



Auto Clean

UV254 Automatic Cleaning Module

Owner's Manual v 2.1 (04.15.20)

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1 Contents

2	Overview	3
3	Safety	4
3.1	Safety Instructions	4
4	Technical Specifications	5
5	Installation	5
5.1	Unpacking and Inspection	5
5.2	Assembly	6
5.3	Mounting	6
5.4	Plumbing	7
5.4.1	Connecting a UV254 Analyzer	8
5.5	Electrical and Communication	9
6	Start Up and Operation	10
6.1	Start Up	10
6.2	Operation	11
7	Cleaning	12
8	Cleaning Configuration	13
8.1	UVM5000 Organics Monitor Menu	14
9	Maintenance	15
10	Parts and Accessories	15
11	Cabinet Dimensions and Clearance	16
12	Warranty	17

List of Tables

Table 1:	Automatic Cleaning Module Specifications	5
Table 2:	Items and quantity list for unpacking	5
Table 3:	Commercial cleaning solutions	12
Table 4:	Menu functions and configuration for Auto Clean System	13
Table 5:	UVM5000 menu selection of cleaning configuration	14
Table 6:	Maintenance tasks and frequency for Auto Clean system	15
Table 7:	Spare parts for Auto Clean system	15

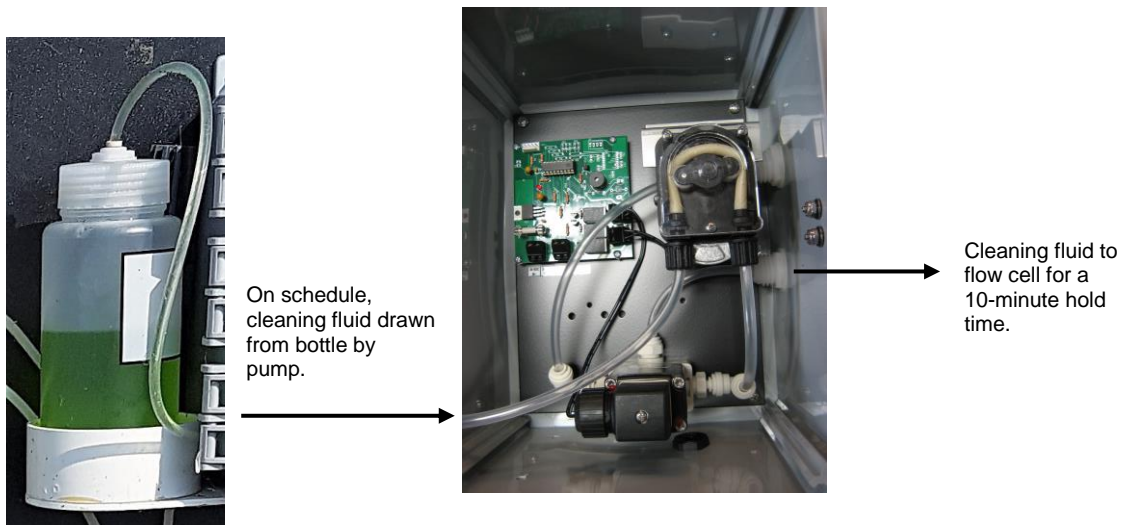
2 Overview

Thank you for purchasing from Chemtrac, Inc.

The Automatic Cleaning Module is a chemical cleaning system for use with the Chemtrac UVM5000 UV254 Organics Monitor, and the UV1 UV254 Organics Sensor. The purpose of the system is to reduce and clean any deposition/fouling in the analyzer flow cell.



The Auto Clean and the UV254 analyzer are plumbed so that process water flows through the cleaning module to the analyzer. When a cleaning cycle starts, the Auto Clean temporarily stops the flow of process water, and instead pumps cleaning solution from its cleaning fluid bottle to the analyzer flow cell. This can be done on an automated periodic schedule, or on an immediate basis through manual intervention.



A portion of cleaning fluid is recaptured and directed back into the bottle after a cleaning cycle is completed. Analyzer measurement resumes after the tubing is rinsed of residual cleaning fluid by the reestablished flow of process water.

