



Installation Instructions and Owner's Manual

NB & NEB Series

Backwashing Filter System



First Sales

12630 US Highway 33 N
Churubusco, IN 46723

Phone (260) 693-1972 Fax (260) 693-0602

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Pre-Installation Instructions

Description of the backwashing filter

The NB/NEB system includes a filtration tank (with gravel and distributor) and a backwashing control valve with bypass. Filtration media for use with the NB/NEB system is purchased separately and selected from the following types:

PART NUMBER	MEDIA TYPE / APPLICATION	VOLUME (CU. FT.)	PACKAGE	SHIP. WT. (LBS.)
A10	ACTIVATED CARBON TASTE & ODOR REDUCTION	1.00	BAG	29
A05P		0.50	PAIL	14
ACC10	CATALYTIC CARBON CHLORAMINE REDUCTION	1.00	BAG	29
ACC05P		0.50	PAIL	14
B10	BIRM REDUCTION OF IRON AND MANGANESE	1.00	BAG	41
B05P		0.50	PAIL	20
C05P	CALCITE SELF LIMITING ACID NEUTRALIZER	0.50	PAIL	45
FA10	FILTER – AG SUSPENDED SOLIDS REDUCTION	1.00	BAG	24
FA05P		0.50	PAIL	12
ZEO10	ZEOLITE SUSPENDED SOLIDS/ SEDIMENT REDUCTION	1.00	BAG	25
Z05P		0.50	PAIL	50
N05	NEUTRALIZER ACID NEUTRALIZER	0.50	PAIL	43
QFS05P	QUARTZ FILTER SAND (.45mm x .55mm) SEDIMENT REDUCTION	0.50	PAIL	51

Successful Application

Any filter media may have specific limitations and/or requirements for successful application. A water sample should be submitted to First Sales for analysis and recommendation by Customer Service.

Time of Backwash

Periodically the control valve will go through a backwash cycle. This cycle is factory preset to 12:00 A.M. flushing the accumulated sediment and/or precipitant to the drain. After the backwashing process the unit is now prepared for the next period of service.

Pre-Installation Instructions

Water Supply

This filter will function properly when the water supply is furnished by a jet pump, submersible pump, variable speed (constant pressure) pump or community water supply. As with all other filter systems, however, it is imperative that the well pump provides enough flow rate for the filter to adequately backwash. In order to ensure sufficient backwash flow rate the following pumping rate test should be performed prior to installing the NB/NEB.

1. Make certain no water is being drawn in the house.
2. Open spigot nearest pressure tank.
3. When well pump starts, close spigot and measure time (in seconds) to refill pressure tank (well pump turns back off). This is **Cycle Time**.
4. Using a container of known volume, draw water from pressure tank and measure how many gallons until the pump turns back on again. This is **Draw Down**.
5. Calculate pumping rate by dividing draw down by cycle time and multiplying by 60.

$$\frac{\text{Draw Down (gallons)}}{\text{Cycle Time (seconds)}} \times 60 = \text{Pumping Rate (gallons per minute)}$$

Example: Draw down is 8 gallons
Cycle time is 65 seconds

$$\frac{8 \text{ gallons}}{65 \text{ seconds}} \times 60 = 7.4 \text{ gpm (gallons per minute)}$$

Location Considerations

The proper location to install the NB/NEB will ensure optimum filter performance and satisfactory water quality. The following factors should be considered in selecting the location of this system.

1. The NB/NEB must be installed after the pressure tank (private well system only).
2. The system should be installed as close as possible (preferably within 15') to an adequate floor or laundry drain capable of handling the backwash cycle volume and flow rate (refer to unit specifications). An air gap should be provided between the NB/NEB drain line and plumbing drain.
3. All water conditioning equipment should be installed at least 10' prior to the water heater. Water temperatures exceeding 100°F can damage the internal components of the control valve and filter tank. An expansion tank may need to be installed in the line to the water heater in order to allow for thermal expansion and comply with local plumbing codes.
4. Water pressure must not exceed the range of 25 - 100 psi.
5. The system must not be subject to freezing temperatures.
6. The control valve requires 115/120 V, 60 Hz electricity from a three prong outlet that is not wired to a switch.
7. Never install a cartridge type filter prior to the NB/NEB. Any cartridge or in-line filter (if desired) may be installed after the NB/NEB system. This will prevent restricting the water flow and pressure available for backwash.
8. Appliances requiring extended periods of continuous or high flow water use (i.e. geothermal heat pumps, swimming pools, lawn irrigation, outside hose bibs, etc.) should bypass the filter.

General Installation

GENERAL INSTALLATION & SERVICE WARNINGS

The water conditioner is not designed to support the weight of plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black "O" Rings. This will allow ease of installation and decrease chance of rolling from the bypass and tank connections. *Avoid any type of lubricants, including silicone, on red or clear lip seals.*

Do not use pipe dope or other sealants on threads. Teflon® tape must be used on the threads of the drain line connection. Teflon® tape is not used on any connection where "O" Ring seals are used

NOTE: If the plumbing system is used as the ground leg of the electric supply, continuity should be maintained by installing ground straps around any non-conductive plastic piping or bypass used in the installation.

Make sure the filter is not installed backwards. The filter will not function properly if installed backwards and filter media may be forced into the water lines. Arrows molded into the valve body and into the bypass indicate the direction of flow.

