



a xylem brand



Residential Fire Pump Package

INSTALLER: PLEASE LEAVE THIS MANUAL FOR THE OWNER'S USE.

DESCRIPTION

The assembly consists of a single pump water boosting system which increases riser pressure by as much as 55 PSI. The pump is automatically controlled to run on demand. The system is to be applied to NFPA 13D systems as required.



SAFETY INSTRUCTIONS

This safety alert symbol will be used in this manual and on the Safety Instruction decal to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THE INSTRUCTION MAY RESULT IN A SAFETY HAZARD!**

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NOTE: The information contained in this manual is intended to assist operating personnel by providing information on the characteristics of the purchased equipment.

It does not relieve the user of the responsibility to adhere to local codes and ordinances and the use of accepted practices in the installation, operation and maintenance of this equipment.

Further information pertaining to the installation, operation, and maintenance of your Residential Fire Pump Package can be found in the installation Operation and Maintenance manuals for the associated equipment provided:

- A. RCW NPE Pump (I.O.M. Part IMPROT)
- B. Tank (Model Specific)

Section 1 - General Description

1.1 The residential fire pumping package will increase the domestic water pressure at the fixtures from 30 to 55 PSI above that of the city water pressure.

1.2 A pressure switch starts and stops the pump.

1.3 PURPOSE OF MANUAL

1.4 This manual is furnished to acquaint you with some of the practical ways to install, operate, and maintain this unit. Read it completely before doing any work on your unit and keep it handy for future reference.

1.5 Equipment cannot operate well without proper care. To keep this unit at top efficiency, follow the recommended installation and servicing procedure outlined in this manual.



1.6 SAFETY INSTRUCTION

1.7 This safety alert symbol will be used in this manual and on the unit safety instruction to draw attention to safety related instructions. When used the safety alert symbol means **ATTENTION BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN A SAFETY HAZARD.**

1.8 ADDITIONAL SAFETY REQUIREMENTS



WARNING: Prevent electrical shocks. Disconnect the power supply before beginning installation. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**



WARNING: Electrical Shock Hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practices. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

1.9 Always use accurate test meters when checking electrical components. Always work with another person in case of emergency.

1.10 STORAGE

1.11 For long periods of storage, the unit should be covered to prevent corrosion and contamination from dirt. It should be STORED in a clean, dry location between 0 and 170°F. The relative humidity should not exceed 85%. The unit should be checked periodically to ensure that no condensation has formed. After storage, again check that it is dry before applying power.

1.12 HANDLING

1.13 Care should be taken to prevent damage due to dropping or jolting when moving the Residential fire pump package. Transportation damage should be brought to the carrier's attention immediately upon receipt.



WARNING: Heavy load, may drop if not lifted properly. Do not lift the entire unit by the motor eyebolts. Lift the unit with slings placed under the unit base rails. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

1.13.1 Location

1.13.2 Install the residential fire pumping package appropriately for ease of inspection, maintenance and service. Observe local electrical codes concerning control panel spacing.

1.14 TEMPERATURE AND VENTILATION

1.15 All electrical equipment is susceptible to failure if operated in ambient temperatures outside of its rating. The OPERATING temperature range for this unit is 40 to 105°F. The relative humidity should not exceed 85% non-condensing. The unit should not be operated outside these extremes.

1.16 ELECTRICAL CONNECTIONS - A.C. POWER & SIGNALS INPUT VOLTAGE

1.17 The input voltage tolerance is +10/-10% of nameplate voltage.

1.18 GROUND CONNECTIONS

1.19 A grounding terminal is provided for a dedicated ground wire connection. All provisions of the National Electrical Code and local codes must be followed.



WARNING: Conduit grounds are not adequate. A separate ground wire must be attached to the ground lug provided in the enclosure to avoid potential safety hazards. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

1.20 POWER WIRING

1.21 Power wire types and sizes must be selected based upon conformance with the National Electrical Code and all local codes and restrictions. In addition, only copper (Cu) wire rated for at least 75°C may be used for the power connections. Refer to the input current as listed on the motor nameplate when sizing wire. Connect the input power to the screw terminals on the motor contactor labeled "L1" & "L2". Connect a ground conductor to the ground lug attached to the circuit board.

