur. The molding machine gate should be closed when ever operating a valve gate.

To Prevent Product Damage:

- Do not operate this product from a power source that applies more than the voltage specified.
- Do not apply any external voltage to the injection forward input. Only a contact closure or solid state relay should be used as an input.
- Set hydraulic operating pressure before connection to the valve gate system. The system is capable of generating ten times the connected air pressure which could be higher than the recommended operating pressure of the valve gate system.

DME RIGHTS

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WARRANTY

D-M-E Company warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, D-M-E Company, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. D-M-E Company shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than D-M-E Company representatives to repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

VCTH-4000, VCTH-8000
Four and Eight Zone Timer Based Hydraulic Valve Gate Controllers

GENERAL DESCRIPTION

This manual describes the installation, operation and servicing of the Valve Gate Controller.

The VCTH-4000 provides four zones of hydraulic actuation. The VCTH-8000 provides eight zones of actuation.

The Controller uses DIN style solid state timers to provide long life and high reliability. Each timer is capable of dual time functions so that each zone can be programmed with a delay time (timer 1) and an on time (timer 2). The timers in turn drive larger solid state relays that are individually fused against faults.

The Controller is designed to operate from a wide supply of operating voltages (88 to 264 Volts AC) so that this one device can be used with almost any available power source. This also makes it easier to relocate the controller between different plants or even different countries. The standard product offering comes with a 125 volt AC plug (North American Standard). This plug may be removed and replaced with any number of 240 VAC plugs.

Test functions are available for each zone to assist in determining the correct hookup of each of the valves.

Hydraulic connections on the back of the controller allow for quick connect and disconnect of the hydraulic lines from the controller.

An air powered pump prevents potential burning of oil which is a typical problem with variable volume piston pumps. The air powered pump also saves electrical energy as the pump only runs when there is demand for flow. A hydraulic accumulator provides instantaneous flow for fast actuation of hydraulic cylinders.

The hydraulic system is capable of providing up to ten times the incoming air pressure. For example, if air pressure is 100 PSI, the hydraulic system is capable of delivering 1000 PSI. An air pressure regulator allows for adjusting the desired hydraulic pressure

UNPACKING AND INSPECTION

After unpacking, inspect your controller and check for any damage that may have occurred during shipment.

Check for proper operation of power switch by turning the switch on and off with no voltage applied. Check all electrical connectors for visual damage. If any damage is observed, return the controller to D-M-E for repair or replacement.

INSTALLATION

You are installing a piece of electronic equipment, which should not be subjected to any physical or environmental abuse. Select a cool, dry, well-ventilated, environmentally clean location, away from heat and moisture.

Connection of Trigger Signal

Using the cable supplied with the controller, connect the controller to the injection molding machine. The best way to accomplish this is to supply a *dry contact* (relay contact closure) that is triggered by the injection forward signal of the molding machine. A solid state relay contact can be also be used. It should source power from contact A to contact C.

Alternatively, a limit switch that is operated from mold closure can be used as the trigger signal. The limit switch can be mounted to the tie bar to catch the closing of the moving half of the mold. It may also be mounted to the mold to detect contact of the mold halves. Contact B of the connector supplies a ground signal to provide shielding of the cable assembly.

Trigger Signal Connection

Connection of AC Power to Controller

The standard offering of the controller is provided with a 120 VAC connector. The controller is designed to run from any voltage between 88 VAC and 264 VAC. Connect the brown conductor of the power cable to L1 (or hot), the blue conductor to L2 (or neutral) and the green conductor with the yellow stripe to ground. *Do not operate the controller without the ground conductor connected.*

NOTE: ALL NATIONAL AND LOCAL ELECTRICAL CODES MUST BE FOLLOWED WHEN CONNECTING THIS EQUIPMENT.

OPERATION

Timer Setup

Do not perform this step until all electrical connections are performed.

Turn controller power on. The timer displays should illuminate. If they do not illuminate, see the Maintenance and Repair sections below.

