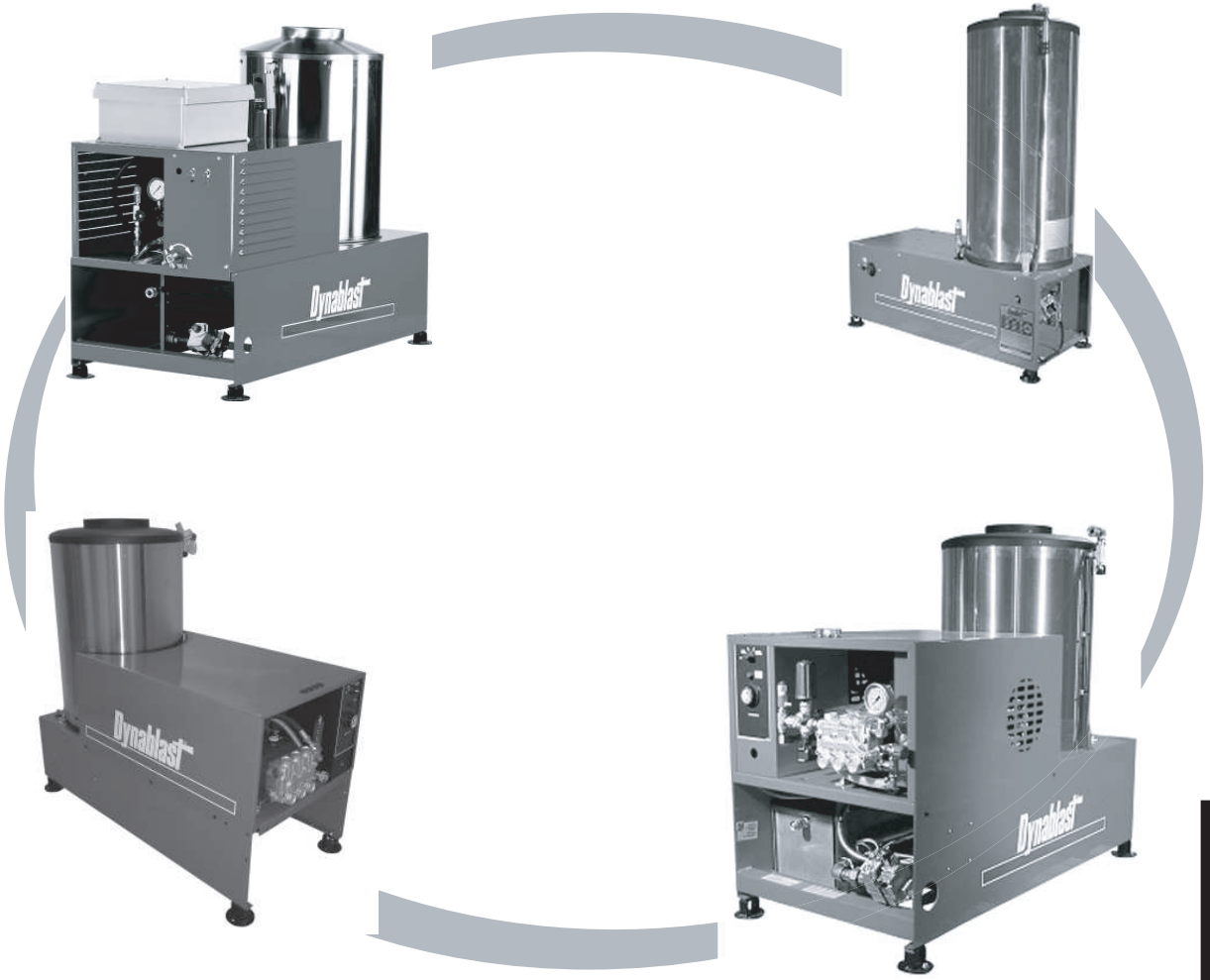
Dynablast®

OPERATOR'S MANUAL

HOT WATER PRESSURE WASHERS



ALSO APPLIES TO

MHGN/P , UHE, & BEN/P SERIES

BEN/P SERIES

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MAN-UHBEN/P12

WARNING: WHEN USING THIS PRODUCT BASIC PRECAUTIONS SHOULD ALWAYS BE FOLLOWED, INCLUDING THE FOLLOWING:

- Read all the instructions before installing or operating this product.
- To reduce the risk of injury, close supervision is necessary when a product is used near children.
- Know how to stop the product and bleed pressures quickly. Be thoroughly familiar with the controls.
- Stay alert – watch what you are doing.
- Do not operate the product when fatigued or under the influence of alcohol or drugs.
- Keep operating area clear of all persons.
- Do not overreach or stand on unstable support. Keep good footing and balance at all times.
- Follow the maintenance instructions specified in the manual.
- Wear appropriate safety clothing and protective gear including eye protection.
- If you are using chemical additives in conjunction with your pressure washer, follow the chemical manufacturer's safety precautions carefully.
- Incorrect wiring may result in electric shock. See Electrical Wiring Schematics for details.

WARNING: RISK OF INJECTION OR SEVERE INJURY. KEEP CLEAR OF NOZZLE. DO NOT DIRECT DISCHARGE STREAM AT PERSONS. THIS EQUIPMENT IS TO BE USED ONLY BY TRAINED OPERATORS.

WARNING: IF YOU SMELL GAS, SHUT OFF THE GAS SUPPLY TO THE APPLIANCE, EXTINGUISH ANY OPEN FLAME, AND TEST ALL JOINTS WITH A SOAP SOLUTION. IF THE ODOUR PERSISTS, CALL YOUR GAS SUPPLIER IMMEDIATELY

UNPACKING AND ASSEMBLY

- Carefully remove the cardboard or wood crating in which your new unit was shipped.
- Attach the axle, wheels and castor (if provided) to your unit. For propane-fueled hot water units only:
- Obtain a propane tank of an appropriate size for your unit and application.

Tank Size	250,000 BTU	300,000 BTU	350,000 BTU
30 LB	5 hrs	n/r	n/r
40 LB	6 hrs	5 hrs	n/r
60 LB	9 hrs	8 hrs	7 hrs
100 LB	16 hrs	13 hrs	11 hrs

*n/r - not recommended

Anticipated times are based on the burner operating 50 to 60% of actual washer time.

This section is primarily meant as a guide for those users who will be permanently installing their units, either in a shop location or in a vehicle.

- All applicable codes must be followed for your installation. They expand on and take precedence over any recommendations in this booklet.

- Plan your installation carefully before you begin. Determine how you are going to supply water, heater fuel (propane or natural gas) and electricity to the unit. Consider machine dimensions given in the technical specifications appendix at the end of this booklet, and draft hood dimensions given in Appendix B when selecting an installation area.

- Protect the unit from freezing. If the machine is going to be exposed to freezing temperatures, winterize it as described in the Storage Instructions Section.

- With permanent in-shop or in-plant installations, locate the unit where it will not interfere with operations or material movement and where it will not be subject to inadvertent damage. It is often desirable to mount the unit in separate machine room or up on a platform above the work floor

- Ensure that any required plumbing, electrical, gas supply and exhaust venting work is done by authorized trades people in accordance with local regulations.

- Drawing water from a pond, stream or similar "non-water main" source is not recommended, but if this must be done, use at least a 3/4" supply hose for units pumping up to 3 gallons per minute (gpm), a 1" hose for 4 gpm units and a 1-1/2" hose for larger units. Use of a filter on the water pickup hose is required.

- While every unit is supplied with a screen washer on the inlet connection, we recommend using a 100 mesh inlet filter in areas where the water source is excessively turbid or may contain suspended matter. The filter should be inspected regularly for clogging and cleaned or replaced, if necessary.

- When connecting your unit to a pressure water supply, we recommend installing a 20 psi pressure regulating valve on the machine inlet. Excessive inlet water pressure can cause premature seal failure in the pump. These regulators are available from your dealer.

- Hard plumbed water supplies may require a pulsation dampener installed at the machine inlet.

