



UV Water Treatment
Atlantium Hydro-Optic™ Solutions

User Manual

Guide to the Atlantium Hydro-Optic UV System

Models RZ104-11

RZ104-12

Document No. PE12CB00E

February 2015



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Publication Catalog No. **PE12CB00E**, Revision **005**, February 2015

Controller software version: **BM4.xx** with EPA reporting

TRACS software version: **BM8.xx** with EPA reporting

System and accessory specifications are subject to change without notice.

IMPORTANT NOTICE

It is strictly forbidden to alter/change the system hardware in any way.

Any change made without written permission from Atlantium shall void the warranty.



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Validations and certifications completed:



Revision History

Revision #	Description	Date
001	Based on AE120000E with united electrical location options. Now electrical options are location specific.	Dec 2013
002	Updated troubleshooting, electrical warning, Software	June 2014
003	Conditional s fix	July 2014
004	Electrical information, surge protection updates	Oct 2014
005	Updates power consumption for ultrasonic cleaner	Feb 2015



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1 Introduction

Congratulations on purchasing an Atlantium **RZ104-11/12** Hydro-Optic UV Water Treatment System. This user guide provides you with clear guidelines for preparing the site for installation, correct installation and software configuration procedures, and a good understanding of all system functions for maximum benefit from your Atlantium Unit.

The Atlantium **RZ104-11/12** systems guarantee water bio-security at optimized energy efficiency, and meet EPA criteria for providing bio-security.

Atlantium systems are designed to provide applications for the following Industries:

- | | |
|---|---|
| <ul style="list-style-type: none">■ Aquaculture■ Dairy■ Bio-Pharma■ Municipal■ Power Plants | <ul style="list-style-type: none">■ Bottled Water■ Beverages■ Beer■ Aquariums■ and more |
|---|---|

Applications

- **Water Disinfection** - meets US EPA criteria for providing bio-security
- **Chlorine Replacement** - provides a chemical-free alternative to chlorine for treating source water. It easily inactivates microorganisms including those that are resistant to chlorine and heat.
- **Non-Thermal Pasteurization** - replaces energy-intensive heat pasteurization of water - meets US FDA criteria for pasteurized equivalent water.
- **Post-Active Carbon** - protects against breakthroughs and reduces bio-fouling downstream. Significantly reduces the frequency of aggressive cleaning, and lengthens the lifespan of RO membranes
- **Dechlorination / Chlorine Destruction** - efficient, clean, non-chemical alternative to activated carbon filter or sodium bio-sulfite. Reduces risk, better protection, lower operating expenses.
- **Ozone Destruction** – efficient, cost-effective solution.
- And more.

Patented Innovative Technology

- Field proven worldwide, used by world-leading brands
- Based on Hydro-Optic engineering that optimizes UV efficiency and enables uniform dose distribution
- Medium Pressure High Intensity UV effective in cold & warm water, compromises microorganisms' repair mechanisms for long-term bio-security
- Guaranteed required dose for complete microbial inactivation.
- Sustainable operation provides the security and stability that the industry demands.

Guaranteed Dose Delivery

- Unique monitoring & control software assures that required UV dose is being delivered at all times.
- Dedicated UVIS sensors per lamp for real-time monitoring
- Automatically adjusts lamp power based on real-time analyses of critical parameters such as water flow rate, lamp intensity and water transmittance to UV (UVT).
- A user-friendly interface displays the monitored data in real-time including the actual delivered dose as well as the other critical parameters, so you can verify that you are actually getting the dose that you need.

Introduction

Lower Electrical Consumption

Fiber optic and hydraulic principles applied to UV system design enables:

- Optimized UV power and uniform dose distribution.
- Efficient use of power, with lower electrical consumption than low or medium-pressure-based UV systems.

Minimum Down Time

- True in-line system.
- UV lamps securely positioned outside the water.
- Quick lamp replacement (4 minutes) and better safety.

Integrates with your Process Line

- Field proven installation.
- With no additional software, you can integrate the Atlantium system into your current process using Atlantium's customizable settings.

TRACS Total Reporting Analysis & Control Software (Optional)

- Reporting functions meet your regulatory requirements
- A single installation of Atlantium's **TRAC Software** enables real-time access of up to nine Atlantium systems.
- The sophisticated data logging system enables traceability over time of all monitored data.
- It maintains a database and provides detailed analysis and reporting functions that can be used for trend analysis or proof of compliance.
- Settings reports document any changes to the operations and controls
- You can print out history and all the reports you need, ready for signature.



TRACS Total Reporting Analysis & Control Software can be upgraded into your Atlantium system if the need arises at a later time.

Regulatory Compliance

- Meets the most stringent regulatory criteria including FDA and EPA.
- Automatically generated reports at the push of a button for proof of compliance and traceability.
- Provides validated minimum required dose and not average dose.

Efficiency and Easy Maintenance

- For total efficiency and dependable performance, the Atlantium system monitors the lamps for performance, assuring that a lamp is replaced only when absolutely needed.
- By following the easy preventive maintenance programs you keep the system working at peak performance.
- The **Viewport** allows you to safely peek at what's going on inside.

1.1 Before You Begin

Before you begin using this product, or any installation or service operation, please read the following safety information:

- Attention to these warnings helps prevent personal injuries and damage.
- It is your responsibility to use the product in an appropriate manner.
- This product is designed for use solely indoors.
- You are responsible if the product is used for other than its designated purpose or in disregard of Atlantium instructions. Atlantium shall assume no responsibility in any way for such use of the product.
- The product is used for its designated purpose if it is used in accordance with its product documentation and within its performance limits.
- Using the product requires technical skills. It is therefore essential that only skilled and specialized staff or thoroughly trained personnel be allowed to use the product.
- Keep the basic safety instructions and the product documentation in a safe place and pass them on to the users.
- Applicable local or national safety regulations and rules for the prevention of accidents must be observed at all times.

1.2 Tags and Their Meaning

The following indicators are used in the product documentation to warn the reader about risks and dangers.



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates the possibility of incorrect operation which can result in damage to the product.



Indicates a hazardous situation involving electricity which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving Electrostatic Discharge (ESD), which, if not avoided, can result in damage to the product.



Indicates a hazardous situation involving UV light which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving a hot surface which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving working in an enclosure with moving parts, which if not avoided, can result in serious injury to the hands.



Indicates a hazardous situation involving poisonous material which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving caustic chemicals which, if not avoided, can result in death or serious damage.



Indicates that components or equipment are heavy and care is to be taken to avoid lifting incorrectly. Incorrect lifting can be dangerous to the personnel lifting and may result in dropping and damaging the components or equipment.



Indicates that components or materials to be discarded are classified as hazardous waste and must be disposed of appropriately.



Indicates information related to installation, safety or use of system.



2 About the RZ104 System

This Atlantium **RZ104-11** or **RZ104-12** Hydro Optic Water Disinfection System includes a disinfection unit, a Ballast Module configuration, and Controller. The quartz disinfection chamber takes advantage of **Total Internal Reflection** and reflects UV light back into the water to uniformly distribute the UV dose. Water flows unimpeded, resulting in low head-loss.

The specially designed short (Arc length 95mm / 3.74 inch) MPH1 lamps deliver a broad spectrum disinfection that irrevocably damages DNA and proteins in microorganisms. Housing Atlantium Quick Connect MPH1 lamps within a thick quartz tube significantly reduces risk of breakage and its consequences. A UV Intensity Sensor (UVIS) provides continuous measurement of each lamp's output.

In addition, a UVT Analyzer reports and tracks the water quality and a UV-proof Viewport allows you to view the inner workings. An optional Ultrasonic cleaning system cleans the surface of the quartz tubes automatically.

2.1 The RZ104-11/12 Units

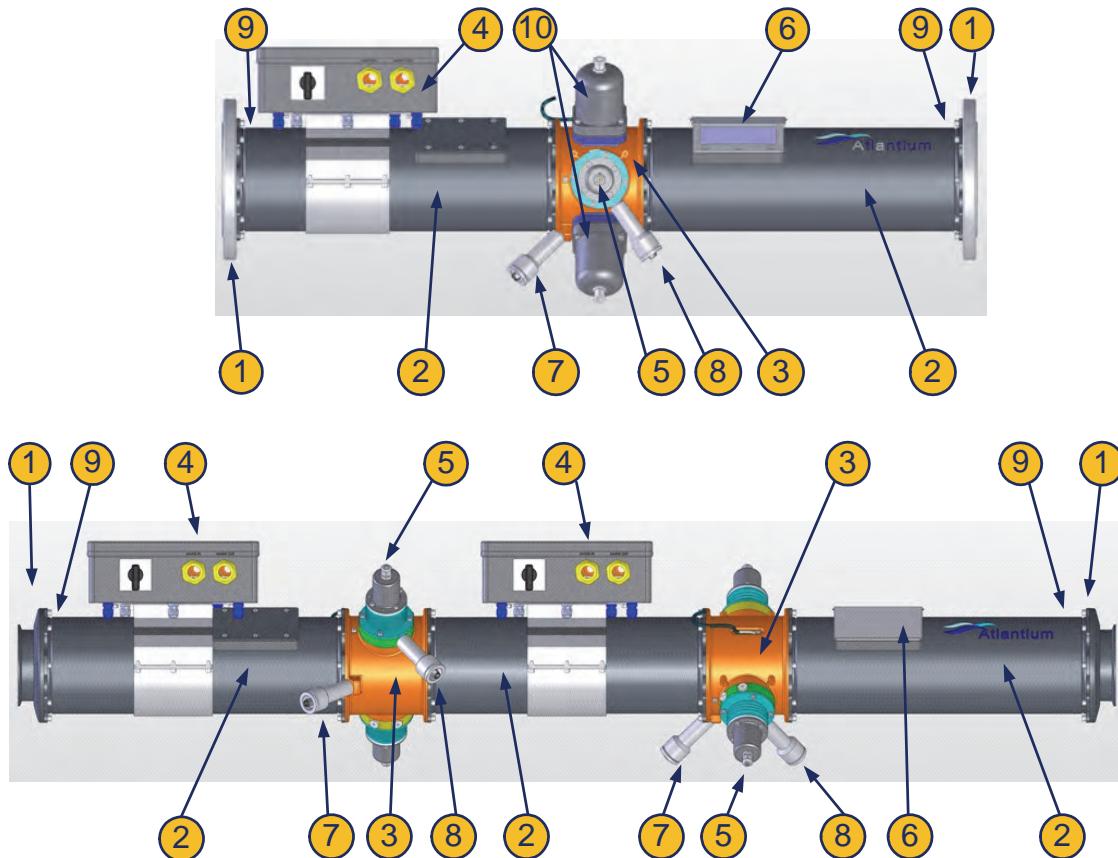


Figure 2-1: The **RZ104-11** and **RZ104-12** Units

The **RZ104-11** shown on the top above contains the Flange interface and the optional Ultrasound cleaning system. The **RZ104-12** shown on the bottom above contains the Ferrule/Tri-Clamp interface. The Lamp chambers do not contain the optional Ultrasound Cleaning system.

All of the system types may contain either Flange or Ferrule/Tri-Clamp interface and include the optional Cleaner.

About the RZ104 System

Table 2-1: Atlantium Unit Key

#	Item	Description
1	Flange or Ferrule/Tri-Clamp interface	The unit connects to the facility piping via a flange interface as per customer order
2	Quartz Disinfection Chamber	The quartz pipe in which the disinfection occurs
3	Lamp Chamber	The chamber that holds the lamp and optional Cleaning system
4	Connection Box	The box that sits on top of each lamp unit and holds the electrical circuitry
5	Lamp Arc length (mm / inch): Lamp total length (mm / inch):	Lamp encased in quartz tube assembly Medium Pressure High Intensity (MPHI) 95 / 3.74 262.8 / 10.35
6	Viewport	The UV-proof window to view the Unit working.
7	UVT Analyzer	The sensor that measures the UV transmittance through the water. Together with the UV Intensity sensor and the Controller, it analyzes, tracks and reports the water quality.
8	UV Intensity Sensor	The sensor that measures the UV intensity in the Lamp chamber and feeds it to the real time dose calculation.
9	Lifting strap area	The place designated to place lifting straps to lift and transport the Unit
10	Ultrasonic Cleaning system	A sophisticated cleaning system for the quartz tube utilizing ultrasonics

2.2 RZ104 Systems' Interface Control Drawings

The following pages contain the ICDs of the systems in the RZ104-11/12.

