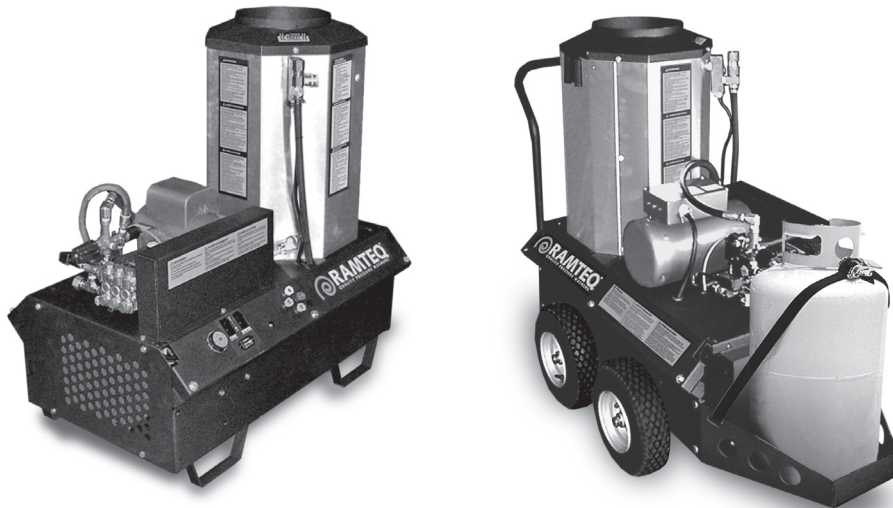




**RAMTEQ®**  
QUALITY PRESSURE WASHERS



# Operator's Manual

## XV NG/LP Series

### Natural Gas/Propane

#### **READ THIS MANUAL**

This manual contains important information for the use and safe operation of your RAMTEQ® machine. **FAILURE TO READ THIS MANUAL AND FOLLOW ITS INSTRUCTIONS PRIOR TO OPERATING OR ATTEMPTING ANY SERVICE OR MAINTENANCE PROCEDURE COULD RESULT IN SERIOUS INJURY OR DEATH TO YOU OR OTHER PERSONS; ALSO DAMAGE TO THE MACHINE OR TO OTHER PROPERTY.**



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## Unpacking Instructions

### INSPECTION

Carefully unpack your new RAMTEQ equipment by removing the banding and cardboard box from pallet. Remove the pressure washer from the pallet and check for any physical damages that may have occurred during shipment. Check for all parts specified and shown below.



#### INCLUDED PARTS

- Pallet
- Packing Material  
Outer Box
- XVNG or XVLP  
Series Machine
- Operator's Manual
- Wand / Trigger Gun
- Nozzle 0°, 15°, 25°, 40°
- Hose 3/8" X 50'
- QC Hose Fittings

### NOTICE

Information in this operator's manual is subject to change without notice.

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## Safety Guidelines



**READ THIS FIRST! FAILURE TO READ AND OBSERVE ALL WARNING STATEMENTS COULD RESULT IN SEVERE BODILY INJURY OR DEATH, POSSIBLE INJURY TO OTHER PERSONS, DAMAGE TO MACHINE OR OTHER PROPERTY.**

- DO NOT operate this machine in areas where open flames are not permitted. DO NOT store or use combustible materials on or near this machine. Use this equipment only in well ventilated areas. Failure to follow this warning may cause carbon monoxide build up, fire or explosion, and possible injury or death.
- DO NOT operate this machinery unless the gas installation has been done by a competent professional and the installation meets all federal, state, and local codes.
- DO NOT operate this machine while under the influence of alcohol, drugs or while fatigued.
- DO NOT direct discharge stream at yourself or others. Risk of injection or injury may occur. Never put your hand or fingers over the spray tip. Do not try to stop or deflect leaks with your hand or body. Always face nozzle and wand to the ground when testing.
- DO NOT operate this machine WITHOUT wearing protective Eye Wear. Gloves, Hard Hat, Mask, Ear Plugs & Steel Toe Work Boots are also recommended, DO NOT wear loose clothing. Keep your body and clothing clear of the engine and discharge stream when the machine is running.
- DO NOT tie back or block trigger gun in OPEN position. Never leave the pressure washer unattended once you have started it. If you leave, shut down machine completely.
- DO NOT overreach or stand on an unstable support while operating this machine. Maintain good footing and balance.
- DO NOT permit this machine to run while unattended or for extended periods of time with trigger gun closed. Damage to pump may occur.
- DO NOT operate this machine in an unsafe manner or around unsupervised children. Keep all other personnel clear while operating this machine. This product should only be operated by trained personnel.
- DO NOT alter original factory settings prior to operating this machine. Risk of injury to yourself or other persons may occur.
- DO NOT remove hoses, guns, nozzles or any components while this machine is still hot or while it is running.
- DO NOT attempt to service this machine before reading the service manual.
- DO NOT use water with a temperature over 140 degrees Fahrenheit
- DO NOT use any electrical outlet that is not properly grounded or does not comply with all federal, state, and local laws and/or electrical codes
- DO NOT operate this machine without knowing how to stop and bleed water pressures. Know all controls before using this machine.
- DO NOT spray caustic, acids or abrasive fluids through this machine.
- DO NOT permit water to freeze inside this machine. Pump and plumbing damage may occur.
- Use only recommended RAMTEQ parts when servicing this machine.
- RAMTEQ will not be held liable for any unauthorized modifications made to this machine. Any such action will void the warranty.