Typical Installation

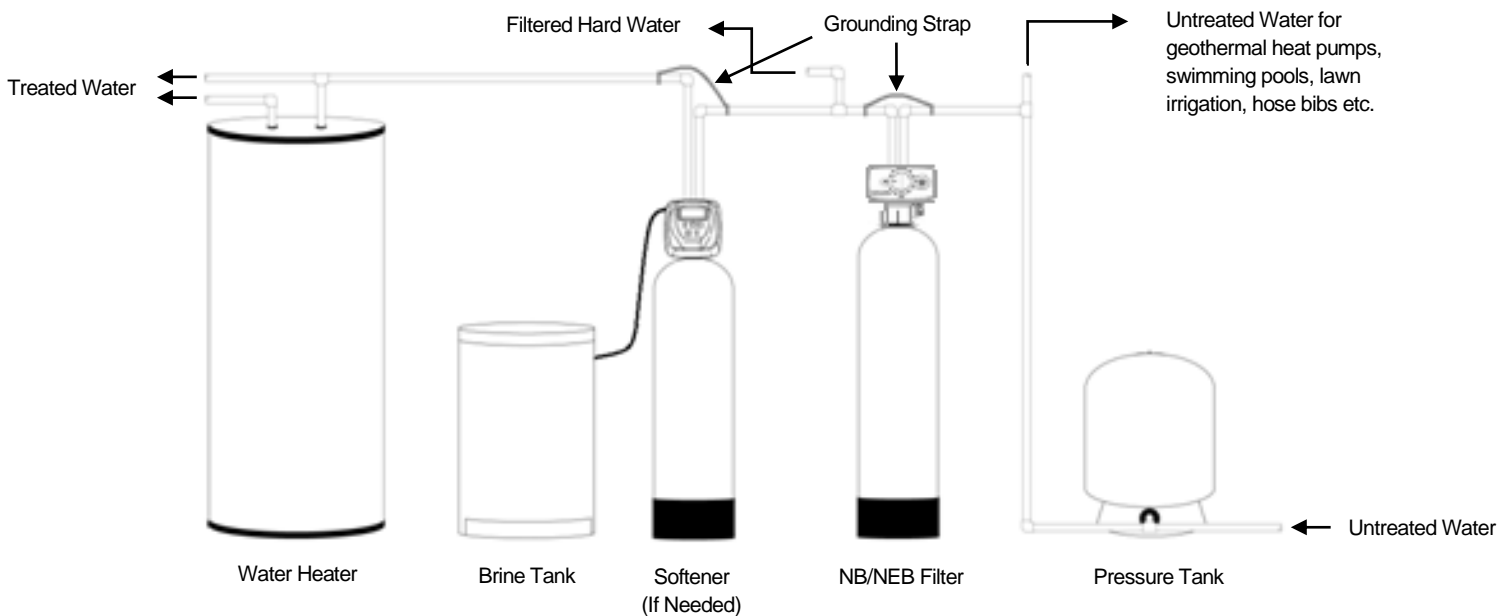


FIGURE 1: Typical Installation

Installation Instructions

- STEP 1:** Carefully remove all components from packaging. **DO NOT DISCARD PACKAGING** until all backwash system components and fittings have been located.
- STEP 2:** Place unit at desired installation position. Be sure the location is within 15 feet of a drain that is lower than the control valve and near a non-switched electrical outlet. Also, ensure the tank is on a level and firm base. Install the unit with at least 10 feet of piping before the water heater to prevent hot water from backing into the filter. Turn off the main water supply and drain the system.
- STEP 3:** With the backwash filter unit in the upright position, **remove the control valve** from the mineral tank being careful to not pull the distributor out of the gravel at the bottom of the tank..
- STEP 4:** Cover the top of the distributor tube with the included red cap and, using the included blue media funnel, **pour filter media(s) (purchased separately) into the mineral tank**. If using multiple filter media types, load in the order of heaviest (most dense) to lightest (least dense). 12" – 14" of space **MUST** be left empty at the top of the mineral tank to allow for media bed expansion during backwash and to prevent filter media from being discharged through the drain line.
- STEP 5:** Use a garden hose or bucket to **fill the media tank with water**.
IMPORTANT: Carbon, Filter Ag, Zeolite and Birm must be soaked for at least 2 hours prior to submitting it to full backwash flow rate to prevent over-expansion of the media bed during backwash.
- STEP 6:** Clean mineral tank threads to remove any filter media. Remove red cap from distributor tube and reinstall control valve by threading it securely onto the mineral tank. (O-ring seal; **HAND TIGHTEN ONLY!**).
- STEP 7:** If not factory installed, use the clips and screws provided and attached the bypass valve to the inlet/outlet of the control valve. See Figures 2, 3, and 4 below.

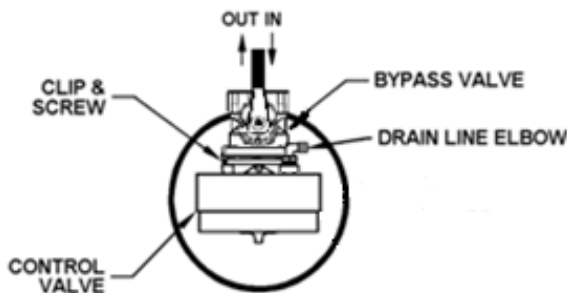


FIGURE 2: Top View of NB Control Valve

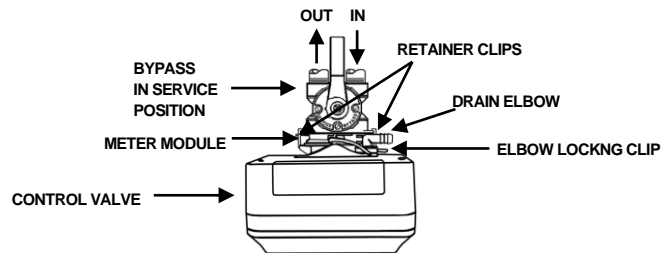


FIGURE 3: Top View of NEBW Control Valve

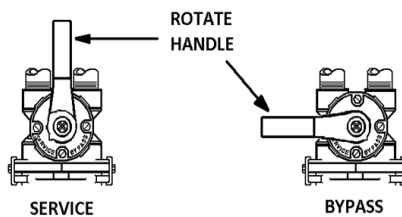


FIGURE 4: Bypass Valve

Installation Instructions (cont.)