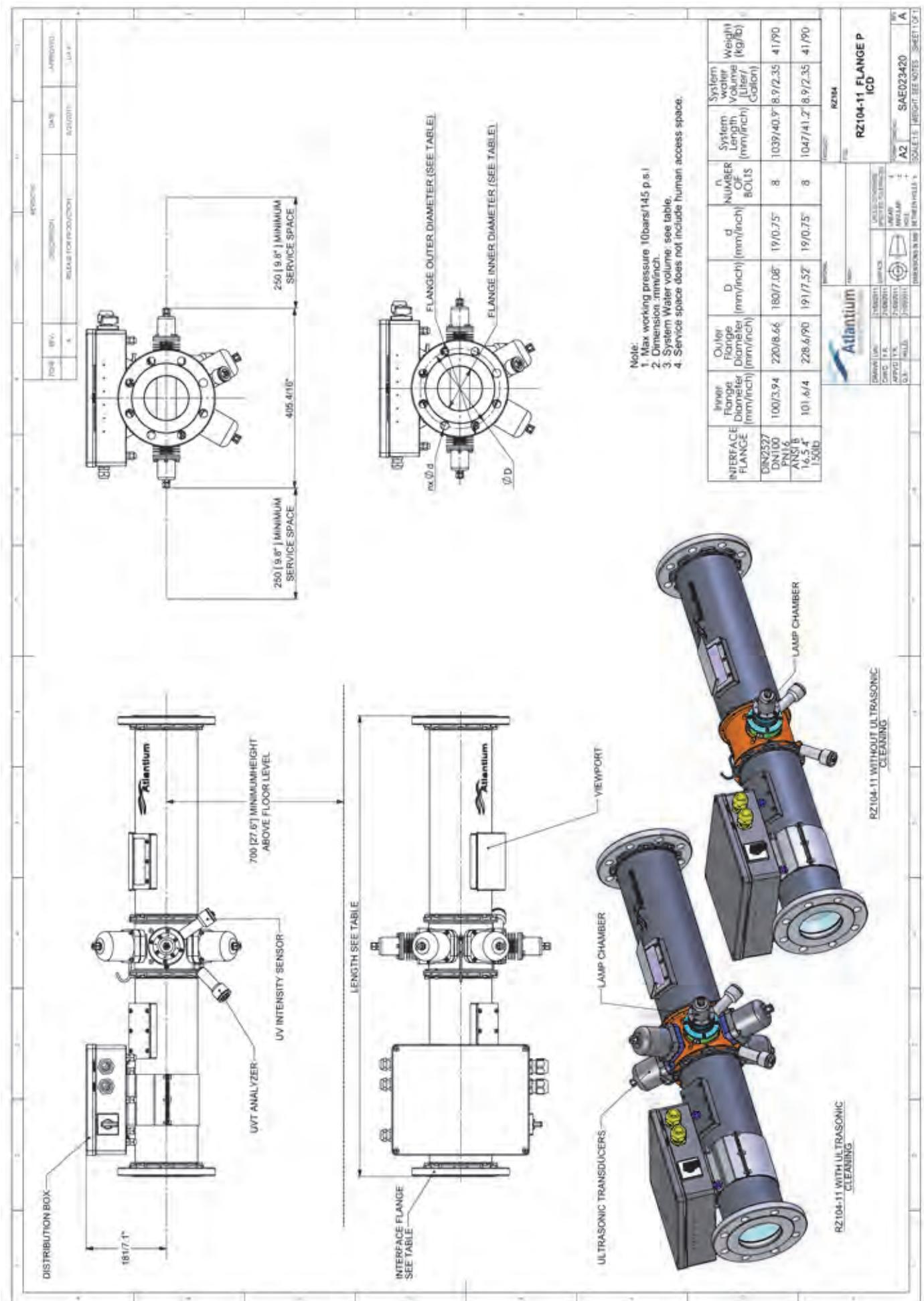


Figure 2-2: **RZ104-11** ICD Drawing

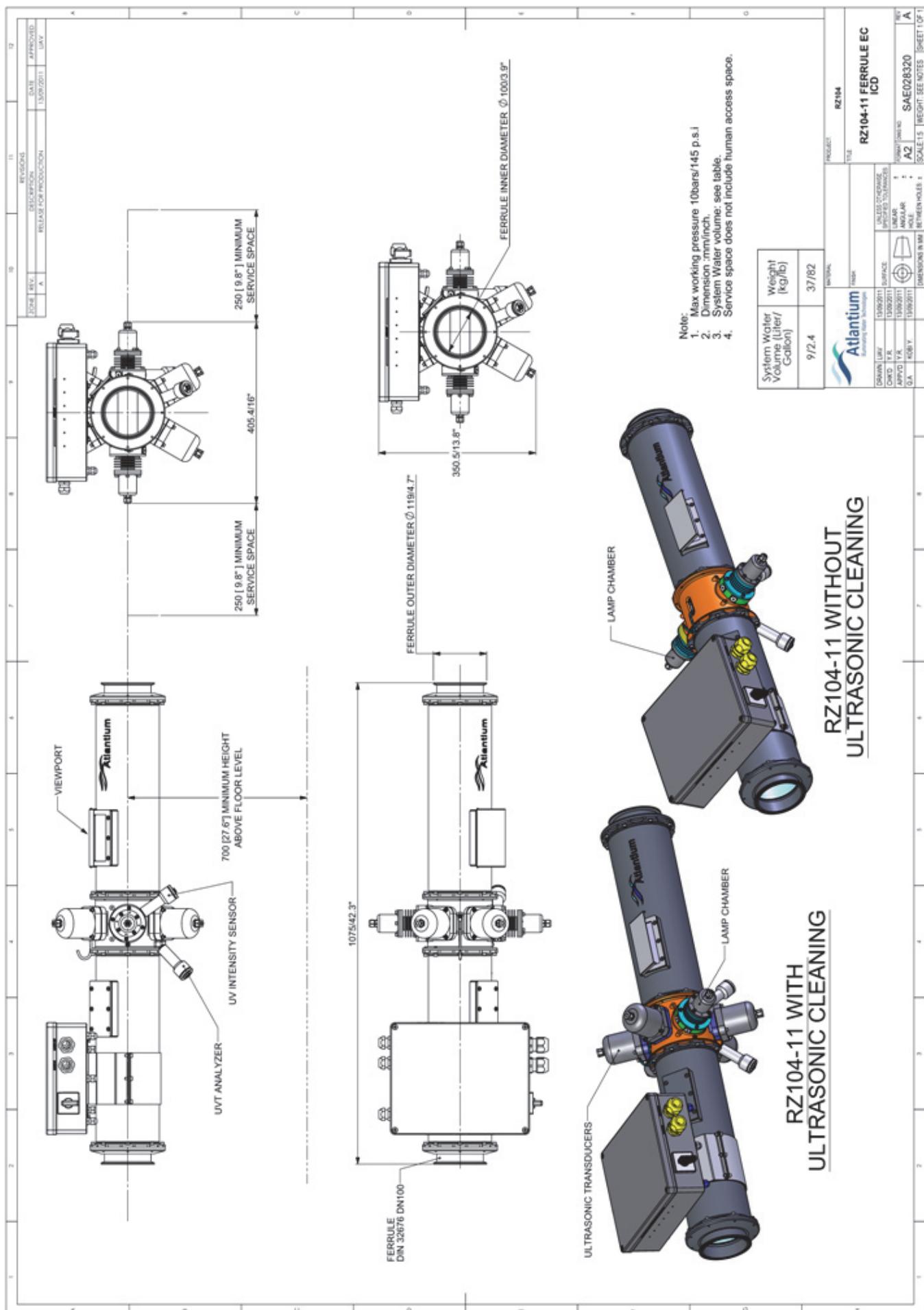


Figure 2-3: **RZ104-11** ICD Drawing with Tri-clamp/Ferrule Interface

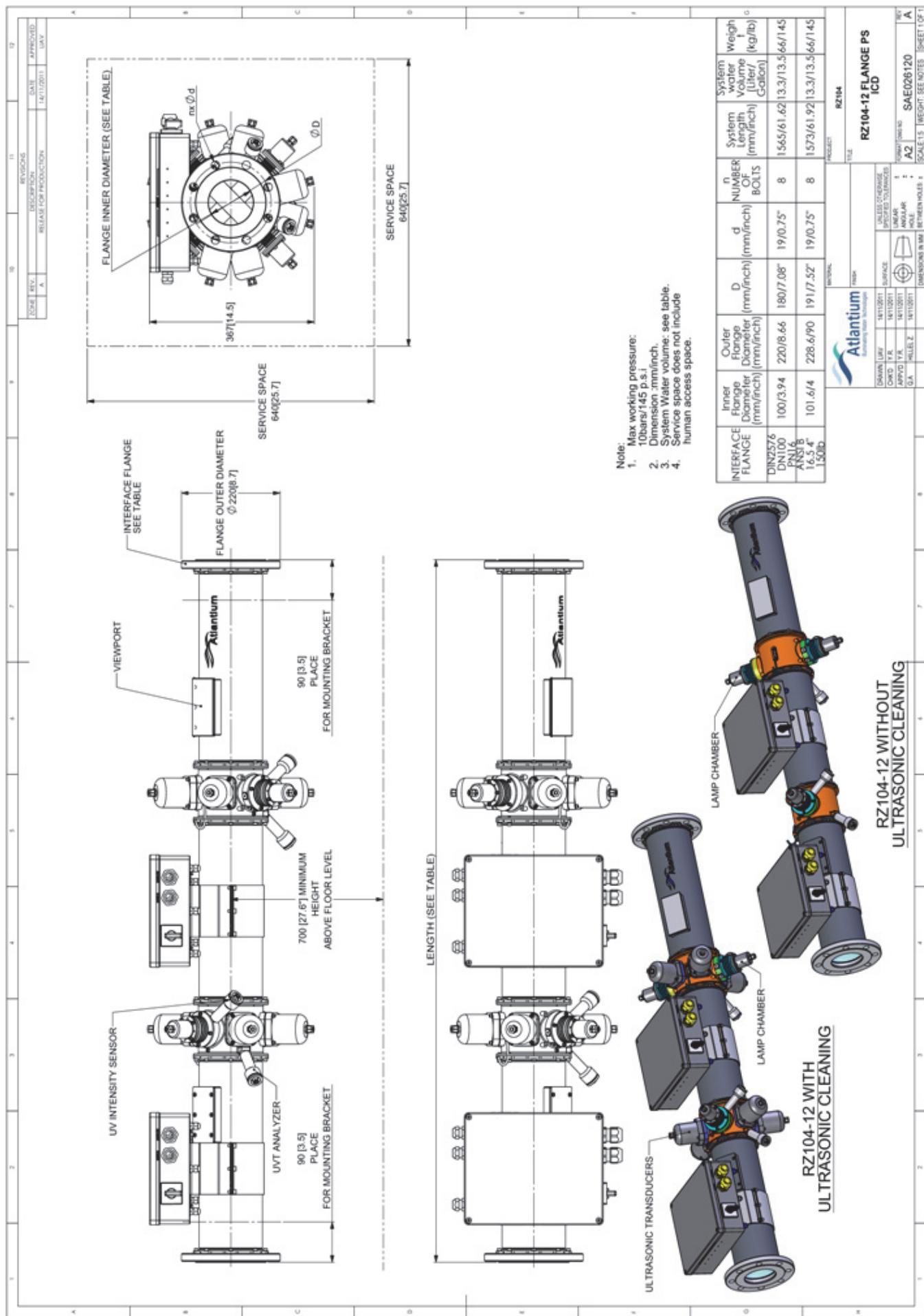


Figure 2-4: RZ104-12 with Flange Interface ICD

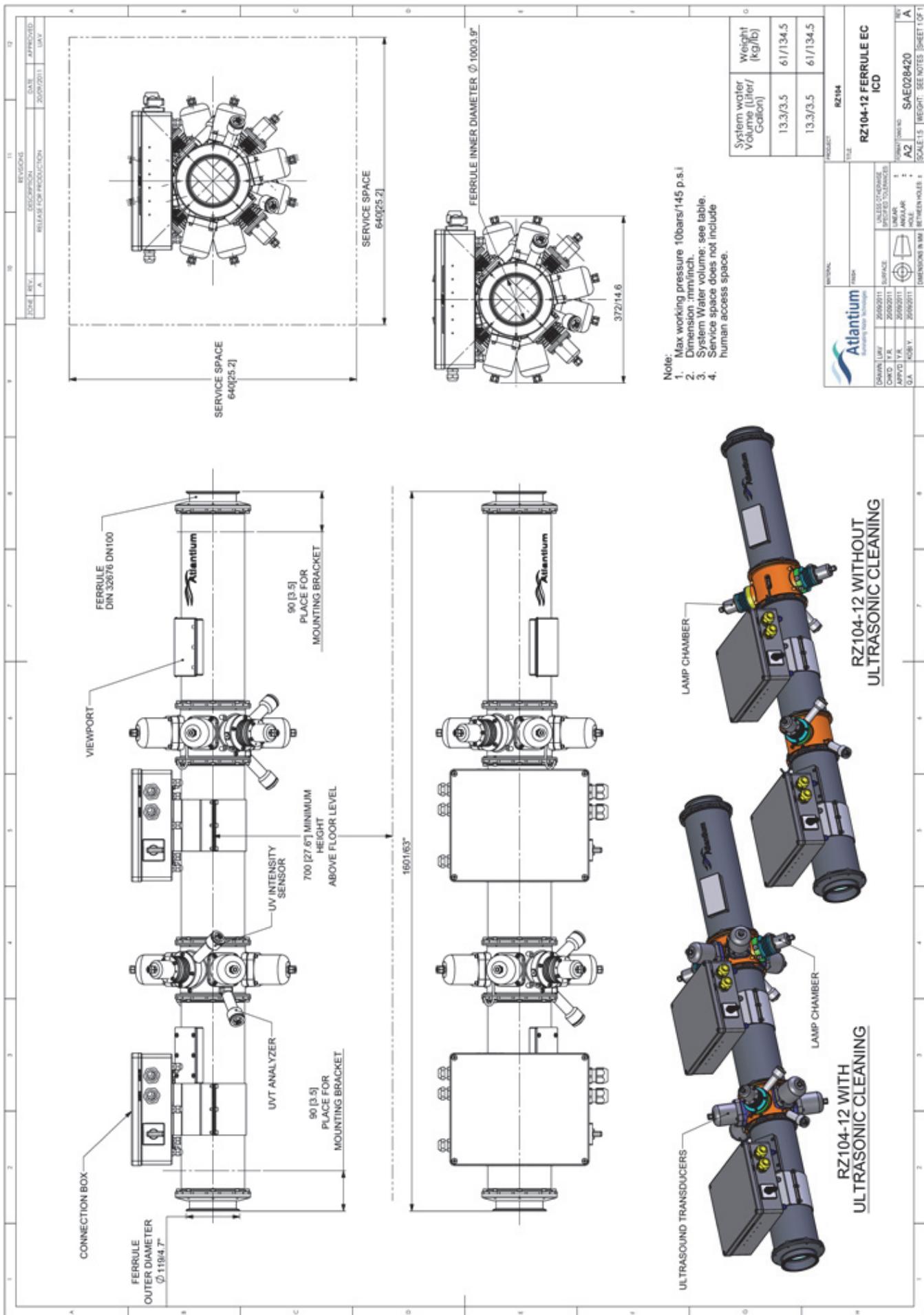


Figure 2-5: **RZ104-12** ICD with Tri-clamp/Ferrule Interface

About the RZ104 System

2.3 Atlantium System Footprint

The Atlantium system has a small, compact footprint that facilitates in-line installation in any process train.

Table 2-2: **RZ104-11/12** Physical Specifications

Item	Detail		
lamps			
RZ104-11	1		
RZ104-12	2		
Atlantium Unit Construction Materials:			
Casing:	Electro-polished Stainless steel 316		
Quartz Chamber:	High grade fused silica (Quartz)		
Standard Pipe Flange Interface Options:	Flange		Ferrule/Tri-Clamp
	DIN2527 DN100 PIN16	ANSI B 16.5 4" 150lb	DIN 32676 DN100
Unit Length (mm / inch)			
RZ104-11	1039 / 40.9	1047 / 41.2	1075 / 42.3
RZ104-12	1565 / 61.62	1573 / 61.92	1601 / 63
Inner Ø Diameter (mm / inch)	100 / 3.94	101.6 / 4	100 / 3.9
Outer Ø Diameter (mm / inch)	220 / 8.66	228.6 / 90	119 / 4.7
Bolt Circle Diameter	180 / 7.08	191 / 7.52	N/A
Bolt Hole Diameter	19 / 0.75		N/A
Number of Bolts	8		N/A
Width at Widest Point (mm / inch)	119 / 4.7		
Unit Volume (Liter / Gallon)			
RZ104-11	8.9 / 2.35		9 / 2.4
RZ104-12	13.3 / 13.5		13.3 / 3.5
Weight (without water) (Kg / lb)			
RZ104-11	41 / 90		37 / 82
RZ104-12	66 / 145		61 / 134.5
Service Clearance on each side (mm / inch)	320 / 12.6		
Minimum Height above Floor Level (mm / inch)	750 / 29.5		
Maximum Working Pressure	10 Bars / 145 P.S.I.		
Maximum Flow Rate	Application dependent		
Place for Mounting Brackets on each end of the Unit (RZ104-12 only)	90 / 3.5		

About the RZ104 System

2.4 The Ballast Module

Ballast Module is a water-proof easy plug-n-play box that contains the ballast power supply and related circuitry. Its convenient plugs make it easy to service. Its modular design makes it serviceable and flexible and easier to fit into an existing plant. A Ballast Module is supplied for each lamp in the Atlantium system. Its heat sink frame complies with industry standards. It can be mounted on the wall or other suitable anchoring point. The location of the Ballast Module must be designated according to the maximum distance needed for positioning the **Cable Harness** of the Atlantium Unit. The **Cable Harness** is 5m / 16.4' (also available in 10m / 32.8' length). For systems with more than one lamp, the Ballast Modules can be positioned one above the other or next to one another. The Ballast Module must have at least 300 mm (11.8 inches) of clearance on its right and left sides for proper ventilation and 300mm (11.8 inches) of clearance on the bottom for cable routing. For more details on mounting, see *Installing the Ballast Module(s)* on page 5-10.

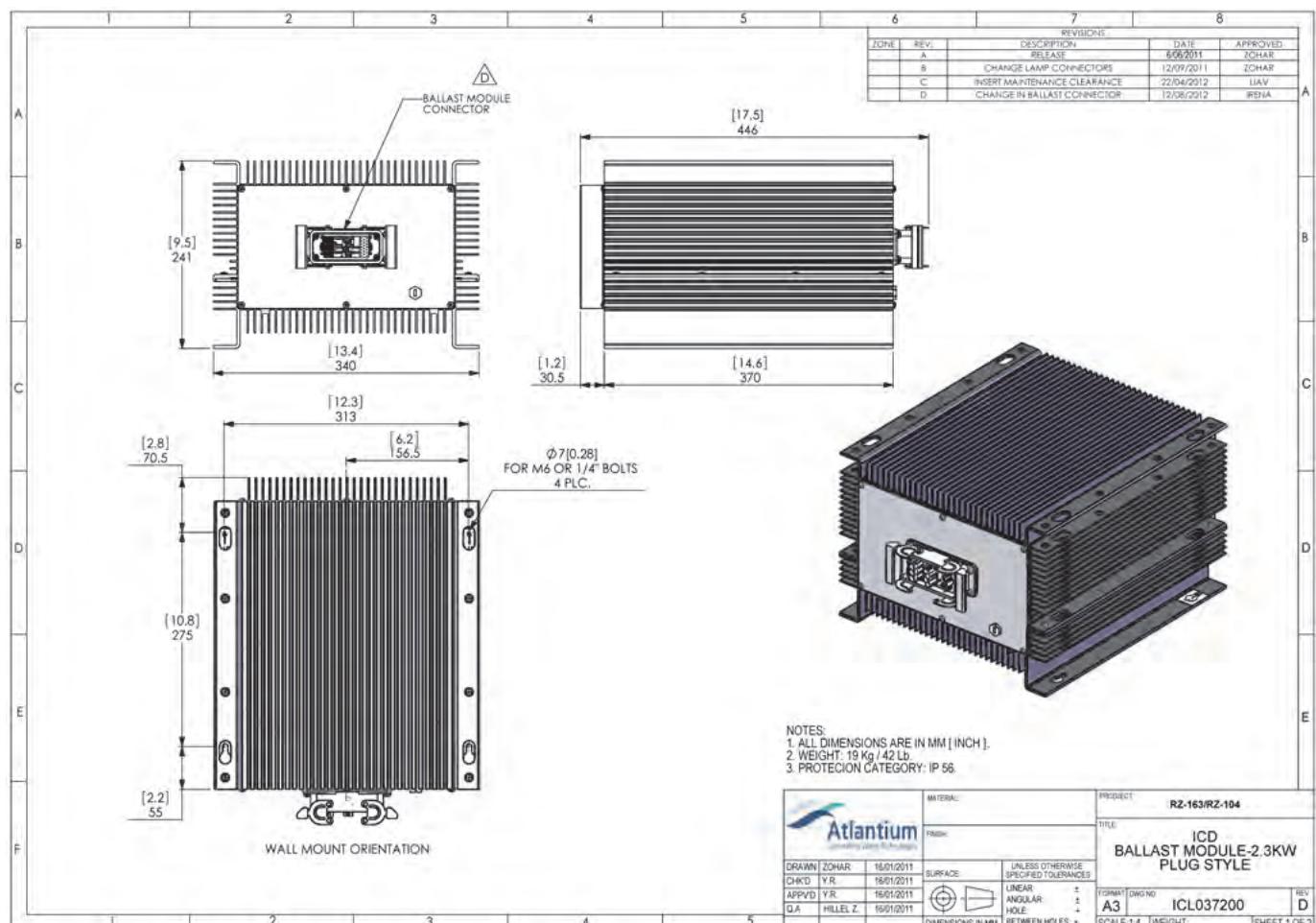


Figure 2-6: Ballast Module ICD Drawing - Single Connector

About the RZ104 System

Table 2-3: Ballast Module Physical Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	340 / 13.4 x 241 / 9.5 x 446 / 17.5
Weight (Kg/Lb):	19 / 42
Heat Load per Ballast Module: (For calculating space cooling requirements)	50W
Protection Category:	IP 56.

2.5 Electrical Usage

Utilize a Residual Current Device (RCD) that is Type A with 3000A surge resistance.

Atlantium recommends ABB P/N F204 A-xx/0.03 AP-R (xx represents the current rating according to the system load. Select the appropriate RCD accordingly. Calculating the value, takes into account the power consumption of the system (see the table in the section below) and the mains voltage of your locale.

The tables below detail the Atlantium Unit's electrical details and power consumption.

Table 2-4: **RZ104-11/12** Electrical Details

Electrical	Details
Phase:	3 phase
Voltage:	400/440/480 VAC per Ballast Module
For locations with 440/480VAC	4-wire system that contains 3 phases and Ground
Maximum allowed voltage tolerance:	±10% from the nominal voltage

2.5.1 Power Consumption and Local Voltage Requirements

The table below details the power consumption of the Atlantium system according to local voltage.

Table 2-5: Power Consumption

#of lamps:	1	2
Maximum power (kW)	1.1	2.1
Direct Feeding (w/o Power Module)	Current consumption @440V (A)	1.4
Direct Feeding (w/o Power Module)	Current consumption @480V (A)	1.2
Direct Feeding w/Power Module	Current consumption @440V (A)	3.0
Direct Feeding w/Power Module	Current consumption @480V (A)	2.7

2.6 Surge Protection

Every Atlantium system **must** be protected by a device that prevents electrical surges and fluctuations from causing damage. There are three types of surge protection:

- UPS (Uninterruptible Power Supply) has an internal battery that allows the equipment plugged into it to continue to run in the event of a power outage until power is restored. It also has the benefit of performing the same functionality of surge protectors, protecting against spikes and surges. If needed, the UPS allows the system to be shut down cleanly if power is out for a lengthy period.
- Surge protection device protects your equipment from variations in electrical current, such as surges and spikes.
- OVPD module (Over Voltage Protection Device) - available from Atlantium. see below.

2.6.1 Surge Protector Devices

Surge protection devices are designed to protect industrial communication networks. This device recommended by Atlantium uses a combination of 3-electrode gas discharge tubes and fast clamping diodes. Typical applications include industrial processing equipment, transmission systems, I/O cards, probes, actuators, and displays. Surge protection devices are available via Atlantium.

Table 2-6: Surge Protector Details

Atlantium PN	DATA SHEETS	Module PN	Description
EP0002000	DOC002000	4983-DS277-404	SURGE PROTECTOR 440-480 3P 40KA
EP0002600	DOC002600	4983-DS120-402	SURGE PROTECTOR L + N, 115V
EP0002800	DOC002800	1352740000	SURGE PROTECTOR L + N, 230V

2.6.2 The OVPD Module

The Over Voltage Protection Device (OVPD Module) may be required in locations where fluctuations in the voltage may occur. Consult your Atlantium representative.

About the RZ104 System

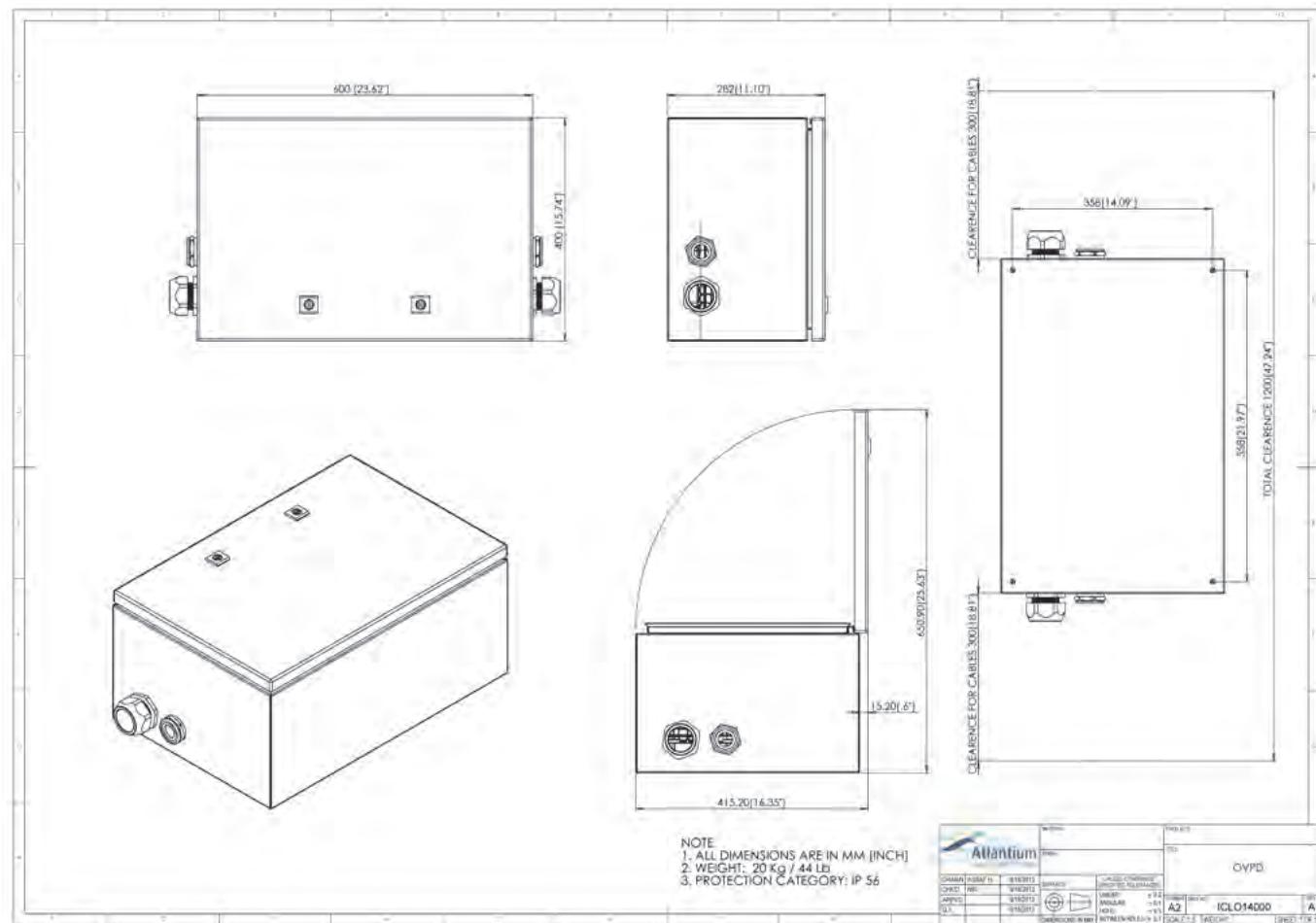


Figure 2-7: OVPD ICD Drawing

Table 2-7: OVPD Module Details

Physical	Details
Dimensions (W x H x D) (mm/inch):	400/15.74 x 600/23.62 x 282/11.10
Weight (Kg/Lb.):	20244
Minimum Clearance for Electrical Cables Routing on each of two sides (top/bottom) (mm/inch):	300/18.81
Total Clearance (mm/inch):	1200/47.24
Electrical	
Voltage:	Up to 600VAC
Protection Category:	IP 56.

