

EASY-KLEEN

PRESSURE SYSTEMS LTD.

MANUFACTURER OF HIGH PRESSURE CLEANING EQUIPMENT

Owner's Manual

Commercial and Industrial Cold Water Electric



Manual 1 ENGLISH

1-800-315-5533 • service@easykleen.com • www.easykleen.com

Easy-Kleen Pressure Systems

1-800-315-5533

This manual contains operational information that is specific for commercial and industrial cold water, electric driven machines.

Read the following instructions carefully before attempting to assemble, install, operate or service this pressure washer. Failure to comply with these instructions could result in personal injury and/or property damage.

Table of Contents

IMPORTANT SAFETY INFORMATION	3
SERVICE MANUAL	4
SPECIFICATIONS.....	5
INTRODUCTION	7
OPERATING INSTRUCTIONS.....	8
CHEMICAL APPLICATION.....	9
WINTER PUMP PROTECTION	10
GENERAL MAINTENANCE.....	10
MAINTENANCE CHECKLIST	10
GLOSSARY OF TERMS.....	11
COMPONENT IDENTIFICATION.....	12
QUICK DIAGNOSTICS AND SOLUTIONS GUIDE.....	18
MANUFACTURER'S WARRANTY	19
CIRCUIT DIAGRAMS	21

IMPORTANT SAFETY INFORMATION

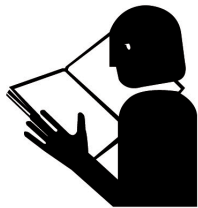
The safe operation of our pressure washing systems is the FIRST priority of Easy-Kleen. This will only be achieved by following the operation and maintenance instructions as explained in this manual and all other enclosed manuals.

This manual contains essential information regarding the safety hazards, operations, and maintenance associated with this machine. The manual should always remain with the machine, including if it is resold.

ALL CAUTIONS AND SAFETY WARNINGS MUST BE FOLLOWED TO AVOID INJURY OR DAMAGE TO EQUIPMENT.

THIS EQUIPMENT IS TO BE USED ONLY BY TRAINED OPERATORS AND MUST ALWAYS BE ATTENDED DURING OPERATION.

⚠ CAUTION



Read the owner's manual thoroughly. Failure to follow instructions could cause malfunction of the machine and result in death, serious bodily injury and/or property damage.

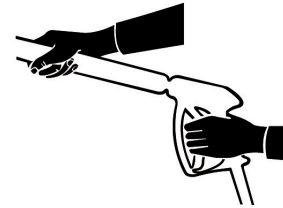


High pressure spray can cause paint chips or other particles to become airborne and fly at high speeds. To avoid personal injury, eye, ear, hand, and foot safety devices must be worn.

⚠ WARNING



Risk of Electrocution. Keep wand, hose, and water spray away from electrical wiring or fatal shock may result. The machine's electrical supply must be connected to a GFCI (Ground Fault Circuit Interrupter).



Trigger gun kicks back - Hold with both hands. Hot Surfaces - Use only designed gripping areas of lance.

⚠ CAUTION



Risk of injection or severe injury to persons - keep clear of nozzle - do not direct discharge stream at persons. This machine is to be used only by qualified operators.



Beware of Gun Back Pressure - be extremely careful when using a ladder, scaffolding or any other relatively unstable location. The cleaning area should have adequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.

⚠ WARNING

- Keep hands clear from belt guard and other moving parts. **DO NOT OPERATE MACHINE WITH BELT GUARD REMOVED.**
- Protect high pressure hoses from sharp objects and vehicles. Inspect condition of hoses prior to use, or serious injury could occur.
- Do not pass acids or other caustic or abrasive fluids through the pump.
- Do not attempt to operate this machine if fatigued or under the influence of alcohol, prescription medications or drugs.
- Some of the maintenance procedures involved in this machine require a certified technician (these steps are indicated throughout this manual). Do not attempt to perform these repairs if you are not qualified.
- For further assistance, call our toll free number 1-800-315-5533.

Easy-Kleen Pressure Washers Service Manual

This manual is intended for technical personnel to assist in the diagnosis and repair of issues with pressure washers. Some of the information in this manual will apply to other pressure washer models and may not apply to this model.

This manual is not intended for use by non-technical personnel.

It is advised to always refer to competent technical personnel when repairs are advised to avoid equipment damage or potential personnel injury.

If you need further explanation of any of the information in this manual, suspend any activity involving the equipment and call our toll free number for assistance, 1-800-315-5533.

 **WARNING**
CALIFORNIA Proposition 65

Detectable amount of chemicals known to the State of California to cause cancer, birth defects or other reproductive harm may be found in pressure washing equipment, accessories and exhaust.

California Health and Safety Code 25249.5

For More Information Visit
www.p65warnings.ca.gov D01-00612

SPECIFICATIONS

Commercial Cold Water Electric				
MODEL	GPM	PSI	DRIVE RPM	HP/VOLTAGE
AS152E Alternate Spec	2.2	1500 1000	1750	2/110/1ph 15 Amps
AS2436E	3.6	2400	1750	5/220/1ph
AS253E-GP	3.5	2400	1750	5/220/1ph
AS304E	4	3000	1750	7.5/220/1ph
AS3636E	3.6	3600	1750	7.5/220/1ph
AS3035E-GP	3.5	3000	1750	7.5/220/1ph

Industrial Cold Water Electric					
MODEL	GPM	PSI	DRIVE	HP	VOLTAGE
IS204FE-1	4	2000	FLANGE/COUPLING	5	220V 1ph
IS204FE-3	4	2000	FLANGE/COUPLING	5	208/440/575V3ph
IS204E-1	4	2000	BELT	5	220V 1ph
IS204E-3	4	2000	BELT	5	208/440/575V 3ph
IS304FE-1	4	3000	FLANGE/COUPLING	7.5	220V 1ph
IS304FE-3	4	3000	FLANGE/COUPLING	7.5	208/440/575V 3ph
IS304E-1	4	3000	BELT	7.5	220V 1ph
IS304E-3	4	3000	BELT	7.5	208/440/575V 3ph
IS255FE-3	5	2500	FLANGE/COUPLING	7.5	208/440/575V 3ph
IS208E-3	8	2000	BELT	10	208/440/575V 3ph
IS306E-1	5.5	3000	BELT	10	220V 1ph
IS306E-3	5.5	3000	BELT	10	208/440/575V 3ph
IS404FE-1	4	4000	FLANGE/COUPLING	10	220V 1ph
IS404FE-3	4	4000	FLANGE/COUPLING	10	208/440/575V 3ph
IS1212E-3	12	1200	BELT	10	208/440/575V 3ph
IS3606E-3	6	3600	BELT	15	208/440/575V 3ph
IS465E-3	6.5	4000	BELT	20	208/440/575V 3ph
IS505E-3	5	5000	BELT	20	208/440/575V 3ph
IS310E-3	10	3000	BELT	20	208/440/575V 3ph
IS2512E-3	12	2500	BELT	20	208/440/575V 3ph
IS3685E-3	8.5	3600	BELT	20	208/440/575V 3ph
IS654E-3	4.3	6500	BELT	20	208/440/575V 3ph
IS704E-3	4	7000	BELT	20	208/440/575V 3ph
IS808E-3	8	8000	BELT	50	208/440/575V 3ph

In-Plant Systems				
MODEL	GPM	PSI	HP	VOLTAGE
IP1010E-1	10	1000	7.5	208/440/575V 3ph
IP1510E-1	15	1000	10	208/440/575V 3ph
IP2110E-1	21	1000	15	208/440/575V 3ph
IP1022E-1	10	2200	15	208/440/575V 3ph
IP4210E-2	42	1000	2 X 15	208/440/575V 3ph
IP3612E-1	36	1200	30	208/440/575V 3ph
IP4510E-1	45	1000	30	208/440/575V 3ph
IP7212E-2	72	1200	2 X 30	208/440/575V 3ph
IP9010E-2	90	1000	2 X 30	208/440/575V 3ph
IP13510E-3	135	1000	3 X 30	208/440/575V 3ph
IP18010E-4	180	1000	4 X 30	208/440/575V 3ph
IP2320E-1	23	2000	30	208/440/575V 3ph
IP4620E-2	46	2000	2 X 30	208/440/575V 3ph
IP6012E-1	60	1200	50	208/440/575V 3ph
IP7010E-1	70	1000	50	208/440/575V 3ph
IP6010E-1	60	1000	40	208/440/575V 3ph
IP3025E-1	25	3000	50	208/440/575V 3ph
IP4020E-1	20	4000	50	208/440/575V 3ph

Firehouse & Car Detailing Series					
MODEL	GPM	PSI	DRIVE	HP	VOLTAGE
FD2040E	4	2000	DIRECT DRIVE	5	230V-1PH
FD3035E-GP	3.5	3000	DIRECT DRIVE	7.5	230V-1PH
FD2435E-GP	3.5	2400	DIRECT DRIVE	5	230V-1PH

Marine Series Electric					
MODEL	GPM	PSI	DRIVE	HP	VOLTAGE
ES204E-A	4	2000	FLANGE & COUPLING	5	220/1PH
ES204E-A-3	4	2000	FLANGE & COUPLING	5	230/440/575V 3PH
ES304E-A	4	3000	FLANGE & COUPLING	7.5	220/1PH
ES304E-A-3	4	3000	FLANGE & COUPLING	7.5	230/440/575V 3PH
ES404-A	4	4000	FLANGE & COUPLING	10	220/1PH
ES404-A-3	4	4000	FLANGE & COUPLING	10	230/440/575V 3PH

INTRODUCTION

Thank you for selecting a quality Easy-Kleen product. We are pleased to have you included among the many satisfied owners of Easy-Kleen cleaning machines. Years of engineering have gone into the development of these fine products and only top quality components and materials are used throughout. Each machine is carefully tested and inspected before leaving our plant to ensure years of dependable performance.

