Better Water LLC

Central R.O. System service

Central R.O. System Service Manual

Central Reverse Osmosis Units Used For HEMODIALYSIS

2436

BETTER WATER, LLC

2436 REVERSE OSMOSIS UNIT MEDICAL DEVICE

EcoSmart 2436 RO Unit

Smart for you, smart for the planet!

5400 to 12,600 Gallons per Day

Save an average of 50% on RO energy cost and as much as a 50% water savings with BWI EcoSmart RO Unit. The Better Water LLC, EcoSmart RO offers both an economical and environmentally friendly choice for the dialysis provider. The unit is simple to operate and extremely quiet.

The 2436 RO carries a 510k certificate from the FDA and is designed to meet or exceed AAMI RD: 62 on RO quality water for dialysis. Each unit is individually tested prior to shipping. Equipment includes enclosed UL 508A industrial panels.

Energy Savings

Standard Features

- Product water divert-to-drain
- Disinfect tank
- Rugged metal frame construction
- Baked on powder coat finish
- Digitally displays: % reject, Feed TDS, Product TDS, Alarm set point
- Standard alarms
- Easy to operate - Just one turn of a knob sends it into flush mode!
- Mobile - locking wheels
- Water tight control box
- Tank or Direct Feed
- Air Cooled Pump provides quiet operation
- Expandable to 8.75 gpm

Solutions. Service. Support.

www.betterwater.com

2436 R.O. UNIT

Models and Specifications

Model	EQRMA -245K	EQRMA -247K	EQRMA -249K	EQRMA -24102K	EQRMA -2412K
Capacity GPM / GPD	3. 75 / 5400	5. 0 / 7200	6. 25 /9000	7. 5 / 10800	8.75/12600
# of Membranes	3	4	5	6	7
Size of Membranes	4" x 4 0" TFC	4" x 4 0" TFC	4" x 4 0" TFC	4" x 4 0" TFC	4" x 4 0" TFC
Control Voltage	24vac	24vac	24vac	24vac	24vac
Overall Dimensions	39" W x 42" D x 77" H (includes pre-filters & junction boxes				
Incoming Water	8 gpm	12 gpm	14 gpm	16 gpm	19 gpm
RO Feed Water requirements	Temp. : 50f-90f, Total Chlorine < 0. 1p p m, T O C < 2p p m, S D I < 3, Operating pH range : 610, 30 psi inlet pressure , Bacterial Count < 1 0 0c fu				
Gauges	P re - Filter, Membrane , Reject , Product				
Flowmeters	Product , Reject				
Water Quality monitor	Digitally Displays : % Rejection , Feed TDS , Product TDS , Alarm Set -Point				
Standard Alarms	Poor Water Quality , Low Feed Pressure , High Membrane Pressure , High Product Pressure , & High Fee Water Temperature				
Other Standard features	Disinfect Tank include , Renalin / Minncare Compatible , Product Water Divert to Drain , Silkscreened Label ing , Rugged Metal Frame Construction , Baked on Powder Coat Finish , Polyamide Membranes , Extremely Quiet Air-cooled pump with Power savings V F D				

BWI carries over 2000 parts, accessories and consumables in stock, and ready to ship including:

Carbon Filters (provides 10 Minute Empty Bed Contact Time)
Duplex & Simplex Softener
Storage Tanks
Brass pressure regulator
Blend valve
City boost pump
Thermometer
Floor valve boxes
Remote alarms
& More!





Central Water Systems | Central Delivery Systems | Reverse Osmosis Units | Portable RO Units

Pre-Treatment Racks | Post Treatment Racks | D.I. Exchange Accessories | Consumables

Hemodialysis | Medical | Pharmaceutical | Laboratories | Commercial | Industrial

Better Water, LLC
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WWW.betterwater.com

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SECTION 1

INTRODUCTION…..5

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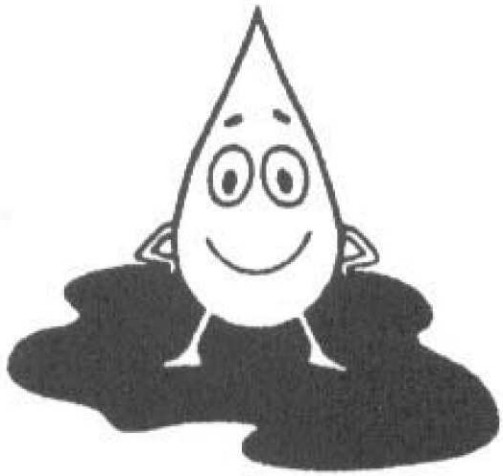

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Introduction

to the

2436, VFD Reverse Osmosis Service Manual

This Service Manual has been developed for the purpose of trouble shooting and ordering factory replacement parts for repairs and/or replacement of parts on the Better Water LLC, 2436, Variable Frequency Drive, Reverse Osmosis Machine. It is important to understand that the 2436 RO is a ***Class II Medical Device*** and that non-factory replacement parts could affect the safety and performance of the RO unit.

This manual covers: Parts Lists, Photographs, Flow Schematics, Wiring Schematics, and service procedures for the Better Water, Inc., **2436 VFD, RO.**

When ordering parts, you may fax your order with hard copy Purchase Order # to: Better Water, LLC, Fax. No: (615) 355-6065

If you have any questions about replacement parts, please call **(615) 355-6063,** and ask for Technical Department.

If you need assistance in Troubleshooting, you may call **(615) 355-6063,** and ask for Technical Department.

NOTE: If the RO is out of warranty (see warranty in Operator's Manual) there may be a service charge for Technical Support; $60.00/hr, (minimum charge $30.00)

Standard Business Hours at Better Water, LLC

Monday-Friday 7:30am-4:00pm, CST

After regular hours, on week-ends and holidays, follow the prompts from the answering service which will inform you of the "on-call" cell phone numbers to call.

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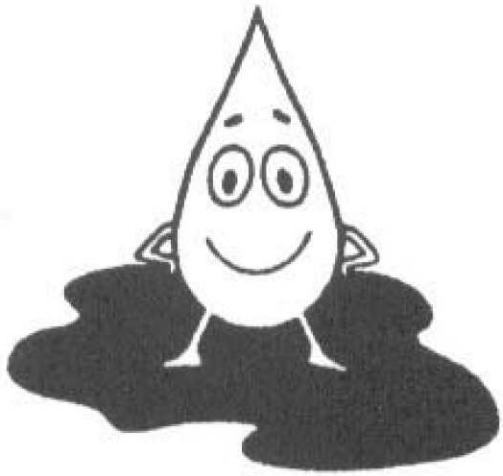

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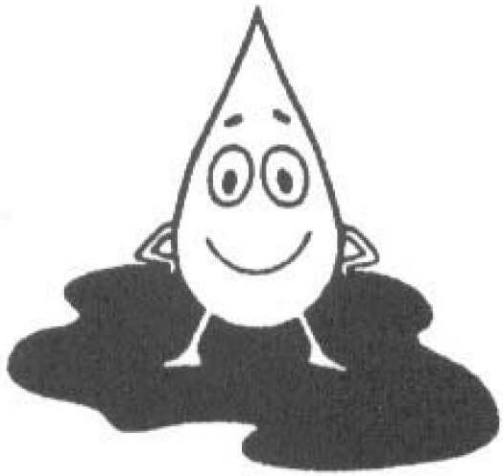

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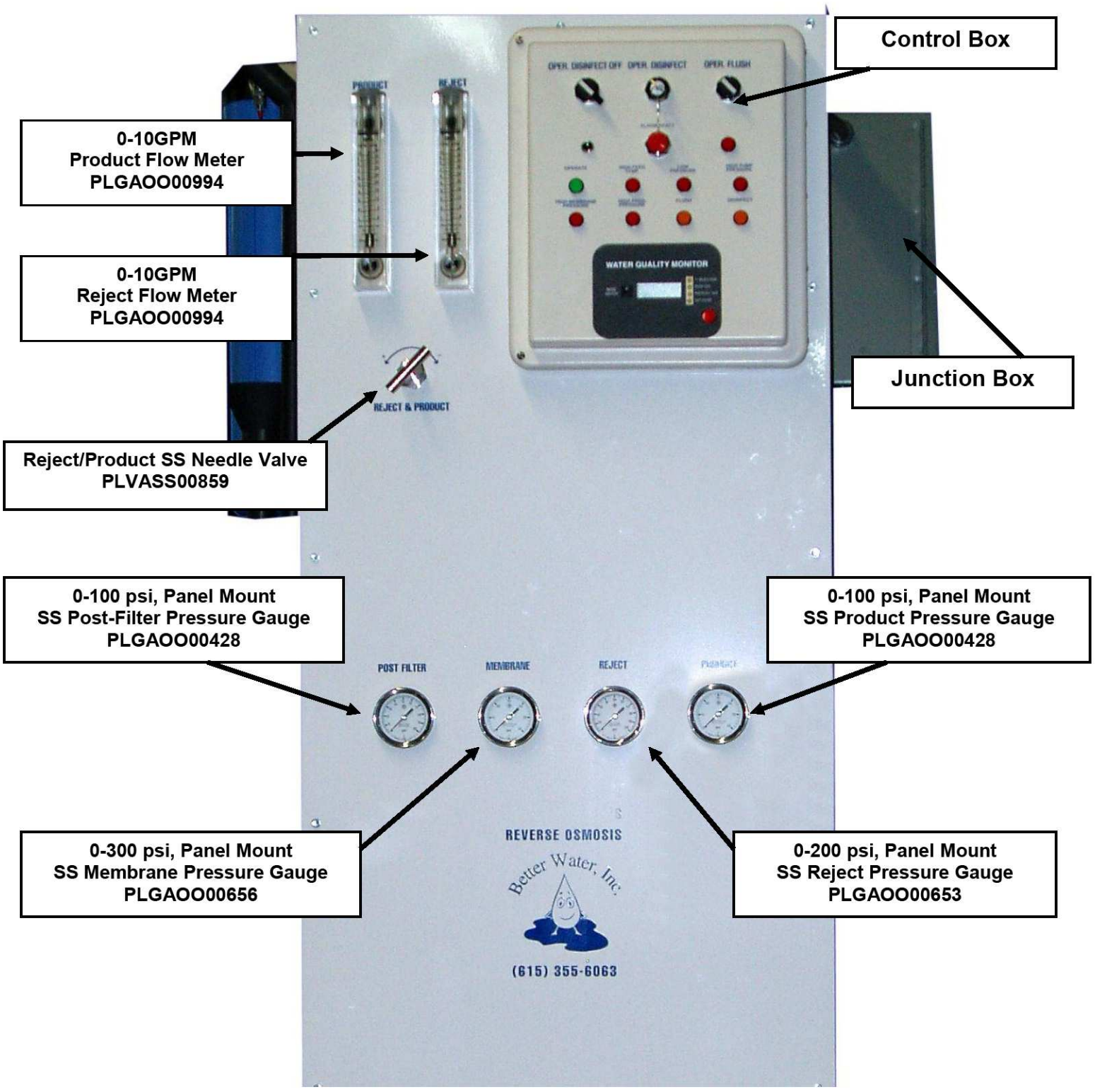
2436 VFD Reverse Osmosis Machine
Front View



RO Front

Product & Reject Flow Meter
Adjustments

The Product and Reject Flow Meters are essential (along with the pressure gauges) to monitor the efficiency of the RO.

The typical RO is set up to operate at a 50% recovery rate, meaning that 50% of the feed water becomes product water, and 50% of the feed water goes to drain (Reject).
{A 75% recovery RO will use 75% of the feed water for product water and 25% of the feed water will go to drain (reject)}

At 50% recovery, the Product and Reject Flowmeters should be set at equal values; a 6.25 gpm RO should optimally show 6.25gpm on the Product Flowmeter and 6.25 gpm on the Reject Flowmeter.

The flows through both Flowmeters are adjusted with the Reject-Product Flow Adjustment Valve, located on the front of the RO, under the Flowmeters.
This Valve will adjust both flows at the same time, raising one and lowering the other.
By turning the valve handle clockwise, the Product Flow will increase and the Reject Flow will decrease.
By turning the valve handle counter clockwise, the Reject Flow will increase and the Product Flow will decrease.

50% Recovery RO, Product = Reject Flow

75% Recovery RO, Product Flow will be 3x Reject Flow

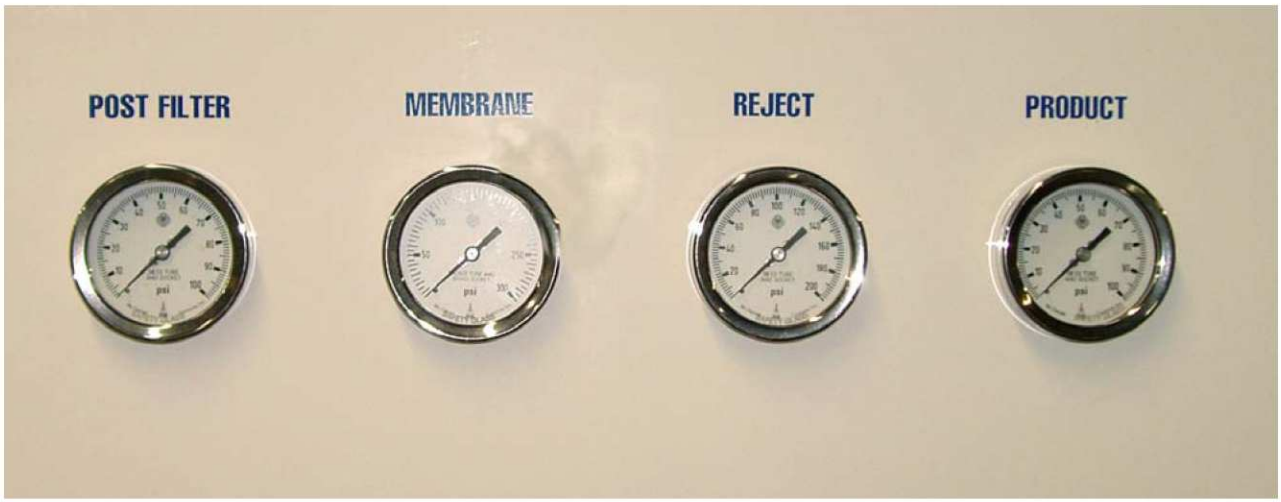
Note about Flowmeters
Flowmeters come in many shapes and sizes. Each Flowmeter is different as to where to read the value on the graduated scale on the Flowmeter. (Some you will read at the top of the float, some you will read at the widest part of the float)

Each Flowmeter will be labeled as to where to read for the accurate flow value. Take note of your specific Flowmeter to get the accurate reading.

Reject-Product Flow Adjustment Valve

Monitoring Gauges

The Pressure Gauges (along with the Flowmeters) are essential in monitoring the efficiency of the RO.
While there are no direct adjustments for these pressures, it is essential that they be monitored to verify that the RO is still operating within the set parameters.
Slight changes in pressures are normal but notice should be taken if the pressures rise or fall out of normal parameters.



POST-FILTER Gauge: This gauge will monitor the ***outlet*** side of the Pre-filter Housing. Your system should be equipped with a pressure gauge on the inlet side of the Pre-Filter. When comparing these two gauges, the ΔP (Differential Pressure) should be ≤15psi. (As a general rule, filters should be changed when the ΔP approaches or exceeds 15psi.) A large pressure drop across any filter is an indication that the filter is fouled.

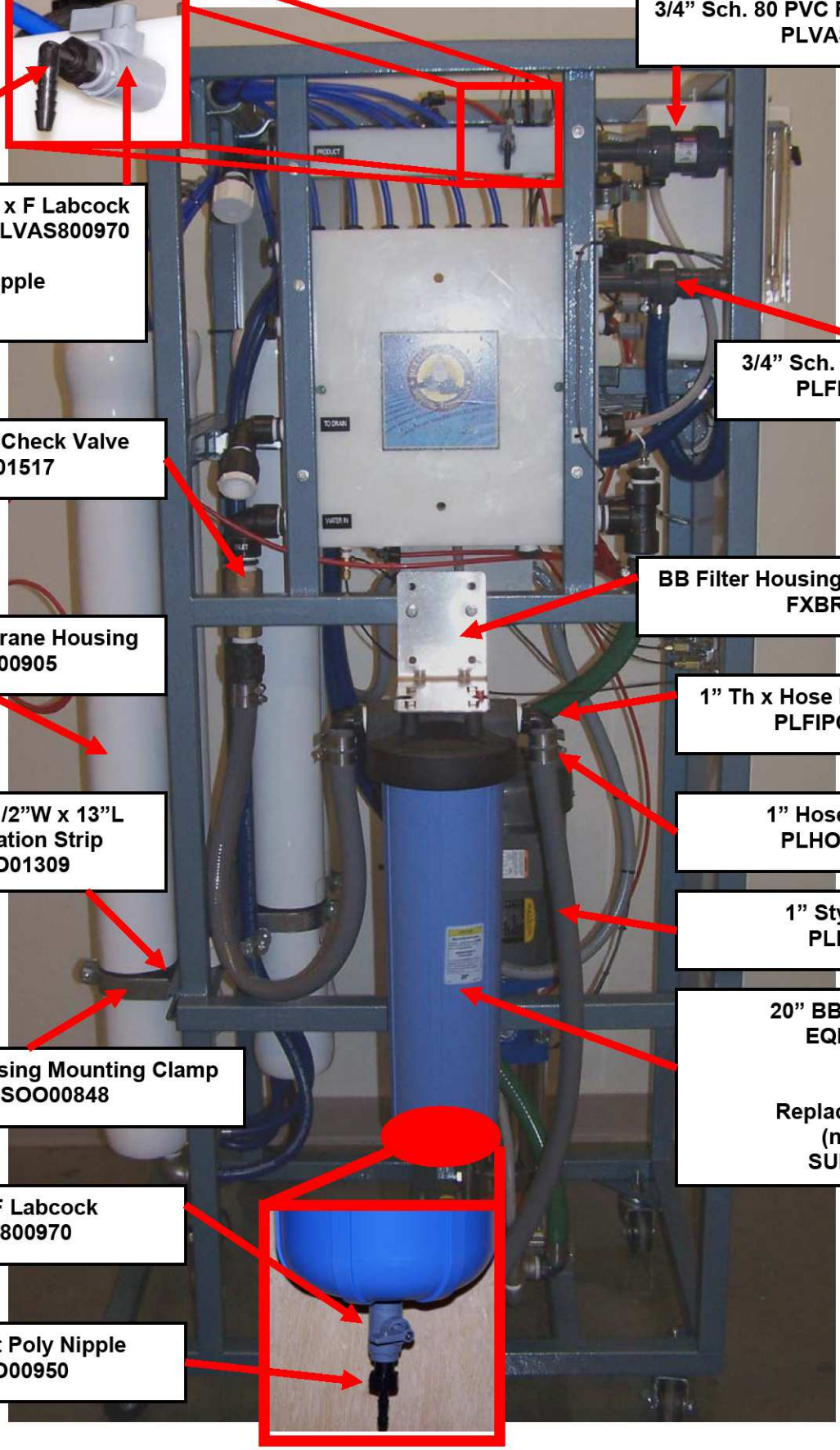
MEMBRANE Gauge: This gauge will monitor the membrane pressure. There are no direct adjustments for this pressure. Membrane Pressure is directly proportionate to the Pump Pressure, regulated by the VFD Pump Controller.

REJECT Gauge: This gauge will monitor the Reject Pressure. There are no adjustments for this pressure.

PRODUCT Gauge: This gauge will monitor the Product Pressure of the RO. This gauge will be monitored closely in a Direct Feed System. On a Tank Feed system, the Product Water is being hosed directly to a reservoir, and therefore is not a closed, pressurized system; hence, there will be very little, if any, pressure showing on this gauge. If this gauge shows a significant value when used in a tank feed system, check the product hose from the RO to the reservoir and make sure there are no kinks or obstructions in the hose.

Front Gauges

Left Side View (pre August 2010)



3/4" Sch. 80 PVC Product Check Valve
PLVAS800182

1/4" M x F Labcock
PLVAS800970

1/4" 90 Poly Nipple
PLFIPO00304

3/4" Sch. 80 PVC Union
PLFIS800134

1" Brass Spring Check Valve
PLVABR01517

BB Filter Housing SS Mounting Bracket
FXBROO00603

Fiberglass Membrane Housing
EQFHOO00905

1" Th x Hose Nipple Poly 90
PLFIPO00350

1/4"thick x 1 1/2"W x 13"L
Rubber Isolation Strip
HWUSOO01309

1" Hose Clamp
PLHOCL003

1" Style 5000 Hose
PLHOST00316

20" BB Filter Housing
EQFHOO00591

Replacement O-Ring
(not visible)
SUMIOO00587

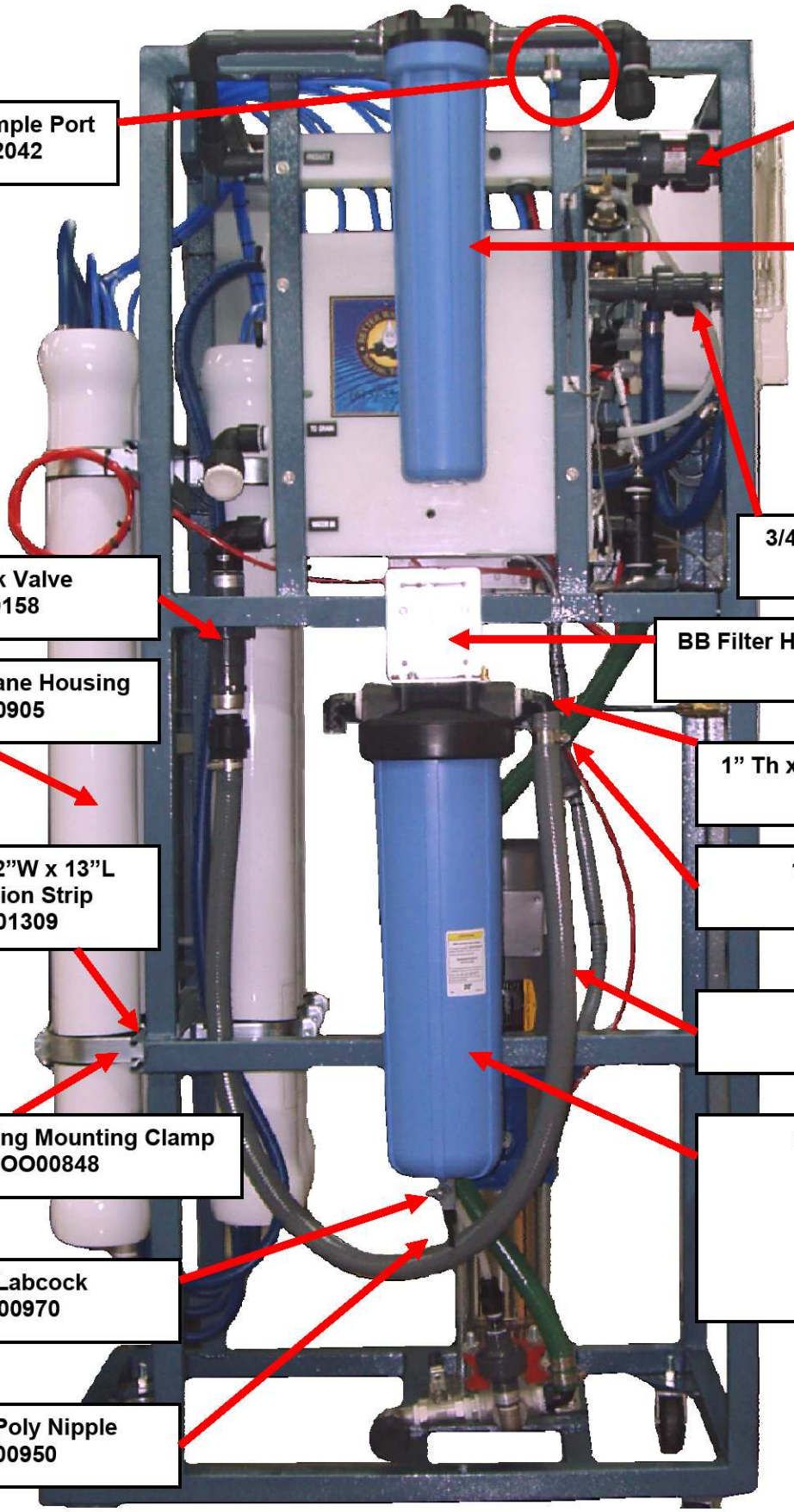
Membrane Housing Mounting Clamp
HWUSOO00848

1/4" M x F Labcock
PLVAS800970

1/4" Straight Poly Nipple
PLFIPO00950

RO Left, pre August 2010

Left Side View (post August 2010)



1/4” Millipore Sample Port
PLFISSOO02042

3/4” Sch. 80 PVC
Product Check Valve
PLVAS800182

20” Filter Housing
EQFHOO00592

Replacement O-Ring
(not visible)
SUMIOO00589

Replacement .03 Filter
SUCAPE00575

3/4” Sch. 80 PVC Union
PLFIS800134

1” PVC Check Valve
PLVAS800158

BB Filter Housing SS Mounting Bracket
FXBROO00603

Fiberglass Membrane Housing
EQFHOO00905

1” Th x Hose Nipple Poly 90
PLFIPO00350

1/4”thick x 1 1/2”W x 13”L
Rubber Isolation Strip
HWUSOO01309

1” Hose Clamp
PLHOCL003

1” Style 5000 Hose
PLHOST00316

Membrane Housing Mounting Clamp
HWUSOO00848

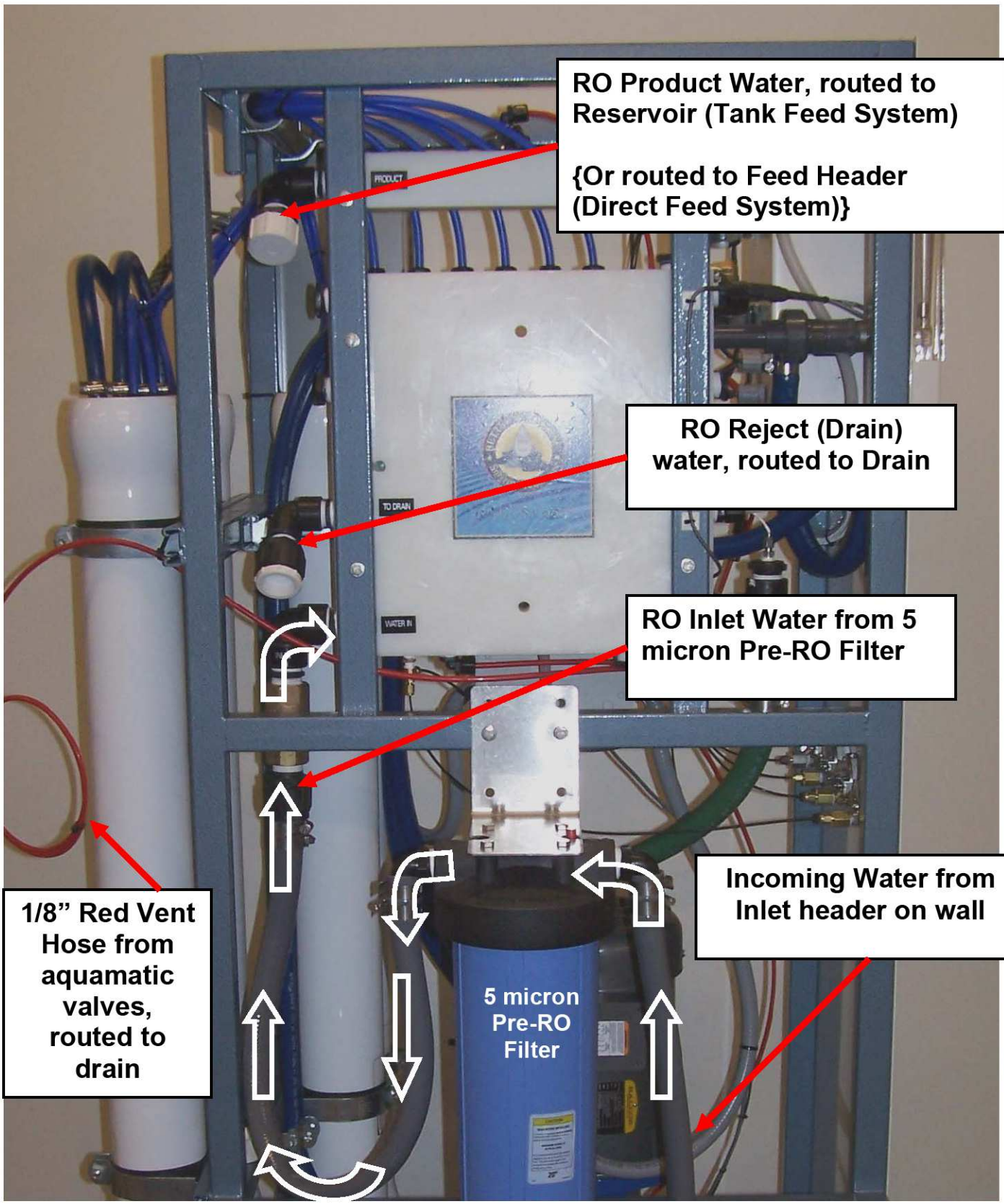
20” BB Filter Housing
EQFHOO00591

Replacement O-Ring
(not visible)
SUMIOO00587

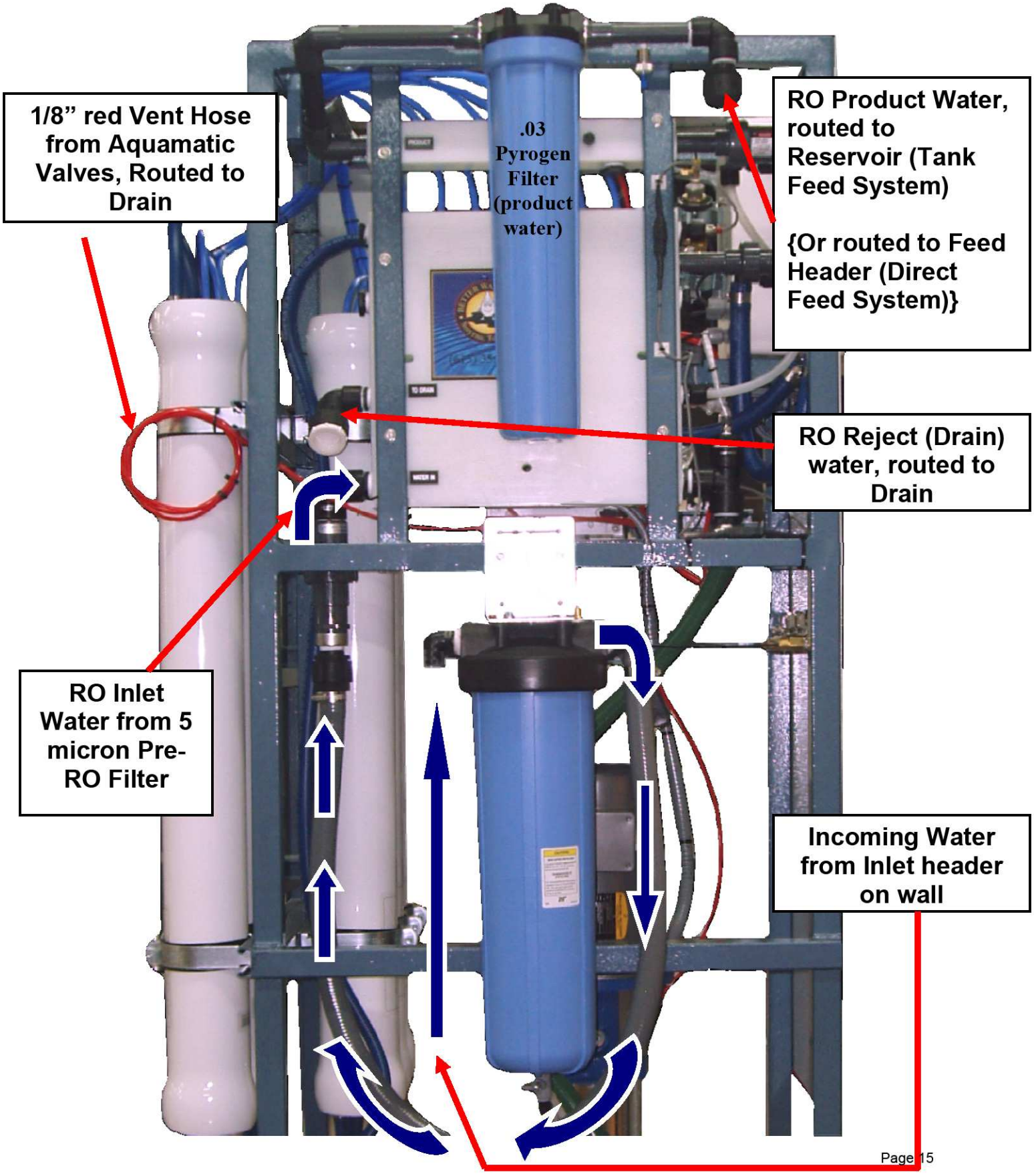
1/4” M x F Labcock
PLVAS800970

1/4” Straight Poly Nipple
PLFIPO00950

2436 VFD Reverse Osmosis Machine
Left Side View, Hose Connections (pre August 2010)



2436 VFD Reverse Osmosis Machine
Left Side View, Hose Connections (post August 2010)



RO Left Side Hose Connections post Aug2010)

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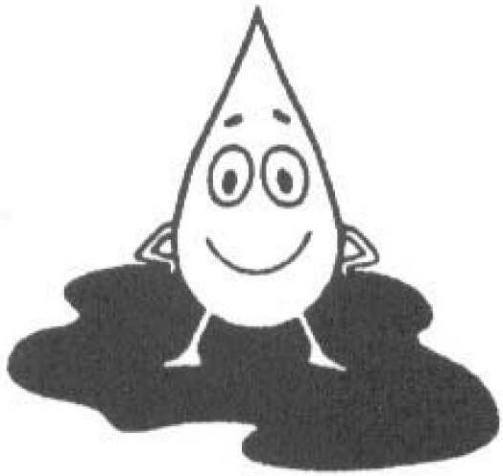

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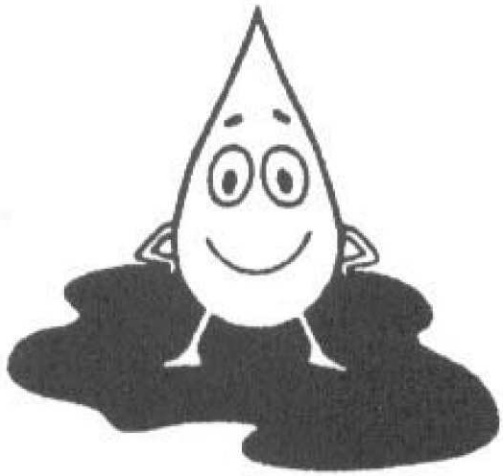

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2436 VFD Reverse Osmosis Machine
Front View, Control Box

Control Box

The Control Box, located on the front of the RO is the heart of all the controls for the Reverse Osmosis Machine. Constructed of a water tight, water resistant and corrosion resistant material, the box can be secured shut with 2 screws, and easily opened for access to the control boards, temperature controller, flush timer, tank/direct switch, and other controls. The outside of the box contains switches for operations, digital display for continuous monitoring of water quality, alarm lights, and an alarm re-set button.

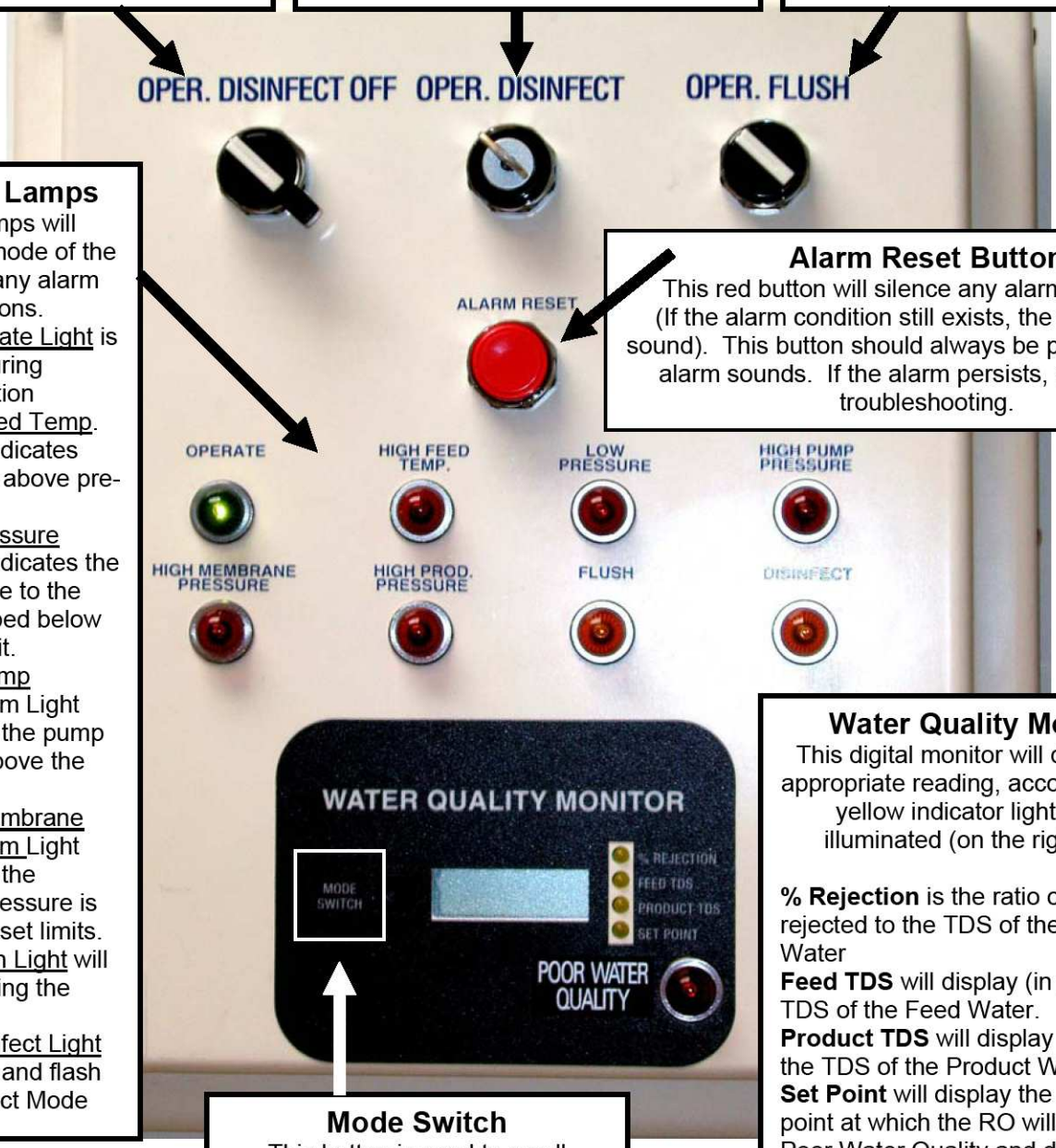
The Control Box is powered by Low Voltage (24 Vac) from a transformer in the Junction Box.

Control Box Door
Functions and Operations

Operate-Disinfect-Off Switch
This switch will determine the function of the RO.
OPERATE – Normal Position
DISINFECT – Used when in Disinfect Mode
OFF – Used to turn off all functions of the RO

Keyed, Operate-Disinfect Switch
This keyed switch is a safety feature, which must be turned (with the key) to the Disinfect position, and works in conjunction with the Operate-Disinfect-Off Switch to start the Disinfect Mode of the RO.

Operate-Flush Switch
This switch controls the FLUSH mode of the RO. When in FLUSH position, it works in conjunction with the Flush Timer to regulate all aspects of the FLUSH Mode.



Indicator Lamps
These lamps will indicate the mode of the RO and/or any alarm conditions.
GREEN Operate Light is illuminated during normal operation
RED High Feed Temp. Alarm Light indicates water temp is above pre-set limit.
RED Low Pressure Alarm Light indicates the water pressure to the RO has dropped below the preset limit.
RED High Pump Pressure Alarm Light indicates that the pump pressure is above the preset limit.
RED High Membrane Pressure Alarm Light indicates that the Membrane Pressure is above the preset limits.
AMBER Flush Light will illuminate during the flush cycle.
AMBER Disinfect Light will illuminate and flash during Disinfect Mode

Alarm Reset Button
This red button will silence any alarm on the RO. (If the alarm condition still exists, the alarm will re-sound). This button should always be pushed first if an alarm sounds. If the alarm persists, proceed with troubleshooting.

Water Quality Monitor
This digital monitor will display the appropriate reading, according to the yellow indicator light that is illuminated (on the right side)

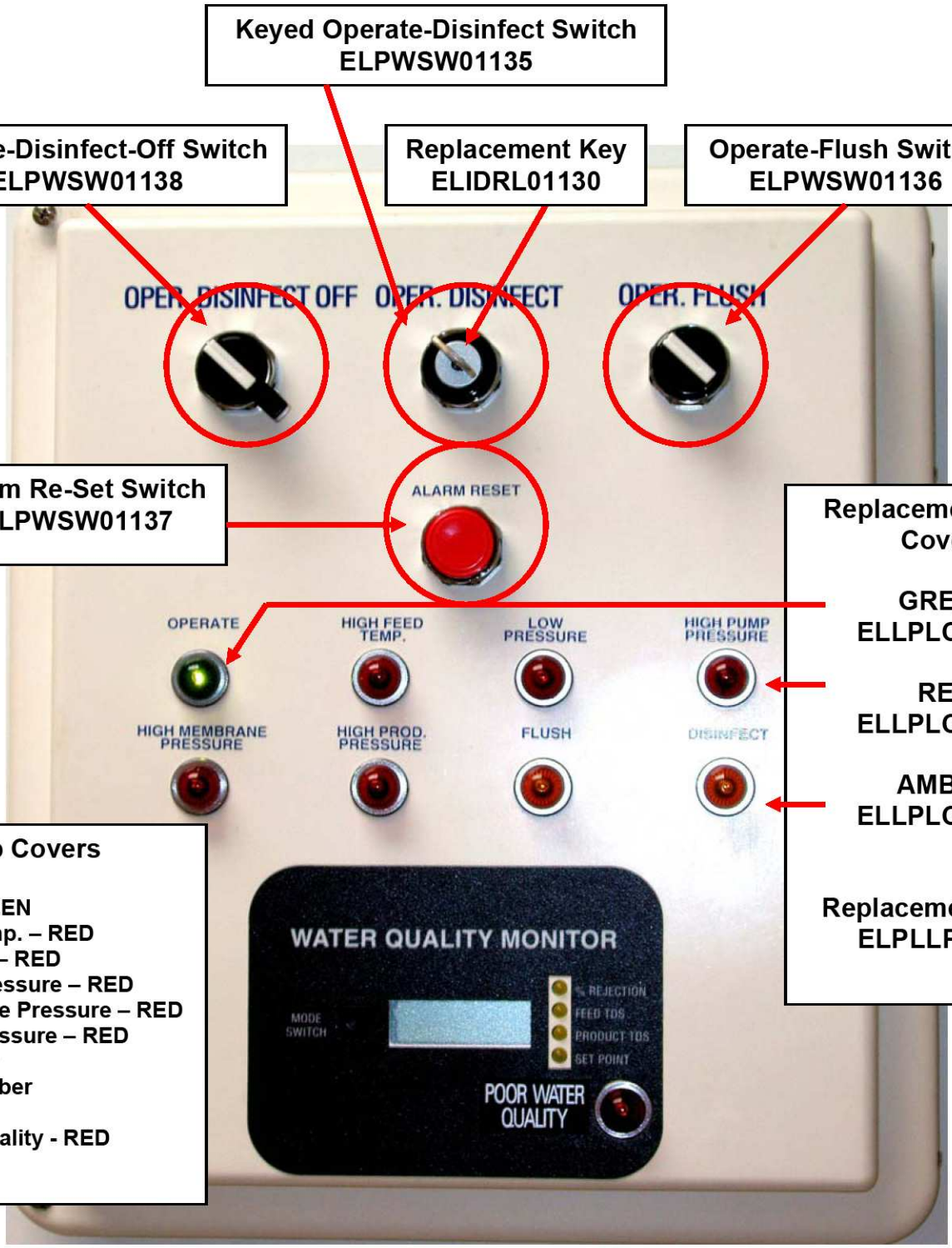
% Rejection is the ratio of TDS rejected to the TDS of the Feed Water
Feed TDS will display (in ppm) the TDS of the Feed Water.
Product TDS will display (in ppm) the TDS of the Product Water.
Set Point will display the Alarm set point at which the RO will go into Poor Water Quality and divert to drain.