1.21.1 System Pressure Switch

1.21.2 A system pressure switch is connected to the terminals labels "Pressure".


- 1.21.3 **Flow Switch**
- 1.21.4 An optional flow switch is connected to the terminals labels "Flow Sw".
- 1.21.5 **Local or Remote Alarm Indication**
- 1.21.6 Two relay outputs labeled "Out2" and "Out3" rated for 7 Amps at 240VAC are supplied. These outputs are normally open and close to indicate an alarm condition exists. Out3 closes when the pressure switch closes and stays closed until system pressure restores and the preset timer expires. Out2 closes when the flow switch closes and opens when the flow switch opens.

- 1.22 **FIELD CONNECTION DIAGRAMS**
- 1.23 Refer to the RCW NPE pump Installation, Operation, and Maintenance manual for specific details unique to the pump.
- 1.24 The following field connection diagrams should be reviewed prior to unit installation and operation.


Drawing #	Description	Page
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Section 2 - Installation Instructions


- 2.1 Place the unit preferably on a concrete floor or base. Level the base in both directions by placing steel shims between the base and the anchor bolts.


 **WARNING:** Heavy load, may drop if not lifted properly. Do not lift the entire unit by the motor eyebolts. Lift the unit with slings placed under the unit base rails. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

- 2.2 A well-leveled and secured unit will result in quiet operation as well as longevity of service.
- 2.3 See drawing Appendix C for general piping requirements.
- 2.4 Eccentric increasers can be used in the suction line when increasing the pipe size. The straight side of eccentric reducers should be installed on top to eliminate air pockets. Support the suction and discharge lines independently by the use of pipe hangers or anchors. Do not attempt to spring the suction and discharge lines into position.

 **CAUTION:** The Residential fire pump package includes a high pressure relief valve. Make sure the discharge of the valve is directed to the floor drain before making the unit operational. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.**


- 2.5 The power supply required for the unit is indicated on the nameplate located inside the control panel. A dedicated ground wire must be connected to the unit.

 **WARNING:** Electrical shock hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practices. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

 **WARNING:** Conduit grounds are not adequate. A separate ground wire must be attached to the ground lug provided in the enclosure to avoid potential safety hazards. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

Single phase motors have internal overload protection. The disconnecting means and short circuit protection are to be supplied and mounted by others.

- 2.6 For units installed with an optional tank, the tank must be installed per the requirements of drawing Appendix C. Fill the tank per the tank prior to putting the unit into service.

 **CAUTION:** Seal damage may occur. Do not run pumps dry. Fill and vent the pump volute prior to operation. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.**

Section 3 - Putting the Unit Into Service

CAUTION: Prevent subsequent damage. A unit showing symptoms of possible problems (noise, leaks, vibration, and/or continual operation) must be corrected immediately. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.**

3.1 Whenever the riser water pressure falls below the system pressure switch setting the pump will start through a power relay.

3.2 When the system pressure rises above the setting of the system pressure switch the pump will stop (provided the minimum run timer has expired.)

3.3 ADJUSTMENTS AND SETTINGS

3.3.1 System Pressure Switch

WARNING: Electrical shock hazard. Disconnect and lockout power before servicing the unit. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

3.3.2 Back out the locking screw (see Figure 1) to allow main adjustment wheel to turn freely.

- a) Determine the pressure to be maintained across the sprinkler system.
- b) Adjust main adjustment wheel (see Figure 1) to desired setting for pump to turn ON.
- c) Turn main adjustment wheel counterclockwise to increase or clockwise to decrease pressure. Each number on main adjust wheel represents an approximate window shift of 1.8 psi for EPS40-2. For each 1/2 rotation of the adjustment wheel the window changes by approximately 11 psi for EPS40-2. The LED on Out3 will come ON in the control panel when pressure switch is activated.
- d) The pressure switch has a fixed differential which doesn't require adjustment for turning OFF the pump. The approximate differential varies from 3 psi @ 10 psi system pressure to 6 psi @ 100 psi system pressure.

e) Retest the set point several times to ensure the accuracy of the setting and to ensure the pump starts and stops at the correct pressure.

f) Re-seat locking screw.

