



Model VXT-24

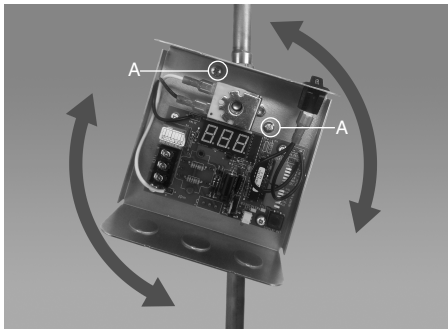
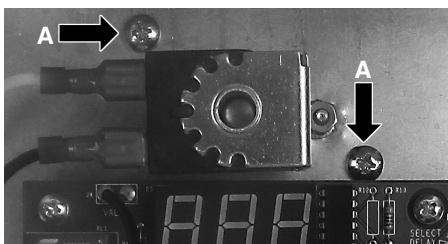
## Programmable Water Feeder for Steam Boilers

24 VAC Operating Voltage

U.S. Patent No. 6,688,329; 7,093,611;  
6,926,028

### SPECIFICATIONS

MAX AMBIENT TEMPERATURE: 100°F  
FLOW RATE: 1 GPM  
MAXIMUM FEED: 10 Gallons (2 Cycles)  
ELECTRICAL: 24 VAC, 60 HZ



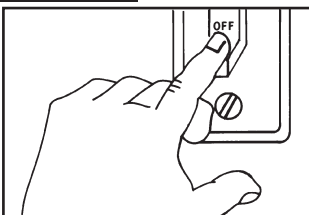
The VXT can be rotated to accommodate the orientation of the incoming water line. To rotate, loosen the 2 mounting screws located inside the housing (A) a quarter turn (these screws should NOT be removed from the housing). Rotate housing to desired position (clockwise or counter-clockwise). Once positioned, tighten the 2 mounting screws (A).

- UNIVERSAL COMPATIBILITY – page 2
- PROGRAMMABLE FEED DELAY SETTINGS – page 3
- PROGRAMMABLE FEED AMOUNT SETTINGS – page 3
- FEED COUNTER – page 4
- UNDERFEED PROTECTION – page 4
- LOCKOUT FLOOD PROTECTION – page 4

**BLUE = QUICK-GUIDE**  
to frequently asked questions

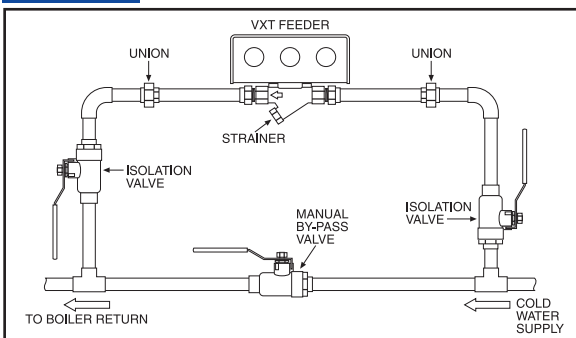
## INSTALLATION

### Step 1 Warning



**WARNING** – To prevent electrical shock or equipment damage, power must be off during installation or servicing of the control. To prevent serious burns, the boiler should be thoroughly cooled before installing or servicing control. Only qualified personnel may install or service the control in accordance with local codes and ordinances. Read instructions completely before proceeding.

### Step 2 Plumbing



The feeder can be mounted on a horizontal or vertical cold water supply line. It must be installed with a manual by-pass valve and unions (as shown above) for future serviceability. Arrows on the valve indicate direction of water flow. Do not install feeder on hot water supply.

**IMPORTANT:** It is important to prevent any contaminants from entering the feed valve during or any time after installation. The feeder must be installed with non-ferrous plumbing materials only to prevent rust from contaminating the valve. Apply pipe compound sparingly. Remove and clean the feed valve strainer after the first feed cycle to remove any contaminants that could have been introduced during installation. See Service / Maintenance on page 4 for additional information.

### LIMITED MANUFACTURER'S WARRANTY

We warrant products manufactured by Hydrolevel Company to be free from defects in material and workmanship for a period of two years from the date of manufacture or one year from the date of installation, whichever occurs first. In the event of any claim under this warranty or otherwise with respect to our products which is made within such period, we will, at our option, repair or replace such products or refund the purchase price paid to us by you for such products. In no event shall

Hydrolevel Company be liable for any other loss or damage, whether direct, indirect, incidental or consequential. This warranty is your EXCLUSIVE remedy and shall be IN PLACE OF any other warranty or guarantee, express or implied, including, without limitation, any warranty of MERCHANTABILITY or fitness for a particular purpose. This warranty may not be assigned or transferred and any unauthorized transfer or assignment thereof shall be void and of no force or effect.