- STEP 8:** Shut off all water at main supply. On private well system, turn off power to pump and drain pressure tank. Make certain pressure is relieved from complete system by opening nearest faucet to drain system. **SHUT OFF FUEL / ELECTRICAL SUPPLY TO WATER HEATER.**
- STEP 9:** Cut main supply line as required to fit plumbing to inlet and outlet of bypass valve.
- STEP 10:** Attach plumbing. **DO NOT** apply heat to any fitting connected to bypass valve or control valve, as damage may result to internal parts or connecting adapters. **MAKE CERTAIN WATER ENTERS THROUGH INLET AND DISCHARGES THROUGH OUTLET** (See figure 2).
- STEP 11:** Use the provided polyethylene tubing (**NO VINYL TUBING**) to run drain line from control valve discharge fitting to floor drain or sump pit capable of handling the backwash rate of the filter (refer to specifications and flow rate on page 14). There must be an air gap at the end of the drain line to prevent siphoning of waste water. Length of drain line should be 15' or less. **AVOID OVERHEAD DRAINS.**
- STEP 12:** **MAKE SURE THE BYPASS VALVE IS IN THE "BYPASS" POSITION** (Figure 4, Page 5) and open the main supply valve or turn on power to the pump on private well systems.
- STEP 13:** For the **NB** Series rotate the Manual Regeneration Knob (see Fig. 5, page 7) to the "Backwash" position.
- For the **NEB** Series plug transformer into an un-switched electrical outlet and attached the power cord to the control valve. Then press and hold down the center "ADVANCE" button for 5 seconds and release after "GO TO BW" appears on the screen (see Figure 6, page 8). When the backwash countdown timer begins, unplug the transformer from the electrical outlet.
- STEP 14:** Refer to Figure 4 on page 5 for appropriate bypass valve operation. Rotate bypass lever of stainless steel bypass $\frac{1}{4}$ of the way to Service allowing unit to fill slowly. **IMPORTANT: Activated Carbon, Filter Ag and Birm must be soaked for at least 2 hours prior to submitting it to full flow rate to prevent loss of media to drain.**
- When all air has been purged from the system and only water is running to the drain, slowly turn the bypass valve to the "Service" position and allow the NB/NEB to backwash for 10 minutes or until the water runs clear (whichever is longer).
- STEP 15:** Plug the softener into an un-switched electrical outlet and allow the unit to complete regeneration automatically.
- STEP 18:** Check for leaks and correct as necessary.
- STEP 19:** Turn power or fuel supply back on to water heater.
- STEP 20:** Set the regeneration days frequency (refer to page 5 for **NB** Series). The **NEB** units may be configured to regenerate based on gallons and/or days (refer to pages 9 & 10).
- STEP 21:** Set the current time of day on the timer (note AM and PM) (refer to Figure 5, page 7 or Figure 6, page 8).

RECOMMENDED: Retain the red distributor cap and blue media funnel for future replenishment of filter media.

NOTE: If the filter is loaded with any self-sacrificing media like Calcite or Neutralizer, mark the media level on the side of the tank by shining a bright light through the tank to see its level. Replenish the media in the mineral tank when the level drops by more than three inches.

NB Time Clock Setting Instructions

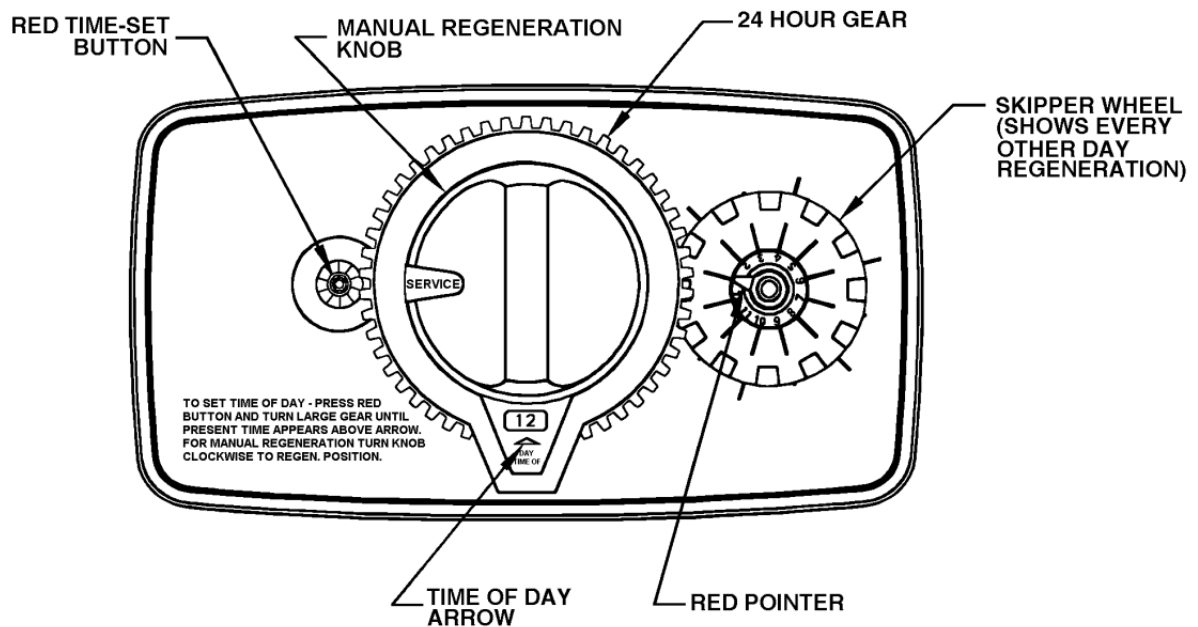


FIGURE 5: Front of Time Clock Timer Assembly

How to set Time of Day:

1. Press and hold the red button to disengage the 24 hour gear.
2. Turn the large 24 hour gear until the actual time of day is at the time of day arrow.
3. Release the red button to again engage the 24 hour gear.

How to set the Backwash Days:

1. Rotate the skipper wheel until the number 1 is at the red pointer. Each number represents a day. The number by the red pointer is tonight.
2. Slide the metal tabs outward on the desired days of backwash. Factory default setting is every third day.

How to Manually Initiate a Regeneration Cycle:

1. Grab the manual regeneration knob and turn clockwise SLIGHTLY.
2. The drive gear will engage the regeneration knob which will make a complete revolution and return to the "Service" position after the regeneration cycle.