- Note that some cities/municipalities may require back-flow prevention.

- If you are going to mount your unit in a vehicle, it must be mounted on suitable vibration dampening mounts. Please check with your dealer for parts suitable for your installation.

These Hot Water Pressure Washer units are certified for installation on combustible flooring with radiation shield, but must not be installed directly on carpeting. If a radiation shield is not used, install only on non-combustible flooring. A minimum clearance of 6 inches must be maintained between unit and combustible walls and 10 inches on top.

If you are installing permanent piping runs from your unit to remote wash locations, use only Schedule 80 pipe and heavy duty fittings rated for the operating pressure of your pumping module or use pressure or steam rated reinforced flexible hose suitable for the operating pressure of your unit.

*NOTE: allow sufficient clearances for servicing.

OPERATING GAS MANIFOLD PRESSURE AND INPUT

See Technical Specifications Section
The manifold pressure measurement tap is located on the gas valve.

HIGH ALTITUDE

This equipment is certified for installation up to 2,000 feet altitude without adjustment.
For operation at elevations above 2,000 feet:

- In Canada, the input rating should be derated 10% for altitudes between 2,000 to 4,500 feet.
- In U.S.A., the input ratings should be reduced at the rate of 4% for each 1,000 feet above sea level.

The input rating derate will be achieved by reducing the gas manifold pressure based on the maximum input rate.

ELECTRICAL

If your unit uses an electrically powered motor, have it permanently connected by a qualified electrician. See Wiring Schematics Section.
In Canada, all electrical wiring is to be done in accordance with the Canadian Electrical Code, CSA C22.1 Part 1, and/or any local codes.

In the United States of America, all electrical wiring is to be done in accordance with the National Electrical Code, ANSI/NFPA 70 (latest edition) and/or any local codes.

GROUNDING INSTRUCTIONS

If your pressure washer is electrically powered: THE MACHINE MUST BE ELECTRICALLY GROUNDED.

DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel and follow local codes to ensure the outlet is properly grounded.

GAS SUPPLY

If you are connecting your hot water pressure washer to a fixed propane or natural gas source, have the gas supply and suitable venting installed by a licensed gas fitter.

Natural Gas or Propane Installation
In Canada, the installation must conform with CSA Standards B149.1 or 2(latest edition) for gas burning appliances and equipment and/or any local codes.

In the USA, the installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1(latest edition).

Propane
Insert the male POL connector on the regulator into the female receptacle located on the propane tank shut-off valve and tighten firmly (L. H. thread). Open tank valve and check for leaks with soap solution

NOTE: Continuous outdoor operation in low temperatures may require several propane tanks manifolded together to maintain consistent vapourization of the propane. Contact your local LP gas distributor for multiple tank requirements and manifold assembly.

HEATER MODULE SET UP (MHG400N/P

Join the heater module to the high pressure outlet of the cold water pressure washer by the 42" connector hose (longer hose is available if required, contact your dealer).

Connect the high pressure hose to the outlet of the heater module. The connection hose must be rated for minimum operating pressure 3500 psi.

VENTING REQUIREMENTS & INDDOR INSTALATION

Stationary Installations

A draft hood must be fitted to the top of the flue outlet. Use the same size as the draft hood outlet and avoid short turns. For horizontal runs maintain ¼" rise per foot of vent. Horizontal runs are not to exceed 75% of vent height. Exhaust gasses should not be vented into a wall or ceiling, or a concealed space in the building. Installations must comply with CSAB149.1 &2 (in Canada) or ANSI Z223.1 (in the USA) installation code requirements and/or any local codes. This machine is suitable for connections to a TYPE B venting when fitted to a draft hood.

CAUTION: If the pressure washer is left unused for an extended periods in sub-zero weather, freezing air could fill the venting system. If the building has a negative air pressure condition, the freezing air could be drawn down onto the heat exchanged coil causing the water in the coil to freeze. This could result in the coil to rupture. Have a heating specialist ensure that a positive pressure condition is maintained in the building to prevent this from occurring.

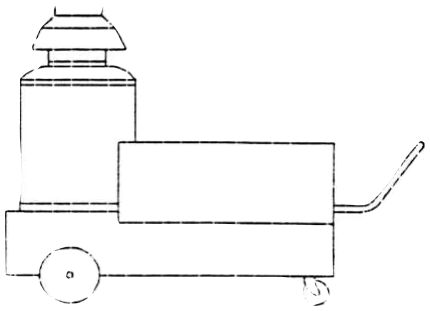
Free Air for Combustion and Venting

If the unit is installed in an equipment room or other enclosed structure, care must be taken to ensure there is sufficient free air for combustion and ventilation. Observe CSA B149.1 & 2 or ANSI Z223.1 installation code requirements. Care should be taken to keep the base of the unit clear of trash, or any object(s) that could obstruct the free flow of air into the combustion area.

NOTE - Machines to be used indoors MUST be in accordance with local regulations.

1. Make sure chimney is of suitable size.
2. Make sure that there is enough air for combustion. (60 sq. in)
3. Be sure to protect against a down draft in below freezing weather.

CAUTION - A down draft can cause the coil to freeze, resulting in expensive damage!



CHIMNEY SIZE

These Machines are not to be connected to a type "B" Gas Vent unless otherwise stated on the name plate of the machine.

1. A draft hood is supplied for stationary installation.
2. All venting should be the same size as the draft hood
3. Never use ventpipe smaller than the draft hood.
4. If total run is more than 25', use larger size chimney.
5. A 90 degree elbow is equivalent to a run of 20 feet.
6. If a horizontal run is used, make sure the flow rises at least 1/4" per foot.

COMBUSTION AIR SUPPLY

1. These hot water pressure cleaners burn Natural Gas or Propane. This means that air is required for combustion , for draft diverter dilution and for ventilation.
2. The appliance installer will know how and where to place a supply air duct. Take care that this opening will not promote drafts which could blow out the pilot light.
3. Keep the area around the machine clear so this air can get to the burner. If the wheels are removed, the machine should be bolted to a stand 18" offthe floor.

APPLIANCE IN CONFINED SPACE

The confined space should have two permanent openings: one near the top of the enclosure and one near t he bottom of the enclosure. Each opening shall have a free area of not less than one (1) square inch per 1000 BTUs per hour of the total input rating of all appliances within the enclosure. The openings shall have free access to the room interior which should have adequate infiltration from the outside.

WARNING: IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE. DO NOT TAMPER WITH FACTORY INSTALLED CONTROLS.

GENERAL OPERATING INFORMATION

- Bleed all air from the machine before turning it on.
- Do not leave the machine running in bypass mode (gun closed) for more than three minutes. Extended periods of bypass operation will cause extreme premature wear of the pump seals or valves.
- When shutting down a hot water unit shut the heater off and continue to run water through the coil until the coil has cooled to inlet water temperature. This procedure reduces the possibility of trapping superheated water inside the coil and will also extend coil life by reducing scale buildup inside the coil.
- Check hoses, guns and fittings regularly for wear, cracks, cuts, leaks and excessive abrasion. Immediately repair worn items and replace with factory approved parts having a suitable pressure and temperature rating.
- Chemicals that affect steel, brass or rubber should not be used.
- Always run fresh water through the pressure washer after using salt water. Salt water accelerates corrosion and deterioration of the pump, seals and hoses.
- WARNING: Pilot flame or burners may ignite nearby fuels or gases. Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this machine.

Basic Burner Controls
The units are equipped with automatic gas valves. A temperature limit control protects the system against excessive outlet water temperature. A flow-sensing switch prevents burner operation without water flow. Each machine comes fitted two master ON/OFF switches to control pump and burner operation.

Lighting the Pilot
Before lighting the pilot for the first time, purge air from the supply hose. Then wait five minutes before lighting pilot.

For Standing Pilot
Turn gas cock knob on combination gas valve to "PILOT" position. Depress the knob and hold in while pushing piezo igniter button (located on control panel) until distinct click is heard. Repeat if pilot does not light on the first click. Continue holding knob in depressed position for about 1 minute or until pilot remains burning when released. Turn knob to "ON" position in readiness for controlled operation of main burner.