The cleaning system is controlled through the Operator Interface of the Chemtrac UV254 analyzer. From here, the system is enabled, and a cleaning frequency is selected.

Cleaning of the flow cell is best achieved when cleaning frequency and cleaning fluid work in unison to prevent the accumulation of fouling agents inside the flow cell.

3 Safety

3.1 Safety Instructions



Please read and follow all safety instructions outlined in this owner's manual prior to installation and/ or operation.

1. Visually inspect the device prior to operation. If it seems broken or damaged in any way, do not use. Contact Chemtrac, Inc. for a replacement.
2. Ensure that all responsible personnel carefully read this manual before installing or servicing the device.
3. Failure to properly install and maintain this device may impact its effectiveness and warranty.
4. Improper use of this device may cause injury.

4 Technical Specifications

Table 1: Automatic Cleaning Module Specifications

CHARACTERISTIC	TECHNICAL DATA
CLEANING FREQUENCY	User configurable cleaning cycle
CLEANING CAPACITY	1L cleaning fluid bottle
DIMENSIONS	10" high x 18" wide x 6" deep (25 cm x 46 cm x 15 cm)
ENCLOSURE	Wall mountable
FLUID CONNECTIONS	¼" (6 mm) push-to-connect fittings and flex tubing
ELECTRICAL	Operates from 24 VDC
STORAGE TEMP.	-20°C to +60°C (-4°F to +140°F)
OPERATING TEMP.	0°C to 45°C (32°F to 113°F)
WEIGHT	10 lb (4.5 kg)
WETTED MATERIAL	Polypropylene, Marprene
WARRANTY	1-year limited warranty

5 Installation

5.1 Unpacking and Inspection

To begin, remove the Auto Clean system from the packaging and carefully inspect the product to ensure that no visible damage has occurred during shipping. The following items will be packed inside the box:

Table 2: Items and quantity list for unpacking

ITEM
Automatic Cleaning Module
1L Cleaning Fluid Bottle
Bottle Holder
Power and Communication Cable
Owner's Manual

Please ensure all items are unpacked and accounted for before moving on to assembly.

5.2 Assembly

The cleaning fluid bottle holder must be mounted onto the Auto Clean system from the underside of the enclosure as shown in Figure 5.1. Fittings are supplied with the holder.

After mounting the enclosure, fill the 1L bottle with cleaning fluid. Recommended fluids are outlined in Section 7 – Cleaning. Connect the tubing from the system to the spout on the bottle.



Figure 5.1: Cleaning fluid bottle holder

5.3 Mounting

The system is enclosed in a wall-mountable cabinet. The cabinet should be attached at all four of the mounting holes provided (top left and right; bottom left and right in Figure 5.2).

Use screws and washers that are sturdy enough to support the cabinet weight of approximately 10 lbs.

Cabinet dimensions are to the nearest 1/8 inch. Refer to Section 11, Cabinet Dimensions and Clearance for drawings of dimensions and clearance.

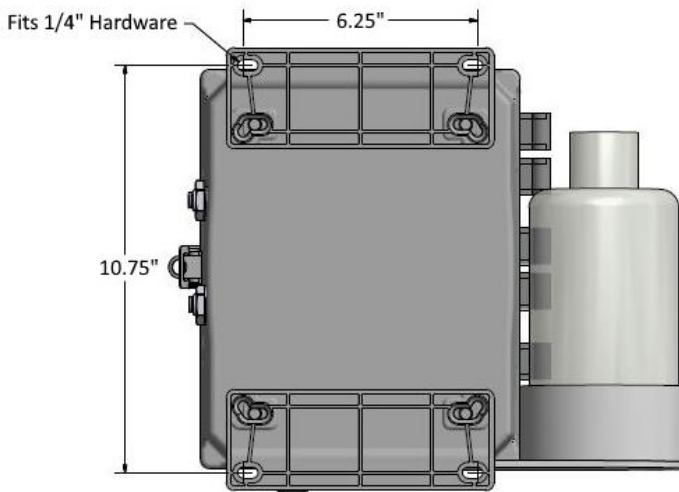


Figure 5.2: Mounting cabinet

The expanded view at right (Figure 5.3) shows an example of a 1/4" bolt and washer inserted in the front side of the cabinet.