Poor Water Quality Light will illuminate when the %Rejection drops below the preset limit. This is set at 90% at the factory

Mode Switch
This button is used to scroll between the 4 displays of the Water Quality Monitor.

NOTE: FEED TDS, **PRODUCT TDS** and **SET POINT**, when selected will be displayed for 30 seconds and then revert to **% REJECTION**

Control Box Door,
Outside View



Control Box Outside Door

Outside View
(on Models August 2010 and later)

Timed Operate Button

ELPWSW01108

Interlock Fault Light

ELLPLS01896

Timed Operate Button

When pressed, the Timed Operate Button will allow the RO to run for 30 minutes prior to the operator to performing their daily checks (such as Chlorine, hardness, etc…)
The Tmied Operate Mode runs for 30 minutes and cannot be altered or changed. The **TANK – OFF – DIRECT** switch must be in the TANK position before starting the Timed Rinse. (It can be activated when in the OFF position but is not recommended) The Timed Operate will not operate in DIRECT mode. When this button is pressed, the RO will run for 30 minutes and will turn off automatically. (NOTE: If the water level in the reservoir is between the OFF float (top float) and the ON Float (2nd float from top) the RO will not turn on until the water level drops to the ON Float.

This feature is only on models produced August 2010 and later.

Interlock Fault Light

The Pre-Treatment Interlock Fault Light will illuminate and alert the operator that the interlock system has been interupted. This is normal during the Backwash and/or regeneration of any pre-treatment backwashing filters or softeners.
This light will also illuminate when other fault conditions occur, such as interlock wires being disconnected, interlock relay failure of Main Control Board problems.
The RO will not run when this light is illuminated. If this light is illuminated and no filter or softener is in backwash or regeneration mode, call for assistance.

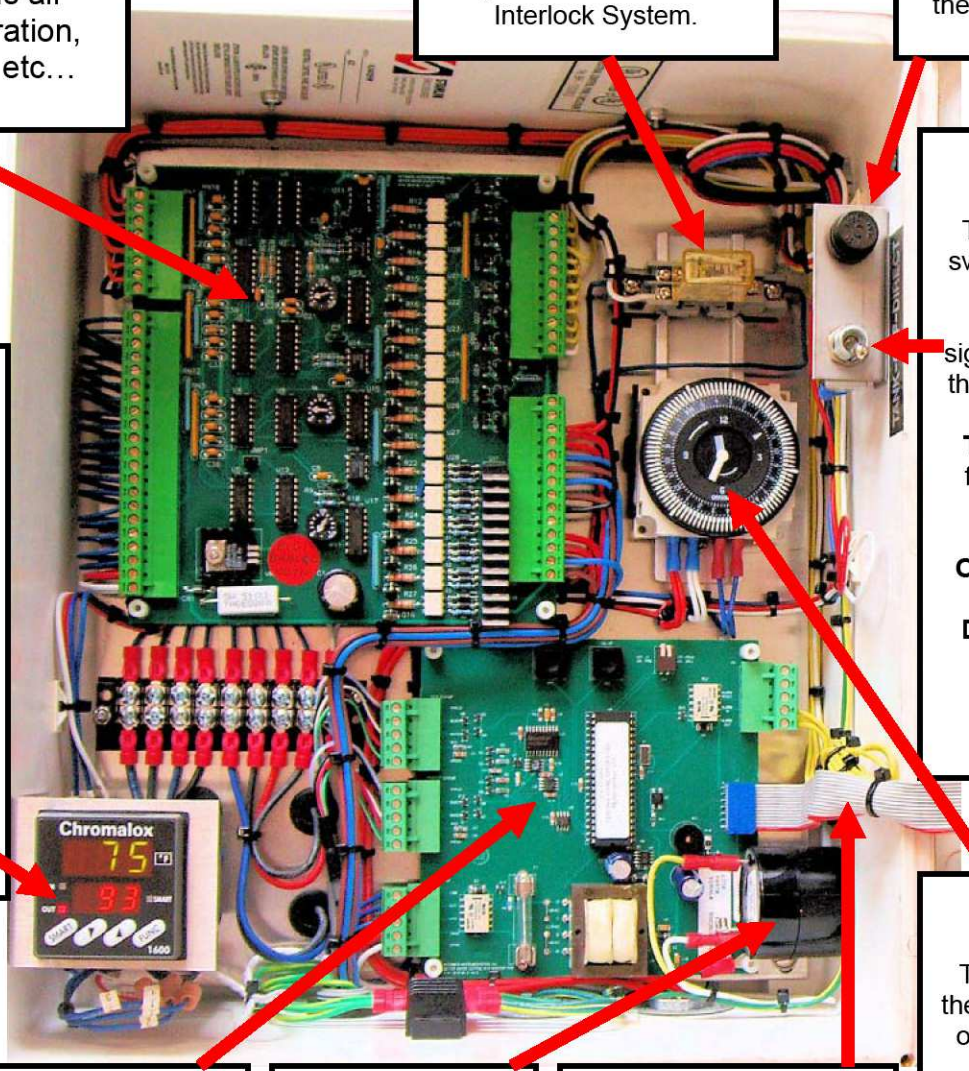
This feature is only on models produced August 2010 and later.

Control Box
Functions and Operations

Main Control Board
This is the "brain" of the RO and controls all functions of operation, alarms, signals, etc…

24vac Relay
This relay controls the signals to and from the Interlock System.

4 amp Fuse
This fuse will protect all 24vac functions of the Control Box from power overload coming from the Transformer in the Junction Box.



Tank-Off-Direct Switch
This 3 position toggle switch determines if the RO will run in conjunction with the signals from the floats in the Reservoir or will run continuously.
TANK- will recognize float signals from the reservoir.

OFF – RO will not run.

DIRECT – Ro will run continuously, and bypass the float switches in the Reservoir.

Chromalox Temperature Controller
This controller will monitor the water temperature prior to entering the membranes and also provides a high temp. limit to shut down the RO if the water temperature reaches or exceeds a pre-set limit. (93°F)

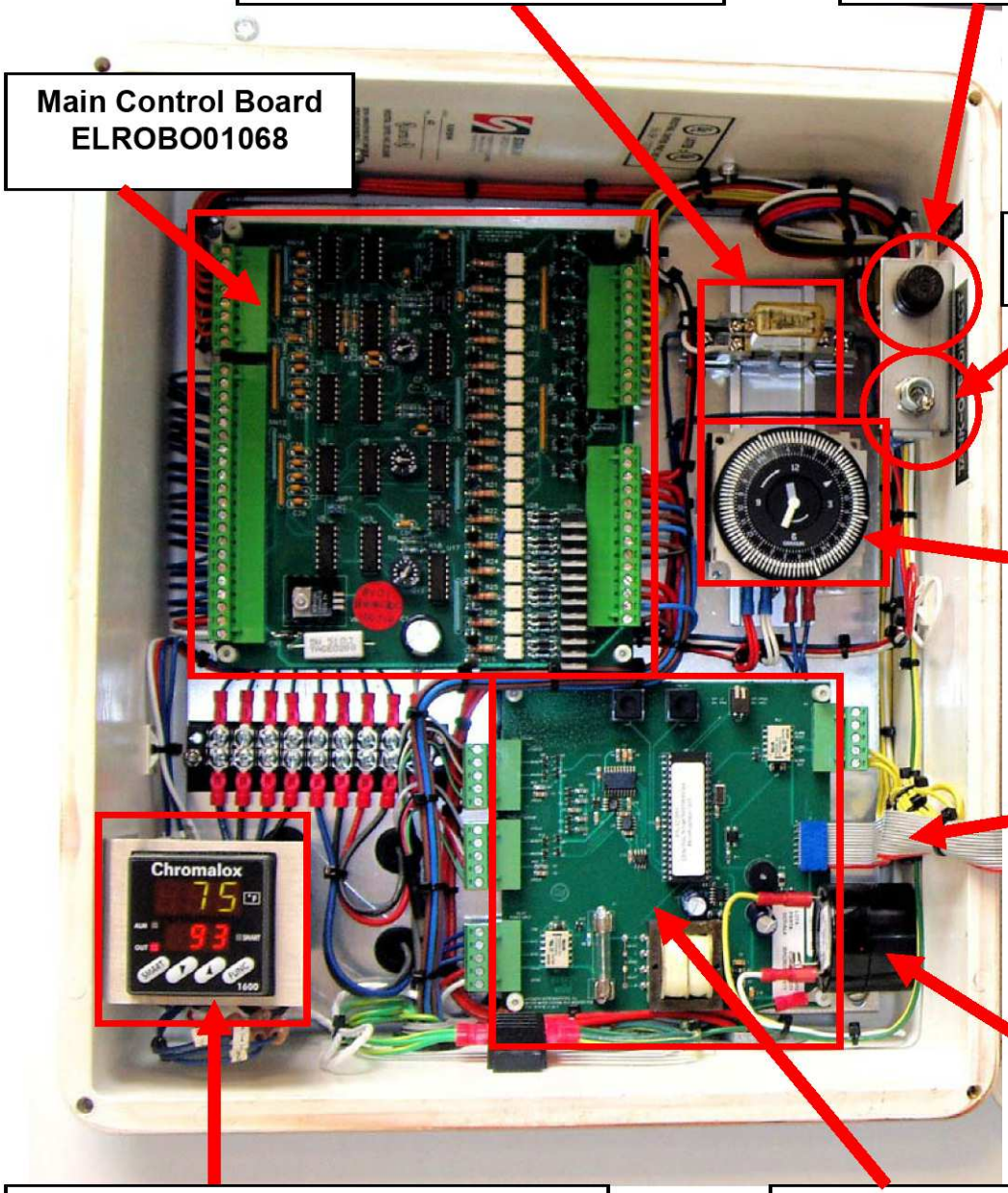
24 hour Flush Timer
This Timer will control the length and frequency of the Flush Cycles, of the RO. This timer works in conjunction with the OPERATE – FLUSH Switch on the Front of the Control Box. This timer is only activated when the OPERATE - FLUSH switch is in the FLUSH position.

Water Quality Control Board
This Control Board Receives signals from the Main Control Board and other signals , and those signals are transmitted to the Water Quality Monitor Display Board on the front of the Control Box, through the Water Quality Monitor Display Cable.

Piezo Alarm
This is a 24vac audible alarm that will sound when the RO goes into any alarm condition.

Water Quality Monitor Display Cable
This Ribbon Cable caries signals to the Water Quality Monitor Display Board, on the Front of the Control Box.

Control Box,
Inside View



24vac Relay & Relay Base

Relay: ELIDRL01146
Base: ELIDRL01142

4 amp Fuse & Fuse Holder

Fuse: ELLFFS00836
Fuse Holder ELOTEL00833

Main Control Board
ELROBO01068

Tank-Off-Direct Switch
ELPWSW01109

24 hr. Flush Timer
ELPWSW00989

Ribbon Cable
EQMOCB01354

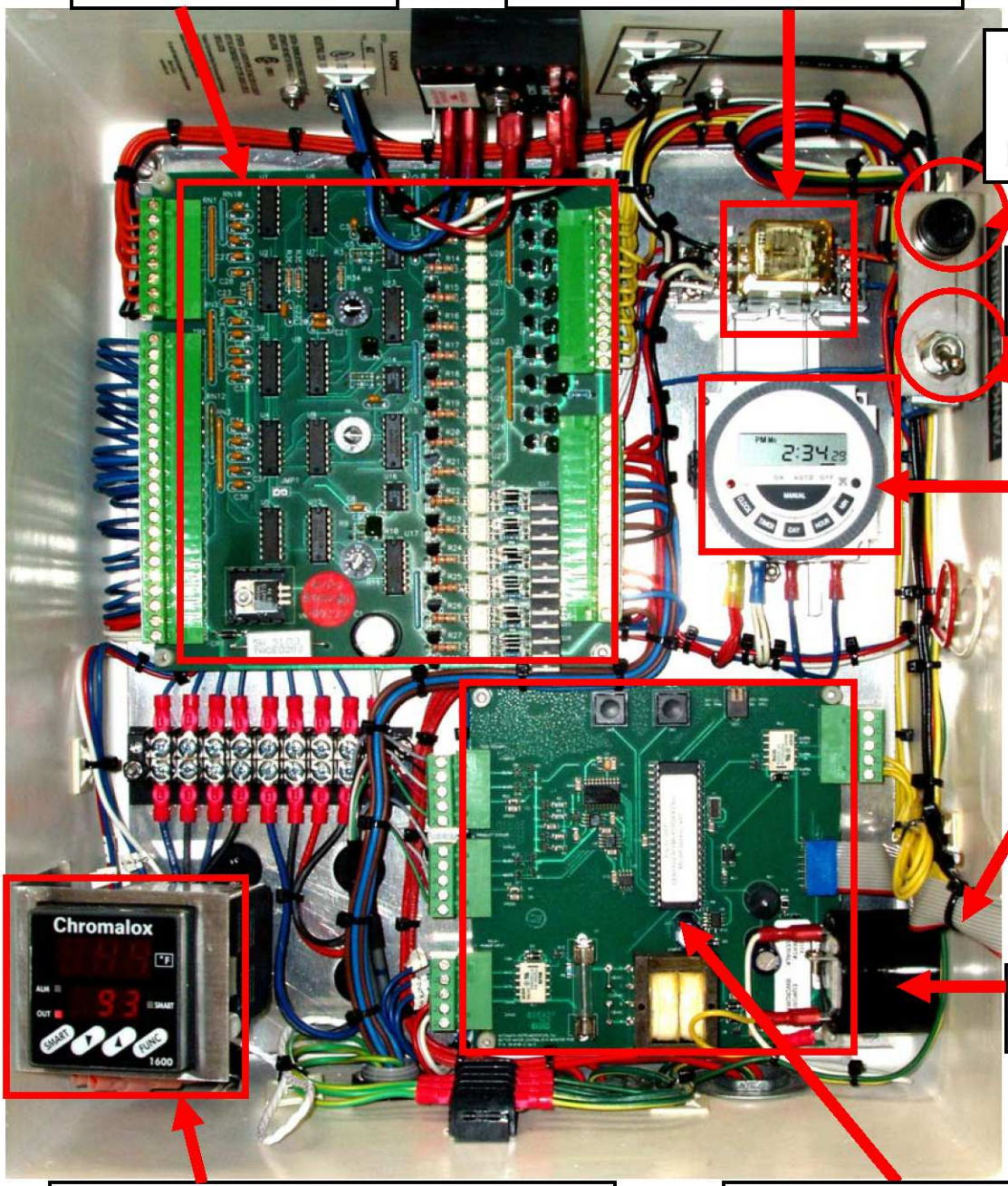
Loud Tone- Piezo Alarm
ELSAPZ01097

Chromalox Temperature Controller
ELCPD100001

Water Quality Control Board
EQMOBO01351

Control Box inside front

(Models manufactured August 2010 and later)



Main Control Board
ELROBO01068

24vac Relay & Relay Base

Relay: ELIDRL01147
Base: ELIDRL01143

4 amp Fuse & Fuse Holder

Fuse: ELLFFS00836
Fuse Holder ELOTEL00833

Tank-Off-Direct Switch
ELPWSW01109

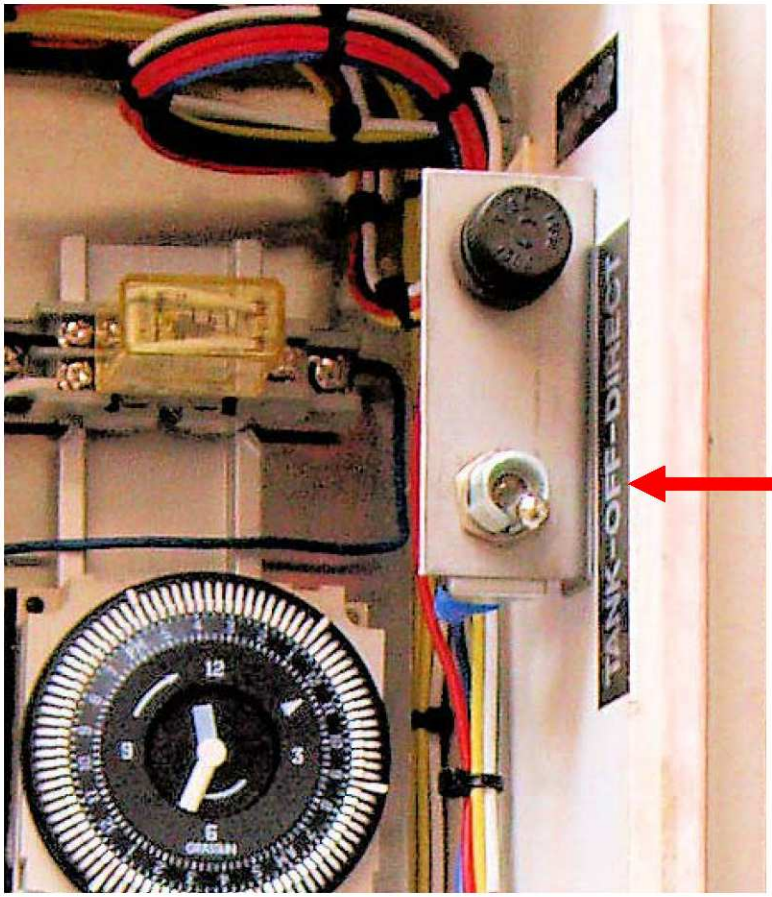
24 hour Flush Timer
ELPWSW00991
(Digital timer - August 2010 and later)

Ribbon Cable
EQMOCB01354

Loud Tone- Piezo Alarm
ELSAPZ01097

Chromalox Temperature Controller
ELCPD100001

Water Quality Control Board
EQMOBO01351



Tank-Off-Direct Switch
This 3 position toggle switch determines if the RO will run in conjunction with the signals from the floats in the Reservoir or will run continuously.

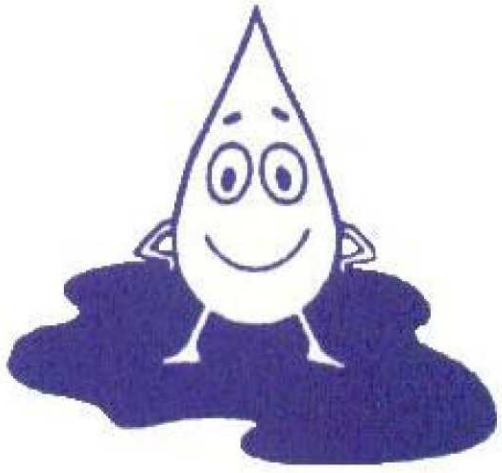
DIRECT – RO will run continuously, and bypass the float switches in the Reservoir.

OFF – RO will not run.

TANK- will recognize float signals from the reservoir.

On version 1, the Tank-Off-Direct Switch is located inside the Control Box. (ROs made prior to August 2007 and after August 2010 will have the switch on the inside of the control box)

Manufacture Date	Version
Prior to August 2007	Version 1
August 2007 to August 2010	Version 2
August 2010 to present	Version 1



Tank-Off-Direct Switch Variations

On version 2, the Tank-Off-Direct Switch is located on the outside, right side of the Control Box.
(ROs made August, 2007 to August 2010 will have the switch on the outside of the control box)

Tank-Off-Direct Switch
This 3 position toggle switch determines if the RO will run in conjunction with the signals from the floats in the Reservoir or will run continuously.

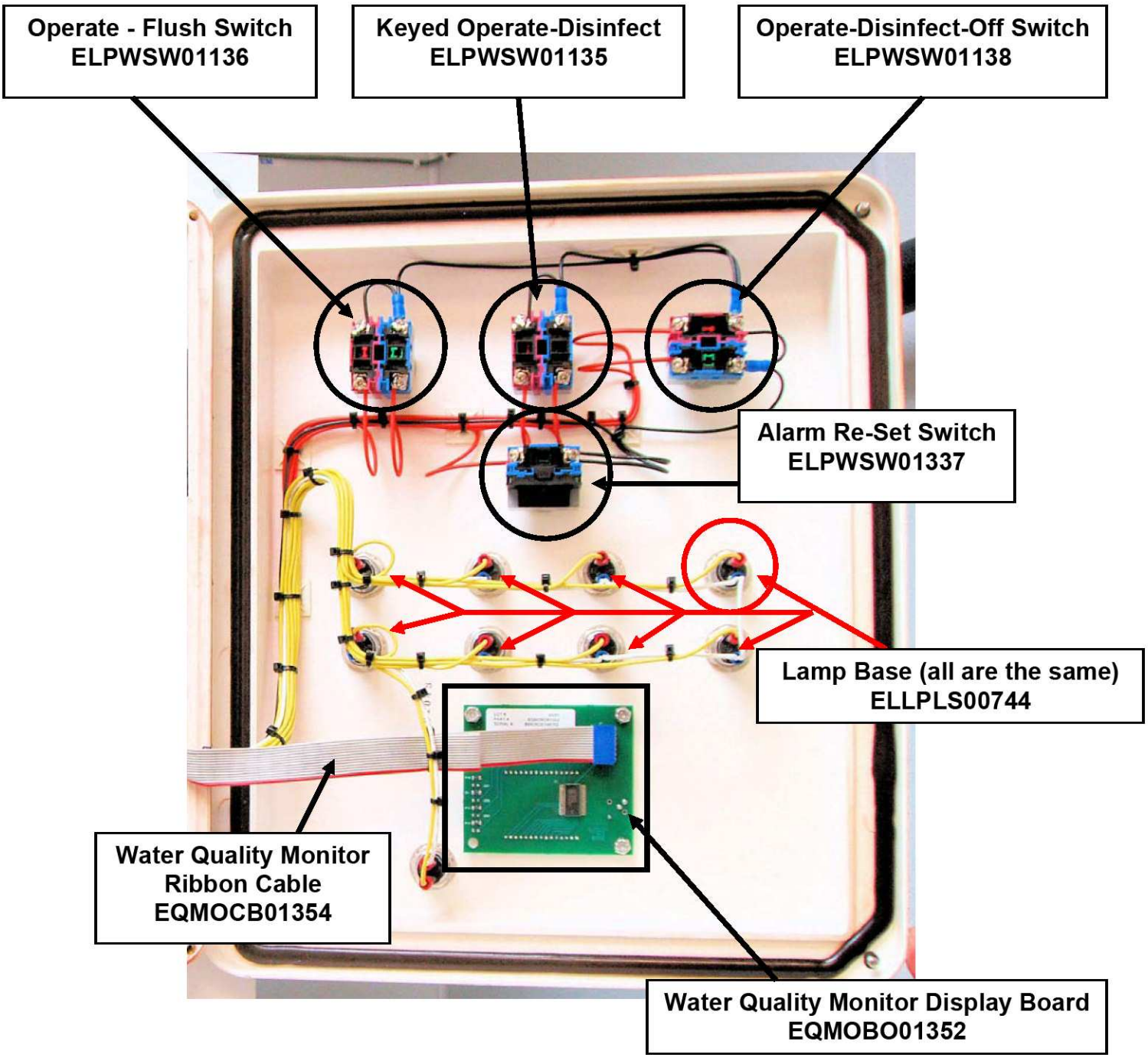
DIRECT – Ro will run continuously, and bypass the float switches in the Reservoir.

OFF – RO will not run.

TANK- will recognize float signals from the reservoir.

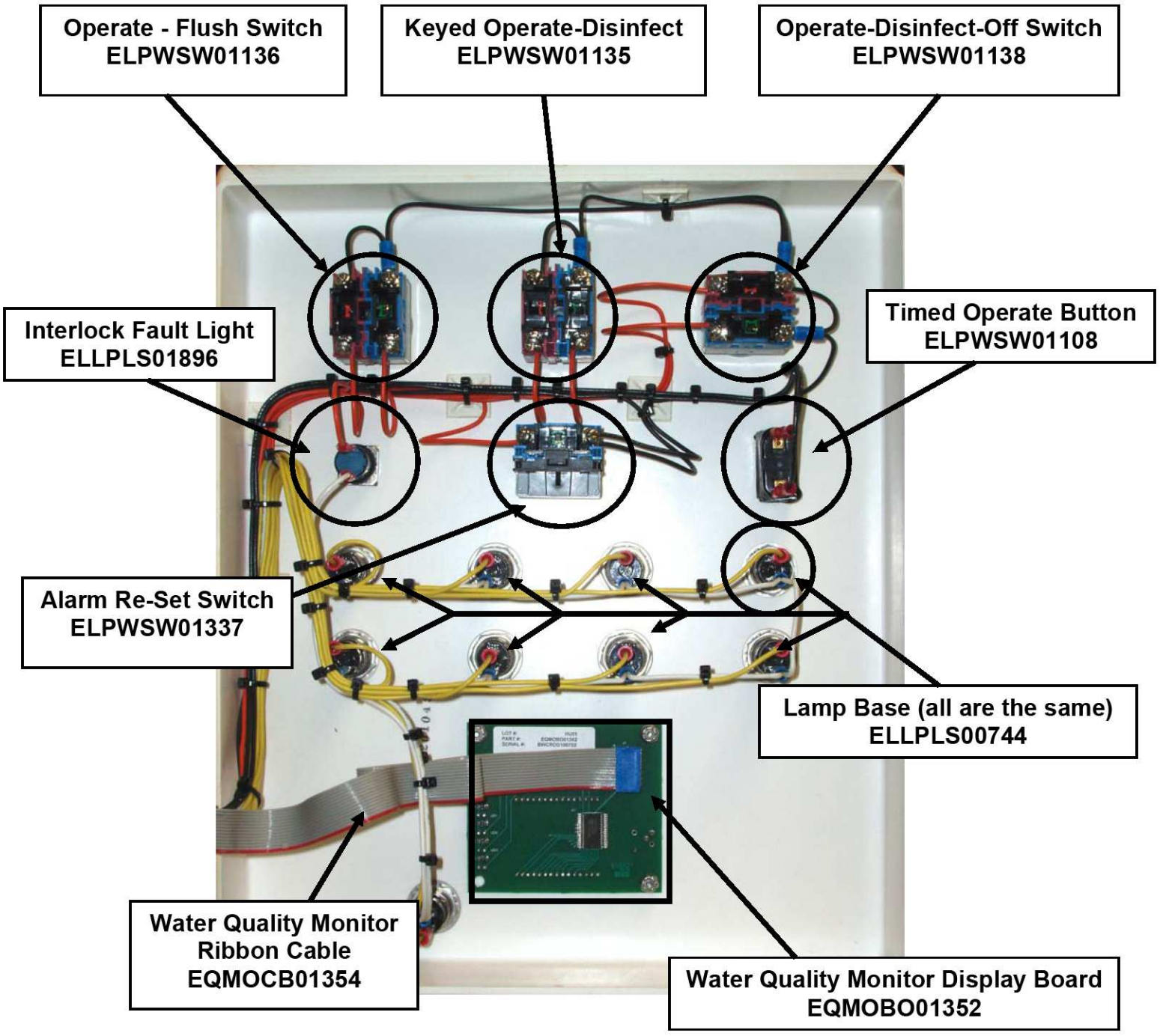
Tank Direct Switch Variation

Control Box Door,
Inside View



Control Box inside door

(Models manufactured August 2010 and later)



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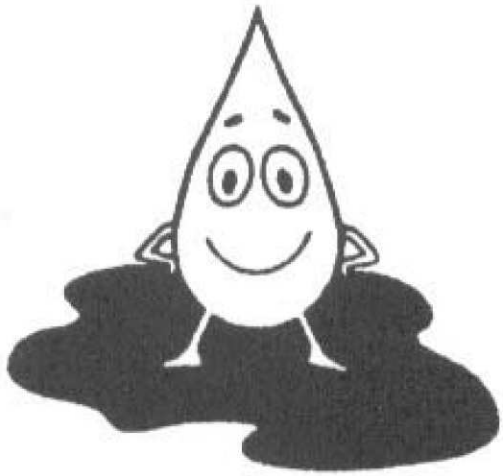

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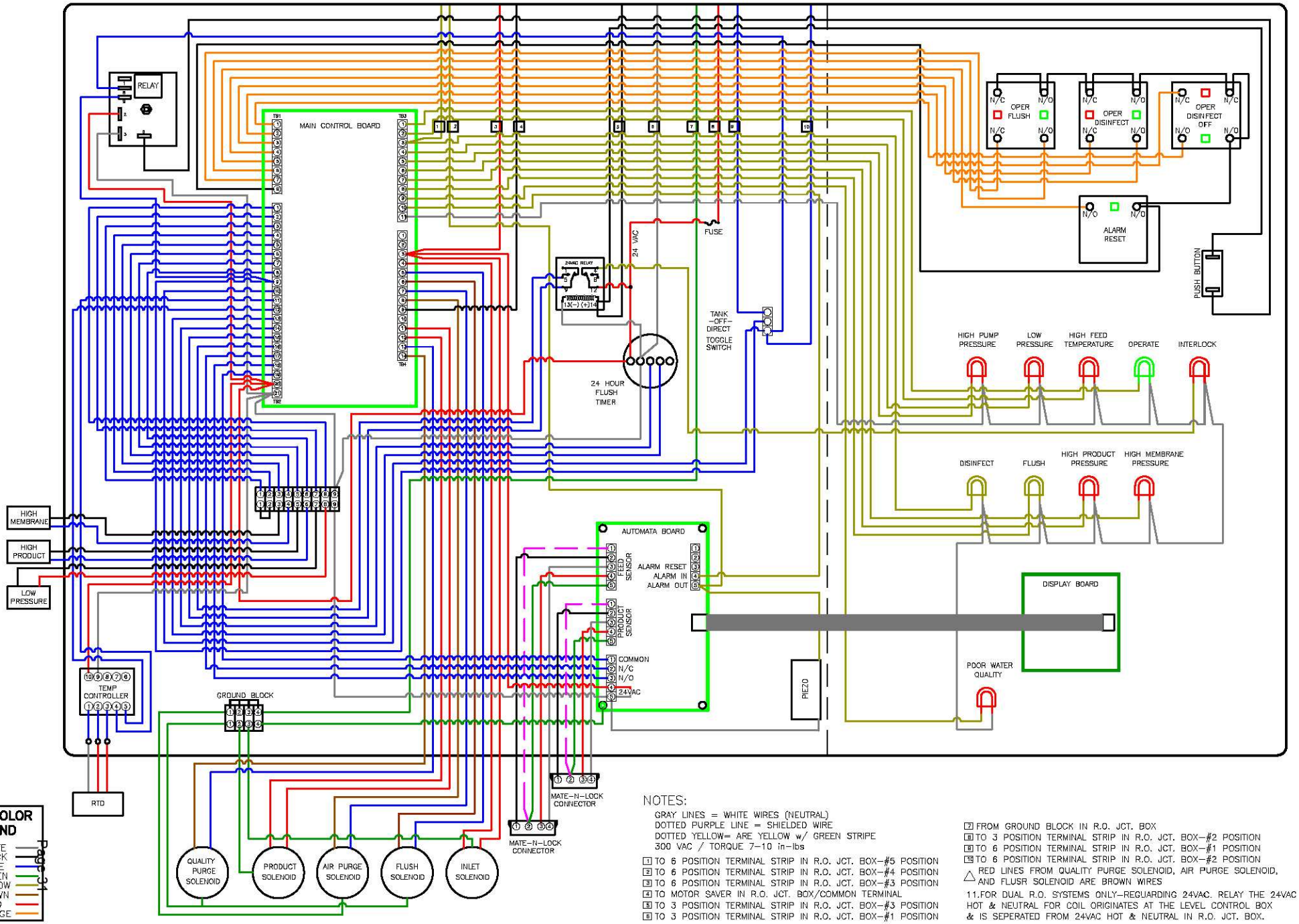
REV	DESCRIPTION	DATE	Rev. by:	REV	DESCRIPTION	DATE	Rev. by:
1	ADDED RELAY AND SWITCH	06/18/10	RTS				

"LABEL ALL BOXES TYPE 1 ENCLOSURE"



WIRE COLOR LEGEND

- WHITE
- BLACK
- BLUE
- GREEN
- YELLOW
- BROWN
- RED
- ORANGE

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NOTES:

GRAY LINES = WHITE WIRES (NEUTRAL)
DOTTED PURPLE LINE = SHIELDED WIRE
DOTTED YELLOW= ARE YELLOW w/ GREEN STRIPE
300 VAC / TORQUE 7–10 in–lbs

[1] TO 6 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#5 POSITION
[2] TO 6 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#4 POSITION
[3] TO 6 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#3 POSITION
[4] TO MOTOR SAVER IN R.O. JCT. BOX/COMMON TERMINAL
[5] TO 3 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#3 POSITION
[6] TO 3 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#1 POSITION
[7] FROM GROUND BLOCK IN R.O. JCT. BOX
[8] TO 3 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#2 POSITION
[9] TO 6 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#1 POSITION
[10] TO 6 POSITION TERMINAL STRIP IN R.O. JCT. BOX–#2 POSITION
△ RED LINES FROM QUALITY PURGE SOLENOID, AIR PURGE SOLENOID, AND FLUSH SOLENOID ARE BROWN WIRES

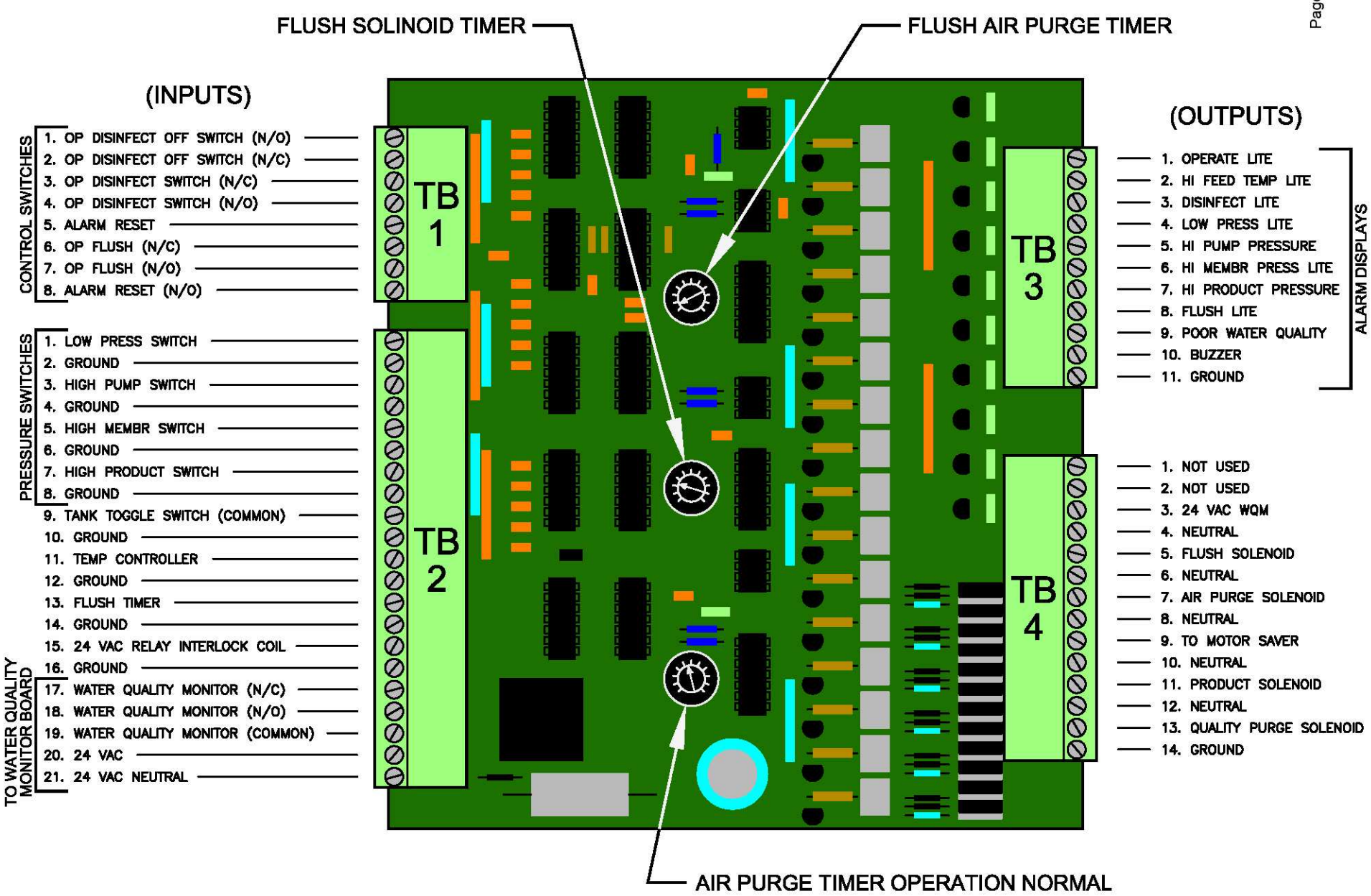
11.FOR DUAL R.O. SYSTEMS ONLY–REGUARDING 24VAC. RELAY THE 24VAC HOT & NEUTRAL FOR COIL ORIGINATES AT THE LEVEL CONTROL BOX & IS SEPERATED FROM 24VAC HOT & NEUTRAL IN R.O. JCT. BOX.

BETTER WATER INC.

