ITT

McDonnell & Miller

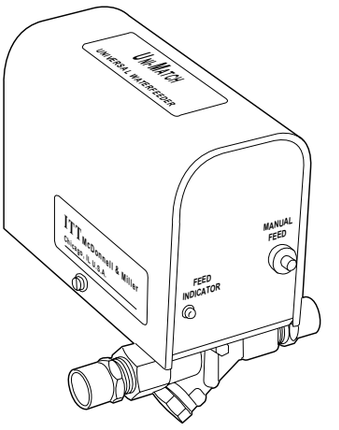
Installation & Maintenance Instructions
MM-303(F)

Series WF2 Uni-Match® Electric Water Feeder

Applications:

For use on boilers with mechanical (float type) or electronic (probe type) LWCO's.

The Uni-Match® water feeder is available in either 24 or 120 volt and all models feature a manual feed button. Field selectable dwell/feed cycles allow condensate to return to the boiler before feeding, lessening the chance the boiler will be overfed or flood.



Uni-Match

WARNING

- **Before using this product, read and understand instructions.**
- **Save these instructions for future reference.**

- **All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of plumbing, steam, and electrical equipment and/or systems in accordance with all applicable codes and ordinances.**
- **To prevent electrical shock, turn off the electrical power before making electrical connections.**

- **Boiler manufacturer schematics should always be followed. In the event that the boiler manufacturer's schematic does not exist, or is not available from the boiler manufacturer, refer to the schematics provided in this document.**

- **To prevent water damage check to make sure there is adequate floor drainage capacity. Check all components in the system to insure that they will not leak in the event of an overfeed condition.**

- **After installation, check for proper operation of all of the limit and operating controls, before leaving the site.**

Failure to follow this warning could cause property damage, personal injury or death.

Engineered for life

SPECIFICATIONS

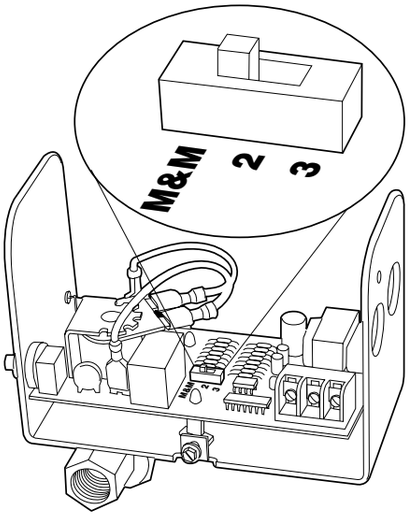
Maximum Water Pressure:
150 psi (10.5 kg/cm^2)
Maximum Boiler Pressure:
15 psi (1 kg/cm^2)
Maximum Boiler Size:
2000 sq. ft. EDR
500,000 BTU/hr output capacity
Maximum Water Temperature:
175˚F (79˚C)
Maximum Ambient Temperature:
100˚F (38˚C)
Maximum Power Consumption (during water feed only):
15 VA @ 24 VAC
20 VA @ 120 VAC (50 or 60 Hz)
Pipe Connections:
3/8" NPT (sweat adapters included for connection to 1/2" copper pipe)
Flow Data:
2 gpm (7.6 lpm) standard
Orifices included to change feed rate to 1 gpm (3.8 lpm) or 4 gpm (15.1 lpm)

OPERATION

The Uni-Match water feeders have a three-position slide switch which initiates a dwell period specific to the position of the switch. If the return condensate satisfies the low water cut-off (LWCO) during the dwell period, no water will be added to the boiler. Once the dwell period has passed, the feeder will be activated and water will be added to the boiler. The feeder will be deactivated when the LWCO has been satisfied.

When controlled by a LWCO with a delay-on-make (DOM) feature, such as the 15 second delay on the PS-801 and PS-802, the water level in the boiler will be restored to a level up to 1" above the level of the probe. This lessens the chances of overfeeding, which can result in damage to the boiler.

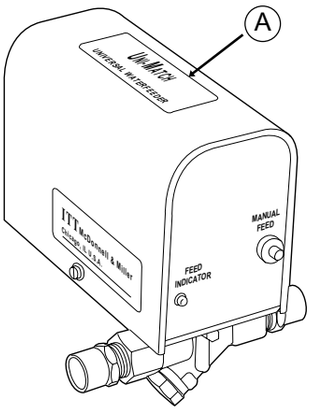
The position of the slide switch also dictates the length of the dwell period, the length of time valve is open and the number of dwell/feed cycles. The control is set with the slide switch in position 3 and can be changed in the field after installation. The chart on the right indicates the cycles and length of dwell/feed cycles for each position.