The system should be mounted in a convenient location near the UV254 analyzer to be cleaned (less than 2 ft.).



Figure 5.3: Sample bolt and washer for attachment

5.4 Plumbing

Process water from a pressurized source flows through the Auto Clean system and into the connected instrument for measurement.

Piping is required to be ¼" OD flex tubing of whatever pressure rating is needed for the particular site. Figure 5.4 displays the two push-to-connect inlet and outlet ports on the side of the Auto Clean system.

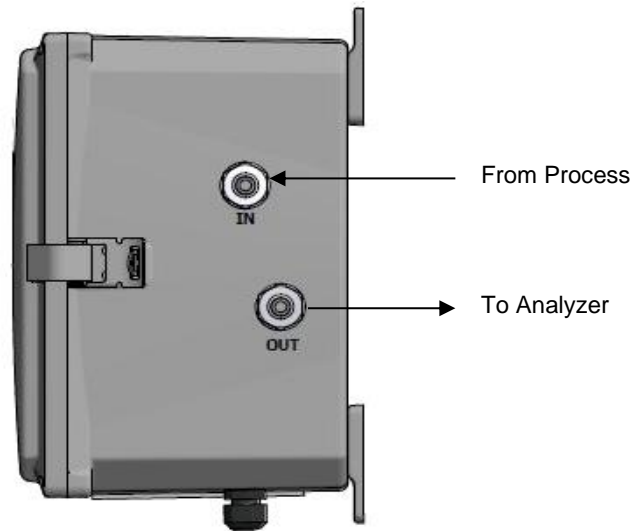


Figure 5.4: Auto Clean system ports

The Auto Clean system is connected in series with the instrument to be cleaned. It is preferred to keep the tubing between the Auto Clean and instrument less than 2 feet. Configurations for the UV254 analyzer are outlined in Figure 5.6.

Note: If installing with a Dual Feed system, the Auto Clean will be installed prior to the Dual feed on the Stream 1 port (See Figure 5.5). Refer also to the Dual Feed manual for further instructions.

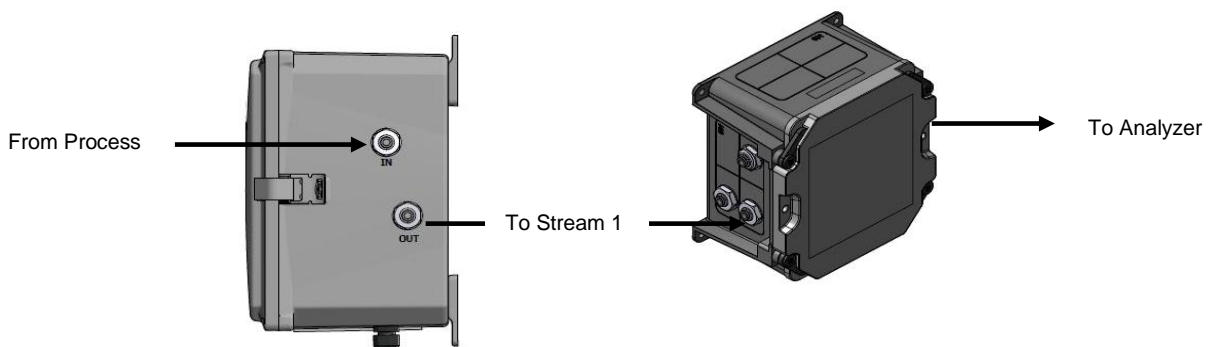


Figure 5.5: Auto Clean plumbing with Dual Feed

5.4.1 Connecting a UV254 Analyzer

1. Connect ¼" OD flex tubing from a pressurized source to the IN port on the Auto Clean system.
2. Connect ¼" tubing from the OUT port on the Auto Clean to the IN port on the side of the analyzer.
3. Connect ¼" tubing to the OUT port on the analyzer and divert to drain.

IMPORTANT: The test water must be allowed to flow unrestricted to drain so that no significant pressure will occur inside the flow cell.