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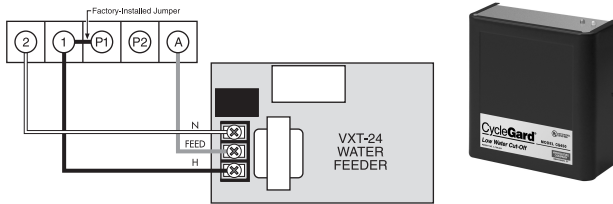
## Step 3 Wiring

Select the wiring diagram **1** through **7** below that corresponds to the low water cut-off installed on the boiler.

Consult boiler manufacturer's instructions for proper burner terminal connections.

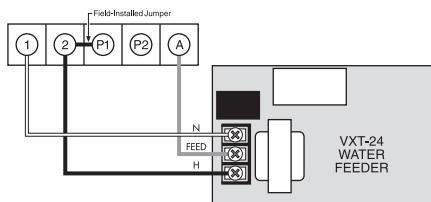
### Hydrolevel

#### 1 Safgard Model 400 / CycleGard CG400 STANDARD WIRING



**Note:** If there is no jumper installed on the low water cut-off between 1 and P1, see **ALTERNATE WIRING** box.

#### 2 Safgard Model OEM-24TD STANDARD WIRING



**IMPORTANT**  
To prevent over-feeding and possible flooding, when used with the OEM-24TD, the VXT should be set with a Feed Delay of 10 minutes and a Feed Amount of 1 to 5 gallons (see step 5). DO NOT USE LWCO SETTING.

**Note:** If there is no jumper installed on the low water cut-off between 2 and P1, see **ALTERNATE WIRING** box.

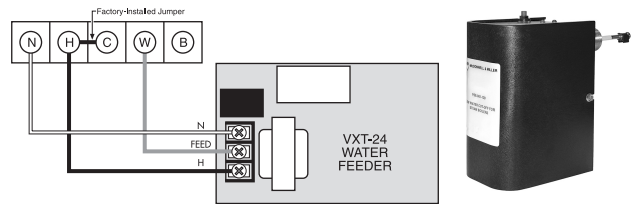
#### ALTERNATE WIRING

##### Safgard & CycleGard Models:

If there is no jumper installed between terminals 1 and P1 on the low cut-off (between 2 and P1 on Model OEM-24TD), then the cut-off is powered by a separate power source from the burner circuit and the following wiring must be used: ① Connect a wire from the FEED terminal on the feeder to the A terminal on the cut-off. ② Connect a wire from terminal H on the feeder to the burner circuit hot. ③ Connect a wire from terminal N on the feeder to burner circuit common.

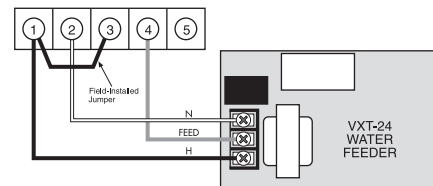
### McDonnell & Miller

#### 3 PS-800 Series – Newer Models STANDARD WIRING



**Note:** If there is no jumper installed on the low water cut-off between H and C, see **ALTERNATE WIRING** box.

#### 4 PS-800 Series – Older Models STANDARD WIRING



**Note:** If there is no jumper installed on the low water cut-off between 1 and 3, see **ALTERNATE WIRING** box.

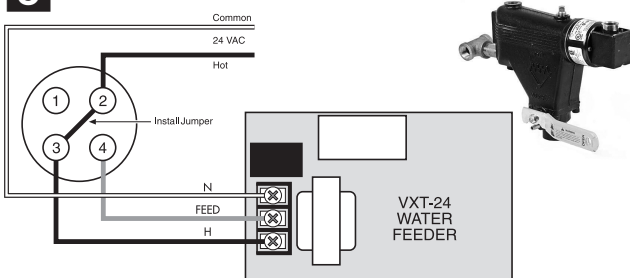
#### ALTERNATE WIRING

##### PS-800 Series:

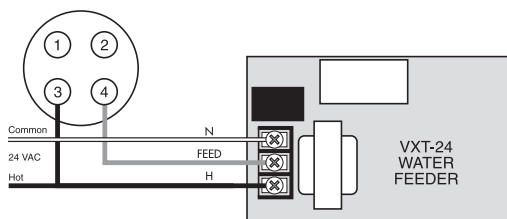
If there is no jumper installed between terminals H and C on the low water cut-off (terminals 1 and 3 on older models), then the cut-off is powered by a separate power source from the burner circuit and the following wiring must be used: ① Connect a wire from the FEED terminal on the feeder to the W (4 on older models) terminal on the cut-off. ② Connect a wire from terminal H on the feeder to the burner circuit hot. ③ Connect a wire from terminal N on the feeder to burner circuit common.