For Electronic Intermittent Pilot
The equipment does not have a continuous pilot flame. It is equipped with an electronic ignition device that automatically lights the pilot. Do not try to light the pilot by hand.
Turn gas cock knob on combination gas valve to "ON" position. Pilot burner will automatically ignite, and will be followed by the main burner when water is flowing through water heater coil and burner switch is on.

Use only your hand to push in or turn the gas control knob. Never use a tool. If the knob will not push in by hand, do not try to repair it; call a qualified repair technician.

Operating the Main Burner
Be sure water is flowing through water heater coil before turning on burner switch. Turn the pump switch to the "ON" position to engage the pump, a steady stream of water should flow from the spray gun. Turn the burner switch to the "ON" position. Burner will ignite and remain in operation as long as there is sufficient water flow to satisfy the flow switch and/or pressure switch and temperature limit control.

Should pilot outage occur, turn automatic gas valve to "OFF". Wait 5 minutes before re-lighting to clear combustion chamber of accumulated gas.

Shutdown Procedure
- In the case of hot water units turn the burner control switch to "OFF", turn the knob on the combination gas valve to "OFF", and continue to run water through the unit until the heater coil is completely cooled to inlet water temperature. This procedure reduces the tendency of scale to accumulate inside the heat exchanger coil.

- For electrically driven pump modules, use the ON/OFF control switch to shut down.
- Disconnect the gun/wand from the outlet hose and drain the water from the gun/wand by holding the trigger gun open and pouring any water out backwards through the gun. This will help reduce internal corrosion of your gun/wand.
- If a movable hot water unit is to be relocated after it is shut off, turn off the heater fuel supply and let the pilot light burn out the fuel remaining in the lines. After the pilot has gone out, turn the gas control valve to the OFF position.
- WARNING : If your unit is vehicle mounted, always shut off the heater fuel supply and extinguish the pilot prior to moving the vehicle.

Condensation From Coil

When cold water is being pumped through the heater coil and the burner is firing, condensation may form at times on the coil and drip down into the burner compartment. This can be particularly noticeable on cold, humid days giving the false appearance of a leaking coil.

OPERATING THE PRESSURE WASHER

- Your pressure washer should only be operated by trained personnel. High pressure spray can cause injury.
- If your connections are not already made, connect the water, heater fuel and electrical (if applicable) supplies. This work should be done by authorized trades people in accordance with local regulations.
- If your heater module is driven by a gasoline engine, check that the fuel tank is full. Review the engine supplier's starting procedure. WARNING: Extinguish the pilot flame on a hot water heater before refueling a gasoline engine.
- Connect the outlet hose to the outlet fitting of the heater coil. (If the unit has not been used for a few days, flush the system to remove any loose rust or scale. To do this, disconnect the gun/wand and run water through the machine for at least two minutes and until the water runs clear from the hose outlet. Connect the gun/wand or steam wand only after the unit has been completely flushed so that any rust or scale which comes loose does not clog the nozzle.)
- Open the water supply valve to the machine. The pump will self-prime if the water supply is reasonably close to the machine and if the lift to the machine is not too great. We recommend that the horizontal distance to a standing water source not exceed 15 feet and the lift not exceed 12 inches. If you are drawing water from a water tank, pond, stream or similar "non-water main" source, use at least a 3/4" supply hose for units pumping up to 3 gallons per minute (gpm), a 1" hose for 4 gpm units and a 1-1/2" hose for larger units.
- If your unit is driven by a gasoline or propane carbureted engine, operate it at the factory preset (3400 rpm) to obtain full design performance.
- Holding the gun/wand with both hands, pull the trigger gun open and check for proper operation and then proceed with your cold water washing task.
- If you want to wash with hot water or you want to steam clean, turn the burner control switch to the ON position. The burner will only operate if there is water flowing past the flow switch.

USING THE CHEMICAL INJECTOR FEATURE

Low Pressure Injectors

These pressure washers are normally supplied with a chemical solution or additive injector mounted on the outlet side of the pump. To operate this device, follow the instructions below.

- Insert the solution pickup hose into the chemical container. The container may be mounted above or slightly below the injector.
  NOTE : Follow the chemical manufacturer's use and safety instructions.
- If your unit is equipped with a dual wand attached to the trigger gun outlet, open the needle valve with the handle on the dual wand which controls flow through the second wand (with the large orifice brass nozzle at the outlet end). Opening this valve will induce suction through the injector to the chemical solution pickup hose. If you do not see chemical solution moving through the pickup hose toward the injector, or it is flowing too slowly or too quickly, adjust the suction control on the injector or the chemical control valve on the panel until chemical is flowing at the rate you desire.
- If your unit is equipped with a single wand connected to the trigger gun and the wand has a quick-connect

style fitting on the outlet end, remove the pressure nozzle from the quick-connect fitting and insert the brass soap nozzle into the quick-connect fitting. When you open the trigger gun with the soap nozzle installed on the wand, you will induce suction on the chemical solution pickup hose. If necessary, adjust the injector suction as described above.

High Pressure Injectors
On an optional basis, an inlet side chemical solution injector based on a float tank system is available for the application of chemical solutions at high pressure. If your unit is equipped with this system, follow these steps to apply chemical solutions.

- Insert the solution pickup hose into the chemical container. The container may be mounted above or slightly below the injector. NOTE: Follow the chemical manufacturer's use and safety instructions.
- Open the trigger gun and then open the chemical control valve and adjust it until you are picking up chemical solution at the desired rate.
- Do not allow the machine to run with the injector valve open and no chemical running through it. This will cause the pump to cavitate, causing damage to the seals and pump valves.

WARNING: Any metal parts that are exposed to the flow of the superheated water, such as the steam wand and hose couplings, become very hot during steam operation. Exercise extreme caution around these parts and wear protective clothing.

MOVING INSTRUCTIONS

WARNING - Moving any powered machinery can be hazardous, always do so with the utmost caution.

Electric Powered Machines
Turn off all power supplies, turn off gas valve and distinguish the pilot light. Have a qualified tradesperson disconnect the gas supply and the electrical connection. Ensure the machine is moved on an stable base.

Gas Powered Machines
Turn off engine, turn off gas valve and extinguish the pilot. Disconnect propane tank for stationary machines, or turn off propane tank for movable machines. Ensure machine is moved on a stable base.

Machines Equipped with Wheels and Castors
Follow directions noted above as applicable. Ensure moving surface is smooth and clear of debris. Lock castor when finished moving machine. CAUTION: Risk of Injury and Damage - Machine is very heavy and can tip.

STORAGE INSTRUCTIONS

Ensure machine is protected from the elements and from external damage. If machine is going to be sitting for any period of time, ensure gas supply is shut off, power to the machine is shut off and all the water is drained from the coil. You may wish to cover the machine to prevent a build up of dust or soot in the coil or around the motor.

Protection from Freezing
If your unit is exposed to freezing temperatures, extensive damage may be caused by water freezing inside the machine. Freezing can cause the heat exchanger coil to split. Freezing can cause pump heads to crack. Damage from equipment freeze up is not covered by warranty.

The most dependable approach to cold weather protection is to avoid exposing the machine to freezing temperatures. If the machine must endure freezing temperatures, the complete unit should either be drained of all contained water or filled with a suitable antifreeze solution.

Flushing the System
To remove any loose rust or scale which could become loose and clog the outlet nozzle or affect normal pump operation, flush the machine for about two minutes prior to using it for the first time and again if the machine has not been used for a few days. Flush the machine by removing the nozzle from the wand or by removing the complete gun/wand assembly from the output hose and then turning on the pumping module. (It is not necessary to operate the heater while you are flushing the unit.)

Daily Maintenance
- Check the oil level in the pump, engine and gear box (if applicable) at least daily. Use SAE 30 non-detergent oil in the pump , SAE 90W oil in the gear box, and the oil recommended by the engine manufacturer in the engine. NOTE: Oil in propane converted engines should be changed three times as often as gas engines.
- Check all hoses and hose fittings for leaks, cracks, or excessive abrasion. Replace the "O" - rings in the quick connect hose fittings if necessary.