Each timer unit has two internal timers. Timer 1 sets the delay from when the trigger signal is received and the valve is to open. This is referred to as the “delay” timer. Timer 2 sets the duration the valve is open. This is referred to as the “on” timer.

Use the SET/LOCK button on the front of the timer to select between the delay timer (Timer 1) and the on timer (Timer 2). The Timer unit front panel will display which timer is selected. (See Page 11).

Use the up and down arrow buttons below the display to set the desired time value. Each time value can be set to any value between 00.00 seconds to 99.99 seconds. To set any valve to open immediately, set the delay timer (Timer 1) value to 00.00 seconds.

If the sum of the delay and the on timer is set to a value larger than the time the trigger signal is active, internal electronics will automatically reset the timers at the end of the trigger signal.

When triggered, “Timer 1” (delay timer) of each of the timers will be displayed. The timer will count down until it reaches zero. When Timer 1 reaches zero, Timer 2 (on timer) will be displayed and the timer will count down until it reaches zero. If Timer 1 value is zero, Timer 2 will be displayed when the trigger signal is displayed, Timer 1 will not be displayed.

Proper setting of each of the “on” timers is determined by part weight or size. For most applications, the on timer should run through the injection fill phase and into the pack (and hold, if present) phases of the injection molding machine.

In order for the timers to function, the related selector switch must be in the AUTO position. NOTE: The timers do not run in the OFF or HAND position.

WARNING!

Do not operate the HAND function of the selector switches when someone is inside the gate area, especially if they are looking at the face of the hot runner system.

When manually testing valve gate operation, make sure the safety gate is closed. Failure to do so could result in serious injury.

The HAND position of the selector switches can be used to verify correct connection to the valve gates. **Warning!: verification should be performed with the operator gates closed to prevent injury from hot plastic.**

Verify correct operation of the timers once the trigger signal is applied.

Fill the Hydraulic Reservoir

The hydraulic system is compatible with a large range of hydraulic fluids. In the absence of information regarding the valve gate system, Mobil DTE 25 or an equivalent is recommended. This has an ISO Grade of 46.

After making sure that the empty port on the front of the unit is tight, fill the reservoir to the top of the sight glass. Once the hydraulic connection lines are charged the first time, it may be necessary to add more hydraulic fluid.

Connect Air Pressure Supply

Connect an air line to the back of the unit. Quick connects are not recommended as they will limit air volume. Maximum recommended air pressure is 100 PSI. If the system is to run near continuously, it may require upwards 50 CFM of air flow.

A dry air supply is recommended. While the pump is capable of handling moist air, water may be build up inside of the cabinet and leak onto the floor.

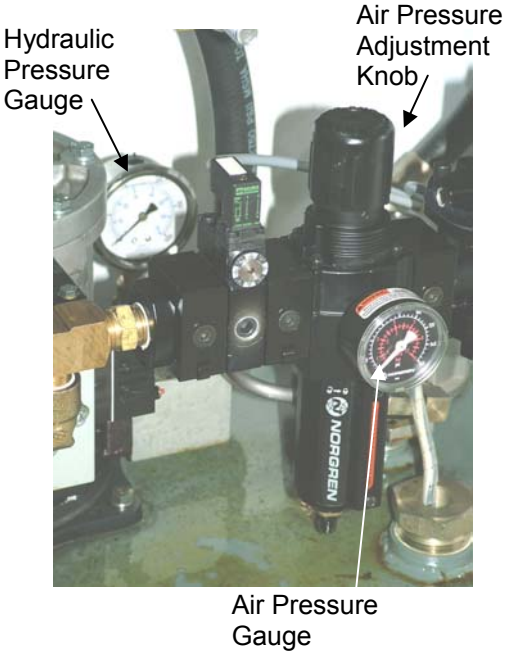
Setting Hydraulic Pressure

Hydraulic pressure should be set prior to connection to the valve gate system. Maximum hydraulic pressure will be ten times the available air pressure.

Connect one of the supplied hydraulic lines to the open and closed connections for valve gate #1.