About the RZ104 System

2.7 Power Module

In localities with 400VAC, a Power Module is not required. The Power Module provides the step-down transformer required to interface between the voltage of the Atlantium Unit and the local voltage where relevant.

The Power Module is required for:

- In localities with electrical power distribution of 440-480VAC (such as in the USA and Mexico), where the Atlantium system includes the Ultrasonic Cleaner.
- In localities with electrical power distribution of less than 400VAC, such as 200VAC used in Japan.
- In localities with electrical power distribution of over than 480VAC, such as 600VAC used in Canada.

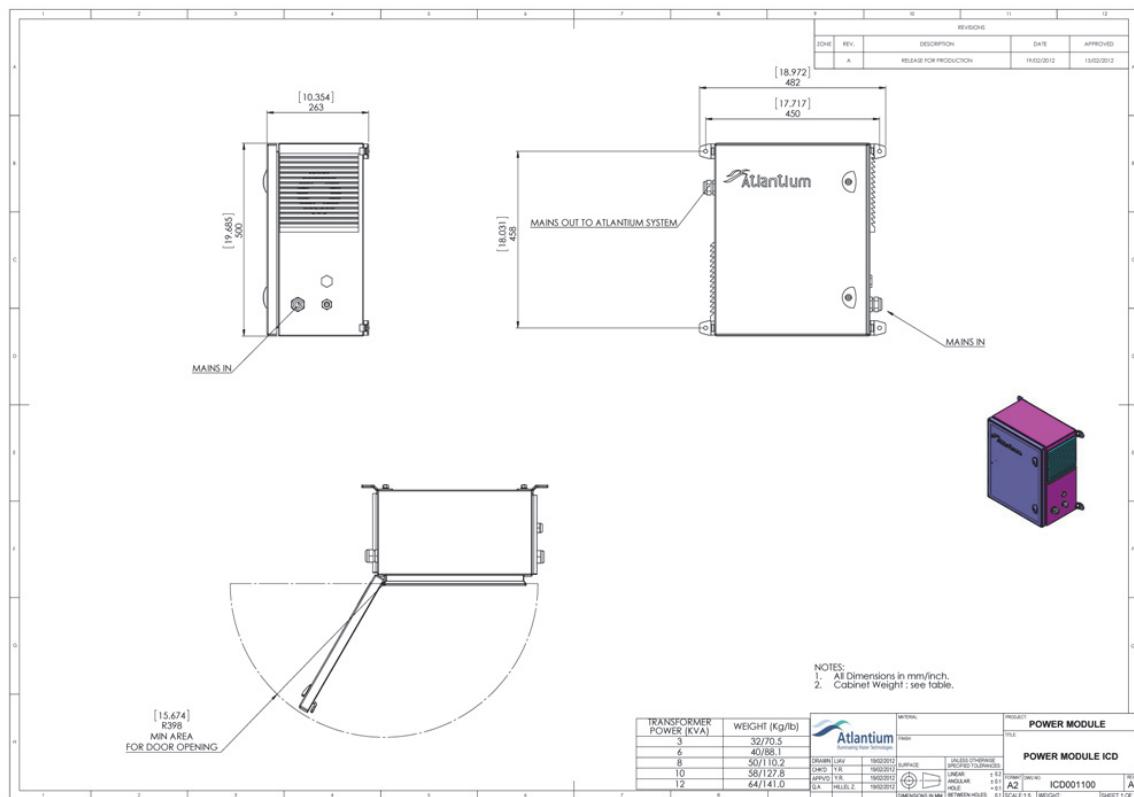


Figure 2-8: Power Module

Table 2-8: Power Module Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	18.97 / 482 x 10.35 / 263 x 19.68 / 500
Minimum area with open door:	15.67 / 398
Minimum Clearance for Electrical Cables Routing:	5 0 / 2
Weight (Kg/Lb.):	
RZ104-11	32 / 70.5
RZ104-12	32 / 70.5

About the RZ104 System

Table 2-8: Power Module Details

Physical	Details
Electrical	
Voltage:	3 phase x 200 / 230 / 400 / 440 / 480 Voltage
Protection Category:	IP 56.

2.8 48VDC Module (as needed)

The **48VDC Module** may be utilized some installations in localities with 440/480VAC **Electrical Power Distribution Systems**, such as, the USA and Mexico. It provides a 48VDC power feed to the Connection Box. The **48VDC Module** can be mounted on a wall or suitable anchoring point up to **10m / 32.8'** from the Atlantium Unit.

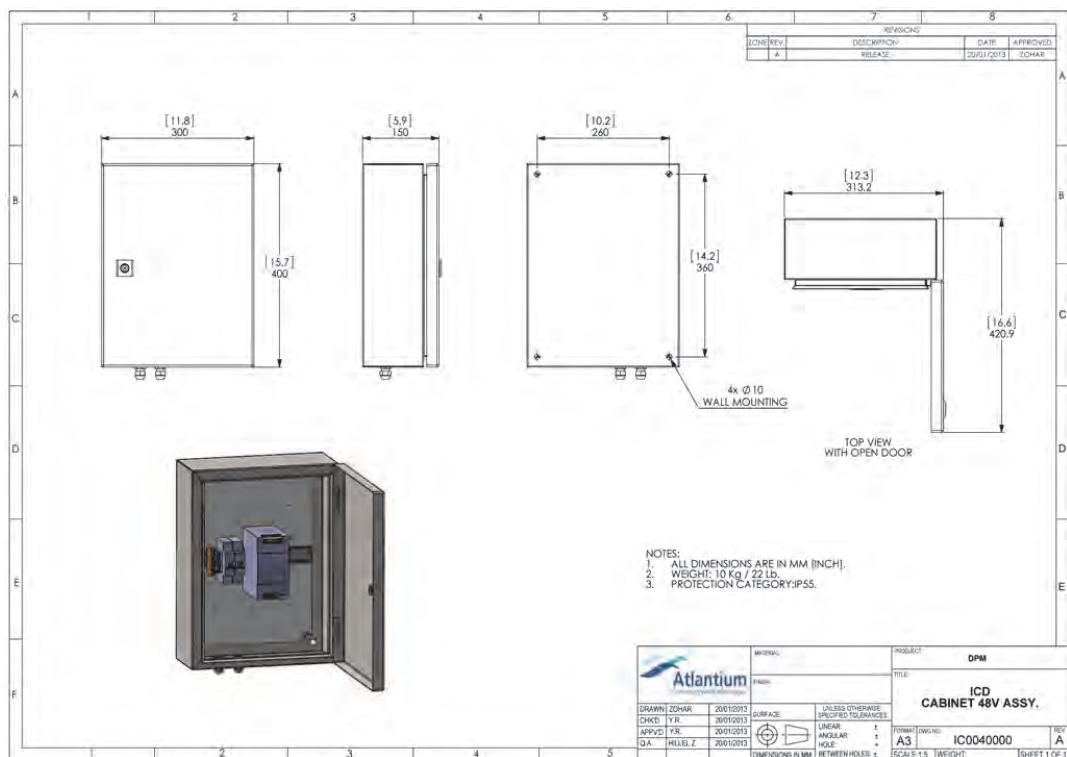


Figure 2-9: 48VDC Module

Table 2-9: 48VDC Module Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	300 / 11.8 x 150.7 / 5.9 x 400 / 15.75
Length with open door:	420.9 / 16.6
Minimum Clearance for Electrical Cables Routing:	50 / 2
Weight (Kg/Lb.):	10 / 22
Electrical	

About the RZ104 System

Table 2-9: 48VDC Module Details

Physical	Details
Maximum Power Consumption:	Maximum 285W
Voltage: Incoming Outgoing	200-500VAC 48V
Protection Category:	IP 56.

2.9 The Controller

The Atlantium system is monitored and controlled from a **Controller**. It can be mounted on a wall or suitable anchoring point up to 50 meters (164.04 ft.) from the Atlantium Unit. However, it should be located in close proximity to the Atlantium Unit where it is easy to reach the touch screen and read the monitoring information.

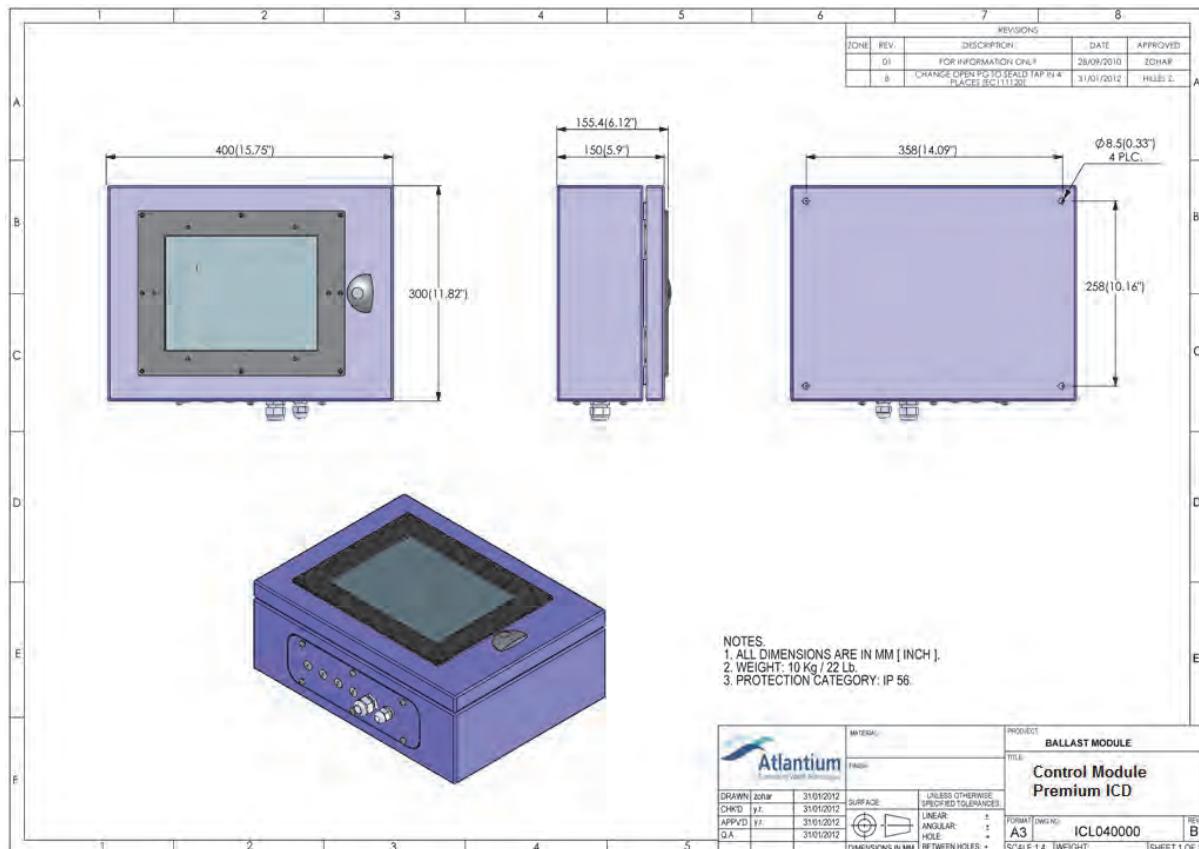


Figure 2-10: Controller ICD Drawing

Table 2-10: Controller Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	400/15.75 x 300/11.82 x 144.4/6.12
Weight (Kg/Lb.):	9.8/21.6
Minimum Clearance for Electrical Cables Routing (mm/inch):	50/2

About the RZ104 System

Table 2-10: Controller Details

Physical	Details
Electrical	
Maximum Power Consumption:	Maximum 40W
Voltage:	1 or 2 phase 120-240VAC
Protection Category:	IP 56.

2.10 Ultrasonic Cleaning Module (Optional)

The optional Ultrasonic cleaning system mounted on the Atlantium unit also includes a module that houses the power supply needed to operate the optional Ultrasonic Cleaning system. It can be mounted on a wall or suitable anchoring point up to **10m / 32.8'** from the Atlantium Unit.

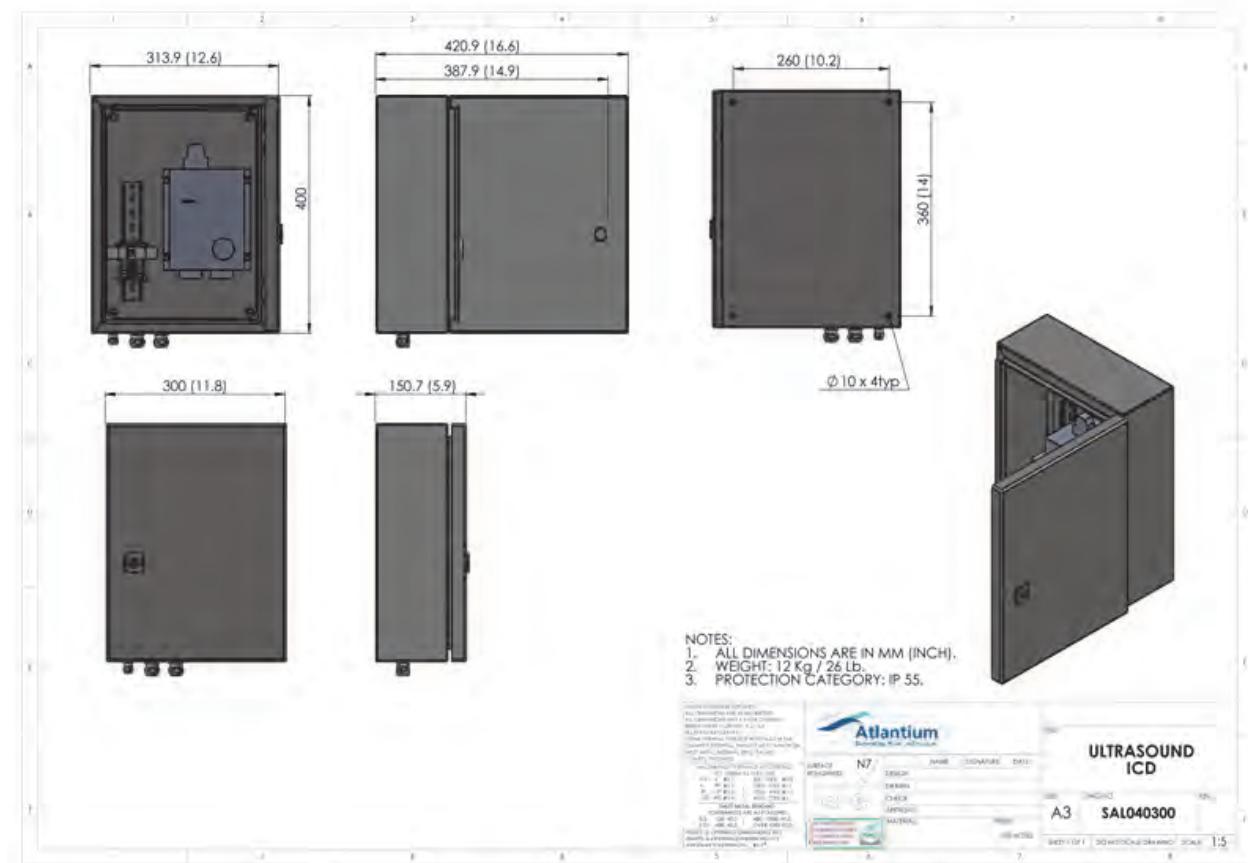


Figure 2-11: Ultrasonic Cleaning System Module

About the RZ104 System

Table 2-11: Ultrasonic Cleaning Module Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	300 / 11.8 x 150.7 / 5.9 x 400 / 15.75
Length with open door:	420.9 / 16.6
Minimum Clearance for Electrical Cables Routing:	5 0/ 2
Weight (Kg/Lb.):	12 / 26
Electrical	
Maximum Power Consumption:	Maximum 300W
Voltage:	1 phase 230VAC
Protection Category:	IP 56.

2.11 Environmental Requirements

The Atlantium system is to be situated indoors in an area that is adequately cooled and with sufficient air flow. However, there have been many successful Atlantium installations in less friendly environments. Consult your Atlantium representative to choose the most suitable location.

Table 2-12: Atlantium System Environmental Details

Environmental	Details
Maximum ambient air temperature:	45°C (113°F)
Maximum ambient air temperature in the Ballast Modules environment:	45°C (113°F)
Maximum atmospheric relative humidity:	95%
Water Temperature: Maximum – high temperature: ■ Without Ultrasonic Cleaning: ■ With Ultrasonic Cleaning: For water temperature above 70°C (160°F) consult with Atlantium service engineers Minimum – cold temperature:	99°C(210.2°F) 70°C (160°F) No limit

2.12 Regulatory Compliance

The Atlantium System complies with the following regulatory standards:

- Long Term 2 Enhanced Surface Water Treatment Rule of January 5th, 2006
- 3rd party validated by HDR/HydroQual, Inc.
- EMC directive 2004/108/EC
- European Low Voltage Directive (LVD), 2006 / 95 / EC for electrical safety
- Council Directive 98 / 83 / EC of 3 November 1998 for the quality of water intended for human consumption
- ISO 9001:2008 Quality Management Standard – Development, Design, Production and Sales of Water Disinfection Systems
- US Federal Performance Standards 40 CFR 141.720
- All components have CE or UL 508 NRTL (MET) certification
- Resolucion exenta No 2.327 del 31 de diciembre de 2010, en el marco de la Ley General de Pesca y Acuicultura
- GOST Standards Institute, Russian Federation
- National Institute of Public Health, Poland



3 Getting Ready for Installation

Using the guidelines and information in this section, you can prepare the piping and electrical setup for installing the Atlantium Hydro Optic Water Treatment System. If you have any questions, consult with an Atlantium application engineer.

3.1 Planning

Consider where to locate the unit from the perspective of your process. Prepare your installation plan according to the planning points below, as well as the other guidelines in this manual.

3.1.1 Access

- **Premises Access**
 - Take into account that sufficient door space is required to transport the Atlantium Unit into the facility where it is to be placed.
- **Service Access**
 - Take into consideration that sufficient space is required for maintenance personal to access the Atlantium Unit for periodic component replacement.