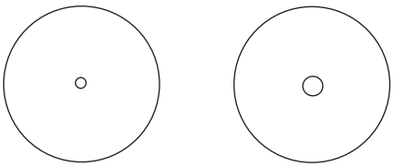
Switch Position	Initial Dwell	Initial Feed	Dwell/Feed Cycles
M&M	60 seconds	60 seconds	Repeats until LWCO is satisfied
2	90 seconds	90 seconds	One
3	100 seconds	100 seconds	One

STEP 1 - Installation

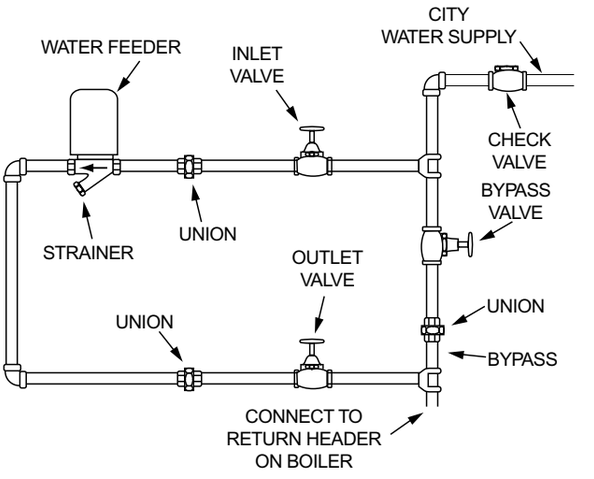
1. Check the product data plate (A) to make sure that the correct model water feeder (120V or 24V) was selected for installation with the boiler low water cut-off.



2. Uni-Match water feeders are shipped from the factory equipped for a 2 gpm feed rate. A separate kit with instruction sheet and field installable orifices for 1 gpm and 4 gpm feed rates is included. If the alternate feed rates are required, refer to the instruction sheet provided with the kit for orifice replacement.



3 a. Control must be installed within eyesight of boiler.
b. Clearance must be provided on all sides to service control.
c. Unit must be installed in a horizontal pipe in an upright position.
d. Arrow on feeder must point in the direction of flow into the boiler.
e. Install isolation valves and unions on the inlet and outlet piping for easier trouble-shooting and repair/replacement.
f. Install manual fill valve and bypass line for removal while the boiler is in service.



STEP 2 - Electrical Installation

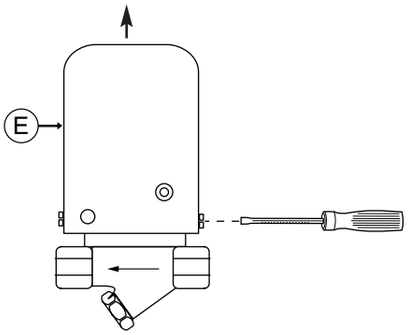
IMPORTANT
Boiler manufacturer schematics should always be followed. In the event that the boiler manufacturer's schematic does not exist, or is not available from the boiler manufacturer, refer to the schematics provided in this document.

WARNING	
	To prevent electrical shock, turn off the electrical power before making electrical connections. **Failure to follow this warning could cause property damage, personal injury or death.**

Cover Removal & Replacement

To Remove Cover
Using a flat head screwdriver, loosen (do not remove) the two (2) screws that secure the water feeder housing (E) and remove cover.

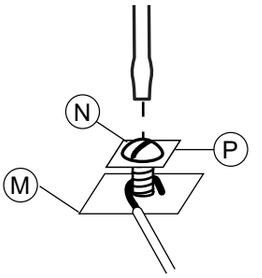
To Replace Cover
Place cover on the control housing and tighten cover screws to approximately 2 ft•lb (2.6 N•m).



Terminal Connections

For all wire connections to the terminal block (M).

