

SINGLE 14-16" CARBON FILTER & NHWB OPTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Freecall 1800 656 771
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FILTRATION

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INSTALLATION RECORD

S-14-CF, S-16-CF with optional No Hard Water Bypass (NHWB)

Please complete the following as a record for Warranty & Service purposes.

FILTER MODEL:

SERIAL NO.:

PURCHASED FROM:

PURCHASE DATE:

DATE INSTALLED:

INSTALLED BY:

COMPANY:

CONTACT:

This product is to be installed by suitably qualified personnel only. Please review this manual thoroughly before installing your carbon filter. For correct installation, follow the recommended steps and guidelines. If at any stage of installation you are unsure of how to proceed, please call our technical team on AU 1800 656 771. For NZ 0800 721 447 for further information.

ABOUT

Please familiarise yourself with the components of your Carbon Filter.

COMPONENTS OF THE CARBON FILTER

Control Valve

Clack Automatic 5 Cycle. This controls the cycles of the filter operation. Features a non-metallic material for long life. Safe 15-volt DC power supplied by a wall-mounted transformer (supplied)

The valve is time-clock controlled which can be set to backwash anywhere from 1-28 days (7 days is a standard setting). This, in turn, automatically initiates the backwashing of the filter media based on setting selected.

Underbed Gravel

Graded and washed gravel is the support media for the carbon.

It helps to distribute an even water flow through the media bed to and from the distributor system during service/backwash

Pressure Vessel (Media Tank)

Wave Cyber pressure vessels have a one-piece HDPE inner liner with a FRP Filament winding outer shell.

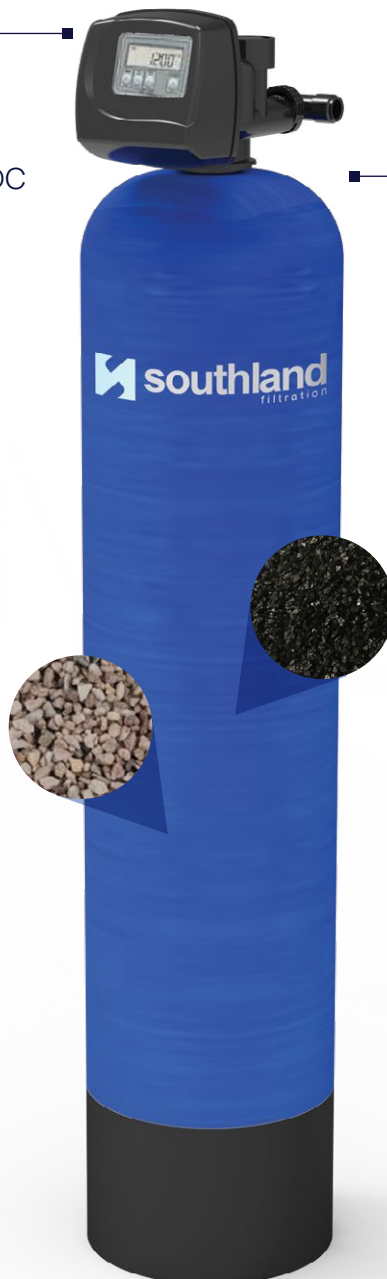
The pressure vessel houses both the filter media and the distributor system.

Carbon Media

Coconut-based granular carbon

This carbon media is used for the removal of a wide range of organic pollutants. These impurities include organic colour, taste and odour.

It's also very effective in the removal of chlorine, chlorine taste and odour.



How does your Carbon Filter work?

ORGANICS

Natural organic matter (NOM) is a complex mixture of organic compounds. Most NOM is derived from decaying plant and/or animal matter that is found in ALL groundwater and surface waters. Although NOM has no direct impact on health, it can affect the colour and taste of the water.

NOM, however, can impact on the efficacy of drinking water treatment processes, and consequently the safety of drinking.

Other organic contaminants come from organic chemicals. These 'human-made' chemical compounds include pesticides, petroleum, dry-cleaning solvents and degreasing agents. This group of chemicals includes volatile organic chemicals (VOCs). These contain carbon and evaporate at room temperature, plus synthetic organic chemicals (SOCs).