3.1.2 Hydraulics

- **Piping**
 - Align the upstream and downstream piping with the designated location for the Atlantium Unit.
 - Prepare the flanges/ferrules and piping as specified according to ***The Piping Infrastructure*** on page 3-17. To avoid a step in the connection, make sure that the internal diameters where the Atlantium Unit and your piping match.
 - **Do not** use sealing material that contains graphite when sealing the flanges/ferrules and gaskets as it accelerates the corrosive process on stainless-steel components, including those of the Atlantium system.
- **Mechanics**
 - Prepare the supports needed for the Atlantium Unit, noting the minimum level above the floor is at least 750mm / 29.5 inch.
 - Check that the piping on the inlet and outlet sides has adequate support structures so that there are no mechanical stresses that may endanger the Unit.
 - Check the upstream and downstream piping for vibrations. Make sure that the piping to be attached to the Atlantium Unit is anchored and reinforced to protect the Unit against vibration. A high vibration level can cause damage to any hydraulic system, including the Atlantium unit. High vibration can be caused by an unbalanced pump or by sudden valve close.
- **Hydrodynamics**
 - Water hammer can cause damage to any hydraulic system, including the Atlantium Unit. Make sure that this phenomenon does not occur in your facility's water line. To prevent water hammer, consult your system engineer and check your facility system procedures, including:
 - ◆ When starting the water flow when the lines are empty, keep valves open so that the air in the pipes has a simple release pathway.
 - ◆ Sudden valve closures can cause water hammer. Make sure that valves close gradually, enough to avoid this problem.
 - ◆ Ensure that all pumps that impact the Atlantium system employ soft start-up procedures.

Getting Ready for Installation

- ◆ The Atlantium Unit must be totally filled with water. Assure that no air can be trapped in the unit and that air can be released. Verify through the Unit's viewport after installation that there are no bubbles.

3.1.3 Flow Data

- Evaluate your flow trends to determine whether you require a flow meter or flow switch. If the flow varies, a **flow meter** is required to detect and report on the flow coming into the unit. Make sure that there are to be **no** branches on or off the pipes between the flow meter and the Unit inlet. If the flow rate is static, a **flow switch** can be used instead.

3.1.4 Application

- Verify that the dose-related parameters, such as the UVT and the flow, are the same as those defined in the Atlantium application scope of supply.
- Determine what a low flow situation means to your process and whether you need to shut down the Unit (low flow indicates upstream problems) or recirculate (low flow normal) when the flow goes below the normal range.
- For systems that include TRACS identify the locations for the **TRACS** operational and viewer computer stations. Consider a place that is conveniently accessible when checking system operations but protected from environmental factors

3.2 Typical Installation Set-Up

Use the diagrams below as a general basis for your installation drawings. Be sure to include service access as you fit the Atlantium system into your facility (i.e., nearby pipes, electrical fixtures, support beams, etc.)

Below are two typical installation setups:

- Typical Atlantium System Setup without Bypass
- Typical Atlantium System Setup with Bypass

For **PMO** installations, a bypass system can be installed using a flow plate (not shown).

For information about adapting the installation to your facilities and your industry needs, contact your Atlantium representative.

Typical Atlantium System Setup (No Bypass)

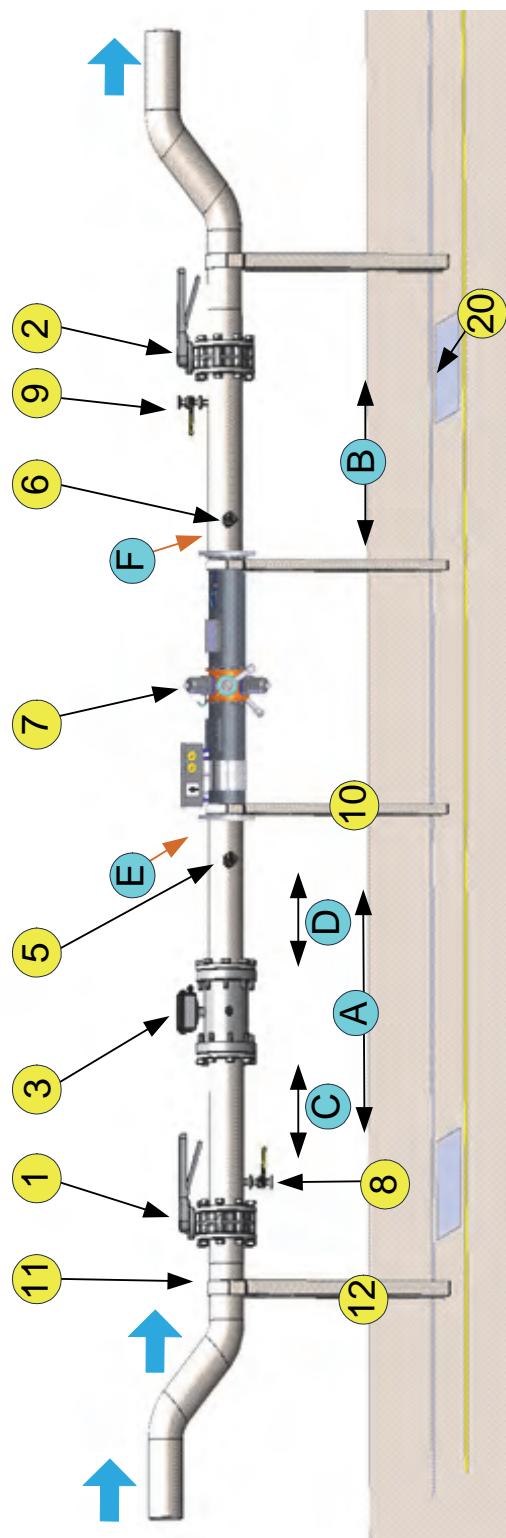


Figure 3-1: Typical Atlantium System Setup (No Bypass)

Typical Atlantium System Setup (With Bypass)

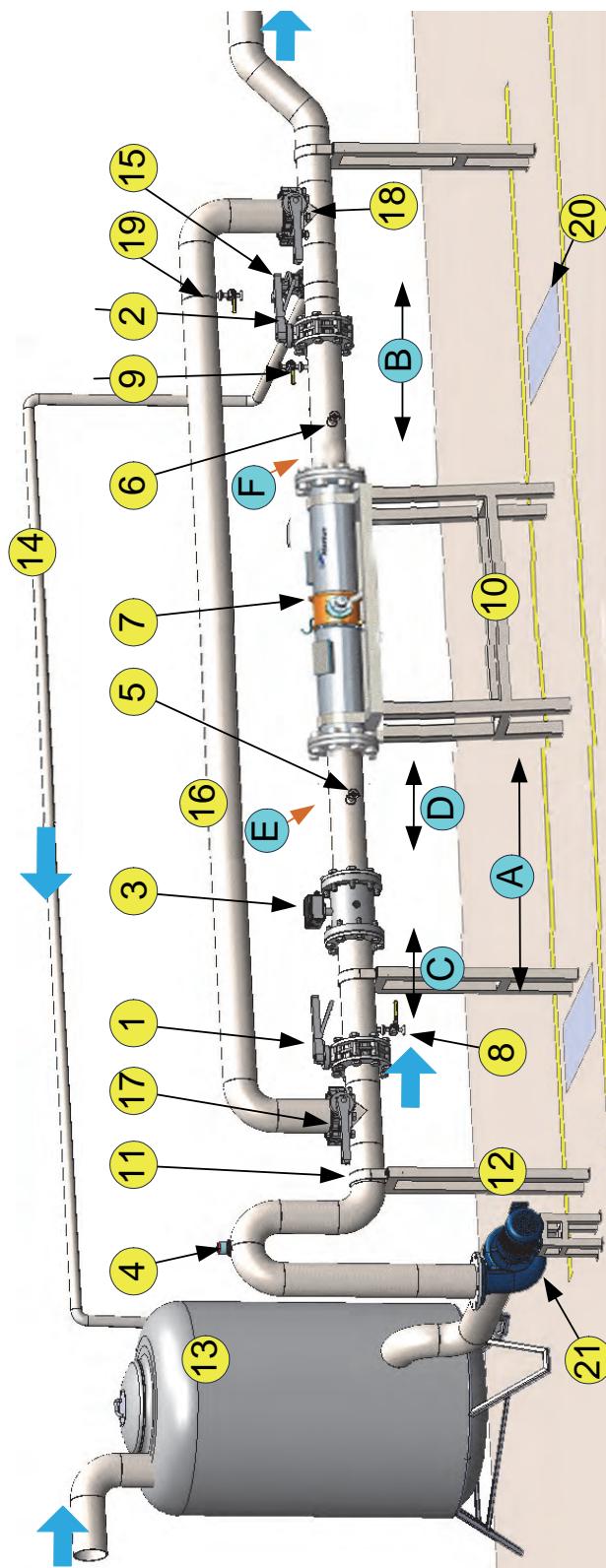
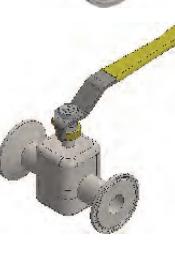


Figure 3-2: Typical Atlantium System Setup with Bypass

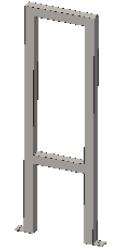
Getting Ready for Installation

Table 3-1: Typical Atlantium System Component Setup Key

#	Description		Atlantium P/N or recommended and available at Atlantium
	 Direction of water flow in the pipes		-
1	Inlet isolation Valve ■ Isolating Valve on the Inlet side ■ Stainless Steel aseptic valve		-
2	Outlet isolation Valve ■ Isolating Valve on the Outlet side ■ Stainless Steel aseptic valve		-
3	■ Flow Meter flow measurement device with 4-20mA analogue output signal ■ To be installed on the same line as the Atlantium system, with no branching before or after the flow meter ■ Follow the manufacturer's Installation instructions		Available Flow Meters: KROHNE OPTIFLUX 6000 KROHNE OPTIFLUX 2300
4	Air Release valve - To prevent air bubbles where necessary ■ Automatic Air Release valve is used to release air bubbles trapped within the line ■ Install at a high position to allow air bubbles to accumulate and release from this point		-
5/6	Inlet/Outlet Sampling Points ■ Position aseptic sampling valves horizontally (90°) on the pipe center, within 50cm of the Unit ■ Aseptic sampling valve must be a dedicated valve for sampling only and resistant to alcohol and flame		■ Aseptic Sampling Valve Kit for Stainless Steel Pipe - KTB005700 ■ Aseptic Sampling Valve Kit for Plastic Pipe - KTB0011500
7	Generic Atlantium Unit (shown with flange interface. Systems are also supplied with ferrule interface.) (RZ104-11 is shown. The piping and placing of components are similar for RZ104-12.)		-
8	Draining/CIP Port - For performing CIP on the Atlantium Unit ■ The Draining port should be positioned close to the Inlet valve and between that and the Unit, on the bottom of the pipe ■ It is also used as one of the CIP ports and connects to a hose		■ CIP Kit - SAB012900 ■ CIP Valve Kit for Stainless Steel - KT0011600 ■ CIP Valve Kit for Plastic - KT0011700 (the valve itself is not part of the kits) See CIP Valves and CIP Kit on page 3-20., for information on CIP equipment.
9	CIP Port - For performing CIP on the Atlantium Unit ■ The CIP port should be positioned between the Unit and the Outlet valve, on top of the pipe, at the highest point before the isolation valve, in order to allow the pipes to be completely filled with solution		

Getting Ready for Installation

Table 3-1: Typical Atlantium System Component Setup Key

#	Description		Atlantium P/N or recommended and available at Atlantium
10	<p>System Supports</p> <ul style="list-style-type: none"> ■ Supports are required to assure no mechanical stress on the Atlantium Unit 		-
11	<p>Support brackets</p> <ul style="list-style-type: none"> ■ Brackets are used to hold the Atlantium Unit and pipes attached to the support mounts ■ Is to include internal flexible material to absorb vibrations and assure that the pipes and Atlantium Unit are mounted tightly and securely 		-
12	<p>Pipe Supports</p> <ul style="list-style-type: none"> ■ Pipe Supports are required to assure no vibrations in the pipeline 		-
13	Water tank		-
14	<p>Recirculation Line >5m³/h (>20gpm (Optional))</p> <ul style="list-style-type: none"> ■ A Recirculation line is highly recommended to keep water flowing constantly, thereby assure a high disinfection level 		-
15	<p>Recirculation Line Isolation valve (Optional)</p> <ul style="list-style-type: none"> ■ Stainless Steel aseptic valve 		-
16	<p>By-Pass (Optional)</p> <ul style="list-style-type: none"> ■ If the facility uses quartz corrosive CIP chemicals, such as caustic soda, use a By-Pass line to prevent damage to the Atlantium Unit 		-

Getting Ready for Installation

Table 3-1: Typical Atlantium System Component Setup Key

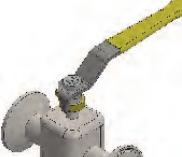
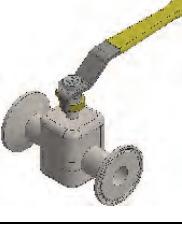
#	Description		Atlantium P/N or recommended and available at Atlantium
17	By-Pass Inlet isolation Valve (Optional) ■ Stainless Steel aseptic valve		-
18	By-Pass Outlet isolation Valve (Optional) ■ Stainless Steel aseptic valve		-
19	By-pass draining port (Optional) ■ The Draining port should be positioned on the bypass line, at the lowest point of the pipe		-
20	Drain ■ It is recommended to install a drain close to the draining valve		-
21	Pump ■ To prevent water hammer, the pump must be able to start up gradually.		-

Table 3-2: Typical Atlantium System Distances Setup Key

#	Description
A	Minimum 10D (1000mm/40inch) of straight horizontal pipe between the Inlet isolation valve and the Atlantium Unit (For sites with space constraints, consult an Atlantium Application Engineer to find appropriate solutions.)
B	Minimum 5D (500mm/20.inch) of straight horizontal pipe between the Atlantium Unit and the Outlet isolation valve (For sites with space constraints, consult an Atlantium Application Engineer to find appropriate solutions.)
C	Position the Flow Meter or Flow Switch typically requires a minimum 5D (500mm/20inch) of straight horizontal pipe immediately preceding it on the Inlet side. Refer to the manufacturer's instructions.
D	Position the Flow Meter or Flow Switch typically requires a minimum 2D (200mm/11inch) of straight horizontal pipe immediately following it before the Atlantium Unit. Refer to the manufacturer's instructions.
E	Position the Inlet Sampling Point Maximum Distance from the Atlantium System Inlet .5 meters/1.5ft.
F	Position the Outlet Sampling Point Maximum Distance from the Atlantium System Outlet .5 meters/1.5ft.

3.3 Electrical Requirements

The electrical infrastructure is to be installed and in place prior to the system's delivery.

For information on the footprint of the components of the Atlantium system, see the section, **About the RZ163 System** on page 2-1. Use the diagrams below to help you plan the electrical infrastructure. See also **Power Consumption and Local Voltage Requirements** on page 2-15 and on page 5-11.

Take into account:

Getting Ready for Installation

- Evaluate the quality of your power and the likelihood of blackout/brownouts, electrical surges or interruptions. Determine which power surge protection and uninterrupted power supply you may need. See on page [2-16](#). For PMO pasteurization equivalent, a 20 minute power protection device is required for the **TRACS** computer.
- To verify that you order the correct lengths for cables (i.e., Cable Harness, power cables, data cable, etc.), measure the distance between the proposed location of the relevant Atlantium components and between them and the Power source.
 - Planning the placement of the Ballast Modules, Controller and the path of the various cables must take into consideration the length of the **Cable Harness** and the other cables. Cables must be placed in a path that does not interfere with passage ways.
 - The power mains connections must be in the vicinity of the Ballast Modules, Controller.
 - The power cable and connecting plug are to be obtained locally.
- If your region experience periodic power outages, consider including uninterrupted surge protection devices.
- Prepare cables of sufficient length to connect from the auxiliary equipment (i.e., the flow meter/flow switch, etc.) to the Atlantium system.
- See *Preparing for the Electrical Wiring to the Mains* on page [3-13](#).

For Systems Utilizing Saltwater

- The Atlantium Unit must be grounded. Be sure to prepare a ground point next to the designated location for the Atlantium Unit.
- Minimize the corrosion potential of the treated water by ensuring that there is sufficient grounding.

3.3.1 Typical Atlantium System Cabling Diagram

The following diagrams provide the typical Atlantium System Cabling schematics according to the local electricity options. The key to the system cable follows after the diagrams in [Table 3-3](#) on page [3-12](#).

Typical Atlantium System with 115VAC Connection

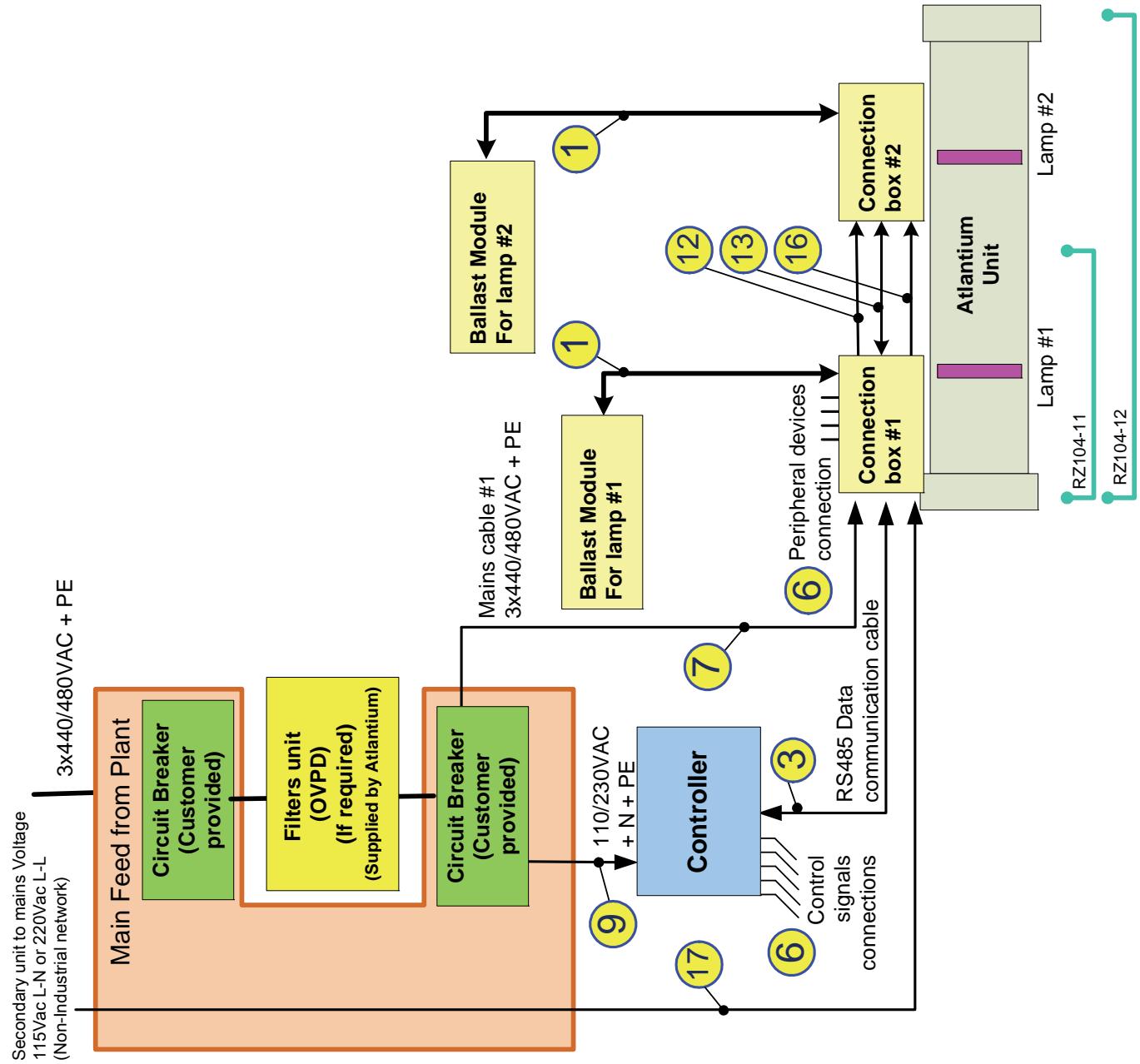


Figure 3-3: Typical Cabling Schematics for the Atlantium System with 115V Connection