IMPORTANT: If system was supplied with Dual Feed Option, be sure to review the Dual Feed manual for additional plumbing information.

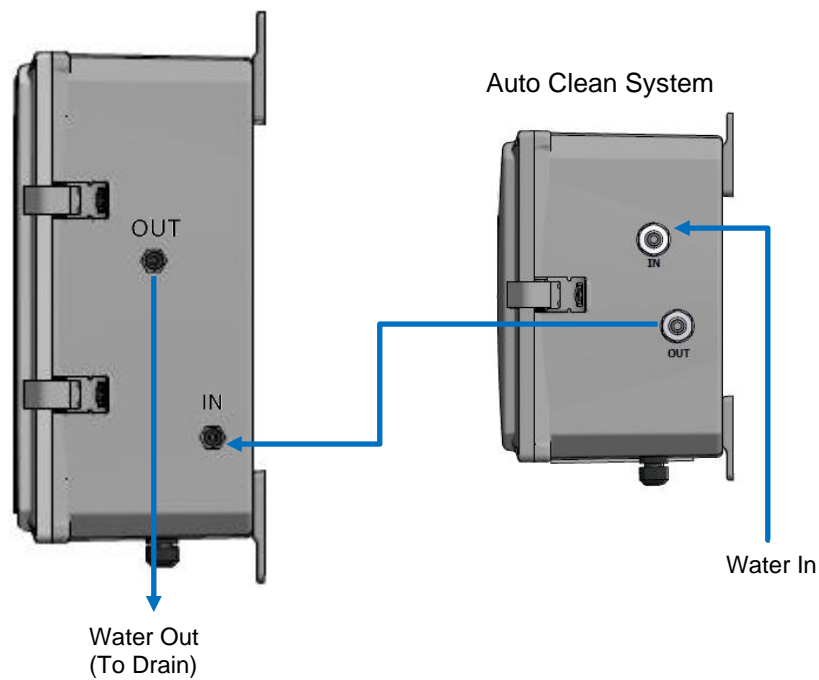


Figure 5.6: UV254 Analyzer and Auto Clean plumbing connections

5.5 Electrical and Communication

The power and communication line from the UV254 analyzer feeds into the Auto Clean system via an electrical conduit fitting at the bottom of the cabinet. The system is powered and controlled through the connected UV254 analyzer.

Connections at the analyzer are shown in Figure 5.7.

- White and green wires to terminal 7 and 8 (Clean Out). Polarity is not important.
- Black wire to terminal 9 (24 VDC Out -).
- Red wire to terminal 10 (24 VDC Out +).

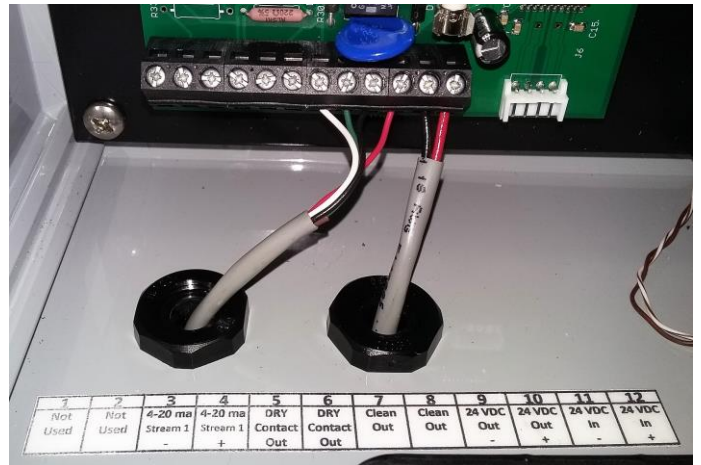


Figure 5.7: UV254 Analyzer connections

The terminal block connections at the Auto Clean system control board are shown in Figure 5.8.

1. Connect the white and green wires leading from the UV254 analyzer to the right terminal block. Polarity is not important.
2. Connect the power wires leading from the analyzer to the left terminal block. The black power wire connected to the left (-) terminal and red wire to the right (+) terminal.