VOCs and SOCs do not occur naturally in drinking water. When products are improperly stored or disposed of, or when a spill occurs, they can contaminate groundwater and drinking water supplies. Spraying chemicals and pesticides can result in the contamination of ground and rainwater tank supply. VOCs and SOCs are considered a health risk if consumed over a period of time.

Note: Chlorine is classed as an organic chemical compound.

FUNCTION OF A CARBON WATER FILTER

The carbon media is used to adsorb organic contaminants as the water is passed through and over the media bed. When correctly sized, the carbon filter removes and retains the organic and chlorine contaminants. It will also remove limited amounts of larger particles in the water supply.

Note: Due to the retention of the organic contaminants on the carbon, the carbon media has a limited life depending on the amount of contaminant removed and will eventually need replacing.

Backwashing flushes the larger particles to waste to prevent premature fouling of the media for optimal life.

WHAT CONTROLS THE BACKWASH?

The carbon filter has an automatic time clock control valve. This valve controls the service, backwash and rinse cycles. Once the controller is programmed and set it automatically initiates the backwash and cycles based on the programming. (e.g. day and time of backwash, plus length of cycle times required).

WHAT ARE THE STAGES OF THE BACKWASH CYCLE?

1st Stage - Service Position

In this position the raw water is passed down through the media for the removal of the contaminants supplying treated water for usage. The filter is in this position prior to commencing the backwash cycle.

Note: The filter is in this position prior to commencing the backwash cycle.

2nd Stage - Backwash Position

The water flow through the media is reversed to lift and wash the carbon bed clean of entrapped sediment and particulate matter to waste.

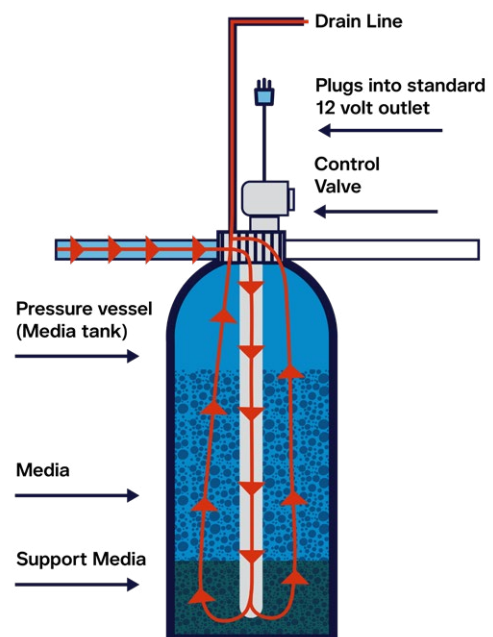
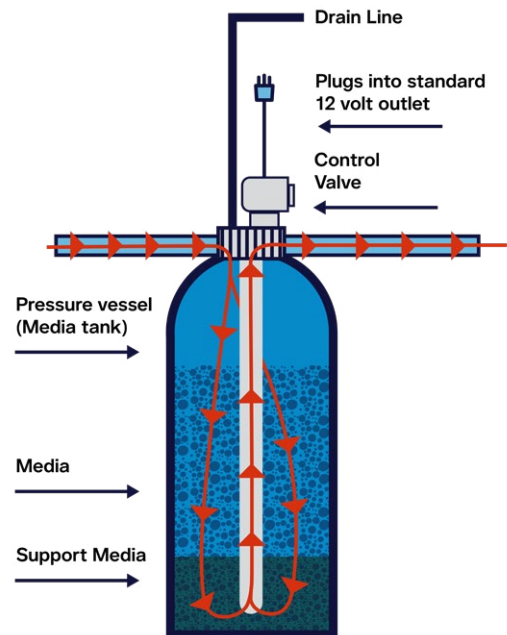
3rd Stage - Fast Rinse Position

The water flow is passed down through the media to settle the media bed. The fast rinse will flush any residual particles left in the media and control valve to waste before returning to service.

The backwash cycle is now complete.