Typical Atlantium System with 48VDC Module

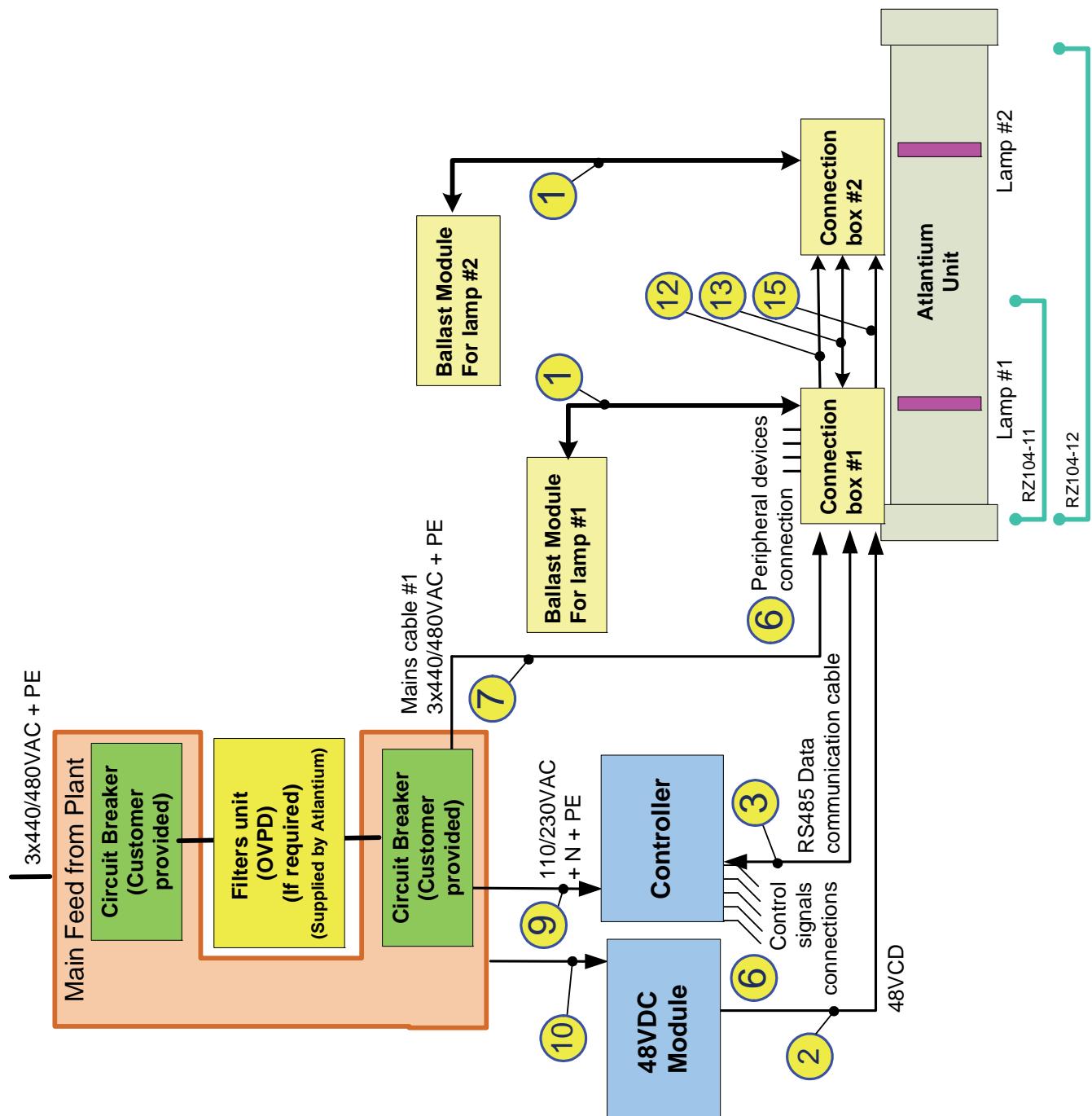


Figure 3-4: Typical Cabling Schematics for the Atlantium System with 48VDC Module

Typical Atlantium System with Ultrasonic Cleaner

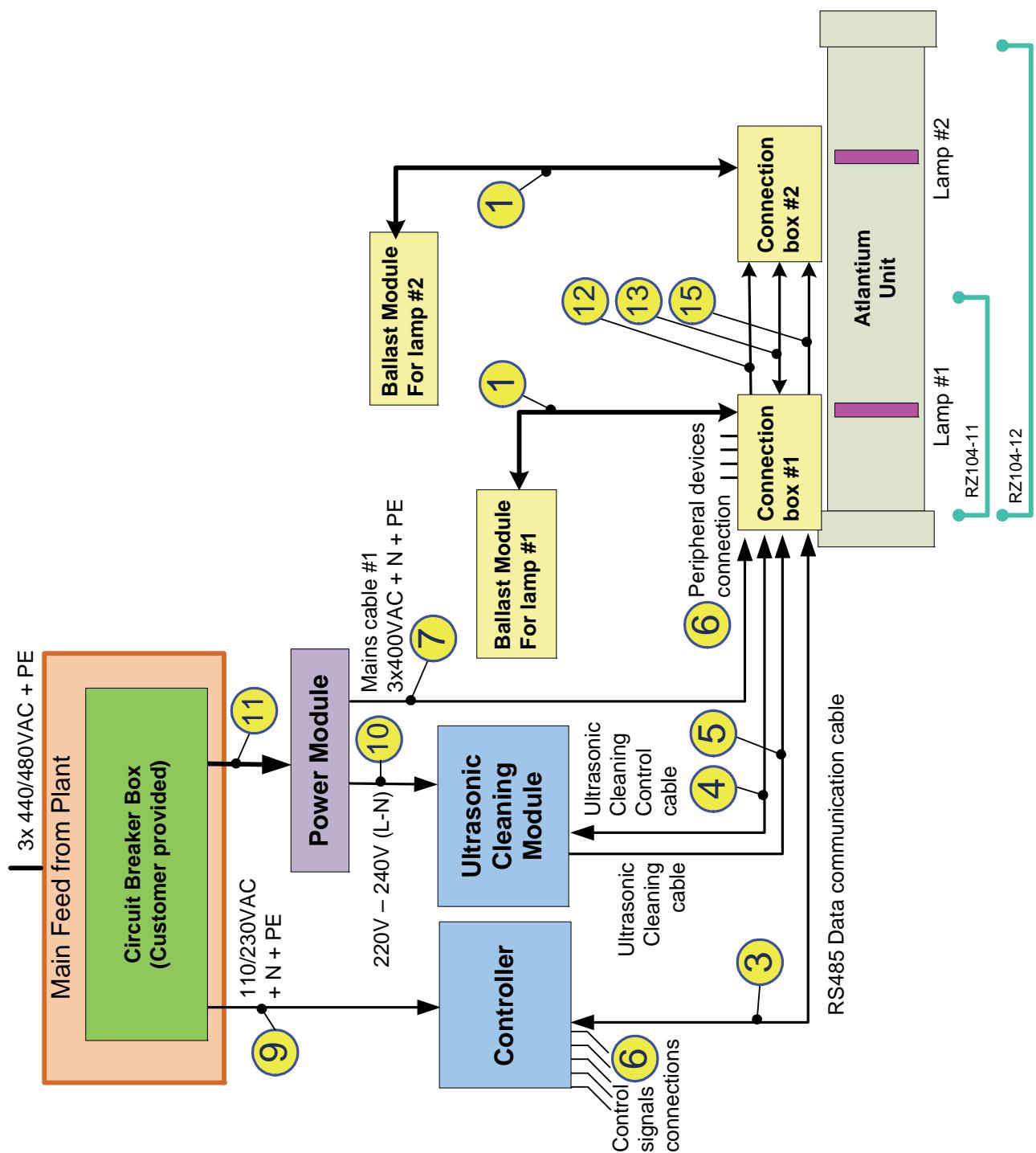


Figure 3-5: Typical Cabling Schematics for Atlantium Systems with Ultrasonic Cleaner

Getting Ready for Installation

If you require longer cables than those Atlantium provides, or need to replace cables, the table below contains the specifications for all Atlantium system cables.

Table 3-3: Key to System Cables

	Item	Sizes	Cat. No.	Description	Supplied by
1	Wiring Harness	5m/16.4ft. 10m/32.8ft.	HSL015500 HSL15400	Bundle	Atlantium
2	48VDC Module power cable	10m/32.8ft.	HSL015600	Power cable to the 48 VDC Module 2x1.0mm, 300V, HO5RR	Atlantium
3/4	Controller and Ultrasonic Cleaner Module RS485 Data communication cable	5m/16.4ft.	HSL013200	Shielded twisted pair, 22AWG, 300V(General cables C0720A)	Atlantium
5	Ultrasonic Cleaning Module Power Cable	5m/16.4ft.	HSL013200	3-wire flexible cable of 1.5mm ² each, 500V. HO5 RR-F 3G1.5 (Lapp, P/N 1600200)	Atlantium
6	Cables for control signal connections and peripheral device connections				Customer
7	Power Cable to the Mains	5m/16.4ft. 10m/32.8ft.	HSL013300 HSL014400	5-wire flexible cable of 4mm ² each, 600V, HO7 RN-F 5x4 (Lapp, P/N 16001303)	Atlantium
8	48VDC Module power cable to the mains	2m/6.56ft.	HSL013800	3-wire 19AWG flexible cable of 0.75mm ² each, 600V. HO5 RR-F 3G.075	Atlantium
9	Controller Power Cable to the Mains	1.6m/5.3ft.	HSL011600	3-wire 16AWG + Shield flexible cable of 0.75mm ² each, 500V. HO5 RR-F 3G.075 (Lapp, P/N 600207)	Atlantium
10	Ultrasonic Cleaning Module Power Cable to the Mains			220V – 240V (L-L-N)	Atlantium
11	Power Module power cable to the mains			According to local regulations	Customer
12	Power cables		HSL014200	Factory-installed Power cables, daisy chains all Connection Boxes	Atlantium
13	RS485 Data communications cables		HSL012500	Factory-installed Data communications cables, daisy chains all Connection Boxes	Atlantium
14	48VDC Module power cable		HSL015700	Factory-installed 48VDC power cable, daisy chains all Connection Boxes	Atlantium
15	Ultrasonic cleaning cable		HSL014300	Factory-installed Ultrasonic cleaning cable, daisy chains all Connection Boxes	Atlantium
16	115/230 VAC power cable		HSL015700	Factory-installed 115/230 Power cable, daisy chains all Connection Boxes	Atlantium
17	115/230 VAC power cable to the Mains	10m/30ft	HSL015600	For 115VAC L-L; For 230VAC L-N	Atlantium

3.3.2 Preparing for the Electrical Wiring to the Mains

You must prepare the following elements for connecting the Atlantium system to the mains:

- Mains system area circuit breaker according to the total systems' power consumption to be connected to this line. See [on page 2-14](#).
- Plan to include an Over Voltage Protection Device (OVPD) (available from Atlantium) if needed. See [**The OVPD Module**](#) on page [2-16](#).
- Circuit breakers per Atlantium system installed and terminal blocks for N, PE. See the diagrams below.
- If you intend to lengthen or replace the mains power cable connected to the Atlantium Unit with a longer cable, prepare the cables according to your location electrical distribution system requirements.

For locations with 440/480 VAC: 4-wire system that contains 3 phases and Ground

Use the diagrams below as relevant for preparing for the connections to the Mains.

Wiring Diagram for 440/480VAC Electrical Distribution Systems Systems with 115V Connection

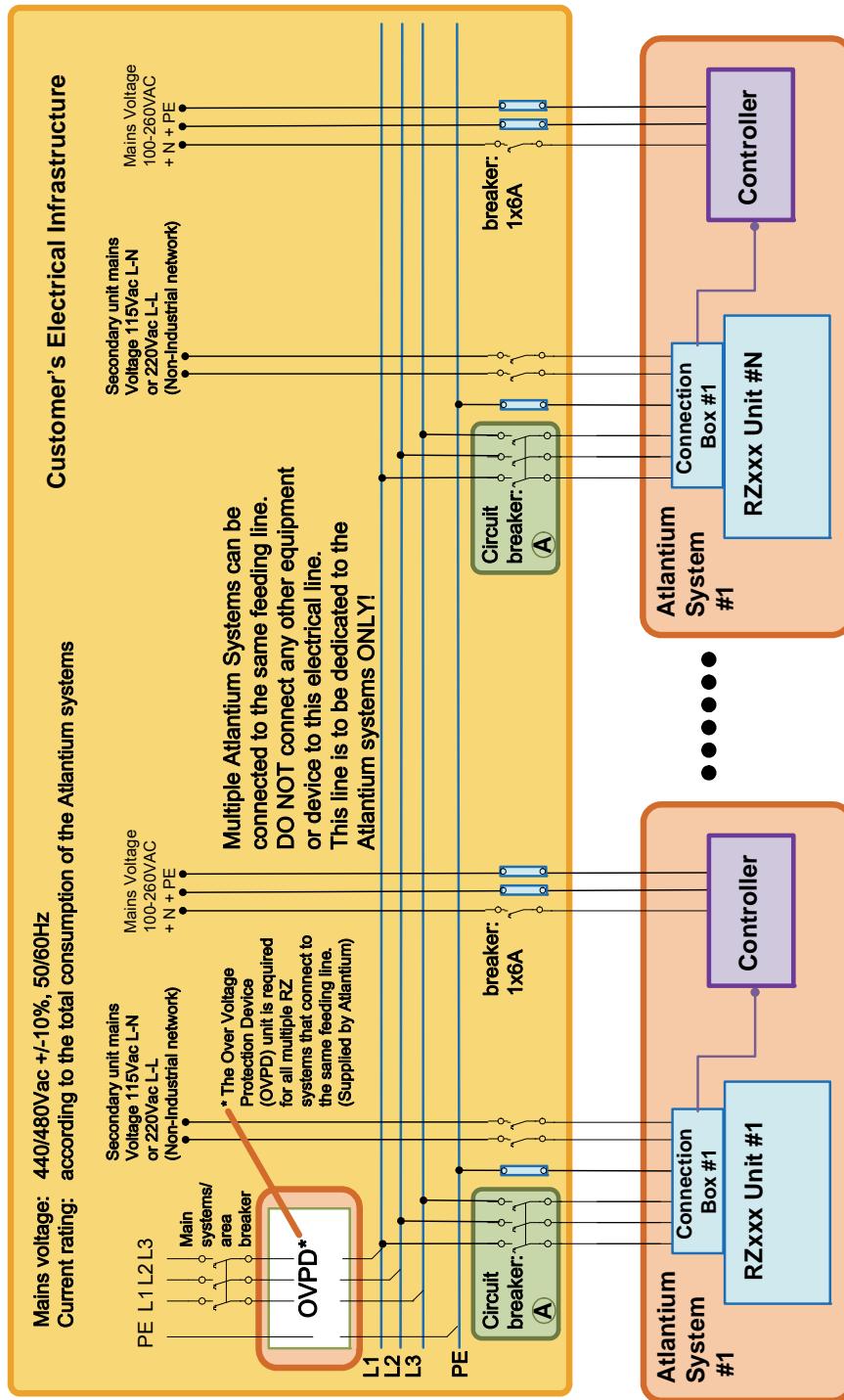


Figure 3-6: Typical Connections to the Mains for the Atlantium System with the 115VAC Connection

(A) For local voltage requirement regarding the circuit breaker, see *Power Consumption and Local Voltage Requirements* on page 2-15.

Systems with 48VDC Module

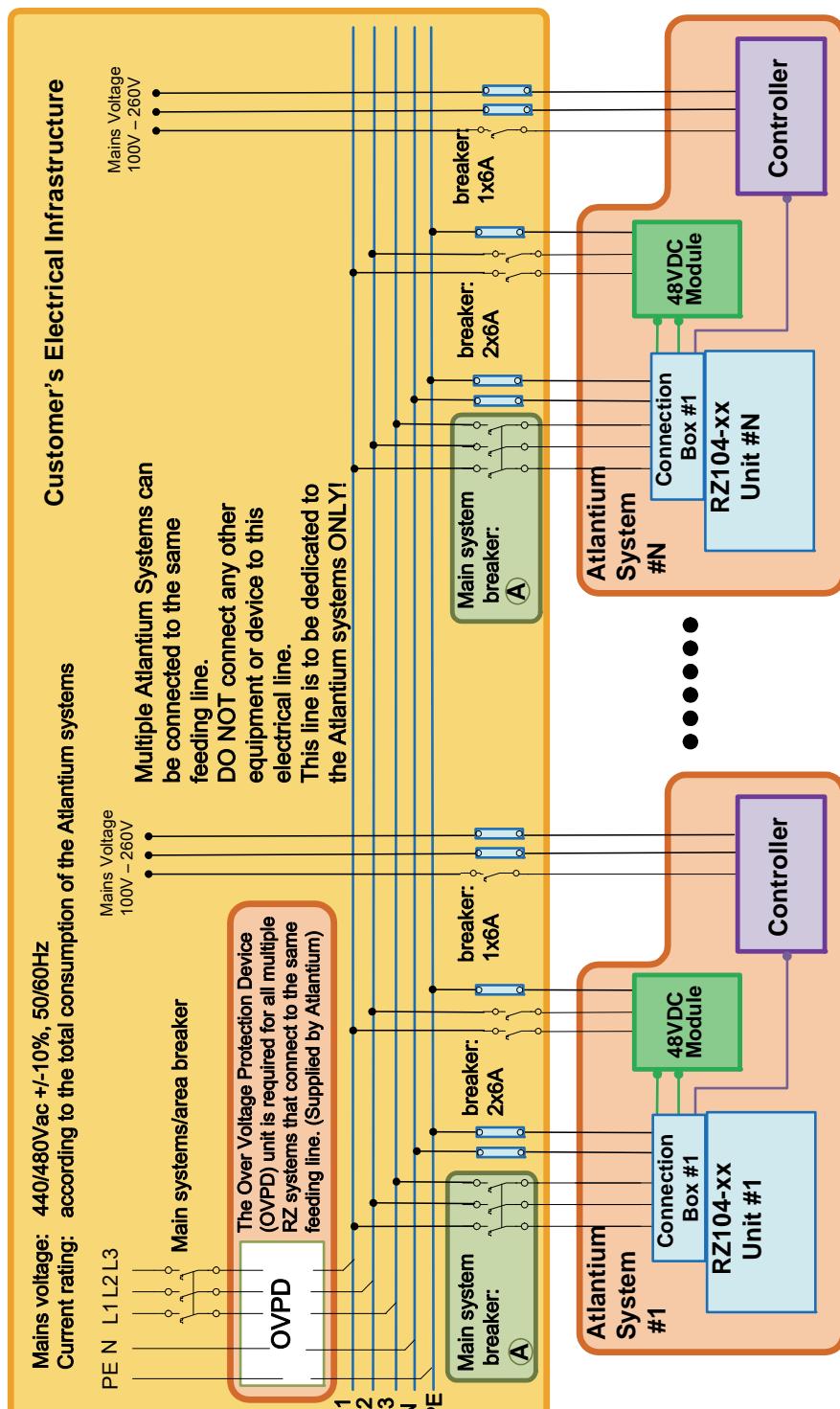


Figure 3-7: Typical Connections to the Mains for the Atlantium System with the 48VDC Module

(A) For local voltage requirement regarding the circuit breaker, see **Power Consumption and Local Voltage Requirements** on page 2-15.