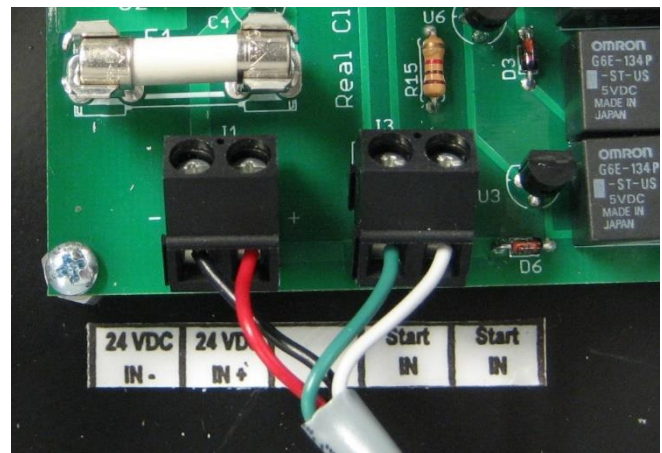


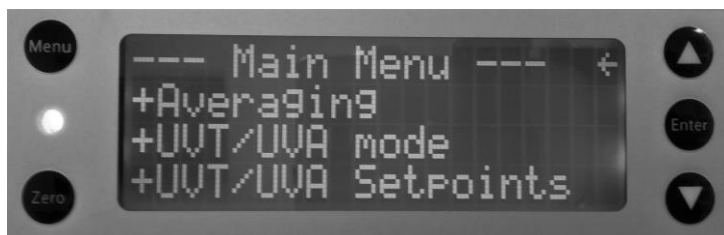
Figure 5.8: Auto Clean system communication and power connections

6 Start Up and Operation

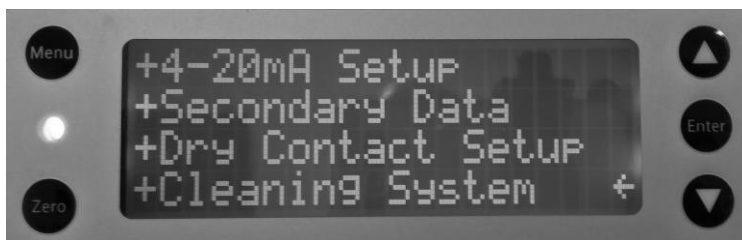
6.1 Start Up

Once plumbing and electrical connections have been made, you need to enable the cleaning system and enter settings for cleaning configuration. This is accomplished through the UVM5000 Operator Interface. Section 8 gives more detail on menu selections.

From the main menu, press the down arrow button to scroll to the +Cleaning system menu. Access the Main Menu page by pressing the Menu button. You may need to press the button more than once to have the screen displayed.

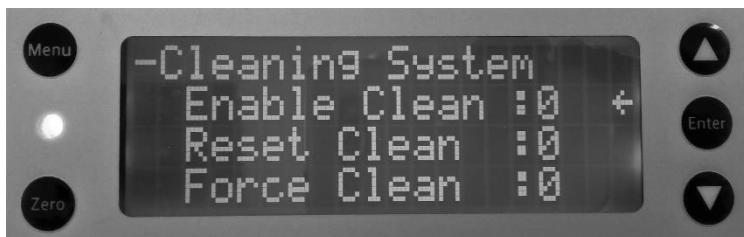


Scroll down by pressing the down arrow repeatedly.



Press Enter to expand the +Cleaning System menu.

1. To enable the cleaning system, scroll down to 'Enable Clean' and press Enter to enable the cleaning system. The 0 turns to 1, which signifies the item has been selected and therefore, enabled.



2. Scroll down from the last entry until the +Clean Frequency menu is displayed. Expand the menu by pressing the Enter button. Seven selections are available. The default is 4: 3 days. De-select a frequency by scrolling to it, and then pressing Enter to remove the checkmark. Conversely, select an option by scrolling the arrow to it, and then press Enter to place a checkmark beside it.



Implementing these two settings is the minimum you need for set up. The system is ready for use. For all other functions, refer to Section 8, Cleaning Configuration. If the system encounters any problems, associated alarms or warnings are displayed on the Operator Interface of the UVM5000.