Note: This controller has the ability to repeat the backwash and rinse cycles which is commonly used for a more efficient backwash of the media.

All functions are fully automatic once the control valve has been programmed and set.



General Specifications

Minimum operating pressure	240 kpa (35psi)
Maximum operating pressure	700 kpa (100psi)
Maximum & maximum operating temperature	5°C to 43°C
Inlet & outlet connections	32mm Male BSP
Valve drain fitting	25mm Hose Barb
Mains power requirement	240 Volt, 10 amp
Control valve power	15 Volt DC supplied by wall mount transformer
Transformer output current	500mA

MODEL	CONTINUOUS SERVICE FLOW RATE	PEAK SERVICE FLOW RATE	BACKWASH FLOW RATE
S-14-CF	20 lpm	40 lpm	41 lpm
S-14-CF-NHWP	20 lpm	40 lpm	41 lpm
S-16-CF	26 lpm	53 lpm	56 lpm
S-16-CF-NHWP	26 lpm	53 lpm	56 lpm

INSTALLATION & OPERATING WARNINGS



CAUTION!

The Carbon filter is NOT designed to remove microbiologically unsafe contaminants from the water supply. If the water is for potable and/or food process use it should be disinfected prior to use.

7. For installations subject to excessive or prolonged water hammer, a water hammer arrestor should be fitted.
8. Waste connections should comply with minimum air gap requirements as per AS3500.1, Table 4.5.



IMPORTANT! FAILURE TO COMPLY COULD VOID WARRANTY

1. All plumbing MUST conform to Australian Standards guidelines and Local Council regulations.
2. For filters subjected to permanent hydrostatic pressure an integral non-testable backflow prevention device should be fitted in the inlet line. This should be in accordance with AS3500.1 and complying with AS245.1 clauses 3.6.3, 3.6.4, 7.3.1 and 7.3.3.
3. For filters subjected valve should be installed.
4. Prevention device in accordance with AS3500.1 and complying with AS 2845.1 Clauses 3.6.3, 3.6.4, 7.3.1 and 7.3.3 should be fitted in the inlet line.
5. For filters subject to hydrostatic pressure greater than 700 kPa a suitable pressure control device should be fitted in the supply line.
6. Where the hot water system is a mains-pressure storage type, a cold water relief valve of suitable rating should be fitted (if not already installed). The relief valve should be positioned between the non-return valve and the cold water inlet of the hot water system.



IMPORTANT! FOR TANK FILLING OR OPEN-DISCHARGE APPLICATIONS ONLY

The automatic control valve must have a positive back pressure during the regeneration or backwash cycle to ensure effective operation and prevent untreated water going to service. If using the softener/filter to fill a storage tank (or any other open-discharge application) a 'No Hard Water Bypass' must be used.

(Note: Softener/Filter Models with 'NHWB' suffix include bypass option).



Fig. A No Hard Water Bypass valve (NHWB)

If there is any step or parts you are not sure of during installation please do not hesitate to contact Southland Filtration for clarification to avoid incorrect installation.

INSTALLATION & OPERATING CHECKLIST

Step One: Locate the Carbon Filter

1. It is advisable to locate the filter in a protected environment. If the unit is to be installed outside, or in the open, a protective shelter or shed is recommended.
2. The distance between the filter and a drain or waste outlet should be as short as possible.
3. The filter will require a standard 3-pin, 240-volt 10-amp grounded power outlet.
4. If the filter is to be installed outside or where the sunlight hits the LCD display it is recommended to purchase the weatherproof cover for the valve to protect the LCD display and electronics (see Fig. A).
5. An approved inlet isolation valve (not supplied) is recommended to be installed on the inlet line.



Fig. A Waterproof cover

WARNING

Hot water can severely damage the filter. If installing near a hot water service ensure a minimum of 2 metres of piping between the outlet of the filter and inlet of the heater to help avoid heat transfer. Ensure a non-return valve on the inlet of the hot water system is present and functional.

Do not install filter where it or its connections (including drain and overflow lines) will be subjected to ambient temperatures under 1°C or over 49°C.