Initially after first 50 Hours
- Change the pump oil.

Monthly or 50 Hour Maintenance
- Replace the pressure nozzle. Use the correct size orifice. See Pressure Nozzle Sizing Section
- Check for scale buildup in the coil. Remove the hose from the heat exchanger outlet and look for any visible scale accumulation.

100 Hour Maintenance
- Change oil in engine (if engine is propane converted, change at 30 hours).
- Change gear box oil.

500 Hour Maintenance
- Change the pump oil.

Water Hardness and Scale Buildup
Units operated in areas with "hard" or high mineral content water supply are often prone to developing a scale buildup within the heat exchanger coil (similar to deposits seen in electric kettles used to heat "hard" water). The tendency for scale to accumulate can be minimized by completely cooling the coil after each use. Allow water to flow through the coil with the burner turned "OFF" until the coil has cooled to the temperature of the inlet water.

When water conditions are such that scale buildup is inevitable, we recommend using a water conditioner of suitable capacity to soften the water prior to the pump inlet.

Check regularly for visible accumulation of scale in the heater coil. If there is any scale visible inside the pipe at the heat exchanger outlet, have the coil de-scaled by a qualified service technician. Refer to the de-scaling procedure.

Burner Removal
Shut off the gas supply line to the washer unit. Turn gas cock knob on gas valve to "OFF" position. Disconnect the thermopile/thermocouple and pilot line from the gas valve. Disconnect 3/4" pipe union in burner valve train. Remove the two burner retaining bolts. Slide burner down and out through open frame end.

DESCALING THE COIL

WARNING: Coil de-scaling using acid should only be done by qualified personnel.

The best way to acidize the coil is with a circulating pump capable of handling acids:
1. Fill a plastic container with a suitable acid diluted with water to the desired strength.
2. Connect the discharge from the circulating pump to the hot water outlet on the water heater with a suitable hose. Connect the inlet of the circulating pump to the acid container with the suction hose. Disconnect the

water heater inlet hose form the pump module and use it as a return hose to the acid container. Start the pump, circulating the acid solution through the coil and back into the acid container, As the acid dissolves the scale it becomes neutralized, so about every five minutes add more acid to the container until all the scale has been removed from the coil. Flush out coil thoroughly with water after de-scaling.

If no circulating pump is available, another good method can be used:

1. Remove high limit control and piping from coil outlet. Install a standpipe on the outlet of the coil. Disconnect the water heater inlet hose from the pump module and run to a drain or suitable container.

2. Remove cap from standpipe and pour in about 1/2 gallon of acid diluted 50/50 with water. Screw cap back on standpipe immediately. CAUTION: Do not stand directly over chamber when pouring, as acid may blow back upon contact with scale. After ten minutes, pour more acid into chamber. Repeat same procedure until coil is free of scale. Flush out coil thoroughly with water after cleaning. CAUTION: Never allow acid to remain in coil for long periods of time.

PRESSURE NOZZLE SIZING

A standard nozzle "number" consists of 4 or 5 digits. The first two digits specify the spray angle that the nozzle will provide. Standard high pressure spray nozzles have 4 available spray patterns: 0°, 15°, 25°, and 40°. The more concentrated the spray pattern is, the more impact the high pressure spray will have, but the area being cleaned will be decreased. Most pressure washers are provided with a "general duty" 25° nozzle.

Sizing nozzles for pressure washer units is fairly straightforward, with the exception of steam producing units, which are factory designed. Consult the factory for the sizing on these units. To size your nozzle:

For models with the following flows & pressures	Use nozzle #
2gpm @ 1000psi	**04
2gpm @ 1400psi	**03
3gpm @ 700psi	**07
3gpm @ 1000psi	**06
3gpm @ 1200psi	**07
3gpm @ 1500psi	**045
4gpm @ 2000psi	**05
4gpm @ 2200psi	**055
4gpm @ 3000psi	**045
5gpm @ 3000psi	**055

* Replace asterisks with desired spray angle.

Your dealer offers a wide range of options and accessories to customize your unit to best suit your particular application. Many of these features can be added to your machine in the field. Consult your dealer for an experienced recommendation regarding the features that will best assist you.

Time Delay Shutdown (Standard on BEN/P Series)
The Time Delay Shutdown option provides an automatic shutdown capability on any unit with an electrically driven pumping module. In multiple operator environments, particularly where the unit is located outside the wash bay, there can be a tendency for the pump unit to be left running in bypass mode for extended periods. The Time Delay Shutdown feature will automatically shut down the pump if there is no flow through the unit after an adjustable period of time thereby reducing the possibility of pump damage from overheating caused by extended bypass operation.

Standard Pressure Wash Nozzles
The standard pressure wash nozzle that is normally supplied with your unit has an orifice sized for the output specifications of your unit. However, there is a wide variety of spray angle patterns available for most orifice sizes. Your dealer usually stocks angles ranging from 0° to 40° for common orifice sizes and your dealer can advise you which pattern will work best for your application.

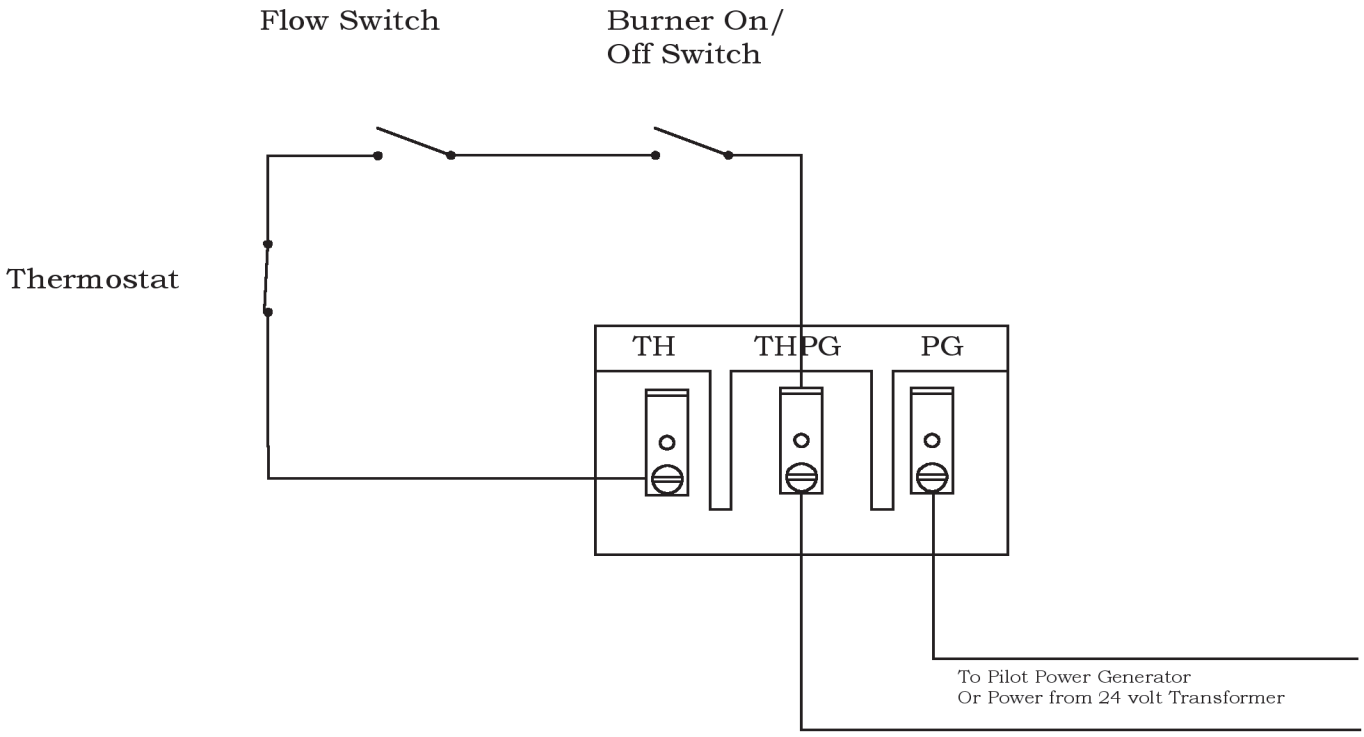
Specialty Nozzles
Consult your dealer for demonstrations of rotary nozzles (intensifiers), foam lances, wet sandblasting attachments, variable spray angle nozzles, water brooms and sewer and pipe cleaning nozzles.