### Float Style Control

#### 5 Using the burner circuit to power the feeder

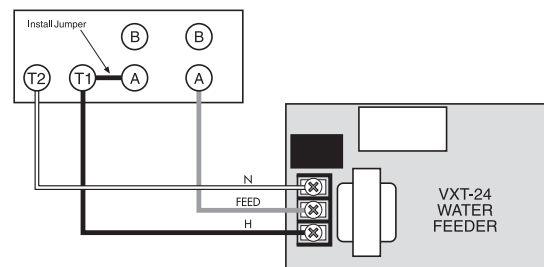


#### 6 Using a separate power source for the feeder

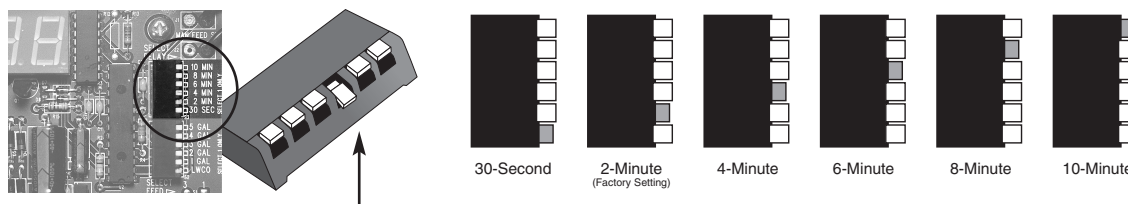


### Honeywell

#### 7 Model RW-700 Guard Ring



## Step 4 Set the Feed Delay



**NOTE: SELECT ONLY ONE DIPSWITCH CORRESPONDING TO THE DESIRED FEED DELAY.**

The feed delay feature is designed to prevent boiler flooding by allowing time for condensate to return to the boiler prior to feeding. If the returns and vents are in good condition, the 2-minute factory setting is usually sufficient. If for any reason condensate takes longer to return to the boiler (such as old return lines or long horizontal runs), a longer delay setting should be selected.

## Step 5 Set the Feed Amount



**NOTE: SELECT ONLY ONE DIPSWITCH CORRESPONDING TO THE DESIRED FEED AMOUNT.**

**CAUTION: BOILER FLOODING CAN OCCUR IF THE FEEDER IS NOT SET PROPERLY. UNLIKE OTHER FEEDERS, THE 1-GALLON TO 5-GALLON SETTINGS WILL FEED THE FULL CYCLE REGARDLESS OF WHEN THE WATER REACHES THE LOW WATER CUT-OFF.**

**LWCO Setting:** The VXT feeder is shipped in the LWCO feed setting. When operating in this setting, the VXT will feed only until the low water cut-off re-energizes the burner circuit (or a maximum of 5 gallons). This will restore boiler operation, but on some applications may only be enough water to satisfy the *minimum* requirements. If additional water is needed to reach the boiler's *normal* operating level, the 1-Gallon to 5-Gallon settings should be selected using the instructions below. **DO NOT USE LWCO SETTING WITH SAFGARD MODEL OEM-24TD.**

**1 Gallon to 5 Gallon Settings:** When the 1 to 5 Gallon settings are used, the feeder will continue to feed until the cycle is complete, regardless of when the low water cut-off is satisfied. These settings should be used only when the LWCO setting does not provide adequate water to restore the boiler to a *normal* operating level. Use the following instructions when choosing these settings:

### **Boilers with probe-type cut-offs:**

1. With power to the system on and the thermostat off, lower the water level to approximately 1/2" below the probe.
2. Press the FEED button on the water feeder and, using a watch with a second hand, time how long it takes boiler water to reach the *normal* operating level (Usually the middle of the gauge glass unless otherwise specified by the boiler manufacturer).
3. Round the time to the nearest minute and set the feeder for the corresponding number of gallons.  
*Example:* If it takes 1 minute and 15 seconds for water to rise from 1/2" below the probe to the normal operating level, round to 1 minute and set the feeder for 1-Gallon.
4. Once the Feed Amount has been set, perform a test cycle by lowering the water a second time (following procedures in Step 1 above) and allowing the feeder to replenish the water automatically.

### **Boilers with float-type cut-offs:**

1. With power to the system on and the thermostat off, lower the water level until 1/4" is visible in the gauge glass.
2. Press the FEED button on the water feeder and, using a watch with a second hand, time how long it takes boiler water to reach the *normal* operating level (Usually the middle of the gauge glass unless otherwise specified by the boiler manufacturer).
3. Round the time to the nearest minute and set the feeder for the corresponding number of gallons.  
*Example:* If it takes 2 minutes and 10 seconds for water to rise from 1/4" in the gauge glass to the normal operating level, round to 2 minutes and set the feeder for 2-Gallons.
4. Once the Feed Amount has been set, perform a test cycle by lowering the water a second time (following procedures in Step 1 above) and allowing the feeder to replenish the water automatically.