Turn controller power on. The pump will run until the accumulator is charged.

Open the bottom door of the cabinet. There is an air pressure gauge and a hydraulic pressure gauge. Note the hydraulic pressure. To adjust the hydraulic pressure, pull the top of the air regulator up and turn it to achieve the desired hydraulic pressure. If hydraulic pressure is higher than required, adjust the air regulator to 1/10th of the desired hydraulic pressure. Use the HAND position for valve gate #1 to reduce the built up hydraulic pressure in the system. Continue making adjustments until the desired pressure is obtained.



Disconnect the hydraulic line looping the open and closed ports for valve gate #1.

Alarms

The system is equipped with a high oil temperature sensor and a low oil level sensor. If either of these activate, an alarm buzzer will activate and the appropriate light on the top of the controller will illuminate.

If the alarm activates, shut the system down immediately. Overheating of oil could be an indication that mold cooling of the clamp plate is not in place. The over temperature alarm triggers at 150 +/- 10 °F (65.5 +/- 5.5 °C). The low oil level will alarm will trigger when oil falls below approximately 3.8 gallons (14.4 liters).

An optional clogged oil filter alarm may also be present on the system.

MAINTENANCE AND REPAIR

NOTE: DISCONNECT POWER BEFORE SERVICING. ONLY ELECTRICIANS OR TRAINED SERVICE PERSONNEL SHOULD REMOVE ACCESS PANELS TO SERVICE INTERNAL COMPONENTS.

Periodic Maintenance

At the rear right inside the lower part of the unit, there is a clogged filter indicator. When the unit is running (pumping), check the gauge. The gauge should be in the green range. If it is in the red range, the filter is in need of replacement.

Also periodically inspect and clean the fan and breather filters on the rear of the unit.

Hydraulic oil quality should be periodically checked, as well.

Troubleshooting and Repairs

Timers Do Not Illuminate

Make sure controller is plugged in and that outlet power is on. Some molding machine outlets may not be energized if machine power is off.

If controller is plugged in and outlet has power, check the fuses inside the top of the controller. Use only the fuses identified in the replacement part list on page 11.

If a single timer does not illuminate, it may require replacement. See timer replacement at the end of this section. The timers are designed to operate for 10 million cycles so they should not require replacement very often.

Timers Illuminate But Don't Run

Check the trigger signal cable and make sure it is connected. If the cable is connected, disconnect the cable from the controller and ensure the molding machine provides a contact closure when expected by checking the signal between pins A and C.

If you can see a contact closure between pins A and C. You can also check for the presence of 24 volts DC between pins A and C of the trigger signal connector on the back of the unit.

Timer(s) Run But Valve(s) Don't Open

Check the small fuses on top of the internal solid state relays for continuity. If any of these fuses are determined to be open, check the affected zone valve for a short circuit. Replace defective fuses only after determining that the related valves are in good order.

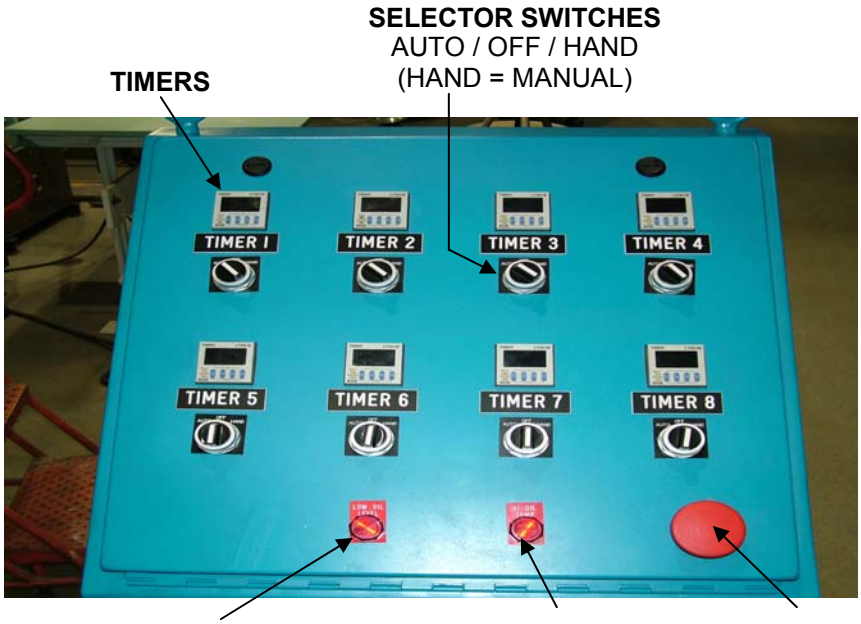
If the fuses on top of the solid state relays are good, it is possible that a solid state relay may require replacement. Replacement fuses and relays are available from DME. See page 11.