**Installation Instructions**

**LOCATION & INSTALLATION GUIDELINES**

- Locate the machine on a solid and level surface so that engine and pump crankcase oil lubricate components properly. Avoid areas where water can build up in the working area. Possible injury can occur caused by the surface becoming slippery from water build up.
- Locate the machine in a well-ventilated area and away from flammable materials or fumes. Be sure ventilation warnings are observed. Keep pressure washer at least 18" away from flammable materials.
- Locate the machine so the operator has easy access to the pressure washer and its controls. Locate the machine so that it is protected from external damage.
- Confer with local gas company, and with proper municipal officials regarding any specific code or regulations governing this installation. Installation must conform with all local codes prior to operation of machine.
- A draft diverter hood must be installed and vented to the outside.
- Check gas union located under burner ring prior to operation. Soap test gas pipe fittings for leaks once pressurized.
- To prevent damage and excessive hose wear, locate the pressure washer so that the hose does not cross traffic areas
- The gas line should be a separate supply direct from the meter to the burner. New pipe is recommended to be used and located so that a minimum amount of work will be required in future servicing. The piping should be so installed as to be durable, substantial and gas tight. It should be clear and free from cutting burrs and defects in structure of threading. Cast iron fittings or aluminum tubing should not be used for the main gas circuit. Joint compounds (pipe dope) should be used sparingly on male threads only and be approved for all gases.
- The following pipe sizes should be used between the meter and the machine:

|                       |                            |                  |
|-----------------------|----------------------------|------------------|
| <b>Natural Gas</b>    | <b>Distance from Meter</b> | <b>Pipe Size</b> |
|                       | 0 - 50'                    | 1-1/2" 1 PS      |
|                       | 50' - 100'                 | 2" 1 PS          |
|                       | 100' - 200'                | 2-1/2" 1 PS      |
| <b>Liquid Propane</b> | <b>Distance from Meter</b> | <b>Pipe Size</b> |
|                       | 0 - 50'                    | 1" 1 PS          |
|                       | 50' - 100'                 | 1-1/2" 1 PS      |
|                       | 100' - 200'                | 1-3/4" 1 PS      |

- Venting: A vented draft diverter hood should be used with all indoor installations. Poor draft will cause the machine to soot and not operate efficiently. Positioning of the machine should be in such a manner so that the stack is as straight as possible and have sufficient height to eliminate downdraft.

**Natural Gas & LP Installation Checklist**

**Checked**

- Has gas supply been inspected by an authorized contractor and meets all local codes? \_\_\_\_\_
- Is machine protected from downdraft and excessive wind? \_\_\_\_\_
- Is machine shielded from moisture of water spray? \_\_\_\_\_
- Is voltage correct and circuit breaker adequate according to specifications and serial plate notations? \_\_\_\_\_
- Is the machine electrically grounded? \_\_\_\_\_
- Have all flammable liquids or gases been removed from location? \_\_\_\_\_
- Is there adequate gas supply for BTU rating of the burner? \_\_\_\_\_
- Is incoming gas supply pressure between 6" and 14" water column? \_\_\_\_\_
- Has the proper gas regulator been installed with proper pressure and volume? \_\_\_\_\_
- Is machine properly vented allowing adequate air flow? \_\_\_\_\_
- Are the propane tanks large enough to prevent freezing? \_\_\_\_\_
- Have gas lines been checked for gas leaks? \_\_\_\_\_



## Operating Instructions

### STARTING THE MACHINE

Following the steps below will insure successful operation:

- Read this manual completely before attempting to start the machine.
- Check that the Motor/Burner switches are in the "OFF" position
- Check the pump oil level and fill with SAE 30w *non-detergent* oil if needed.
- Connect water hose to pump (or float tank if equipped). Turn on water source.
- Connect the power cord to a properly grounded power source.
- Turn the manual gas valve to "ON" position. Adjust incoming gas to 12" wc minimum for LP unit, 5" wc minimum for NG (maximum 14" wc or 1/2psi). The correct operating manifold pressure for natural gas is 3.5" wc and 11" wc for propane.
- Attach high pressure hose to base of spray gun.
- Install water nozzle at the end of wand, making sure it is clear of any obstructions.
- Turn pump switch to "ON"
- Pull trigger on gun until a steady stream of water comes out the nozzle. This purges any air in the system.
- Check for leaks in the system and cycle trigger gun to insure bypass is adjusted correctly. Repair any leaks and correct unloader adjustment if needed. Turn off machine before attempting any repairs.
- Turn burner switch to "ON". Check for burner ignition.
- Adjust thermostat to desired temperature appropriate to the task. Maximum temperature setting may not be needed.
- Insert detergent siphoning tube into a DOT approved container and open the metering valve for detergent application.

### WASHING TECHNIQUES

- Washing from bottom up increases dwell time of soap and lessens vertical streaks.
- Turn soap metering valve "OFF" to purge system of soap
- Rinsing with cold water from top down will retard detergent reaction which will enhance the rinsing performance.
- Wash at 30 to 60 degree angles to prevent splashback.

### STOPPING THE MACHINE


- Turn burner switch to "OFF". Allow water to discharge for a few minutes while cooling down.
- Turn pump switch to "OFF".
- Disconnect water source.
- Pull gun trigger to release water pressure from system.
- Disconnect wand & gun assembly.
- Wind up pressure hose on hose reel.

## Maintenance Instructions

### MAINTENANCE PRECAUTIONS

- Do not permit acidic, caustic or abrasive fluids to be pumped through system.
- Periodically clean detergent inlet screen. This will ensure proper flow of water to the pump.
- High mineral content in water may adversely affect your machine and may require the use of a water softener to ensure proper operation.
- NEVER run the pump dry under any circumstances. Doing so will cause extreme damage to the pump.



 **FAILURE TO MAINTAIN HEAT EXCHANGER COIL MAY RESULT IN A STEAM EXPLOSION WHICH MAY CAUSE SERIOUS INJURY OR DEATH.**

**EXCHANGER COIL MAINTENANCE**

- Hard water conditions may eventually cause clogging in the heat exchanger coil if left unattended. Scale deposits will compromise the heating efficiency and produce an unsafe condition over time. It may be necessary to descale coil.
- Scale buildup from certain detergents may eventually clog up the heat exchanger coil causing an unsafe condition. Use only recommended detergents for better cleaning efficiency.
- Black carbon deposits that collect on the outside wall of the heat exchanger coil may be a result of using a poor grade of fuel or improper burner operation. Heating fuel should be void of water and sediments to eliminate the possibility of sooting and compromising the efficiency of the coil.