Do not install filter near chemicals or chemical fumes.

Step Two: Filter Assembly & Media Loading

1. Position the filter media tank (pressure vessel) in the selected location allowing room for servicing.
2. Place the riser pipe (distributor tube) assembly in the media tank (if not already installed). Ensure riser pipe is sitting in the recess in bottom of tank. The top of the riser pipe should be approximately 5 mm above the top of the tank.
3. Cover the top of the riser pipe (distributor tube) with a cap or plastic bag (not supplied) to stop the media entering the riser pipe (distributor tube).
4. Refer to Table 1 below for the amount of media required for your model. Check you have the correct quantity.
5. While holding the distributor tube to stop it from moving, use a suitable funnel pour in the underbed gravel first, followed by the carbon media.

Loading sequence is: First # 5 Gravel, next # 6 Gravel, next the Carbon

Table 1

MODEL	UNDERBED GRAVEL #5	UNDERBED GRAVEL #6	CARBON
S-14-CF & NHWB	NA	20kg	38kg
S-16-CF & NHWB	20kg	10kg	50kg

6. Remove the cap/plug from the tube and clean the media from the media tank threads and the top of the distributor tube.
NOTE: Clean up any spilt media on the ground around the media tank to prevent any accidents and/or injury.
7. Lightly smear O-ring (silicon) grease to the outside of the top of the distributor tube to approx. 50mm down from the top of the tube.
8. Place the automatic control valve over the distributor tube. Then exerting light downward pressure, screw the valve into the media tank thread until the valve bottoms against the top lip of the tank. **CAUTION! - Hand tighten only, (approximately 1/4 turn should be sufficient).**
9. Re-position the filter media tank so that the control valve is facing in the correct direction.

Step Three: Water Line Connection

FOR FILTER MODELS: S-14-CF, S-16-CF

1. Connect the incoming water line (untreated water) to the inlet adaptor (Fig. C) on the bypass valve (Fig. A). Looking front-on at the valve the inlet is at the back of the valve on the right hand side.
2. Connect the outgoing water line (treated water) to the outlet adaptor (Fig. C) on the bypass valve at the back of the valve on the left hand side. Flow direction arrows are moulded on the control valve barrels to show the correct flow direction.

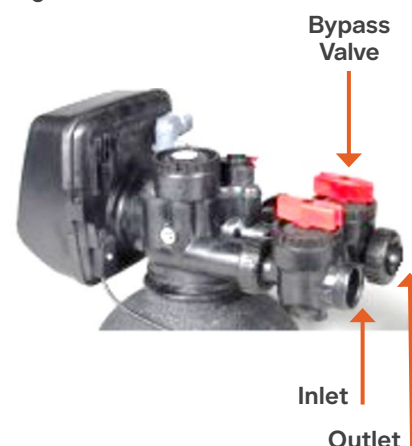


Fig. C Inlet/outlet Adaptors



Fig. C Optional Adaptors

Fig. A



FOR MODELS: S-14-CF-NHWP, S-16-CF-NHWP

1. Connect the incoming water line (untreated water) to the inlet adaptor (Fig. C) on the bypass valve (Fig. D). Looking front-on at the valve the inlet is at the back of the valve on the right hand side.
2. Connect the outgoing water line (treated water) to the outlet adaptor on the NHWP (Fig. D) at the back of the valve on the left hand side. Flow direction arrows are moulded on the control valve barrels to show the correct flow direction.



Fig. C Inlet/outlet Adaptors

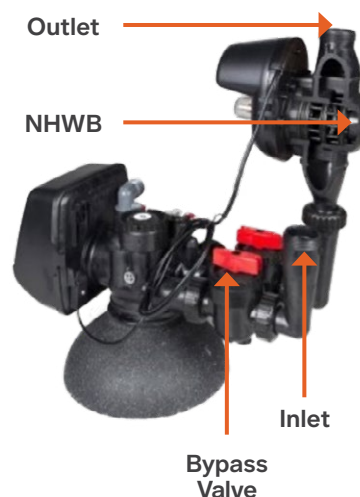


Fig. D V3070FM. Shown with optional V3191-01 vertical adapter kit

Note: NHWP shown in Vertical position, it can also be put in Horizontal position.