Wands
Wands are available in a wide variety of lengths. Short wands simplify access in confined areas; long wands reach into those awkward spots and minimize ladder movement. Your dealer usually stocks a complete range of sizes.

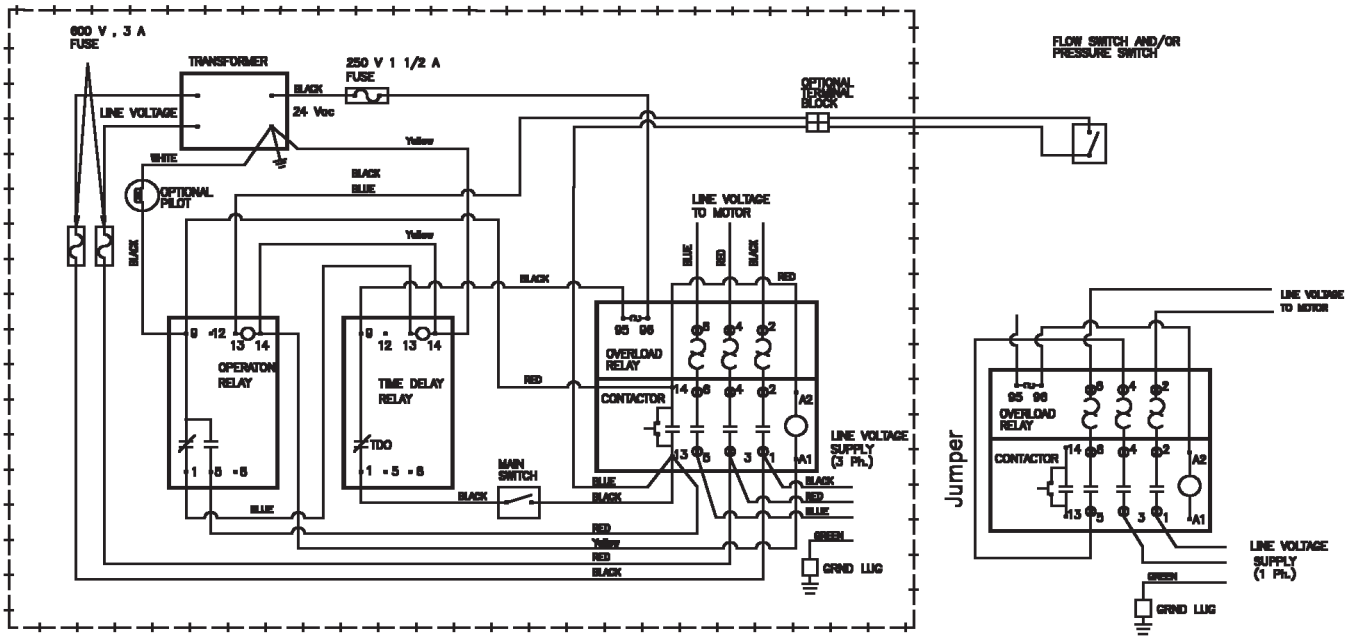
Hose Reels
Pressure wash outlet hoses are heavy and difficult to coil neatly. Providing a conveniently located hose reel makes it easy for the operator to put the hose away properly and can greatly extend hose life. Consult your dealer for the hose reel to suit your application.

Model	3620N/P, 3823 N/P, 4030N/P MHGSN/P 5030N/P, MHG400 N/P	MHG500N/P, UHE422BEN/P UHE430BEN/P, UHE520BEN/P, UHE530BEN/P
Heat Exchange Coil	SCH80 .840 OD ASTM A-53 Pipe	SCH80 .840 OD ASTM A-53 Pipe
Burst Pressure psi(bar)	14000 (965)	14000 (965)
Hydrostatic Test pressure psi(bar)	6000 (413)	6000 (413)
Venting Type	Class A	Class B
Burner	Impinged Jet, Naturally Aspirated	Impinged Jet, Naturally Aspirated
Orifice size	Natural Gas #55 drill size Propane # 65 drill size	Natural Gas #55 drill size Propane # 65 drill size
Ignition type	Standing Pilot W / piezo igniter or intermittent pilot with electronic igniter	Standing Pilot W / piezo igniter or intermittent pilot with electronic igniter
energy Input BTU/H (KW)	250000-350000 (73-102)	250000-350000 (73-102)
Manifold pressure inches (mm)	Natural Gas 5.3 (134) Propane 11 (279)	Natural Gas 5.3 (134) Propane 11 (279)
Temperature Rise °F (°C)	100 (37.7)	120 - 260 (49 - 126)
Flue size inches (mm)	9 (228)	8 (203)
Gas Valve Type	24 volt	24 volt
Electrical Controls	High limit switch Flow Switch Main power on/off	High limit switch Flow Switch Main power on/off
Safety Valve setting psi(bar)	3500 (241)	3500 (241)
Dimensions inches (mm) L x w x h	41 x 18 x 47 (1041 x 457 x 1193)	47 x 23 x 41 (1193 x 584 x 1041)
Weight lbs (kg)	345 - 500 (156 - 226)	560-600 (254 - 272)