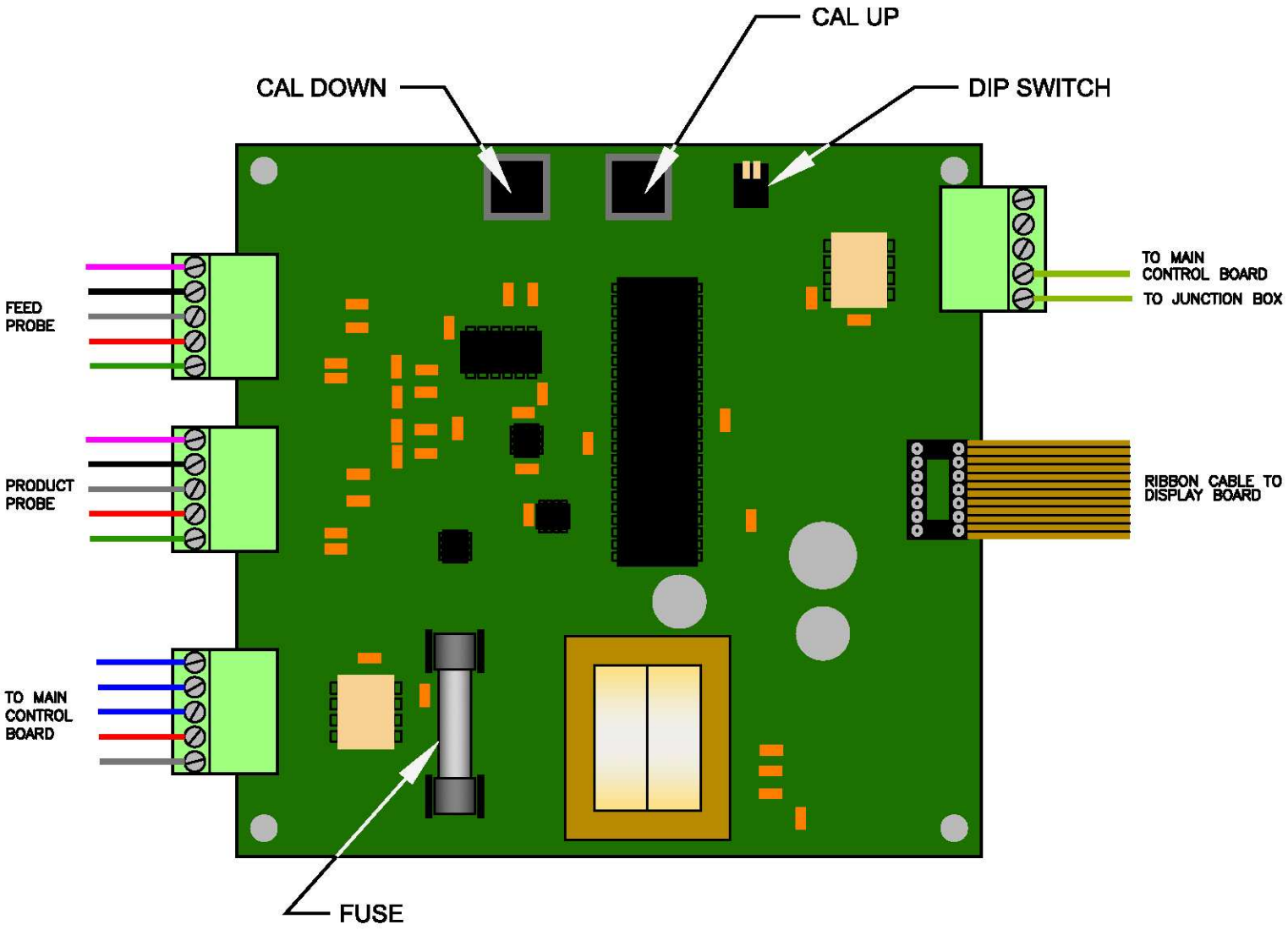
DRAWING TITLE: 24"x 36" R.O. CONTROL BOX SCHEMATICS VFD

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	11/16/06	1	1 OF 1	EQSUBROCB01543 V	3485

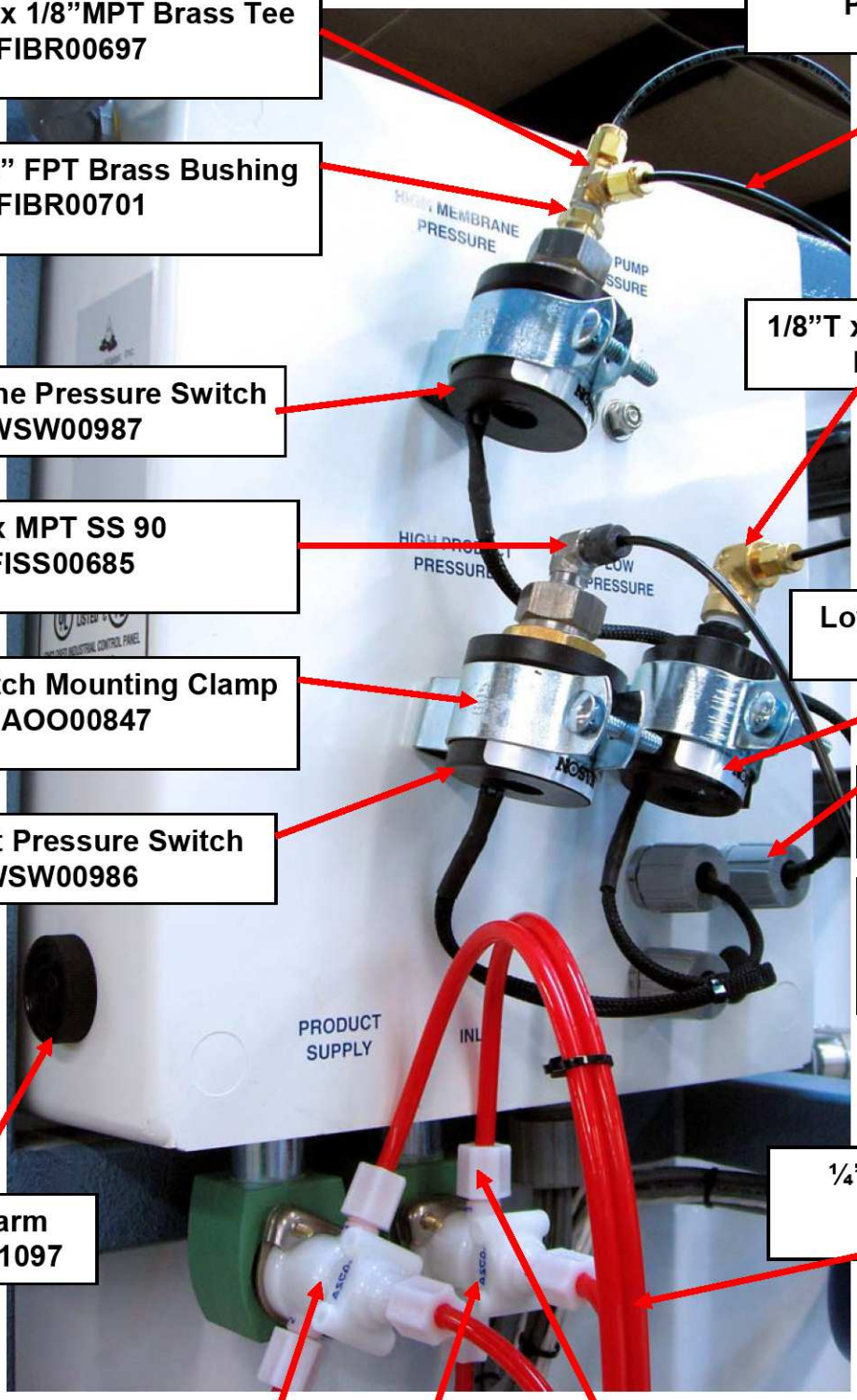
MAIN CONTROL BOARD



WATER QUALITY MONITOR BOARD



Control Box
Back View



1/8”T x 1/8”T x 1/8”MPT Brass Tee
PLFIBR00697

1/8” Black Poly Tubing
PLHOPA00657

1/4”MPT x 1/8” FPT Brass Bushing
PLFIBR00701

1/8”T x 1/4” FPT Brass 90
PLFIBR00679

High Membrane Pressure Switch
ELPWSW00987

1/8”t x MPT SS 90
PLFISS00685

Low Pressure Switch
ELPWSW00985

Pressure Switch Mounting Clamp
HWHAOO00847

½” Hubble Cord Grip
ELHBCC00764

High Product Pressure Switch
ELPWSW00986

½” Hubble Locknut
(Not shown)
ELHBCC00775

Piezo Alarm
ELSAPZ01097

¼” Red Poly Tubing
PLHOPA00908

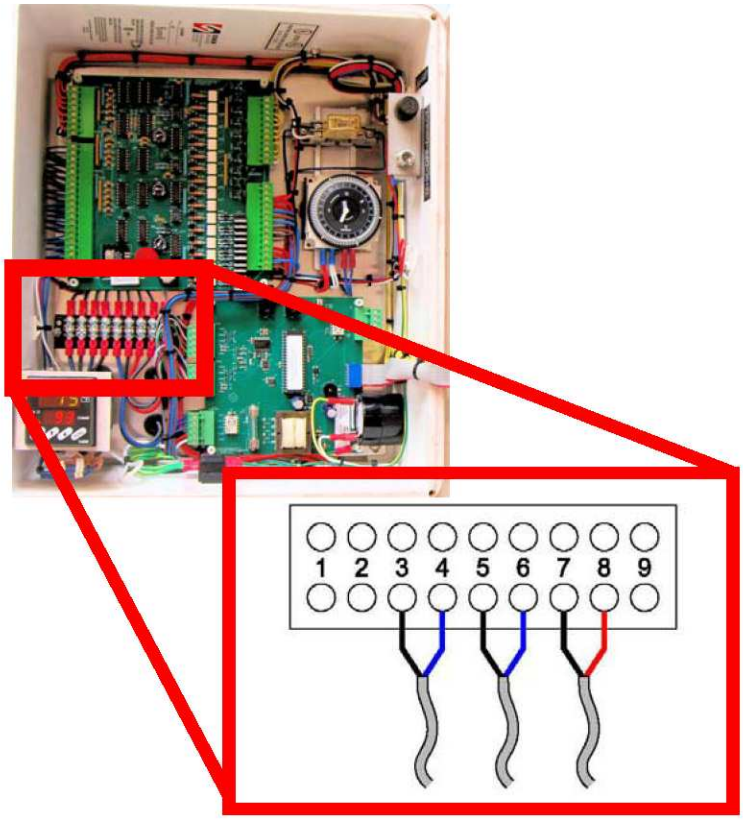
Asco Solenoid Valves
PLVAOO01312

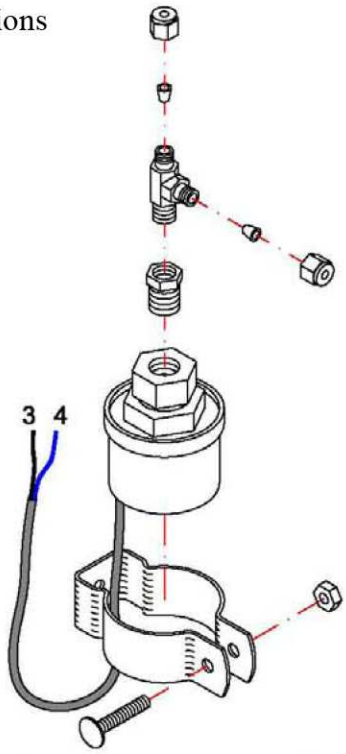
Compression Nut
PLVAOO01572

Control Box back

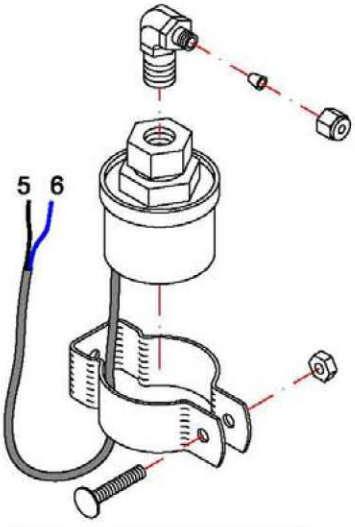
Pressure Switches

The wires from the Pressure Switches on the back of the Control Box are routed through the black rubber grommets in the back of the Control Box and are connected to the terminal strip in the Control Box at locations shown Below.

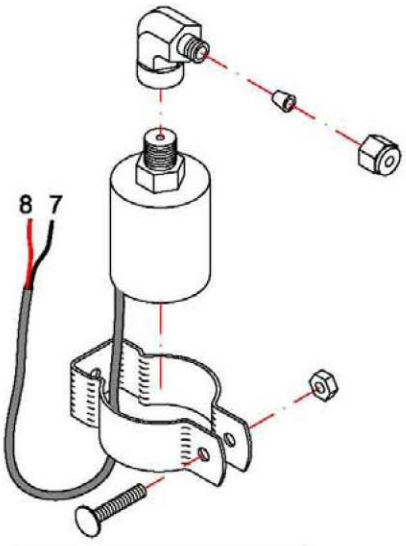




HIGH MEMBRANE PRESSURE SWITCH

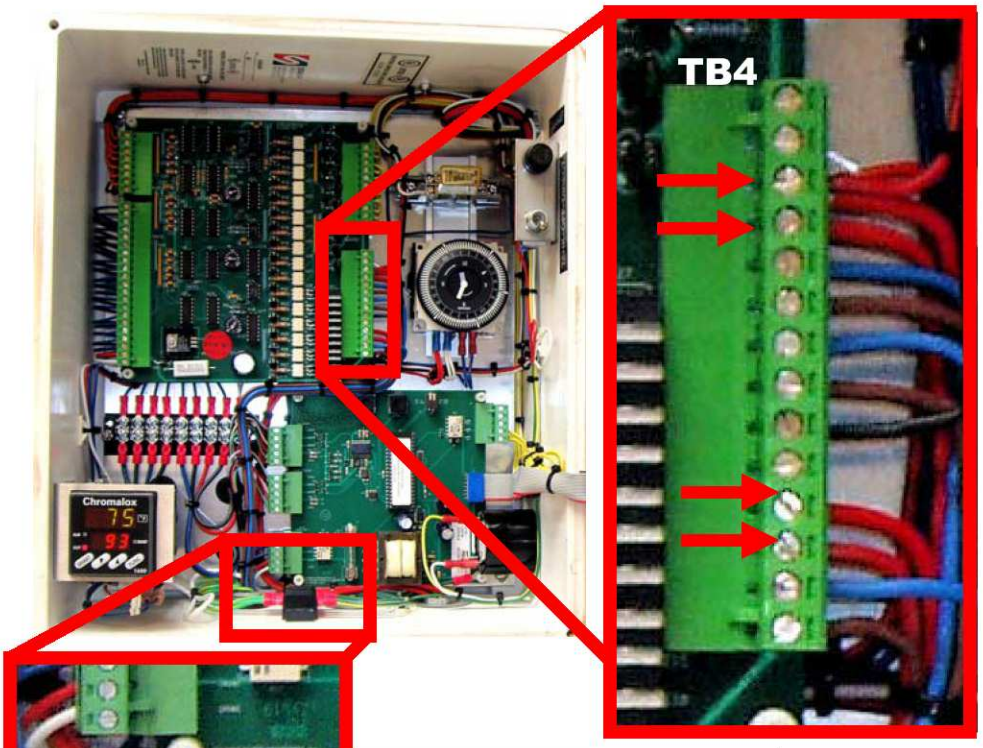


HIGH PRODUCT PRESSURE SWITCH

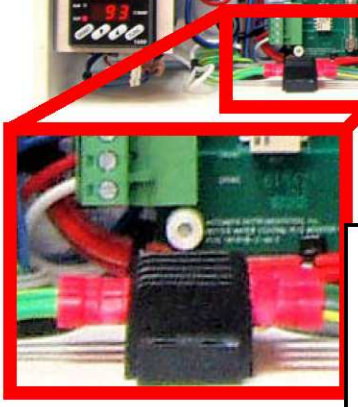


LOW PRESSURE SWITCH

Product & Inlet Solenoid Valves
Wiring Connections



1
2
3 Red from Inlet Solenoid
4 Red from Inlet Solenoid
5
6
7
8
9
10
11 Red from Product Solenoid
12 Red from Product Solenoid
13
14



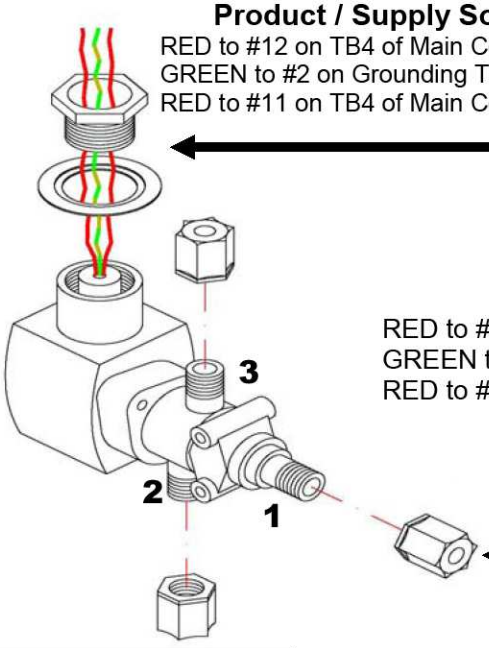
1
2 Green from Product Solenoid
3 Green from Inlet Solenoid
4

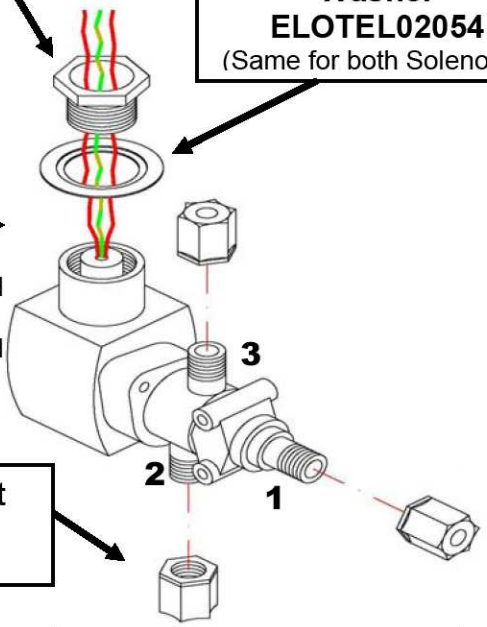
Close Conduit Nipple
ELCNOO00858
(Same for both Solenoids)

Washer
ELOTEL02054
(Same for both Solenoids)

Product / Supply Solenoid
RED to #12 on TB4 of Main Control Board
GREEN to #2 on Grounding Terminal
RED to #11 on TB4 of Main Control Board

Inlet Solenoid
RED to #4 on TB4 of Main Control Board
GREEN to #3 on Grounding Terminal
RED to #3 on TB4 of Main Control Board

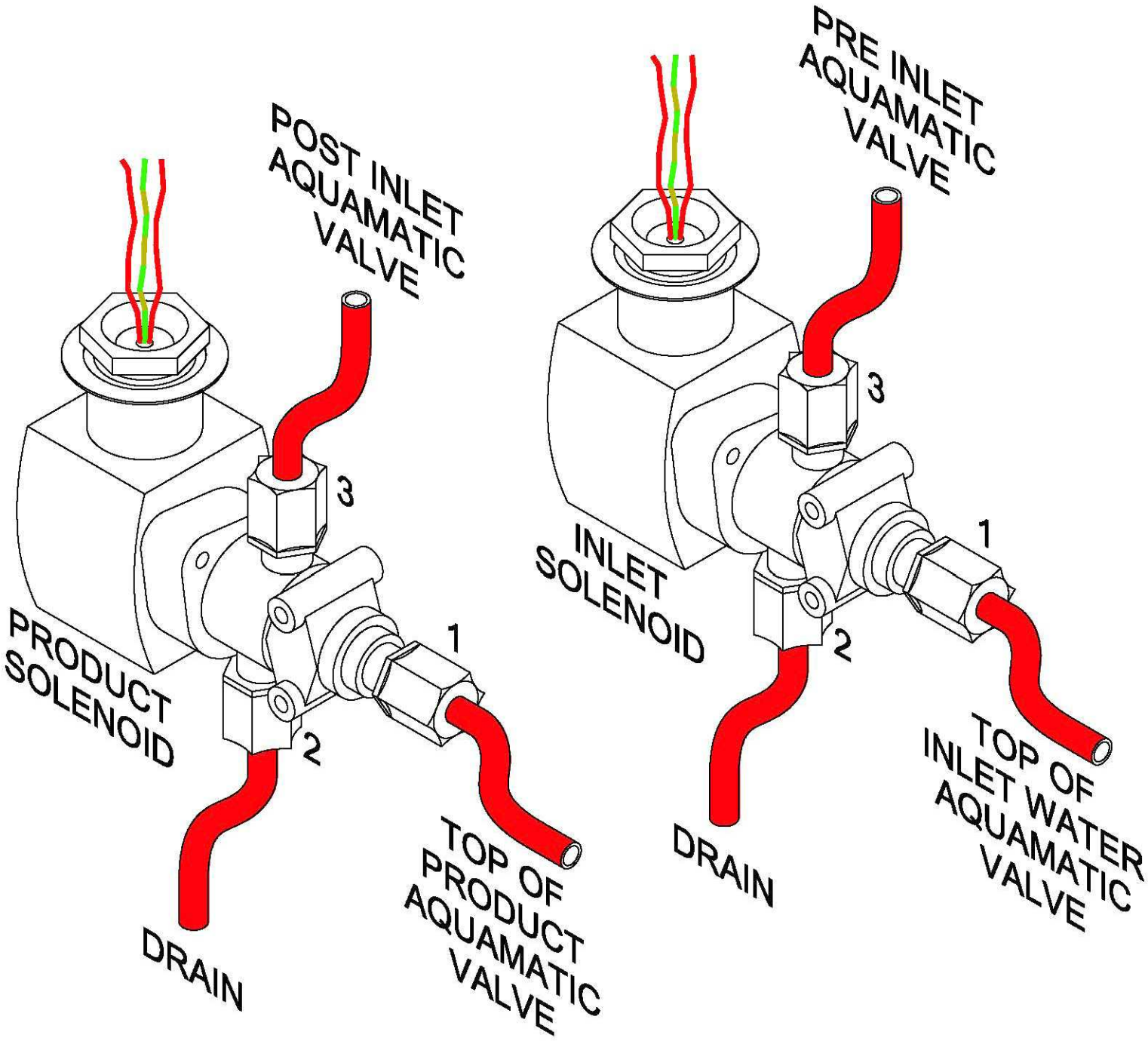




Compression Nut
PLVAOO01572
(All are Same)

Product/Supply Solenoid

Inlet Solenoid



SOLENOID VALVES - HOSE CONNECTIONS

Bulb and Lens Cover Replacement

Replacement Lamp Cover Part Numbers:

Green	ELLPLC00748
Red	ELLPLC00746
Amber	ELLPLC00747

All Bulbs used on the Control Box are the same Part Number: ELPLLP00745

1. To Replace Lens Cover, simply unthread lens cover and remove. (see dia. BLC1)
2. To Remove Bulb, remove lens cover and pull bulb straight out. (see dia. BLC2)
3. Replace with new bulb pushing straight in, taking note to orient the base of the bulb correctly.
4. Replace Lens Cover by threading back in place.

Diagram BLC1
Showing Lens Cover Removal / Installation

Diagram BLC2
Showing Bulb Removal / Installation

Fuse and Relay Replacement

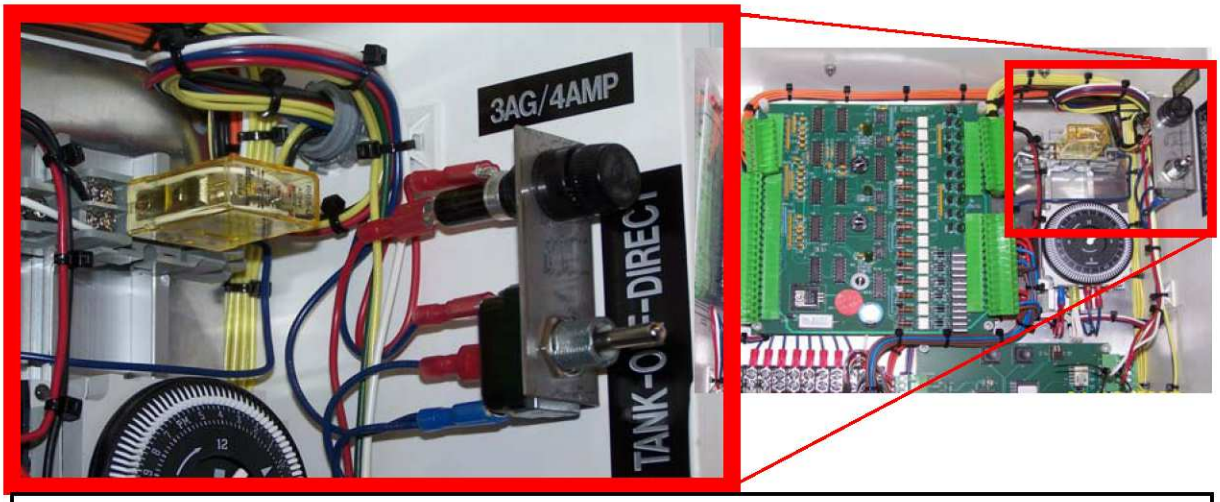


Diagram FR1 Showing Relay and Fuse locations in Control Box

RELAY REPLACEMENT

1. Disconnect the Main Power.
2. To remove the 24vac Relay, grasp and pull straight out. (see dia.FR2)
3. To reinstall new Relay, take note of the 5 pins on the back and line up correctly, and push straight into Relay Base.
4. Reconnect the Main Power.

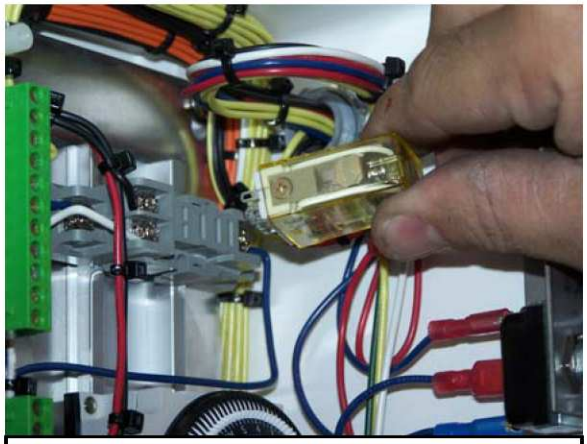


Diagram FR2
Showing Relay Removal / Replacement

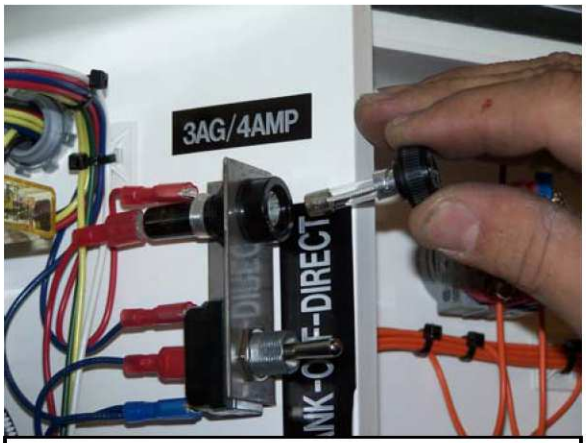
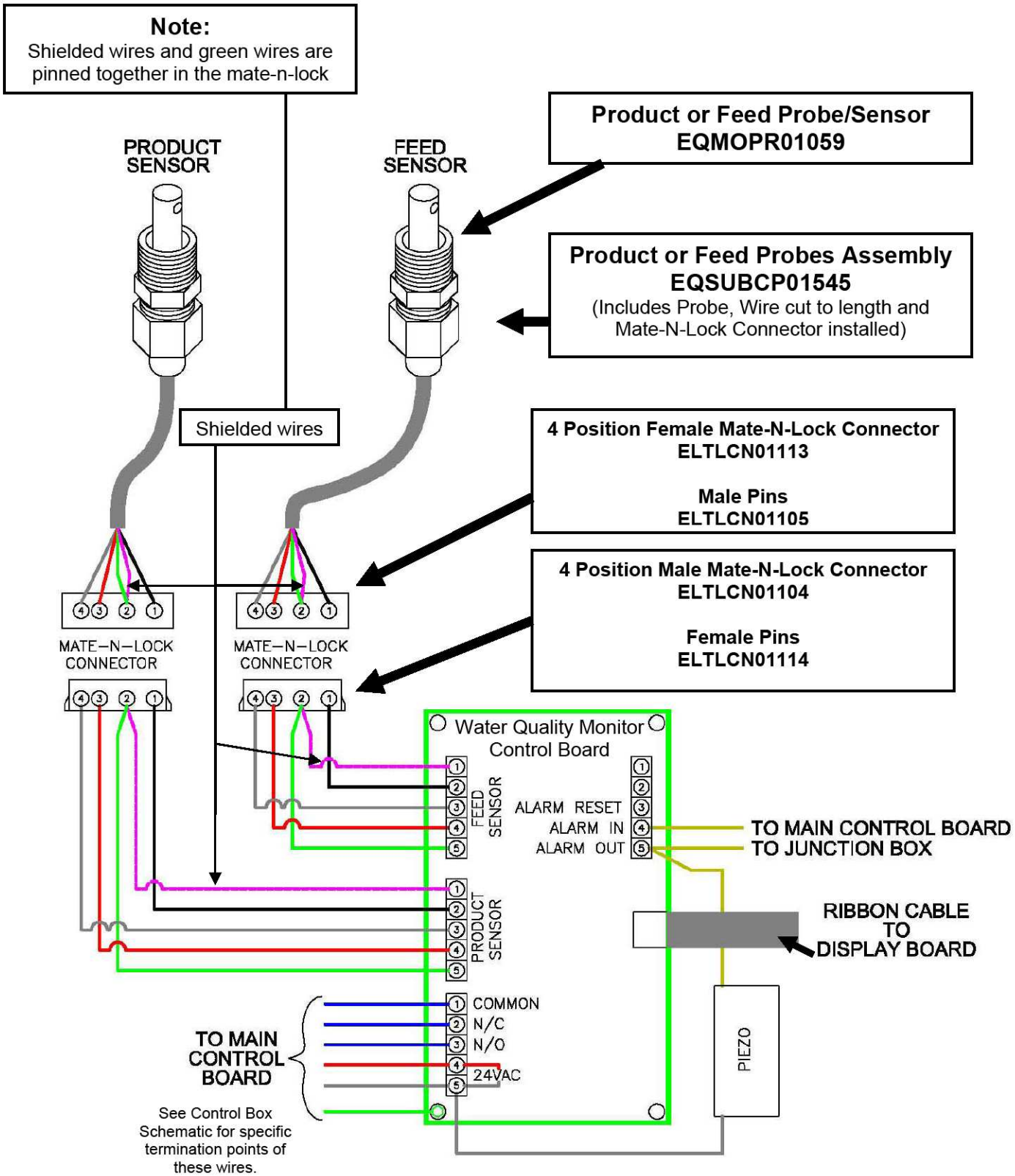


Diagram FR3
Showing Fuse Removal / Replacement

FUSE REPLACEMENT

1. Disconnect the Main Power.
2. To Remove the 24vac /4 amp fuse, grasp the black fuse cover / holder, push in and turn counterclockwise then remove. Fuse is mounted in the cover / holder. (see dia. FR3)
3. Remove the fuse from the cover / holder, and replace with new fuse.
4. To replace; push in, turn clockwise, and release. The cover / holder should stay in place.
5. Reconnect the Main Power.

Water Quality Monitor
Probes and Wiring Connections



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WATER QUALITY MONITOR DISPLAY BOARD REPLACEMENT …..48

WATER QUALITY MONITOR DISPLAY CABLE REPLACEMENT …..49

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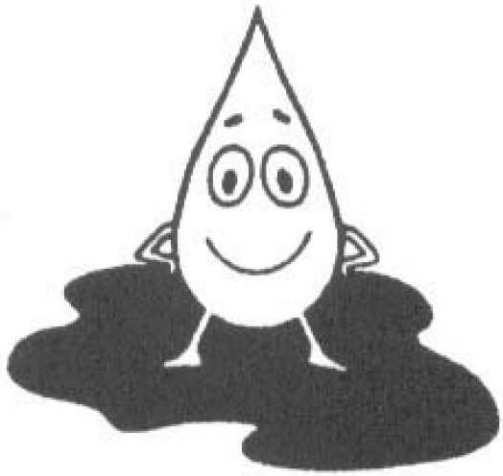

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Main Control Board Replacement

Follow these steps to Remove and Replace the Main Control Board:

1. Disconnect the Main Power
2. Open Control Box door
3. Locate the 4 green removable terminal strips (See white arrows, dia. CB1) and disconnect each one by gently pushing toward the outside. Note: It is not necessary to remove each individual wire from the terminal strips
4. Locate the 4 white threaded retaining nuts (See white circles, dia. CB1) and remove each by unthreading.

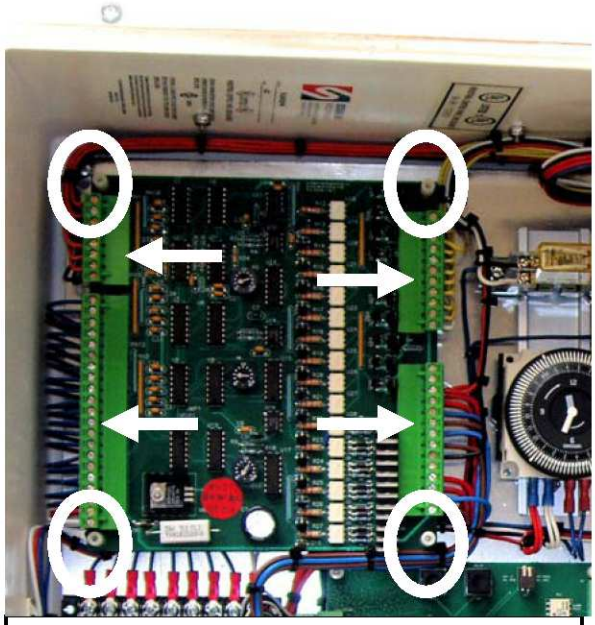


Diagram CB1

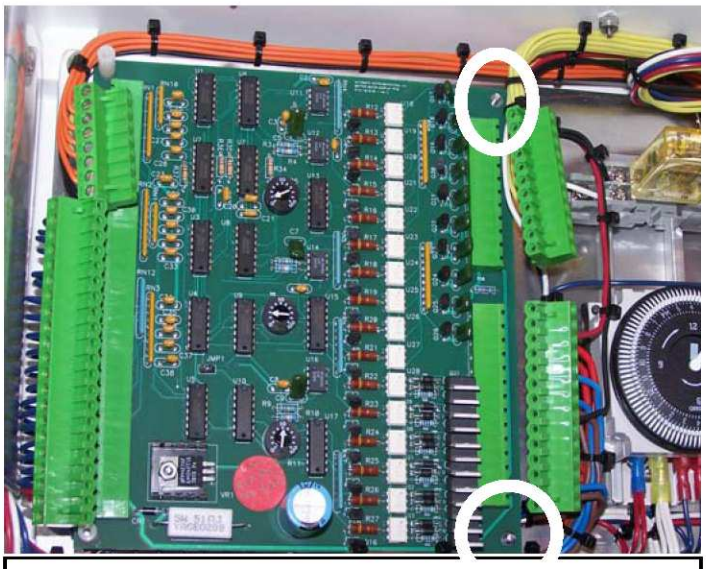


Diagram CB2
Shown: Terminal strips disconnected,
and 2 (right side) retaining nuts removed

4. Remove Board by gently sliding off of the stand off threaded posts. You will have to gently move the wires and terminal strips to the outsides. (Dia. CB3)

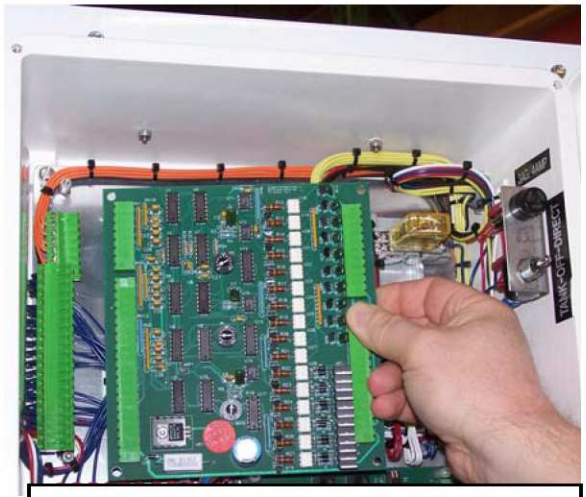


Diagram CB3
Removing Main Control Board

Diagram CB4
Main Control Board Removed

Main Control Board Replacement

5. Remove New Control Board from its packaging, being careful to only handle by the edges.
6. Remove the terminal strips and discard as these are not needed if you left the old ones on. (dia.CB6)

Diagram CB5
New Board Removed from Packaging

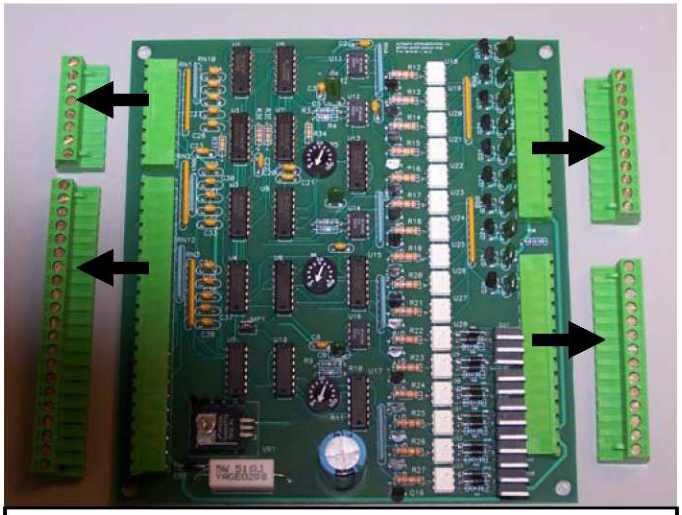


Diagram CB6
New Board with Terminal Strips Removed

7. Install the new Board, taking care to line it up correctly, gently moving wires as necessary to fit in place. (dia.CB7)
8. Reinstall 4 white threaded retaining nuts and clip terminal strips back in place.

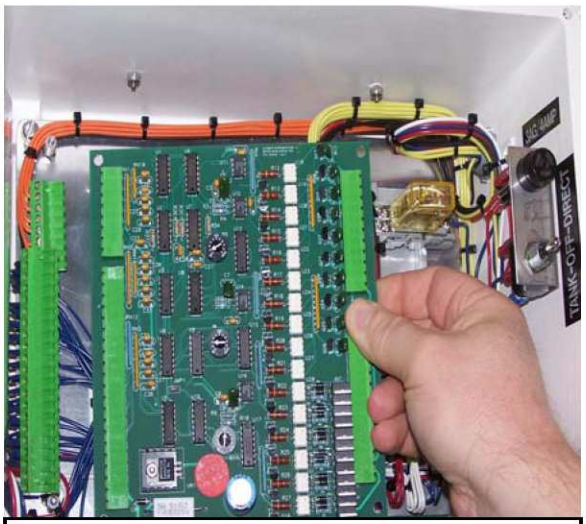


Diagram CB7
Reinstalling New Control Board

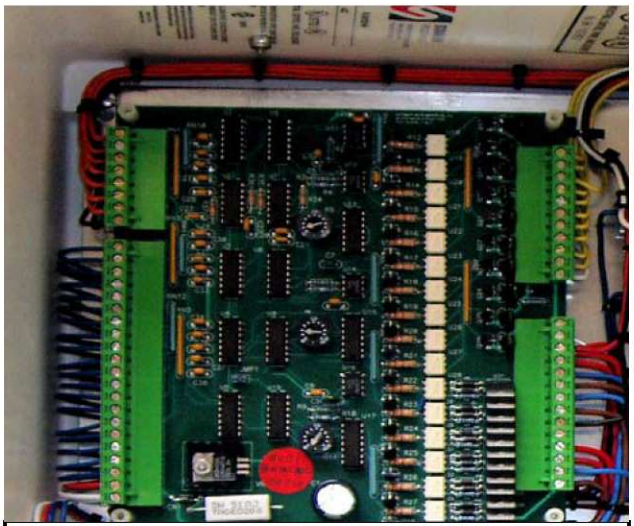


Diagram CB8
New Control Board Installed and Secured

9. After Installation, be sure check the settings on the adjustable POT settings. They should be : **TOP: 10, MIDDLE: 20, BOTTOM: 50** (dia. CB9)
10. Reconnect the Main Power

Main Control Board Replacement

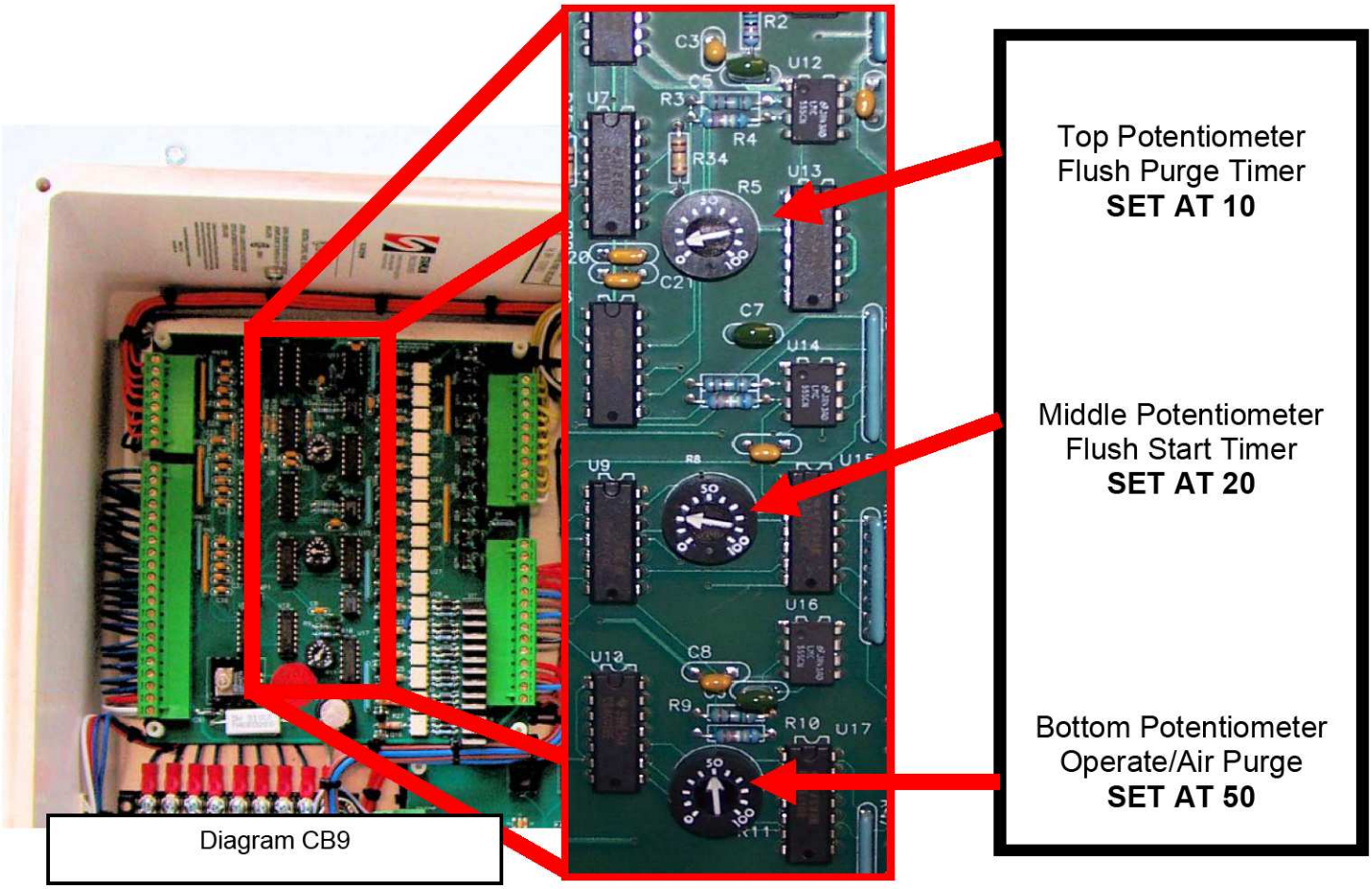


Diagram CB9

NOTE: Be sure to check and see that there is no Jumper installed on JMP1. If there is, remove and discard.

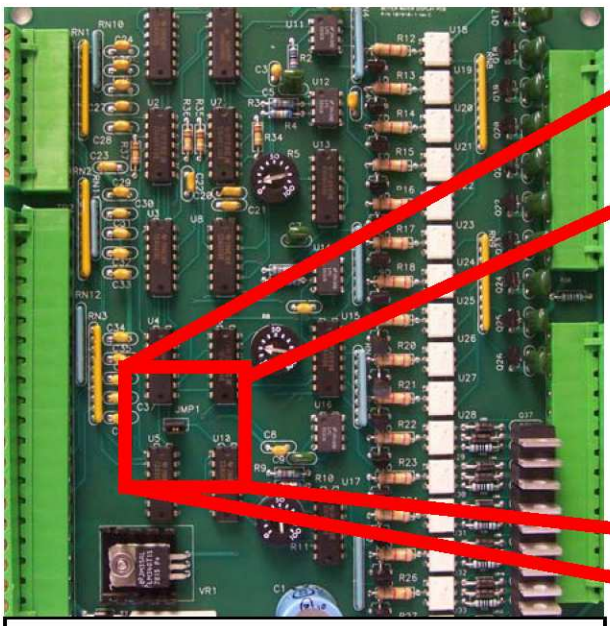


Diagram CB10

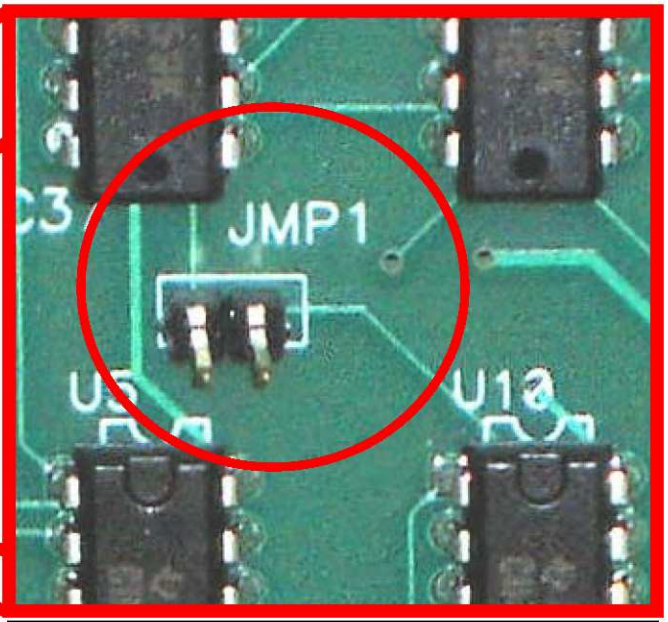


Diagram CB11
Jumper Removed for Proper Operation

Water Quality Monitor Control Board Replacement

Follow these steps to Remove and Replace the Water Quality Monitor Control Board

1. Disconnect the Main Power.
2. Open the Control Box door.
3. The Piezo Alarm must be removed before the WQM Board can be removed;
    a. Locate the Piezo Alarm.(dia.WQMB1)
    b. On the outside of the Control Box, unscrew the retaining nut that holds the Piezo Alarm in place.
    c. Slide the Piezo Alarm toward the inside of the Control Box and let it hang gently on its wires. (It is not necessary to disconnect the wires.) (dia. WQMB2)

4. On the Water Quality Monitor Control Board, locate the Display Board Ribbon Cable. (dia.WQMB1)
5. Carefully unplug the Display Board Ribbon Cable. Be extremely careful not to damage or bend the prongs on the cable end. (dia. WQMB2)
6. Locate the 4 green removable terminal strips on the board and disconnect each one by gently pushing toward the outside. NOTE: It is not necessary to remove each individual wire from the terminal strips. (dia. WQMB2).