Timer Replacement

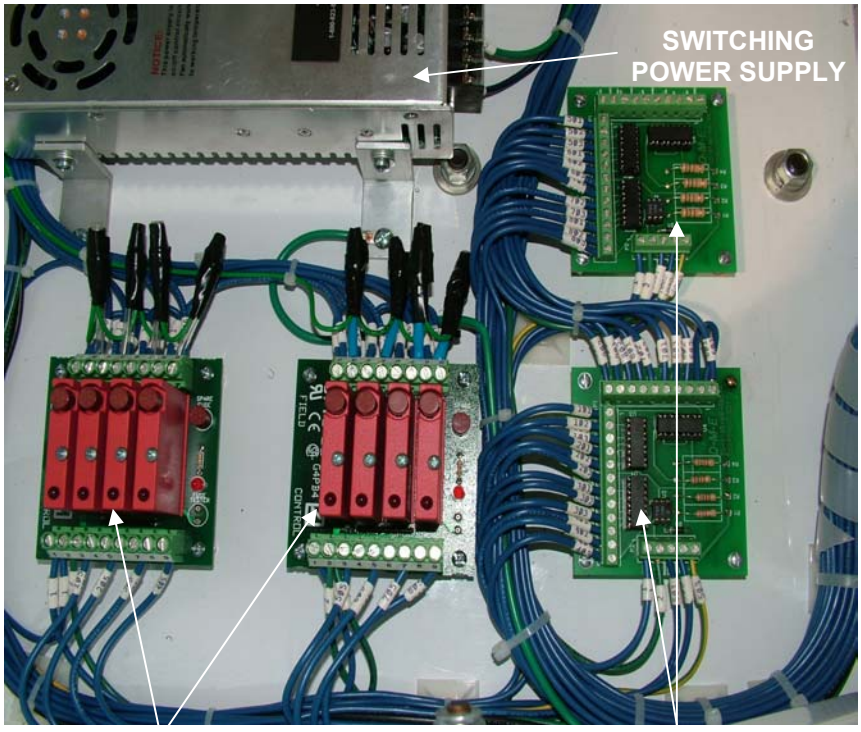
If timer replacement appears to be necessary, we recommend returning the unit to DME or have it serviced by another known qualified service technician. Replacement timers are available from DME. Use part number RPM-0100.

The replacement timer must be setup before installation. (See Page 11). A small access plate on the right side of the timer gives access to a bank of small switches. Open the plate. Set all switches except switch number four to "ON". Replace the damaged timer making sure to locate all wires in the proper location. Tighten all unused screws. The provided instructions also give details on correct mounting of the timer.