To continue to receive satisfactory performance, remembering that this machine represents a substantial investment on your part, and if properly cared for and maintained it will return this investment many times over. As with all mechanical equipment, your machine requires proper operation and maintenance as outlined in this manual for maximum trouble free life.

This manual has been prepared under the direction of our engineering and service technicians. Their experience in designing, manufacturing, installing and servicing our equipment from our company's inception is condensed in this manual. They know what information the end user needs in order to get the optimum performance from their pressure washer. Please read carefully.

This manual contains information that will be specific for your pressure washer, as well as similar models.

Carefully review any additional manuals that have been included with your system and follow ALL ADDITIONAL OPERATING INSTRUCTIONS AND SAFETY NOTICES. They are specific for the quality components that have been used to manufacture your machine and are an integral part of the operating and maintenance procedures.

The management & staff at Easy-Kleen are proud of the equipment that we design and manufacture, and we thank you for making us your # 1 choice in pressure washers. If you have any questions please do not hesitate to call us, 1-800-315-5533.

Our goal is that you will be satisfied with the performance, quality, and service you receive from Easy Kleen and that if you need to replace this machine in years to come, you will give us the opportunity to continue supplying equipment to your company.

PLEASE READ MANUALS CAREFULLY BEFORE USING MACHINE. EXAMINE MACHINE AND CRATE CAREFULLY FOR SHIPPING DAMAGE OR MISSING PARTS. REPORT PROMPTLY ANY SHORTAGES OR DAMAGE CLAIMS TO FREIGHT CARRIER OR DEALER.

OPERATING INSTRUCTIONS

1. Perform pre-start maintenance inspection on all applicable systems prior to operating the machine. This is essential for the safe, effective and efficient operation. You will get optimum performance from your system ONLY if these instructions and inspections are followed. Any indication that the pressure washing system was not operated and maintained according to these instructions may cancel the manufacturers' warranty.

Controls – Make sure all controls turned to the off position.

Pump – Oil level - Level the pressure washer. Be sure oil level in the pump is correct on dip stick. If the level is low, add the correct oil to the proper level. **USE ONLY SAE 30 W NON-DETERGENT OIL OR HYDRAULIC 68. DO NOT OVER FILL.**

Visually inspect all electrical components to assure they are in good condition, showing No signs of exposure, breakage or splicing.

Visually inspect all hoses, nozzles and guns to assure they are in good condition. If replacements are necessary they must be rated to withstand the machines operating pressure and temperatures.

2. Attach high-pressure hose to water outlet quick connector. Attach the other end of high pressure hose (with quick coupler) to spray gun. Ensure that quick disconnect connections are tightly locked together. Apply a sharp pull on hose to confirm they are secured.

Attach wand nozzle specific to task requirements (i.e. chemical or pressure wash).

[Quick Coupling Operation – Pull back sleeve end and insert male end into nozzle quick coupler, release sleeve and confirm connection by pulling on nozzle].

3. Attach water source to water inlet located on pump. The water source must be attached with a good quality standard garden type hose (1/2" minimum is required). Connect male fitting into the female pump inlet fitting. Make sure that the inlet screen/filter is intact and fitted correctly. Turn on water source. WATER MUST BE IN SUFFICIENT SUPPLY, AND PRESSURE MUST BE BETWEEN 20 –60 PSI TO ENSURE PROPER AND SAFE OPERATION. Specific attention should be given if using a well water supply. Ensure water is flowing from end nozzle with trigger gun pulled. Deplete system of all air.

4. Start electric motor. Turn PUMP switch to 'ON'. PUMP switch is located on the frame beside the motor, or for auto stop/start systems, PUMP switch is located on the electrical box.

5. Pressure adjustment - The pressure regulator (unloader) is located on the pump (see diagram). It controls pressure being generated by the pressure washer. This regulator may be adjusted to the desired pressure by turning the adjustment knob. Turning the adjustment knob clockwise will increase the pressure. NEVER OPERATE SYSTEM AT A HIGHER PSI THAN THE MAXIMUM RATING OF 160° F. This machine has been adjusted to operate at a specific maximum pressure as per the machine specifications. Pressure may be reduced for lighter use by turning the Pressure Regulator/Unloader counter clockwise. If continuing to turn the unloader clockwise does not increase the pressure, then this implies the maximum has been reached for the system. Any further turning of the unloader will cause the pressure to spike when the wand trigger is released, resulting in possible damage to the machine. To avoid this effect, loosen the unloader (counter-clockwise) until the pressure just starts to drop (see pump head pressure gauge) and until it no longer exceeds the maximum pressure rating for the machine.

6. You are now ready to start the cleaning operation - Pull trigger on the pressure wand assembly to start cleaning. To stop the pressurized water, release the trigger. **DO NOT LEAVE UNIT RUNNING WHEN NOT IN USE.**

7. To stop Operation. Turn PUMP switch to 'OFF'. Squeeze and release trigger after shutting off to relieve system of pressure.

8. Prior to storage – Inspect pressure washer for any damage or required maintenance. If your machine is to be exposed to cold weather, please refer to winter pump instructions found in this manual. If possible, do not allow unit to remain outside in the elements.

Warning – If unit is left running while not in use, pump damage may occur. Do not leave unit running while not in use!

CHEMICAL APPLICATION

Downstream Chemical Injection: Standard (Direct Drive Units) High Pressure Soap (Belt and Flange Driven Units) (Optional)

NOTE: Do not remove back flow preventer as chemical may flow back into potable water source. For standard chemical injection, ensure the black nozzle is properly fitted at the end of the wand. The chemical injector will not function if this nozzle is not fitted.

1. Chemical preparation – Select detergent/chemical that best suits your cleaning task. Prepare dilution according to the manufacturer's instructions. The volume of chemical being used may be adjusted at valve located on the chemical injector. Note: for EK Pumps, the volume is preset and cannot be adjusted.

2. Insert the intake hose, located on the chemical injector at the pump, into the chemical being used.

3. Fit black nozzle on the standard wand, or for the dual wand, turn adjustment knob on, and adjust for required flow rate. For high pressure soap systems, the black nozzle is not needed; use one of the other wand nozzles.

4. To apply chemical, engage trigger on pressure wand assembly. Turn chemical injector's nipple to adjust flow. For the high pressure soap systems, open ball valve and engage trigger.

5. Chemical can now be applied through pressure wand assembly. It will take 5 – 15 seconds for chemical to travel to spray nozzle. The volume of chemical being used may be adjusted at the chemical injector.

6. For best results apply chemical from bottom to top, and allow for proper penetration time prior to rinsing. Do not allow chemical to dry. Rinse from bottom to top and then top to bottom.

WINTER PUMP PROTECTION

The following procedure MUST be used when the pressure washing unit is stored at temperatures below freezing.

1. All water must be drained or blown (via compressed air) from system. Connect a short piece of male fitted ½" garden type hose on to the female inlet on the pump.
2. Place the open end of the hose into a wide mouthed container of full strength, winter rated, vehicle windshield washing fluid or Anti-Freeze, **RATED FOR MINIMUM -40°C**.
3. Connect the pressure wand assembly.
4. Start the pump and engage trigger on the pressure gun. Operate the system until the fluid runs the same color as the windshield washing fluid. Your machine is now prepared for storage.
5. Disconnect fluid supply, blow out with compressed air, and cap end.

GENERAL MAINTENANCE

Water Condition

Use a softener on your water system if local water is known to be high in mineral content. The advantages of soft water are very beneficial: prevents scale buildup in heater coil, cleans better with considerably less detergent, prevents streaking on painted surfaces and glass when rinsing.

MAINTENANCE CHECKLIST

- Daily:**
1. Check pump oil for proper level and adjust accordingly.
 2. Examine the quality of the oil.
 3. Check pump for oil and/or water leaks.
 4. Inspect and clean inlet filters.

- Weekly:**
1. Examine all fittings, components and connections for damages, loose parts, or leaks. – Replace accordingly—
 2. Check for water leaks
 3. Check thermostate

- Monthly** 1. Check fuel filter

Recommendation for Oil Changes and Component Replacement

1. Change the oil in the pump after the first 50 hours and every 500 hours after the initial oil change. Use SAE 30 W Non-Detergent for GP Pumps and Hydraulic 68 for EK Pumps.
2. Change all other components on the pump as needed.

GLOSSARY OF TERMS

AUTO START/STOP – Unit will automatically start when the trigger is pulled, and it will stop the motor on time delay after the trigger has been released in order to prevent the pump from bypassing and overheating.

PSI – Pounds per square inch. Pressure washers are designed and rated to operate at a specific PSI. Operating at pressures exceeding the maximum rating could result in damage to the unit and/or SEVERE PERSONAL INJURY.

GPM – Gallons per minute. The orifice on the pressure wand assembly has been selected to deliver up to the maximum GPM for your machine.

PRESSURE WAND ASSEMBLY – This refers to the gun, wand, and nozzle.

PUMP – The pump moves the water through the system and delivers it to the pressure wand assembly.

UNLOADER VALVE – Is a valve located at the head of the pump for unloading water back into the bypass when the trigger gun is shut off. It also reduces the load on pump when gun is off.

OIL, PUMP – The oil used within the pump to lubricate its operation. It is Important to use only SAE 30 W Non Detergent (for GP Pumps) or Hydraulic 68 (for EK Pumps) in the pump.

BACK FLOW PREVENTER – Device to prevent flow backwards into potable water supply.