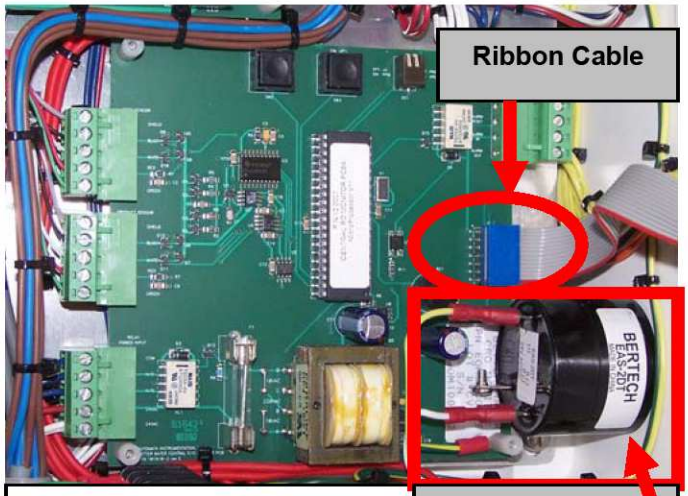


Diagram WQMB1

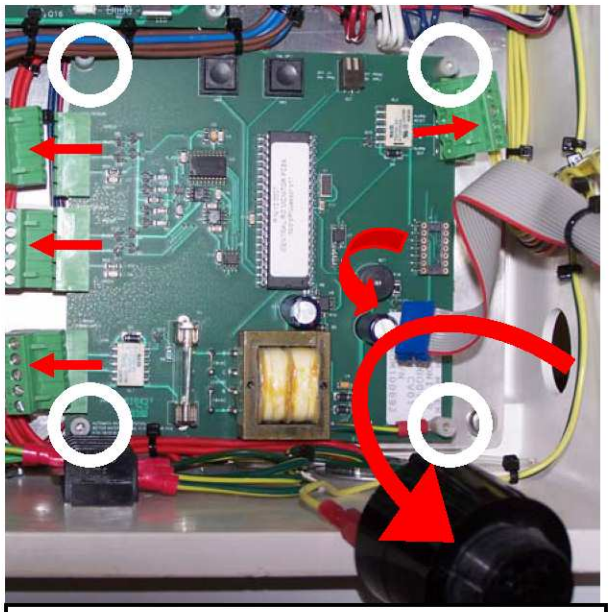


Diagram WQMB2
Showing Piezo Alarm removed, Ribbon Cable unplugged, and Terminal Strips unplugged

7. Locate the 4 white threaded retaining nuts and remove them. (see dia. WQMB2) ***NOTE*** the green/yellow ground wire on the lower right post. Be sure to reinstall this ground wire on the installation of new board.
8. Remove Board by gently sliding off the stand off threaded posts. You may have to gently move wires and terminal strips to the outside. (dia.WQMB3)
9. Remove New Control Board from its packaging, being careful to only handle by the edges.

Water Quality Monitor Control Board Replacement

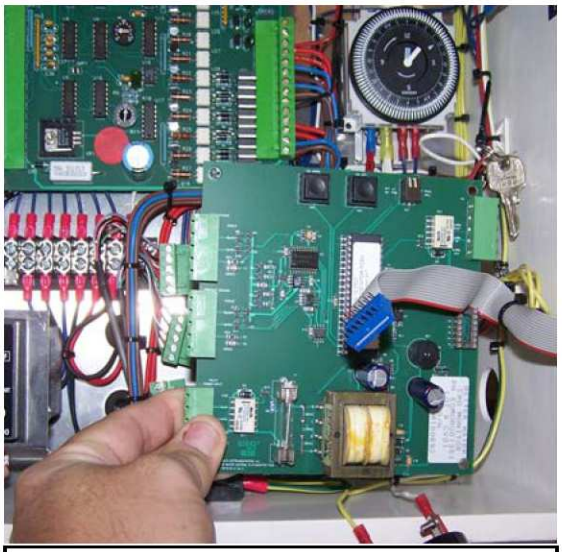


Diagram WQMB3
Removing Water Quality Monitor Board

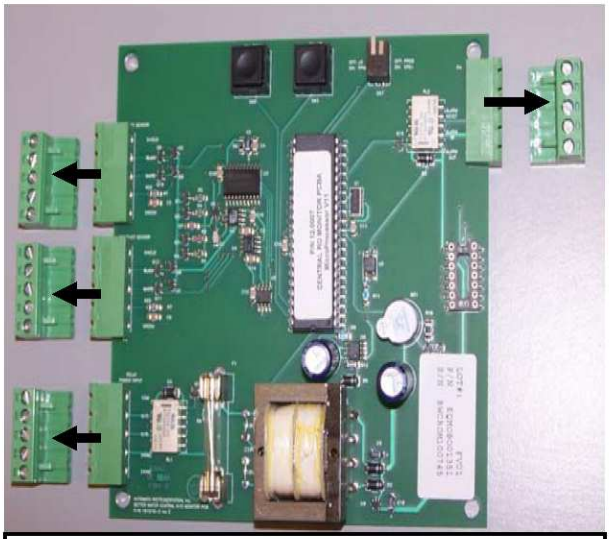
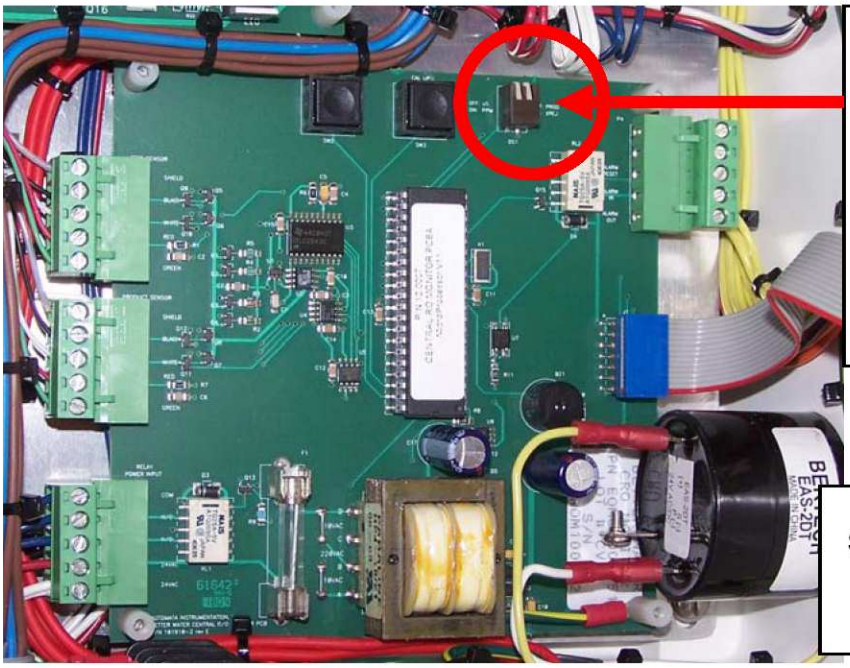


Diagram WQMB4
New Board with Terminal Strips Removed

10. Remove the terminal strips and discard as these are not needed if you left the old ones on. (dia. WQMB4)
11. Install New Board, taking care to line it up correctly, gently moving wires as necessary to fit in place.
12. Reinstall the 4 white threaded retaining nuts, starting with the lower right. Do not forget to reinstall the ground wire to the first retaining post/nut.
13. Reinstall the 4 green terminal strips, making sure they snap in securely.
14. Carefully reinstall the Display Ribbon Cable.
15. Reinstall the Piezo Alarm, holding it in place and securing the retaining nut on the outside of the Control Box.
16. Reconnect the Main Power.



NOTE:
The **LEFT DIP Switch** should be in the ON position (pushed back) for PPM reading, or in the OFF position (pulled forward) for µS.

The RIGHT DIP Switch (Prod/Rej) should always be in the ON position (pushed back)

Diagram WQMB 5
Showing New Water Quality Monitor Control Board, Retaining Nuts re-installed, Display Ribbon Cable re-installed and Piezo reinstalled

Water Quality Monitor Display Board Replacement

Follow these steps to Remove and Replace the Water Quality Monitor Display Board

1. Disconnect the Main Power.
2. Open the Control Box Door.
3. Locate and unplug the Display Ribbon Cable from the Display Board. Be extremely careful not to damage or bend the prongs on the cable end. (White arrow, Dia.WQMDB2)

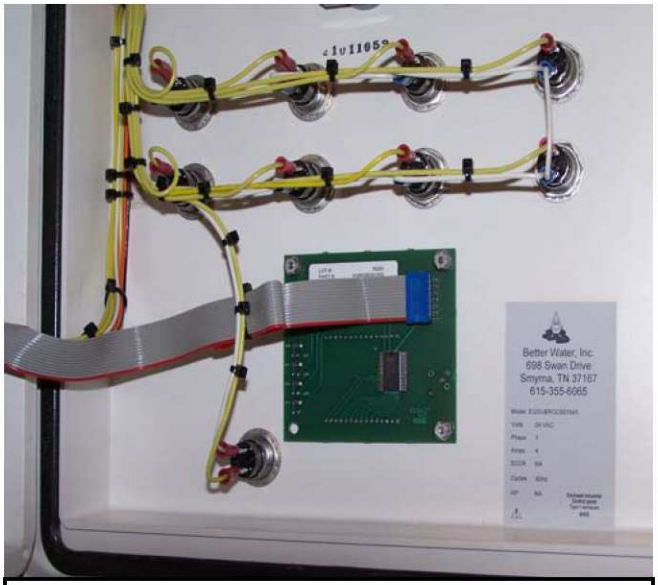


Diagram WQMDB1

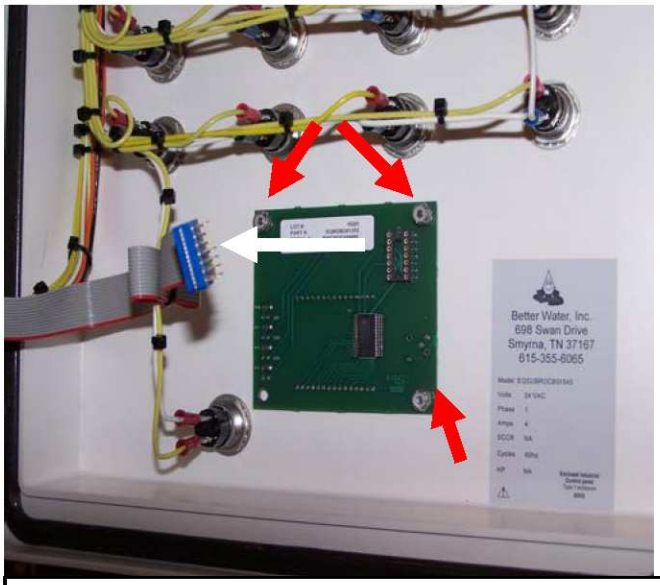


Diagram WQMDB2
Showing Ribbon Cable unplugged and Retaining Nut Locations

4. Remove the 3 nuts securing the Display Board. (Red arrows, Dia,WQMDB2)
5. Remove the Display Board by gently sliding off the stand off threaded posts.
6. Remove the new board from its packaging, being careful to only handle by the edges.
7. Install the new board, taking care to line it up correctly and gently sliding it onto the stand off threaded posts.
8. Reinstall the 3 retaining nuts and tighten securely but do not over tighten.
9. Carefully plug the ribbon cable back into the board.
10. Reconnect the Main Power.

Water Quality Monitor Display Cable Replacement

Follow these steps to Remove and Replace the Water Quality Monitor Display Cable

1. Disconnect the Main Power
2. Open Control Box Door
3. If there are any zip ties securing the cable at any point, carefully remove them.

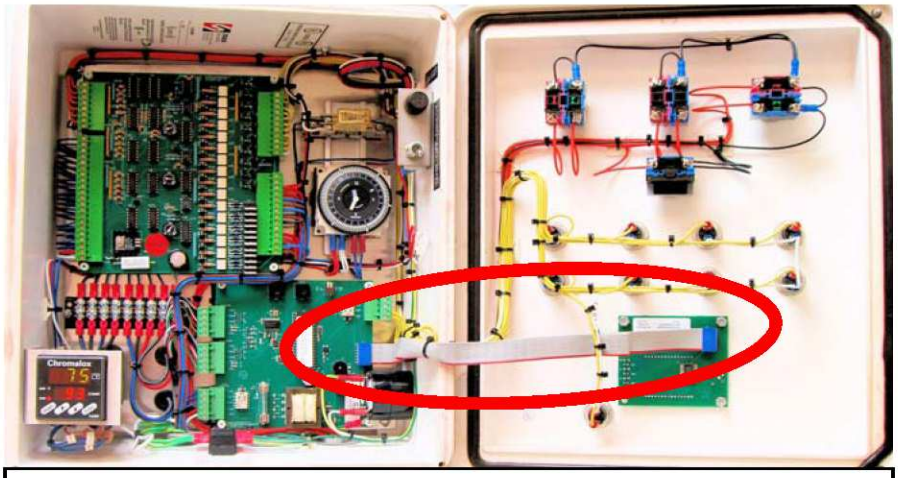


Diagram WQDC1, Showing Display Cable attached to Water Quality Monitor Control Board and Water Quality Monitor Display Board

4. Carefully unplug the Display Ribbon Cable from the Water Quality Monitor Control Board (see dia. WQDC2) and from the Water Quality Monitor Display Board. (see dia.WQDC3)

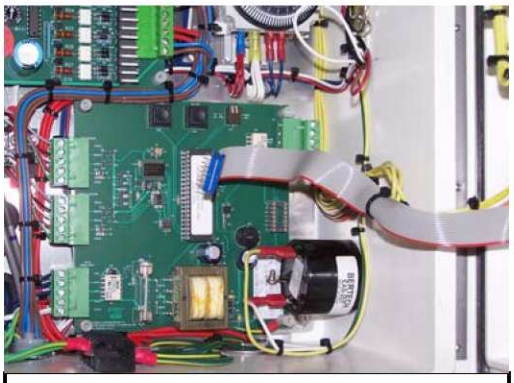


Diagram WQDC2
Display Cable unplugged from Control Board

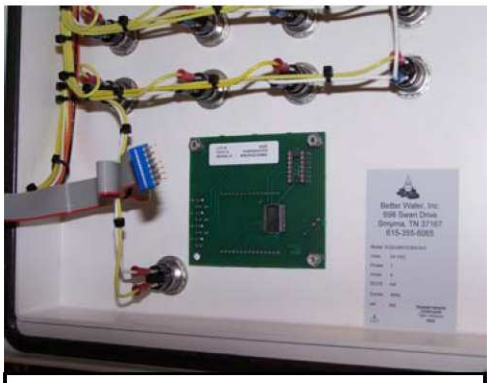


Diagram WQDC3
Display Cable unplugged from Display Board

5. Remove the old ribbon cable and discard.
6. Remove the new Ribbon Cable from its packaging, being extremely careful not to damage or bend the prongs on each end of the cable.
7. Carefully plug the Ribbon Cable back into Control Board and the Display Board.
8. Install new zip ties to secure ribbon cable (if desired).
9. Reconnect the Main Power.

Calibration
of the Water Quality Monitor Board

The calibration of the Water Quality Monitor Control Board requires the use of a Hand Held TDS Meter, calibrated to NACL Solution and not 442 solution. Follow the directions of your Hand Held Meter. {The procedure is the same for setting the display to read in PPM or µS.}

The Water Quality Monitor Control Board is calibrated at the factory. If you replace the Board, or if you need to recalibrate, follow these steps:

A. With the RO running, record the readings as displayed on Water Quality Monitor; record % Rejection, Feed TDS and Product TDS.

B. Take a sample from the Feed Water (somewhere in Pre-Treatment) and determine the TDS with the Hand Held Meter. Record this reading. (This is Feed TDS reading from the Hand Held Meter.)

C. With the RO running, take a Product Water sample from the labcock on the top left side of the RO and determine the TDS with the Hand Held Meter. Record this reading. (This is the Product TDS reading from the Hand Held Meter.)

D. Compare the Feed & Product TDS readings from the RO to the Feed & Product TDS readings of your Hand Held Meter. If the readings are the same, no calibration is needed. If the readings are different, proceed as follows:

SEE NOTE ON PAGE 47 TO VERIFY SETTING OF DIP SWITCHES

Locate the ***"CAL DOWN & CAL UP"*** buttons and the DIP Switches on the Water Quality Monitor Control Board. (See Diagram FR1)

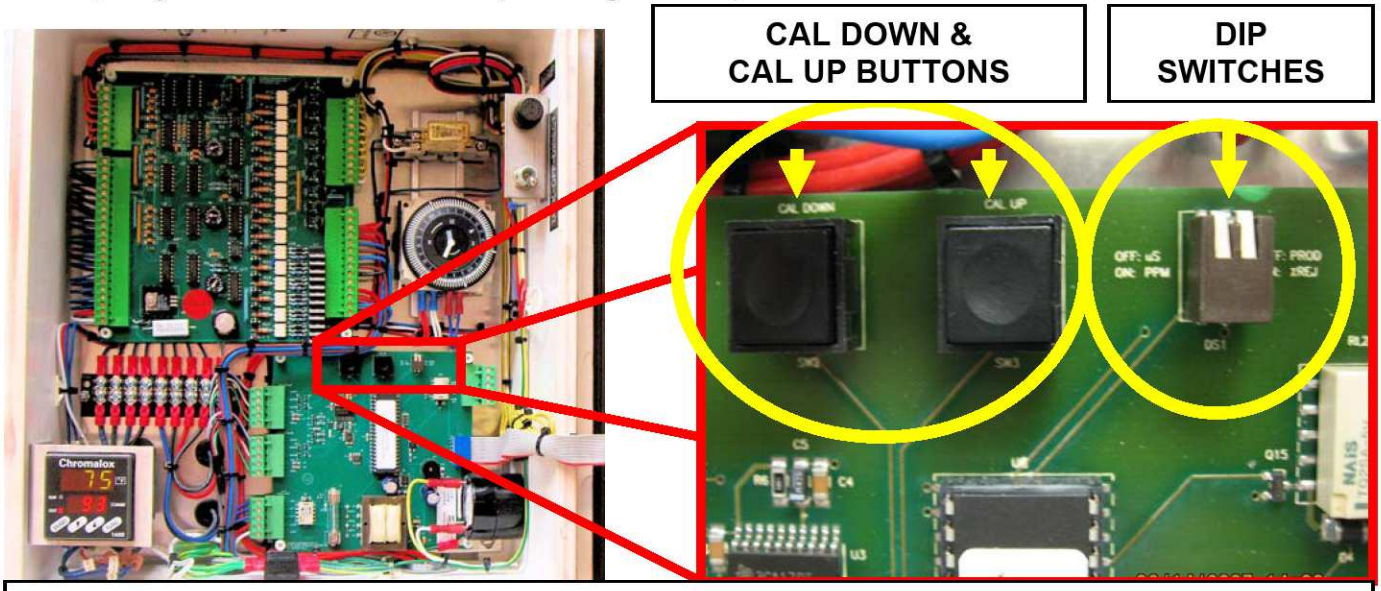


Diagram FR1
Showing location of ***CAL DOWN & CAL UP*** Buttons on Water Quality Monitor Control Board.

Calibration
of the Water Quality Monitor Board

To Calibrate FEED TDS

1. With the RO running, press the MODE Switch on the Water Quality Monitor until FEED TDS is displayed.

2. Press the CAL DOWN or CAL UP buttons until the reading displayed matches the reading from your Hand Held Meter.

3. Once this is set, push the MODE Switch until %Rejection is reading **"CAL"**
{NOTE: The new setting will only be saved if "CAL" is displayed on %Rejection}

4. See NOTE on page 47 to verify setting of DIP Switches

To Calibrate PRODUCT TDS

1. Press the MODE Switch on the Water Quality Monitor until PRODUCT TDS is displayed.

2. Press the CAL DOWN or CAL UP buttons until the reading displayed matches the reading from your Hand Held Meter.

3. Once this is set, push the MODE Switch until %Rejection is reading **"CAL"**
{NOTE: The new setting will only be saved if "CAL" is displayed on %Rejection}

To Verify % REJECTION

The Water Quality Monitor Control Board automatically calculates the % Rejection. The following mathematical equation will enable you to convert FEED TDS & PRODUCT TDS values to a % Rejection, and verify the Control Board is accurately calculating the % Rejection:

FEED TDS – PRODUCT TDS = REJECTED SUM ÷ FEED TDS x 100 = %REJECTION

Example:

FEED TDS = 402 PRODUCT TDS = 10

402 – 10 = 392 ÷ 402 x 100 = 97.5% REJECTION

Water Quality Monitor
Factory Re-set

If you replace the Water Quality Monitor Control Board, a Factory Reset is recommended. This will ensure that all functions are restored to the Factory default settings. Other instances that may require the need for a Factory Reset are: power spikes, blown fuses, nuisance alarms, or power loss in only 1 leg of 3 phase power.
If you notice only "---" on the display of the Water Quality Monitor, you should perform a Factory Reset before assuming that the board needs to be replaced.

Locate the ***"CAL DOWN & CAL UP"*** buttons on the Water Quality Monitor Control Board.

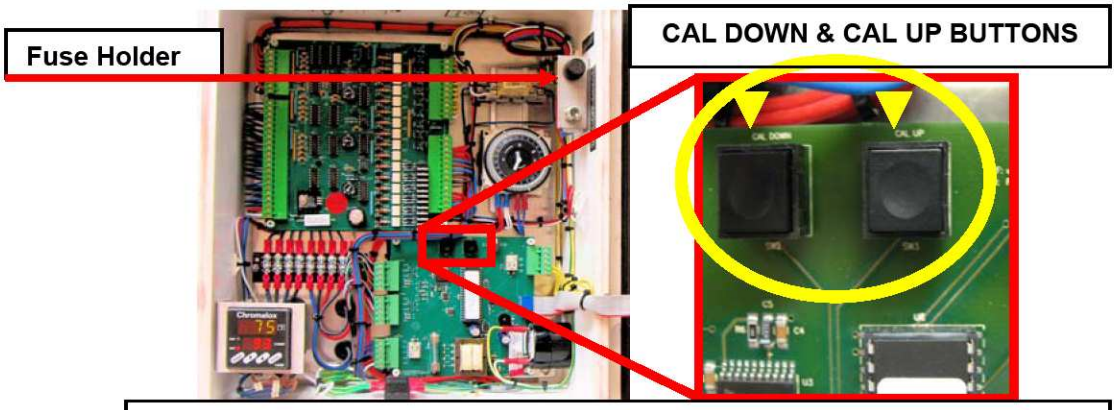


Diagram FR1
Showing CAL DOWN & CAL UP Buttons on Water Quality Monitor Control Board

To perform a Factory Reset, follow these steps:

1. Remove the fuse from the fuse holder (Refer to Diagram FR3, Fuse & Relay Replacement, Section 2) Wait 5-10 seconds and then replace the fuse into the fuse holder.

2. Turn the RO to ***OFF*** at the Operate-Disinfect-Off switch.

3. Open the Control Box door and depress both buttons (CAL UP & CAL DOWN) simultaneously.

4. While still depressing both buttons, turn the RO to ***OPERATE*** and press the Alarm Reset button.

5. Remain holding in the buttons for 5-10 seconds, and then release both buttons.

6. Turn the RO to ***OFF*** at the Operate-Disinfect-Off switch.

7. Turn the RO back to ***OPERATE*** and press the Alarm Reset button.

This will reset the Water Quality Monitor to the Factory Default Settings

Adding Resistors to
Water Quality Monitor Board

The Water Quality Monitor Board is designed to receive an input signal from the Feed Probe and an input signal from the Product Probe and convert these signals to a digital value. These values will be displayed on the Display Board. The Water Quality Monitor Board will also take these 2 input values and calculate the %Rejection.
The Water Quality Monitor Board is "Self Ranging" and will automatically calculate the %Rejection, using the most appropriate range.

Range of Feed TDS	Range of Product TDS
0-200ppm	0-20ppm
200-500ppm	0-50ppm
500-1000ppm	0-100ppm
1000-2000ppm	0-200ppm

The Water Quality Monitor Board is not designed to read very low values from the Feed Probe. In instances where the Feed TDS is very low (≤ 70ppm) the Display Board may give errors in the display. This will appear as all zero's (0000) or all dashes (-----).

If these types of displays are noticed on the Display Board, follow these steps:

1. **Perform a Water Quality Monitor Board Factory Reset.** (Complete procedures for Factory Reset)
    a. After performing a Factory Reset on the Water Quality Monitor Board check the display again and if the display has not changed, proceed:

2. **Verify with a hand held TDS Meter** that the Feed TDS is 70ppm or less,
    a. If the Feed TDS is verified to being above 70ppm, call for assistance.

    b. If the Feed TDS is 70ppm or less, it may be necessary to add a 510 kilo-ohm resistor to the Product Probe wire connections on the Water Quality Monitor Board. These resistors are available through Better Water, Inc., (**PART# ELCPDI01011**) or can be purchased at many electronics parts stores.

To add resistors to the Water Quality Monitor Board; follow these steps:

1. Turn the RO off and unplug the main power cord (or disconnect the main power.)
2. Open the Control Box Door and locate the Water Quality Monitor Board and the Product Probe wire connections.
3. Locate the Black and White wires. (See Dia. WQR1)

Adding Resistors to
Water Quality Monitor Board

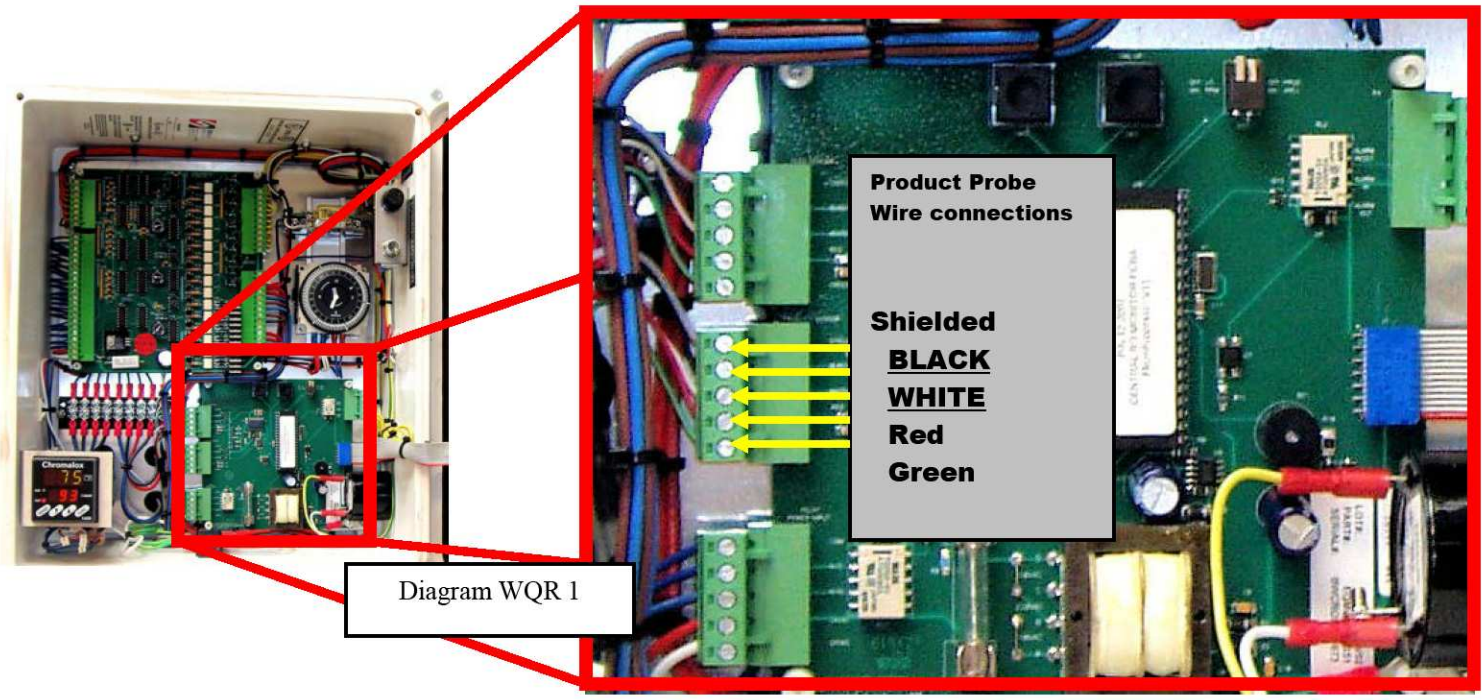


Diagram WQR 1

Diagram WQR 2
Showing approximate way to bend Resistor to fit

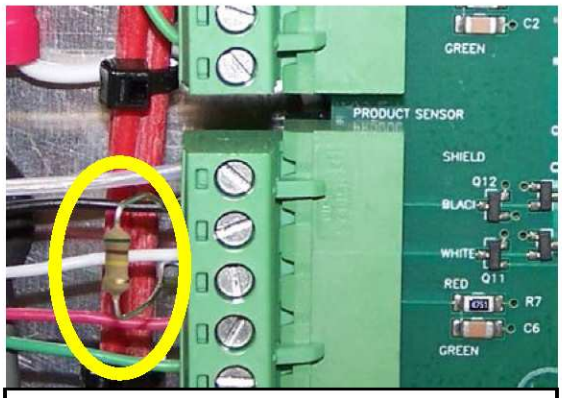


Diagram WQR 3
Showing Resistor installed on WQM Board

4. Carefully bend the wires on both ends of the resistor to the correct shape to allow them to be inserted with the black and white wires of the Product Probe. (Dia. WQR 2)
5. Loosen the screws in the green terminal block holding the black and white wires from the probe.
6. Insert the ends of the resistor under the screw, making sure that the wires from the probe remain under the screw with the resistor wires.
7. Tighten both connections, making sure that all wires are securely fastened under the screws. (See Dia. WQR 3)
8. Plug in the RO (or reconnect main power)
9. Turn on RO and let it start up as normal.
10. Check readings on Display Board.
11. If this has not resolved the erroneous readings, call for assistance.

Chromalox Temperature Controller Replacement

Follow these steps to Remove and Replace the Chromalox Temperature Controller

1. Open Control Box Door and locate the Chromalox Temperature Controller.

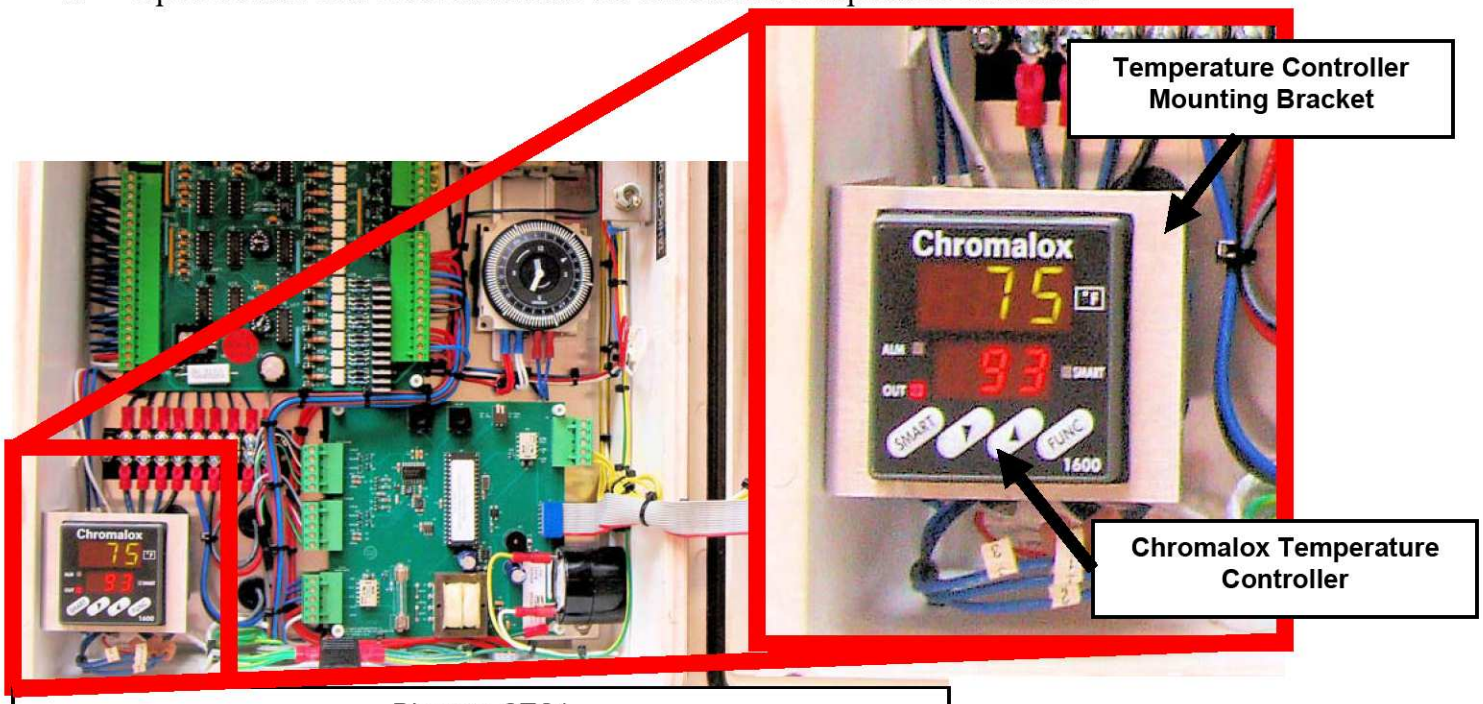


Diagram CTC1
Showing location of Chromalox Temperature Controller

NOTE: It is ***not*** normally necessary to replace the Temperature Controller Housing or Mounting Bracket when replacing the Temperature Controller.

2. Grasp the Temperature Controller by the front edges protruding from the bracket and while holding back on the bracket, pull the Temperature Controller forward until you hear it "unsnap" from the housing. Remove controller from housing.

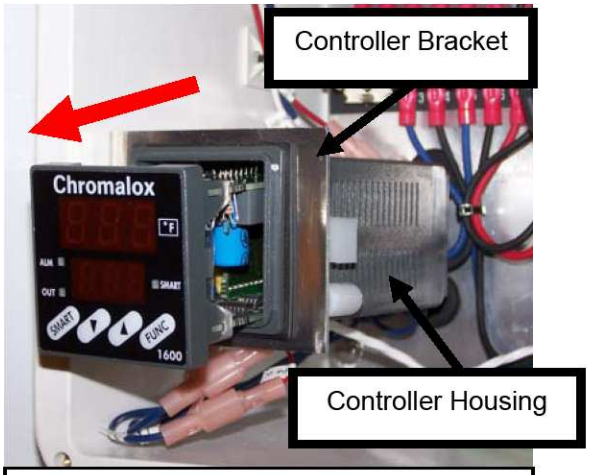


Diagram CTC2
Showing Removal of Chromalox Temperature Controller

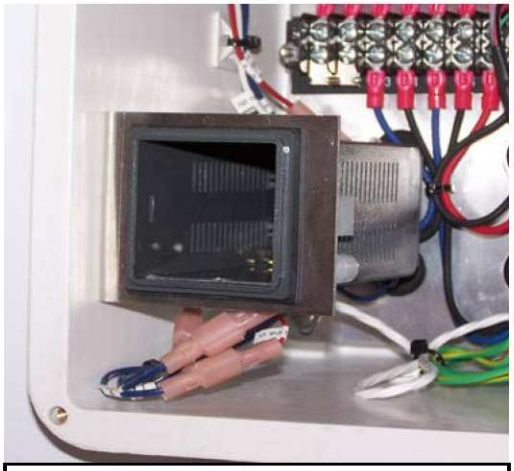


Diagram CTC3
Showing Chromolox Temperature Controller Housing with Controller Removed

Chromalox Temperature Controller Replacement

3. Remove New Temperature Controller from its packaging and from the new Housing.

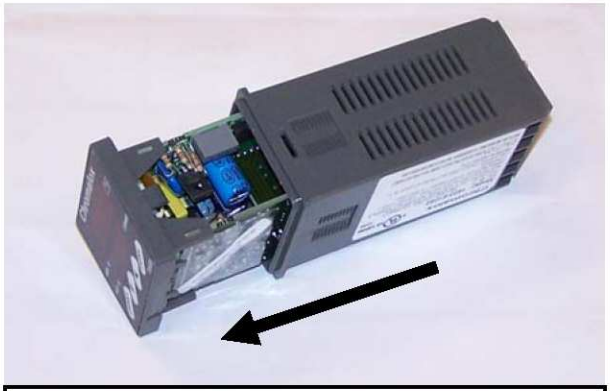


Diagram CTC4
Showing removal of controller from new housing

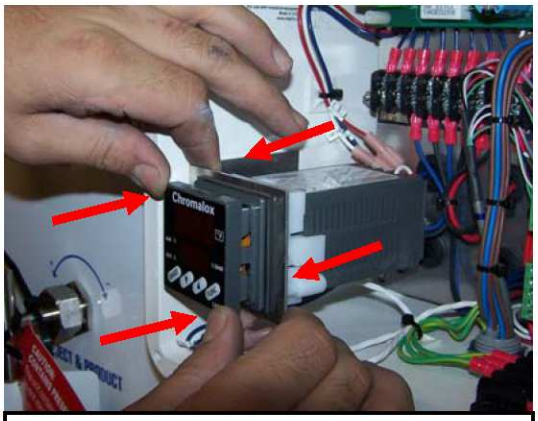


Diagram CTC5
Showing installation of new Temperature Controller

4. On the left side of the Controller locate switch V2 and unclip it. (see Dia. CTC6)

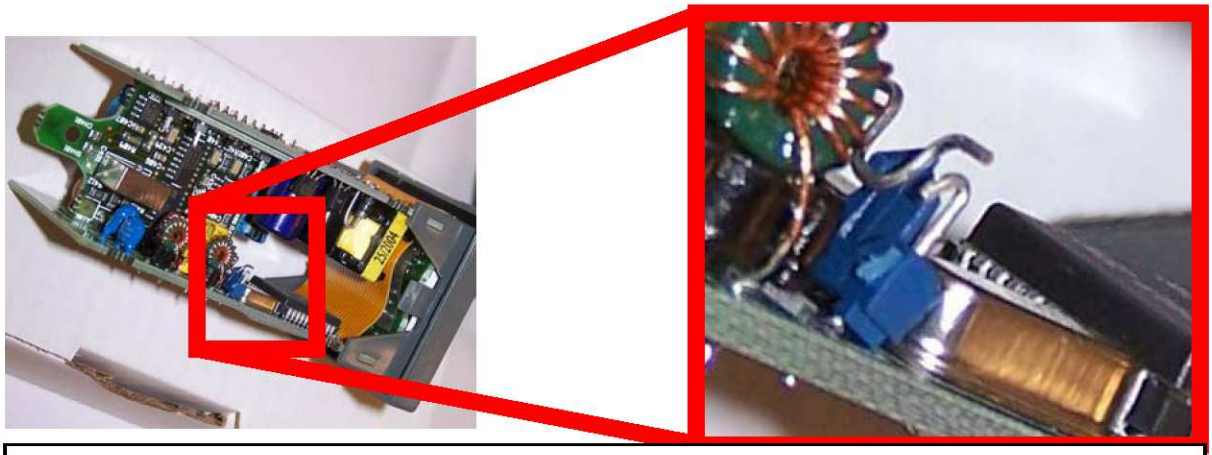


Diagram CTC6
Showing location of Switch V2 and exploded view showing switch unclipped.

5. Carefully slide the new Controller into the housing and bracket in the Control Box. Apply back pressure to the bracket while pushing in on the Controller at the corners. (see Dia. CTC5)

NOTE: **Switch V2 must be unclipped to program Temperature Controller. Switch V2 must be clipped for normal Temperature Controller operation.**

You are now ready to program the new Chromalox Temperature Controller

Programming the Chromalox Temperature Controller

Follow these steps to Program the Chromalox 1603 Temperature Controller

{For steps 1-3, refer to illustrations in the previous section}

1. Remove Controller from case.
2. Un-Latch clip (on switch V2)
3. Slide Controller into housing just enough for controller to power up.

NOTE: Top screen will read "CnF", hit "FUNC" key and it will initiate at P1.
Use up/down arrows to set data. Press "FUNC" key to advance to next parameter (P1, P2, P3, etc…)

4. Proceed as follows:
   P1 = 12
   P2 = 0
   P3 = 700
   ***P4 = r** (P4 will not appear on initial programming until after P5 has been set)
   P5 = 1
   P6 = H.A
   P7 = r
   P8 = OFF
   P9 = 0
   P10 = 0
   P11 = 0
   P12 = INF

5. Repeat above step to set P4 value if this is the initial programming
6. Press "FUNC" key to save changes. Screen will display "**-.-.-.**"
7. Remove Controller from case.
8. Re-latch Clip (on switch V2)
9. Insert Controller back into casing, pushing all the way in until you hear it "snap" into place. (see Diagram CTC5 in previous section)
10. Press "FUNC" key and proceed as follows, pressing "FUNC" key to advance to next parameter (SP, AL, HAS, etc…)
    SP = 93
    AL = 93
    HSA = .1
    Pb = .0
    HS = .5
    rL = 0
    rH = 200

11. Press "FUNC" key to save changes
12. After this step, the controller will go to *OPERATE* mode

NOTE: the "FUNC" key must be pressed to save any changes made to preset values.