WARNING: Electrical shock hazard. Disconnect and lockout power before servicing the unit. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

3.3.6 The minimum run timer is factory set to 5 minutes. The setting should be verified before the unit is placed into operation and adjusted if a shorter minimum run time is desired. Do not adjust the timer with power applied to the unit. Set the run timer by moving the small black plastic jumper on the right side of the PCB to 15 seconds, 30 seconds, 1 min, 2 min, 3 min, 4 min, or 5 min. The system will default to 15 seconds if no jumper is used.

3.3.7 Optional Tank

3.3.8 Refer to the specific IOM that was shipped with the tank for installation and operating instructions.

3.3.9 Procedure to set Relief valve:

- a) Switch ON the pump by opening the test valve slowly to create a pressure drop.
- b) Close the test valve after the pump turns ON.
- c) Let the pump run until it reaches the set pressure and switches OFF.
- d) Loosen (counterclockwise) adjusting screw in relief valve until it releases pressure.

CAUTION: Relief valve exhaust must be piped to an adequately sized drain. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.**

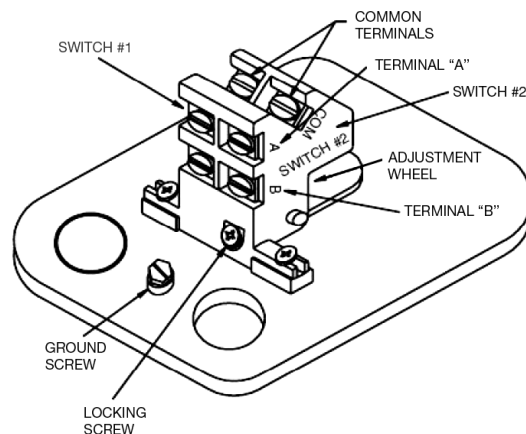



FIGURE 1

Section 4 - Final Check List


A. SYSTEM PIPING AND UNIT INSTALLATION

- ___ 1. Is the unit base properly leveled and secured?
- ___ 2. Is the shut-off valves to the pump suction open?
- ___ 3. Is the shut-off valve on the discharge line open?
- ___ 4. Is the shut-off valve on the hose bib closed?
- ___ 5. Is the piping properly supported to prevent strains on unit?
- ___ 6. Is the system, including the pumps, purged of debris and air?


 **CAUTION:** Seal damage may occur. Do not run pumps dry. Fill and vent the pump volute prior to operation. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE AND/OR MODERATE PERSONAL INJURY.**

B. ELECTRICAL WIRING AND CONTROL SETTINGS


- ___ 1. Does the feeder line voltage correspond to the unit voltage? Check the unit nameplate or motor terminal connection.

 **WARNING:** Electrical shock hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practices. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

- ___ 2. Are the feeder wires correctly sized for the load?


 **WARNING:** Conduit grounds are not adequate. A separate ground wire must be attached to the ground lug provided in the enclosure to avoid potential safety hazards. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

- ___ 3. Have all the power terminals in the control panel been checked for tightness? This is imperative since stranded wires tend to “flow” and become loose after initial installation.

 **WARNING:** Electrical shock hazard. Single phase AC power. Disconnect and lockout power before servicing the unit. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

- ___ 4. Is the pressure control correctly set? The pressure switch needs to be set for proper operation. For best results, use a continuity meter (across the switch) to reset the controls. The legend plate on the control indicates approximate readings only and therefore should be used with caution.

Section 5 - Troubleshooting

 **DANGER:** Troubleshooting live control panels exposes personnel to hazardous voltages. Electrical troubleshooting must only be done by a qualified electrician. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

5.1 Pump will not operate

- 1) Check incoming power
- 2) Check motor overload. Reset if tripped.
- 3) With contactor pulled in, check voltage of the motor leads. Voltage should be the same as the incoming power. If no voltage is present, replace the contactor. If voltage is present, contact an electrician to check the leads and motor.