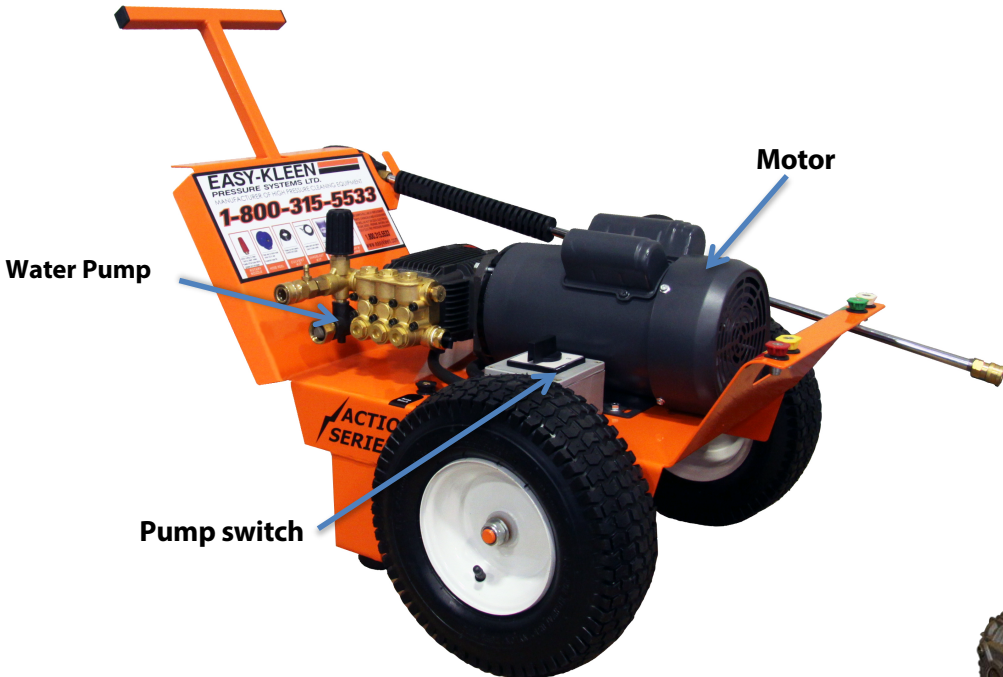
MAXIMUM WORKING PRESSURE - Each machine is equipped with a safety pressure relief valve which prevents over pressurization of the high pressure system. It is an important safety device and must not be tampered with in any way.

PRESSURE SWITCH - A pressure switch is used to control the motor for the auto stop/start feature (see diagram).

FLOW SWITCH – A flow switch is installed on the outlet of the high pressure pump and will shut off the pump and motor in the absence of water flow as well as turning it back on when flow is detected (by squeezing the trigger).

COMPONENT IDENTIFICATION

Commercial Model: AS Series



Motor

Water Pump

Pump switch



Hand Carry Frame



Wall Mount Frame

Industrial Model: IS Series

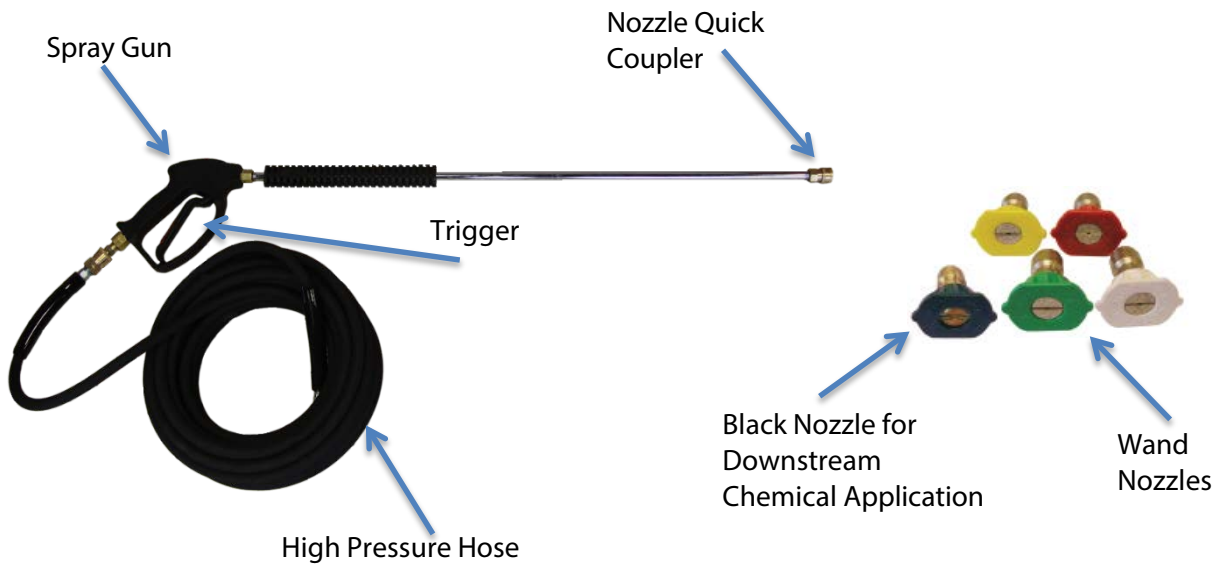


**Model shown with optional auto stop start.*

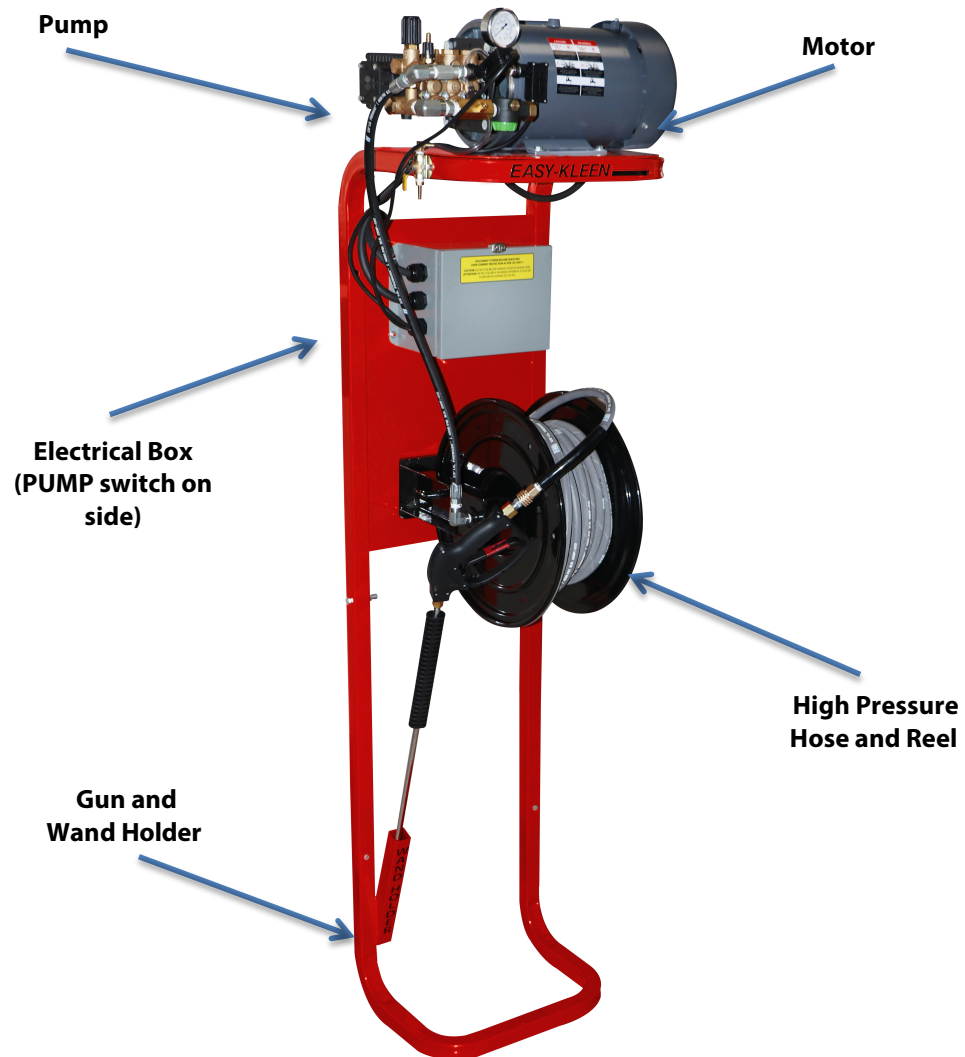


Stationary Frame

Pressure Wand Assembly:

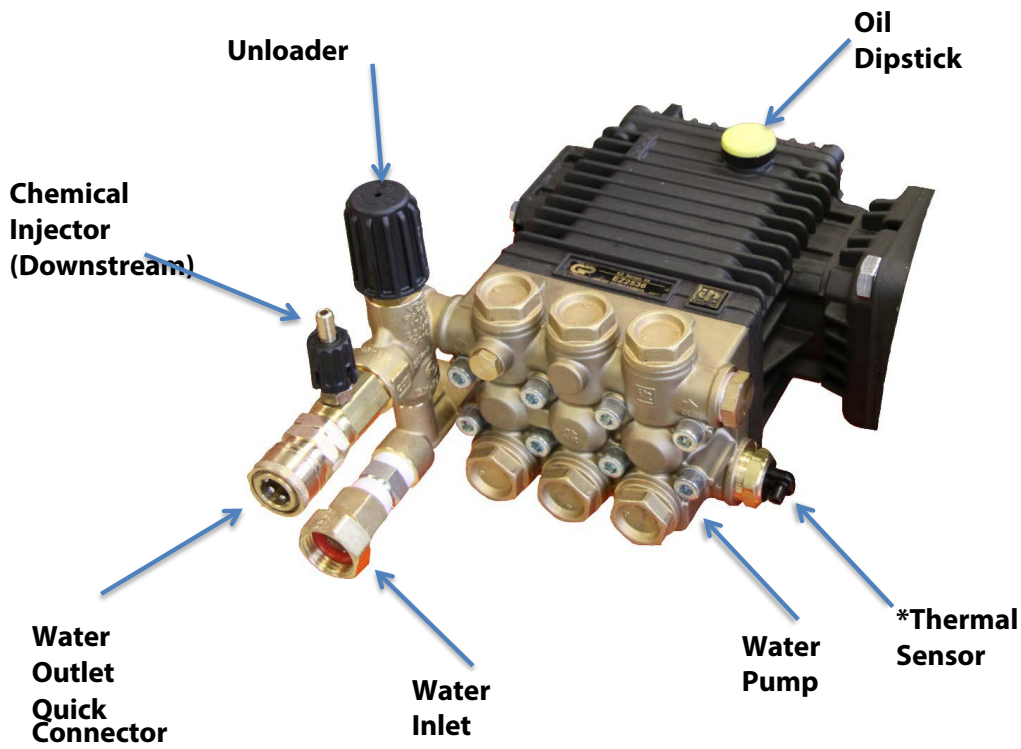


Firehouse and Car Detailing System:



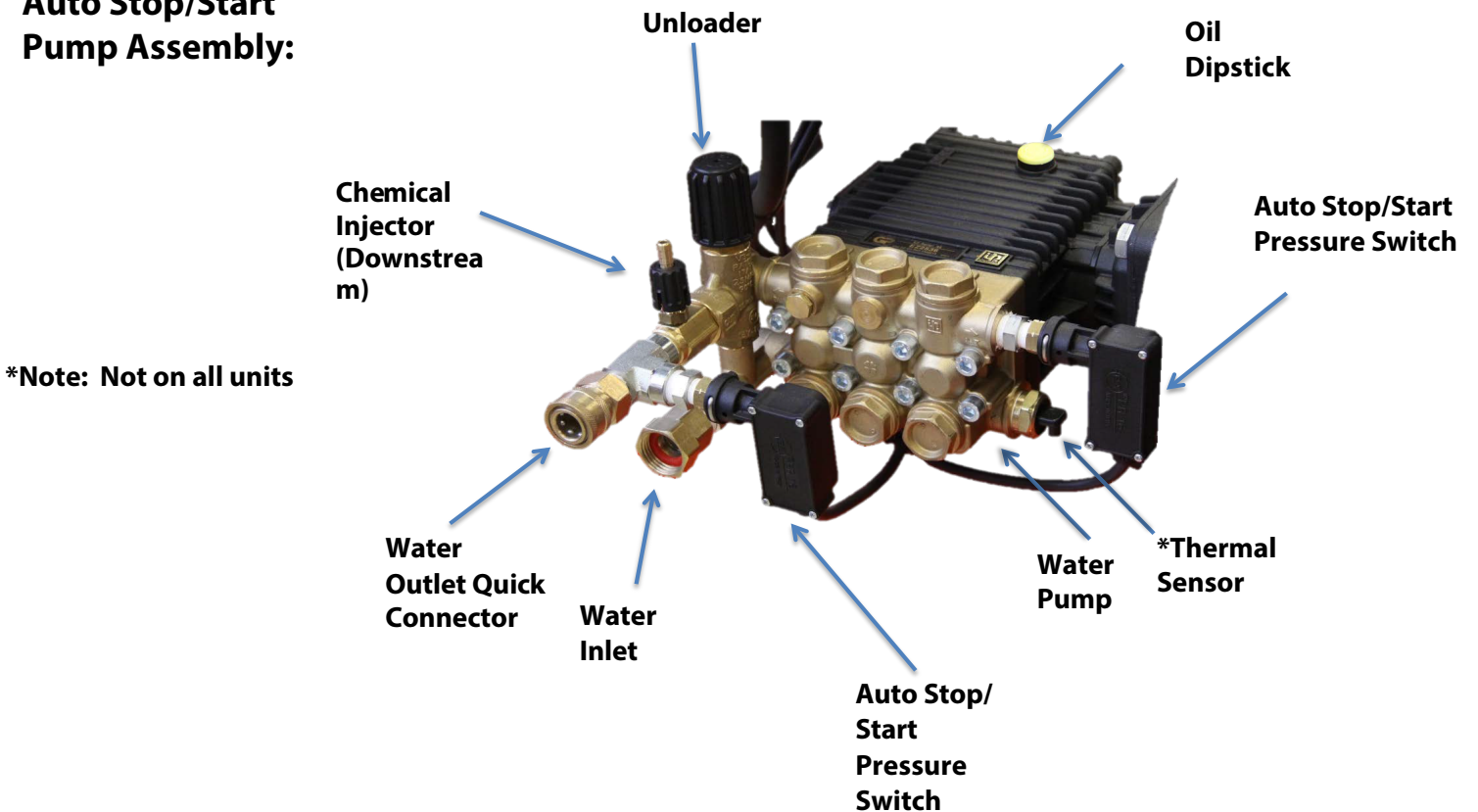
*Note: On Cold Water Units, Max Temp 160°. Also, running hot water will shorten the life of your pump seals.

Manual Stop/Start Pump Assembly:



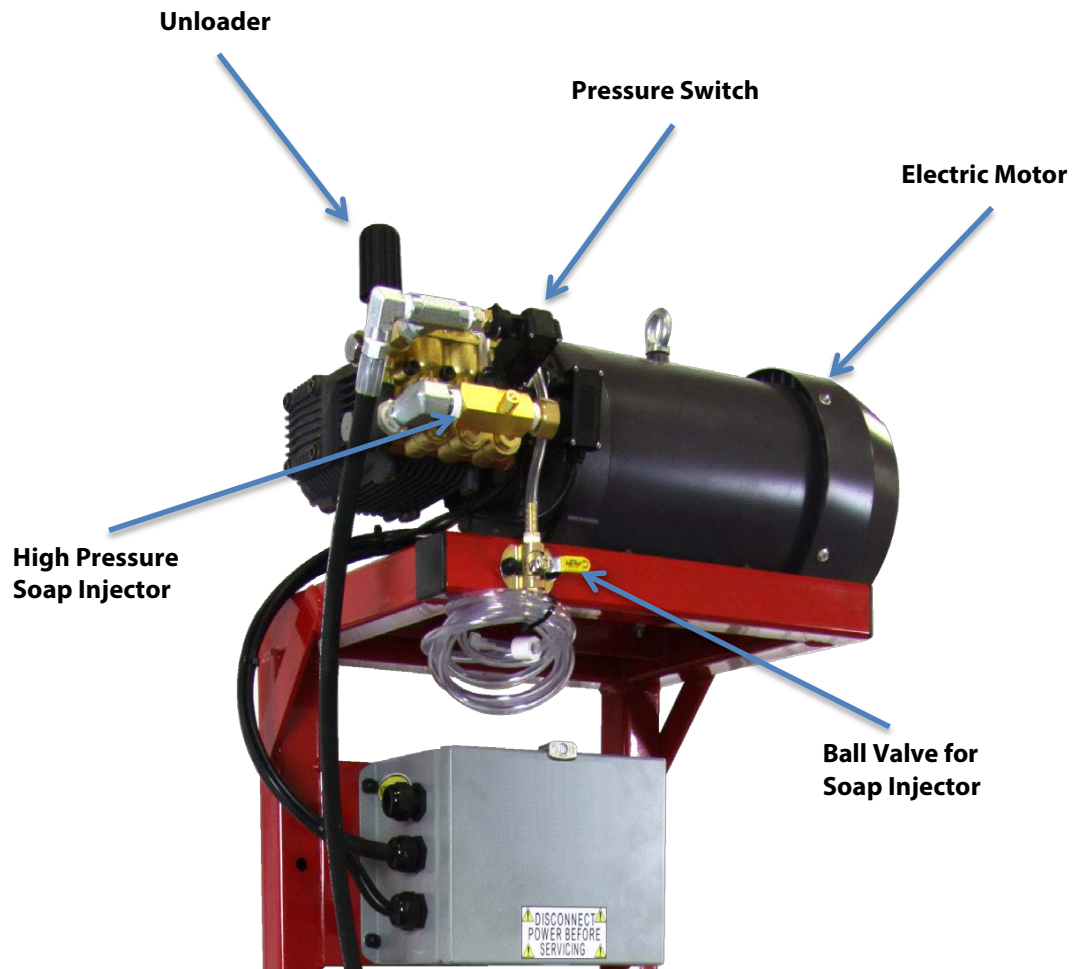
***Note: Not on all units**

Auto Stop/Start Pump Assembly:



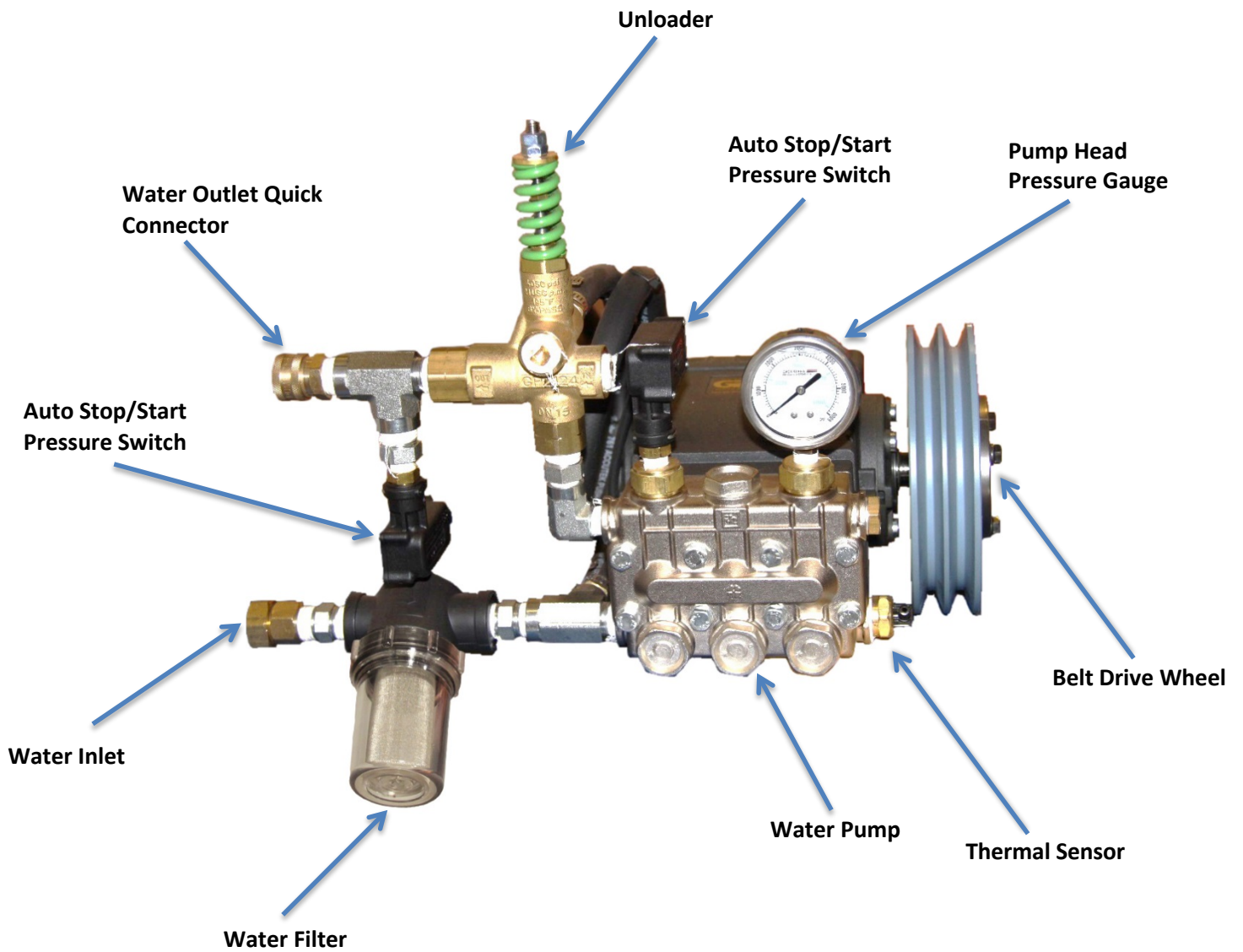
***Note: Not on all units**

Firehouse and Car Dealing System Pump Assembly:



Maximum Inlet Temperature on Pump is 165° F

Belt Driven Pump Assembly:



QUICK DIAGNOSTICS AND SOLUTIONS GUIDE

PUMP		TYPE OF OIL
EK Pump		Hydraulic 68 (650ml)
GP Pump		30W SAE Non-Detergent
PROBLEM	POSSIBLE CAUSES	SOLUTIONS
PRESSURE		
No pressure or Very low pressure	Metal in oil	<ul style="list-style-type: none"> - Examine oil in pump to see if there is metal in oil. - If you find traces or pieces of metal, your pump has damaged components.
	Dirt in water	<ul style="list-style-type: none"> - Verify if there is dirt in nozzle tip or in valves in pump. - If nozzle is plugged, clean or replace it. - If valves in pump are clogged, clean valves. - If valves in pump are damaged, replace valves.
	Wrong nozzle size	<ul style="list-style-type: none"> - Make sure you have the right nozzle size. The black nozzle will drop pressure in order to use chemical injector and is only for soap or chemical. If you are not using soap, use a different color.
Pressure too high	Wrong nozzle size	<ul style="list-style-type: none"> - Make sure you have the right nozzle size.
	Unloader adjusted improperly or damaged	<ul style="list-style-type: none"> - Check pressure of pump with a pressure gauge and adjust to desired pressure. - If you cannot reduce pressure, replace unloader.

EASY-KLEEN

PRESSURE SYSTEMS LTD.

MANUFACTURER OF HIGH PRESSURE CLEANING EQUIPMENT

Oct 6th, 2020

MANUFACTURER'S WARRANTY

Thank you for your purchase of an Easy-Kleen pressure cleaning system. All original equipment are warranted for a specific period and on the conditions set forth, that the product is free from defect in materials and workmanship as follows:

Electric Motors	1Phase	18 Months
	3 Phase	24 Months
For warranty for these items manufacturer needs to be contacted		
Oil Burners	Igniters, Fuel Solenoid, Burner Motor, Fuel Assembly, Drive Shaft, Electrodes Blower, Wheel Fuel Pump	1Year Parts
Propane / Natural Gas Burners	Burner Rings, Gas Valves, Gas Valve Control Board	1Year
Fitting	All Fittings, Brass Stainless Steel, Steel, Etc.	30 Days
Heating Coils	All Coils	1Year Replacement
	Under 5100 PSI- 5 Year Prorated	25% Year each year for 4 Years
Gas Motors	Honda and Kohler have manufacturer's warranty. Manufacturer does not cover fuel systems.	
Lifan Motor	Contact Easy-Kleen for Warranty	1Year (for commercial use)
Frames	Limited warranty on Frames, Belt Guard, Welds due to manufacture defect.	
	Paint is not covered under the manufacturer's warranty due to the aggressive environment or natural wear.	
Plastic Tanks	Water or Fuel	1Year
Accessories/Wear Items	Unloader, Regulating Valves, Safety Valves, Jetter Valves, Check Valves, Foot Valves, Pulsation Dampeners, Trigger Guns, Rotary Nozzles, Chemical Injectors, Hose (Jetter Hose Not Included), Hose Reels, Sandblast Kits, Surface Cleaner, Water Broom, Water Strainer, Belts, Ball Valves, Swivels, Balanced Relief Valves, Accumulator Lances	90 Days
Electrical Components	Switches, Time Over Loads, Contactors, Transformer, Thermostat, Vacuum Switches, Flow and Pressure Switches, Relays, Primary Controls	90 Days
No Warranty Items	Fuel Filters, Nozzles, O- Rings, Thermo Relief Valves (Pump Seals, Valves, Plungers)	
ANY PARTS NOT LISTED ABOVE CALL FOR WARRANTY TIME FRAMES		

NOTE* Due to original equipment manufacturer's requirements, Easy-Kleen is not permitted to perform warranty repairs or claims for electrical motors, gas, or diesel engines. Please contact Easy-Kleen service department for a local warranty representative.

LIMITATIONS OF LIABILITY

Easy-Kleen liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall Easy-Kleen's liability exceed the purchase price of the product in question. Easy-Kleen makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations or specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at our manufacturer location, is such part or parts at inspection shall disclose to have been defective. Easy-Kleen does not authorize any other party, to make any representation or promise on behalf of Easy-Kleen or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of Easy-Kleen products conform to local codes. While Easy-Kleen attempts to ensure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY.

Easy-Kleen reserves the right to make any changes to an Easy-Kleen product at any time without incurring any obligation with respect to any product previously, ordered, sold, or shipped.

PUMP WARRANTY TIME LINE		
Cat Pumps	Direct Drive Pumps	2 Years
	Car Wash Pumps (Including all models used in Car Wash or Portable Fresh Water Pressure Cleaning applications)	5 Years
	All other pumps not listed above	1 Year
Giant Pumps	Pressure Washer and Self- Serve Car Wash Applications	5 Years
	All other Giant Pumps, Industrial and Consumer Pumps	1 Year
	Lifetime on Manifolds due to Manufacture defects	
AR Pumps	Plunger Pumps	5 Years
	Axial Pumps	1 Year
	AR Accessories	90 Days
General Pumps	Manifolds	5 Years
	Pressure Washer Pumps	5 Years
EK Pumps	Manifolds	5 Years
	Pumps	1 Year
	Accessories	90 Days
	Manufacturer does not cover wet end of Pump Seals, Valves, and Plungers.	

WARRANTY REPAIRS

Warranty claims must first contact Easy-Kleen's Service Department to be issued a preauthorized repair number (PARN). You will need a copy of your invoice and the equipment serial number.

If new parts are needed, they will be invoiced to you as normal. Defective parts are to be sent to us PREPAID for warranty consideration. If a part is found to be defective, a credit will be issued to cover the costs of parts. All work is performed at the manufacturers' place of business when returned PREPAID. This warranty will not cover labor if warranty work is conducted at the customer's place of business. Road service will be charged at the normal rate in these situations.

WARRANTY DOES NOT COVER:

- When warranty part is warranted the warranty time frame does not re-start.
- Warranty freight cost will be covered by Easy-Kleen for the first 30 days of sale of the machine due to manufacture defect or workmanship.
- Neglect of the periodic maintenance as specified in the owner's manual.
- Improper repair or maintenance.
- Operating methods other than those indicated in the owner's manual.
- The use of non-genuine Easy-Kleen parts or accessories other than those approved by Easy-Kleen
- Exposure of chemical agents, such as: Sea Water, Sea Breeze, Salt, or other environmental phenomenon.
- Collision, fuel contamination or deterioration, neglect, unauthorized alteration or misuse.
- Warranty does not cover travel or time if a service call is needed.
- Warranty does not apply when pump or accessory is altered or used in excess of recommended speeds, pressure, temperatures, or handling fluids not suitable for pump or accessory material.
- Construction warranty does not apply to normal wear.
- Warranty does not apply to normal wear (such as but limited to seals, packing valves, plungers and sealing O-Rings), freight damage, freezing damage or damage caused by parts or accessories not supplied by Easy-Kleen.
- After 30 days freight will become chargeable.
- Warranty covers In-House Labour and Parts if manufacture defect is repaired at an Easy-Kleen approved Service Center.