NEB Electronic Display Operation

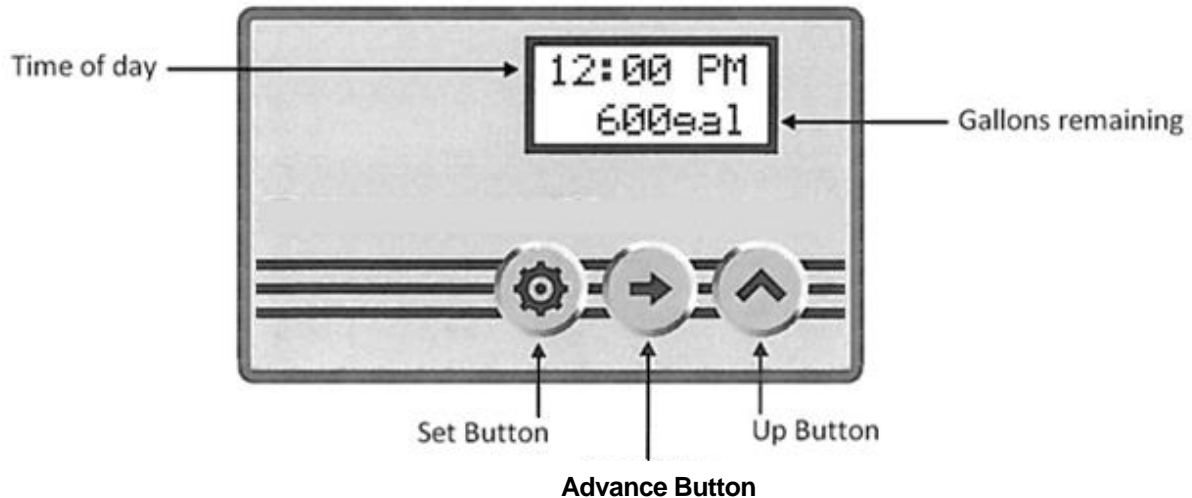


FIGURE 6: Front of Electronic Meter Timer Assembly



SET BUTTON

1. Press and hold Set Button for 5 seconds to enter Programming Mode.
2. When valve is in Programming Mode, press Set Button to confirm setting and advance to next menu option.



ADVANCE BUTTON

1. Press and hold Advance Button for 5 seconds to initiate an immediate regeneration cycle.
2. Press and release Advance Button during a regeneration cycle to immediately advance the valve to the next step in the regeneration process.
3. When the valve is in Programming Mode, press the Advance Button to move the cursor.