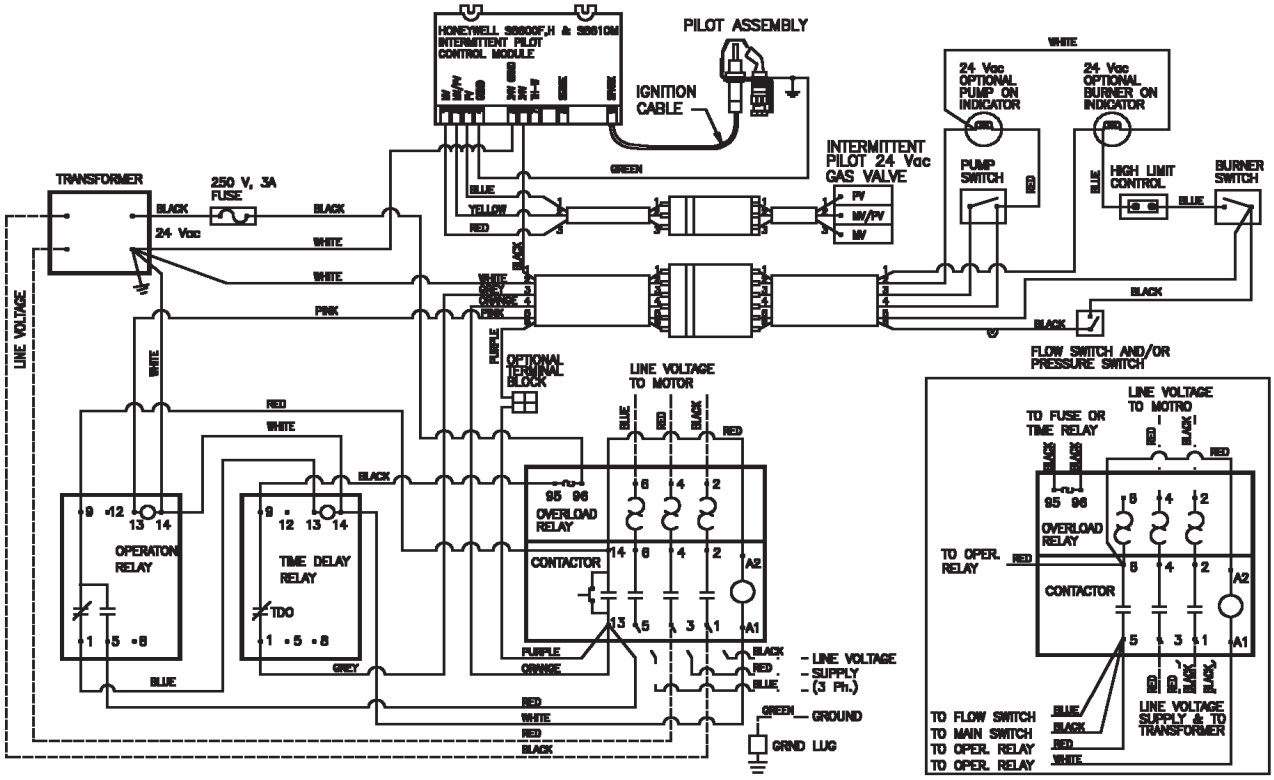
MHGN/P Heater Modules



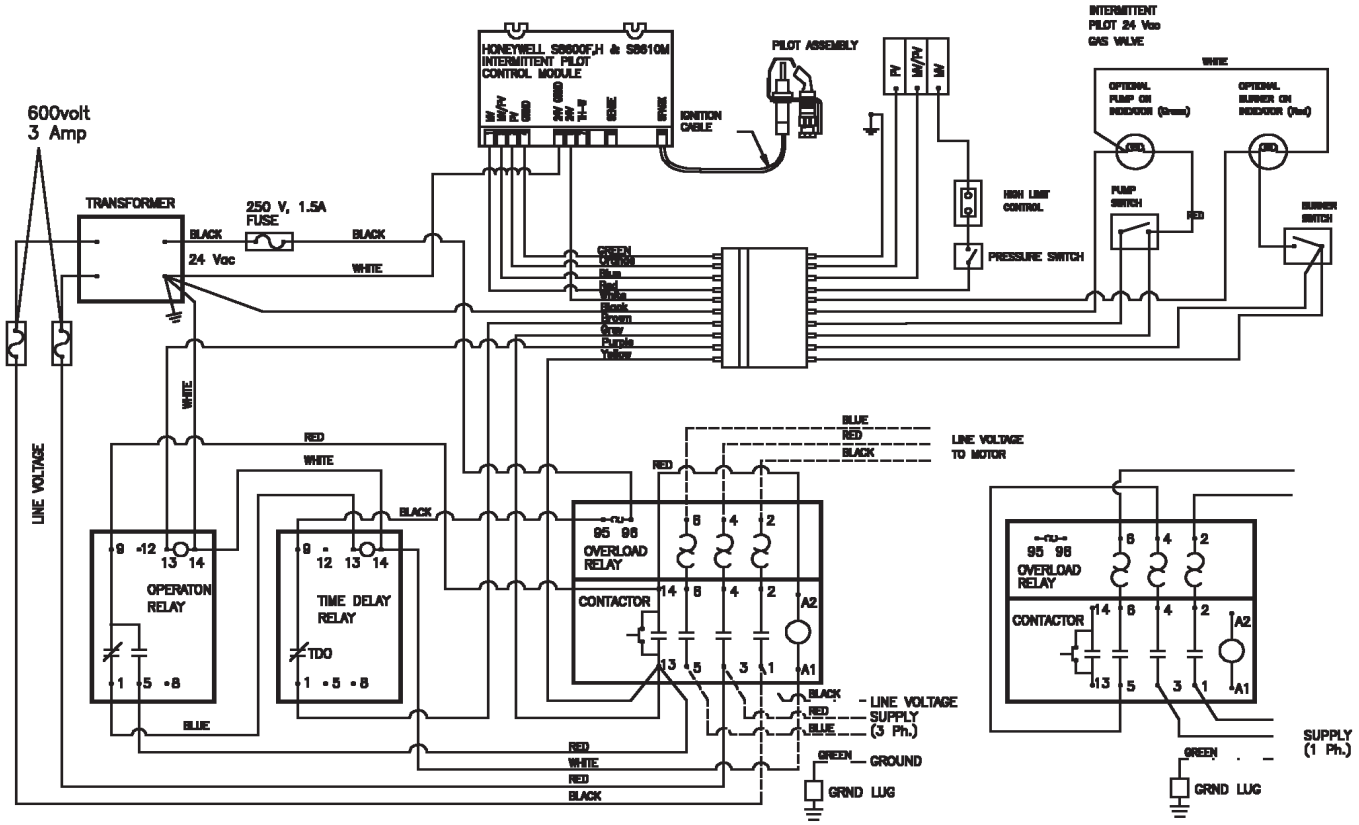
500 Series with Electronic Ignition
(prior to Nov 1999)



Ultra Hot Wiring with Electronic Ignition
(Nov 1999 to April 2002)

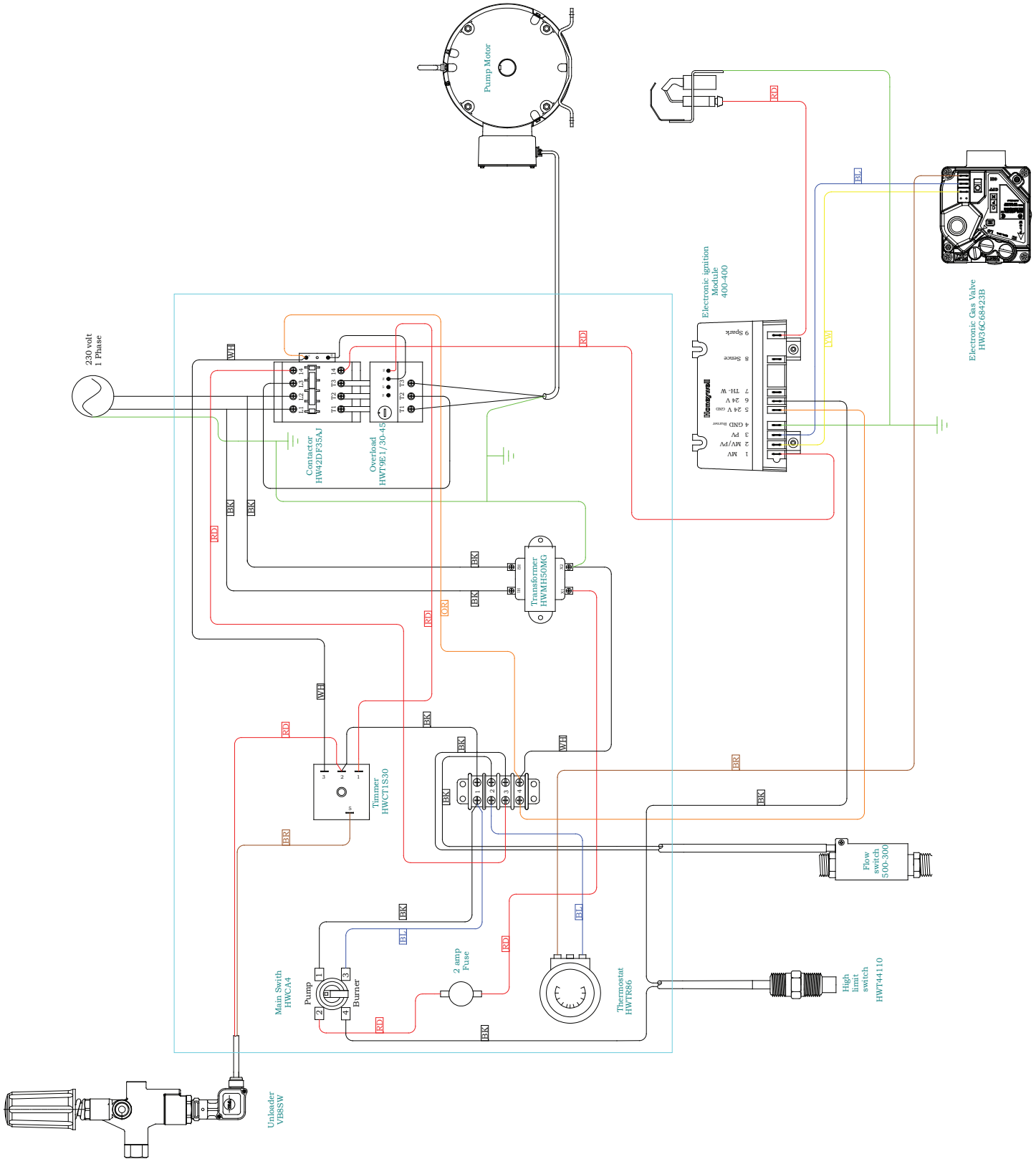


BEN / BEP SERIES
(November 2002)