1. Strip about 1/3" (8.5 mm) of insulation from the wire.
2. Loosen the terminal screw (N) but DO NOT REMOVE. Move the wire clamping plate (P) back until the plate touches the back side of the screw head.
3. Insert the stripped end of the wire under the wire clamping plate (P) and securely tighten the terminal screw (N).



WARNING

Do not use automatic water feeders with manual reset LWCO's. Failure to follow this warning could cause flooding, property damage, personal injury or death.

NOTE

Before connecting water feeder, operate boiler and check all safety devices.

NOTE

Unless otherwise noted, water feeder voltage should be the same as the LWCO and burner circuit voltage.

Wiring Diagram Selection Chart

Based on the water feeder and low water cut-off combination you are installing, select proper wiring diagram and proceed to that page.

Feeder Model	LWCO Model	Diagram Number	Page
WF2-U-24	PS-802 with burner wiring harness	1	6
WF2-U-24	PS-802 with burner terminal connections	1	6
WF2-U-24	67 w/24 volt burner circuit	4	7
WF2-U-24	67 w/120 volt burner circuit	6	7
WF2-U-24	67G (millivolt burner circuit)	9	8
WF2-U-120	PS-801 with numbered terminals	2	6
WF2-U-120	PS-801 with lettered terminals	3	6
WF2-U-120	67 w/24 volt burner circuit	7	8
WF2-U-120	67 w/120 volt burner circuit	5	7
WF2-U-120	67G (millivolt burner circuit)	8	8
WF2-U-24	Hydrolevel 400	10	9
WF2-U-24	Hydrolevel CG400	11	9
WF2-U-120	Hydrolevel 450	12	9
WF2-U-120	Hydrolevel CG450	13	10
WF2-U-120	Hydrolevel CGT450	14	10
WF2-U-24	Honeywell LWCO (24 volt)	15	10
WF2-U-120	Honeywell LWCO (120 volt)	16	11
WF2-U-24	TACO LWCO (24 volt)	18	11
WF2-U-120	TACO LWCO (120 volt)	17	11

Wiring Diagram Legends

1. —— Bold lines indicate action to be taken in Step shown.
2. —— Grey lines indicate existing wiring.

Diagram 1 WF2-U-24 / PS-802-LWCO

- Connect wire from terminal **'N'** of water feeder to terminal **'N'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'H'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'W'** on LWCO.

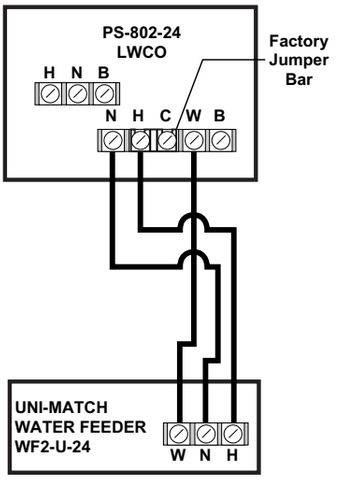


Diagram 2 WF2-U-120 / PS-801-LWCO with numbered terminals

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'4'** on LWCO.

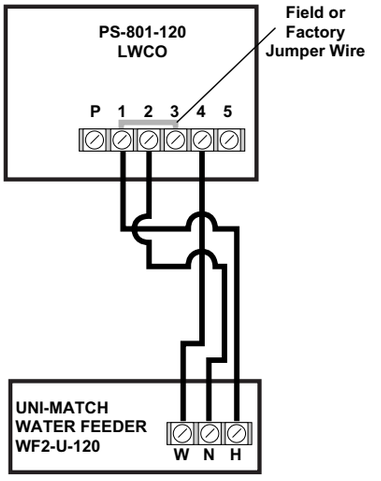


Diagram 3 WF2-U-120 / PS-801-LWCO with lettered terminals

- Connect wire from terminal **'N'** of water feeder to terminal **'N'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'H'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'W'** on LWCO.

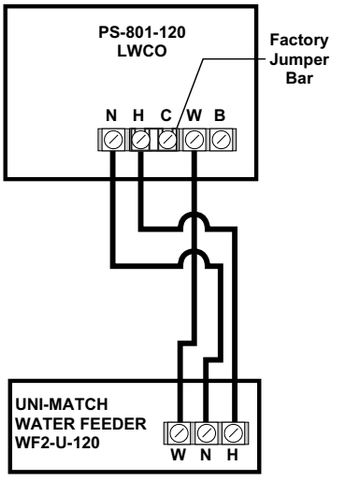


Diagram 4 WF2-U-24 / 67 with 24 volt burner circuit

- Connect wire from terminal **'N'** of water feeder to **'Neutral'** wire of burner circuit.
- Connect wire from terminal **'H'** of water feeder to terminal **'2'** on LWCO.
- Connect jumper wire connecting terminals **'2'** and **'3'** of LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'4'** on LWCO.