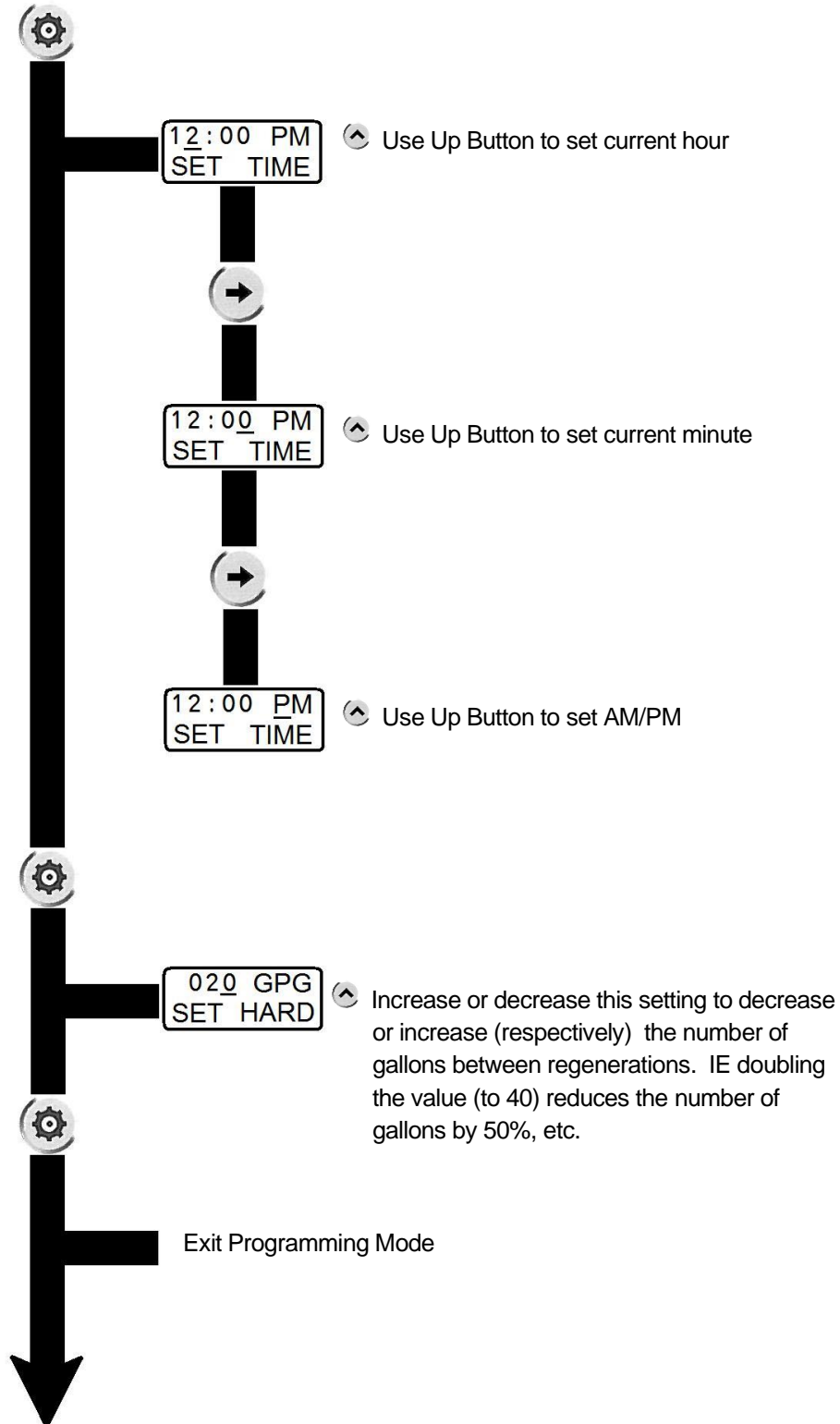
UP BUTTON

1. When the valve is in the Programming Mode, press Up Button to adjust setting.

NEB Electronic Programming

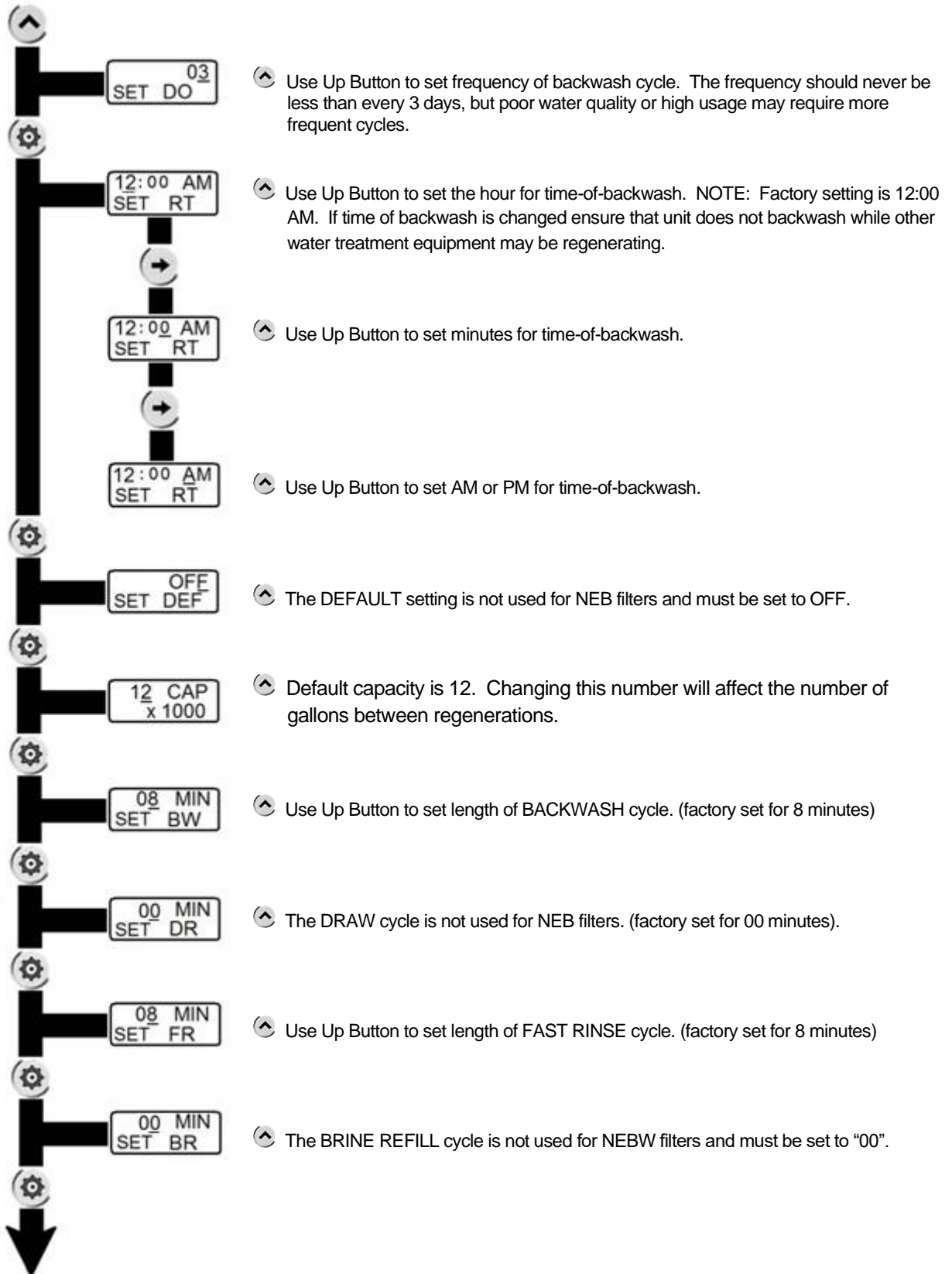
Enter Programming Mode:

Press and Hold the SET Button for 5 seconds.



NEB Additional Programming

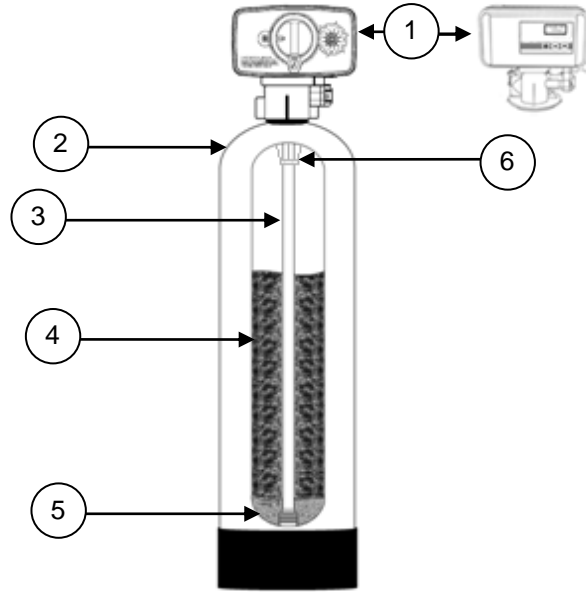
Press and HOLD the UP button for 5 seconds to enter the programming mode.