Programming the Chromalox Temperature Controller

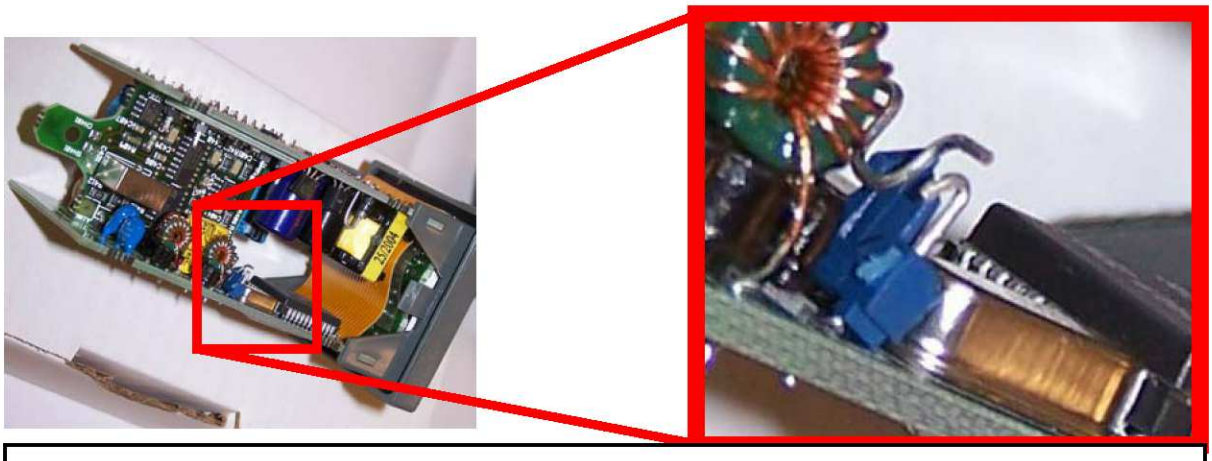


Diagram CTC6
Showing location of Switch V2 and exploded view showing switch unclipped, for programming.

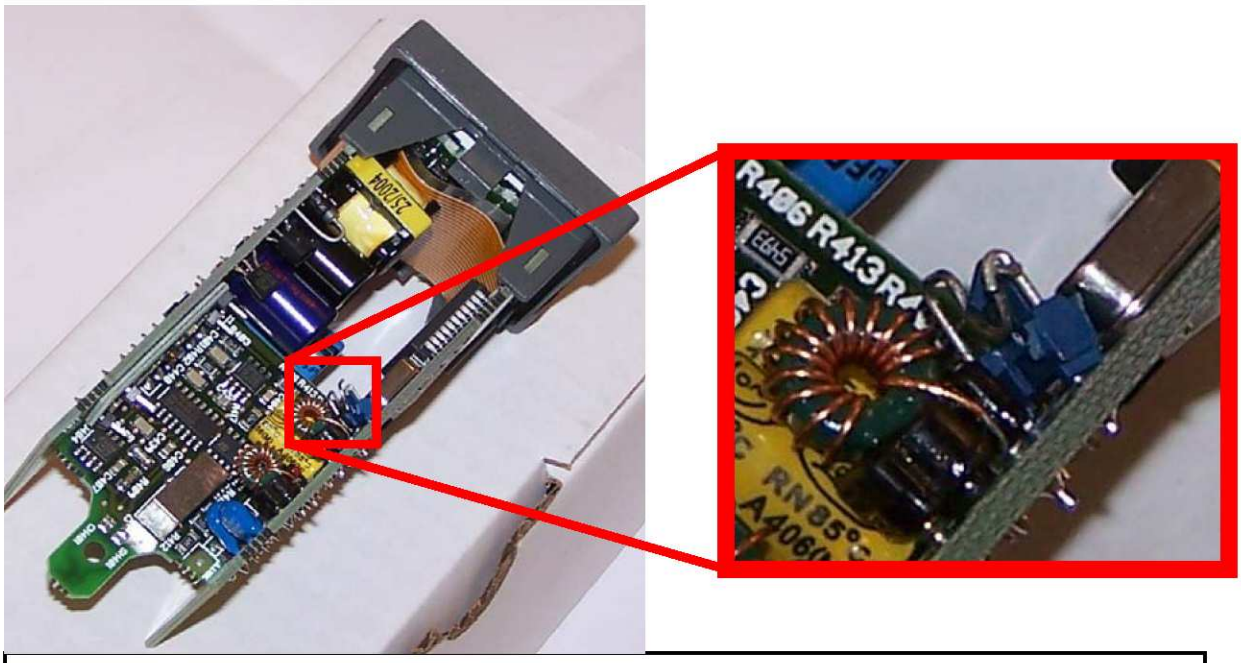


Diagram CTC7
Showing location of Switch V2 and exploded view showing switch clipped, for normal operation.

Analog 24 hr. Flush Timer

(On models produced prior to August 2010)

The Flush Timer regulates the Flush Cycle of the RO and is only activated when the ***OPERATE-FLUSH*** Switch (on the front of the Control Panel) is in the ***FLUSH*** position. When in the ***FLUSH*** mode, the RO will be running, sending high volumes of water across the outside of the membranes, flushing it to drain.

The Flush Timer is a 24 hour time clock divided into 15 minute increments. Each white toggle on the outer edge is a 15 minute cycle.
The Flush Timer operates on 24vac and receives its power from the RO. In the event of a power loss to the RO, the Flush Timer retains all of its settings except the correct time of day. For this reason, it is important to check this timer daily to assure that it is set to the correct time of day.
In normal situations (RO being used 6 days a week or more) a single 15 minute daily flush cycle is sufficient. An RO being used less than 6 days a week should be set up to flush every 3-5 hours.

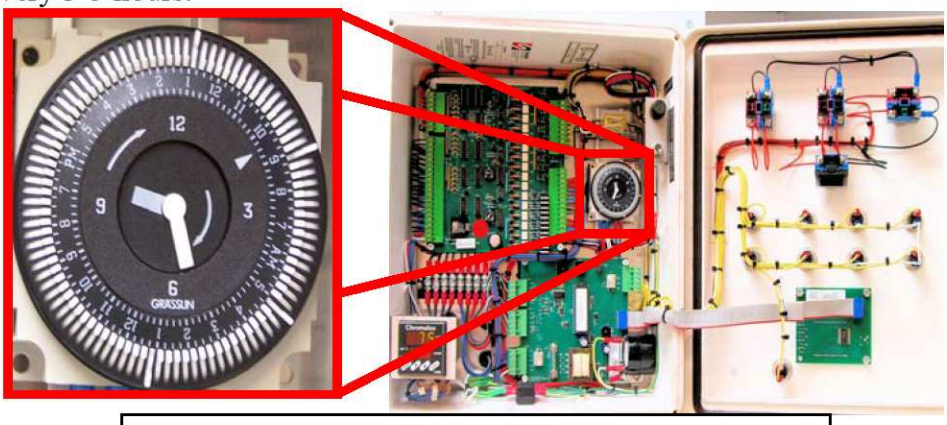
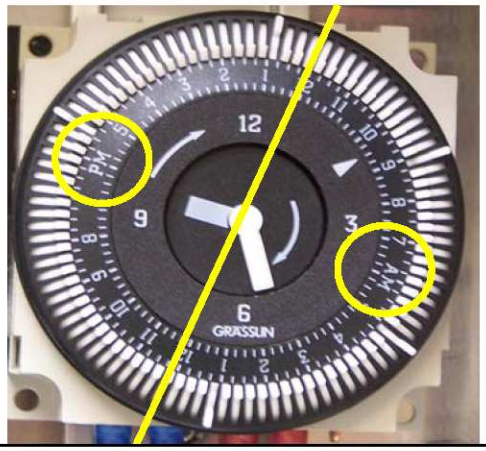


Diagram FT1
Showing orientation of Flush Timer in the Control Box.

To Identify the AM or PM side of the Flush Timer, look for the 2, 12's and then find the AM & PM on each side. This designates the AM or PM side of the clock wheel.

PM side of 24 hour clock wheel



AM side of 24 hour clock wheel

Diagram FT2
Showing AM & PM Side of Flush Timer

Analog Flush Timer

Time Setting

(on models produced prior to August 2010)

It is important that the Flush Timer be kept at the proper time of day. Otherwise, the flush cycles will not occur at the correct time and could possibly initiate during the Backwash or Regeneration Cycles of other parts of the Pre-Treatment, possibly causing Low Pressure Alarms, or other irregularities of the water treatment system.

To set the Flush Timer to the correct time of day, follow these steps:

1. Note the correct time of day from a reliable source.
2. Grasp the outer wheel of the Flush Timer by the outer edges and turn clockwise until the hands of the clock (in the center) are positioned to the correct time.

NOTE: The white arrow will also point to the correct time, indicating AM or PM.

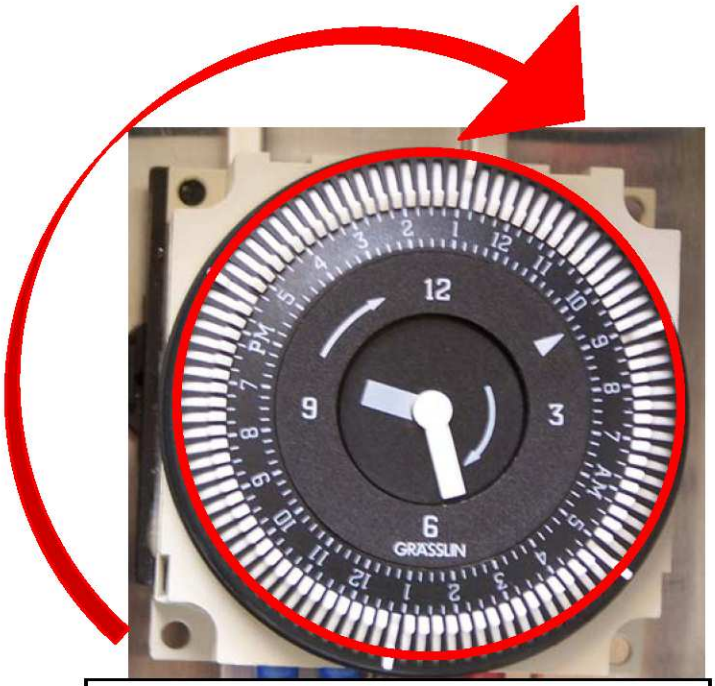


Diagram FT3
Showing only Clockwise movement of Flush Timer Wheel

Clock Hands will indicate the correct time

White Arrow will indicate AM or PM side of clock

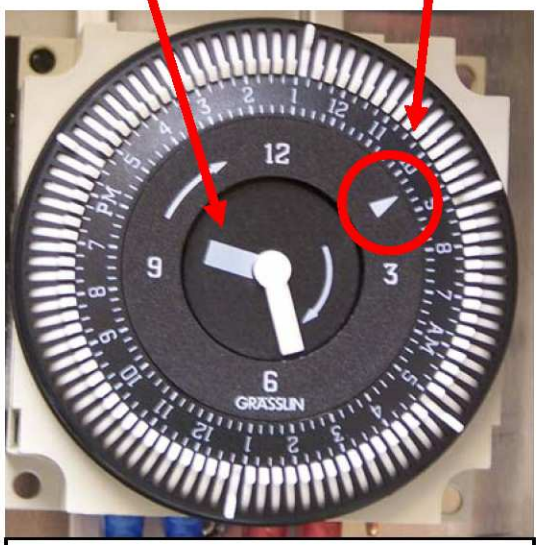


Diagram FT4
Showing Clock Hands and white arrow

Analog Flush Timer
Frequency Setting
(on models produced prior to August 2010)

Each white toggle on the outer edge of the Flush Timer clock wheel is a 15 minute cycle. When the toggles are pushed toward the inside, they are inactive. To activate a toggle, move that specific toggle toward the outside. As the timer advances (clockwise), the activated toggle will reach the white arrow and the Flush Timer will activate the Flush Cycle at that specific time.

NOTE: It is important to keep the timer set at the correct time of day so when the timer activates at a specific time, it is assured that this is the actual time of day (or night).

An RO operating 6 or more days a week only needs to flush one 15 minute cycle per night. (An RO operating less than 6 days a week should be set up to flush every 3-5 hours. These times are set by moving the specific toggle(s) to the outside of the wheel. These times should not interfere with the Backwash or Regeneration cycles of any other piece of Pre-Treatment equipment, and the Flush Cycle should end before the clinic opens and the system is started for the new day.

Example:

Last use of RO water:	**10:00pm**
#1 Carbon backwashes:	**11:00pm – 11:45pm**
#1 Softener regenerates:	**12:30am – 2:00am**
RO Flushes	**3:30am – 3:45am**
Clinic opens at	**5:00am**

5 toggles moved to the outside of the wheel

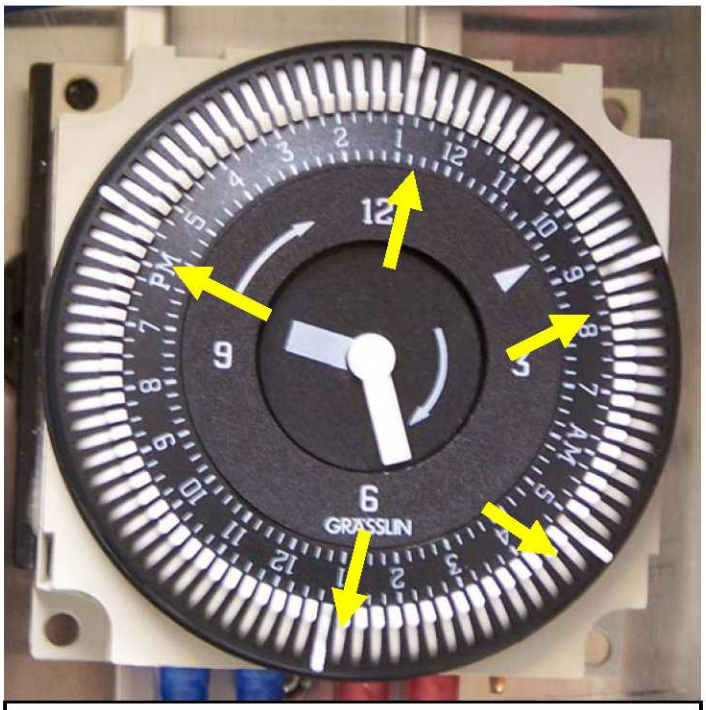


Diagram FT5
Showing Toggles set to Flush at 5 times

This Flush timer set to Flush at:

12:45am-1:00am
4:45am-5:00am
8:45am-9:00am
12:45pm-1:00pm
5:15pm-5:30pm

Time set at 9:25am

Digital 24 hr. Flush Timer

(on models produced August 2010 and later)

The Flush Timer regulates the Flush Cycle of the RO and is only activated when the ***OPERATE-FLUSH*** Switch (on the front of the Control Panel) is in the ***FLUSH*** position. When in the ***FLUSH*** mode, the RO will be running, sending high volumes of water across the outside of the membranes, flushing it to drain.

In August 2010, the analog Flush Timer was replaced with a Digital Flush Timer. The function of the flush timer remains the same; however the following applies to the Digital model: It is recommended that operators verify the time and day at least weekly. The digital flush timer is equipped with a **Lithium CR2032** battery. If the battery fails, it should be replaced.

BATTERY REPLACEMENT

To replace the battery perform the following procedure:

1. Remove the 4 amp fuse (in black fuse holder) inside the Control Box. {This will disconnect all 24 volt power from the Control Box.
2. Remove the Timer from the Control Box Back Plate by removing the white plastic retainers threaded onto the threaded studs in the corners of the timer.
3. It is not necessary or recommended that the wires be disconnected from the timer.
4. Gently pull the timer straight out, without putting undue stain on the wires. Gently turn the timer so the back is facing out.
5. The battery is located on the back of the timer.
6. With a coin or screwdriver, open the battery compartment and remove the old battery.
7. Replace the battery **(Lithium CR2032),** taking care to insert the new battery properly.
8. Replace the battery cover.
9. gently put the timer back on the 4 retaining threaded studs and replace the white plastic threaded retainers.
10. Replace the 4 amp fuse.

To set the digital timer to the correct day and time, perform the following procedure:

1. Push and HOLD the **CLOCK** button,
2. Select the Day desired
3. Select the Hour desired
4. Select the minute desired
5. When set to correct day, hour, and minute, Release the **CLOCK** Button.
6. NOTE: This Timer ***Does Not Have*** A Daylight Savings Time feature. If you are in an area that recognizes the time change twice a year, you will need to reset the timer at each time change.

Digital 24 hr. Flush Timer

(on models produced August 2010 and later)

FLUSH MODE

To Set the Time for FLUSH MODE, perform the following procedure:

1. 1st, Select the day or days for the RO to Flush
2. Push the **TIMER** button. The display should read **1 ON --:--** (Set Flush Start Time)
3. Options are single and multiple days
    a) 7 days, Mo thru Su, ***(recommended setting)***
    b) Single Day, (any day of the week)
    c) 5 days, Mo thru Su
    d) 2 day week-end, Sa & Su
    e) 6 days, Mo thru Sa
    f) 3 days, Mo thru We
    g) 3 days, Th thru Sa
    h) Every other day, Mo, We, Fr

It is recommended that the timer be set to 7 days, Mo thru Su.

Next Select hour and minute for the time the RO is to Flush.

1. Push the **TIMER** button. The display should read **1 OFF --:--** (Set Time to Shut Off)
2. Set this the same as above.
3. THE recommended ***MINIMUM*** Flush Time should be set for no less than 15 minutes.
4. EXAMPLE:
    1 ON 8:00am Mo Tu We Th FR SA SU
    1 OFF 8:15am Mo Tu We Th FR SA SU

In this example, the RO is set to OPERATE OPERATE FLUSH mode. At 8:00am Monday thru Sunday, the RO will go into Flush Mode. At 8:15am Monday thru Sunday, the RO will shut off the Flush Mode.

It is recommended that the RO should go into Flush Mode 4 times per day. (This covers 3 day/week operations and 6 day/week operations when the RO is not in regular use.)
Up to 8 time intervals can be set, but 4 is recommended.

It is also recommended that the RO not be set to flush during regularly scheduled Backwash or regeneration of Filters and Softeners. {if the timer is set during these times, the Interlock System will prevent the RO from running, (or will shut down the RO). If the RO does not get a proper and regular FLUSH, fouling of the RO membranes or Low Pressure Alarms can occur}

MANUAL FLUSH

This timer has a Manual Flush Feature. To activate the manual Flush Feature:

1. The RO must be in **FLUSH MODE** (switch on front of control box)
2. Push the **MANUAL** button (with the RO set to FLUSH, on the outside/front of the Control Panel)
3. The RO will start in Flush Mode. (This will be indicated on the timer display and RED indicator light on the timer)

(Con't on nextpage)

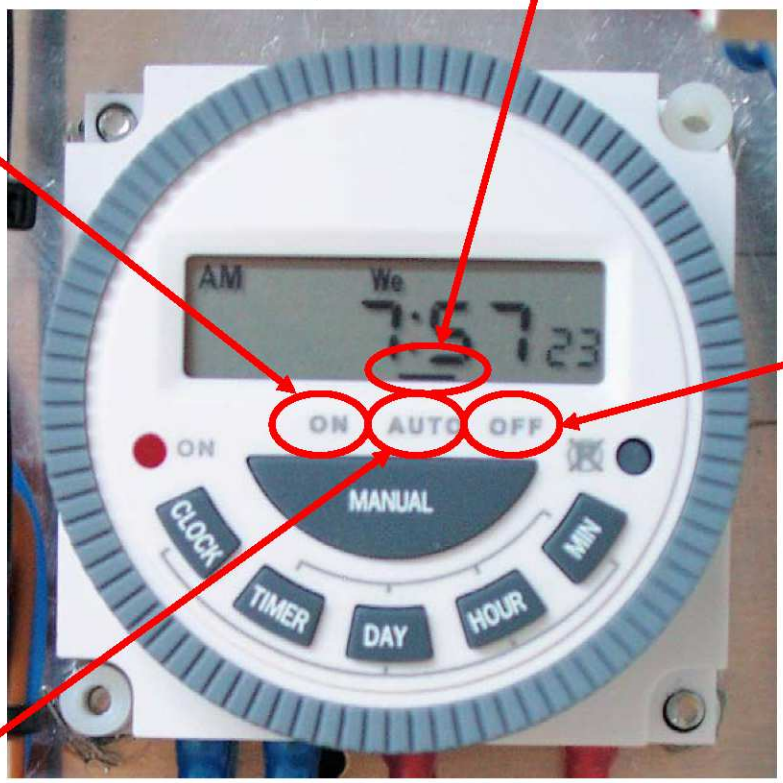
Digital 24 hr. Flush Timer

(on models produced August 2010 and later)

4. The timer below the display will be: **ON-AUTO-OFF** with a bar in the LCD display indicating which mode is activated. When in Manual Mode, the bar in the LCD will be above ON.
5. To terminate the Manual Flush Mode, push the **MANUAL** button twice and the bar in the LCD display will move to above the **OFF.**
6. Push the **MANUAL** button once more to set the bar in the LCD display above **AUTO**.
7. (NOTE: if the bar in the LCD display is not above **AUTO**, the RO ***will not*** flush automatically in **FLUSH MODE**.

Mode Indicator Bar
(This bar will move over the **ON**, **AUTO**, or **OFF** to indicate which mode is active)

ON
Manual Flush
Mode Indicator Bar will be above **ON** when in Manual Flush



OFF
Timer is OFF
Mode Indicator Bar will be above **OFF** when Timer is Off

AUTO
Auto Flush
Mode Indicator Bar will be above **AUTO** when in Auto Flush

In the picture above, the Timer is set in **AUTO** position

SECTION 5

JUNCTION BOX ….. 67

JUNCTION BOX, FUNCTIONS & OPERATIONS …..68

JUNCTION BOX, COMPONENT IDENTIFICATION …..69

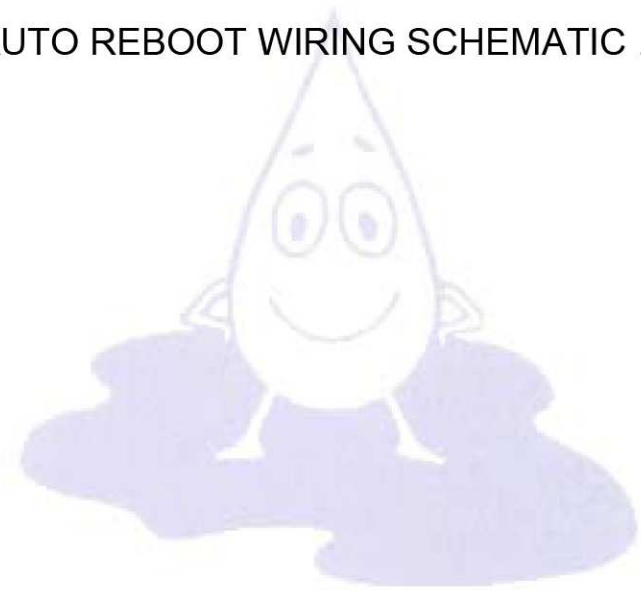
CONTACTOR / MOTOR SAVER VARIATIONS …..71

AUTO REBOOT TIMER …..72

TRANSFORMER FUSE REPLACEMENT …..73

JUNCTION BOX WIRING SCHEMATIC …..74

AUTO REBOOT WIRING SCHEMATIC …..75



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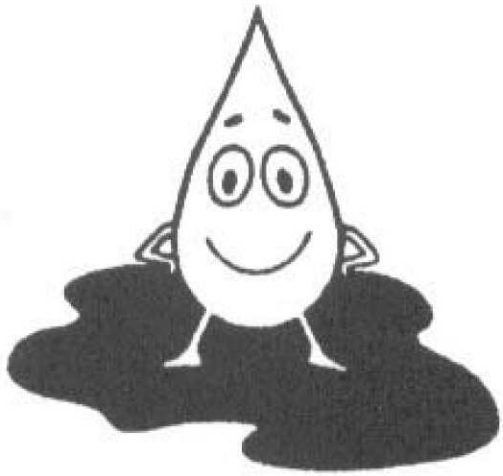

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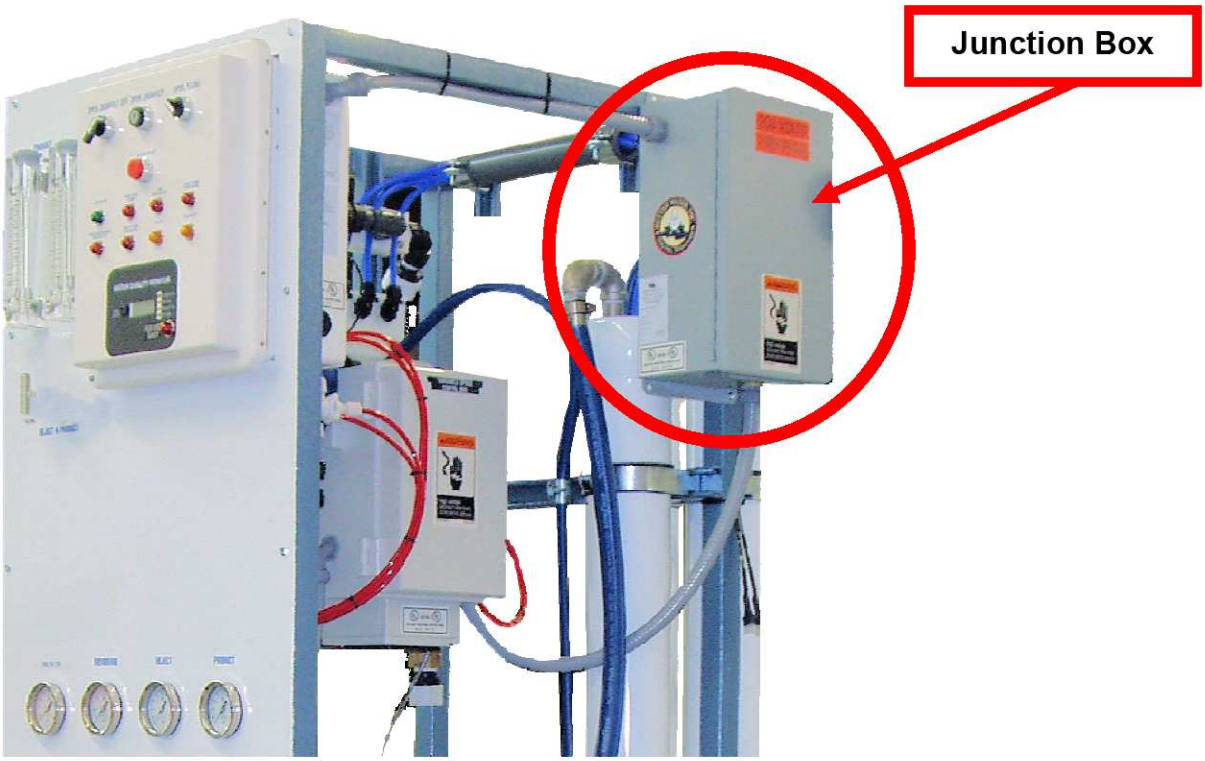
Junction Box



The Junction Box of the Reverse Osmosis Machine is located on the right side of the unit in the upper rear corner of the frame.

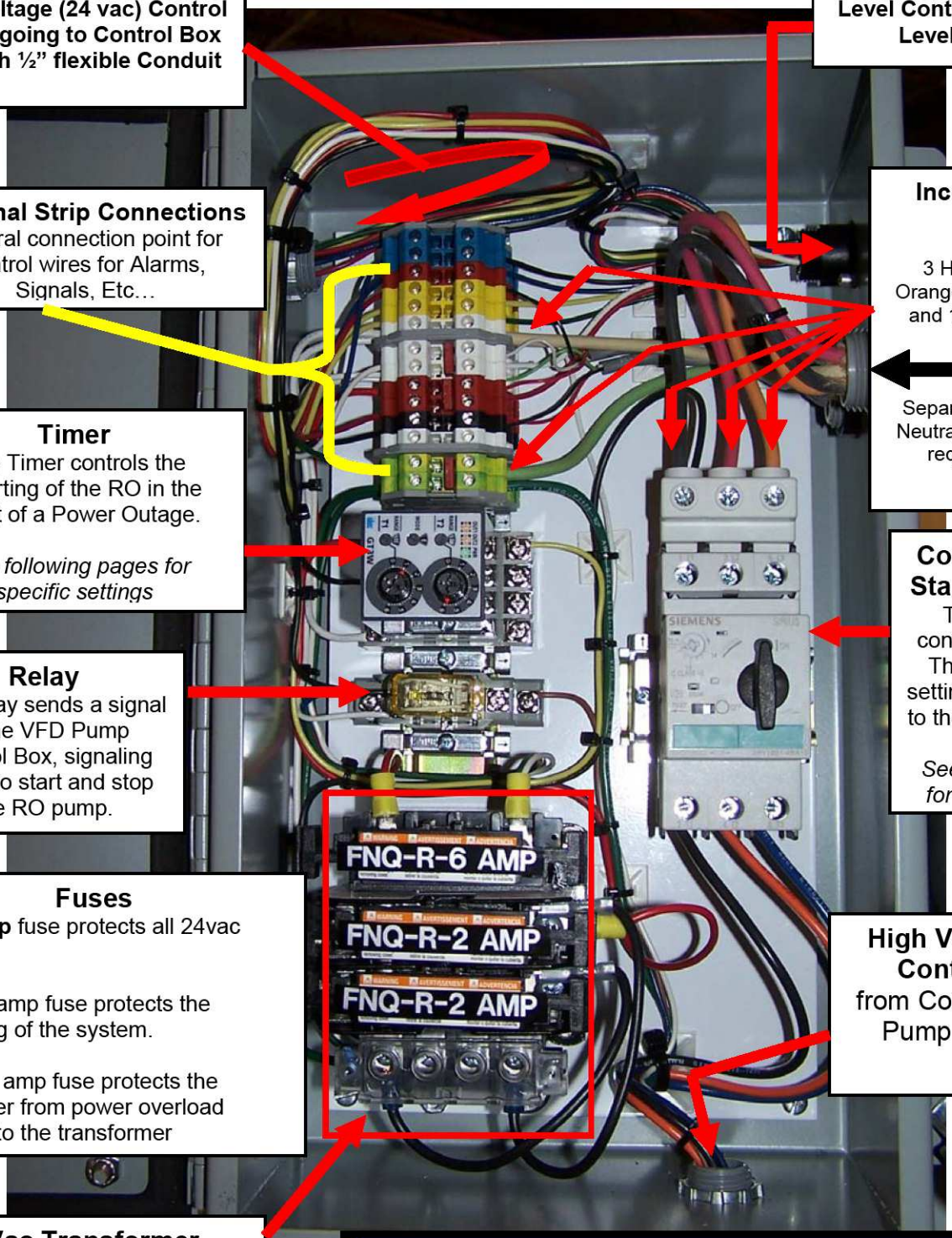
CAUTION

The Junction Box Contains High Voltage Incoming Power.
Unplug Main Power Cord or Disconnect Main Power
Before attempting any work in this box !

The Junction Box contains the Main Contactor/Motor Starter Controller, a timer that controls the Automatic Re-Start Feature, Fuses, Relays, and the 24Volt Transformer that supplies power to the Control Box.

This box contains a locking, hinged lid and should be kept closed at all times. To open the box, loosen the two screws/clips on the right side of the box. (Only loosen enough to swing the clips out of the way.) The screws do not have to be completely removed.

Junction Box
Functions and Operations



Low Voltage (24 vac) Control wiring going to Control Box through ½" flexible Conduit

Level Control Wiring going to Level Control Box

Terminal Strip Connections
Central connection point for control wires for Alarms, Signals, Etc…

Incoming Power Wires
(3 phase)
3 Hots,(Black, Pink, Orange) 1 Neutral,(White) and 1 Ground, (Green)

Separate and Dedicated Neutral and Ground wires required for proper operation.

Timer
The Timer controls the restarting of the RO in the event of a Power Outage.

See following pages for specific settings

Contactor/Motor Starter Controller
This is the main contactor for the RO. The AMP overload setting is set according to the size of the pump

See following pages for specific settings

Relay
This relay sends a signal to the VFD Pump Control Box, signaling when to start and stop the RO pump.

Fuses
Top 6 amp fuse protects all 24vac Controls.

Middle 2 amp fuse protects the Neutral leg of the system.

Bottom 2 amp fuse protects the transformer from power overload coming into the transformer

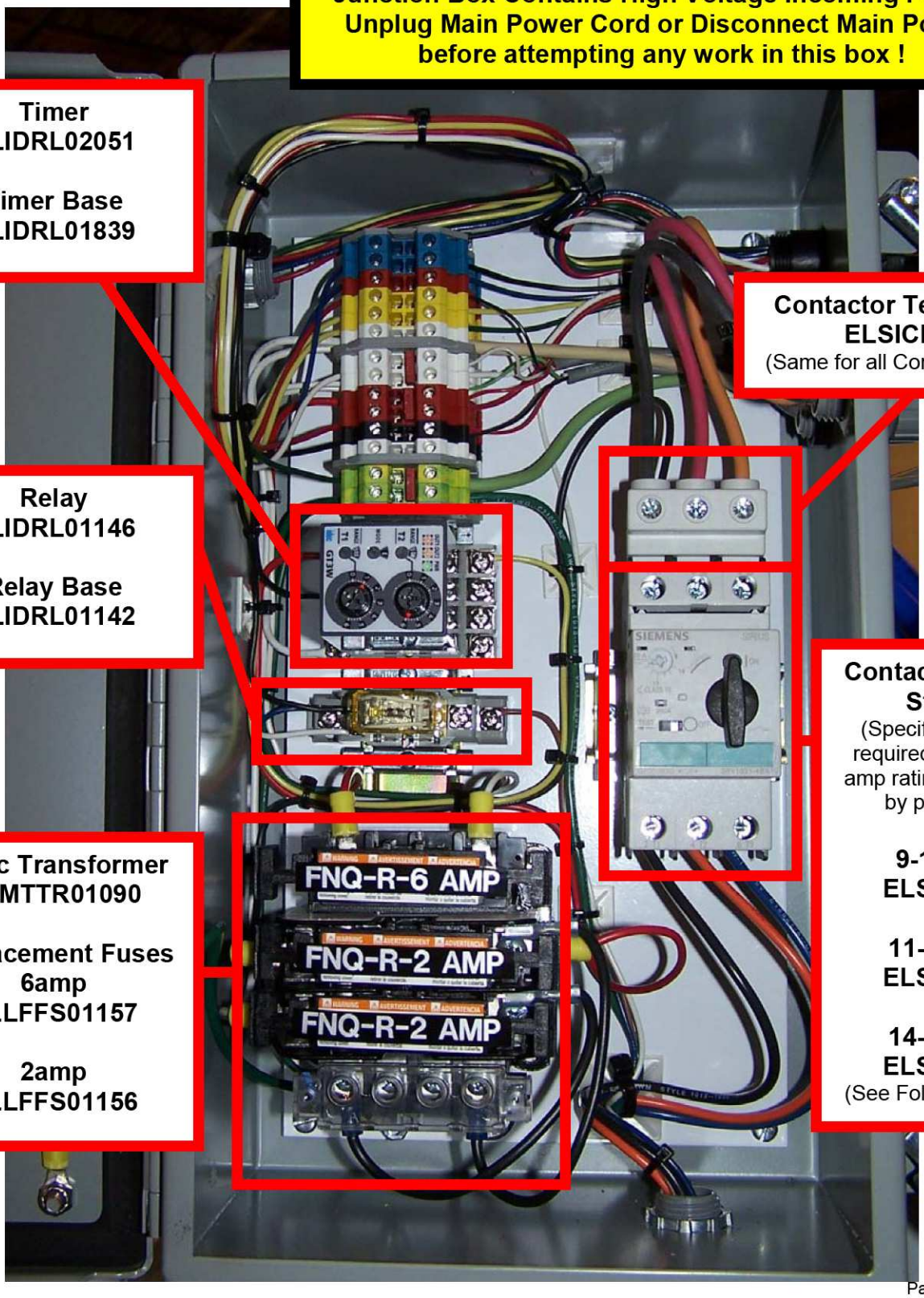
High Voltage Pump Control Wiring
from Contactor to VFD Pump Control Box

24 Vac Transformer
The Transformer converts high voltage power to 24vac to operate the Control box and, Level Control System, and Interlock System

CAUTION
Junction Box Contains High Voltage Incoming Power. Unplug Main Power Cord or Disconnect Main Power before attempting any work in this box !

Junction Box
Part Numbers

CAUTION
Junction Box Contains High Voltage Incoming Power. Unplug Main Power Cord or Disconnect Main Power before attempting any work in this box !



Timer
ELIDRL02051

Timer Base
ELIDRL01839

Relay
ELIDRL01146

Relay Base
ELIDRL01142

24vac Transformer
ELMTTR01090

Replacement Fuses
6amp
ELLFFS01157

2amp
ELLFFS01156

Contactor Terminal Kit
ELSICN022
(Same for all Contactors listed)

Contactor / Motor Starter:
(Specific Contactor required depends on amp rating determined by pump size)

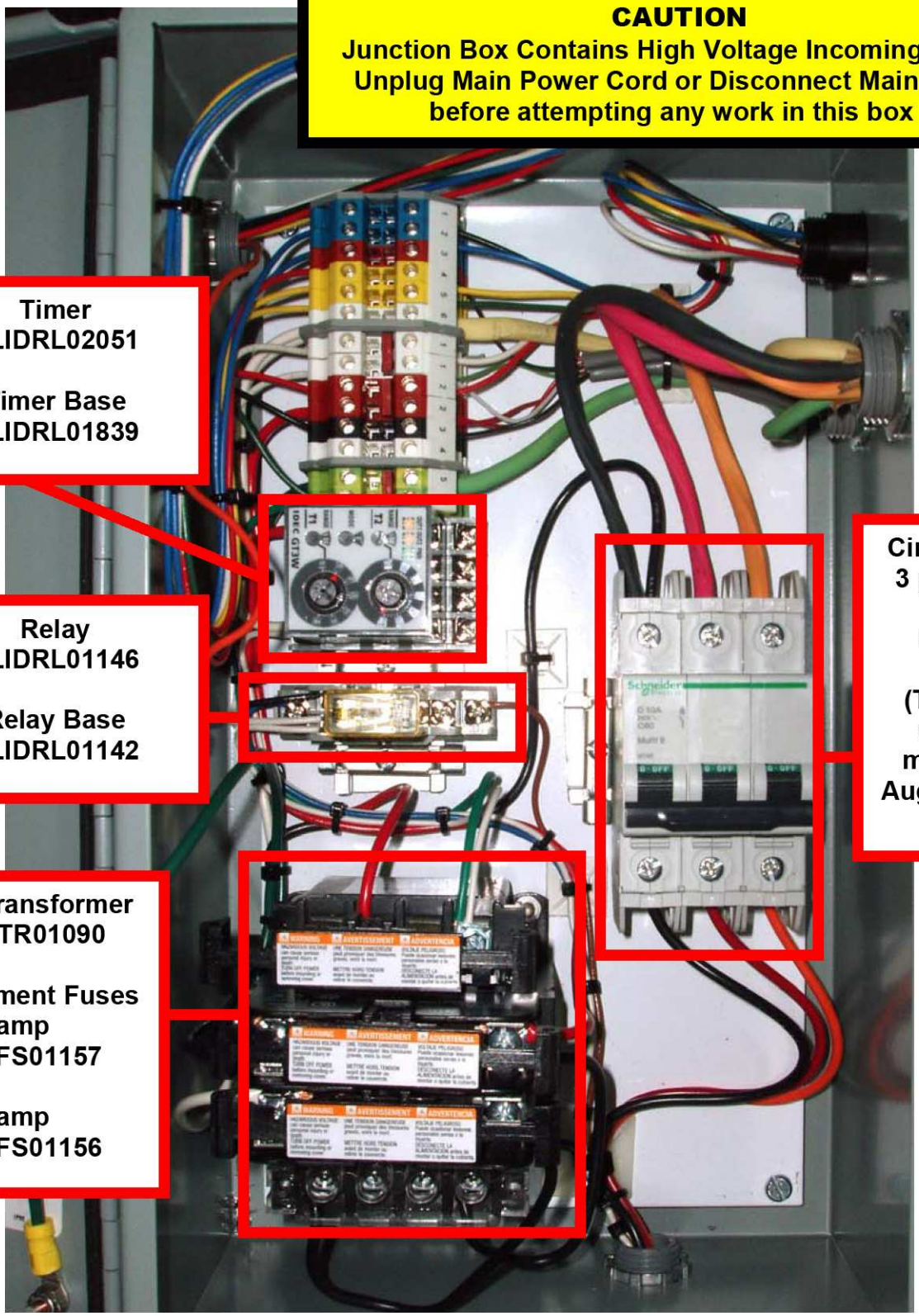
9-12 amp
ELSICN016

11-16 amp
ELSICN012

14-20 amp
ELSICN011
(See Following pages)

Part Numbers
(Models manufactured August 2010 and later)

CAUTION
Junction Box Contains High Voltage Incoming Power. Unplug Main Power Cord or Disconnect Main Power before attempting any work in this box !



Timer
ELIDRL02051

Timer Base
ELIDRL01839

Relay
ELIDRL01146

Relay Base
ELIDRL01142

24vac Transformer
ELMTTR01090

Replacement Fuses
6amp
ELLFFS01157

2amp
ELLFFS01156

Circuit Breaker:
3 pole, 10 amp

ELSIRL001

(This breaker used on all models made August 2010 and later)

Possible Variations

The specific Contactor/Motor Starter that is installed in your RO Junction Box will be determined at the factory by the size of the RO Pump and Motor, the amp draw during starting and operation, and several other factors. If you have determined that the Contactor/Motor Saver needs to be replaced, pay close attention to the markings on the original and order the appropriate replacement accordingly.
The 3 main Contactor/Motor Savers that are used by Better Water Inc. are as follows:

ELSICN011
14-20 AMP

ELSICN012
11-16 AMP

ELSICN016
9-12 AMP

To determine the final setting of the Thermal Overload of the Contactor/Motor Saver, Take an AMP reading from each of the 3 legs of incoming power and find the average. Multiply the average of the 3 legs by 125% and the total will be the final setting.