Step Four: Drain & Overflow Line Connection

1. When ideally positioned, the filter will be above, and not more than 6 metres from the drain. Connect 25mm (1") tubing or hose (not supplied) to the drain outlet fitting to the drain (Fig. E).
2. **IMPORTANT:** Support the hose or tube to prevent kinking. A kinked hose will prevent proper backwash and regeneration.
3. Alternatively, the 25mm (1") hose tail fitting can be removed and the drain hard plumbed with 25mm (1") pipe and fittings (not supplied).
4. If the filter is located where the drain lines must be elevated, you may elevate the lines up to 2 metres providing the run does not exceed 5 meters and the water pressure at the softener is not less than 280kPa.

Note: You can elevate an additional 610mm for each additional 70Ppa pressure.

5. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 180mm loop at the far end of the line so that the bottom of the loop is level with the valve drain line connection. This will provide an adequate siphon trap.
6. Where a drain empties into an overhead sewer line, a sink-type trap must be used.



CAUTION!

Never connect the drain line directly into a drain, sewer line or trap. Always allow an air gap between the drain line (not supplied) and the wastewater (Fig. F) to prevent the possibility of vacuum pressure in the pressure vessel or sewage being back siphoned into the pressure vessel.



Fig. E

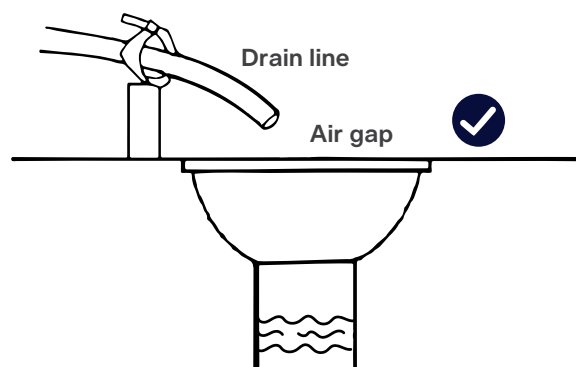
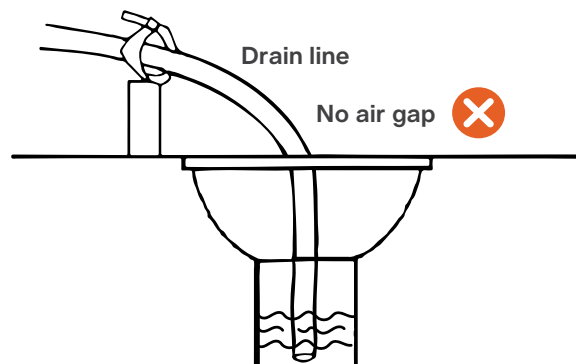


Fig. F



Control Board Connections

Take a moment to familiarise yourself with the control board components

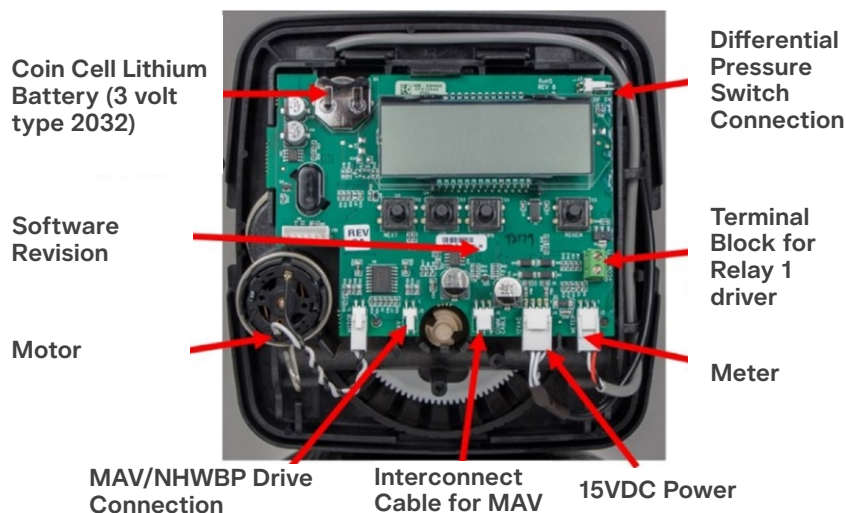


Fig G.