Specifications

Description	NB1044	NB1054	NB1248
Filter Media Volume, cu. ft.	1.0	1.5	2.0
Gravel Underbed, lbs.	20	20	25
Operating Flow Rate, gpm			
Continuous (no duration limit, 5 gpm/ft ²)	2	3	4
Service (intermittent flow up to 10 gpm/ft ²)	5	6	8
Peak (10 mins. or less, 15 gpm/ft ²)	8	9	12
Backwash Flow Rate	5	5	7
Service Pipe Size, in			
Standard	¾	¾	¾
-1S Suffix on Model Number	1	1	1
Minimum Space Required, in.			
Mineral Tank, diameter x height	10 x 44	10 x 54	12 x 48
Overall, length x width x height	14 x 10 x 52	14 x 10 x 62	15 x 12 x 56
Approximate Ship Wt., lbs. (Media Not Included)	44	47	55
Description	NEB1044-S	NEB1054-S	NEB1248-S
Filter Media Volume, cu. ft.	1.0	1.5	2.0
Gravel Underbed, lbs.	20	20	25
Operating Flow Rate, gpm			
Continuous (no duration limit, 5 gpm/ft ²)	2	3	4
Service (intermittent flow up to 10 gpm/ft ²)	5	6	8
Peak (10 mins. or less, 15 gpm/ft ²)	8	9	12
Backwash Flow Rate	5	5	7
Service Pipe Size, in			
Standard	¾	¾	¾
-1S Suffix on Model Number	1	1	1
Factory Programming Settings			
Day Override Setting	3	3	3
Regeneration Time	12:00 AM	12:00 AM	12:00 AM
Default Size Setting	OFF	OFF	OFF
Regenerate after capacity (grains)	12,000	12,000	12,000
Backwash (minutes)	8	8	8
Brine Draw (minutes)	1	1	1
Fast Rinse (minutes)	4	4	6
Brine Refill (minutes)	1	1	1
Minimum Space Required, in.			
Mineral Tank, diameter x height	10 x 44	10 x 54	12 x 48
Overall, length x width x height	14 x 10 x 52	14 x 10 x 62	15 x 12 x 56
Approximate Ship Wt., lbs. (Media Not Included)	48	52	59

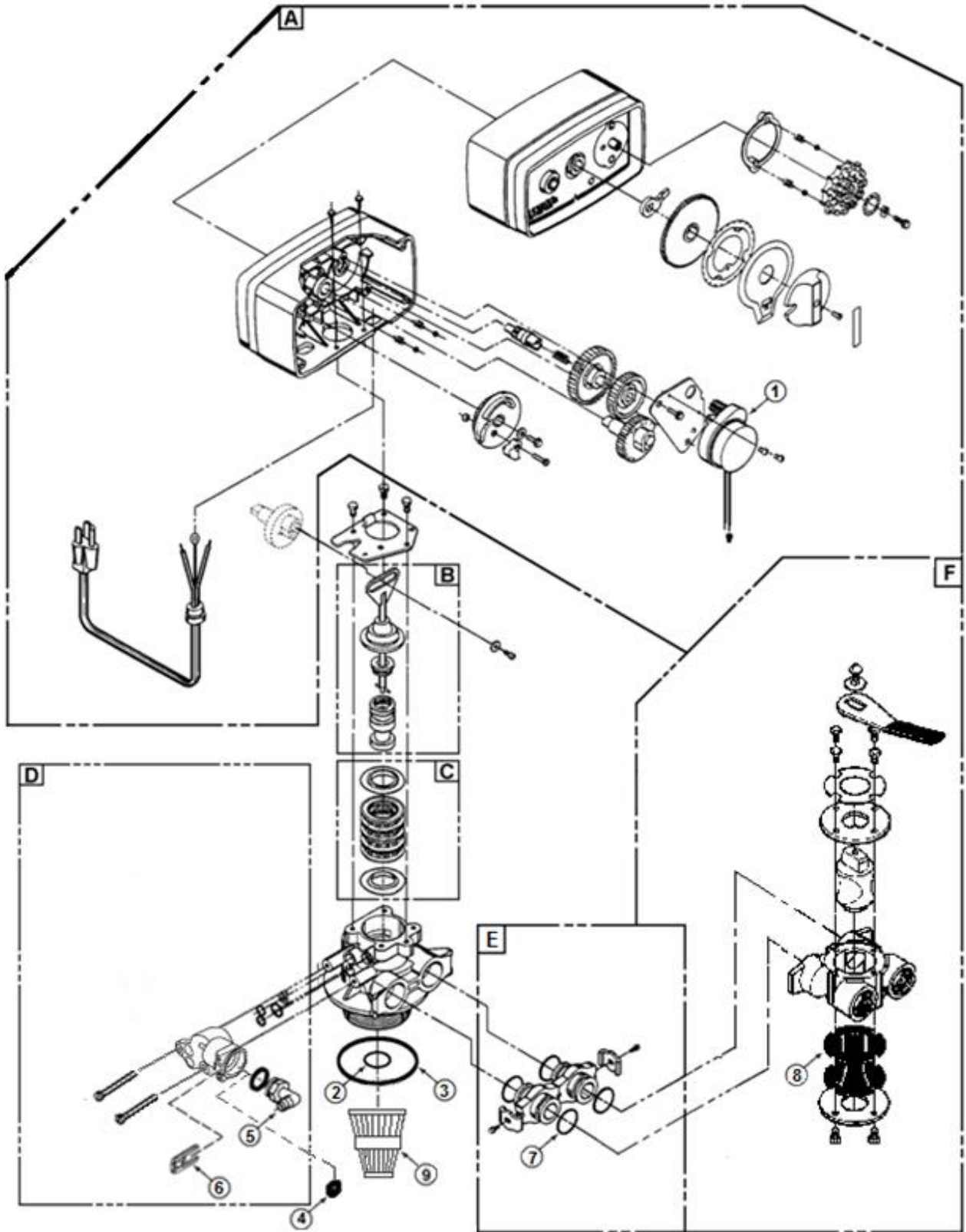
Component Parts Breakdown & List



Ref #	Description	Unit		
		NB1044 NEB1044-S	NB1054 NEB1054-S	NB1248 NEB1248-S
1	Timeclock Valve L/Bypass	NB1044/1054 Vlv Assy L/BP	NB1044/1054 Vlv Assy L/BP	NB1248 Vlv Assy L/BP
	Electronic Metered L/Bypass	NEB1044/1054 Vlv Assy L/BP	NEB1044/1054 Vlv Assy L/BP	NEB1248 Vlv Assy L/BP
2	Mineral Tank	MTP1044N	MTP1054N	MTP1248N
3	Distributor	D100S-48	D100S-54	D100S-48
4	Media Qty (See page 2 for list)	1 cu ft	1.5 cu ft	2 cu ft
5	1/4" X 1/8" Gravel	QC20	QC20	Qty ½ QC50
6	Top Screen	18280-02	18280-02	18280-02

- Notes
1. Refer to pages 13 – 14 for complete control valve breakdown of time clock initiated control valves and pages 15 – 16 for meter initiated control valves.