To turn the Auto Clean system off, disable the device by removing the checkbox opposite Enable Clean (reverse of step 1).

6.2 Operation

The system consists of a 3-way stainless solenoid valve, a peristaltic pump, and a 1L chemical cleaner storage container. The cleaning process is initiated automatically on a preselected time interval or can be manually triggered.

The cleaning process consists of the following steps:

1. Solenoid shuts off the process water flow to the analyzer flow cell (LED turns on).
2. Solenoid opens flow from peristaltic pump to the analyzer flow cell.
3. Peristaltic pump turns on and pumps cleaning solution into the analyzer flow cell.
4. The pump turns off and the system waits to allow the chemical cleaning solution to remove fouling and staining present on the walls of the quartz flow cell.
5. The pump turns on in the opposite direction to re-capture the cleaning chemical.
6. Solenoid valve opens the water flow from the process to purge out the cleaning solution (LED turns off).

The process is now complete.

During the cleaning cycle, the measured UVA/UVT value shown on the M series instrument is held to the last value measured before the cycle started and released after the purge time is complete.

7 Cleaning

The Auto Clean system comes with a 1L chemical storage bottle. After a cleaning cycle, approximately 85% of the used cleaning fluid is pumped back into the bottle reducing the need to replenish the fluid on a regular basis.

Two important factors that affect the sensor performance are the cleaning fluid used to clean the flow cell, and how often the flow cell is cleaned (cleaning frequency).

Cleaning Frequency

The optimum frequency of cleaning is quite variable depending on the amount and type of fouling agents in the water. This will be dependent on the application and installation point.

For wastewater, a higher frequency will be required (ex. 1-24hrs) whereas high purity water will require a lower frequency (ex. once a month). Each installation will be different and require configuration onsite.

Once in operation, observe the flow cell for signs of fouling prior to the first cleaning cycle. If fouling is present, increase the cleaning frequency accordingly. The measured data can also be observed for signs of a saw tooth effect as shown in Figure 7.1. If the saw tooth shows an upward trend, as shown in Figure 7.2, the sensor is drifting and cleaning frequency must be increased.

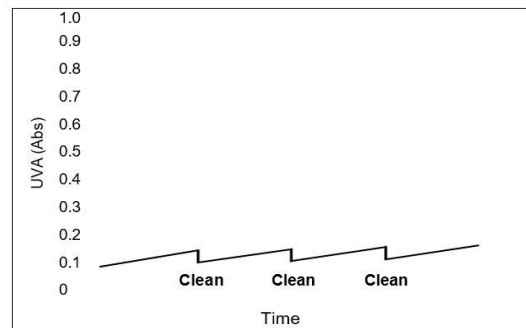


Figure 7.1: Effective cleaning

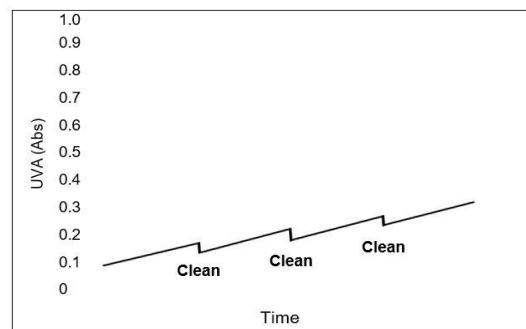


Figure 7.2: Inadequate cleaning

Cleaning Fluid

Selecting an effective cleaning solution is essential for optimal performance. The following commercial cleaning solutions and acids are readily available to remove common fouling agents.

Table 3: Commercial cleaning solutions

SOLUTION	FOULING AGENTS
Lactic Acid <20% solution (CLR®)	Removes lime, calcium, rust, magnesium, and other dissolved minerals
Sulfamic Acid <10% solution (Lime Away®)	Removes lime, calcium, rust, magnesium, and other dissolved minerals
Phosphoric Acid <30% solution (Rust Off, Hagasen Blue)	Removes lime, calcium, rust and color staining
Citric Acid <20% solution	Removes mineral scaling
Sodium Hypochlorite <6% solution (Not bleach)	Removes oil, grease and biofilm
Acetic Acid <20% solution	Removes oil and grease
Sulfuric Acid <10% solution	Removes oil and grease

8 Cleaning Configuration

The Auto Clean system is controlled and configured through the M series analyzer. Below is a general summary of the functions and configurations for the system.