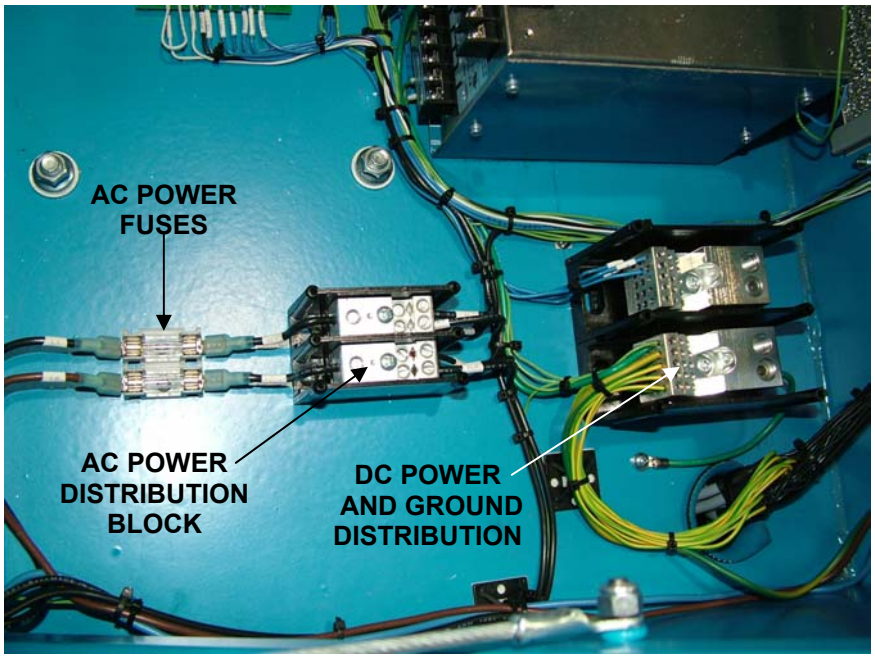
The first time the unit is powered up, set the timer to "Integrate A" mode by performing the following: (1) Press and hold the SET/LOCK button, (2) Press the right most up or down arrow, (3) Release the SET/LOCK button, (4) Continue pressing the right most up or down arrow until "In-A" is displayed, (5) Press the reset key. The timer is now ready for use.



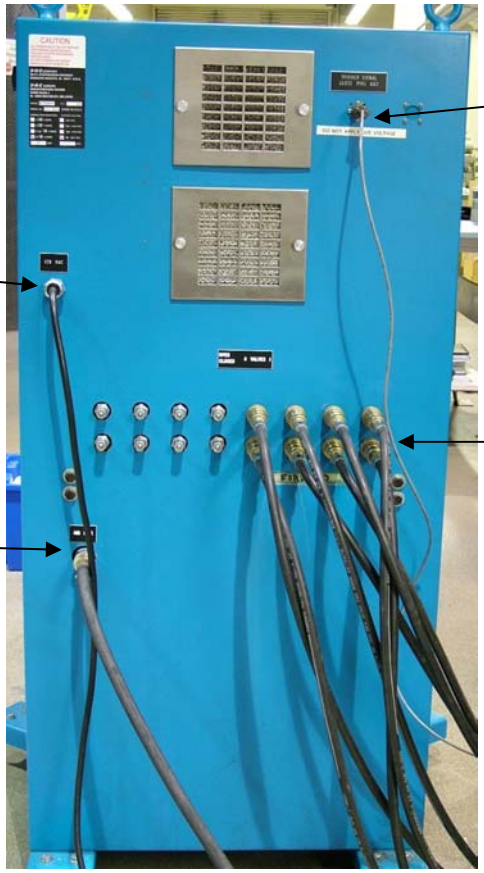
CONTROL PANEL OF UNIT



INTERNAL ELECTRONICS



POWER FUSING AND DISTRIBUTION



SPECIFICATIONS

HYDRAULIC

Hydraulic Pump
5 Gallon/Min. (18.9 Liters/Min.)
Air powered
30 — 100 PSI (2.07— 6.89 BAR)
Max volume: 50 CFM (1416 Liters/Min.)
10:1 Intensification ratio
(60 PSI air yields 600 PSI hydraulic)

Accumulator
1 Gallon (3.79 Liters)
With discharge valve
Depressurizes when power is off
Precharged with 400 PSI Nitrogen

Valves
D03 Form Factor
24 VDC Coils
Single solenoid, spring return
Four or eight valves

Hydraulic Quick Connects
HNV-14-M by PCI
Similar to Parker 60 Series

Air Regulator
Adjustable zero to 100%
Set to adjust hydraulic pressure

Alarm Sensors
Oil Temperature
Triggers at 150 +/- 10 °F
(65.5 +/- 5.5 °C)
Oil Level
Triggers at under 3.8 Gallons (14.4 liters)
There may be an optional clogged filter alarm, as well.