BEN / BEP SERIES

1 Phase A-Vent

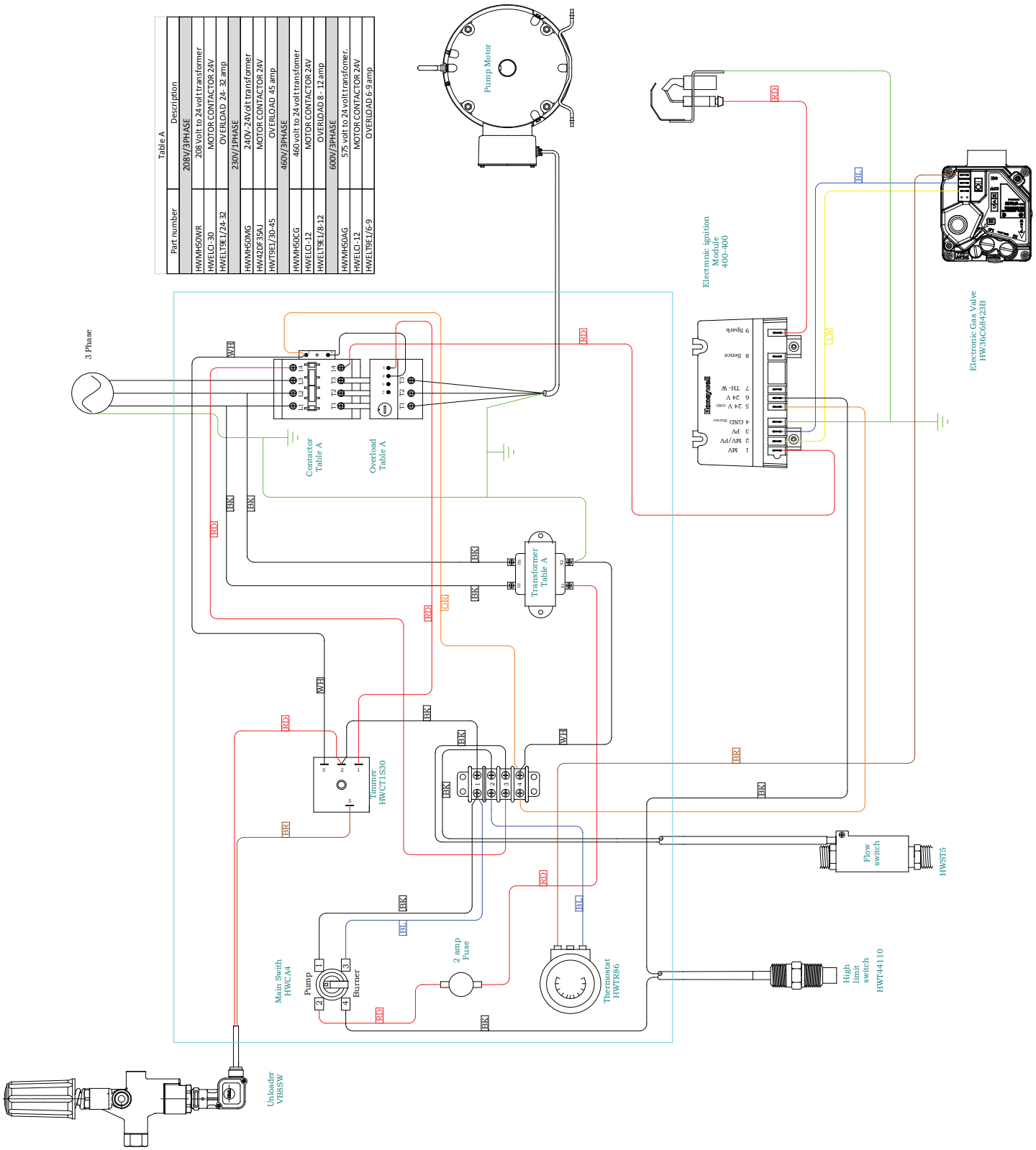


BEN / BEP SERIES

3 Phase A-Vent

Table A

Part number	Description
	208V/3PHASE
HWMH50WR	208 Volt to 24 volt transformer
HWELCI-30	MOTOR CONTACTOR 24V
HWELT9E1/24-32	OVERLOAD 24 - 32 amp
	230V/1PHASE
HWMH50MG	240V-24Volt transformer
HW42DF35AJ	MOTOR CONTACTOR 24V
HWT9EJ30-45	OVERLOAD 45 amp
	460V/3PHASE
HWMH50CG	460 volt to 24 volt transfomer
HWELCI-12	MOTOR CONTACTOR 24V
HWELT9E1/8-12	OVERLOAD 8 - 12 amp
	600V/3PHASE
HWMH50AG	575 volt to 24 volt transfomer.
HWELCI-12	MOTOR CONTACTOR 24V
HWELT9E1/6-9	OVERLOAD 6-9 amp



Effective May 1, 2002

This product is warranted to be free from defects in materials and workmanship under normal use and service, for a period of one year from the date of purchase, unless stated otherwise below, when operated and maintained in accordance with the Maintenance and Operation Instructions supplied with the unit. The warranty does not cover misuse or negligence.

This warranty is extended only to the original purchaser. Hoses, spray guns, wands and other accessories are warranted for 30 days. Warranty is void if repairs are attempted by anyone other than an Authorized Service Centre.

If a difficulty develops with the product, you should contact the nearest Authorized Repair Centre or DYNABLAST INC. office. Only these locations are authorized to make repairs to the product or replacement of defective parts, which will be done at no charge within a reasonable time after receipt of the product. Units or parts should be returned at the customer's expense to the nearest DYNABLAST location or Authorized Service Centre. Pack unit in a strong carton and pad tightly to avoid damage. Damage in transit is not covered by warranty. Include original purchase receipt with any claim (but keep a copy for your files).

DYNABLAST INC. liability under warranty is limited to repair of the product and/or replacement of parts and is given to the purchaser in lieu of all other remedies including incidental and consequential charges. There are no expressed warranties other than those specified herein.

SPECIAL WARRANTIES	WARRANTY PERIOD
Honda Engine (warranted by Honda) please refer to your engine owners manual.	2 year parts and labour
Interpump / General Pump Limited Warranty (see attached for details)	5 years non-wear parts
Fabricated Components (frame, coil skin, coil cap, handle, belt guard)	1 year parts, 1 year labour
Burner, Transformer, Control Switch, Safety Switch	1 year parts and labour
Schedule 80 Heating Coil Limited Warranty *(see below)	5 year parts, 1 year labour
Schedule 40 Heating Coil	2 year parts, 1 year labour

* Limited Coil Warranty (Schedule 80 only)
  - 100% cost of coil replacement, for up to 3 years, including 1 year labour.
  - 50% cost of coil replacement, for up to 4 years, not including labour.
  - 25% cost of coil replacement, for up to 5 years, not including labour.

We must receive the coil serial number section of the coil to substantiate the warranty claim.

We will not replace coils under warranty if the coils have been subjected to misuse such as:
1. Freezing 2. Lime Deposit 3. Other foreign material deposit 4. Shock or Vibration

Any replacement during the warranty period will have a warranty of one (1) year, or the balance of the original warranty, whichever is greater.

Contact your dealer for sales and service support. For your nearest dealer, contact Dynablast Inc. Mississauga, Ontario, Canada at 1-877-52BLAST.