Table 4: Menu functions and configuration for Auto Clean System

MENU	DESCRIPTION
-Cleaning System	
Enable Clean	Cleaning must be enabled for the Auto Clean system to operate.
Reset Clean	When the cleaning fluid is changed or refilled, the user must do a Reset to reset the counter on the cleaning bottle.
Force Clean	At any time, the user can trigger a cleaning cycle by selecting force clean. This does not interfere with the normal cleaning schedule.
Pumping Time	Pumping Time allows for configuration of time (in seconds) the cleaning system pumps cleaning fluid to the sensor. The pumping time should be configured to ensure the cleaning fluid reaches and fills the quartz flow cell prior to the 10-minute holding period. Longer distances between the cleaning system and sensor will require a longer pumping time. Default setting is 120 seconds, suitable for a tube length of 24-36 inches.
-Clean Frequency	Clean Frequency allows the frequency of cleaning to be configured i.e. hour, day, week, or month. Default is 3 days.
-Alarms	If enabled, alarm conditions are displayed on the main menu.

8.1 UVM5000 Organics Monitor Menu

Table 5: UVM5000 menu selection of cleaning configuration

MENU ITEM	DESCRIPTION
CLEANING SYSTEM	
Enable Clean	Press Enter then up/down to select 0 or 1 to turn on automatic cleaning system
Reset Clean	Press Enter then up/down to select 0 or 1 to reset fluid alarms after refilling fluid
Force Clean	Press Enter then up/down to select 0 or 1 to force a cleaning cycle
Pumping Time	Press Enter then up/down to select 60, 90 or 120 seconds
CLEAN FREQUENCY	
0: No Cleaning	
1: 4 hours	
2: 12 hours	
3: 24 hours	
4: 3 days	
5: 1 week	
6: 2 weeks	
7: 1 month	
Select	Press Enter then up/down to select cleaning frequency (value 0-7)
ALARMS	
Cleaning	Alarm status (0= no alarm 1=alarm)
Clean Fluid Empty	Alarm status (0= no alarm 1=alarm)
Clean Fluid Low	Alarm status (0= no alarm 1=alarm)

9 Maintenance

Following the manufacturer's recommended maintenance schedule will ensure optimal performance of the product. Parts and accessories are outlined in Section 10.

A standard recommended maintenance schedule for the Auto Clean system is as follows:

Table 6: Maintenance tasks and frequency for Auto Clean system

FREQUENCY	TASK
Site Specific	<ul style="list-style-type: none"> Automatic cleaning cycle configuration to ensure proper sensor cleaning
Weekly	<ul style="list-style-type: none"> Visual inspection for leaks, corrosion or other issues. Inspect cleaning fluid levels. Replenish if necessary. View connected analyzer or controller display for configured cleaning alarms.