System Start-up

The final step before putting the filter into service:

1. Set the actual time of day into the control valve.
2. Backwash the filter

Step Five: Setting Time of Day

1. Close the inlet isolation valve.
2. Plug in the transformer and turn on the power point. The control valve will automatically drive to the service position. If a NHWB is fitted it will sync with the valve and drive to service.
3. Scroll through the display by pressing the NEXT button until time of day screen is displayed. (Refer Fig. H)
4. Press and hold the SET CLOCK button until the Hour flashes. (Refer Fig. H)
5. Using the UP or DOWN buttons press to change the Hour then press NEXT to set. Repeat the same to change the Minutes. (Refer Fig. H)



Fig H.

6. Press NEXT to set and return to Time of Day display.

NOTE: Time of day should only need to be set after power outages lasting more than 8 hours. Or if the backup battery has been depleted and a power outage occurs, or when daylight savings time begins or ends. If a power outage lasting more than 8 hours occurs, the time of day will flash 'On and Off' which indicates the time of day should be reset. If a power outage lasts less than 8 hours and the time of day flashes 'On and Off', the time of day should be reset and the backup battery replaced. Refer (Fig. G)

Step Six: Initial Start Up

1. Make sure the Inlet Isolation valve is closed.
2. Close the outlet valve on the bypass or outlet isolation valve if NO bypass is installed.
3. Press and hold the REGEN button (refer Fig. I) for three seconds until the drive motor starts.
4. When the drive stops the valve will be in the backwash position.
5. Turn the power OFF.
6. Slowly open the inlet water supply valve 1/4 to 1/3 allowing water to fill the tank slowly in order to expel air. CAUTION: If water flows too rapidly, there could be a loss of media to the drain. (Ideally once the water is running to drain shut the inlet valve and let the media soak overnight.)
7. When the water is flowing steadily to drain without the presence of air, fully open the inlet valve and turn the power back ON to let the controller finish the backwash cycle.
8. When the backwash cycle is finished the valve will forward to the fast rinse cycle.
9. When the fast rinse cycle is finished the valve will forward to the start of the 2nd backwash cycle. (This will ensure that all the carbon dust and fine particles are flushed out of the system.)
10. When the 2nd backwash cycle is finished the valve will forward to the start of the 2nd fast rinse cycle.
11. When the 2nd fast rinse cycle is finished the valve will forward to the Service position.



Fig G.

Note: The handles also indicate the flow direction

12. Put the bypass valve into the service position and/or open the outlet isolation valve.
13. The Filter is now in service and ready to supply Filtered (treated) water.

Immediate Backwash Feature

An immediate backwash can be initiated at any time by pressing and holding the REGEN button for 3 seconds. (Refer Fig. I)

A backwash can be set to be initiated at the pre-programmed time by pressing the REGEN button once and letting go. (Refer Fig. I)



Fig. I

Backwash
Button
(REGEN)

INSTALLATION IS NOW COMPLETE

Owner Operator Screen Displays

User Displays

General Operation

When the system is operating, one of five displays may be shown. Pressing NEXT will alternate between the displays shown below.



User 1

Typical user display. Shows volume remaining to regeneration. This screen will not be viewed if the control is set for time-clock operation.



User 2

Displays number of days to next regeneration. Only viewed if Step 11S or Step 5F is set to OFF.



User 3

Displays flow rate L/min. If a meter is not used this display will be shown but 0 will be displayed. If 1.0Γ is selected in Step 2CS an "A" in front of the flow rate indicates that the tank with the control valve on it is in service. If "b" is displayed the tank with the in/out head is in service.

Note: "A" and/or "B" will only be displayed on Twin - Alternating or Multiple systems.