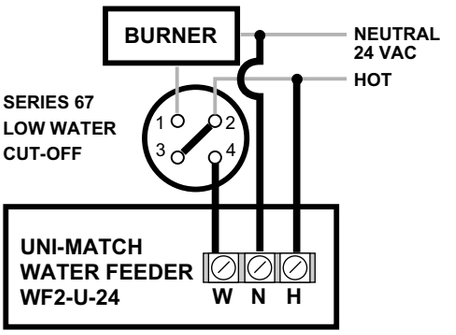


Diagram 5 WF2-U-120 / 67 with 120 volt burner circuit

- Connect wire from terminal **'N'** of water feeder to **'Neutral'** wire of burner circuit.
- Connect wire from terminal **'H'** of water feeder to terminal **'2'** on LWCO.
- Connect jumper wire connecting terminals **'2'** and **'3'** of LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'4'** on LWCO.

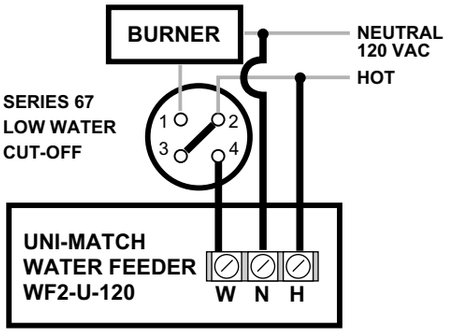


Diagram 6 WF2-U-24 / 67 with 120 volt burner circuit

- Install wire from burner circuit **'Neutral'** wire to the transformer input **'Neutral'** terminal.
- Install wire from burner circuit **'Hot'** wire to the transformer input **'Hot'** terminal.
- Install wire from transformer output **'Neutral'** terminal to terminal **'N'** on the water feeder.
- Install wire from terminal **'W'** on the water feeder to terminal **'4'** on the low water cut-off.
- Install wire from transformer output **'Hot'** terminal to terminal **'H'** on water feeder and terminal **'3'** on low water cut-off.

NOTE: Transformer provided by others.

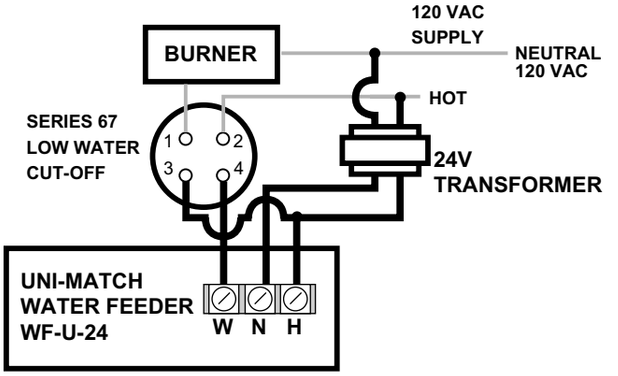


Diagram 7 WF2-U-120 / 67 with 24 volt burner circuit

- Install wire from burner circuit **'Neutral'** wire to terminal **'N'** on water feeder.
- Install wire from burner circuit **'Hot'** wire to terminal **'H'** on water feeder and terminal **'3'** on low water cut-off.
- Install wire from terminal **'W'** on the water feeder to terminal **'4'** on the low water cut-off.

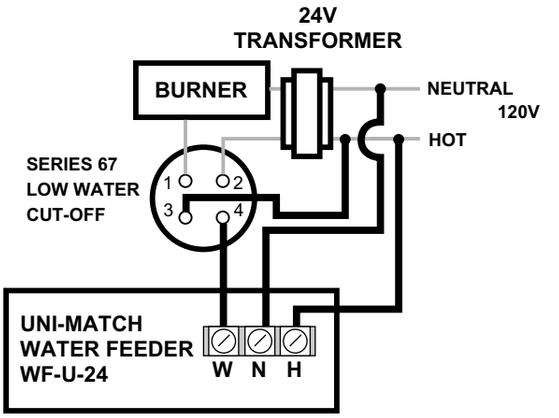


Diagram 8 WF2-U-120 / 67 with millivolt burner circuit

- Install wire from 120 volt circuit **'Neutral'** wire to terminal **'N'** on water feeder.
- Install wire from 120 volt circuit **'Hot'** wire to terminal **'H'** on water feeder and terminal **'3'** on low water cut-off.
- Install wire from terminal **'W'** on the water feeder to terminal **'4'** on the low water cut-off.