## Step 6 Attach Service Tag

Write the installation date on the top of the VXT SERVICE TAG and hang it in a visible location on or near the VXT Water Feeder.

## Feed Counter

The VXT's built-in feed counter records the number of gallons that enter the boiler during automatic feed cycles or if the FEED button is pressed.\* To determine how much water has been added to the boiler since the last service, the counter should be checked, recorded, and reset each time the boiler is serviced. The counter reset (DISPLAY RST) button is located in the bottom right corner of the circuit board.

The addition of water to a boiler raises the oxygen level and accumulates lime and other mineral deposits over time. Excessive feed cycles, resulting from leaks in the system, can cause cast iron boilers to oxidize (rust) internally, significantly reducing the life of the boiler. Additionally, lime and sediment buildup resulting from excessive makeup water can impede heat transfer causing damage and/or premature failure of the boiler.

### Recommended Limits on Makeup Water

Many factors, such as the water capacity of the boiler, feed water conditions and boiler design can impact the amount of water that can safely be added to a steam boiler. As a general guideline for late model boilers, Hydrolevel recommends the annual limits in the table at the right for boiler operation. If feed amounts significantly exceed these levels, the system should be checked for leaks by a qualified technician. **Note:** Any makeup water limits provided by the boiler manufacturer supercede Hydrolevel recommendations. Please check the boiler manufacturer's instructions carefully.

\*The VXT Feeder is equipped with an orifice to regulate flow rates over a wide range of water pressures. The Feed Counter readings are designed to be accurate to  $\pm 15\%$  with water pressures between 20 to 90 PSI.

Recommended Makeup Water Limits	
Net IBR Rating BTU/HR	Annual Limit
Up to 90,000	18
91,000 - 120,000	22
121,000 - 150,000	25
151,000 - 185,000	30
185,000 & Higher	35
<b>Note:</b> Consult boiler manufacturer for limits that may differ from the above.	

## Service / Maintenance



### WARNING

**Water Damage Potential:** Failure to maintain the VXT Series feeder can result in excess mineral deposits collecting in the valve. If left unchecked, these deposits can impede valve operation with the potential for overflowing the heating system and allowing water to escape radiators into the living space.

The following maintenance must be performed by a qualified service technician:

#### Annually:

- Record the feed amount shown on the display on the VXT SERVICE TAG. Press the reset button (DISPLAY RST) on the bottom right corner of the circuit board. **Note:** If the feed amount exceeds the limits in the table above, the system should be checked for leaks.
- Remove and clean the strainer located on the valve body. **IMPORTANT:** If the strainer shows signs of mineral deposits collecting on the screen, install a Hydrolevel Feed Valve Service Kit (Part No. 45-345).

**Every 3 Years:** Install Hydrolevel Feed Valve Service Kit (Part No. 45-345). **Note:** If hardened calcium deposits have formed on the brass surface inside the valve, replace the valve (Part no. 45-343).

**12 Years:** Replace the VXT Series Water Feeder after 12 years of service.

## Diagnostics / Trouble Shooting



**A small indicating light in the lower right hand corner of the digital feed counter illuminates whenever the low water cut-off is calling for a feed.** The light remains on for the duration of the call from the cut-off regardless of the mode the feeder is in (delay, feed or lock-out). The light turns off when the cut-off is satisfied and stops calling for a feed.



**If LOC appears in the digital counter, the safety lockout feature is activated. This feature engages only when the feeder completes two consecutive feed cycles and the low water cut-off does not re-energized the burner.** The feeder can be reset by briefly interrupting power to the heating system. **Important:** The following trouble shooting steps should be taken to determine the cause of the lockout condition before restoring normal operation.

- If the boiler is **overfilled**, the low water cut-off is not functioning properly. Using the manufacturer's instructions, check the low water cut-off operation.
- If the boiler is in **low water**:
  - Check boiler and return piping for leaks.
  - If no leaks are detected, check to determine if the flow of the feeder is restricted. Check isolation valves around feeder to ensure they are fully opened. Remove and clean the Feed Valve Strainer.
  - Check the feeder setting to ensure that it is set to feed adequate water in the event of a low water condition.



**If ERR appears in the digital counter, more than one or no delay or feed button has been selected.** See Step 4 and Step 5 for DELAY and FEED setting instructions.



**If the digital counter is flashing, the meter has "rolled over" (exceeded 999) representing an excessive feed amount for most applications.** Check the system thoroughly for leaks. If no leaks are found, check to determine if the makeup waterline is restricted. Check feed valve strainer for blockage or heavy buildup of debris. Reset Feed Counter (see above) once problem is resolved.