**MOVING, STORAGE**

- Place machine in covered area when not in use to protect from elements. Protect machine from freezing in cold temperatures by storing in a heated location.

**WINTERIZING**

- Non-float Tank Machines: To protect the machine from freezing temperatures while storing or transporting, connect short length of garden hose (approximately 3 ft.) to water inlet connection on machine. Remove the pressure nozzle from the wand and insert the short garden hose end into a container of antifreeze. Place the wand into the antifreeze container and start engine running machine until antifreeze appears from the end of the wand. Turn engine "OFF" and replace pressure nozzle. Coil up hose and move machine to storage area.
- Float Tank Machines: Pour antifreeze into float tank and remove water nozzle from end of wand and carefully insert into opening of float tank. Start machine and run until antifreeze water mixture has circulated throughout the machine returning back to the float tank.

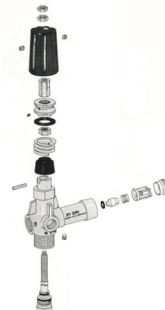
**PUMP MAINTENANCE**

- Fill crankcase to dot on oil gauge window per specifications with the specific oil created by the pump manufacturer (i.e. **General Pump Oil**). Ensure the right oil for specific pump as it may vary.
- Change oil after **40 Hour Break-in Period**.
- Change oil every **Three Months or at 500 Hour Intervals** thereafter.

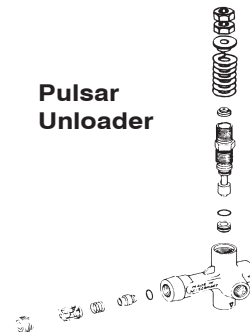
**UNLOADER ADJUSTMENT**


■ All RAMTEQ machines have the unloader correctly set at the the factory. Setting an unloader is a difficult job without the proper equipment and training. Should the need arise to change the unloader settings, please contact your local distributor.

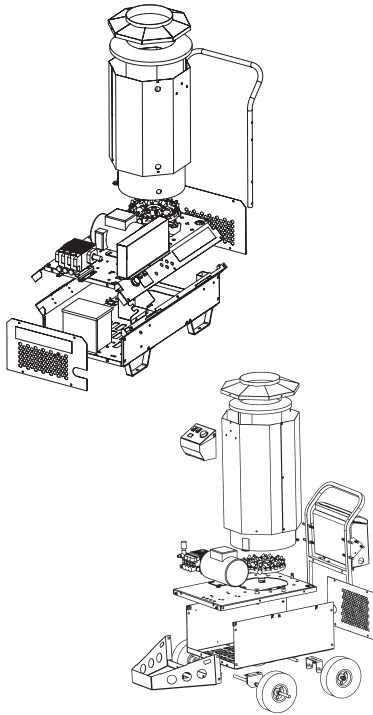
**Sutner Unloader**



**Pulsar Unloader**



 **CHANGING THE UNLOADER SETTINGS WITHOUT THE PROPER EQUIPMENT AND TRAINING MAY RESULT IN NON-WARRANTY DAMAGE TO THE PUMP.**



### Chassis Components

| Part #       | Description                                   | Qty. |
|--------------|---|------|
| 180-00300-01 | Chassis, XV Series                            | 1    |
| 180-00308-01 | Handle, XV series (round tubing)              | 1    |
| 180-00030-01 | Forklift Tine                                 | 4    |
| 175-00001-04 | (LP version -not shown) Axle, SS, 5/8"x28.5"  | 2    |
| 567-00016-01 | (LP version -not shown) Spacer, nylon         | 4    |
| 516-00001-01 | (LP version -not shown) Bushing, Wheel Collar | 4    |
| 170-00007-01 | (LP version -not shown) Wheel ,Pneumatic, 12" | 4    |
| 180-00292-01 | Power Plate, XVNG Series                      | 1    |
| 180-00298-01 | XVNG Belt Guard                               | 1    |
| 180-00318-01 | XVNG Closeout Panel                           | 1    |
| 155-00002-01 | XV Coil                                       | 1    |
| 180-00015-02 | XV Coil Shell, Stationary                     | 1    |
| 180-00016-02 | XV Coil Shell, Removable                      | 1    |
| 180-00071-01 | XV Coil Cap                                   | 1    |
| 191-00003-01 | XV Coil Cap Insulation                        | 1    |
| 180-00382-01 | (LP version -not shown) LP Tank Carrier       | 1    |
| 200-00009-01 | Motor, 5.0HP, 230/60/1, Baldor L1410T         | 1    |
| 584-00002-40 | Pulley, Maska# 2MBL49                         | 1    |
| 516-00002-23 | Bushing, SP, split taper, Maska# L-1 1/8"     | 1    |
| 220-00093-01 | Pump, Comet Model# FW4030S                    | 1    |
| 584-00002-43 | Pulley, Maska# 2MBL57                         | 1    |
| 200-00009-01 | Bushing, SP, split taper, Maska# L-1 1/8"     | 1    |

### XVNG Belt Drive Pumps

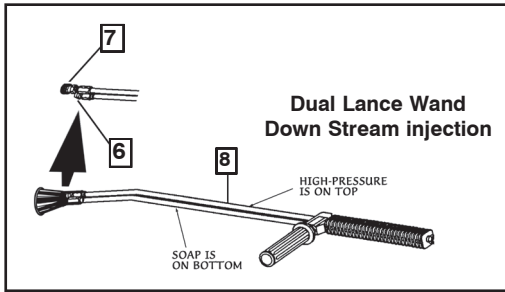
General Pump TC1509S17, TC1809S17, TC91811S17 Triplex Pump