User 4

Displays total volume in cubic meters since last reset. If a meter is not used this display will be shown but 0 will be displayed.
PRESS ▼ FOR 3 SECONDS TO RESET TO 0.



User 5

Shows current time.

MAINTENANCE

FAQs and Troubleshooting

TC control valves do not have meters so shaded areas are not applicable for TC control valves

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Timer does not display time of day.	a. Power Adapter unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective Power Adapter	c. Replace Power Adapter
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	c. Defective PC board.	c. Replace PC board
3. Display does not indicate water is flowing. Refer to user instructions for how the display indicates water is flowing.	a. Bypass valve in bypass position	a. Put bypass valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Meter not installed	f. Install meter
	g. PC board incorrectly programmed	g. Refer to programming instructions
4. Control valve regenerates at wrong time of day	a. Power outages	a. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration incorrect	c. Reset regeneration time
	d. Control valve set at "on 0" (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL + on 0 (delay + immediate regeneration)	e. Check control valve set-up procedure regeneration time option

PROBLEM	POSSIBLE CAUSE	SOLUTION
5. Control valve stalled in regeneration	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective Power Adapter	c. Replace Power Adapter
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
6. Control valve does not regenerate automatically when the correct button(s) is depressed and held. For TC valves the buttons are UP and DOWN. For all other valves the button is REGEN.	a. Power Adapter unplugged	a. Connect Power Adapter
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
7. Control valve does not regenerate automatically but does when the correct button(s) is depressed and held. For TC valves the buttons are UP and DOWN. For all other valves the button is REGEN.	a. Bypass valve in bypass position	a. Put bypass valve in normal operation position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign matter
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
8. Time of day flashes 'On and Off'	a. Power outage	a. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
9. Error Codes 101, 1001 or E1 – Unable to recognise start of regeneration 102, 1002 or E2 – Unexpected stall 103, 1003 or E3 – Motor ran to long, timed out trying to reach next cycle position 104, 1004 or E3 – Motor ran to long, timed out trying to reach home position If other error codes display contact the factory	a. Control valve has just been serviced	a. Unplug power source jack from the printed circuit board (black wire) and plug back in or press button sequence to reset valves: TC valves (three buttons) press and hold SET and DOWN buttons for 3 seconds. (Cover button may have other names like “SET HOUR “, “CLOCK” or “SET CLOCK” but the circuit board is labeled with SET.) All other valves press and hold NEXT and REGEN buttons for 3 seconds.
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter
	c. High drive forces on piston	c. Replace piston(s) and spacer stack assembly
	d. Control valve piston not in home position	d. Unplug power source jack from the printed circuit board (black wire) and plug back in or press button sequence to reset valves: TC valves (three buttons) press and hold SET and DOWN buttons for 3 seconds. (Cover button may have other names like “SET HOUR “, “CLOCK” or “SET CLOCK” but the circuit board is labeled with SET.) All other valves press and hold NEXT and REGEN buttons for 3 seconds.
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive bracket

PROBLEM	POSSIBLE CAUSE	SOLUTION
10. Error Codes for MAV and NHWB	a. Foreign matter is lodged in MAV/ NHWB	a. Check MAV/NHNB piston and spacer stack assembly for foreign matter
106 or 1006 – MAV/NHNB unable to find proper park position, motor ran too long.	b. High drive forces on MAV/ NHNB piston	b. Replace MAV/NHNB piston and spacer stack assembly
107 or 1007 – MAV/NHNB motor ran too short (stalled) while looking for proper park position	c. MAV/NHNB motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	c. Check MAV/NHNB motor and wiring. Check interconnect wiring to both PC boards. Replace motor or wiring if necessary.
	d. MAV/NHNB drive gear damaged, missing or broken gear	d. Replace MAV/NHNB drive cap.
If other error codes display contact the factory	e. MAV/NHNB main gear cover assembly incorrectly aligned to drive assembly.	e. Reseat MAV/NHNB main gear cover assembly properly
	f. PC board is damaged or defective	f. Replace PC board

**Talk to
an expert**

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