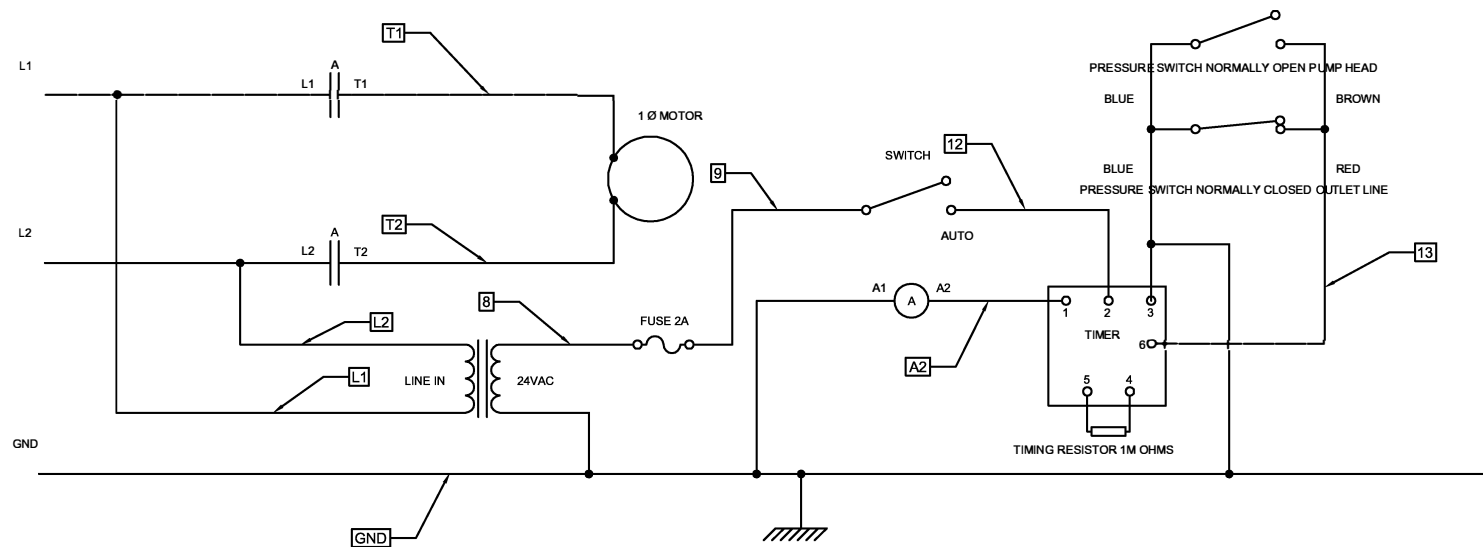
WARRANTY DOES NOT COVER DEFECTS CAUSED BY:

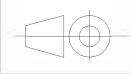
- Improper or negligent operation or installation, accident, abuse, misuse, neglect, unauthorized modifications, including, but not limited to, the failure of the customer to comply with recommended product maintenance schedules.
- Improper repairs
- Neglected maintenance/incorrect operation (specified in the Owner/Operator's Manual
- Unapproved devices or attachments
- Water sediments, rust corrosion, thermal expansion, scale deposits or a contaminated water supply or use of chemicals not approved or recommended by Easy-Kleen Pressure Systems Ltd.
- Improper voltage, sudden voltage spikes or power transients in the electrical supply
- Usage which is contrary to the intended purpose of the equipment
- Natural calamities or disasters including, but not limited to, floods, fires, wind, freezing*, earthquakes, tornados, hurricanes and lightning strikes

*Includes damage done to components that come in contact with water as a result of freezing in a non-winterized machine.

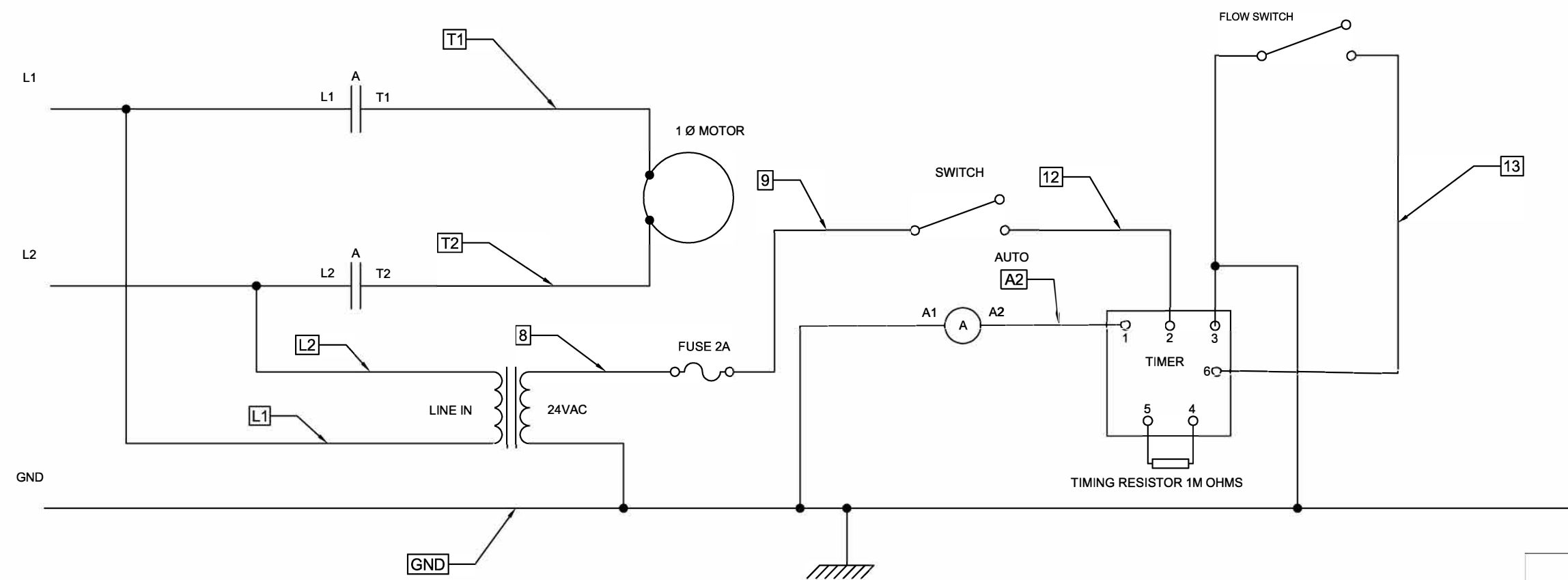
CIRCUIT DIAGRAM

AUTO START STOP SINGLE PHASE 120V/240V AC COLD WATER WITH PRESSURE SWITCH





AUTO START STOP SINGLE PHASE 110V/220V AC COLD WATER WITH FLOW SWITCH

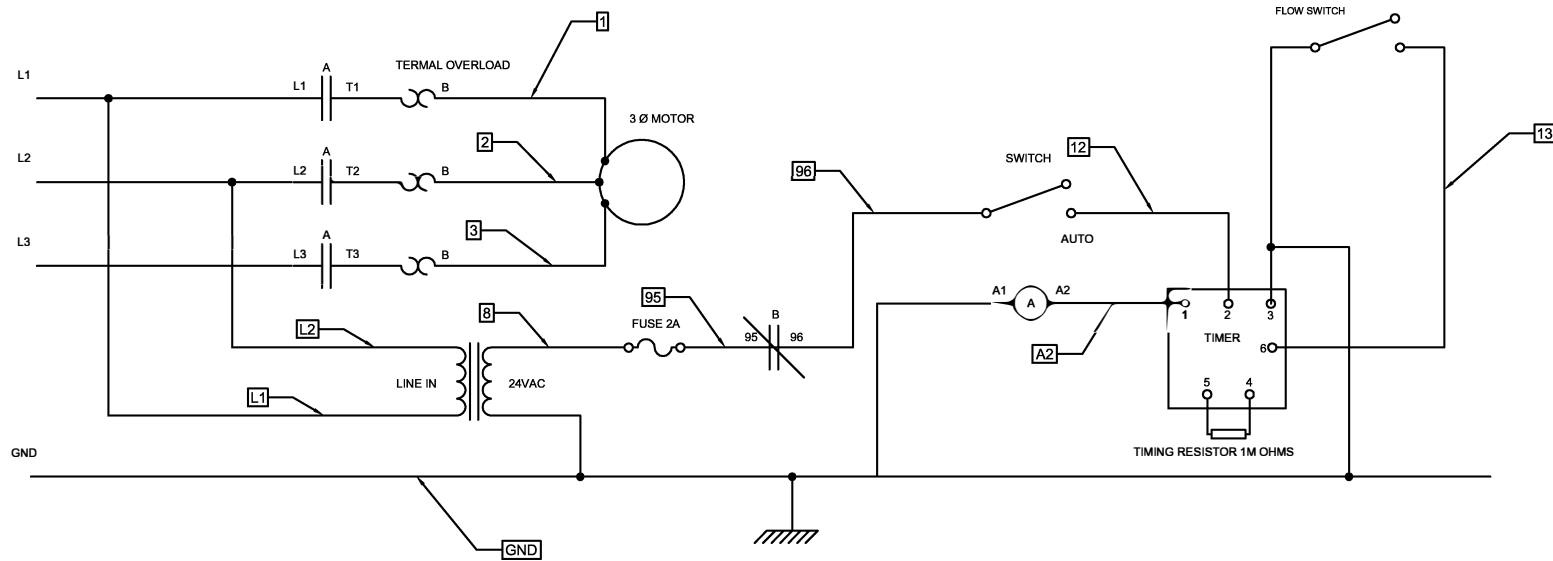


USED ON
AS,IS, FD, IP SERIES
5 d

DATE	03 DEC 2015	MATERIAL	SPEC.	TREATMENT	FINISH	SHEET No.	ITEM No.	
SCALE	NTS	AUTO START STOP 1 PHASE 110/220 V AC COLD WATER WITH FLOW SWITCH					PART No. 1004	