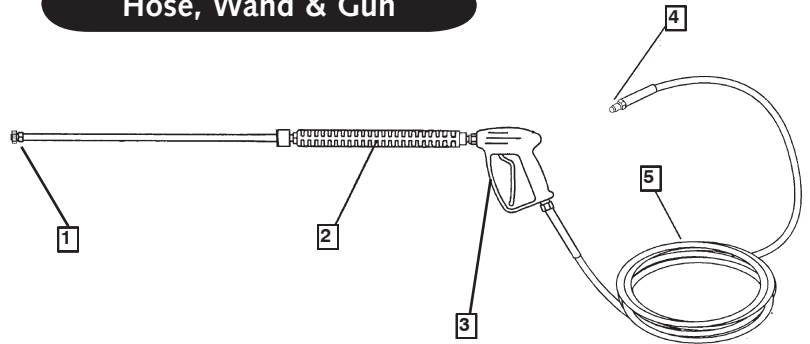
| Ref.# | Part #       | Description  | Qty |
|-------|--------------|--|-----|
| 1a    | 220-00105-01 | TC1509S17 Triplex Plunger Pump Complete (XV150, XV200) | 1   |
| 1b    | 220-00106-01 | TC1809S17 Triflex Plunger Pump Complete (XV200, XV300) | 1   |
| 1c    | 220-00107-01 | TC1811S17 Triplex Plunger Pump Complete (XV500)        | 1   |
| 2a    | 221-0000XX-X | Manifold, Brass Head (TC1509S17 & TC1811S17)           | 1   |
| 2b    | 221-0000XX-X | Manifold, Brass Head (TC1809S17)                       | 1   |

#### Pump Repair Kits

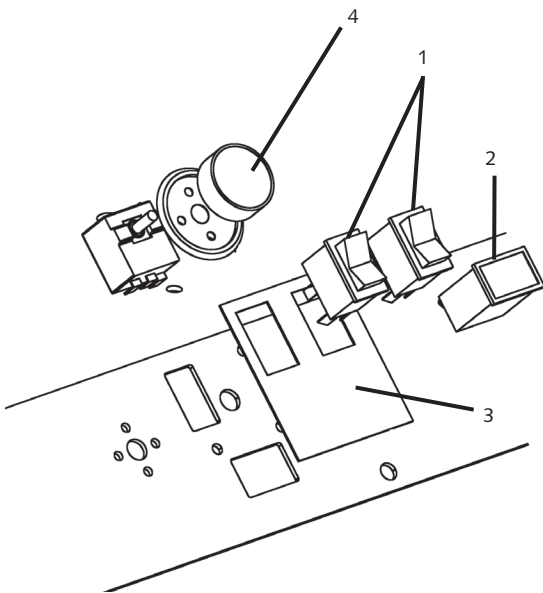
|              |  |       |
|--------------|--|-------|
| 221-00021-01 | Check Valve Assembly Kit #123 (All TC Pumps)     | 1 kit |
| 221-00003-01 | Oil Seal Kit #83 (All TC Pumps)                  | 1 kit |
| 221-0000X-XX | Seals, HP, 15mm Kit #196 (TC1509S17 & TC1811S17) | 1 kit |
| 221-0000X-XX | Seals, HP, 18mm Kit #197 (TC1809S17)             | 1 kit |
| 221-0000X-XX | Rings, 15mm Kit #198 (TC1509S17 & TC1811S17)     | 1 kit |
| 221-0000X-XX | Rings, 18mm Kit #199 (TC1809S17)                 | 1 kit |
| 221-0000X-XX | Seals, LP, 15mm Kit #200 (TC1509S17 & TC1811S17) | 1 kit |
| 221-0000X-XX | Seals, LP, 18mm Kit #225 (TC1809S17)             | 1 kit |
| 221-0000X-XX | Packing, 15mm Kit #226 (TC1509S17 & TC1811S17)   | 1 kit |
| 221-0000X-XX | Packing, 18mm Kit #227 (TC1809S17)               | 1 kit |



### Hose, Wand & Gun



| Ref.# | Part #       | Description                          | Qty |
|-------|--------------|--------------------------------------|-----|
| 1     | 270-00002-01 | Nozzle 4.0 0° 1/4" (XV150)           | 1   |
|       | 270-00001-01 | Nozzle 3.5 0° 1/4" (XV200)           | 1   |
|       | 270-00006-01 | Nozzle 6.0 0° 1/4" (XV200)           | 1   |
|       | 270-00003-01 | Nozzle 4.5 0° 1/4" (XV300)           | 1   |
|       | 270-00004-01 | Nozzle 5.0 0° 1/4" (XV500)           | 1   |
|       | 270-00002-02 | Nozzle 4.0 15° 1/4" (XV150)          | 1   |
|       | 270-00001-02 | Nozzle 3.5 15° 1/4" (XV200)          | 1   |
|       | 270-00006-02 | Nozzle 6.0 15° 1/4" (XV200)          | 1   |
|       | 270-00003-02 | Nozzle 4.5 15° 1/4" (XV300)          | 1   |
|       | 270-00004-02 | Nozzle 5.0 15° 1/4" (XV500)          | 1   |
|       | 270-00002-03 | Nozzle 4.0 25° 1/4" (XV150)          | 1   |
|       | 270-00001-03 | Nozzle 3.5 25° 1/4" (XV200)          | 1   |
|       | 270-00006-03 | Nozzle 6.0 25° 1/4" (XV200)          | 1   |
|       | 270-00003-03 | Nozzle 4.5 25° 1/4" (XV300)          | 1   |
|       | 270-00004-03 | Nozzle 5.0 25° 1/4" (XV500)          | 1   |
|       | 270-00002-04 | Nozzle 4.0 40° 1/4" (XV150)          | 1   |
|       | 270-00001-04 | Nozzle 3.5 40° 1/4" (XV200)          | 1   |
|       | 270-00006-04 | Nozzle 6.0 40° 1/4" (XV200)          | 1   |
|       | 270-00003-04 | Nozzle 4.5 40° 1/4" (XV300)          | 1   |
|       | 270-00004-04 | Nozzle 5.0 40° 1/4" (XV500)          | 1   |
| 2     | 265-00001-01 | 36" Wand, Insulated                  | 1   |
| 3     | 275-00001-01 | ST1500 Trigger Gun                   | 1   |
| 4     | 552-00004-03 | 3/8" Quick Connect Plug              | 1   |
| 5     | 284-00001-01 | Hose 3/8" X 50' 3000 PSI Swivel Ends | 1   |
| 6     | 554-00006-02 | 1/4" nptm Quick Connect Socket       | 1   |
| 7     | 270-00038-01 | Nozzle (Low Pressure Soap) #40, 15°  | 1   |
| 8     | 265-00002-01 | Dual Lance Wand                      | 1   |