EXAMPLE: Leg 1 = 8.3 amps, Leg 2= 8.1 amps, Leg 3=8.3 amps

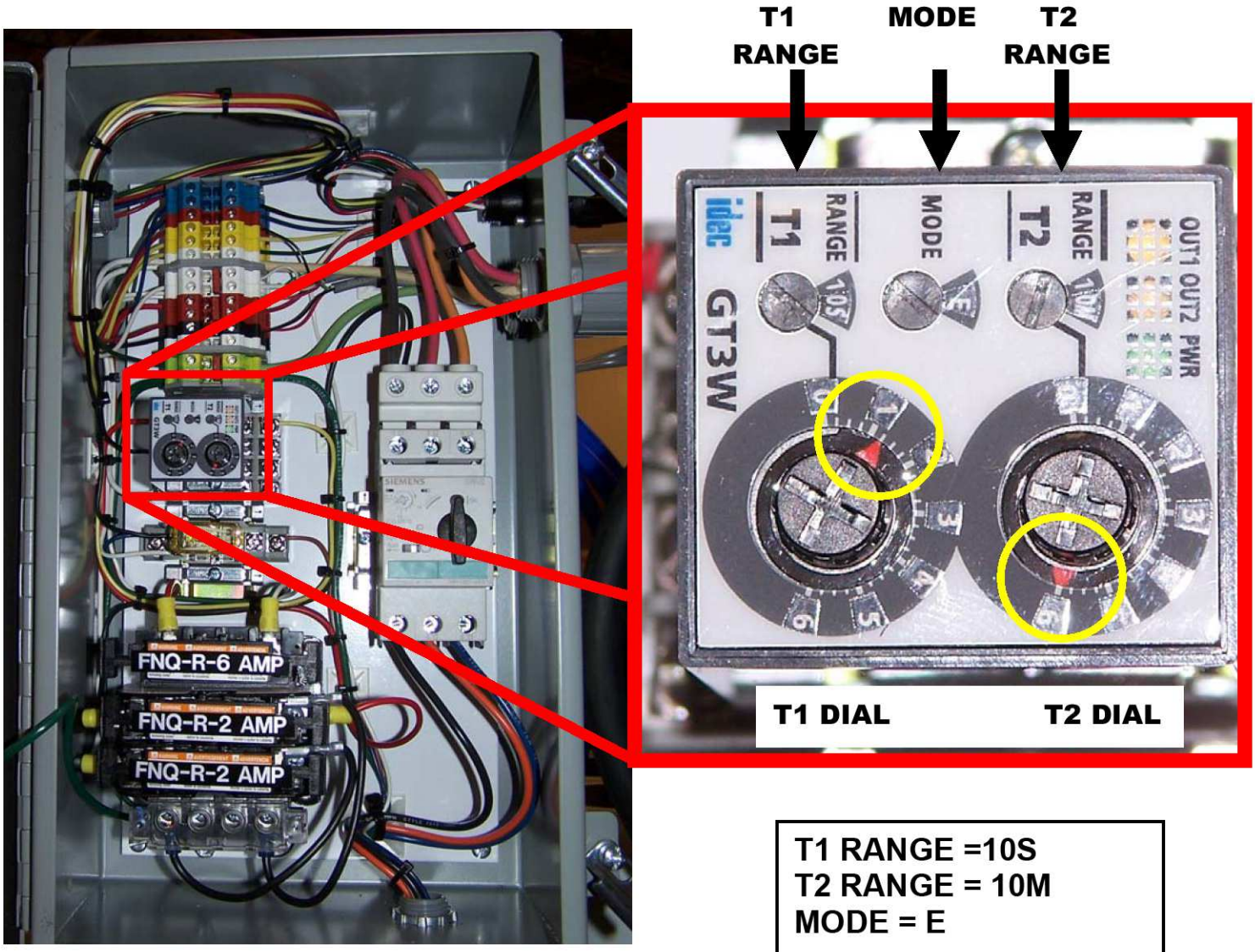
8.3 + 8.1 + 8.3 = 24.7 24.7 ÷ 3 = 8.23 (average) 8.23 x 1.25 = 10.28 (setting)

The Thermal Overload of the Contactor/Motor Saver would be set at 10.28

All ROs manufactured August 2010 or later are equipped with a 3 pole Circuit Breaker in place of the above Contactor/Motor Saver (shown at left)

Auto Reboot Timer Settings

In Junction Box



The Auto Reboot Timer Controls the restarting of the RO in the event of loss of power. When the power returns, the timer automatically sends the appropriate signals to the Pump Control Box and to the Main Control Board to restart the RO.

The Timer is preset at the factory and should not be adjusted. The settings are listed to the right.

T1 RANGE =10S
T2 RANGE = 10M
MODE = E

T1 DIAL = 1
T2 DIAL = 6

CAUTION
Junction Box contains High Voltage Incoming Power. Unplug Main Power Cord or Disconnect Main Power before attempting any work in this box !

Transformer Fuse Replacement

To replace any one of the fuses in the Transformer, follow these steps:

1. Open the Junction Box Door.

CAUTION
THE JUNCTION BOX CONTAINS HIGH VOLTAGE INCOMING POWER. UNPLUG THE MAIN POWER CORD OR DISCONNECT MAIN POWER BEFORE ATTEMPTING ANY WORK IN THIS BOX.

2. Grasp the appropriate fuse holder by the left and right side and pull straight out. (See dia. TFR1 & TFR2

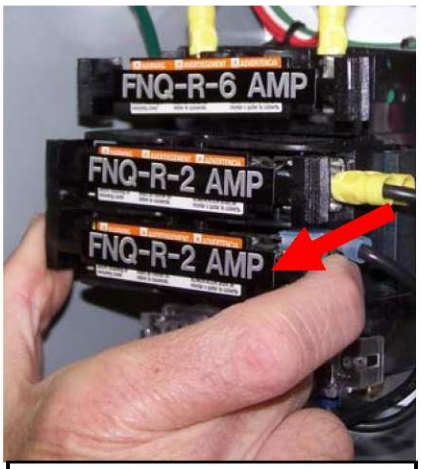


Diagram TFR1

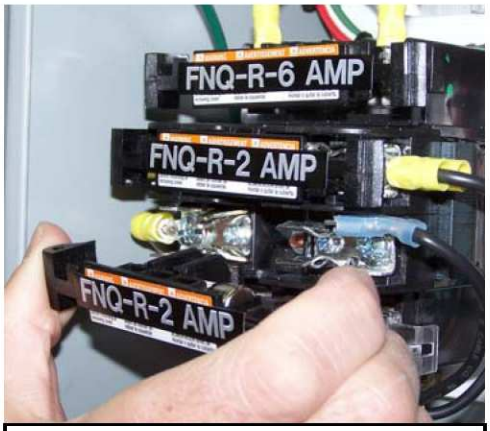


Diagram TFR2

3. Remove the fuse from the clamp in the fuse holder and replace with new fuse. (See dia. TFR3)

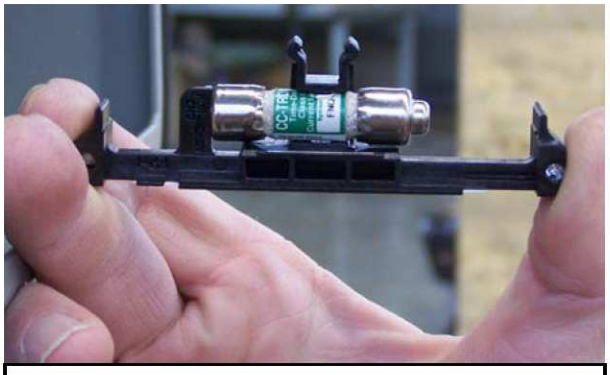


Diagram TFR3

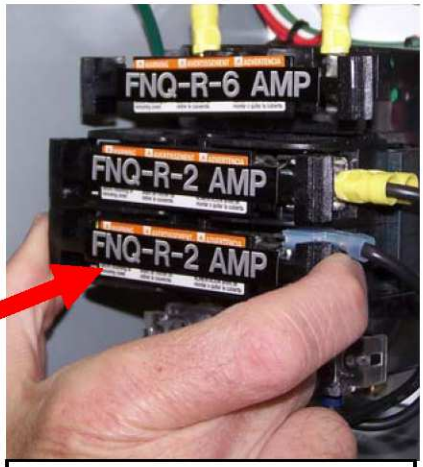
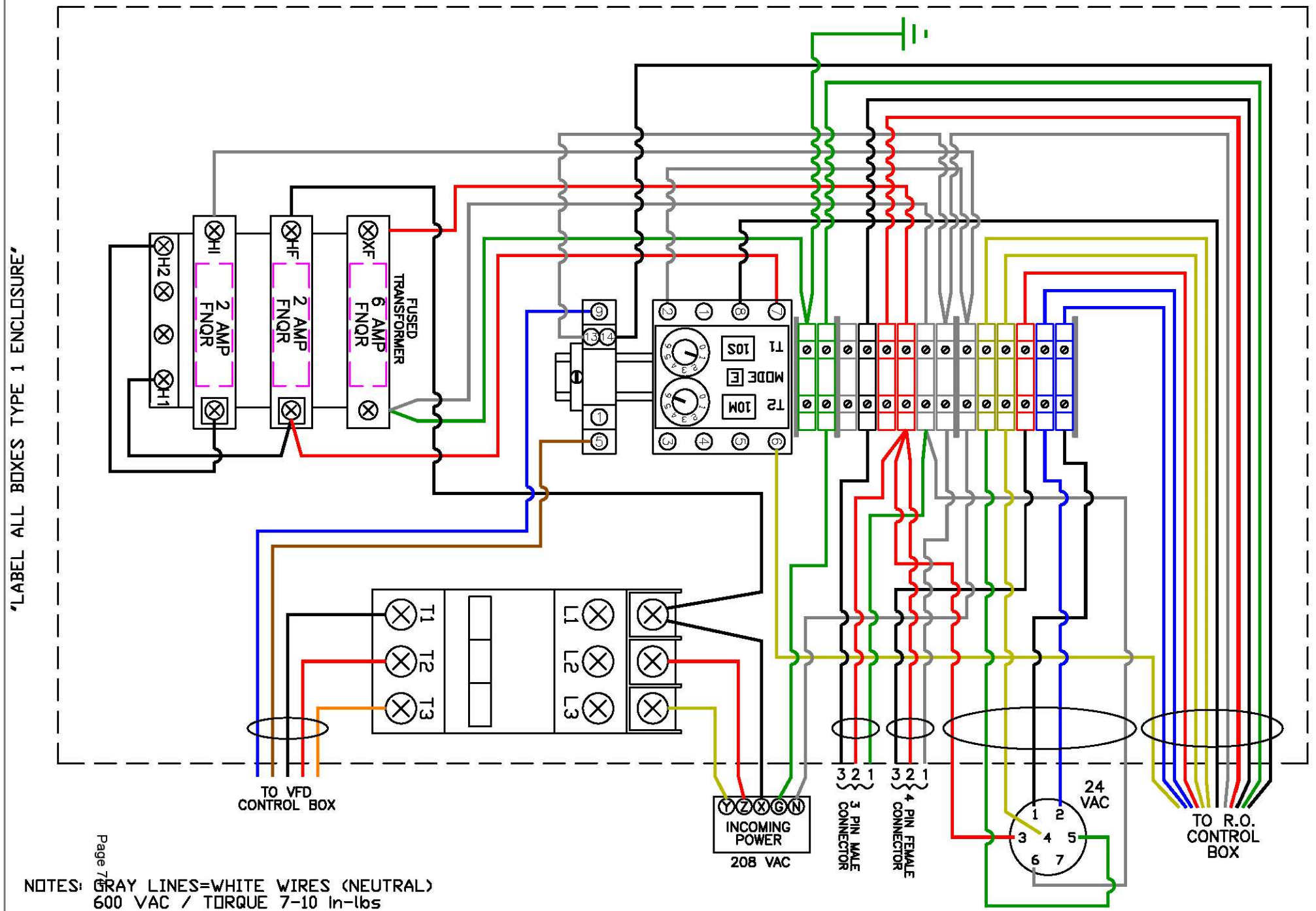


Diagram TFR4

4. Carefully push the Fuse Holder back in place. (See dia. TFR4)

REV	DESCRIPTION	DATE	Rev. by:
3	MOVED WHERE 4 PIN FEMALE CONNECTOR WIRE GO	04/23/07	RTS
4	REMOVED MOTOR PROTECTOR AND REPLACED WITH BREAKER	08/16/10	RTS



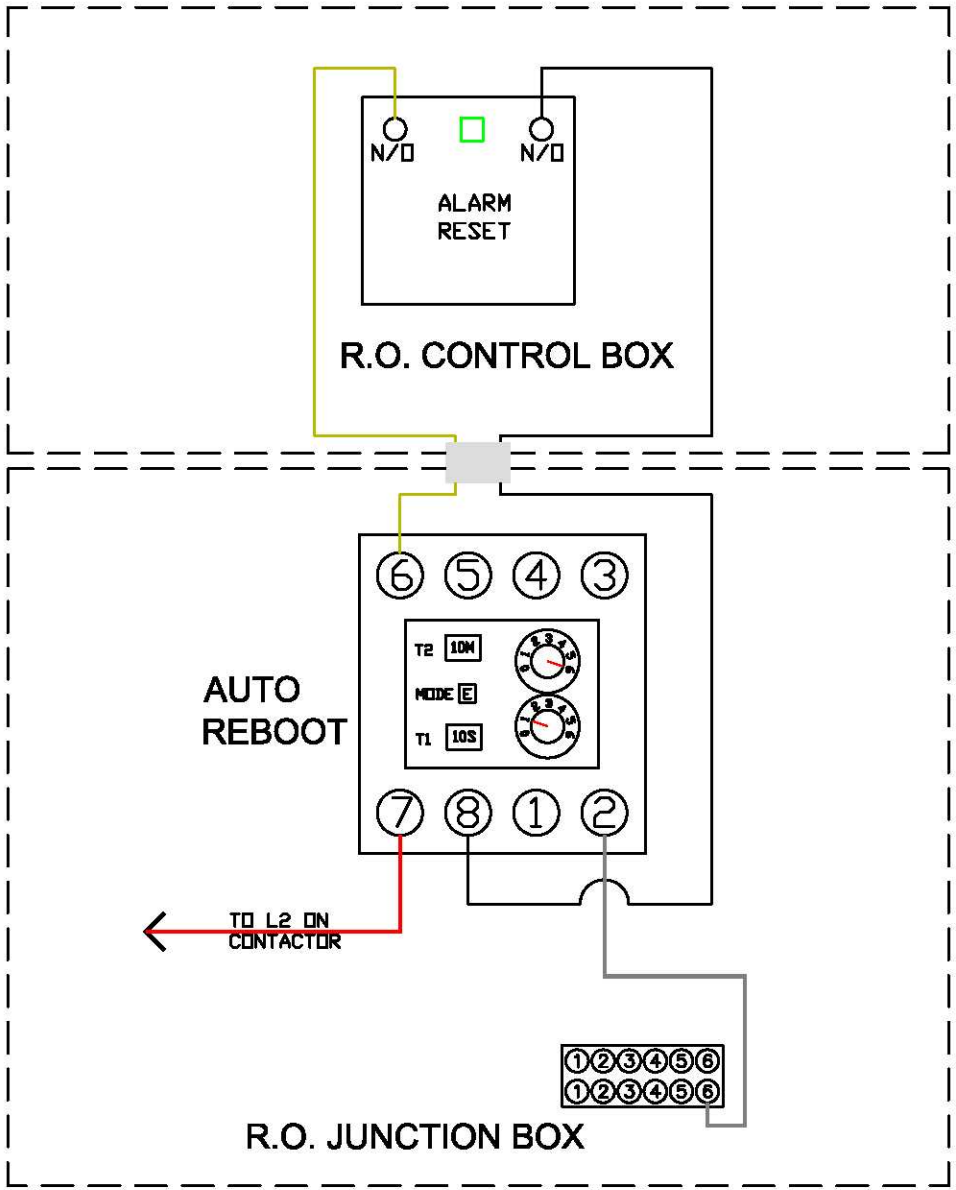
NOTES: GRAY LINES=WHITE WIRES (NEUTRAL)
600 VAC / TORQUE 7-10 in-lbs

BETTER WATER INC.

DRAWING TITLE: 3PH/208V/3HP VARIABLE SPEED JUNCTION BOX SINGLE

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	07/24/06	4	1 OF 1	EQSUBROJBØ1543	1384

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1		00-00-00	



NOTE:
WIRES FROM AUTO REBOOT
TO ALARM RESET ARE RUN
THROUGH 1/2" CARFLEX CABLE

BETTER WATER INC.

TITLE:
CENTRAL R.O. AUTO REBOOT
EQROAUTOREBOOT

CHECKED BY: E. Smith
APPROVED BY: A. Clark
DRAWN BY: JASON CULLIGAN
REV
SCALE NTS
DATE: 8-21-03
DWG NO: 1325

ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

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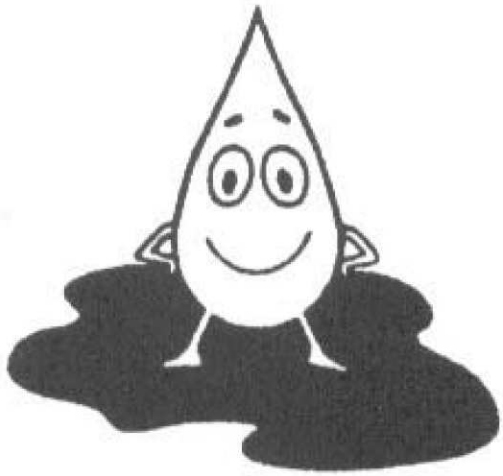

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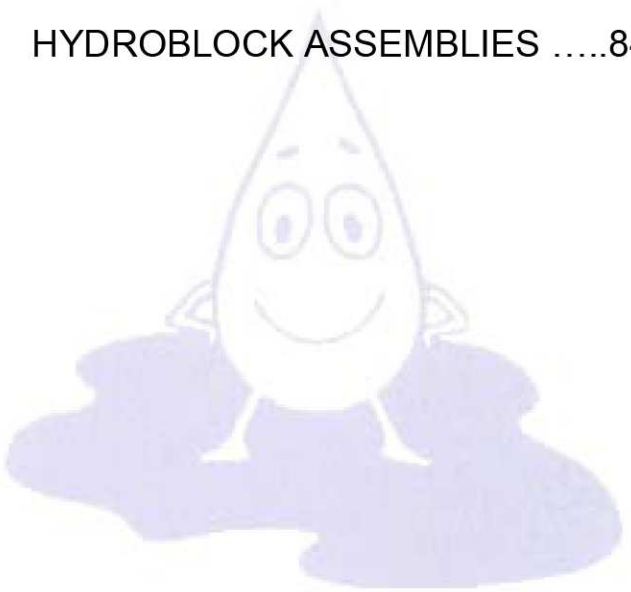
SECTION 6

RO PUMP OUTLET HEADERS …..79

RO PUMP INLET HEADERS …..82

HYDROBLOCK ASSEMBLIES …..84



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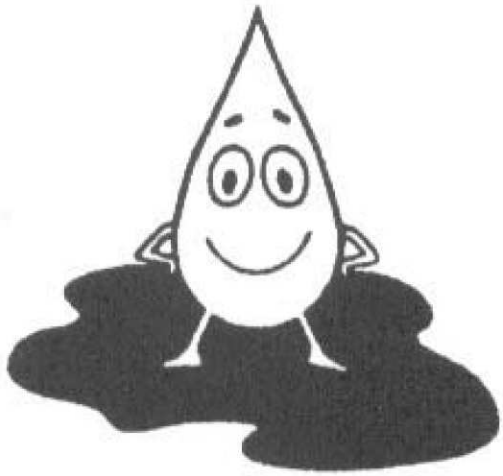

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RO Pump Outlet Headers

The 2436 Series Reverse Osmosis Machine is available with 3,4,5,6, or 7 membranes. If the RO is equipped with 3,4, or 5 membranes, there will be a single hose from the pump, feeding the membranes. If the RO is equipped with 6 or 7 membranes, there will be 2 hoses from the pump feeding the membranes.

The outlet piping from the pump also incorporates a pressure transducer that sends and receives signals from the VFD Control box, thus controlling the pump.

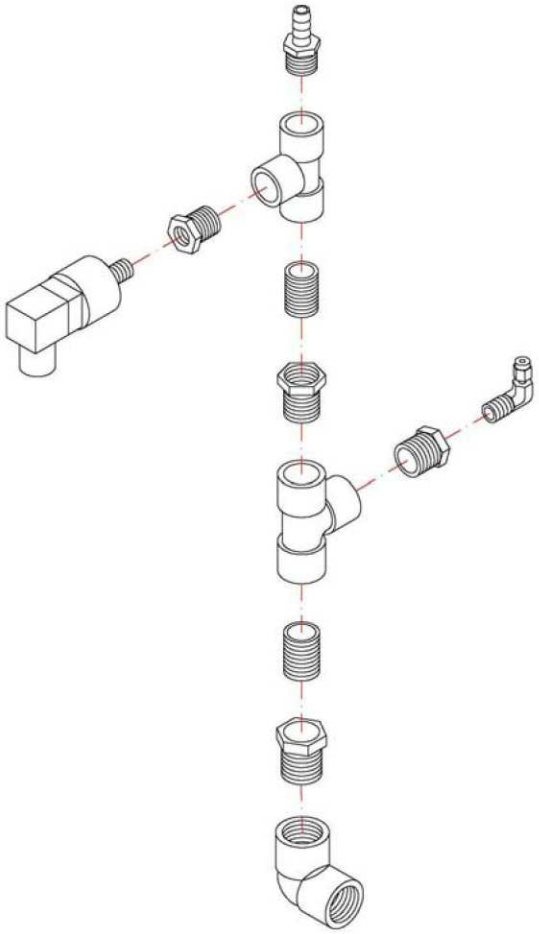


Diagram ROOPA 1
Outlet Pump Header for RO with 3, 4, or 5 Membranes

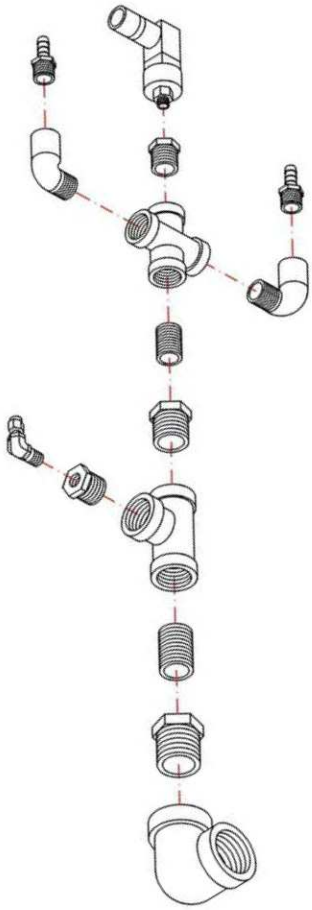


Diagram ROOPA 2
Outlet Pump Header for RO with 6 or 7 Membranes

RO Pump Outlet Headers
For ROs with 3, 4,or 5 Membranes

¾ " x ¼" SS Reducing Bushing
PLFISS00879

0-300psi
Transducer
PLGAOO00105

¾" SS Hose Nipple
PLFISS00968

¾" SS Tee
PLFISS00871

¾" SS Close Threaded Nipple
PLFISS00865

1" x ¾" SS Reducer Bushing
PLFISS00875

1" SS Tee
PLFISS00870

1" SS Close Threaded Nipple
PLFISS00872

1 ¼" x 1" SS Reducer Bushing
PLFISS00265

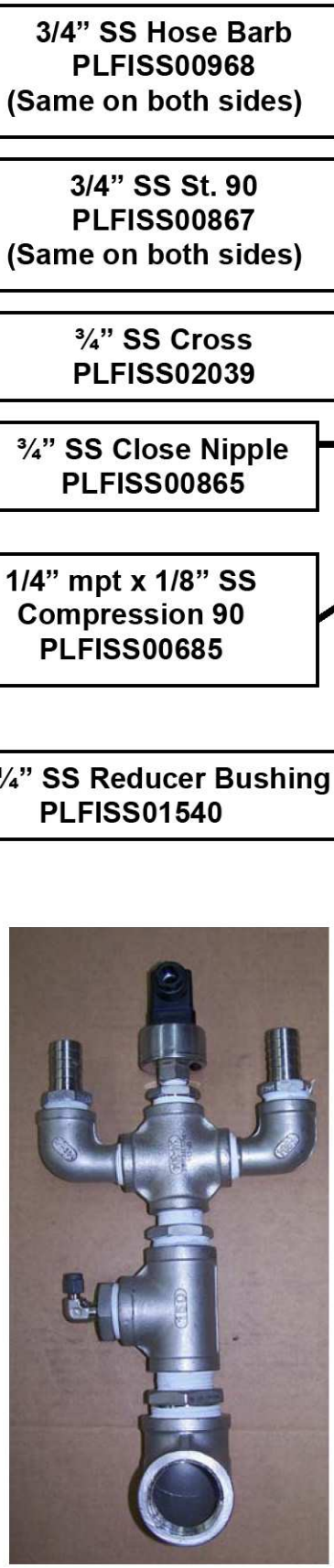
1 ¼" SS Threaded 90
PLFISS00967

1/4" MPT X 1/8 Compression SS 90
PLFISS00685

1" x ¼" SS Reducer Bushing
PLFISS01540

Diagram ROOPA 3
Outlet Pump Header for RO with 3, 4, or 5 Membranes.

RO Pump Outlet Headers
For ROs with 6 or 7 Membranes



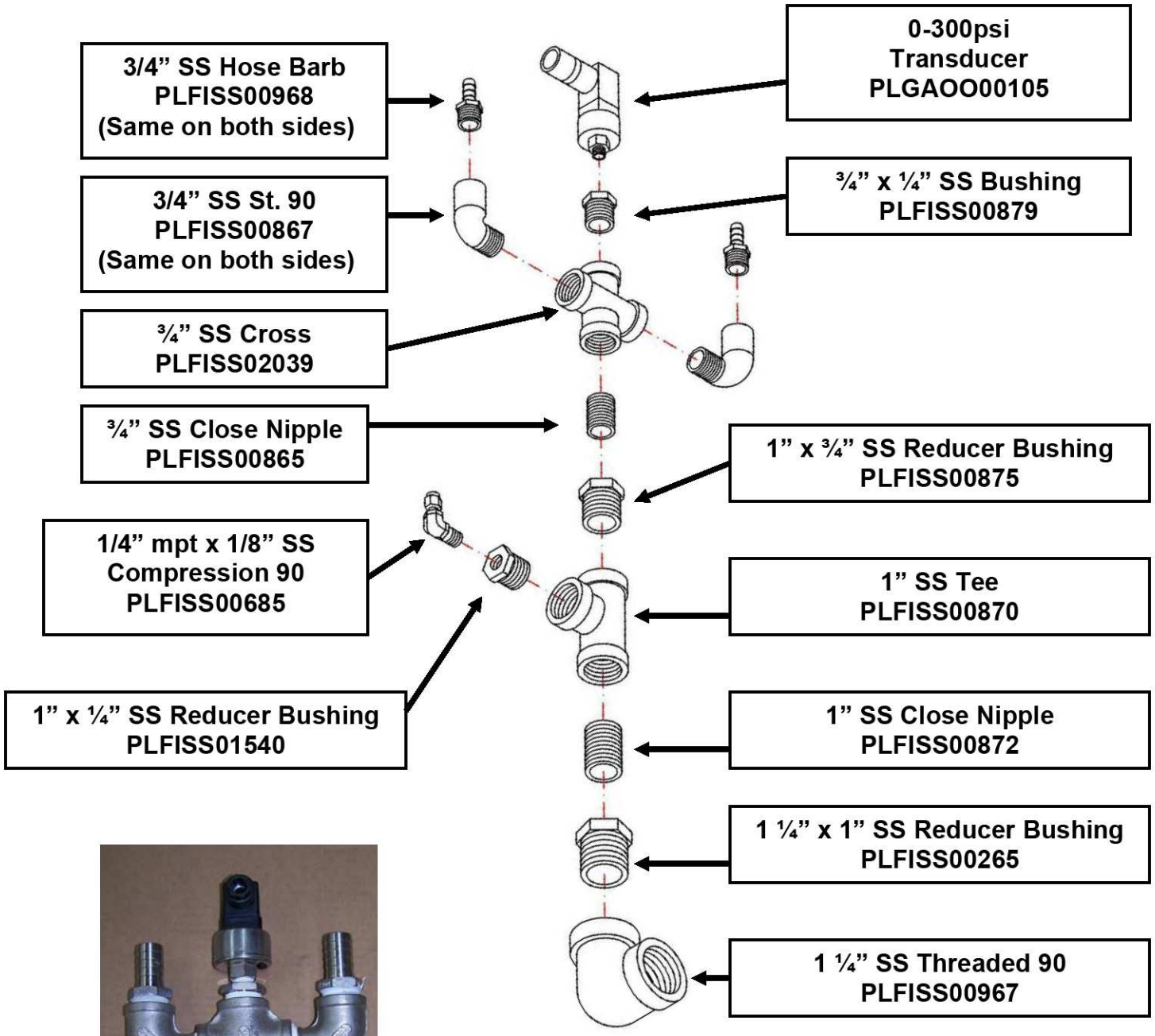


Diagram ROOPA 4
Outlet Pump Header for RO with 6 or 7 Membranes.

RO Pump Inlet Header

The Inlet Pump Header on the Reverse Osmosis Machine incorporates the CLEAN/DISINFECT Valve and connection for the hose used in the cleaning and Disinfecting procedures.

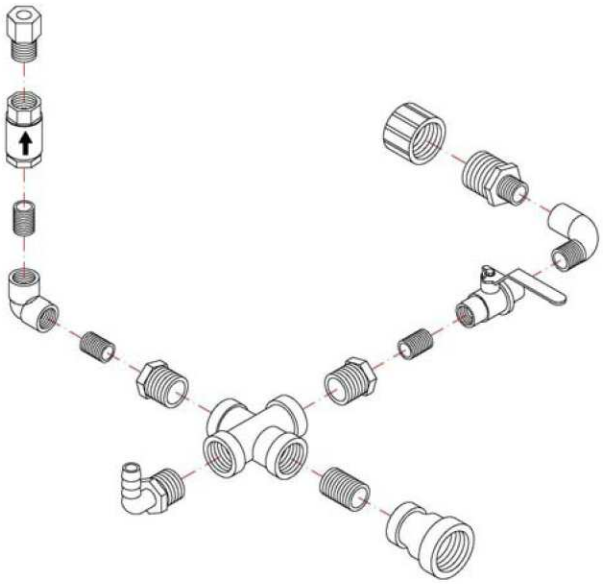


Diagram ROIPA 1
Pump Inlet Header located on left side of RO at the bottom.

RO Pump Inlet Header

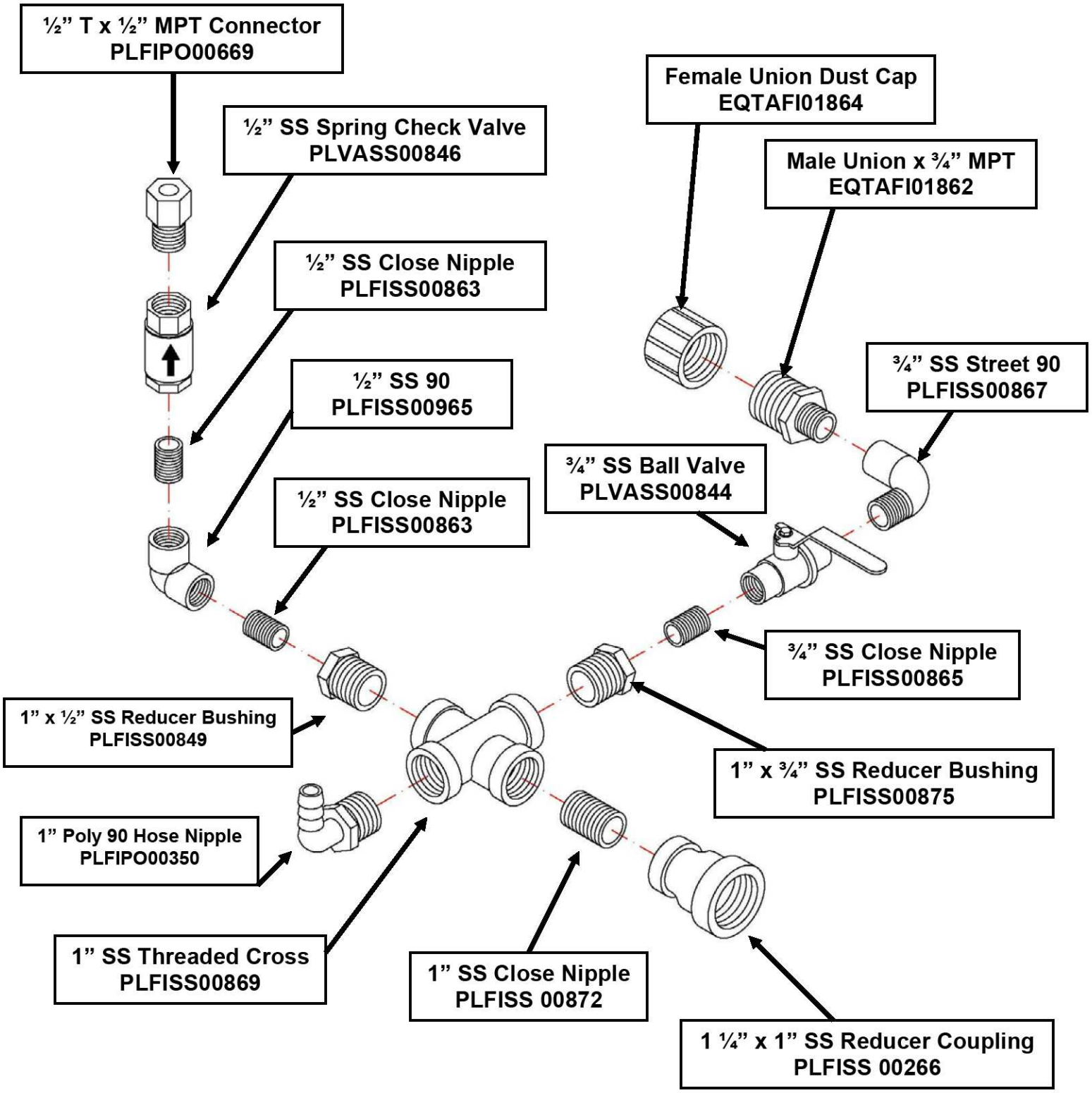


Diagram ROIPA 2
Pump Inlet Header

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
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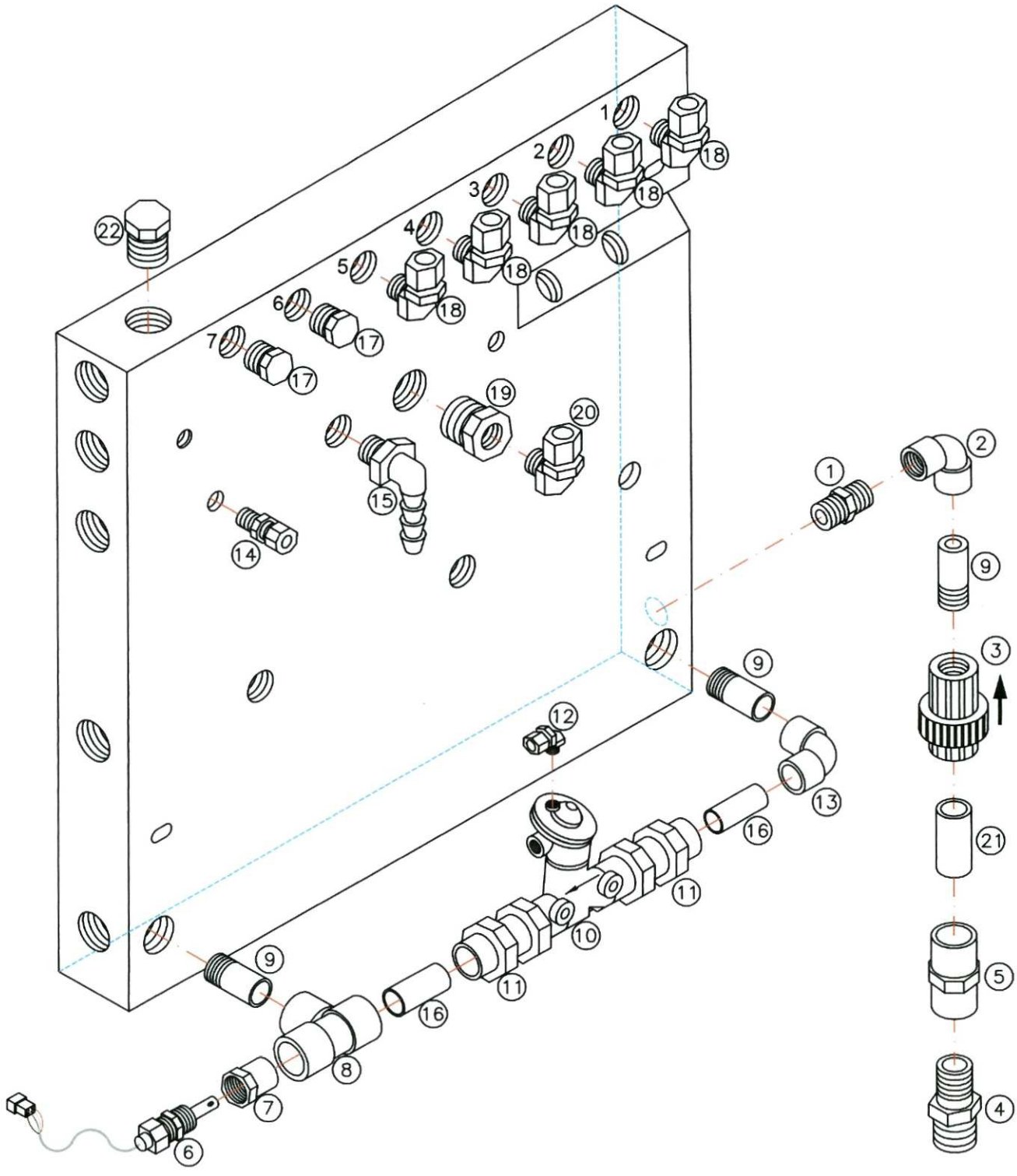
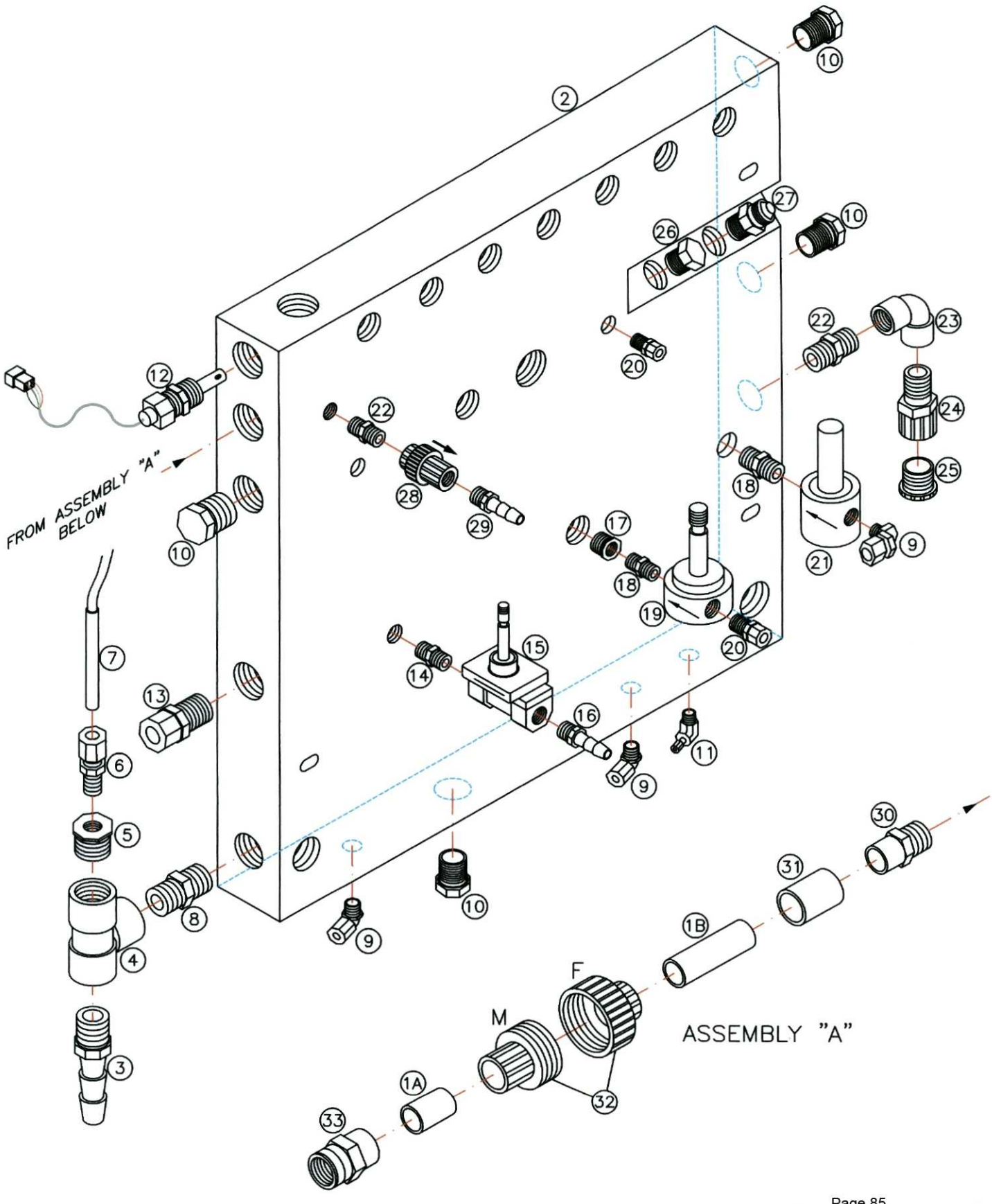


NOTE:

IF THE R.O. HAS 3 MEMBRANES PORTS 4, 5, 6 & 7 WILL HAVE PLUGS. IF THE R.O. HAS 4 MEMBRANES PORTS 5, 6 & 7 WILL HAVE PLUGS. IF THE R.O. HAS 5 MEMBRANES, PORTS 6 & 7 WILL HAVE PLUGS.