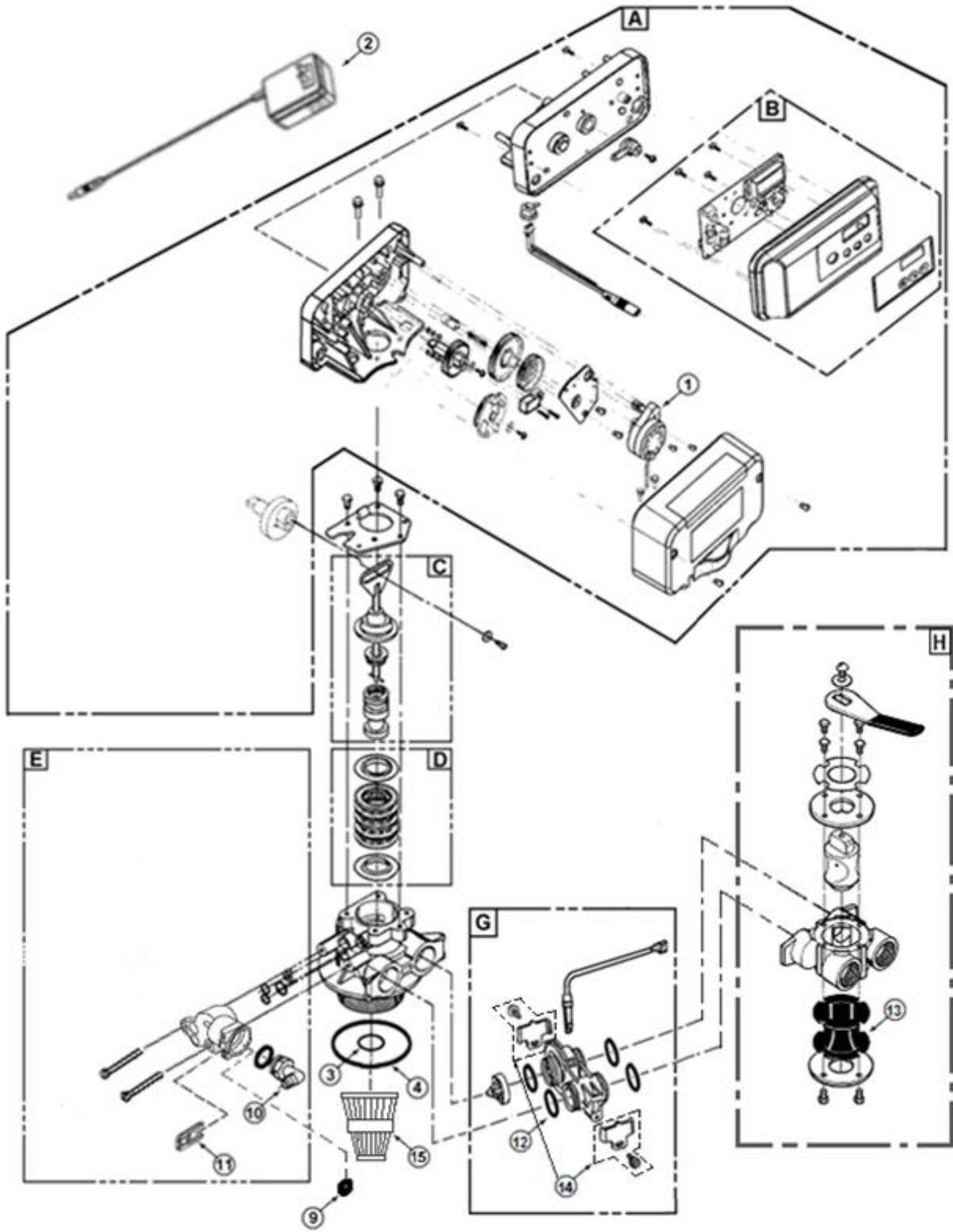
NB Time Clock Control Valve Breakdown



NB Time Clock Control Valve Parts List

REF #	Part Number	Description
A	N-PH	Power head, Time clock
B	60102-00	Piston Assembly
C	60125	Seal and Spacer Kit
D	NE-BW HOUSING	Drain Housing Assy, Blank DLFC
E	60900-41	Coupling, Adapter S/ASSY
F	60040SS	Bypass Valve, Stainless, ¾" NPT (Standard)
	60041SS	Bypass Valve, Stainless, 1" NPT (Optional, use -1S suffix)
1	18743-1	Motor, 120v/60hz, 1/30 RPM
2	13304	O-Ring, Distributor, -121
3	12281	O-Ring, Tank, -338
4	12092	Flow Control Washer, 5.0 GPM (NB1044, NB1054)
	12408	Flow Control Washer, 7.0 GPM (NB1248)
5	NE-DRAIN ELB	Drain Elbow, Quick Connect x ½" barbed
6	NE-DRAIN CLIP	Quick Release Clip, Drain Elbow
7	13305	Coupling O-Ring, -019
8	14105	Bypass Valve Seal, Single Lever
9	18280-02	Top Screen, Bayonet Style