5.2 Pump will not build pressure

- 1) Suction valve is closed. If closed, open.
- 2) Discharge valve is closed. If closed, open.
- 3) Relief valve is open and discharging to drain, Reset relief valve to correct pressure setting.

- 4) Hose bib is open. If open, close.
- 5) Motor not operating at rated RPM. Have motor checked at local motor repair shop.
- 6) Internal pump damage. Take pump to authorized pump repair facility.

5.3 Pump will not start automatically

- 1) No power. Restore if there is no power.
- 2) System pressure switch is not adjusted properly. Refer to section 3.

 **WARNING:** Electrical shock hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practices. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

Appendix A - Programmable Control Module

- 1.1 The control system allows for intelligent pump control while improving system reliability. Timers and relays used in a conventional controller are integrated into a single sequence controller. The working program is stored on a non-volatile EEPROM chip that is an integral part of the unit. This means there is no danger of ever losing a program due to power losses.



WARNING: Electrical shock hazard. Inspect all electrical connections prior to powering the unit. Wiring connections must be made by a qualified electrician in accordance with all applicable codes, ordinances, and good practices. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

- 1.2. OK LED is on when the processor is running. If this LED is not lit, check power connections. If power is applied to the unit and LED is still not lit, replace unit.
- 1.3. The Aux in LED is reserved for future use.
- 1.4. The Flow Sw. LED is lit when the flow switch is closed.
- 1.5. The Pressure LED is lit when the pressure switch is closed.
- 1.6. The Out3 LED is lit when Output 3 is closed. Output 3 is closed when the pressure switch is closed, or when the pressure switch is open and the run timer is active.
- 1.7. The Out2 LED is lit when Output 2 is closed. Output 2 is closed when the flow switch is closed.
- 1.8. The Contactor LED is lit when the Contactor output is closed. The Contactor output closes when the pressure switch is closed, or when the pressure switch is open and the run timer is active.