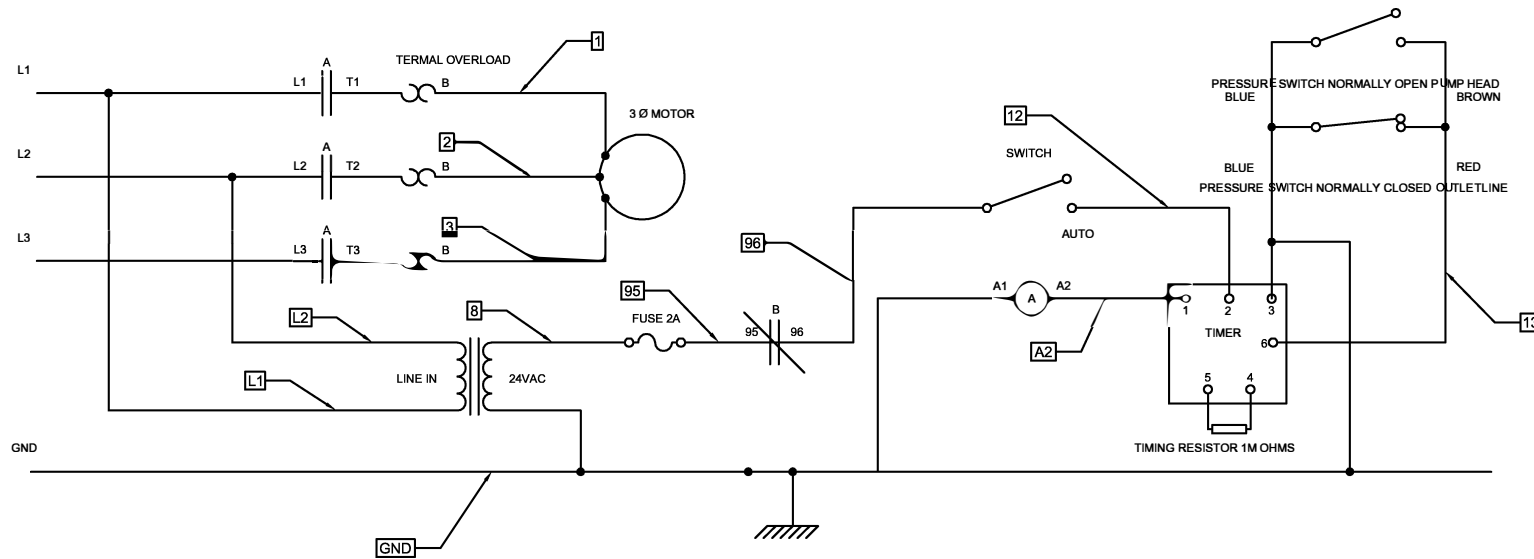
CIRCUIT DIAGRAM

AUTO START STOP 3 PHASE 208/230/460/575V AC COLD WATER WITH FLOW SWITCH



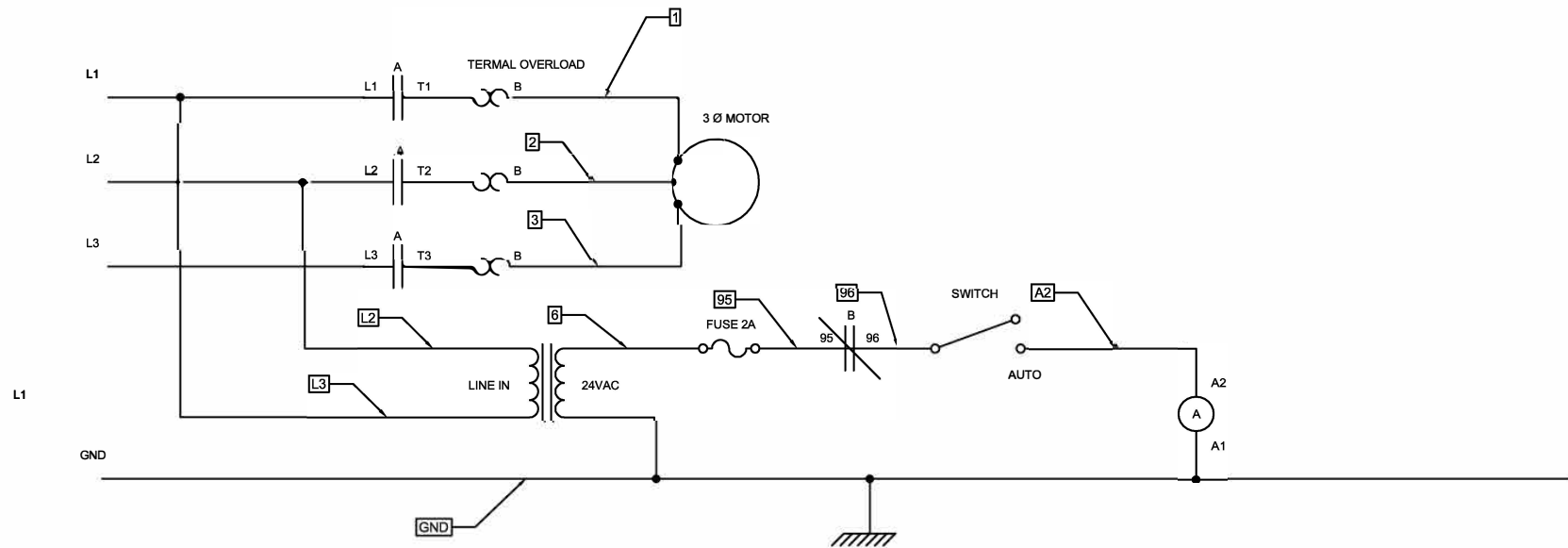
CIRCUIT DIAGRAM

AUTO START STOP 3 PHASE 208/230/460/575V AC COLD WATER WITH PRESSURE SWITCH



CIRCUIT DIAGRAM

MANUAL START STOP 3 PHASE 208/220/460/575V AC COLD WATER WITH CONTACTOR AND TRANSFORMER



POWER SYSTEM DIAGNOSTICS - Gas Motor Not Starting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Gas motor not starting	Fuel	Check to see if proper fuel levels are maintained
	No ignition	Check ignition by removing spark plug from cylinder. If electric start, try starting using the recoil starter.
	Electric Starter/Battery	Recharge or replace battery.
	Fuse blown in key switch	18 amp engine, open key switch, replace 30 amp fuse
Spark Plug - strong gas smell	Flooded	Wait 5 minutes before attempting to restart.
	No ignition	Check ignition by removing spark plug from cylinder. If electric start, try starting using the recoil starter.
	Bad plug	Check spark plug and replace if necessary. Carbon deposits can indicate a fouled plug or too much fuel.
Plug does not fire	Poor connection	Inspect the ignition connection.
	Bad magneto	Check the source of spark plug for engine ignition.
Bad ignition system	Poor connection	Check the source of spark for the engine ignition.
Spark Plug - no gas smell	No fuel to cylinder	Check fuel delivery from carburetor to cylinder. Check carburetor float bowl for fuel.
	Fuel line restricted	Inspect fuel line to carburetor for restrictions or clogging. Flexible line may be kinked.
	Stuck carburetor float	Unstick float
	Clogged carburetor needle valve	Unclog needle valve.
	Bad fuel pump	Replace fuel pump.

FLUID SYSTEM DIAGNOSTICS - Flow and Pressure

PROBLEM	POSSIBLE CAUSE	SOLUTION
No Flow	No power	Make sure pump is operating. Check drive belts and couplings, make necessary adjustments.
	Trigger gun valve	Check trigger gun, repair or replace.
	No water source	Ensure water supply is not restricted and hoses are in good repair and not kinked.
	Clogged spray nozzle	Check spray nozzle, repair or replace.
	Clogged inlet filter	Check inlet filter, repair or replace.
	Float Valve stuck (optional)	Float valves can become stuck in the "UP" position. Manually dislodge and inspect for problems.
	Faulty unloader valve	Remove and check for proper action, repair or replace.
Low pressure, adequate flow	Incorrect or no spray nozzle	Nozzle should be properly sized for the system. Low pressure indicates that the nozzle in use is too large.
	Worn spray nozzle	Replace nozzle when it shows signs of internal erosion.
	Debris in valves	Clean valves and check o-rings for pits and cracks.
	Lance on low pressure	Adjust pressure so the water flows through properly.
	Unloader is not adjusted correctly	Adjust unloader to proper level.
	Pressure gauge inaccurate	Use a new pressure gauge on a quick connect at outlet to check system pressure and replace if gauge is faulty.
Low pressure, low flow	Pump packings bad	If low pressure persists, pump packings may need replaced.
	Volume Improperly adjusted	If unit has volume adjustment, it may need readjustment
	Discharge leaks	Look for leaks on the discharge side of system.
	Downstream chemical injector (Dema)	Remove the injector and retest system. If the flow is restored, replace the injector.
	Loose drive belts	If belts do not have proper deflection, replace them.
	Pump not running at rated speed	Check engine throttle and see that the motor is rated for the same speed as the pump.
	Stripped pump drive coupling	Inspect coupling and repair or replace.
	Defective easy start valve (optional)	Check the start or throttle-back valve for proper operation.
	Malfunctioning motor or gear	Ensure that the motor or engine is working properly
Unloader stuck in bypass	Piston assembly may be stuck or fouled	
Low pressure, low flow - Bogs	Outlet restriction	Build up can restrict flow. If water is not flowing freely, flush with garden hose to isolate the clog or restriction.
	Clogged nozzle	Distorted spray pattern can indicate a clogged nozzle.
	Nozzle too small	Ensure nozzle is proper size for the system.
	Hose restriction	Correct any kinks or restrictions. Replace crushed hoses.
	Debris in the system	Debris can lodge in the discharge side of the system (valves, fittings, injectors, filters) Flushing with water may correct it.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Excessive pressure	Small spray nozzle	Nozzle must be properly sized for the rated flow and pressure. Reset unloader or pressure relief if nozzle size is changed.
	Faulty pressure gauge	Check the pressure gauge using a properly calibrated pressure gauge on quick connects at the equipment outlet.
	Improperly adjusted unloader	Adjust to the proper pressure using pressure gauge.
	Faulty unloader	Check the unloader action. If it is not working properly, it may need repaired or replaced.
Pump chatters, cavitation, vibration	Air in system	Inspect places where air can enter the system. i.e. fittings, hose, connections etc.
	Chemical line not submerged	If the chemical valve is on, ensure that the chemical line is fully submerged in the chemical
	Inlet line restricted	All inlet connections should be snug and not kinked to reduce the chances of pump starvation.
	Inadequate water supply	Water supply to the system must meet or exceed the rated flow (GPM) on the serial number plate. Faucet must be completely opened or water above the tank outlet in a gravity fed system.
	Float valve stuck (optional)	If float valve is stuck in the up position, water can not enter the float tank. Unstick valve if possible or replace if necessary.
	Turbulence in float tank (optional)	Excessive turbulence allows the pump to draw air into the system. Correct excessive turbulence.
	Inlet or inlet strainer clogged	Regularly clean the inlet and inlet strainer to keep debris from entering the float tank
Water supply too hot	Inlet temperature should not exceed 140F - 160F range.	
Inlet line vibrates	Air in system	Inspect places where air can enter the system, i.e.; fittings, hose, connections etc.
	Debris in inlet check valves	If there is no float tank and the outlet line does not vibrate, the inlet check valve may be clogged. Remove debris. Check o-rings under valves.
Outlet line vibrates	Air in system	Inspect places where air can enter the system, i.e.; fittings, hose, connections etc.
	Debris in inlet check valves	If there is no float tank and the outlet line does not vibrate, the inlet check valve may be clogged. Remove debris.
	Pump packing bad	If they show signs of wear or damage, replace them.
Inlet and outlet lines vibrate	Inlet and outlet check valves fouled	Look for the source of debris in the inlet and discharge check valves and remove.