BETTER WATER LLC	DRAWING TITLE: 2436 RO HYDROBLOCK ASSEMBLY						
APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R SANDGREN	05/02/05	6	1 OF 4	EQRO2436 1HYD LP	1043

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
5	ADDED POLY PRO PARTS	07/05/12	RTS	6	REA # 2066	11/30/12	RTS



BETTER WATER LLC	DRAWING TITLE: 2436 RO HYDROBLOCK ASSEMBLY						
APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R SANDGREN	05/02/05	6	3 OF 4	EQRO2436 1HYD LP	1043

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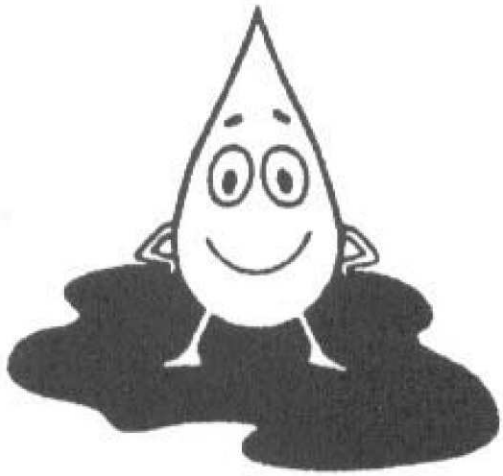

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SECTION 7

MEMBRANE REPLACEMENT INSTRUCTIONS …..89

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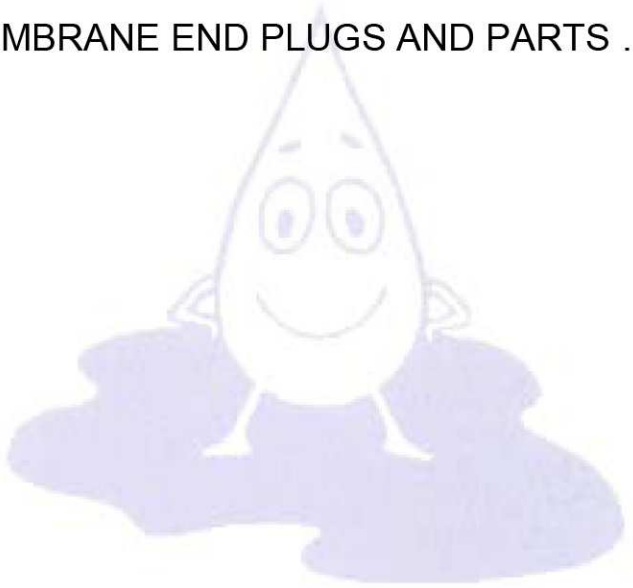
MEMBRANE ARRANGEMENTS …..96

MEMBRANE END PLUGS AND PARTS …..102



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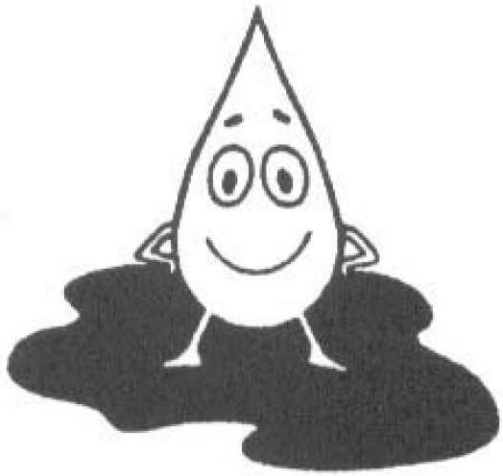

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Membrane Replacement

The Life of an RO membrane is dependant on many factors such as feed water quality, properly operating pre-treatment and routine maintenance such as membrane cleanings and disinfections.
Normally, you can expect the membranes to last from 3-5 years or more.
Eventually, you will need to replace membranes and the following should be used as a guide for this procedure.

1. Make sure that there are no requirements for RO water. (no patients are dialyzing)
2. Turn off the RO and unplug or disconnect from the main power source.
3. Turn off the RO inlet valve from the pre-treatment.
4. Depress the red pressure relief button on the Big Blue pre-filter to the RO to relieve the pressure.

Open and unpack the membranes from their shipping cartons.

5. **Verify Correct Membranes**
    a. Before opening the boxes of the new membranes, verify that they are the correct membranes for your RO. (See dia. MR1) If they are not the correct membranes, DO NOT ATTEMPT to install them.
    b. You should see a round pink "RO MEMBRANE" sticker on the end of the box
    c. You should also see "4040-M5P3X2" on the end of the box
    d. Each membrane is also labeled with an individual serial number. This number should be recorded and also noted in which membrane housing the specific serialized membrane will be installed.

6. **Open and Unpack the New Membrane**
    a. Open the membrane box from the end that is labeled "OPEN THIS END→" (See dia. MR2)
    b. You will notice a black plastic membrane adapter with 2 female ends.
    c. Discard this piece, as it is not needed.
    d. Discard the cardboard end packing from the box

7. **Remove the New Membrane from the box.** (See Dia. MR3)
    a. The membrane is packaged in a liquid preservative in a foil bag, inside a plastic bag.
    b. There are also foam end covers on each end of the membrane,
    c. Remove the membrane in the foil bag from the plastic bag and discard the plastic bag.
    d. Open the foil bag and remove the foam end cover.
    e. Set the membrane (still in the foil bag) aside and prepare the RO for the membrane change.

You are now ready to
Prepare the RO and membrane housing(s) for membrane replacement

Membrane Replacement

8. **Remove the end cap clamps**
    a. On the top of the membrane housing, locate the 2 metal clamps that secure the membrane end cap. (See dia. MR5)
    b. Loosen and/or remove the Allen Screws securing the end cap. There are 2 clamps and Allen screws on each end cap. (See dia.MR5)
    c. After removing the Allen Screws (or loosening them enough for the clamps to be removed, slide the clamps toward the center of the membrane housing until they are released from the groove in the membrane housing. (See dia. MR6)

9. **Remove the Compression nut and blue tubing.**
    a. Locate and loosen the compression nut on the top of the end cap that secures the blue tubing. (See dia. MR7)
    b. It is only necessary to remove the outermost nut, and this should only be hand tight.
    c. It is NOT necessary to remove the entire compression fitting from the end cap.
    d. Remove the Compression nut, leaving it attached to the blue tubing.
    e. Move this tubing out of the way.

10. **Remove the End Cap.**
    a. With the metal clamps and smaller blue tubing removed, grasp the larger blue hose and firmly wiggle the hose (and end cap) back and forth while pulling up to remove the end cap from the housing. (See dia. MR9)
    b. Move the end cap (still attached to the blue hose) out of the way.
    c. **NOTE:** If the end cap is too tight and will not move, refer to ***Alternate End Cap Removal Procedure***, in the following pages.

11. **Remove the Old Membrane.**
    a. Reach into the membrane housing and grasp the membrane by the membrane adapter and gently pull the membrane out of the housing and discard.
    b. It may be necessary to grasp the membrane adapter or one of the "spokes" with a pair of needle nose pliers to pull it out.

12. **Install the New Membrane.**
    a. As stated before, the new membrane is packed in a liquid preservative.
    b. This preservative can be drained from the packaging into a suitable container and transferred to a drain, or…
    c. This preservative can be poured into the membrane housing as the membrane is being installed.
    d. Hold the membrane (still in the foil bag) upright above the membrane housing (with the open end of the foil bag down)
    e. ***Slowly and Gently*** allow the membrane to slide through the foil bag and into the membrane housing. (See dia. MR11)
    f. **CAUTION:** DO NOT allow the membrane to quickly drop into the membrane housing, as this can cause damage to the membrane adapter.

Membrane Replacement

13. Re-Install the End Cap

a. Apply lubricant to the outer O-Rings of the end cap. (See dia. MR12)
b. Glycerin is recommended, KY Jelly can also be used
c. **DO NOT USE** VASELINE, PLUMBER'S GREASE OR SILICONE GREASE.

14. Re-Install the End Cap.

a. Line up the end cap so the membrane adapter fits into the center hole in the end cap.
b. Push end cap down until it seats securely and the groove in the membrane housing is visible. (See dia. MR14)

15. Re-Install the End Cap Clamps.

a. Lay the metal clamps in place and slide them toward the outside until they seat in the groves in the membrane housing. (See dia. MR15)
b. Line up the metal clamps so the Allen screws will line up with the brass threaded part in the end cap.
c. Tighten the Allen screws securing both metal clamps.

16. Re-Install the blue tubing and the compression nut.

a. Insert the blue tubing into the compression socket and tighten the compression nut.
b. Only tighten the compression nut ***HAND TIGHT***, making sure not to cross thread.
c. DO NOT USE A WRENCH

17. Repeat the preceding steps for each membrane to be replaced.

18. After installation of all membranes, the RO should be started and the Product Water flushed to drain for a minimum of 2 hours.

Membrane Replacement

Diagram MR1

Verify that your new replacement membrane is the correct model number. Look for **4040-M5P3X2**, and look for the **Pink "RO Membrane" sticker**

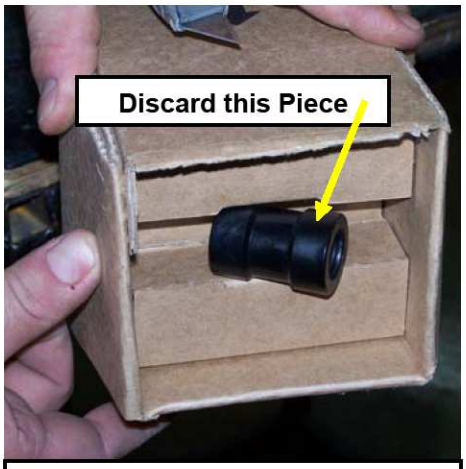


Diagram MR2

Open end of box labeled "OPEN THIS END" and remove cardboard packing. Locate the black plastic connector and discard this. This piece is not needed.

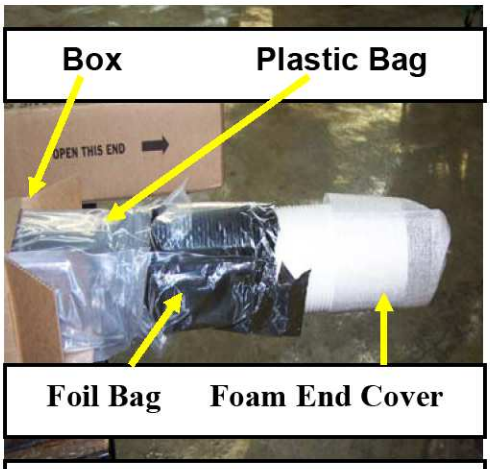


Diagram MR3

Open end of plastic bag. Open end of foil bag. Remove foam end cover from membrane. Leave membrane in foil bag and remove membrane and foil bag from plastic bag.

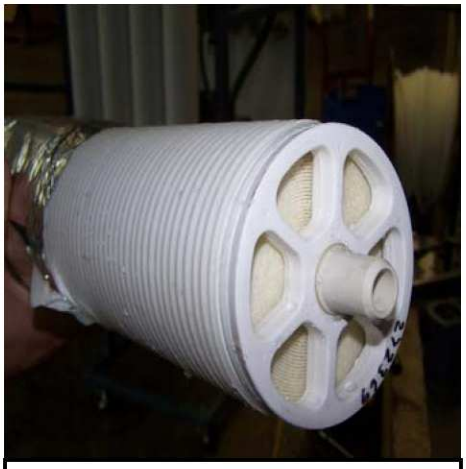


Diagram MR4

Leave membrane in foil bag and set aside.
NOTE: There will be some liquid preservative in bag. Take care to avoid spilling this liquid.

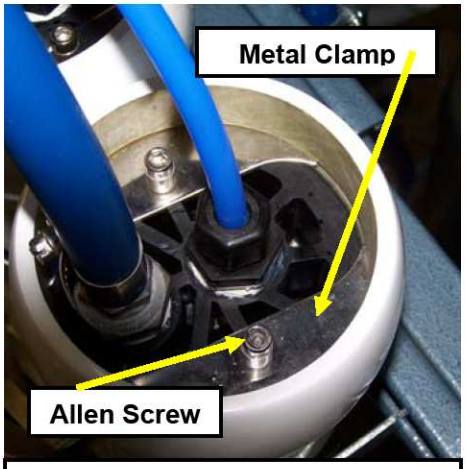


Diagram MR5

Locate the metal clamps on the top of the housing. Loosen and/or remove the Allen Screws. Set them aside; these will be reused later. Repeat for 2nd metal clamp.

Diagram MR6

After loosening (or removing) the Allen Screws, slide the metal clamp toward the center, removing it from the groove on the inside of the membrane housing. Repeat for 2nd metal clamp.

Membrane Replacement

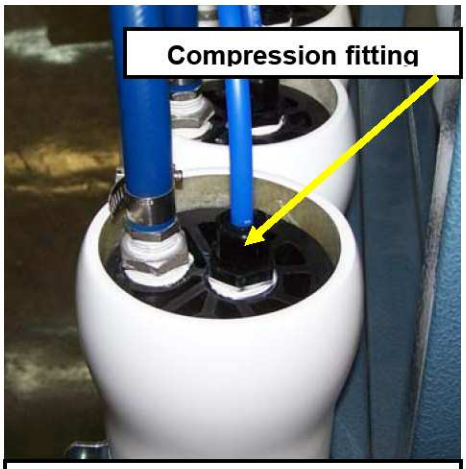


Diagram MR7

After removing both metal clamps, locate and loosen the black compression fitting on the (smaller) blue tubing.

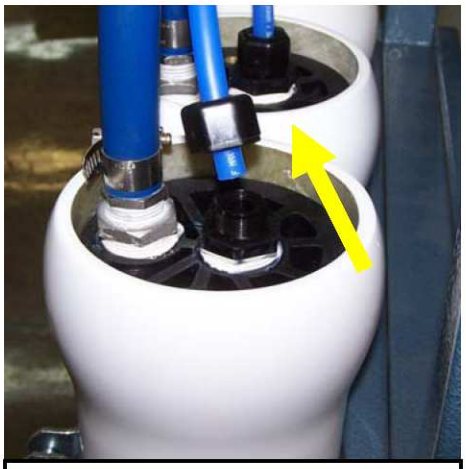


Diagram MR8

Remove the Blue Tubing from the membrane end cap, leaving the compression nut on the blue tubing. Move the tubing out of the way. It is not necessary to remove the other end of the tubing from the RO.

Diagram MR9

Grasp the Blue Hose (larger) and firmly wiggle the end cap out of the membrane housing.
*{If the end cap will not move, see **alternative end cap removal procedure** in the following pages}*
Move the end cap (still attached to the blue hose) out of the way.

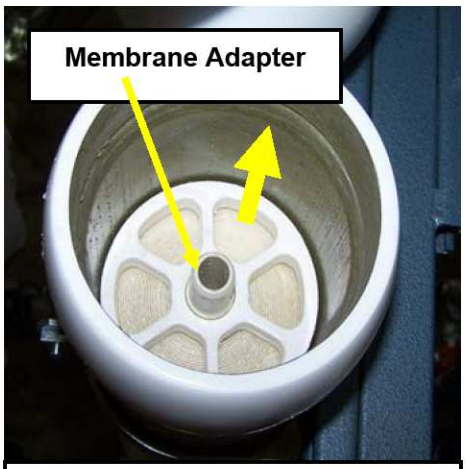


Diagram MR10

Reach into the membrane housing, grasp the membrane adapter and gently pull the membrane out of the housing.
(It may be necessary to grasp the membrane adapter or one of the "spokes" with a pair of needle nose pliers)

Diagram MR11

Slide the new membrane (holding by the foil bag) into the housing. There will be a liquid preservative in the bag. This liquid can be drained before placing membrane in housing, or allowed to drain into housing as membrane is installed.

Diagram MR12

Be sure to put some lubricant on the outer O-Ring of the end cap before re-installing.

Glycerin is recommended,
KY Jelly also works very well.
DO NOT USE Vaseline.

Membrane Replacement

Diagram MR13

Replace end cap into membrane housing. Make sure the end cap seats firmly.

Diagram MR14

Push end cap down until groove in membrane housing is visible.

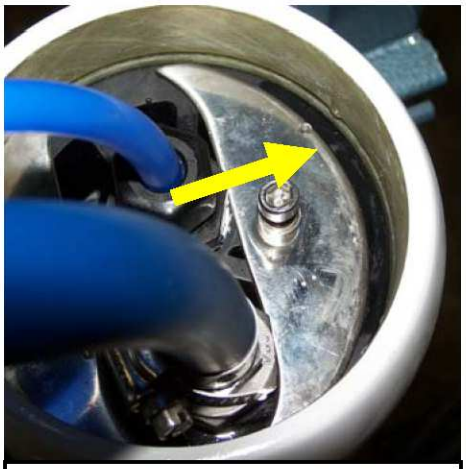


Diagram MR15

Lay the metal clamp in place and slide toward the outside until it seats in the groove in the membrane housing.
Repeat for 2nd metal clamp

Diagram MR16

Line up the clamp so the Allen Screw will fit into the brass threaded part in the end cap.
Repeat for 2nd metal clamp.

Diagram MR17

Tighten the Allen Screw.
Repeat for 2nd metal clamp.

Diagram MR18

Replace the blue tubing and tightene the compression nut only hand tight.
Do not use a wrench!

You are now ready to repeat this procedure for all other membranes to be changed.

After the installation of 1 or more membranes, the RO Product should be rinsed to drain for a minimum of 2 hrs.

Alternate End Cap Removal

Step 10 (Membrane Replacement) and Diagram MR9 explain how to remove the end cap for membrane replacement.
After the RO has been in use for several years, you may find it difficult to remove the end cap by just pulling on the blue hose.
If this is the case, try the following steps.

1. After removing the metal clamps and the compression nut securing the blue tubing:
2. Remove the compression fitting that is threaded into the end cap by using a socket wrench. (See dia. AECR1)
    a. Remove any excess Teflon tape from the socket that may have been left. (See Dia. AECR2)
3. Insert a ¾"x 6"stainless steel pipe threaded nipple and tee into the end cap (where the compression fitting was)
    a. CAUTION: DO NOT OVERTIGHTEN the stainless steel nipple, as this can crack or split the end cap.
    b. Only thread the nipple in a few turns or until it is snug.

4. Grasp the Nipple and move it back and forth while pulling upward to break the end cap loose and remove it. (See Dia. AECR3)

5. Clean any old Teflon tape and/or pipe dope from the compression fitting that was removed.
    a. Wrap only 3-4 wraps of new Teflon tape on the threads of the compression fitting.
    b. Apply a very small amount of Teflon pipe dope to the threads/tape.
    c. Re-install compression fitting in the end cap, being extremely careful not to overtighten as this can crack or split the end cap. (See Dia. AECR4)

6. Continue with membrane replacement procedure step #11.

Diagram AECR1

Remove Compression fitting from end cap with a socket wrench

Diagram AECR2

Clean any excess Teflon tape left in the end cap

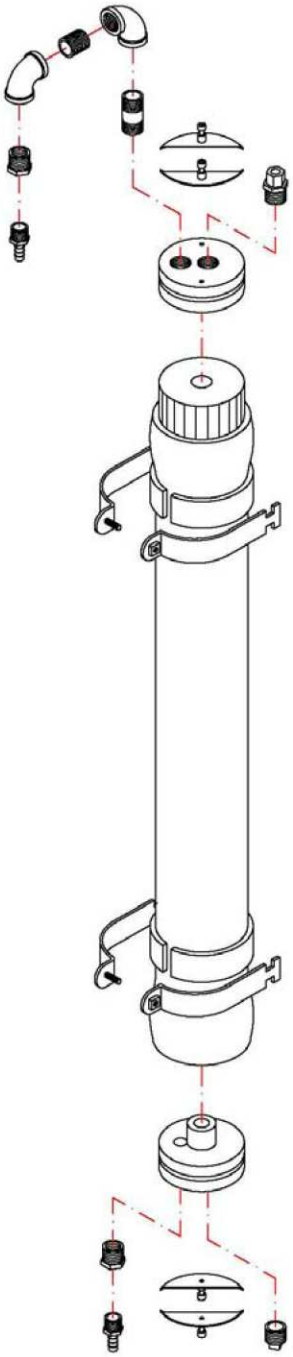
Diagram AECR3
Remove end cap with stainless steel nipple

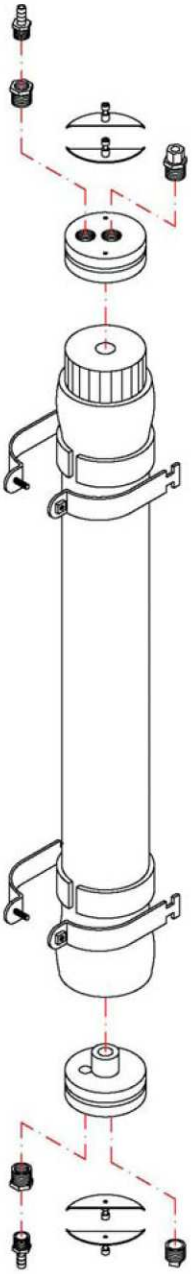
Diagram AECR4

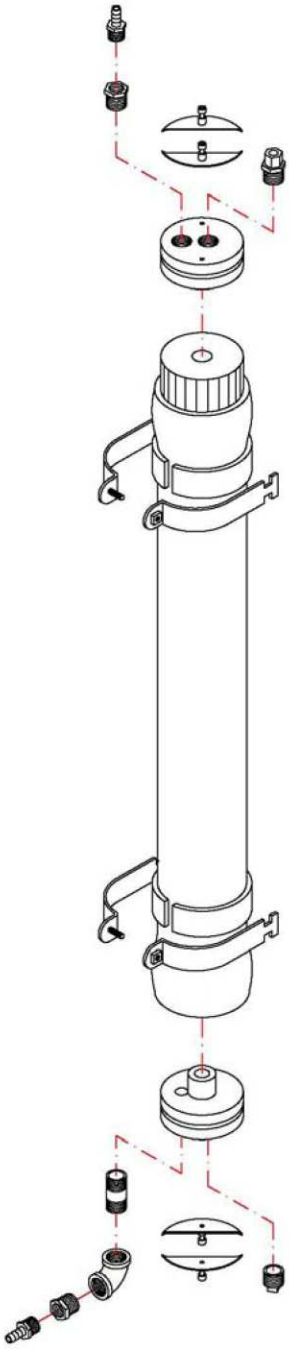
Reinstall compression fitting being careful not to overtighten!

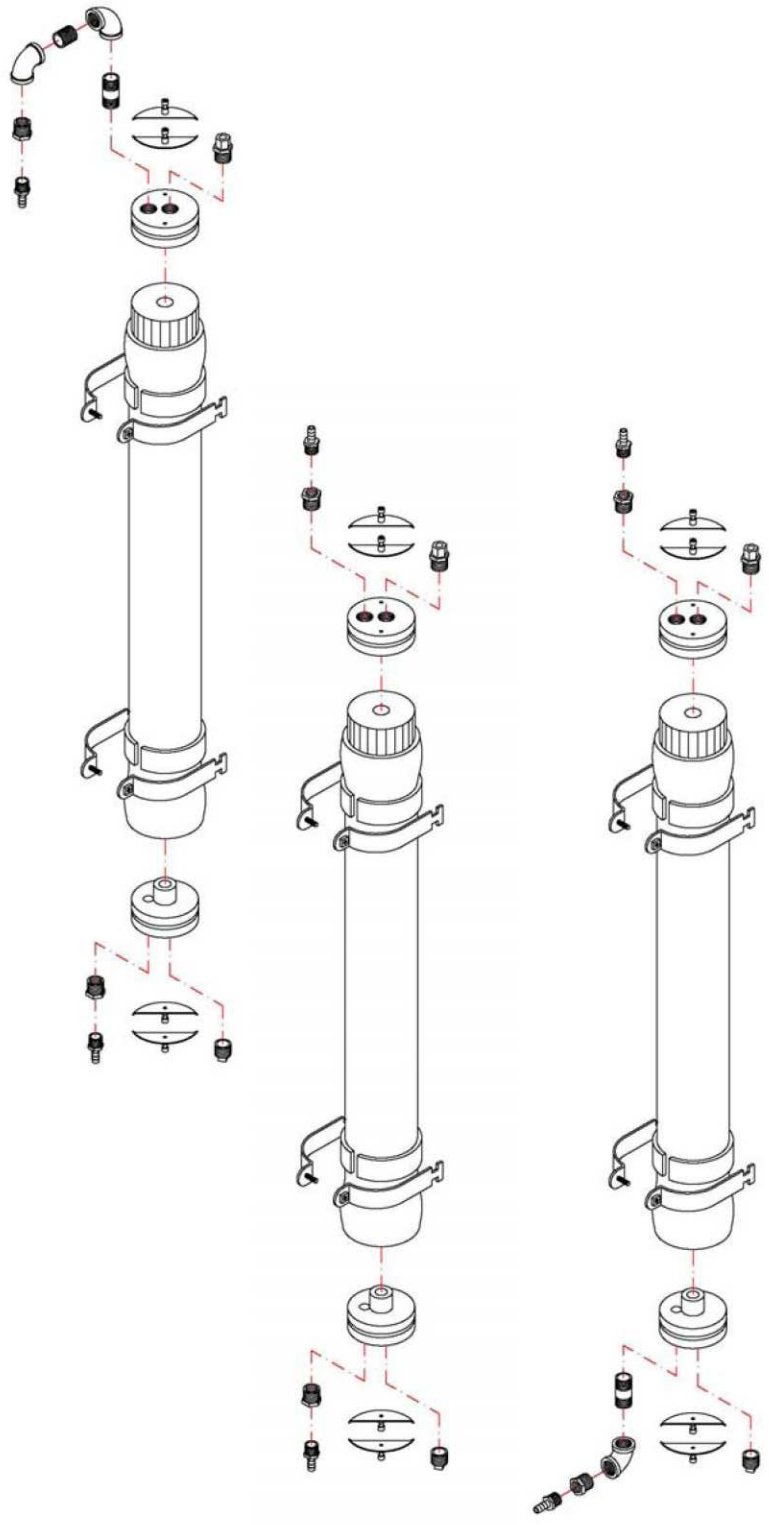
Membrane Arrangements

The 2436 RO is available with 3, 4, 5, 6, or 7 membranes. Each version has the same membranes arranged in a similar but different plumbing arrangement. To determine a part or part number for the specific membrane arrangement of your RO, refer to the following diagrams and pages.