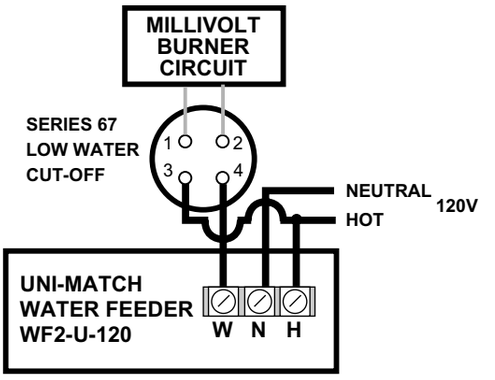


Diagram 9 WF2-U-24 / 67 with millivolt burner circuit

- Install wire from 120 volt circuit **'Neutral'** wire to the transformer input **'Neutral'** terminal.
- Install wire from 120 volt circuit **'Hot'** wire to the transformer input **'Hot'** terminal.
- Install wire from transformer output **'Neutral'** terminal to terminal **'N'** on the water feeder.
- Install wire from transformer output **'Hot'** terminal to terminal **'H'** on water feeder and terminal **'3'** on low water cut-off.
- Install wire from terminal **'W'** on the water feeder to terminal **'4'** on the low water cut-off.

NOTE: Transformer provided by others.