NEB Electronic Control Valve Breakdown



NEB Electronic Control Valve Parts List

REF #	Part Number	Description
A	NE-PH	Power head, Metered
B	NE-FC	Front Panel and Circuit Board Assembly
C	60102-NES	Piston Assembly
D	60125	Seal and Spacer Kit
E	NE-BW HOUSING	Drain Housing, Blank DLFC
G	EM-1	Meter Module (includes cable)
H	60040SS	¾" Stainless Steel Bypass Valve
	60041SS	1" Stainless Steel Bypass Valve (Optional: add "-1" to model number)
1	42349	Motor, 24v/60hz, 2 RPM
2	NE-TRANS	Transformer, 110v Input--24v Output
3	13304	O-Ring, Distributor, -121
4	12281	O-Ring, Tank, -338
9	12092	Flow Control Washer, 5.0 GPM (NEB1044, NEB1054)
	12408	Flow Control Washer, 7.0 GPM (NEB1248)
10	NE-DRAIN ELB	Drain Elbow, Quick Connect x ½" barbed
11	NE-DRAIN CLIP	Quick Release Clip, Drain Elbow
12	NE-CON	Connector O-Ring
13	14105	Bypass Valve Seal, Single Lever
14	NE-CLIPS	Clips & Screws Set for NE, FE
15	18280-02	Top Screen, Bayonet Style

Troubleshooting

PROBLEM	CAUSES	SOLUTIONS
Excessive pressure drop through filter	<ul style="list-style-type: none"> A) Filter not backwashing B) Filter bed loaded with sand C) "Cementing" or "Channeling" D) Drain line restricted E) Top Screen Fouled F) Control Valve plugged with debris 	<ul style="list-style-type: none"> 1) Check timer motor and replace if faulty 2) Ensure uninterrupted power supply 3) Check Backwash frequency setup 4) Verify sediment being removed is less dense than the filter media and install a "Spin-Down" type sediment filter ahead of the unit to remove well sand 5) Verify adequate pumping rate for backwash 6) Probe media bed to check for "Cementing" 7) Check drain line for restriction: frozen, plugged, kinked, exceeds 15', overhead installation, flexible drain line, drain line diameter too small 8) Remove and clean top screen 9) Disassemble and clean control valve
Contaminant not being properly removed	<ul style="list-style-type: none"> A) Leaking bypass valve B) Internal valve leak C) Distributor not seated properly in control valve D) Water usage flow rate exceeds filter specifications 	<ul style="list-style-type: none"> 1) Verify bypass valve is in service position 2) Replace piston, spacers and seals 3) Verify distributor tube seated securely in control valve body 4) Verify actual water usage flow rates against system specifications 5) Increase length of backwash and rinse cycles
Neutralizer media raises pH too high	<ul style="list-style-type: none"> A) Filter is brand new B) Wrong media used 	<ul style="list-style-type: none"> 1) Turn bypass valve very slightly to the "Bypass" position allowing a small amount of untreated water to bleed into the treated water 2) Rebed the unit with a less aggressive media
Neutralizer media fails to raise pH sufficiently	<ul style="list-style-type: none"> A) Water usage flow rate is too high to provide adequate contact time B) Media bed is "Cemented" or "Channeled" 	<ul style="list-style-type: none"> 1) Verify actual water usage flow rates against system specifications 2) Verify adequate pumping rate for backwash 3) Check drain line for restriction: frozen, plugged, kinked, exceeds 15', overhead installation, flexible drain line, drain line diameter too small
Birm Filter fails to remove iron	<ul style="list-style-type: none"> A) pH too low B) Dissolved oxygen level too low 	<ul style="list-style-type: none"> 1) pH of untreated water must be 6.8 or higher – adjust with proper equipment 2) Aerator may be installed prior to the filter
Loss of media to drain	<ul style="list-style-type: none"> A) Air in system B) Insufficient soak time before first backwash after installing media C) Missing top screen 	<ul style="list-style-type: none"> 1) Ensure well system has proper air elimination control 2) Check media level and adjust if necessary 3) Install top screen
Howling or whistling noise during regeneration	<ul style="list-style-type: none"> A) Inadequate drain line diameter or drain line restricted 	<ul style="list-style-type: none"> 1) Reconfigure or replace drain line

Troubleshooting (cont.)

PROBLEM	CAUSES	SOLUTIONS
Continuous flow of water to drain	<ul style="list-style-type: none"> A) Loss of electrical power during regeneration B) Debris in control valve C) Internal leak in control valve D) Drive motor faulty 	<ul style="list-style-type: none"> 1) Ensure electrical outlet is functioning 2) Disassemble and clean control valve 3) Replace seals and/or piston 4) Replace faulty drive motor
Media in the service lines	<ul style="list-style-type: none"> A) Unit installed backwards and top screen missing 	<ul style="list-style-type: none"> 1) Re-plumb the water lines so that the supply side of the line is connected to the inlet of the bypass and the service side is connected to the outlet. 2) Install top screen

Ten Year Limited Warranty

WARRANTY – First Sales, LLC. warrants this water conditioner against any defects that are due to faulty material or workmanship during the warranty period. This warranty does not include damage to the product resulting from accident, neglect, misuse, misapplication, alteration, installation or operation contrary to printed instructions, or damage caused by freezing, fire, flood, or Acts of God. From the original date of consumer purchase, we will repair or replace, at our discretion, any part found to be defective within the warranty period described below. Purchaser is responsible for any shipping cost to our facility and any local labor charges.

- One year on the entire water conditioner
- Five years on the control valve
- Ten years on the mineral tank

GENERAL CONDITIONS – Should a defect or malfunction occur, contact the dealer that you purchased the product from. If you are unable to contact the dealer, contact First Sales, LLC. @ (260)693-1972. We will require a full description of the problem, model number, date of purchase, and selling dealer’s business name and address.

We assume no warranty liability in connection with this water conditioner other than specified herein. This warranty is in lieu of all other warranties, expressed or implied, including warranties of fitness for a particular purpose. We do not authorize any person or representative to assume for us any other obligations on the sale of this water conditioner.

FILL IN AND KEEP FOR YOUR RECORDS

<hr/>			
Original Purchaser	Date of Purchase	Model #	
<hr/>			
Address of Original Installation		City	State
<hr/>			
Dealer Purchased From	Dealer Address	City	State

First Sales
12630 U.S. 33 North, Churubusco, IN 46723
Phone: (260)693-1972 Fax: (260)693-0602