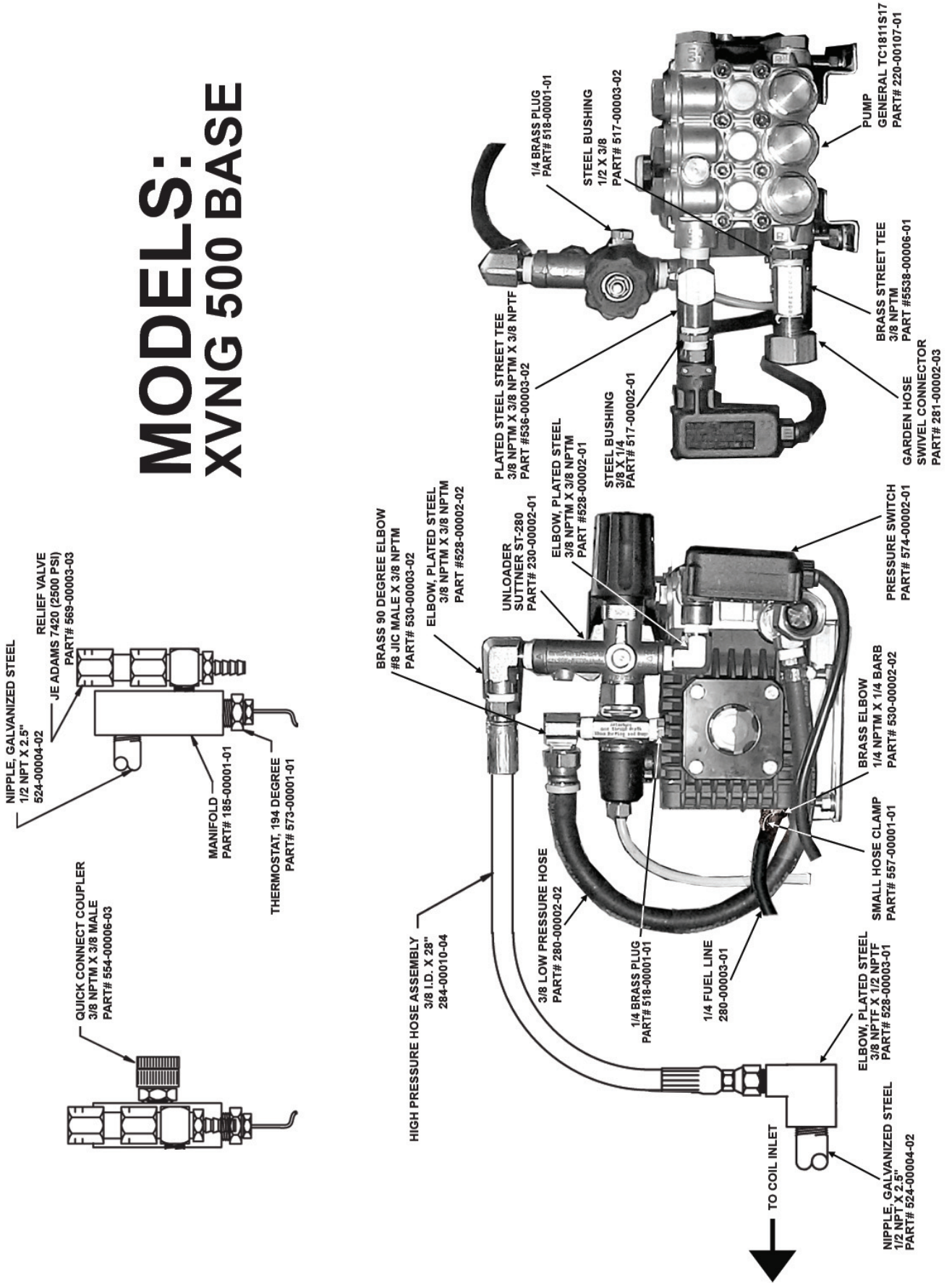
### Control Box Area

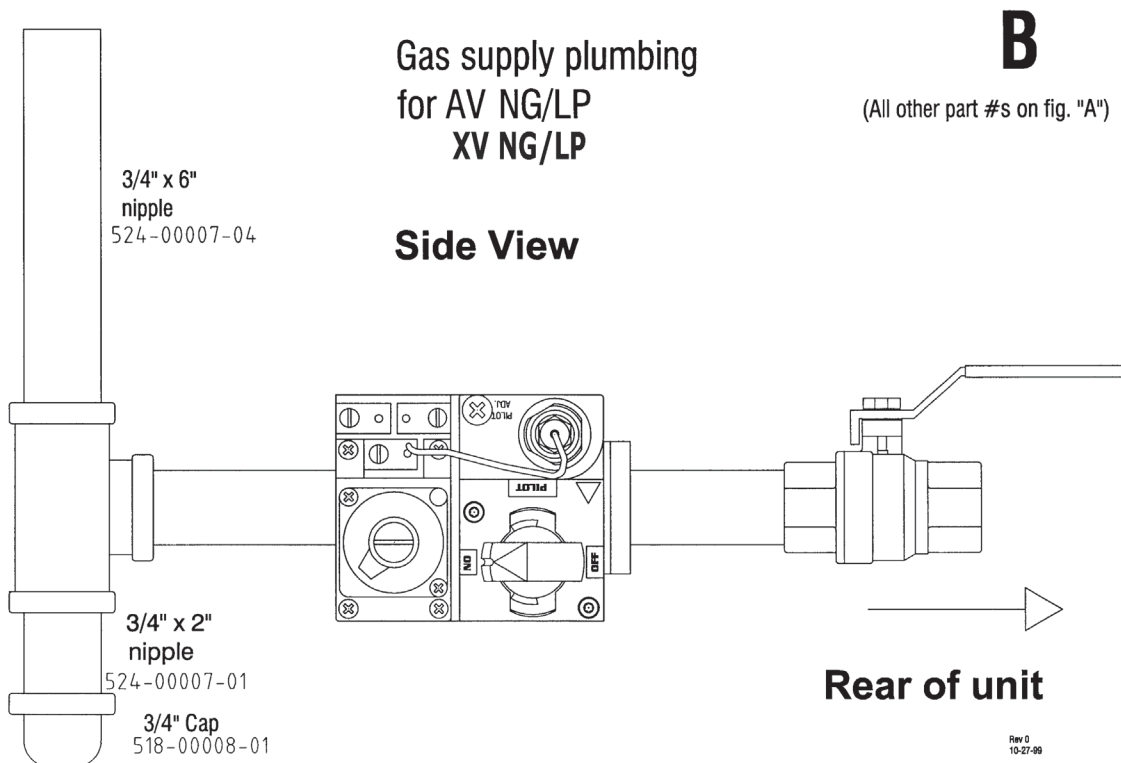
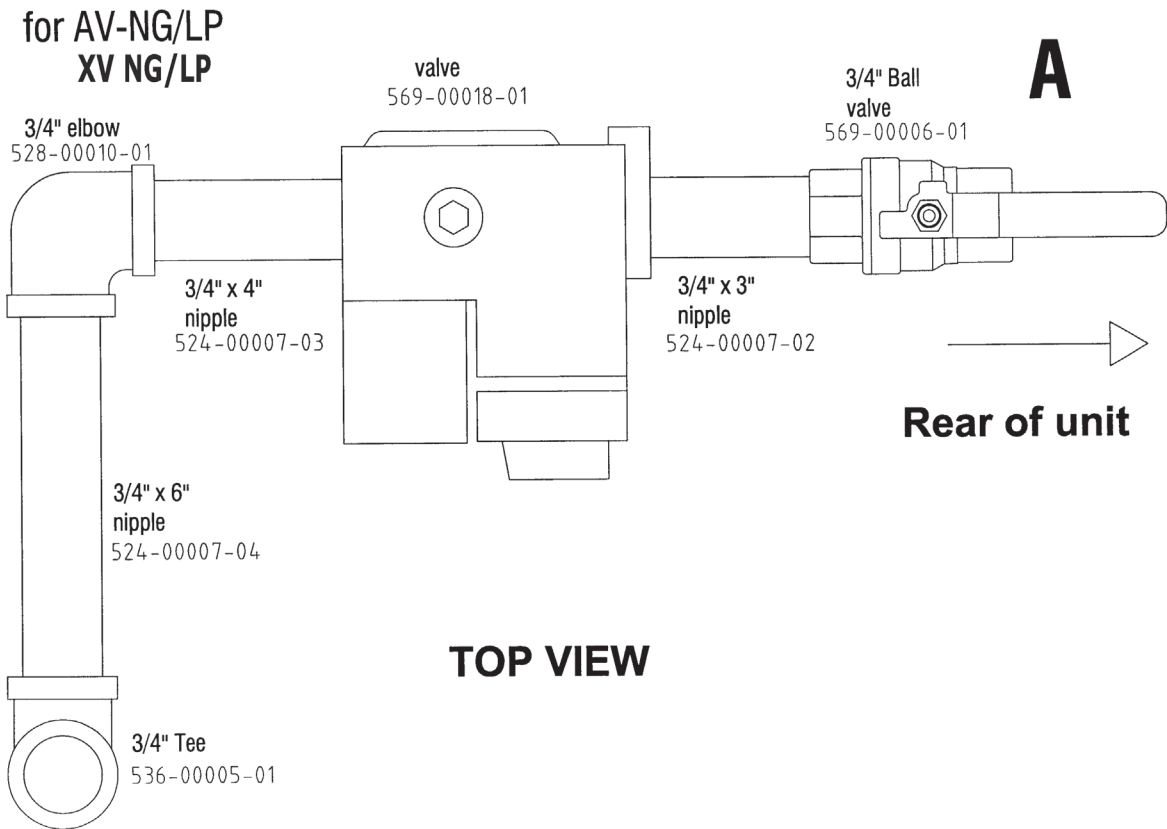
| Ref.# | Part #       | Description                | Qty |
|-------|--------------|----------------------------|-----|
| 1     | 450-00001-01 | Rocker Switch              | 2   |
| 2     | 571-00002-01 | Hourmeter (optional)       | 1   |
| 3     | 305-00040-01 | Label, Controls            | 1   |
| 4     | 573-00001-01 | Thermostat Assembly        | 1   |
| 5     | 180-00289-01 | XV Control Box (Not Shown) | 1   |