Systems with Ultrasonic Cleaner

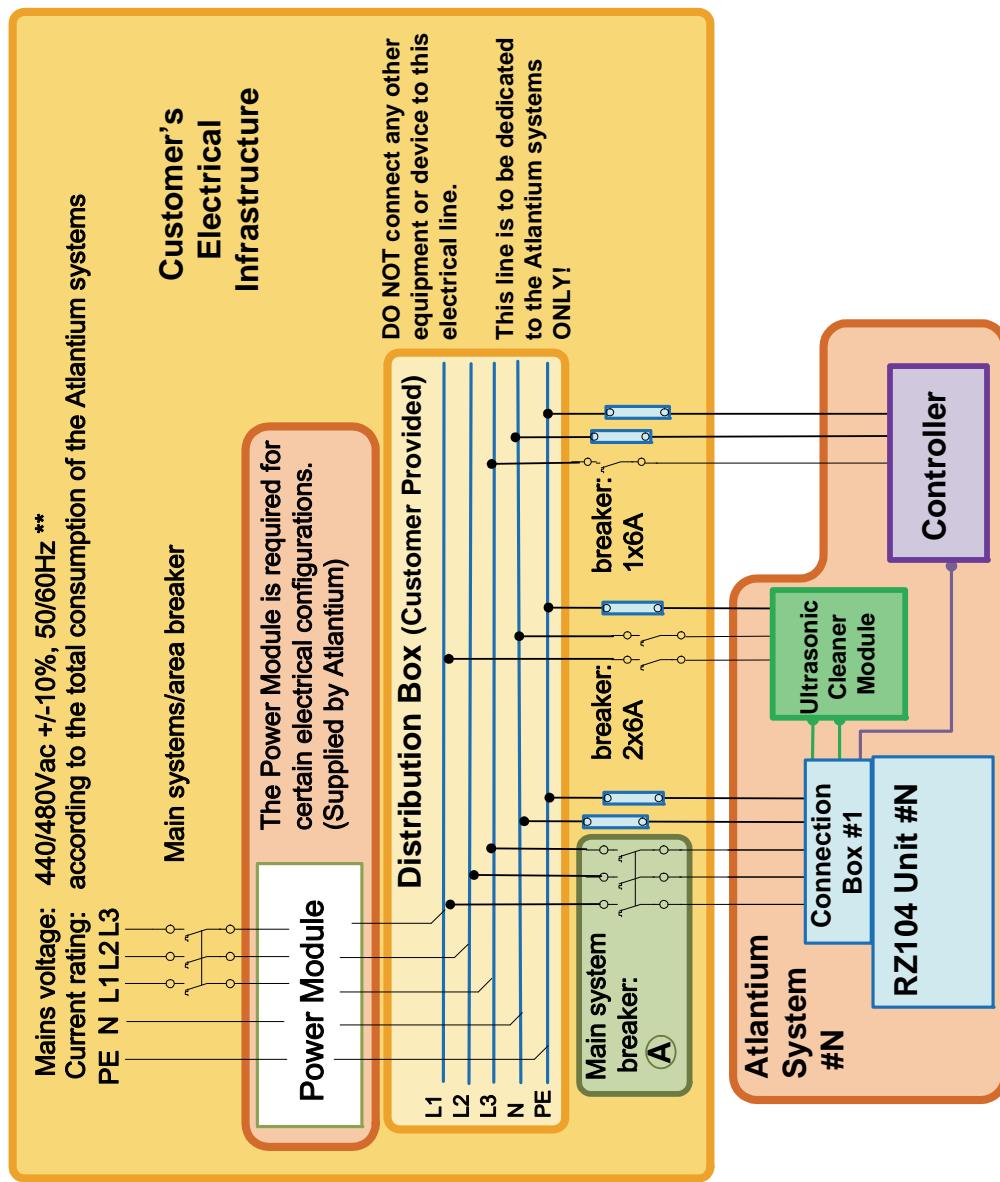


Figure 3-8: Typical Atlantium System Connections to the Mains for Locations with 440/480VAC - includes Ultrasonic Cleaner

(A) For local voltage requirement regarding the circuit breaker, see ***Power Consumption and Local Voltage Requirements*** on page **2-15**.

3.4 The Piping Infrastructure

To review how to prepare the infrastructure, read through the typical installation section before you begin and refer to the section, **About the RZ163 System** on page 2-1.

Install the piping infrastructure before the Atlantium system arrives, but to avoid built-in mechanical stresses perform the final pipe adaptations and welds when the unit is actually situated in its permanent position.



- When sealing the flanges/ferrules and gaskets, **do not** use sealing material that contains graphite as it accelerates the corrosive process on stainless-steel components, including those of the Atlantium system.
- Be sure to align the piping on the inlet and outlet sides of the designated location for the Atlantium Unit with the unit to avoid mechanical stress on the Unit.
- Be sure to secure the piping around the designated location for the Atlantium Unit so that there is no vibration.
- Be sure to position adequate supports on the piping line needed to hold up and stabilize the process piping on the inlet and outlet side of the proposed location of the Atlantium unit.
- Determination of support requirements and design should be made by an on-site mechanical engineer.

3.5 Flow Measurement/Detection

The Atlantium unit requires a flow signal to calculate the dose and operate properly. The flow signal is a measurement of the actual flow or simply a flow/no-flow indicator. The flow signal is collected from either a flow meter or a flow switch.

- A flow meter is required in facilities where the flow rate is variable for any reason.
- A Flow switch can be used in facilities where the flow is at a fixed, steady rate.

The Flow meter or flow switch does not necessarily have to be installed in close proximity to the Atlantium Unit. It may be more remotely positioned, provided that it is located on the inlet side between it and the Unit and there is **no** branching or splits of the water flow.



The Atlantium system cannot be operated when there is no water or no water flow. Any damage caused due to operating the system without water or without water flow invalidates the Atlantium warranty.

Flow Meter

In most cases, a flow meter with a 4-20 mA output is required to measure the flow and automatically adjust the output of the UV system. The flow meter must be able to measure the expected maximum water flow of the specified Atlantium unit. The power source for the flow meter must come from an external source according to the manufacturer's instructions.



Be sure to provide the power source for the flow meter as part of the preparations for installing the Atlantium Unit.

Getting Ready for Installation

Install the flow meter in strict accordance with the instructions supplied by its manufacturer.

Flow meters are available from Atlantium, such as:

- **KROHNE OPTIFLUX 6000** flow meter for high-purity water applications
- **KROHNE OPTIFLUX 2300** flow meter – OPTIFLUX 2000 flow meter, includes **KROHNE IFC 300** signal converter

Consult your Atlantium representative.

OPTIFLUX 6000



OPTIFLUX 2300



Figure 3-9: KROHNE OPTIFLUX Flow Meters

Flow Switch

The flow switch tells the Atlantium Unit when water is or is not flowing. The recommended flow switch is Dry Contact with minimum flow sensing of $0.2\text{m}^3/\text{hr}$ (1gpm).

Install it in a vertical (12:00 o'clock) orientation on top of the pipe. Follow the manufacturer's instructions.



Figure 3-10: Examples of Flow Switch

3.6 Sampling Valves

Locate the Sampling valve indoors in a clean environment out of range from direct contact with fans or A/C air flow. Sampling valves require internal treatment with alcohol, as well as treated with flame. Make sure you allow ample space for these actions. See **Taking Microbial Samples** on page 10-6. for more information. The Sampling valve should be located indoors in clean environment without away from direct contact with fan or A/C air flow.

- **For Stainless Steel Pipes:**
 - Weld the 1 inch clamp fitting at a horizontal orientation (3 or 9 o'clock).
 - Perform a polishing process to achieve a smooth area on the external and internal part of the pipes.
 - Passivate the pipes to avoid corrosion.
- **For Plastic Pipes:**
 - Thread the clamp fitting to the port.
 - On the inlet and outlet sides of the water line, connect the aseptic sampling valves, using the supplied 1" tri-clamp fitting, to any 1 inch tri-clamp fitted port.

Sampling Valve Kits Available from Atlantium

The following Sampling Valve Kits are available from Atlantium:

- Aseptic Sampling Valve Kit for Stainless Steel Pipe
(Can be ordered from Atlantium P/N KTB005700):
 - **Aseptic sampling valve (4).**
 - **Long welding ferrule (1)** – for welding the tri-clamp port to the pipe.
 - **Clamp 1.5" (2)** – for connecting the valve to the welded port.
 - **Clamp 1/2" (7)** – for sealing the flushing port of the valve.
 - **Gasket 1" (3)** – for sealing the valve connected to the pipe.

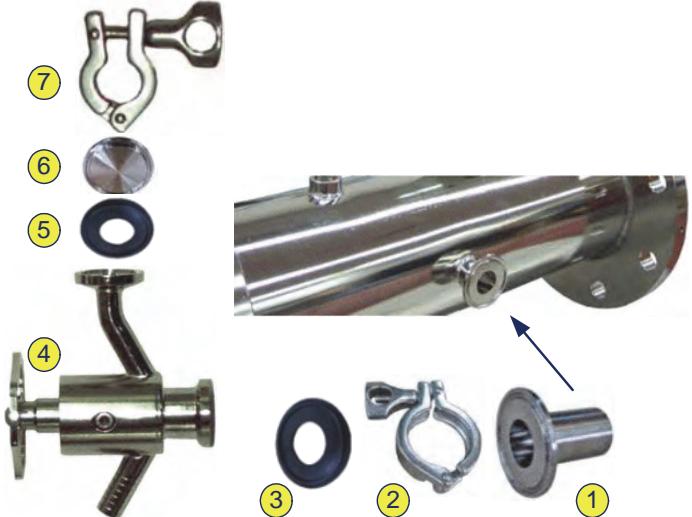


Figure 3-11: Sampling Valve Assembly

- **Gasket 1/2" (5)** – for sealing the valve's flushing port.
- **End cap 1/2" (6)** – for covering the valve's flushing port.
- **Round brush** (not shown) – for cleaning the valve during the CIP process.
- Aseptic Sampling Valve Kit for Plastic Pipe (refer to the figure above)
(Can be ordered from Atlantium P/N KTB0011500):
 - Aseptic sampling valve.(4)
 - **Threaded Male Adapter 1/2" BSP (1)** – for connecting the tri clamp port to the plastic pipe.
 - **Clamp 1.5" (2)** – for connecting the valve to the welded port.
 - **Clamp 1/2"(7)** – for sealing the flushing port of the valve.
 - **Gasket 1" (3)** – for sealing the valve connected to the pipe.
 - **Gasket 1/2" (5)** – for sealing the valve's flushing port.
 - **End cap 1/2"(6)** – for covering the valve's flushing port.
 - **Round brush** (not shown) – for cleaning the valve during the CIP process.

3.7 Draining Valves

It is important to plan for draining the system. Install one draining valve at the lowest point of the pipeline, before or after the Atlantium unit. If you plan to install CIP ports, one of them can double as a draining valve. If there is a Bypass line used occasionally to bypass the Unit in any circumstance, add an additional draining valve to assure that the bypass line does become a potential source of standing water. A bypass line must be empty when not in use.

3.8 CIP Valves and CIP Kit

The CIP (Cleaning-In-Place) recirculation system is used for the periodic cleaning and sterilization process of the Atlantium unit's inner surfaces and quartz tube.

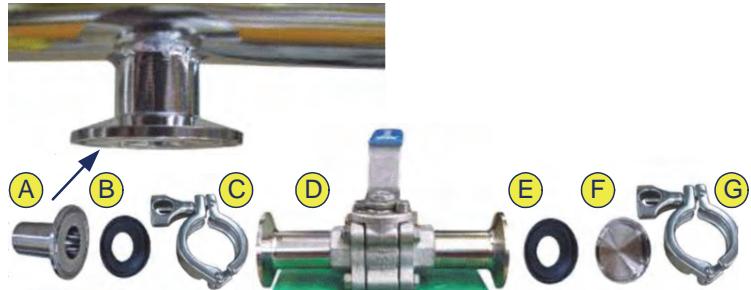


Figure 3-12: CIP Valve Kit

The CIP (Cleaning-In-Place) recirculation system is used for cleaning the Atlantium unit's inner surfaces and quartz tube.

Required equipment for the CIP procedure:

- Two CIP Ports (**D**):
 - For municipal application - chemical resistant brass valves
 - For application other than municipal - a high-purity ball valve (aseptic ball valves), 1 inch diameter, with tri-clamp fitting connection mechanism (A3 Standard) on both sides.
- Accessories:
 - CIP Accessories Kit (refer to the figure above)
(Can be ordered from Atlantium P/N KT0011700):
 - ◆ **Threaded Male Adapter 1/2" BSP (A)** – for connecting the tri clamp port to the plastic pipe.
 - ◆ **Clamp 1.5" (C, G)** – X2 needed for sealing the valve connected to the pipe (1 gasket is included in Atlantium's CIP accessories kit).
 - ◆ **Gasket 1" (B, E)** – X2 needed for sealing the valve connected to the pipe. (1 gasket is included in Atlantium's CIP accessories kit)
 - ◆ **End cap 1/2" (F)** – covering the CIP valve while not in use.
 - ◆ **Hose Adaptor 1"** (not shown) - to attach the CIP hose. (included in Atlantium's CIP accessories kit)
- 100 liter (26.5 gallon) reservoir.* **(4** refer to the diagram below)
- Pump, capable of pumping up to 4 cubic meters per hour.* **(5**
- Supply hose: ID 0.75" / 19mm (5 meters / 15 feet long).* **(6**
- Return hose: ID 0.75" / 19mm (5 meters / 15 feet long).* **(7**

* Contained in the Atlantium CIP Kit (P/N SAB012900). It includes a pocket to hold the hoses **(8**)

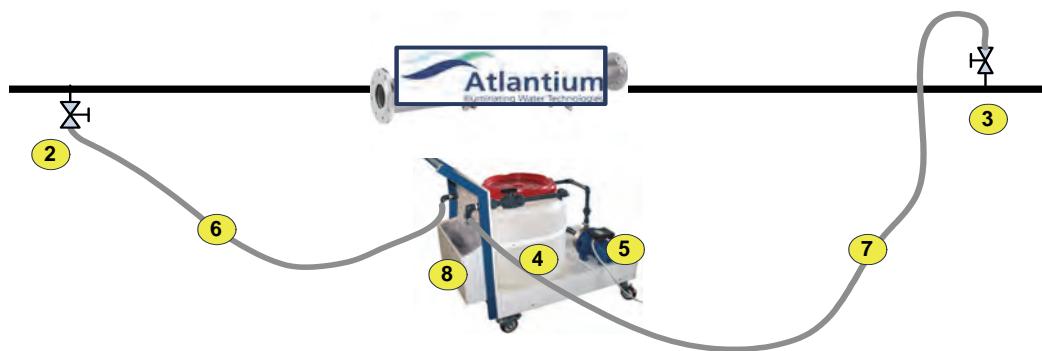


Figure 3-13: CIP Recirculation System Connections

Getting Ready for Installation

Position the CIP/draining valves **(2 & 3)** on both the inlet and outlet sides of the Atlantium unit. To enable connection of the CIP kit, use high-quality, sanitary equipment, including a 1 inch tri-clamp/ferrule on both sides. Weld or thread the 1 inch ferrule at a vertical orientation. A CIP/Draining valve is to be located 1D after the Inlet valve and 1D before the Outlet valve.

Prepare 1" screw ports for the valves and insert the valves:

- **Draining Valve:** at a 6:00 o'clock orientation on one side of the Atlantium unit.
- **CIP Valve:** at a 12:00 o'clock orientation on other side of the Unit.

CIP Safety Devices

Required but not included in Atlantium's CIP Kits: protective devices such as goggles, clothing and gloves (chemical-safe) according to the specified safety standards at your facility.

3.9

Connection to Facility Control

Options are available to set up control of the Atlantium system via your facility control system. Control setup can be made via any of the following:

- **Modbus** - RTU on RS485 (network) serial connection directly to the Facility control ([Appendix A, Modbus Communication Protocol](#))
- **Dedicated computer station** - Ethernet Lan or wireless (TCP/IP) with **TRAC Software** installation for constant system monitoring and data logging - available upon purchase of license (See below)
- **Signal control** - utilizing System Ready, External On/Off, and General Alarm functions, etc. (See [Cabling Auxiliary Components](#) on page **5-12**.)

With any of the above control options, you can still utilize the function of the controller of the Atlantium system. Whichever control facility is utilized, the system communicates to the other control systems such that the last command issued determines the current status.

3.10

TRAC Software Requirements

The **TRACS Total Reporting Analysis & Control Software** (required for regulated installations) is typically installed on two dedicated computers installations:

- The **TRACS Operating Station** (Atlantium-supplied computer) directly controls up to nine Atlantium units, collecting real time data and storing in the database. It provides a full configuration interface and reporting functionality.
- The **TRACS Viewer Station** (customer-supplied computer) allows you to view the data collected from the **TRACS Operating Station** and produce reports from this data. It is not directly connected to the currently operating units.

Minimum System Requirements

A computer designated for use with **TRACS** requires the following:

Operating System:

- Windows 7 (32, 64 bit)
- Windows XP Home (32 bit)
- Windows XP Professional (32 bit)

Disk Space:

- 2 GB for installation
- 50 GB or more free

Processor:

- 1 GHz for Windows XP
- 2 GHz for Windows 7

Peripherals:

- CD Rom Drive
- Free USB port

RAM:

- 2GB Minimum
- 4GB on Windows 7 recommended

3.10.1 System On-Site Connections

The **TRACS Operating** computer may be connected via direct connection or via Ethernet LAN, or from a remote location outside the facility using the Internet. A laptop dedicated for this purpose can be purchased from Atlantium.

The **TRACS Viewer** computer (supplied by the customer) is typically placed at a remote location inside or outside.

Table 3-4: System On-Site Connections

#	Item
1	Controller
2	CAT-5 Cable with RJ-45 Male Connector
3	RJ-45 Female Jack
4	PC with TRACS installed
5	CAT-5 Cable with RJ-45 Male Connector
6	RJ-45 Female Jack
7	CAT-5 Ethernet Cable
#	Maximum Cable Lengths
A	Up to 50 meters (54 yards)
B	5 meters (16.5")
C	3 meters (10")

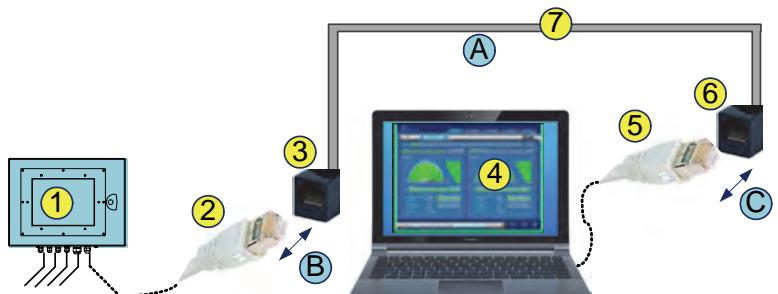


Figure 3-14: TRACS Layout Diagram

Prepare Ethernet connection ports and cables (at the required lengths - cables - not supplied by Atlantium), IP or Modbus addresses, as well as all other computer equipment.

To set up the **TRAC Software** installation on-site (within the facility), the maximal length of the direct-line data cable between the computer and the system must be no longer than 50 meters (54 yards) - the total A+B+C (in the figure above equals less than 50 meters (54 yards)).

Getting Ready for Installation

To set up the **TRAC Software** installation and enable communications from farther away than 50 meters (54 yards), employ signal boosters.

If the **TRACS Operating** and/or **Viewer** computer is to be set up off-site (different building; different city, etc.), communications between the system and the **TRAC Software**, Broadband Internet service is required. This must be set up by your on-site IT personnel. Check with your IT department regarding how the **TRACS Operating** and/or **Viewer** computer is to fit into your network and how the database is to be backed up, etc. Make sure you have the cables you need.



To be certain that your plans cover fully the needs of the Atlantium system requirements, consult with Atlantium's Application Engineer before you finalize your plans.

3.10.2 TRACS Backup Requirements

For systems with **TRACS**, the database is to be backed up on a monthly basis (typically 250 MB). The backup file is generally saved to the computer on which the **TRACS** is running and is then copied to an external, safeguarded location. This backup mechanism is to be ready before the Atlantium System is operational. Consult your IT department. For information on the **TRACS** settings for backup, see *Configuring the Basic System Settings* on page 8-6. For information on the Backup procedure, see *Backing up the TRACS Database* on page 10-8.



4 Safety Overview

The Atlantium **RZ104-11/12** Hydro-Optic Water Disinfection system has been designed according to the highest safety standards, assuring the safety of operating personnel, the environment and the treated water.

WARNING!



Improper use of controls or adjustments or performance of procedures other than those specified herein could result in significant hazards.

Therefore, personnel operating or servicing this system must be thoroughly familiar with all safety requirements and operating procedures and are to adhere to them during use of this system.

To guard against injury, observe basic safety precautions, including the following:

All persons operating the Atlantium system must be aware of proper use and the potential hazards of violating safeguards. Be certain that all personnel carefully review the safety information and the procedures specified in this manual. Only authorized individuals with appropriate training and knowledge, including local regulations, should operate, assist in the operation of or provide maintenance to the system.