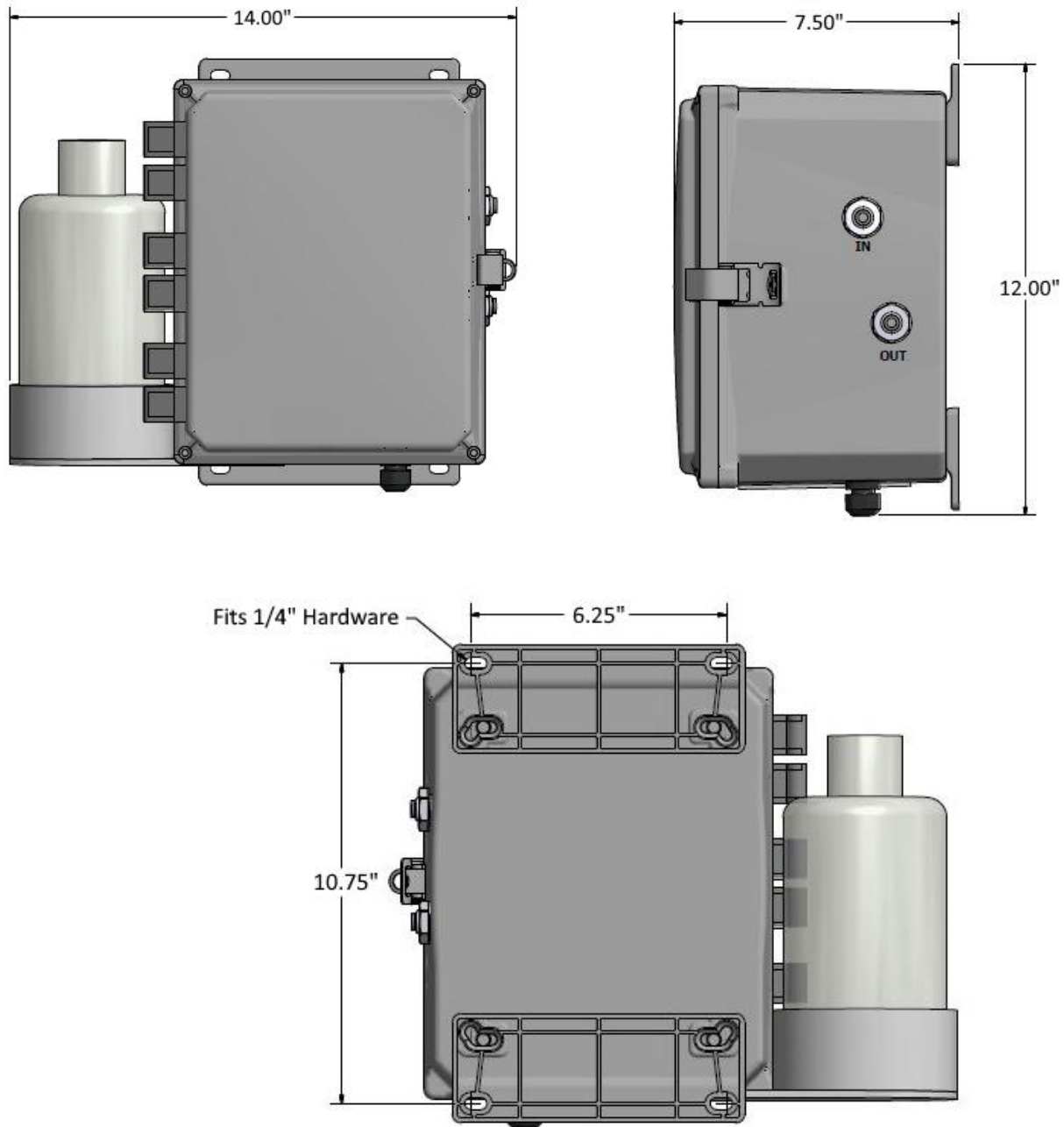
10 Parts and Accessories

Table 7: Spare parts for Auto Clean system

PRODUCT NAME	DESCRIPTION	PART NUMBER
Cleaning Fluid Bottle	1 Liter bottle for chemical fluid storage	25115
Chemical Pump Tubing	Replacement internal pump tubing for chemical pump	25120

11 Cabinet Dimensions and Clearance

The front, side, and back views of the cabinet are shown below to the nearest 1/8 inch. The back view gives the dimensions relevant for spacing of screws to mount the cabinet. Allow a clearance of 6 inches around the cabinet for unit connection.



12 Warranty

Chemtrac, Inc. warrants its equipment to be free from defects in material and workmanship for a period of one (1) year from date of shipment to the original purchaser. Upon receipt of written notice from purchaser, seller shall repair or replace the equipment (at option of Chemtrac, Inc.).

Chemtrac, Inc. assumes no responsibility for equipment damage or failure caused by:

1. Improper installation, operation, or maintenance of equipment.
2. Abnormal wear and tear on moving parts caused by some processes.
3. Acts of nature (i.e. lightning, etc.)

This warranty represents the exclusive remedy of damage or failure of equipment. In no event shall Chemtrac, Inc. be liable for any special, incidental, or consequential damage such as loss of production or profits.

For further assistance or service please contact:

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