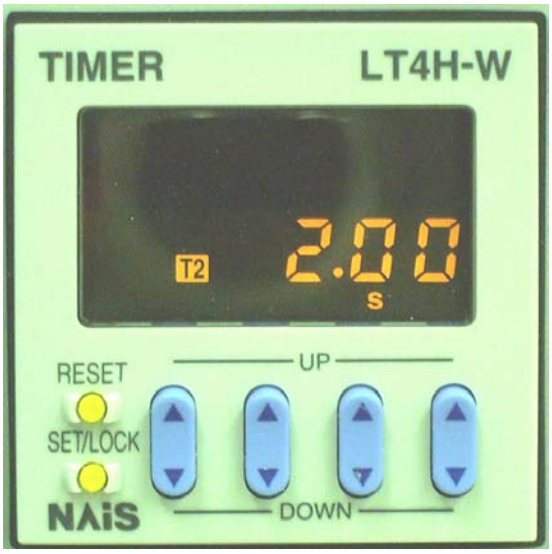
ELECTRICAL

AC Power Input
120 or 240 VAC, 50 or 60 Hz
Actual range, 88 to 264 VAC

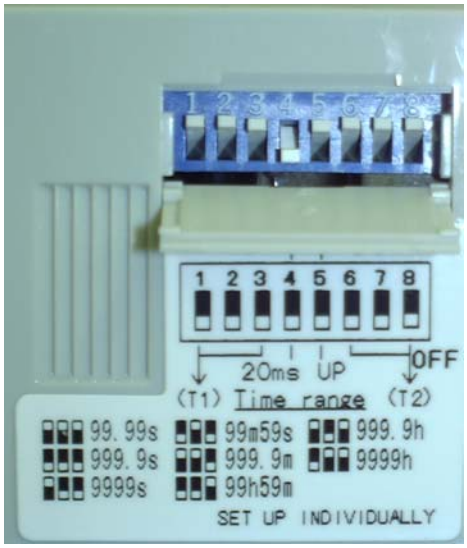
Main Circuit Protection
VCTH-4000: ABC-5 fuses (2)
VCTH-8000: ABC-10 fuses (2)

Power Supply — 24 VDC
VCTH-4000: 300 Watt
VCTH-8000: 500 Watt

Solid State Relays
3 amp, 60 VDC relays
4 in VCTH-4000
8 in VCTH-8000
Protected by 4 amp fuses
Spare fuse(s) included



TIMERS
Use SET/LOCK button to change between T1 (delay) and T2 (on) timers. Use up and down arrows to change time values



TIMER SETUP
Set all switches except 4 to ON (as shown). Switches are on right side of timer behind a cover plate

RETURN POLICY

The D-M-E® VCTH-4000™ and VCTH-8000™ are warranted for 1-year parts and labor, excluding fuses. Contact D-M-E Customer Service for return authorization for repairs, or warranties. Replacement parts are also available through the Customer Service Department.

D-M-E Customer Service

In U.S.: 1-800-626-6653

In Canada: 1-905-677-6370

SERVICE CENTER U.S.A.
D-M-E WORLD HEADQUARTERS
29111 STEPHENSON HIGHWAY
MADISON HEIGHTS, MICHIGAN 48071
TELEFAX: (248) 398-6174
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REPLACEMENT PARTS	
DESCRIPTION	**CATALOG NUMBER**
Fuses VCTH-4000 VCTH-8000	 ABC-5 ABC-10
Solid State Relay Fuses (T5 series, 4 amp, 250 VAC)	RPM-0098
Solid State Relay	RPM-0099
Replacement Timer	RPM-0100
Trigger Cable	RPM-0101