All service and repair of the Atlantium system must be performed by Atlantium field service technicians or other factory-authorized personnel ONLY.

4.1 UV Lamp Safety

Refer the Chemical Safety information at: <http://www.inchem.org/documents/icsc/icsc/eics0056.htm>



UV Exposure: The system generates ultraviolet (UV) light within the Unit, which can cause serious eye damage or blindness if you stare at it directly when it is working. Use the Viewport only. Do not look directly into the lamp enclosure during system operation, examining, or servicing the system's internal components during operation, or when lamps's caps are open, or if energized testing is required.

If the viewport is broken, DO NOT look directly into it. Be sure to request a replacement part immediately. Do not open the viewport's metal cover until the replacement is installed.

Persons potentially subject to UV light exposure – technicians who are servicing the Unit – must wear appropriate eye protection whenever the system is operating.

The Viewport is specifically designed with a UV filter to prevent UV light from escaping so it is safe to look inside. Nevertheless, personnel should not stare at it or any other brilliant light source for any but short intervals to check on Unit operations. The Viewport cover should also be preserved intact.

During maintenance procedures that are conducted with the UV lamps turned on:

- Use Caution floor signs at a distance of 1m/40inch from the Atlantium Unit to warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Wear appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
- **DO NOT look directly into openings that emit UV light.**



Protect Hands: Do not touch the UV lamp with bare hands.

Wait at least 10 minutes until the lamp is cooled down before touching the lamp or starting the replacement procedure.

Use appropriate protective gloves both to protect your hands and to avoid skin oils that leave fingerprints and/or harm the UV lamp.

Lamps can reach a temperature of 1,000°C under operating conditions.

Wait ten minutes to allow the lamp to cool down fully before replacing it.

Keep materials that are sensitive to heat, or which contain solvents, a safe distance away from the lamp, Unit, and electrical connections.



Electric Shock: Before replacing a UV lamp or other components, and during any maintenance requiring lamps to be turned off, make sure the switches on the Connection Boxes of the relevant lamps are turned OFF and place a sign on the Atlantium Unit and Controller alerting others NOT to touch the switches or the screen during maintenance so that no one can inadvertently turn it on while maintenance is in progress.



Prevent Damage: Handle the UV lamp assembly by holding only the contact housings (white ceramic casing).

When handling the UV lamp, always place it on a flat surface or table, so that it is not accidentally damaged.

If the body of the UV lamp is touched accidentally, clean the fingerprints off with alcohol (at least 70%) and wipe dry with a soft, clean, lint-free cloth (usually provided with the lamp). Do not use cleaning rags or materials that can leave a residue.

Do not use a UV lamp that shows any scratches, cracks, or other damage.



Mercury Poisoning: Lamps contain mercury, which is a hazardous substance. Always wear gloves and safety glasses when handling or replacing a UV lamp.

Inhalation of vaporized mercury compounds can be harmful to the lungs, kidneys, and nervous system. Mercury that penetrates the skin or is ingested can also be harmful.

If mercury is inhaled, penetrates the skin, or is ingested accidentally, seek emergency medical treatment immediately.

If a UV lamp brakes during handling and releases mercury, the following precautions should be observed to minimize the risk of exposure to mercury:

- Always wear gloves and safety glasses when handling or replacing a UV lamp.
- Leave the area immediately to avoid inhalation of the mercury vapor.
- Thoroughly ventilate the area for at least 30 minutes or until the mercury vapor concentration is in compliance with applicable federal and local health and safety regulations.
- After handling a broken UV lamp, carefully remove gloves, and then wash hands thoroughly with soap and water. Follow all applicable federal and local health, safety, and environmental regulations.
- Do not turn on or operate the system until all mercury contamination has been cleaned up and removed.
- Establish a Hazard Response Plan to deal with all related hazards and provide it to all personnel associated with the Atlantium system.



Lamp Compatibility: Use original Atlantium UV lamps ONLY. Other lamps are incompatible. They void the warranty and may damage the system.



Proper Disposal:

Expired lamps are classified as hazardous waste and must be disposed of appropriately.

- A non-ruptured UV lamp that is no longer used must be disposed of according to specific local or federal environmental and hazardous waste regulations.
- Broken lamps and parts contaminated by the mercury have to be vacuum-packed and disposed of. Broken lamps, as well as contaminated packing material and other parts have to be considered as special waste, which may only be removed by authorized waste disposal companies.

4.2 Electrical Hazards and Safety Considerations



WARNING!!!

UNDER NO CIRCUMSTANCES

SHALL ELECTRICAL WORK BE CARRIED OUT WITHOUT VERIFYING THAT ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINE FEEDING THE ATLANTIUM SYSTEM COMPONENTS ARE SET TO THE OFF POSITION AND THAT NO ELECTRICAL FEED IS LIVE.



DO NOT SET ANY MAIN CIRCUIT BREAKER OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS TO THE ON POSITION UNTIL ALL ELECTRICAL WIRING IS PROPERLY CONNECTED.
UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.



- **DO NOT DRILL INTO THE CONNECTION BOXES OR ALTER THEM IN ANY WAY!!!!**
- The Connection Box already contains entry glands for **ALL** of the cabling needs.
- Making holes in a Connection Box will destroy its waterproof seal, endangering the components inside.
- **Do Not draw electricity from the Atlantium Unit's Connection Box as it will damage the Unit's electrical configuration.**



The Atlantium Hydro-Optic Water Disinfection system incorporates high-voltage internal components, which can cause serious injury or fatal electrical shock if not used or serviced properly. High voltage components can retain a charge for some period of time even after the system has been turned off.



- Never attempt to remove any system covers or to dismantle any parts, except when performing the maintenance procedures detailed in **System Maintenance** on page 11-1.
- No portion of the Atlantium system is be opened or removed by anyone other than a trained and authorized technician.
- Do not spray or pour any type of fluid directly into the Unit or electrical components. Moisture causes damage to the equipment and electrical shock may result.
- Do not operate the system if the power cables or harnesses are frayed or otherwise damaged.



DO NOT enter **Technician Mode** in the **Controller** unless instructed to do so by Atlantium certified personnel or by an Atlantium System User Manual. for a specific task.

If you are in Technician Mode, **DO NOT WALK AWAY!**



NEVER LEAVE THE ATLANTIUM SYSTEM WHEN IT IS OPERATING IN TECHNICIAN MODE!!

A SYSTEM LEFT IN TECHNICIAN MODE WITHOUT SUPERVISION CAN RESULT IN PERMANENT DAMAGE!!



Utilize best practices regarding electrostatic discharge (ESD).

Avoid direct contact with the electronic circuit boards of the **Controller**, which is sensitive to electrostatic discharge (ESD).

Wear an electrostatic discharge (ESD) Wrist Strap when performing procedures where contact with a circuit board is possible.

Safety Overview

4.3 Keep the Unit Full of Water



The Atlantium system cannot be operated when there is no water. Any damage caused due to operating the system without water invalidates the Atlantium warranty.

4.4 Chemical Use for Cleaning in Place (CIP)



- The chemicals selected and the concentrations used must be approved by Atlantium's Application staff, and the facility's quality assurance and safety officials. The CIP process must comply with the written protocols and procedures set in place by those departments. Refer to the section, *Selecting the Correct Chemicals for CIP* on page 11-2
- Use and handle all chemicals in strict accordance with their manufacturer's instructions, product information sheets, and material safety data sheets (MSDS).
- NaOH (Caustic Soda) as it causes irreversible damage to quartz. It is strictly forbidden to use it without a specific analysis of temperatures, concentration, frequency and duration and written approval from Atlantium's application engineer.

4.5 System Safety Features

The Atlantium Hydro-Optic Water Disinfection system includes the following safety features:

4.5.1 UV Protective Seal



Each lamp is enclosed within a sealed lamp chamber that prevents the UV light from escaping. This means that with proper operation there is no ambient UV escaping from the Unit. If, for any reason, UV light is escaping (if you see visible light leaking from the Unit), the Unit should be serviced immediately.

4.5.2 Lamp On/Off Switch



An On/Off switch is located on the Connection Box on top of the Atlantium Unit. In the event of an emergency, as well as for maintenance purposes, each lamp can be shut down immediately by turning this switch to the Off position. To restore operation, rotate the button clockwise and then the system restarts.

Safety Overview

4.5.3 Software Safety Controls



When the system is started, the Atlantium software performs a series of internal self-testing routines prior to starting system operation.

If the system **does not** pass these tests satisfactorily, UV lamp operation is disabled until the problem is resolved. If problems arise during normal operation, appropriate error messages with varying levels of severity are generated on the touch-screen control panel and on the **TRACS** interface.

Screens that provide setup options and compliance reports are password protected.



WARNING!

Technician mode has three levels of safety controls:

- The Technician mode screens are password protected.
- After a short idle time, the Technician mode reverts to the main screen.
- All changes in the Technician screens are logged and tracked in the Settings Report.

However, do not leave the Controller unattended while in Technician mode even for a short time. An untrained person could damage the operation of the Atlantium system from Technician mode.

4.6 Atlantium Training

As part of the Commissioning and Hand-Off process, Atlantium provides hands-on training on all aspects of the Atlantium system for your designated personnel. Atlantium offers training upgrades as needed and is ready to provide additional training for new personnel or any other needs related to its systems.



5 Installing the Atlantium System

Installation overview:

Hardware setup to be implemented by your facility personnel:

- Phase 1 Unpacking and checking the contents of the Atlantium system packaging (See below)
- Phase 2 Positioning the Atlantium Unit and connecting to the Piping Infrastructure (See page 5-3)
- Phase 3 Mounting the **Controllers**, Ballast Module(s), etc. (See page 5-5)
- Phase 4 Cabling the **Controllers**, Ballast Module(s), etc. (See page 5-11)

Commissioning to be implemented by Atlantium personnel:

- Phase 5 Starting up the system (See page 6-1)
- Phase 6 Configuring the **Controller** (See page 7-1)
- Phase 7 Installing and configuring the **TRAC Software** (See page 8-1)
- Phase 8 Tuning the System (See page 9-2)
- Phase 9 Completing the System Setup and Testing (See page 9-1)

The Installation Process Flow diagram below maps out the installation process.

5.1 Installation Process Flow Diagram

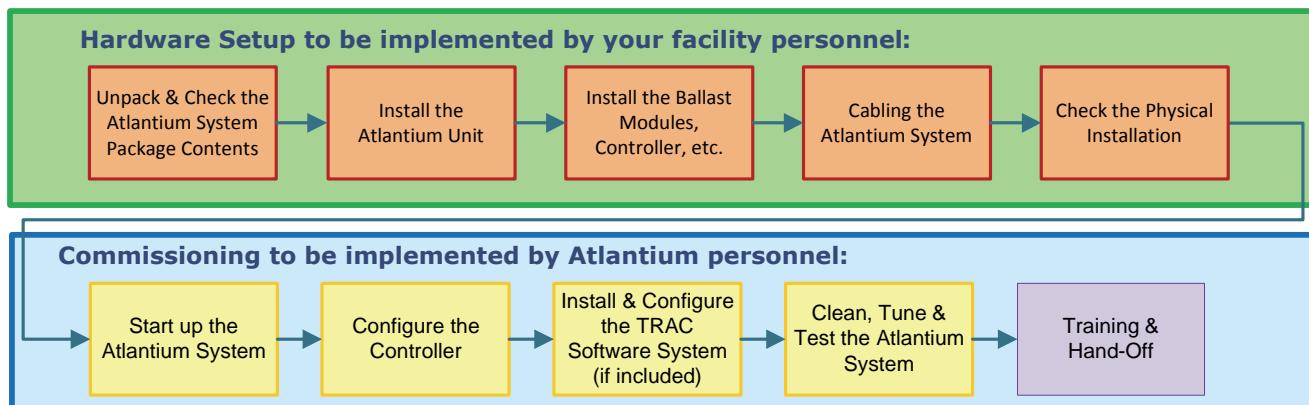


Figure 5-1: Installation Flow Diagram

5.2 Setting the Main Circuit Breakers to OFF Position

Before beginning work to connect the wires/cables of the Atlantium system components, turn the main circuit breakers of the electrical lines feeding the Atlantium system components to the **OFF** position. **Verify that no electrical feed to the Atlantium system components is live.**



WARNING!!!



UNDER NO CIRCUMSTANCES

SHALL ELECTRICAL WORK BE CARRIED OUT WITHOUT VERIFYING THAT ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS ARE SET TO THE **OFF** POSITION AND THAT **NO ELECTRICAL FEED IS LIVE**.

DO NOT SET ANY MAIN CIRCUIT BREAKER OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS TO THE ON POSITION UNTIL ALL ELECTRICAL WIRING IS PROPERLY CONNECTED. UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.

5.3 Unpacking And Checking Package Contents

The Atlantium system is packaged and shipped in specially packed crates that contain:

- The Atlantium Unit
- Ballast Module(s)
- Controller
- 48VDC Module (if included)
- Ultrasonic Cleaning Module (if included)
- Power Module (if included)
- OVPD Module (if included)
- Documentation
- Peripheral accessories as per your order and listed on your delivery documents are crated according to their size and weight. Small accessories may be crated together.

Each of the crates is connected to a forklift-friendly wooden pallet. The Atlantium crates must be lifted off the transport vehicle using a forklift or crane by a qualified operator.

⇒ To unload and check the system:

- Step 1.** Using the forklift or crane, lift each of the crates off the transport vehicle and lower them to a level ground surface.
- Step 2.** Walk around and inspect each crate for damage. Note if there is any separation in the joints or any other indication of any damage in transit. If there is any indication of damage, take a photograph of it and use extra caution when proceeding to the next step.
- Step 3.** Unclamp and remove the panels of the crates.
- Step 4.** As you remove the wrapping and shipping protections, verify that the contents of the crates are correct according to the delivery documents. The Atlantium Unit contains a plate with the model number and other product information. Verify that the correct product version is supplied.



- Immediately report to Atlantium and to the insurance carrier any damage to the crates or to the Atlantium system found before opening the crates or during every step of unpacking, installing or testing of the system.
- If you ordered more than one Atlantium system, check the serial numbers against the delivery documents to verify which components comprise each individual system.

5.4 Positioning the Atlantium Unit

Read through this typical installation section **before** you begin.

Make sure to use your installation drawing during this procedure. The **RZ104** does not include support brackets. Appropriate supports must be installed along the piping on both sides of the **RZ104** Unit to ensure that it is anchored and stable.

Trace the path to be taken to position the Unit to its planned location and clear it of all obstacles.

Atlantium systems can be installed horizontally or vertically in your piping system. For a vertical installation, the Atlantium Unit can be positioned against a wall or on skids.

5.4.1 Required Equipment

Supply the following tools and equipment:

- Lift or crane
- Lifting strap
- Bolts, washers & lock washers
- Supports for inlet/outlet piping and for the Unit as shown on your installation plan



The Atlantium unit is heavy - refer to Table 2-3, **Ballast Module Physical Details**, in Section 2, page 9. Two people are required to get the Atlantium Unit to the designated installation location - a qualified lift or crane operator, at least one other person to guide the Unit as it is transported, and others as needed.

>To position the Atlantium unit:

Step 1. Note the direction of the water flow that is to occur in the piping process into which you intend to place the Atlantium Unit and the Flow indicator marked on the unit. Use this information to decide at which angle to lift the Unit for transport. This is to help you to prepare for placing the Unit at the location.

Step 2. To lift the Unit from its packing crate, loop a lifting strap around the end fittings on each side of the Unit.

Step 3. Join the straps together(1&2) with a third central strap (3) that is being connected to the lift or crane(4).

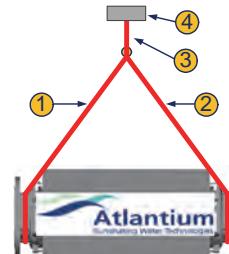


Figure 5-2: Lifting Strap Locations

Step 4. Ensure that all straps are connected securely to the Unit, to each other and to the lift/crane.

Step 5. Using the lift/crane, lift the Unit by the straps, out of the crate and position it for safe transport (near-ground level is preferred).

Step 6. Using the lift/crane and the designated person to guide, carry the Unit to its intended location.

Step 7. At the designated locating, check the installation plan, including the minimum height of the Unit from the floor. Ensure that the Unit is placed so that the Connection Boxes (B) are in a parallel position (A) vis a vis the floor (C) and that the Connection Boxes on the top are level. See the diagram below. For a vertical installation, C in the diagram below represent the wall or skid.

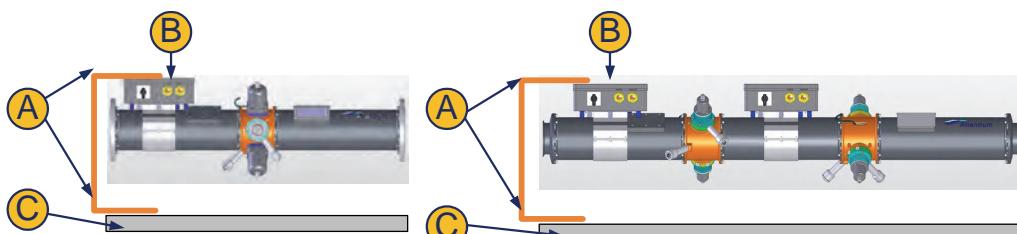


Figure 5-3: Placement of the **RZ104** Unit vis a vis the floor, wall or skid

Installing the Atlantium System



The **RZ104** does not include support brackets. Be sure to install appropriate supports along the piping on both sides of the **RZ104** Unit to ensure that it is anchored and stable.

Step 8. Install the Atlantium Unit:

Horizontal Installation

- a Carefully lower the Unit and using the appropriate bolts, washers and lock washers, bolt the triangle support brackets to the customer-provided corresponding supports.

Vertical Installation

- a Position the Atlantium Unit vertically so that the Flow label is point in up.
To verify if the position is correct, check that the
- b Carefully lower the Unit and using the appropriate bolts, washers and lock washers, bolt the triangle support brackets to the customer-provided corresponding supports.



Figure 5-4: Flow Label Points Up

Step 9. To connect the fitting on one side of the Unit to the fittings of the facility's pipes, insert an o-ring between the Unit's and the facility's pipes. In some cases, a reducer or expander may be necessary.

- For systems with flange interface, on one side of the Unit to the flanged fittings of the facility's pipes with eight appropriate (8) sets of bolts/nuts/flat and lock washers - do not tighten the hardware.
- For systems with Tri-Clamp fittings, on one side of the Unit, clamp the fittings together - do not tighten the hardware.

Step 10. Repeat the step above for the other side of the Unit.

Step 11. Tighten the fastening hardware so that the torque pressure around the fittings is even, and the Unit is firmly connected to the facility's water line.

Step 12. To check for any leakage, open the Inlet and Outlet valves to allow water to flow through the newly installed Unit and its surrounding process piping.

Step 13. If you find any leakage, tighten the connections.

Step 14. Close the Inlet and Outlet valves and use the Draining valve, drain the Atlantium system piping from Inlet valve to Outlet valve.



Figure 5-5: Generic Flange fitting to the Water Line



Figure 5-6: Generic Tri-Clamp Fitting

5.5 Installing Surge Protection

Verify that you have a protective device that prevents electrical surges and fluctuations from causing damage. You must have at least one of these three types of surge protection:

Installing the Atlantium System

- UPS (Uninterruptable Power Supply) has an internal battery that allows the equipment plugged into it to continue to run in the event of a power outage until power is restored. It also has the benefit of performing the same functionality of surge protectors, protecting against spikes and surges. If needed, the UPS allows the system to be shut down cleanly if power is out for a lengthy period.
- Surge protection device protects your equipment from variations in electrical current, such as surges and spikes.
- OVPD module (Over Voltage Protection Device) - if you have purchased this from Atlantium, see below for directions on mounting and connection it.

5.5.1 Installing a Surge Protection Device

The diagram to the right shows the generic wiring for a surge protection device. See the manufacturer's installation instructions with the surge protection device to be installed. For more information about surge protection devices available via Atlantium, see ***Surge Protector Devices*** on page **2-10**.