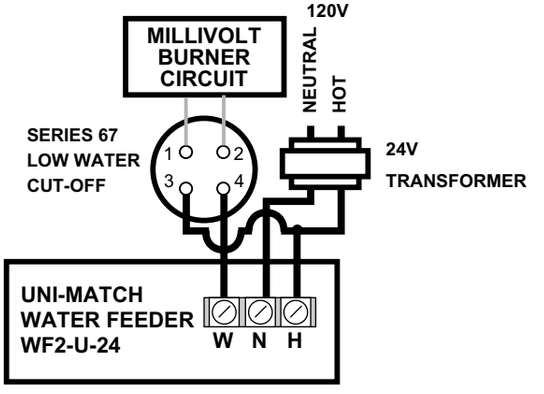


Diagram 10 WF2-U-24 / Hydrolevel 400

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

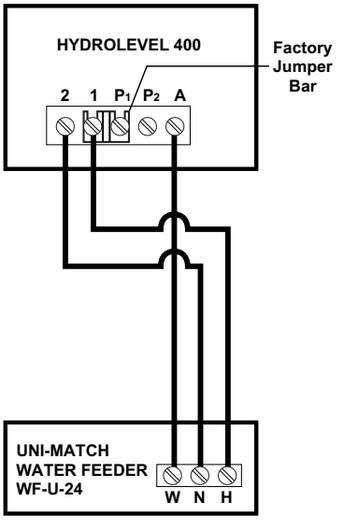


Diagram 11 WF2-U-24 / Hydrolevel CG400

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

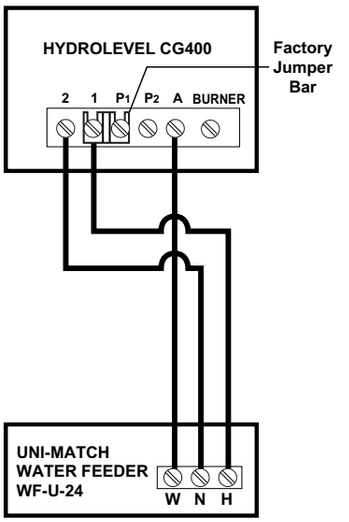


Diagram 12 WF2-U-120 / Hydrolevel 450

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

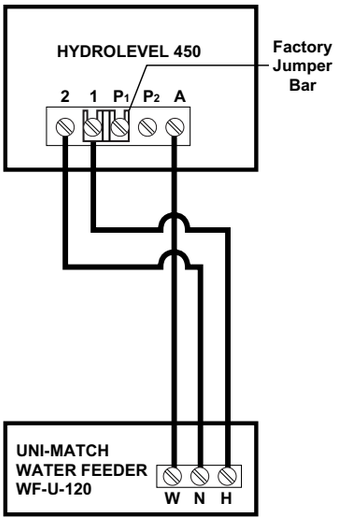


Diagram 13 WF2-U-120 / Hydrolevel CG450

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

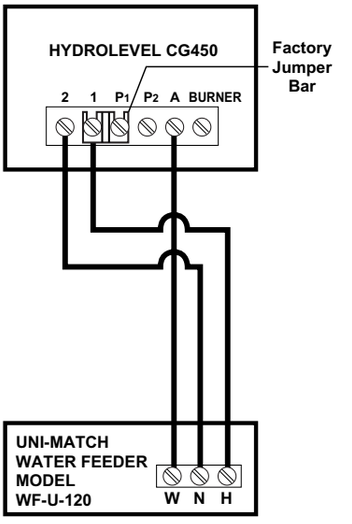


Diagram 14 WF2-U-120 / Hydrolevel CGT450

- Connect wire from terminal **'N'** of water feeder to terminal **'2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'1'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

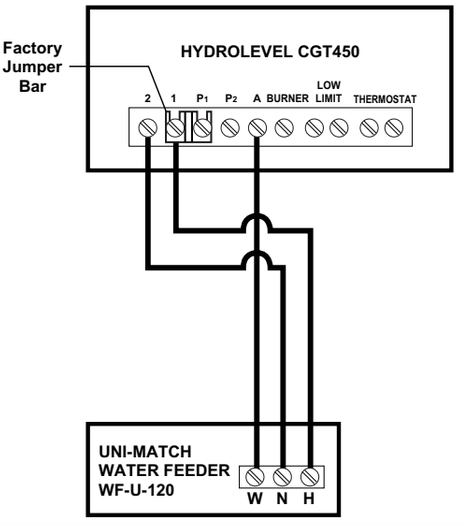


Diagram 15 WF2-U-24 / Honeywell LWCO (24 volt)

- Connect wire from terminal **'N'** of water feeder to terminal **'T2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'T1'** on LWCO.
- Connect jumper wire from terminal **'T1'** to terminal **'A'** on the low water cut-off.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

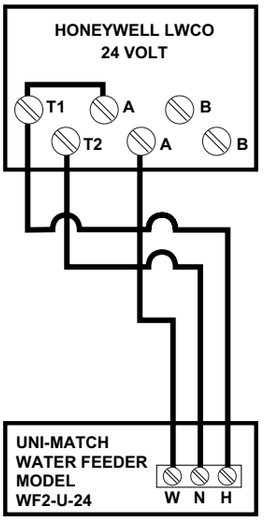


Diagram 16 WF2-U-120 / Honeywell LWCO (120 volt)

- Connect wire from terminal **'N'** of water feeder to terminal **'L2'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'L1'** on LWCO.
- Connect jumper wire from terminal **'L1'** to terminal **'A'** on the low water cut-off.
- Connect wire from terminal **'W'** of water feeder to terminal **'A'** on LWCO.

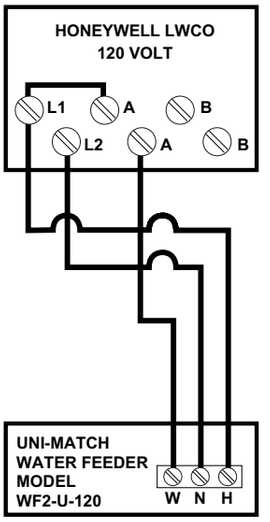


Diagram 17 WF2-U-120 / TACO LWCO (120 volt)

- Connect wire from terminal **'N'** of water feeder to terminal **'N'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'L'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'NO'** on LWCO.