2.0 CHANGING THE MINIMUM RUN TIME

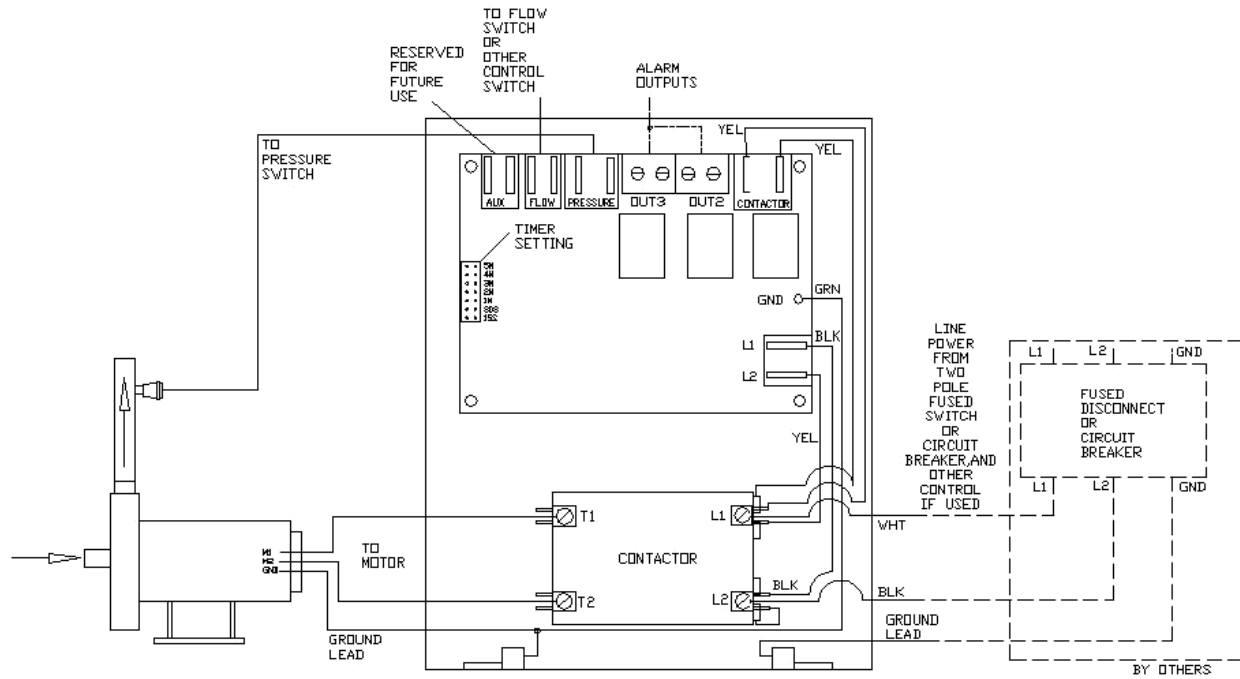
2.1 Adjustable Settings

- 2.2 The run timer is adjustable to 15 seconds, 30 seconds, 1 minute, 2 minutes, 3 minutes, 4 minutes, and 5 minutes. On the right hand side of the PCB near the OK LED is a small black plastic jumper which sets the run time. Shorting the pins at the top of the connector will set the run time to 5 minutes. Shorting the next set of pins down will set the timer to 4 minutes. Shorting the bottom set of pins sets the timer to 15 seconds. Each setting is labeled on the PCB. If no jumper is used, the timer defaults to 15 seconds.



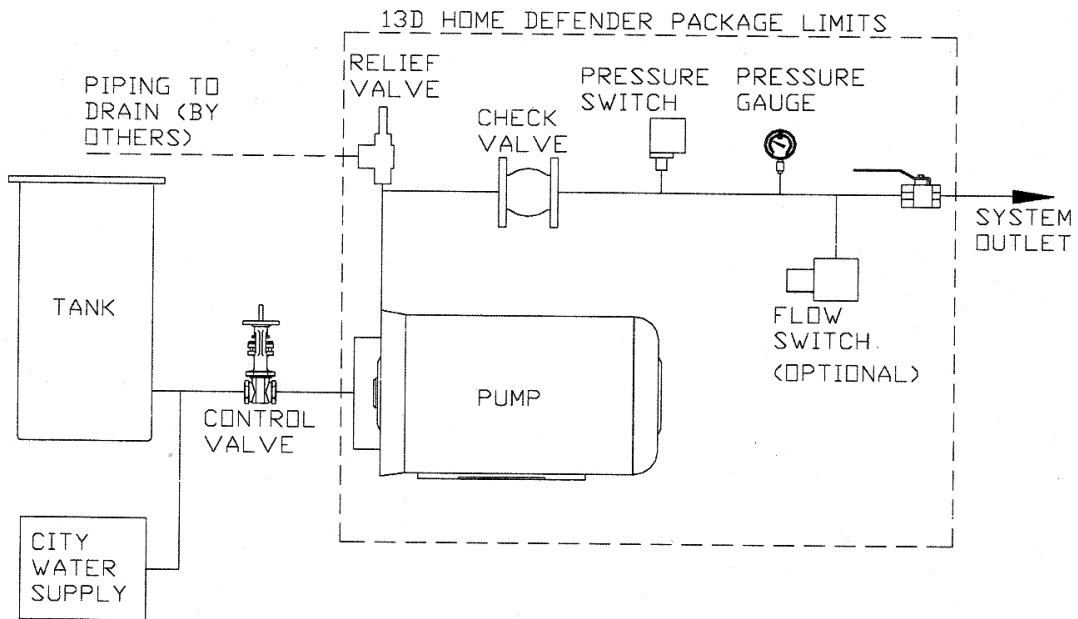
WARNING: Electrical shock hazard. Disconnect and lockout power before servicing the unit. **FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.**

Appendix B - Field Wiring Diagram



Voltage	HP	Amps	M1-M2	GND	Conduit Size
230	1-1/2	10	#14	#12	1/2"
230	3	17	#10	#10	1/2"
230	5	28	#8	#8	1/2"

Appendix C - Field Piping Diagram



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