Warranty for Pumps on Dynablast Pressure Washers

January 1, 2002

The following statement is intended to assist our customers in understanding the terms of our warranty, the circumstances under which we will honour claims and the procedure for making such claims.

Dynablast Inc. warrants each pump manufactured by Interpump and General Pump to be free of defects in material and workmanship for a period of (5) five years from the date of shipment. In addition, Dynablast Inc. warrants all forged brass manifolds to be free of defects in material and workmanship and from damage resulting from freezing for the life of the pump. Liability under this warranty is on all non-wear parts and limited to the repair and replacement of any pump returned to Dynablast Inc. which upon inspection, is judged to be defective due to workmanship or material failure. Any product returned to Dynablast Inc. should be shipped freight prepaid to:

Dynablast Inc.
2625 Meadowpine Blvd.
Mississauga, Ontario, Canada
L5N 7K5

and must display a Return Goods Authorization number obtained from Dynablast Inc. Inside Sales Department 1-877-522 5278, Fax (905) 567-9222.

In the course of marketing or servicing the customer or potential customer's needs, Dynablast Inc. will use its best judgement in its recommendations. However, the ultimate responsibility for product application decisions shall rest with the customer. The sole and only warranty made by Dynablast Inc. is the limited warranty described above. Dynablast Inc. makes no other warranty of any kind, expressed or implied, including any implied warranty or merchantability or of fitness for a particular use or purpose. Dynablast Inc. disclaims and denies any liability for any direct, indirect, special incidental or consequential damages which may be suffered as a result of sale, delivery, servicing, use, loss of any product, downtime, labour, freight or other charges not expressly included herein. The only liability and the total liability of Dynablast Inc. under this warranty or in any claim involving Dynablast Inc. is expressly limited to the replacement or purchase price of the product.

The following items are not warranted due to matters beyond Dynablast Inc.'s control.

1. Normal wear and tear on parts that are considered standard wear parts;
2. Defects caused by the fault or negligence of the buyer or third buyer;
3. Use of unauthorized repair parts;
4. Modifications made by the customer;

This warranty statement supercedes and replaces non-dated warranties or previously dated warranties and applies to pressure washers shipped after January 1, 2002. The Interpump and General Pump pumps included on pressure washers from Dynablast Inc. will be eligible for warranty consideration as outlined above.

FAULT	CAUSE	REMEDY
Pump running normally but pressure low or lack of water on installation	1. Nozzle incorrectly sized or plugged. 2. Pump sucking air. 3. Valves sticking. 4. Unloader valve seat faulty. 5. Worn piston packing. 6. Insufficient water from main water supply. 7. Coil restricted or plugged.	1. Check and replace/clean if necessary. 2. Check water supply and possibility of air ingress. 3. Check and clean or replace if necessary. 4. Check and replace if necessary. 5. Check and replace if necessary. 6. Check main water supply valve & inlet plumbing for blockage and fully "on" position. Open valve, remove blockage. 7. See descale procedure, appendix D.
Fluctuating Pressure	1. Pump sucking air. 2. Valves worn. 3. Blockage in valve. 4. Worn piston packing.	1. Check water supply and air ingress. at joints in suction line. 2. Check and replace if necessary. 3. Check and clean out if necessary. 4. Check and replace if necessary.
Pressure low after period of normal use	1. Nozzle worn. 2. Suction or delivery valves worn. 3. Suction or delivery valves blocked. 4. Unloader valve seat worn. 5. Worn piston packing.	1. Check and replace if necessary. 2. Check and replace if necessary. 3. Check and clean if necessary. 4. Check and replace if necessary. 5. Check and replace if necessary.
Pump noisy	1. Air in suction. 2. Broken or weak suction or delivery valve spring. 3. Foreign matter in valves. 4. Worn bearings. 5. Excessive temperature of liquid.	1. Check water supply and corrections on suction line. 2. Check and replace if necessary. 3. Check and replace if necessary. 4. Check and replace if necessary. 5. Reduce to below 75°C.
Presence of water in oil	1. Oil seal worn. 2. High humidity in air. 3. Piston packing worn.	1. Check and replace if necessary. 2. Check and change oil twice as often. 3. Check and replace if necessary.
Water dripping from under pump	1. Piston packing worn. 2. O.R. plunger retainer worn.	1. Check and replace if necessary. 2. Check and replace if necessary.
Oil dripping	1. Oil seal worn	1. Check and replace if necessary
Loss of motor speed	1. Improper voltage or frequency. 2. Inadequate size feed line to unit. 3. Electric motor overloaded.	1. Check motor nameplate electrical requirements and inspect main power supply, fuses and circuit breakers for proper voltage and frequency (hertz). 2. Check local electrical code. Repair or replace. 3. Check coil back pressure. Descale if back pressure exceeds 40 psi.
Excessive vibration in delivery line	1. Irregular functioning of the valves.	1. Check and replace if necessary.

FAULT	CAUSE	REMEDY
A. Pilot will not light	1. Gas leak in pilot tube. 2. Low or high gas supply pressure. 3. Very high draft or down draft 4. Air in the gas line. 5. No spark: No main power, or faulty transformer, limit switch or faulty ignition control or piezo ignitor.	1. Check all fittings with a soap solution. Do not check for leaks with an open flame. 2. Ensure that gas supply pressure at pressure tap on gas valve (located next to the pilot tube outlet) is the specified pressure. 3. Correct draft extremes. 4. Purge air. 5. Perform normal system checks of main power, main rotary switch, transformer, limit switch, ignition control unit and replace faulty components. Check electrode gap or any possibility of electrode shorting to other metal parts. Be sure that all connections are tight. Also the ignition control and pilot burner must both be chassis ground. If there is still no spark, the pilot and electrode assembly must be replace.
B. Pilot ignites, but will not continue burning after holding down knob on gas valve for two minutes or after spark.	1. Insufficient pilot flame. 2. Thermopile or thermocouple connection loose at automatic gas valve, or sensor connection loose. 3. Defective thermopile or thermocouple.	1. Increase pilot flame by adjusting throttling screw on gas valve (located just to left of terminal block on valve). 2. Tighten screw terminals or plug. 3. Check output voltage with a voltage meter with pilot burning. Output should be a minimum of 250 millivolts for millivolt system and 18 mV for 24 volt system. If lower, check A1, A2 and A3 before installing new thermopile.
C. Sparking but no pilot gas.	1. No gas supplied to pilot valve. 2. Manual valve(s) in "off" position. 3. Faulty pilot valve or faulty wiring. 4. Faulty ignition control unit.	1. Clean pilot orifice, pilot tubing and gas pressure for obstruction. 2. Fully open all manual gas valves. 3. Check the continuity of all wire terminals and pilot valve. 4. Check the "MV/PV and PV" and MV/PV and PV" terminals of ignition control. If reading is not 24 Vac, replace the ignition control.
D. Short thermopile life	1. Excessive heat from pilot	1. Decrease pilot gas supply
E. Pilot flame is lit but main burner does not come on	1. Manual cock on the gas valve is closed. 2. Pilot flame low or wrong pilot burner location. 3. Faulty main gas operator on the gas valve. 4. Faulty wiring or ignition control unit. 5. Check for loose electrical connections at thermostat, gas valve, burner toggle switch and inside heater switch box. 6. Burner switch, flow switch, gas valve, controllers or thermostat high-limit inoperative	1. Open manual book. 2. Following the valve instruction to adjust pilot flame, check gas pressure and pilot line for obstruction when needed. Or relocate the pilot close to main burners. 3. Check the voltage of the main gas operator on the gas valve. If the voltage is the right voltage and the burner still won't turn on, replace main gas operator. 4. Check the "MV/PV" and "MV" terminals in the ignition control. If 24 Vac is present, repair or replace wiring. If not, replace ignition control. 5. Tighten connections. 6. (REFER TO RELATIVE WIRING DIAGRAM) Perform normal system checks of main power, main rotary switch, transformer, limit switch and control components. Replace faulty components.