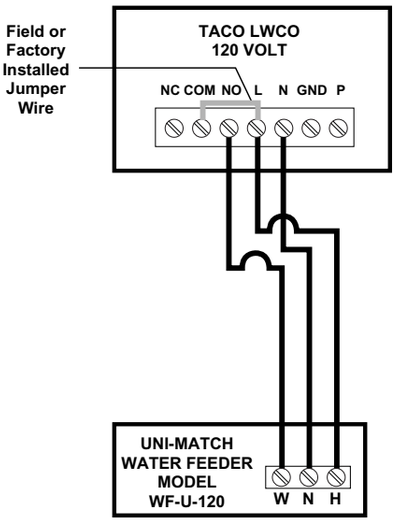
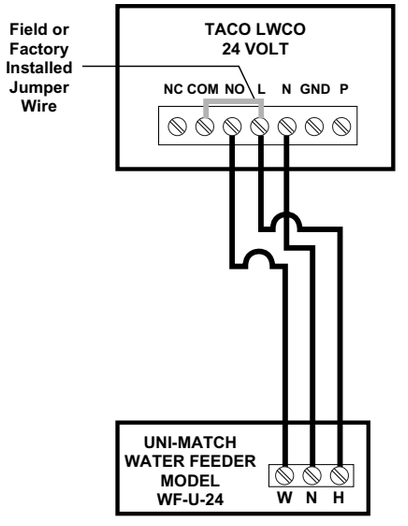


Diagram 18 WF2-U-24 / TACO LWCO (24 volt)

- Connect wire from terminal **'N'** of water feeder to terminal **'N'** on LWCO.
- Connect wire from terminal **'H'** of water feeder to terminal **'L'** on LWCO.
- Connect wire from terminal **'W'** of water feeder to terminal **'NO'** on LWCO.



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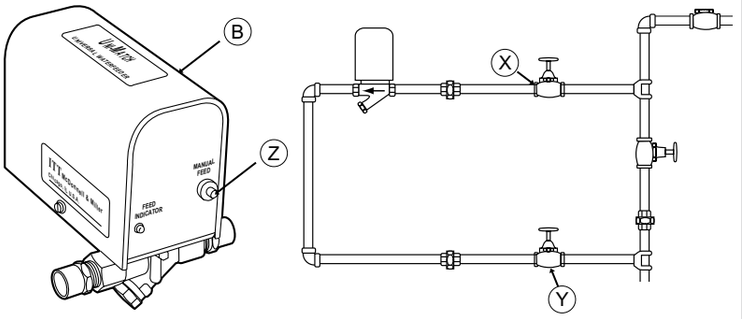
STEP 3 - Testing

a. Open the inlet valve (X) and the outlet valve (Y). Check for any leakage. If there are any leaky connections, close the inlet and outlet valves and correct the problem.

b. Turn the boiler's electric power on and fill it to the manufacturer's recommended normal water level by depressing the red manual feed button (Z) on the water feeder.



c. Check the water feeder (B) operation by performing the following steps:

1. Slowly drain water from the boiler.

2. The burner should turn off when the water level drops below the cut-off level of the LWCO, which will activate the water feeder's delay feed cycle.

⚠ WARNING

If burner does not turn off when water level falls below level of LWCO, turn off power to boiler and check operation of LWCO.

3. Feeder should turn on to feed water to boiler after delay period has expired.
NOTE: Delay period is determined by position of selector. Unit is shipped with switch in Position 3. Refer to chart on page 2 for alternate settings.

4. Feeder will be deactivated when water level is restored to level as determined by LWCO.
NOTE: McDonnell & Miller Series PS LWCO's have a 15 second DOM (Delay on Make) to restore water level in boiler to an appropriate level without overfeeding. Consult other manufacturer's LWCO installation literature for DOM times.

5. Repeat steps to ensure feeder is operating satisfactorily.

6. Using the manual feed button, restore the water level in the boiler to the proper operating level.

STEP 4 - Troubleshooting

If the unit fails to feed water as required, perform the following diagnostic checks:

1. Recheck all wiring to ensure proper connections, as specified in these instructions.
2. Check to insure that the integral strainer is clean and free of debris and sediment.
3. Check to ensure proper operation of low water cut-off controls connected to water feeder.

MAINTENANCE

SCHEDULE:

- **Inspect the water feeder annually.** Replace it if it is worn, corroded, or if components no longer operate properly.
- **Replace the water feeder every 10 years.** More frequent replacement may be required when severe conditions exist such as rapid switch cycling and surging water levels.
- **Disassemble and carefully clean strainer screen at least twice a year.**

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Printed in U.S.A. 4-07 246779