FLUID SYSTEM DIAGNOSTICS - Unloader

PROBLEM	POSSIBLE CAUSE	SOLUTION
Very low or no flow	Unloader stuck in bypass	Isolate the flow problem. If it occurs before the unloader discharge point, check the piston assembly to see if it is fouled or stuck in bypass mode.
Unloader will not unload	Debris in unloader	Take bottom nut off unloader, identify ball, spring and seat. Clean out any debris and
	Sever leak on the outlet of unit	Check for leaks and repair.
Unloader (flow) cycles with system under pressure	Improper flow	Any variation in flow from what the orifice is sized can cause cycling. System must produce the rated flow constantly.
	Nozzle too small	A nozzle that is too small can cause the flow to be reduced.
	Nozzle clogged	A distorted spray pattern indicates a clogged nozzle.
	Improper unloader orifice	The systems rated output should indicate the proper sized orifice for your system.
	Unloader orifice clogged	Check the orifice for clogs and clear out any debris.
	Injector orifice clogged	If the system has a Venturi injector downstream of the unloader, check the orifice for clogs.
	Other downstream restriction	Scale buildup can restrict flow. Check; controls, valves, switches, trigger gun, and lance. Descale as necessary and begin preventive maintenance program for scale prevention.
	Pump not delivering the rated pressure	See low pressure or low flow diagnostics.
Unloader (flow) cycles with system in bypass	High water supply pressure	Check inlet water supply for excessive pressure.
	No restrictions on the unloader	Check unloader bypass port to see if a flow restrictor is properly installed. Install one if none is present.
	Downstream leakage (excessive)	Causes the unloader to sense a continuing flow and divert it to the closed gun. Repair or replace.
Unloader (pressure) produces smooth flow & low volume	Accumulator downstream (option)	Remove the accumulator from the system.
	Unloader adjusted too low	Adjust the unloader using the pressure gauge for the correct pressure.
	Spray nozzle clogged	A distorted spray pattern indicates a clogged nozzle.
	Spray nozzle too small	A small nozzle causes a reduced flow and cycling may result.
	Injector orifice blocked	If the system has a Venturi injector downstream of the unloader, check the orifice for clogs.
Unloader (flow) produces smooth flow & low volume	System not delivering rated flow	See flow diagnostics.
	Unloader adjusted too low	Adjust unloader and regulator until proper pressure is achieved.
	Unloader valve stuck in bypass	If unloader is sticking, repair or replace as necessary.
	Restriction in system	Downstream restrictions can cause a reduction in flow. Check; controls, valves, switches, trigger gun, and lance. Descale as necessary and begin preventive maintenance program for scale prevention.

Unloader (pressure) produces low flow and normal pressure	Unloader adjusted too low	If the unloader is diverting flow to bypass it may be adjusted too low, readjust as necessary.
	Spray nozzle too large	Ensure the proper nozzle is installed on system.
	Internal nozzle erosion	The number of hours of usage can give you a clue to the extent of the wear. If in doubt, change
	Insufficient pump pressure	Check pump seals and packings and tighten drive belts.
Unloader (flow) produces low flow & normal pressure	Unloader adjusted too low	If unloader is diverting flow to bypass, readjust using the pressure gauge.
	Nozzle too large	Ensure the proper sized nozzle is being used.
Unloader (pressure) leaks from main spring or adjusting bolt	Shaft O-ring in valve body worn	Check O-rings for wear or damage and replace as necessary.
Unloader (flow) pressure increases when trigger released	Unloader piston stuck or frozen	Check unloader shaft for proper action. Unstick piston and shaft or replace unloader.
	Bypass port clogged or restricted	Ensure that unloader bypass port is not clogged
	Excessive tension on main spring	If tension is incorrect, adjust or replace as necessary.
Unloader (flow) leaks water around adjusting bolt	Sleeve O-ring worn	Check O-rings for wear or damage and replace as necessary.

FLUID SYSTEM DIAGNOSTICS - Leaking

ANY LEAKS SHOULD BE REPAIRED ASAP TO PREVENT DAMAGE TO THE SYSTEM.

PROBLEM	POSSIBLE CAUSE	SOLUTION
From inlet	Garden hose washer	Ensure the washer is present and in good condition.
From low pressure(inlet) line fittings	Loose clamps or connections	Low pressure line should be properly sealed on barb and tightly clamped.
From float tank(option)	Float tank full of water or stuck	If float is not floating above water, check the float to see if it has filled up with water. If necessary, drain and seal.
From pressure fittings	Fittings not tightened or taped, or cracked	Usually metal to metal fittings should be taped with Teflon tape or lock tight to provide a tight seal. (unless
From quick connects	Bad o-rings	If quick connect o-ring shows wear or damage, replace it.
From pump	Bad packing	If the seal leak is detected under the pump manifold, packing may be worn and in need of replacement.
From trigger gun	Bad rod o-ring	If o-rings show wear or damage, they may need replaced.
	Stripped connectors	Physical damage may not be apparent, but unseen warping from freezing or extreme pressure can still cause leakage.
From nozzle	Weep gun(optional)	If a weep gun has been installed, check the gun valve seat to ensure it is functioning properly.
	Damage gun valve ball or seat	Inspect trigger gun valve assembly for damage or wear to ball or seat. Lodged debris can stop valve from closing. Repair with kit or replace.
From unloader	Bad o-rings or seals	If quick connect o-ring shows wear, damage or improper seating.
From variable pressure Lance(option)	Bad o-rings at adjusting knob	Inspect o-rings for wear or damage and replace as necessary.
Unloader will not unload	Debris in unloader	Take bottom nut off unloader, identify ball, spring and seat. Clean out any debris and reassemble.
	Sever leak on the outlet of unit	Check for leaks and repair.
From pressure relief valve	System over pressure	See pressure and flow diagnostics to find the cause of the excessive pressure and correct it.
	Clogged nozzle	Spray pattern will be distorted if nozzle is clogged, clean out.
	Trigger gun valve not working	If trigger gun valve action is not correct, repair or replace.
	Excessive pressure spike	If water spurts from valve when trigger is released, check unloader adjustment. Pressure spike should be below the level where pressure relief valve is activated.
	Wear or damage to ball or seal	Inspect ball and seal for damage and adjust as necessary.
	Improper relief valve adjustment	Adjust valve properly.

FLUID SYSTEM DIAGNOSTICS - Trigger Gun/Spray Nozzle

PROBLEM	POSSIBLE CAUSE	SOLUTION
No nozzle flow from nozzle when triggerdepressed.	Broken piston rod in trigger gun	If water flows through discharge hose without gun, check trigger gun valve piston rod and replace ifnecessary.
	Missing metal insert in trigger gun (European stylegun)	Inspect to assure insert is in place.
	Blockage in system past gun	Check nozzle or spray accessory for blockage and clear it.
Excess pressure when trigger gun is released	Excessive pressure spikes	After unloader increases pressure to a maximum, further adjustment will only increase the pressure spikes.Re-adjust.
Flow not stopping when trigger gun released	Broken return spring on trigger gun	If trigger action is too loose, return spring may need replaced.
	Debris in gun valve	Debris in gun valve can stop piston return. Clear debris.
Trigger action sticks	Keeper plug too tight	It may be possible to loosen plug slightly without leakage but it will likely need replaced.
Trigger gun leaks	Worn or bad o-ring	Check trigger gun o-rings for ware or damage and replace.
	Stripped or loose connections	Physical damage may not be apparent but unseen warping from freezing or sever overpressure may still cause leaking.
No chemical	Chemical valveclosed Black nozzle	Open chemical valve. If It chatters with no chemical delivery, air is being drawn from the upstream side of the pump. Check fittings, connections and ensure the inlet line is fully submerged into the chemicaljug.
	Chemical dried up in the injector	Inspect and clean as necessary.
	Chemical foot strainer clogged	Maybe a strainer or check valve. Ensure that the ball is not stuck or clogged.
	Chemical line kinked	Chemical line kinking or binding prevents chemical delivery.
	Chemical line too long	An overly long chemical line can prevent the pump from drawing chemical into the system. Try installing a shorter line.
	Chemical too dilute	Verify chemical strength.
	No adjustment for low pressure	Downstream injectors only - Low pressure is required for most injectors to draw chemical. If no adjuster exists it may need low pressure spray nozzle installed on the lance.
Incorrect injector orifice	If not properly sized for the systems rated output, chemical delivery problems will result. Check serial plate forspecs.	
Excessive chemical	Valve improperlyadjusted, check knob on injector	To properly adjust, a chemical flow meter may be used to precisely measure chemical flow.
	Chemical dilution to strong	Verify chemical strength.
Spray pattern irregular	Clogged nozzle	Spray pattern will be distorted if nozzle is clogged.
Volume proper, pressure low	Nozzle to large	Ensure that the nozzle is sized properly sized for the system
	Internal nozzle wear	A loss of pressure may result form gradual nozzle wear. Replace a nozzle of correct size.
Pressure proper, volume low	Clogged nozzle	Spray pattern will be distorted if nozzle is clogged. Check nozzle for clogging if the unit has a pressure unloader.