# MODELS: XVNG 500 BASE

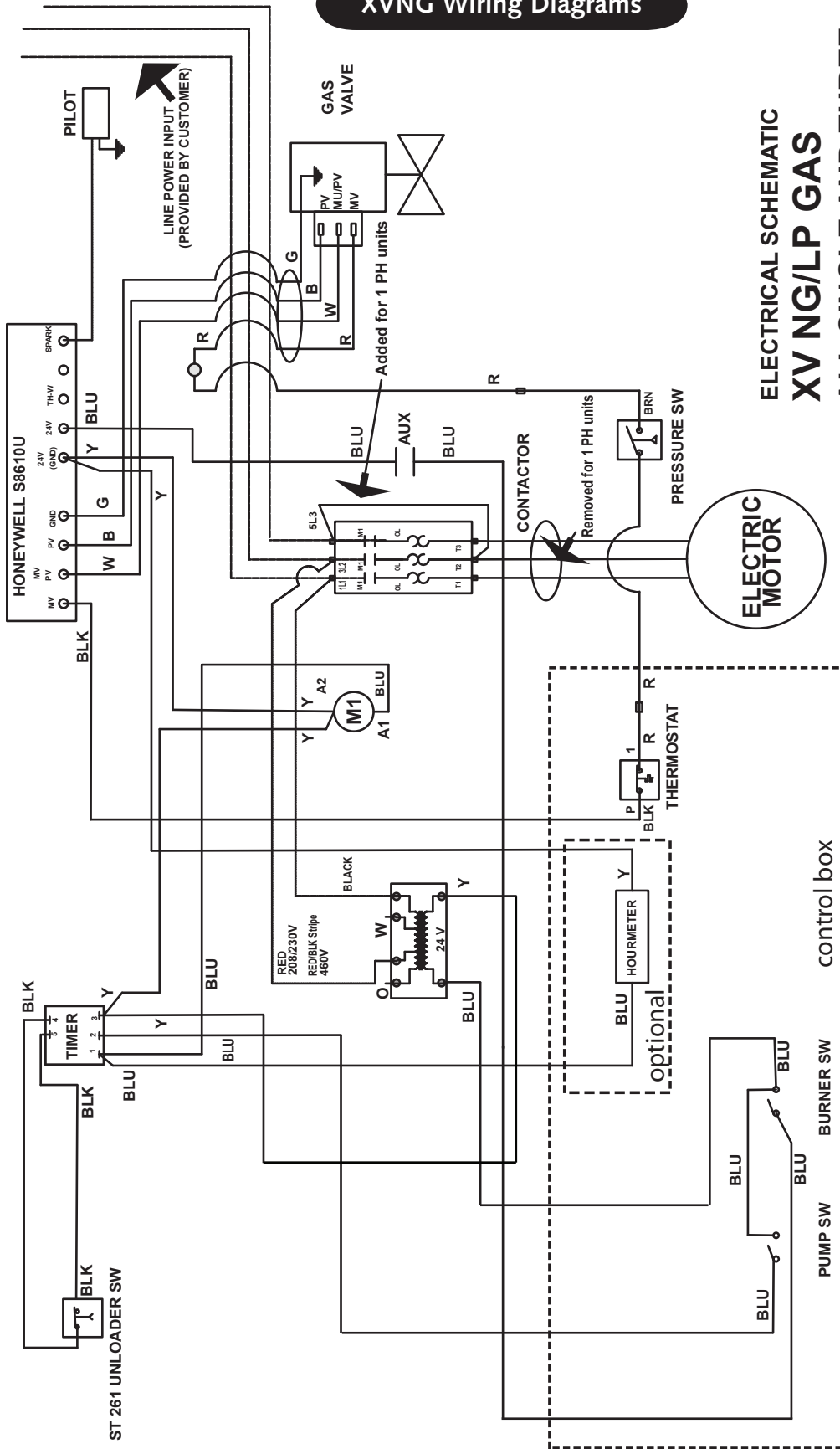




Rev D  
10-27-99



**XVNG Wiring Diagrams**



**ELECTRICAL SCHEMATIC  
 XV NG/LP GAS  
 ALL SINGLE AND THREE  
 PHASE UNITS  
 110, 208/230 and 460 VOLT**

**New Wiring Effective 4/26/05**



## Troubleshooting

| problem  | cause   | action  |
|--|---|---|
| Low Water Pressure   | Insufficient water source<br>Old or incorrect nozzle<br>Plumbing or hose leak<br>Obstruction in spray nozzle<br>Chemical valve open<br>Unloader valve worn<br>Pump valves dirty or worn   | Check hose size/water source<br>Replace nozzle<br>Tighten, repair or replace leak<br>Clean or replace nozzle<br>Close valve or submerge hose<br>Replace unloader<br>Clean or replace packing/valves   |
| No Chemical Flow   | Detergent valve closed<br>Low detergent level<br>Chemical screen dirty  | Open detergent valve<br>Fill detergent container<br>Clean detergent screen  |
| Pilot will not light<br>Burner will not fire                   | No fuel<br>Burner switch turned off<br>Thermostat set too low<br>Defective pressure switch<br>Trigger not pulled<br>Gas valve turned off<br>No voltage to valve<br>Pilot orifice plugged<br>Defective ignition module<br>Defective transformer<br>Defective thermostat<br>Faulty rocker switch<br>Igniter not working | Ensure proper gas flow<br>Turn burner switch on<br>Reset thermostat<br>Replace pressure switch<br>Burner should fire only when trigger pulled<br>Turn gas valve on<br>Check voltage between valves<br>Remove orifice & clean<br>Check voltage to & through module.<br>Replace transformer<br>Replace thermostat<br>Replace switch<br>Test for spark and continuity between ignition wire and ground<br><i>WARNING: High voltage ignitor can cause electrical shock.</i> |
| Pilot lights, but burner will not fire                         | Check for 24v between main valve and pilot valve  | If no voltage at the valve, replace module<br>If voltage, replace valve   |
| Burner fires, but goes out                                     | Check for continuity between ignition cable and ground wire<br>Faulty ignition module<br>Excess draft   | Assure good ground<br>Replace module<br>Protect from windy conditions   |
| Discharge water temperature too high                           | Faulty thermostat<br>Water restriction<br><br>Incoming gas pressure too high  | Replace thermostay<br>Clean or replace spray nozzle<br>Descale coil<br>Check and lower gas pressure   |
| Discharge water temperature not reaching maximum temp setting. | Worn spray nozzle<br>Gas pressure too low<br>Draft under burner manifold  | Replace spray nozzle with proper size<br>Increase gas pressure<br>Prevent down draft with installation of draft diverter  |
| Burner continues to fire even when water not being sprayed     | Faulty pressure switch<br>Main gas valve stuck open   | Replace pressure switch.<br>Replace main gas valve.   |
| Pressure Relief Valve Leaks                                    | Nozzle is dirty<br>Defective relief valve<br>Unloader adjusted incorrectly<br>Restriction on discharge hose<br>Scale restricting flow in coil   | Clean or replace nozzle<br>Replace relief valve<br>Adjust unloader valve<br>Remove nozzle and flush line<br>Clean coil  |
| Pump Motor Not Running   | Pump motor switch off<br>GFCI tripped<br>No voltage to machine<br>Clogged water nozzle<br>Insufficient voltage/ampereage  | Turn on pump motor switch<br>Reset and test GFCI<br>Check power source<br>Clean water nozzle<br>Use proper drop cord  |
| Pump Noisy   | Air in suction line<br>Pump valves dirty<br>Check valve springs worn<br>Low pump oil<br>Pump bearings are worn<br>Incoming water too hot  | Check inlet water fittings<br>Clean/replace pump valves<br>Replace check valves<br>Add SEA 30wt. non-detergent<br>Replace/rebuild pump<br>Reduce temperature/ambient  |