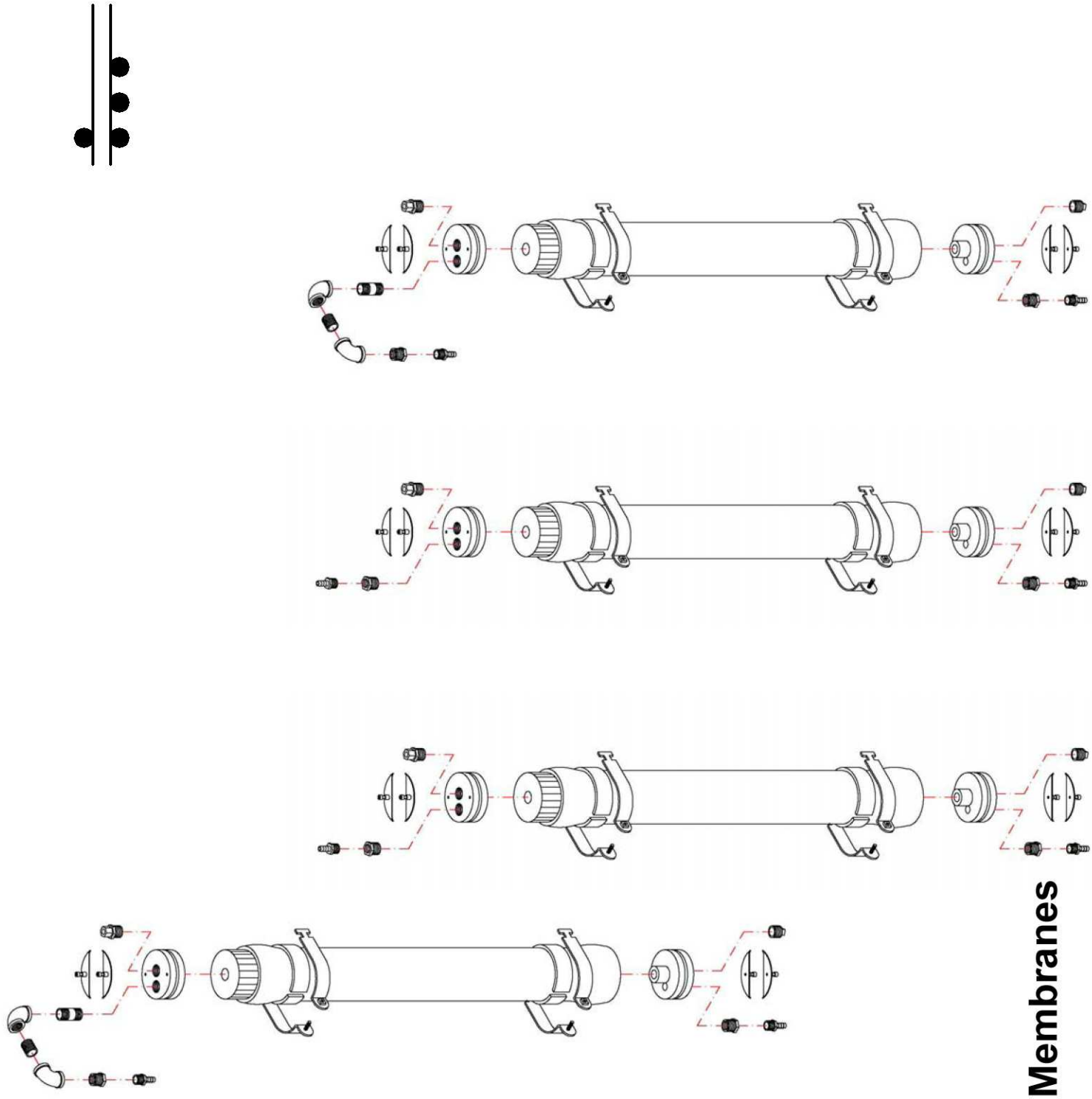




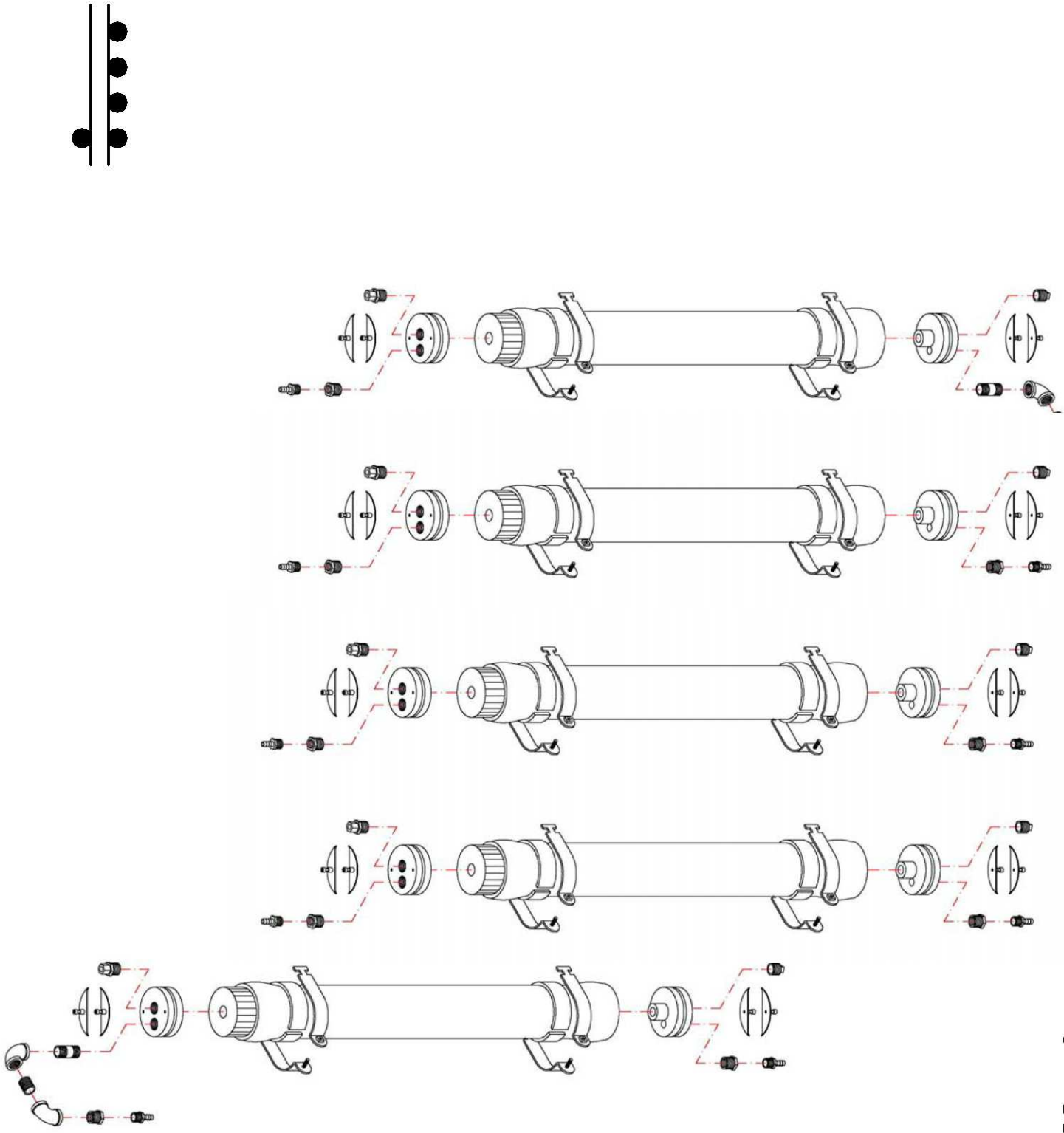




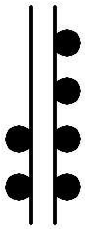
3 Membranes

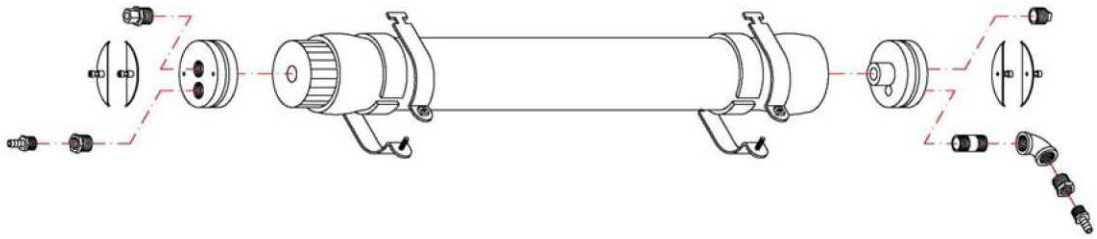


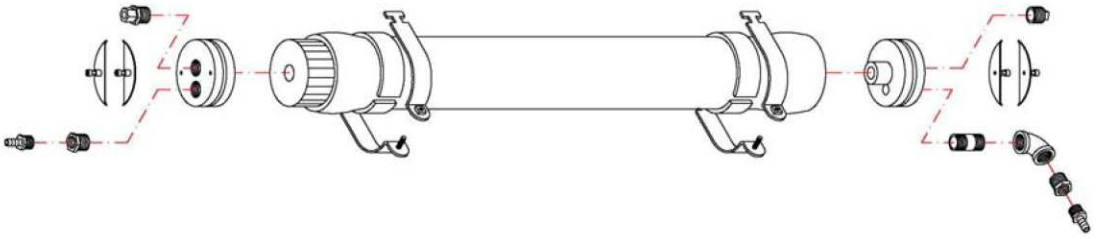
4 Membranes

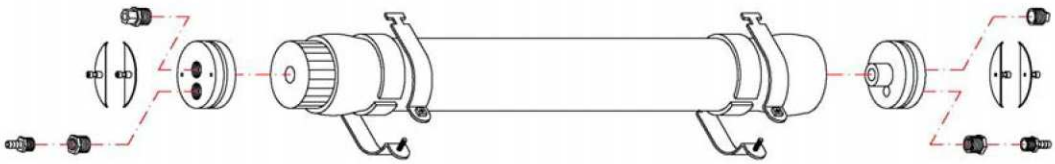


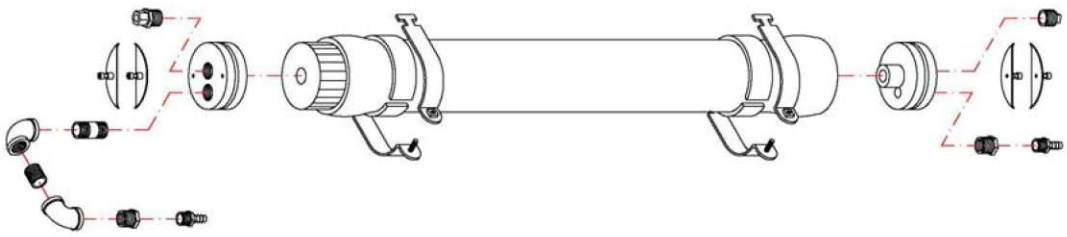
5 Membranes

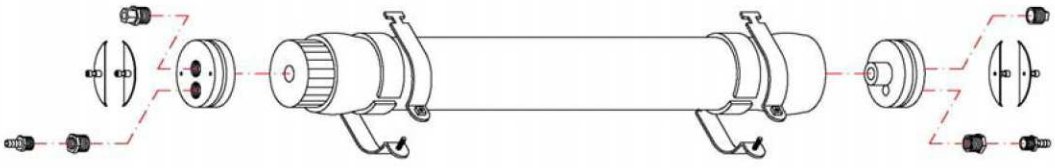


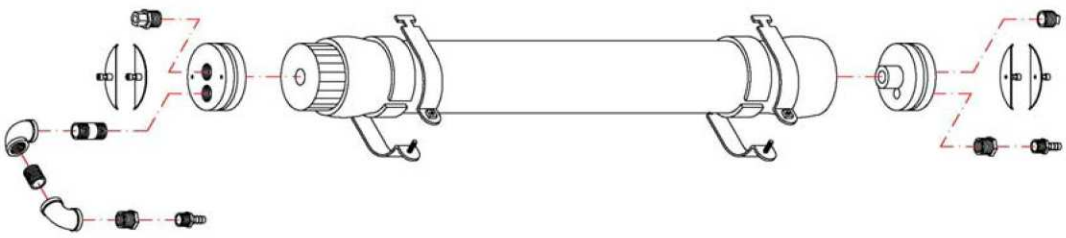


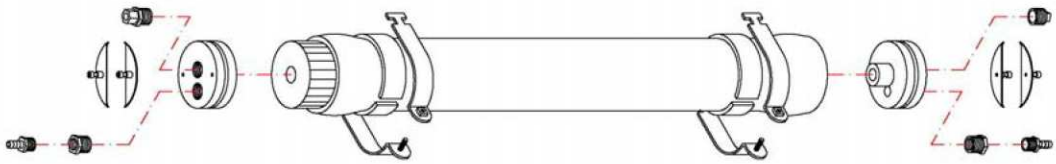


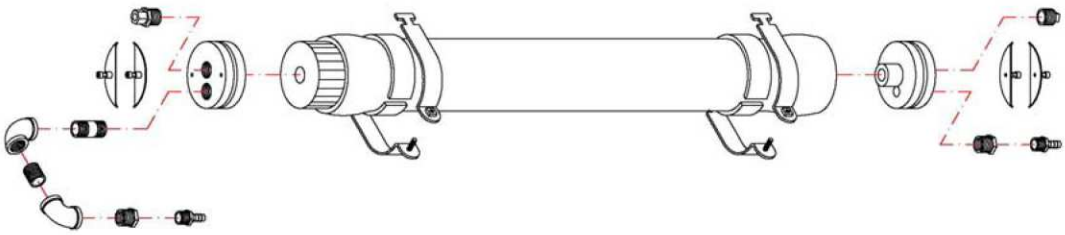


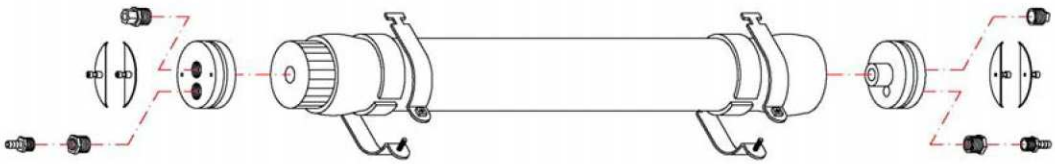


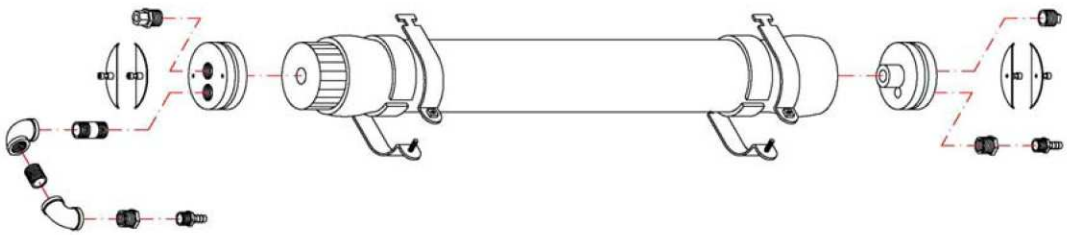


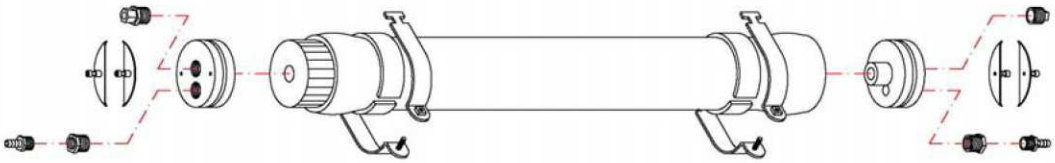


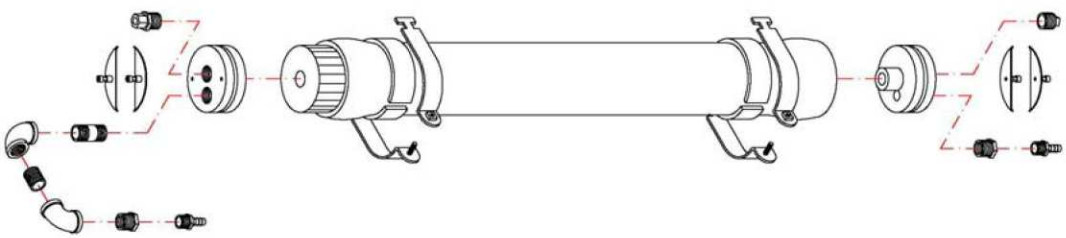






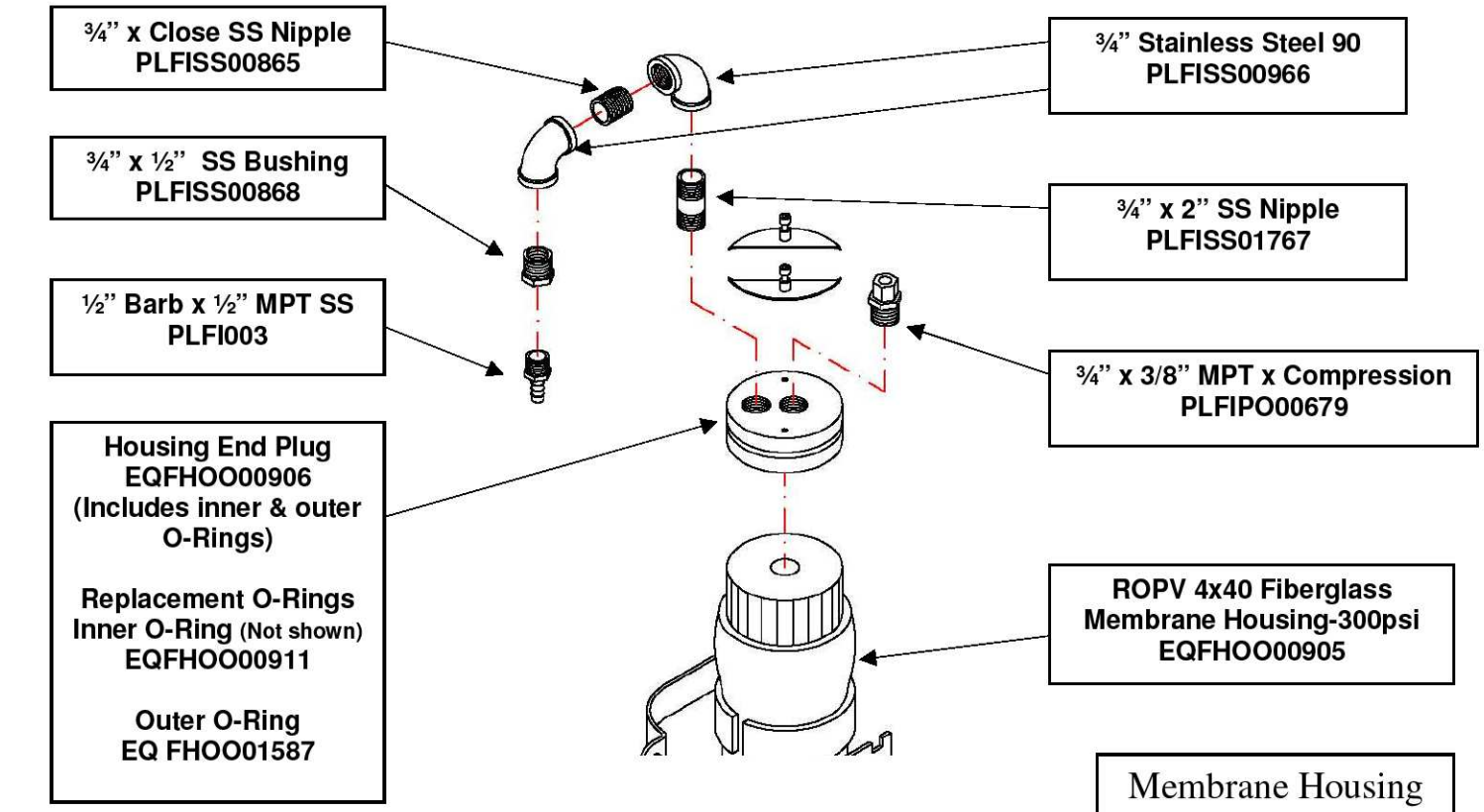




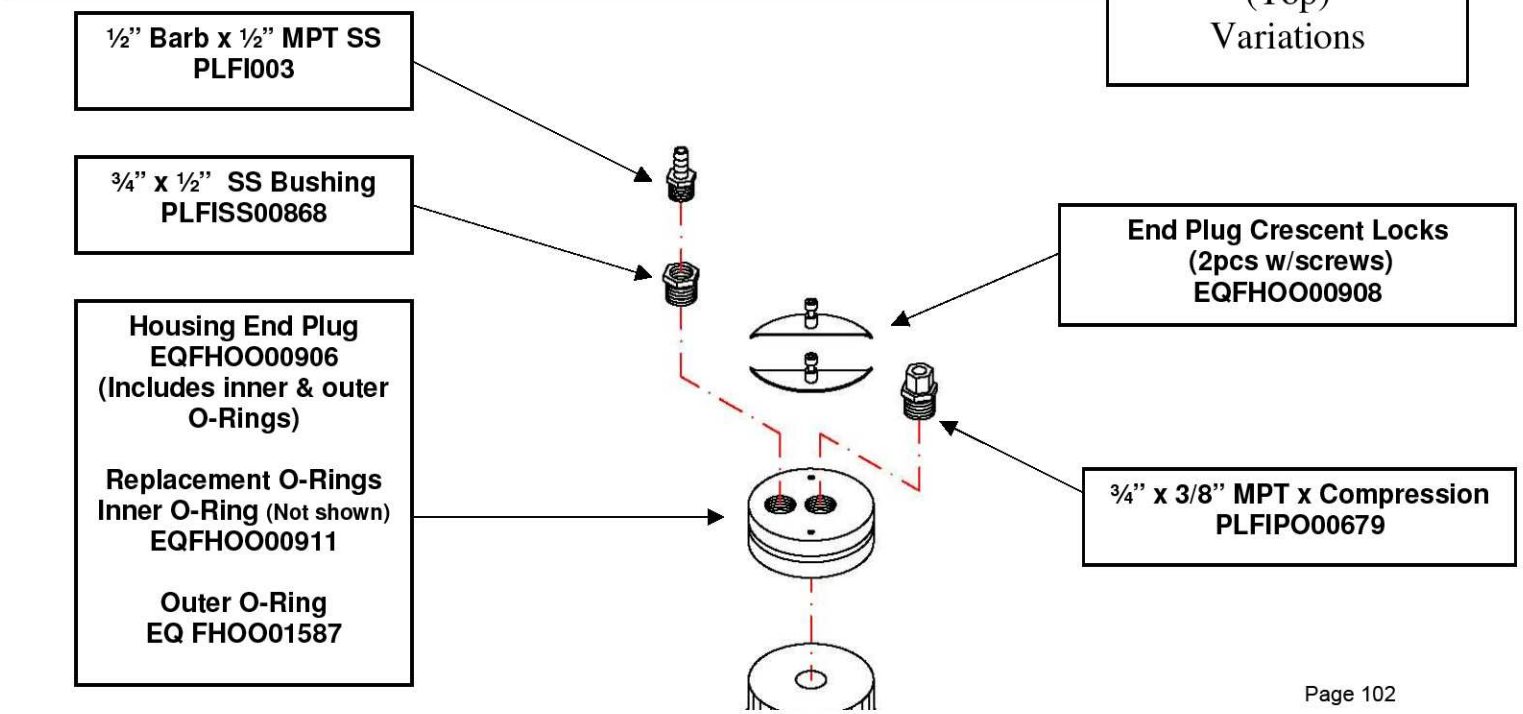


Membrane End Plugs & Parts

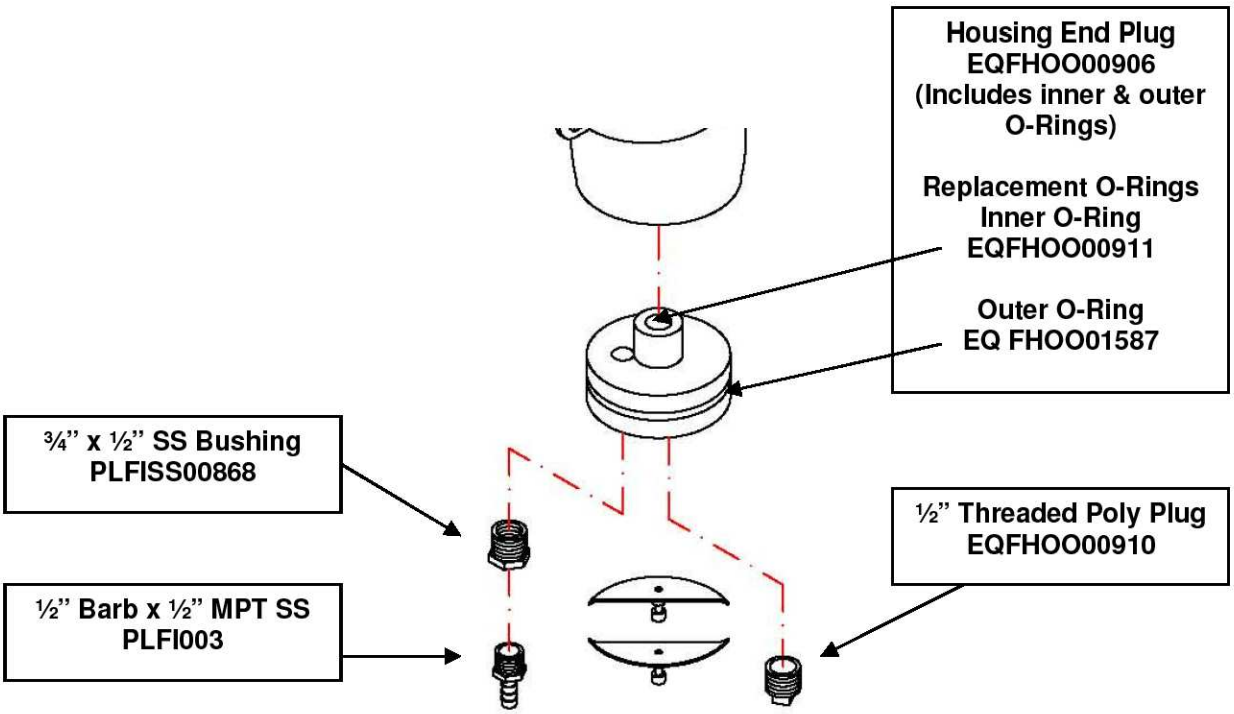
The membranes on the 2436 RO are hosed together in several different configurations. The housings, end plugs, and end plug crescent locks are all the same. There are variations on the plumbing fittings. The following diagrams show the different plumbing fittings used.



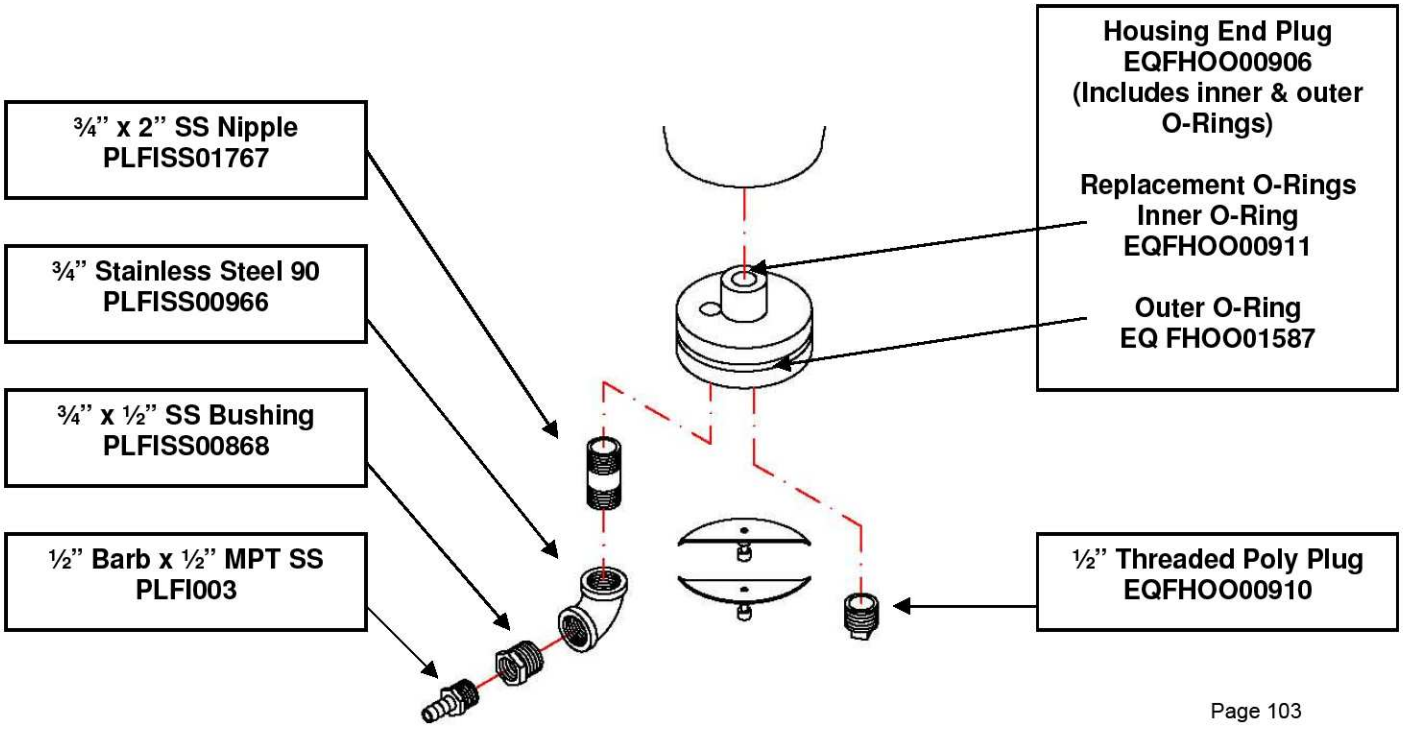
Membrane Housing (Top) Variations



Membrane End Plugs & Parts



Membrane Housing (Bottom) Variations



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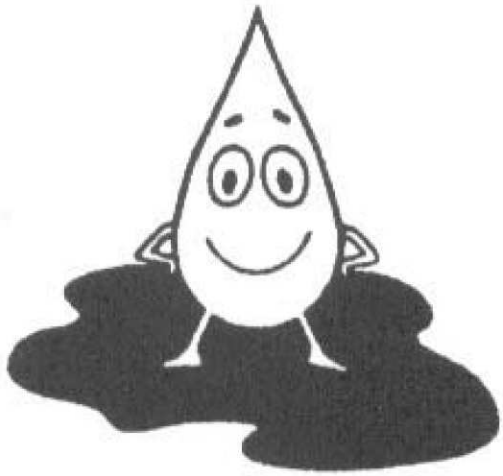

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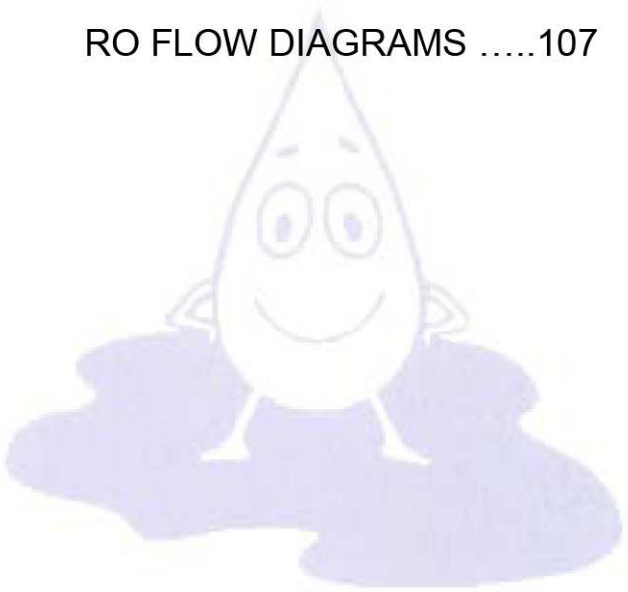
SECTION 8

RO FLOW DIAGRAMS …..107



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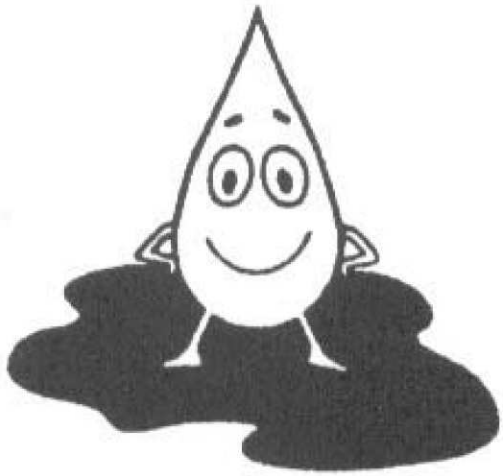

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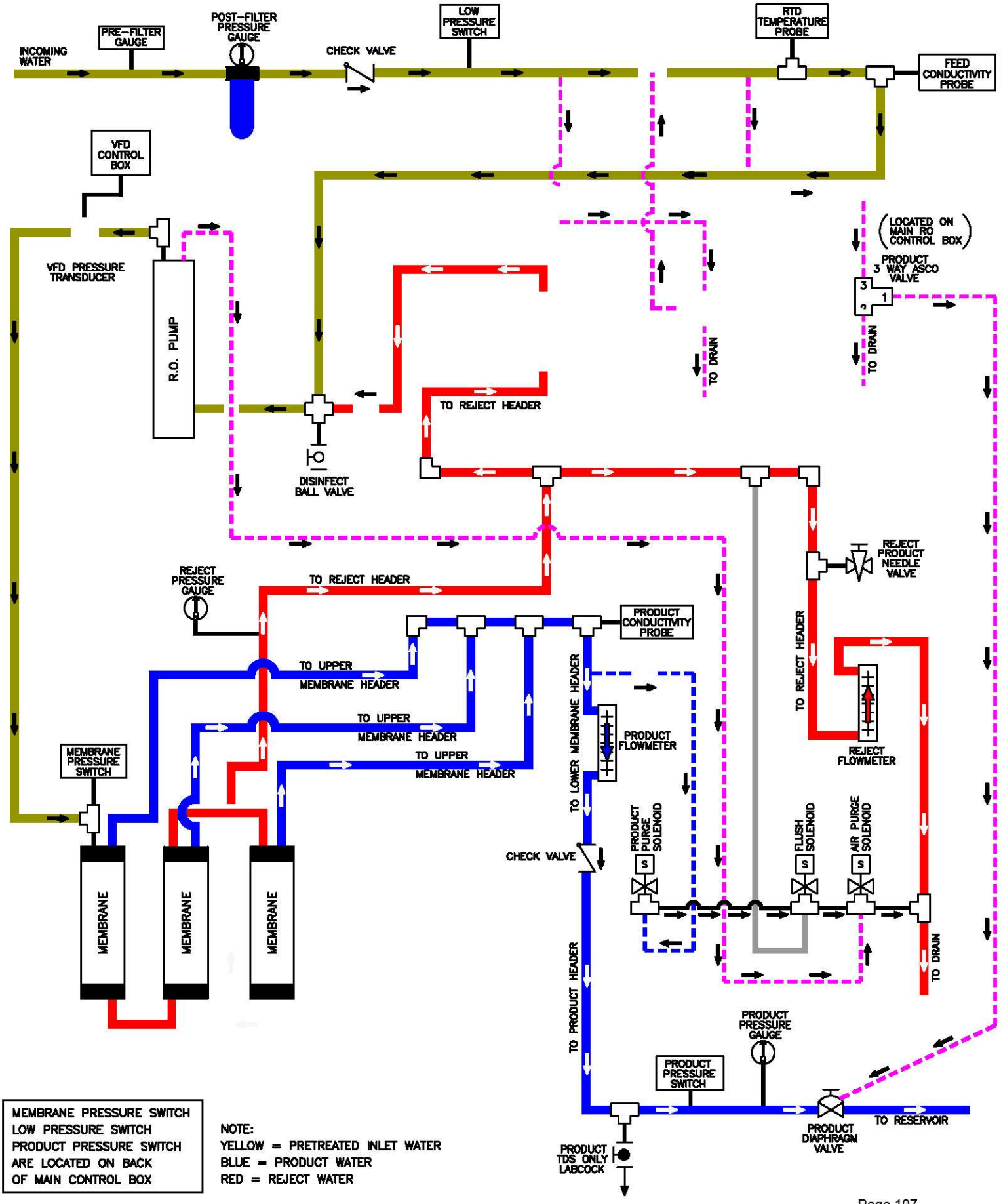

MEMBRANE PRESSURE SWITCH
LOW PRESSURE SWITCH
PRODUCT PRESSURE SWITCH
ARE LOCATED ON BACK
OF MAIN CONTROL BOX

NOTE:
YELLOW = PRETREATED INLET WATER
BLUE = PRODUCT WATER
RED = REJECT WATER

ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

BETTER WATER INC.

DRAWING TITLE: 2436 VFD RO FLOW SCHEMATIC

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	03/16/07	1	1 OF 1		3498

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
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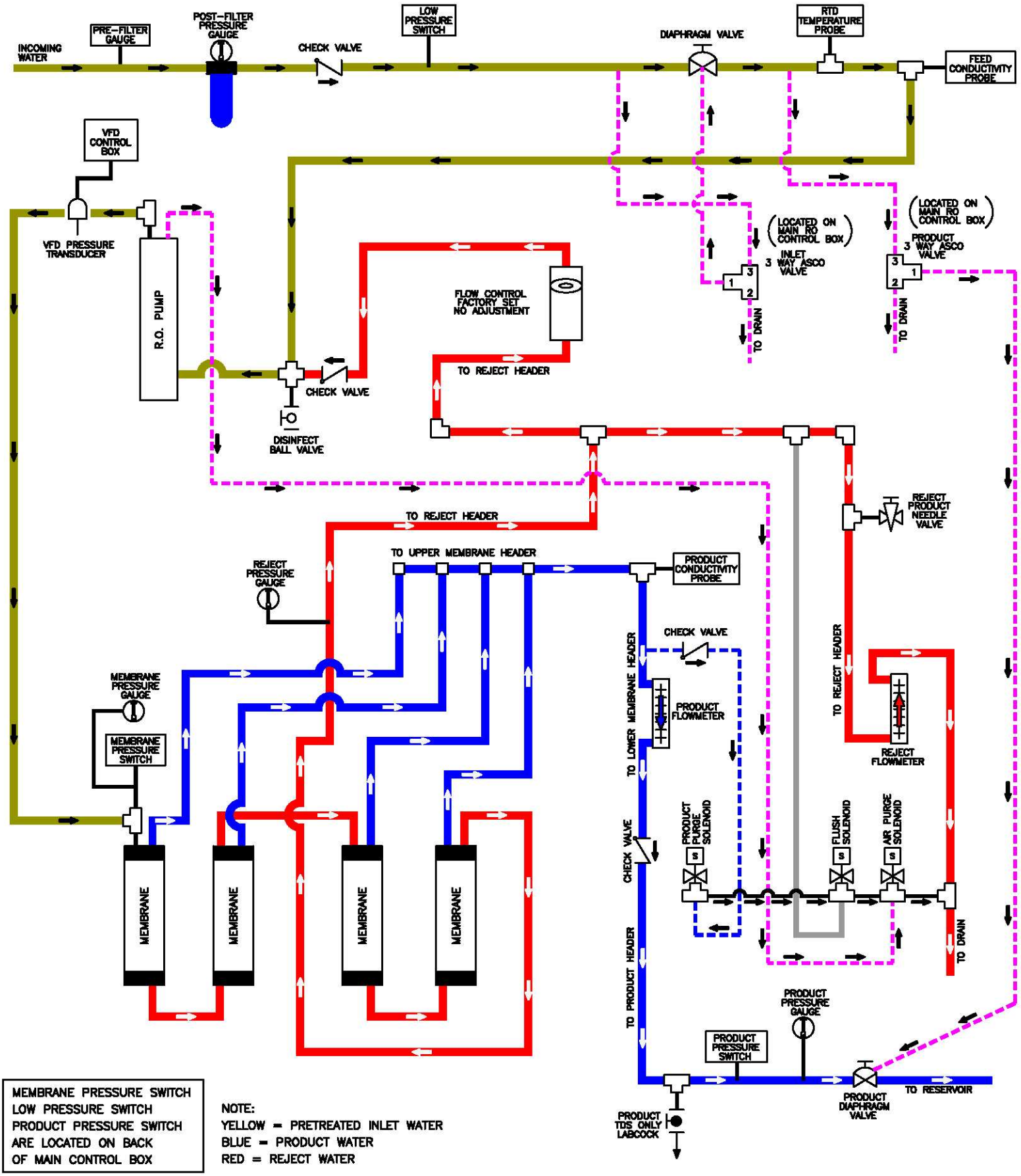

MEMBRANE PRESSURE SWITCH
LOW PRESSURE SWITCH
PRODUCT PRESSURE SWITCH
ARE LOCATED ON BACK
OF MAIN CONTROL BOX

NOTE:
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ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

BETTER WATER INC.

DRAWING TITLE: 2436 4 MEMBRANE VFD RO FLOW SCHEMATIC

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	03/16/07	1	1 OF 1		3520

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
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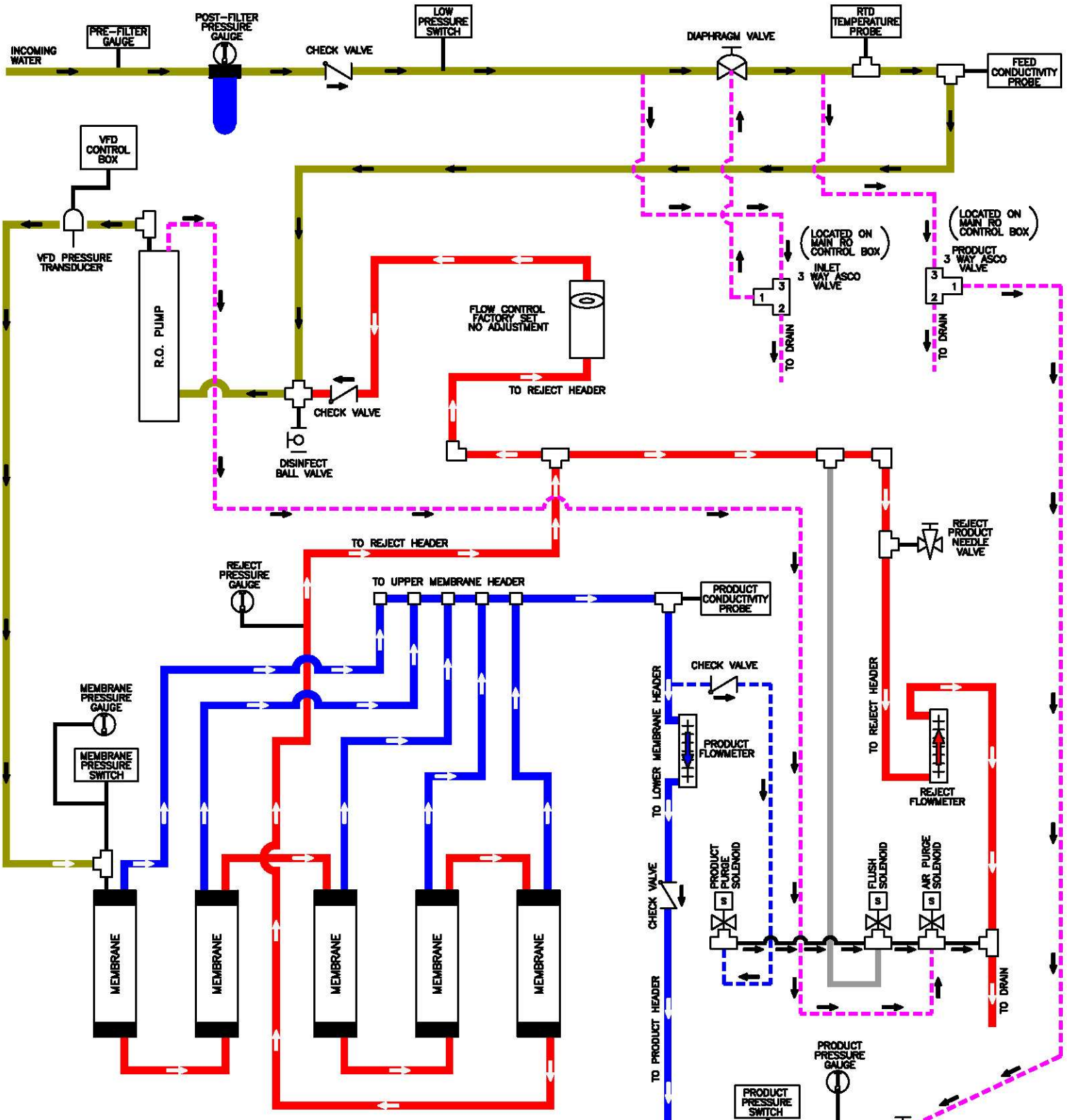


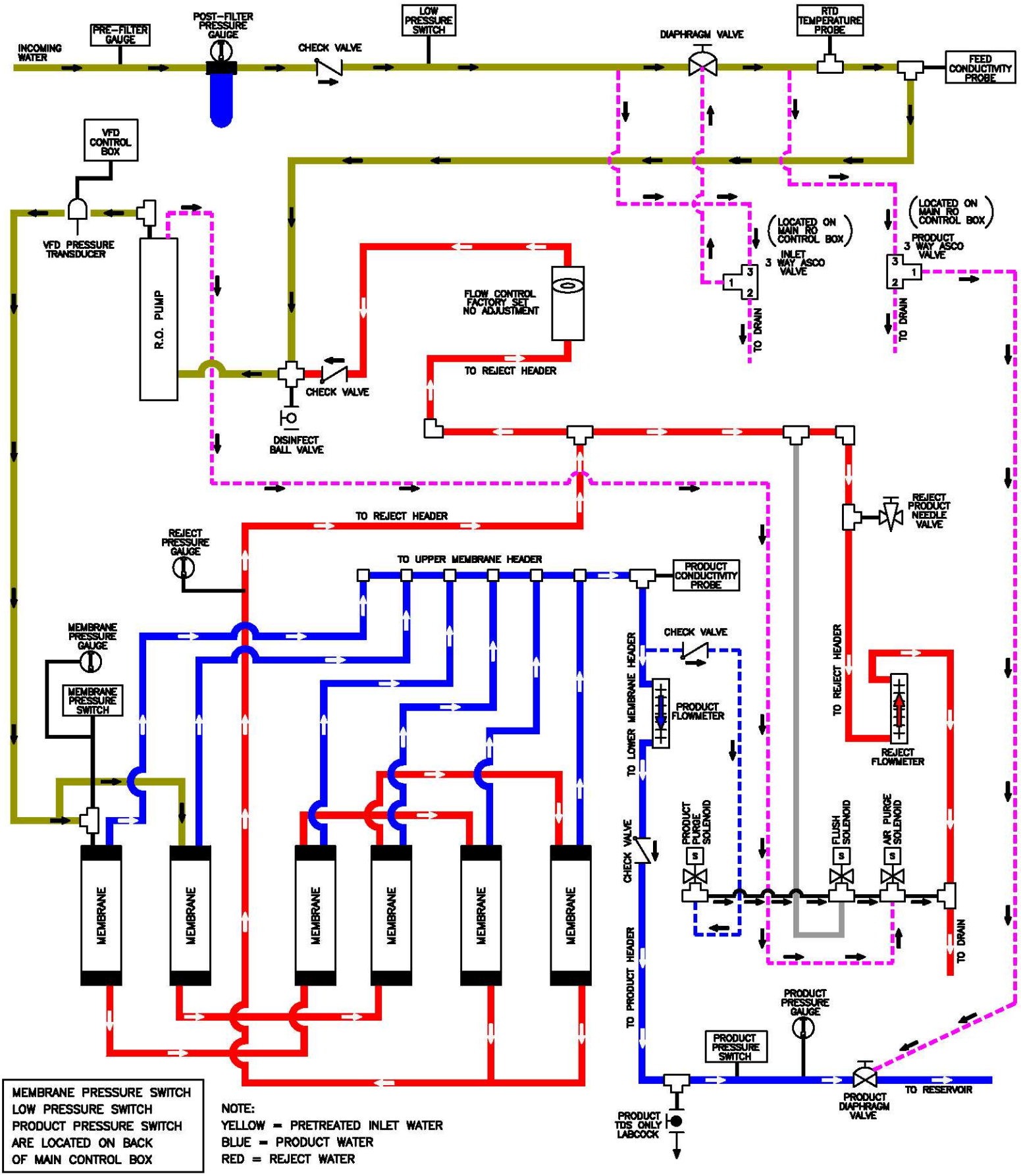
MEMBRANE PRESSURE SWITCH
LOW PRESSURE SWITCH
PRODUCT PRESSURE SWITCH
ARE LOCATED ON BACK
OF MAIN CONTROL BOX

NOTE:
YELLOW = PRETREATED INLET WATER
BLUE = PRODUCT WATER
RED = REJECT WATER

ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

BETTER WATER INC.	DRAWING TITLE: 2436 5 MEMBRANE VFD RO FLOW SCHEMATIC							
APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	03/16/07	1	1 OF 1		3521

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
1	REMOVED LOW PRESSURE FROM TITLE	07/01/10	RTS				



MEMBRANE PRESSURE SWITCH
LOW PRESSURE SWITCH
PRODUCT PRESSURE SWITCH
ARE LOCATED ON BACK
OF MAIN CONTROL BOX

NOTE:
YELLOW = PRETREATED INLET WATER
BLUE = PRODUCT WATER
RED = REJECT WATER

ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

BETTER WATER INC.

DRAWING TITLE: 2436 6 MEMBRANE VFD RO FLOW SCHEMATIC

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	03/16/07	1	1 OF 1		3522

REVISION	DESCRIPTION	DATE	Rev. by:	REVISION	DESCRIPTION	DATE	Rev. by:
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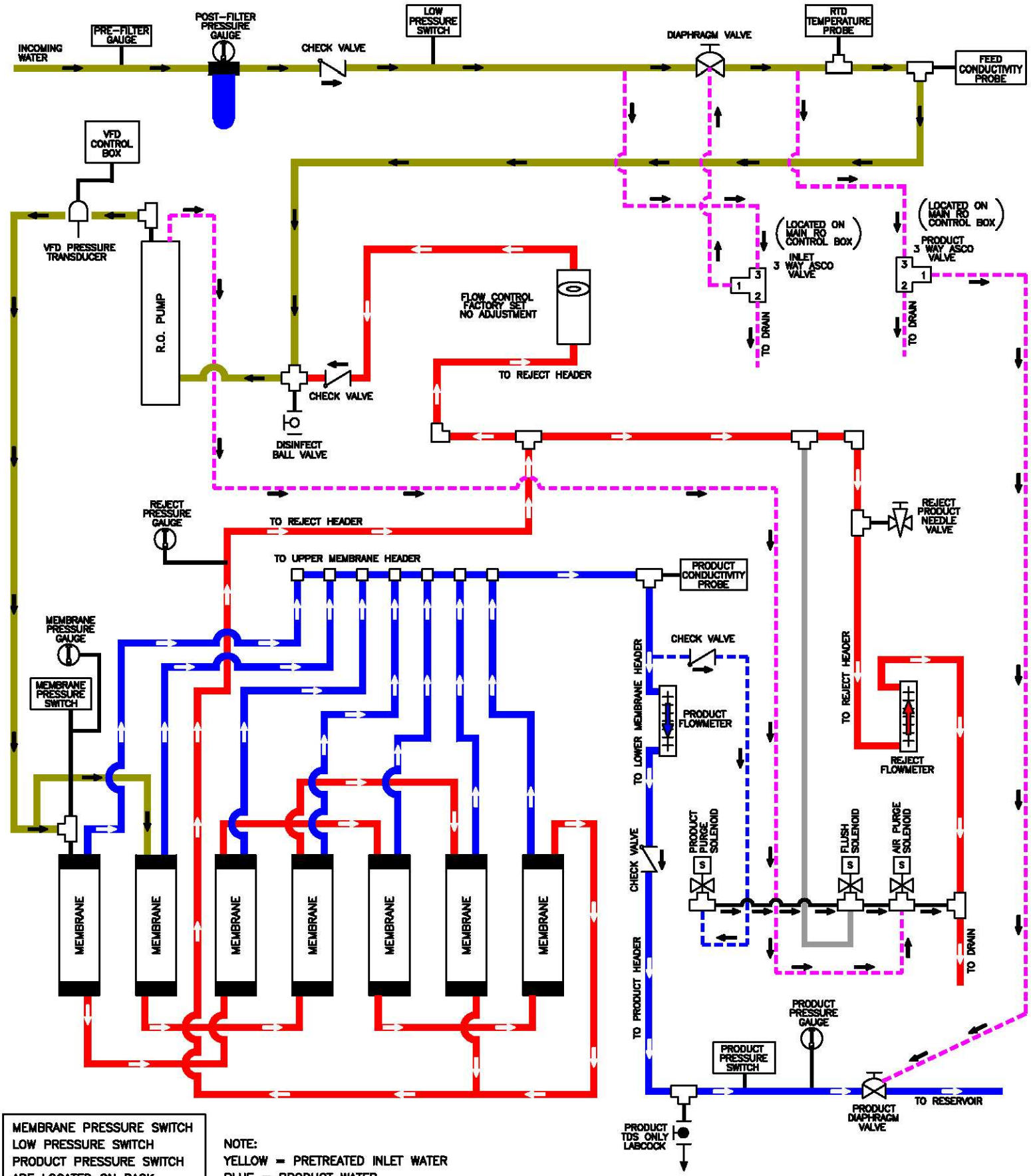

MEMBRANE PRESSURE SWITCH
LOW PRESSURE SWITCH
PRODUCT PRESSURE SWITCH
ARE LOCATED ON BACK
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NOTE:
YELLOW = PRETREATED INLET WATER
BLUE = PRODUCT WATER
RED = REJECT WATER

ACTUAL SIGNATURES ON FILE AT BETTER WATER, INC.

BETTER WATER INC.

DRAWING TITLE: 2436 7 MEMBRANE VFD RO FLOW SCHEMATIC

APPROVED BY:	CHECKED BY:	DRAWN BY:	DATE:	REVISION	SHT. NO.	ASSEMBLY NO:	DWG NO:
		R Sandgren	03/16/07	1	1 OF 1		3523

Appendix 1
Central RO Technical Service Bulletins

Better Water LLC 698 Swan Drive, Smyrna, TN 37167
Ph. (615) 355-6063, Fax (615) 355-6065
WWW.BETTERWATER.COM

Relocation of Wire on Replacement VFDs		TSB 2012009
Created/Last Revised Date 10/18/2012	Last Reviewed Date 10/18/2012	Page 1 of 1

TECHNICAL SERVICE BULLETIN

OVERVIEW:

The manufacturer discontinued the model of the VFD used in Better Water LLC's 2436 ROs and Pretreatment devices in October of 2012. The replacement model is functionally the same with the exception of the use of one of the terminal posts, which will require the relocation of a wire if the older model VFD is replaced with a newer model.

Better Water LLC's part number of **EQMOBO01353** which is the **"3 Phase-In / 3 Phase-Out / 3 Horsepower VFD"** will remain the same. The difference between these two models is mostly cosmetic. See the pictures below of the old and new models.

Old Model VFD
White/Cream color with hinged cover
Front View

New Model VFD
Black color, no hinged cover
Front View

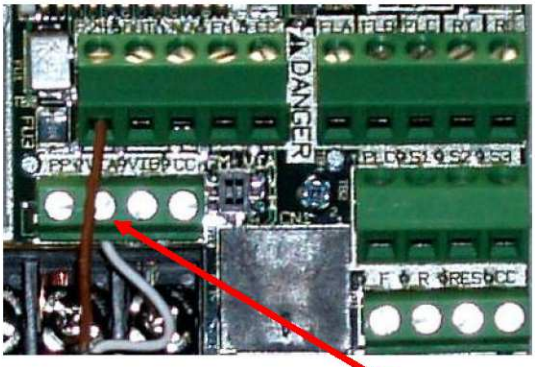
WIRE RELOCATION:

If the older model VFD has to be replaced, do the following, using the before and after pictures as reference:

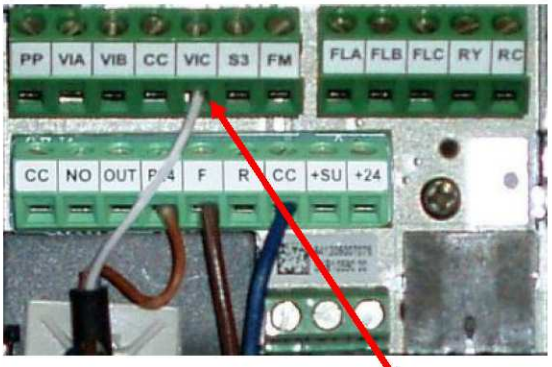
1. Take note of the location of the white wire (*from the pressure transducer*) on the older model VFD's terminal post labeled **VIA**.

2. Replace the older model VFD with the newer model VFD.

3. On the newer model VFD, relocate the white wire (*from the pressure transducer*) to the terminal post labeled **VIC**.



Old Model VFD
White wire is located on the **VIA**
terminal post



New Model VFD
White wire is located on the **VIC**
terminal post

Relocation of Wire on Replacement VFDs		TSB 2012010
Created/Last Revised Date 11/09/2012	Last Reviewed Date 11/09/2012	Page 1 of 1

TECHNICAL SERVICE BULLETIN

OVERVIEW:

The manufacturer discontinued the model of the VFD used in Better Water LLC's 3046 ROs and Post-treatment devices in October of 2012. The replacement model is functionally the same with the exception of the use of one of the terminal posts and the location of grounding posts, both requiring the relocation of wires if the old model VFD is replaced with the new model.

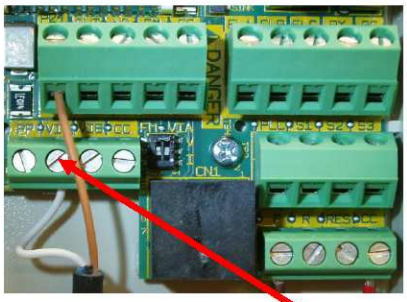
Better Water LLC's part number of **EQMOBO01350** which is the **"3 Phase-In / 3 Phase-Out / 5 Horsepower VFD"** will remain the same. The difference between these two models is mostly cosmetic. See the pictures below of the old and new models.

Old Model VFD
White/Cream color with hinged cover
Front View

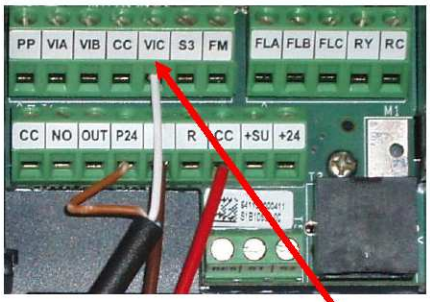
New Model VFD
Black color, no hinged cover
Front View

TERMINAL POST & GROUND WIRE RELOCATION:

1. Turn off the power, and unplug the device from the electrical outlet before opening the control box.
2. On the old model VFD, take note of the location of the **wire (*from the pressure transducer*) on the terminal post labeled VIA** and where the **three ground wires** are located.
3. Replace the old model VFD with the new model VFD, reconnecting the wires with the following exceptions.
4. On the new model VFD, relocate the wire (*from the pressure transducer*) to the terminal post labeled **VIC**.

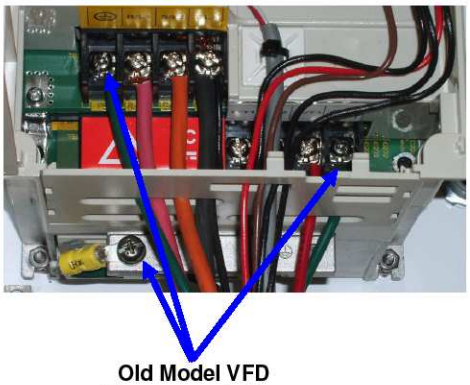


Old Model VFD
Wire located on terminal post **VIA**

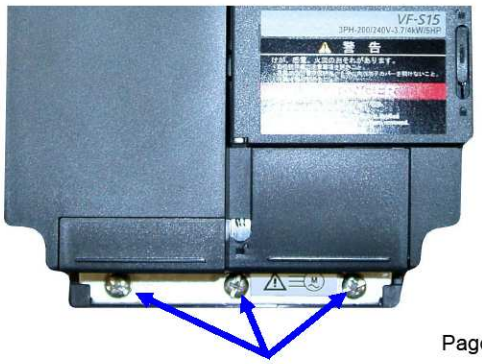


New Model VFD
Wire located on terminal post **VIC**

5. Relocate the three ground wires to the three grounding posts on the bottom of the new model VFD.



Old Model VFD
Three ground wires



New Model VFD
Three grounding posts