| Water In Oil   | High humidity environment<br>Oil seal worn<br>Plunger packing worn  | Change oil frequently<br>Check and replace oil seal<br>Check and replace packing  |
| Water Dripping/Pump  | Plunger packing is worn<br>Plunger retainer oil ring worn<br>Cracked ceramics   | Install new packing kit<br>Replace oil ring<br>Replace ceramics   |
| Oil Dripping   | Oil seal worn<br>Cracked manifold   | Check and replace oil seals<br>Replace manifold   |
| Fluctuating Pressure   | Unloader not adjusted<br>Valves worn<br>Dirt or blockage in valves<br>Pump sucking air<br>Worn plunger packing  | Adjust to specifications<br>Replace with valve kit<br>Clean or replace valve<br>Check water/detergent supply<br>Replace packing kit   |
| Pump Head Overheating  | Extended period in bypass   | Pull trigger gun for water flow   |

## Limited One Year

# WARRANTY

Ramteq Incorporated ("RAMTEQ") warrants that the Product you have purchased from RAMTEQ or from an Authorized RAMTEQ Reseller is free from defects in materials or workmanship under normal use for a period of one (1) year from the date of purchase. This warranty extends only to you, the original Purchaser. It is not transferable to anyone who subsequently purchases the Products from you. This warranty specifically excludes expendable items, including but not limited to hoses, seals, nozzles and gunjets. RAMTEQ manufacturers warrant certain components of the Products for periods greater than one (1) year. MOTORS, GENERATORS, PUMPS, COILS, BURNERS AND ENGINES ARE WARRANTED BY THEIR RESPECTIVE MANUFACTURERS, AND SERVICED THROUGH THESE MANUFACTURERS' LOCAL AUTHORIZED SERVICE CENTERS. Specific warranty details can be found on the individual manufacturers website. RAMTEQ CANNOT PROVIDE WARRANTY ON THESE ITEMS.

During the warranty period, RAMTEQ will repair or replace defective parts, at the option of RAMTEQ.

This limited warranty does not extend to any Product not purchased from RAMTEQ or from an Authorized RAMTEQ Reseller. This limited warranty also does not extend to any Product that has been damaged or rendered defective (a) as a result of accident, misuse or abuse; (b) by operation outside the specifications in the intended applications; (c) by the use of parts not sold or manufactured by RAMTEQ; (d) by the modification of the Product.

#### Warranty Disclaimer

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, RAMTEQ MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. RAMTEQ EXPRESSLY DISCLAIMS ALL AND ANY WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY HAVE BEEN IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

#### Limitation of Remedy

RAMTEQ IS NOT LIABLE FOR ANY DAMAGES CAUSED BY THE PRODUCT OR FAILURE OF THE PRODUCT TO PERFORM, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES. THIS LIMITATION APPLIES WHETHER DAMAGES ARE SOUGHT, OR A CLAIM MADE, AS A CONTRACT CLAIM, AS A TORT CLAIM, OR ANY OTHER CLAIM.

THIS LIMITATION OF LIABILITY, HOWEVER, WILL NOT APPLY FOR PERSONAL INJURY.

#### U.S.A. State Laws

Some states do not allow limitation on how long an implied warranty lasts. In such states, the limitations or exclusions of this Limited Warranty may not apply to you.

Some states do not allow the exclusion or limitation in incidental or consequential damages for consumer products. In such states, the exclusion may not apply to you. This limited warranty gives you specific legal rights. You may also have other rights that may vary from state to state. You are advised to consult applicable state laws for a full determination of your rights.

#### How to Obtain Warranty Service

TO OBTAIN WARRANTY SERVICE YOU MUST CONTACT RAMTEQ or an AUTHORIZED RAMTEQ RESELLER.



# Manufacturers Warranty Period

Click on pictures to open manufacturers website.



5 years



5 years



3 years



3 years



3 years



18 months



3 years



18/36 months



1 year