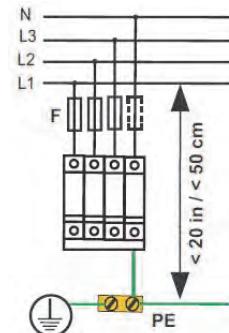


Figure 5-7: Surge protection device wiring - generic

5.5.2 Mounting and Connecting the OVPD Module

If your system includes the OVPD Module, mount it in an appropriate location in your electric box and connect it according to the directions in this section.

>To connect the OVPD

Step 1. To connect the mains to the OVPD module, thread the mains cables (customer provided) through the openings at the bottom of the OVPD module (**B**) and connect them to the terminal block for the mains (**C**) according to the diagram below.

Step 2. To connect the cables coming from the circuit breaker before the Atlantium Unit, thread the cables through the opening at the top of the OVPD module (**A**) and connect them to the terminal block for these cables (**D**) according to the diagram below.

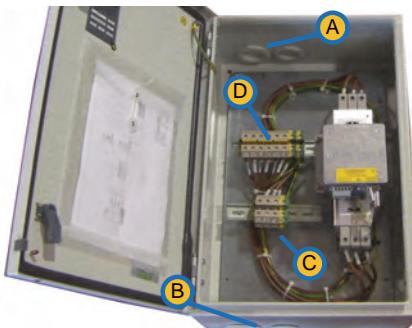


Figure 5-8: OVPD Connections

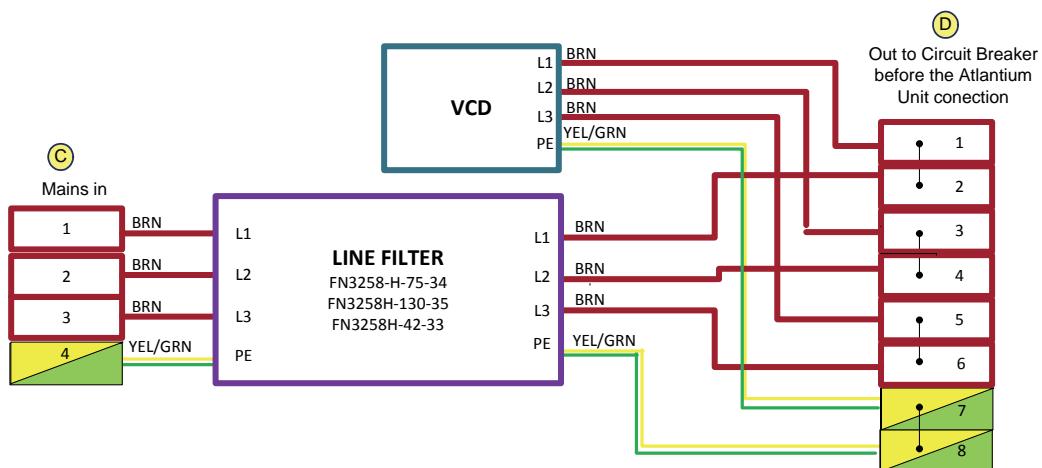


Figure 5-9: Typical Atlantium System Connections for the OVPD

- All wires are 5AWG with UL Standard
- Test: 100% Insulation Resistance: 1000VDC/0.1sec

5.6 Mounting the Controller

The **Controller** can be mounted on a wall or suitable anchoring point. The **Controller** comes with an electrical and Data cable, each 5m long. However it can be placed up to 50 meters (164.04 ft.) from the Atlantium Unit, in a place that it is easy to reach the touch screen and read the monitoring information. A longer Data Cable can be ordered for this purpose.



- When mounting the **Controller**, take into consideration the length of the cables.
- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**

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Table 5-1: **Controller** Components

#	Item
1	Mounting Holes
2	Data Cable + Gland
3	Electrical Cable + Gland
4	Electrical Connectors
5	Holes for Peripheral Component Connections
6	Various Component Connectors
7	Ethernet Connector
8	Cellular Modem (present if ordered)
9	Circuit Breaker

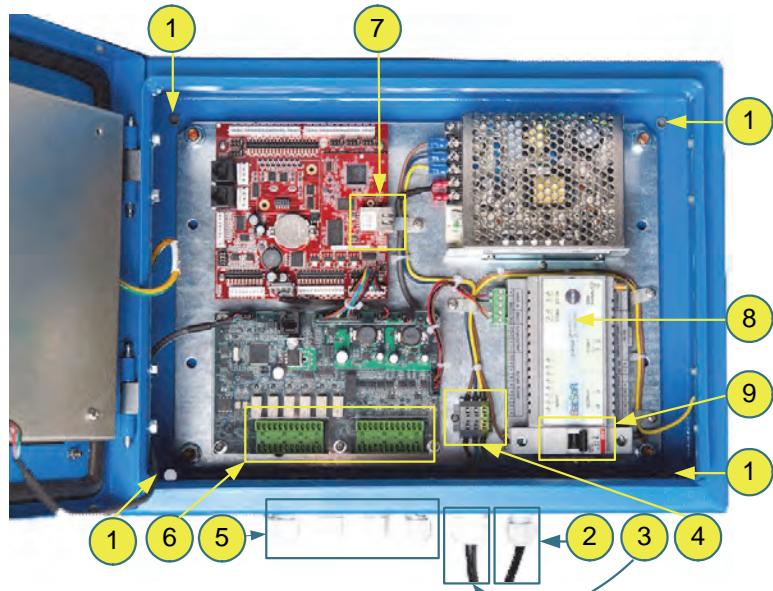


Figure 5-10: Controller Interior

⇒ To mount the Controller on the wall:

- Step 1. On the wall space designated for the **Controller**, make four marks according to the spacing measurements for mounting orientation on the ICD drawing on page 2-2.
- Step 2. The mounting holes (1) are 8.5mm (0.33") in diameter. Using the appropriate drill bit, drill the four holes.
- Step 3. In each hole, insert a plastic anchor.
- Step 4. Uncrate the **Controller** unit package and carefully lift it out.
- Step 5. Open the door of the **Controller** unit and remove the plastic covers on the four holes.
- Step 6. Position the **Controller** unit so that its four holes fit over the drilled holes.
- Step 7. Using appropriate screws and with a screwdriver, screw in the four screws in a diagonal pattern (one corner, then the opposite corner).
- Step 8. To secure the Unit firmly, return to each screw in the diagonal patter and tighten the screws securely.

⇒ To mount the Controller on skids:

- Step 1. At the location designated for the **Controller** set up the skids with spacing that matches the spacing measurements for mounting orientation on the ICD drawing on page 2-2.
- Step 2. The mounting hole (1) are 8.5mm (0.33") in diameter. Using the appropriate bolts and nuts, with a screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24') sticking out.
- Step 3. Uncrate the **Controller** unit package and carefully lift it out.
- Step 4. Open the door of the **Controller** unit and remove the plastic covers on the four holes.
- Step 5. Position the **Controller** unit so that its four holes fit over the corresponding holes on the skids.
- Step 6. Using appropriate bolts and nuts and with a screwdriver, screw in the four bolts adding the nuts in a diagonal pattern (one corner, then the opposite corner).
- Step 7. To secure the Unit firmly, return to each bolt in the diagonal patter and tighten them securely.

5.7 Mounting the Power Module (if included)

For systems requiring the Power Modules (refer to **Power Module** on page 2-12 and **Electrical Requirements** on page 3-7) the Power Modules can be mounted on a wall or suitable anchoring point up to 10 meters (32.8 ft.) (according to the cable length you ordered from Atlantium) from the Atlantium unit. A Power Module can be positioned near a Ballast Module with a minimum of 300 mm (11.8 inches) of clearance on each side for proper ventilation.



- When mounting the Power Module, take into consideration the length of the cables.
- Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.
- The customer must provide the Power cable to the mains.

>To mount the Power Module on the wall:

Step 1. On the wall space designated for the Power Module, make four marks according to the spacing measurements for mounting orientation on the ICD drawing **Figure** on page 2-12.

Step 2. The mounting holes (**B**) are 8.5mm (0.33") in diameter. Using the appropriate drill bit, drill the four holes.

Step 3. In each hole, insert a plastic anchor.

Step 4. Uncrate the Power Module package and carefully lift it out.

Step 5. Open the door of the Power Module (**A**) and locate the mounting holes (**B**).

Step 6. Remove the protective covers from each hole.

Step 7. Position the Power Module so that its four holes fit over the drilled holes.

Step 8. Using appropriate screws and with a screwdriver, screw in the four screws in a diagonal pattern (one corner, then the opposite corner).

Step 9. To secure the Unit firmly, return to each screw in the diagonal pattern and tighten the screws securely.



Figure 5-11: Power Module - Mounting Holes

To mount the Power Module on skids:

Step 1. At the location designated for the Power Module, set up the skids with spacing that matches the spacing measurements for mounting orientation on the appropriate ICD drawing **Figure** on page 2-12.

Step 2. The mounting hole (**B**) are 8.5mm (0.33") in diameter. Using the appropriate bolts and nuts, with a screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24') sticking out.

Step 3. Uncrate the Power Module package and carefully lift it out.

Step 4. Open the door of the Power Module (**A**) and locate the mounting holes (**B**).

Step 5. Remove the protective covers from each hole.

Step 6. Position the Power Module so that its four holes fit over the corresponding holes on the skids.

Step 7. Using appropriate bolts and nuts and with a screwdriver, screw in the four bolts adding the nuts in a diagonal pattern (one corner, then the opposite corner).

Step 8. To secure the Unit firmly, return to each bolt in the diagonal pattern and tighten them securely.

5.8 Mounting the Ultrasonic Cleaner Module (Optional)

The optional Ultrasonic Cleaner Module can be mounted on a wall or suitable anchoring point up to 10 meters (32.8 ft.) from the Atlantium unit. The Ultrasonic Cleaner Module can be positioned near a Ballast Module with a minimum of 300 mm (11.8 inches) of clearance on each side for proper ventilation.

The Ultrasonic Cleaner cable, Data cable, and Power cable are supplied attached to the Ultrasonic Cleaner Module.



- When mounting the Ultrasonic Cleaner Module take into consideration the length of the cables.
- Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.

>To mount the Ultrasonic Cleaner Module on the wall:

Step 1. On the wall space designated for the Ultrasonic Cleaner Module, make four marks according to the spacing measurements for mounting orientation on the ICD drawing **Figure 2-11** on page **2-15**.

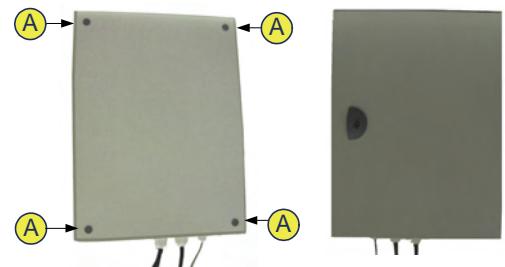


Figure 5-12: Ultrasonic Cleaner Module - Back and Front View

Step 2. The mounting holes (**A**) are 8.5mm (0.33") in diameter. Using the appropriate drill bit, drill the four holes.

Step 3. In each hole, insert a plastic anchor.

Step 4. Uncrate the Ultrasonic Cleaner Module package and carefully lift it out.

Step 5. Open the door of the Ultrasonic Cleaner Module and locate the mounting holes (**A**).

Step 6. Remove the protective covers from each hole.

Step 7. Position the Ultrasonic Cleaner Module so that its four holes fit over the drilled holes.

Step 8. Using appropriate screws and with a screwdriver, screw in the four screws in a diagonal pattern (one corner, then the opposite corner).

Step 9. To secure the Unit firmly, return to each screw in the diagonal pattern and tighten the screws securely.

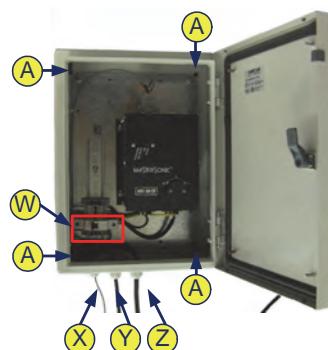


Figure 5-13: Ultrasonic Cleaner Module - Generic Inside View

To mount the Ultrasonic Cleaner Module on skids:

Step 1. At the location designated for the Ultrasonic Cleaner Module, set up the skids with spacing that matches the spacing measurements for mounting orientation on the appropriate ICD drawing **Figure 2-11** on page **2-15**.

Step 2. The mounting holes (**A**) are 8.5mm (0.33") in diameter. Using the appropriate bolts and nuts, with a screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24') sticking out.

Step 3. Uncrate the Ultrasonic Cleaner Module package and carefully lift it out.

Step 4. Open the door of the Ultrasonic Cleaner Module and locate the mounting holes (**A**).

Step 5. Remove the protective covers from each hole.

Step 6. Position the Ultrasonic Cleaner Module so that its four holes fit over the corresponding holes on the skids.

Step 7. Using appropriate bolts and nuts and with a screwdriver, screw in the four bolts adding the nuts in a diagonal pattern (one corner, then the opposite corner).

Step 8. To secure the Unit firmly, return to each bolt in the diagonal pattern and tighten them securely.

5.9 Installing the Ballast Module(s)

Each lamp chamber has a corresponding Ballast Module. The location for mounting the Ballast Module(s) must take into account the length of the cables to be attached from the Atlantium Unit. If you need to calculate space cooling for the location in which you are installing the Ballast Module(s), refer to the heat load per Ballast Module shown below.

Heat Load per Ballast Module: 50W
 (For calculating space cooling requirements)



- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**

Ballast Modules must be installed vertically (as shown to the right) and at least one meter above ground level. Ballast Modules must be at least 300mm (12") from each other or from any other object around them to allow proper ventilation. Ballast Modules must not be installed within closed cabinets.

You can mount them next to each other horizontally or one above another vertically. Arrange the Ballast Modules in consecutive order from left to right according to the number marked on the bottom of the Ballast Module.

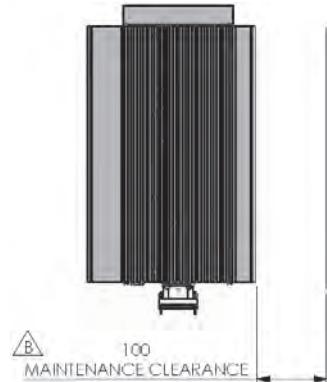


Figure 5-14: Ballast Module Depth

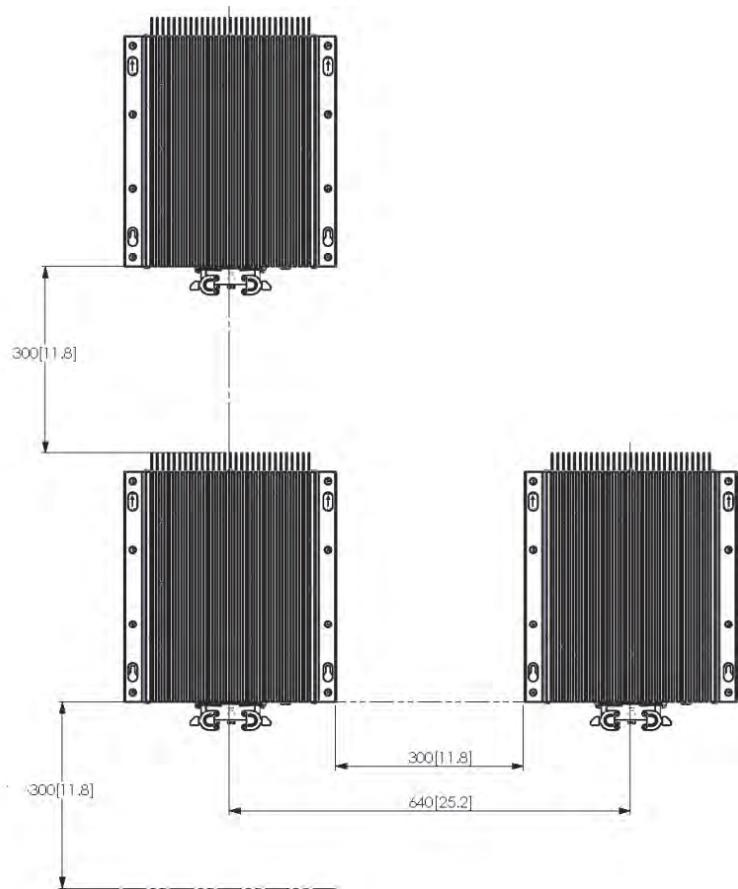


Figure 5-15: Multiple Ballast Module Installation Diagram

Installing the Atlantium System

⇒ To mount a Ballast Module on the wall:



The Ballast Module is heavy! Be sure that the wall on which you intend to mount the Ballast Module is strong enough to carry its weight.

Step 1. On the wall space designated for the Ballast Modules, make four marks according to the spacing measurements for mounting orientation on the ICD drawing on page.

Step 2. The keyhole slots for mounting are 7mm (0.28") in diameter for screws size M6 OR 1/4" bolts. Using the appropriate drill bit, drill the four holes.

Step 3. In each hole, insert a plastic anchor and with the appropriate screwdriver, screw in the screw leaving around 5.6mm (0.20-0.24') sticking out of the wall.

Step 4. Uncrate the Ballast Module package and carefully lift out the Unit.

Step 5. Fit the keyhole slots onto the protruding screw heads and slide the Unit downward until the top of the keyhole slots rest on the screws.

Step 6. To secure the Unit firmly, tighten the four screws.

⇒ To mount a Ballast Module on skids:

Step 1. At the location designated for the Ballast Modules, set up the skids with spacing that matches the spacing measurements for mounting orientation on the ICD drawing on page 2-2.

Step 2. The keyhole slot for mounting is 7mm (0.28") in diameter for screws size M6 OR 1/4" bolts.

Step 3. Using the appropriate screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24') sticking out.

Step 4. Uncrate the Ballast Module package and carefully lift out the Unit.

Step 5. Fit the keyhole slots onto the protruding bolt heads and slide the Unit downward until the top of the keyhole slots rest on the bolts.

Step 6. To secure the Unit firmly, tighten the four bolts and their nuts.

5.10 Connecting the Ballast Module Cables

One side of the **Cable Harness** is attached to the connection box of each lamp of the Atlantium Unit. For the connection of the other end of the **Cable Harness**, there are two options:

Table 5-2: Ballast Module

#	Item
A	Single Connector with lock latch

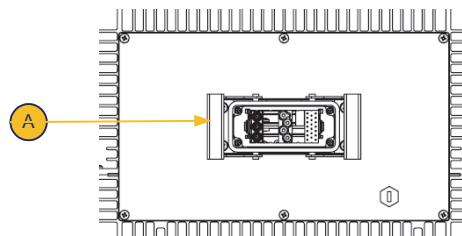


Figure 5-16: Waterproof Box - Single-Connector

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>To connect the cable:

Step 1. According to the electrical drawing of the Installation plan, bring the **Cable Harness** attached to the Connection Box of Atlantium Unit up to the Ballast Module.

Step 2. On the Ballast Module, pull the lock latch of the connector to the open position and remove the protective cover.



Be sure to save the protective cover of the Ballast Module connector in an accessible location for the future in case you need to dismantle the Ballast Module for any reason.

Step 3. Connect the lamp cable lead to the Lamp connection port (**A** in **Figure 5-16** above) (the connector is keyed so it only matches in one position) and pull the lock latch closed to secure the connection.

5.11 Cabling Auxiliary Components

Connect the cables of the mandatory flow signal, and optional Inlet, Outlet/Ready and Bypass Valves, as well as Pressure Transmitter (according to your system configuration) to the Connection Box of lamp 1 on the Atlantium Unit. On a side of the Connection box, there are 5 holes marked **9** in the diagram below to be used to thread these cables.



DO NOT DRILL INTO THE CONNECTION BOXES OR ALTER THEM IN ANY WAY!!!!

The Connection Box already contains entry glands for ALL of the cabling needs.

Making holes in a Connection Box will destroy its waterproof seal, endangering the components inside. Do Not draw electricity from the Atlantium Unit's Connection Box as it will damage the Unit's electrical configuration.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.



The directions below are for all **RZ104-11/12** systems, in which the first Connection Box is labeled number **1**. Where there is reference to the first Connection Box, for systems that contain only one Connection Box the single Connection Box is the first Connection Box.

5.11.1 Connection Box Card 1300

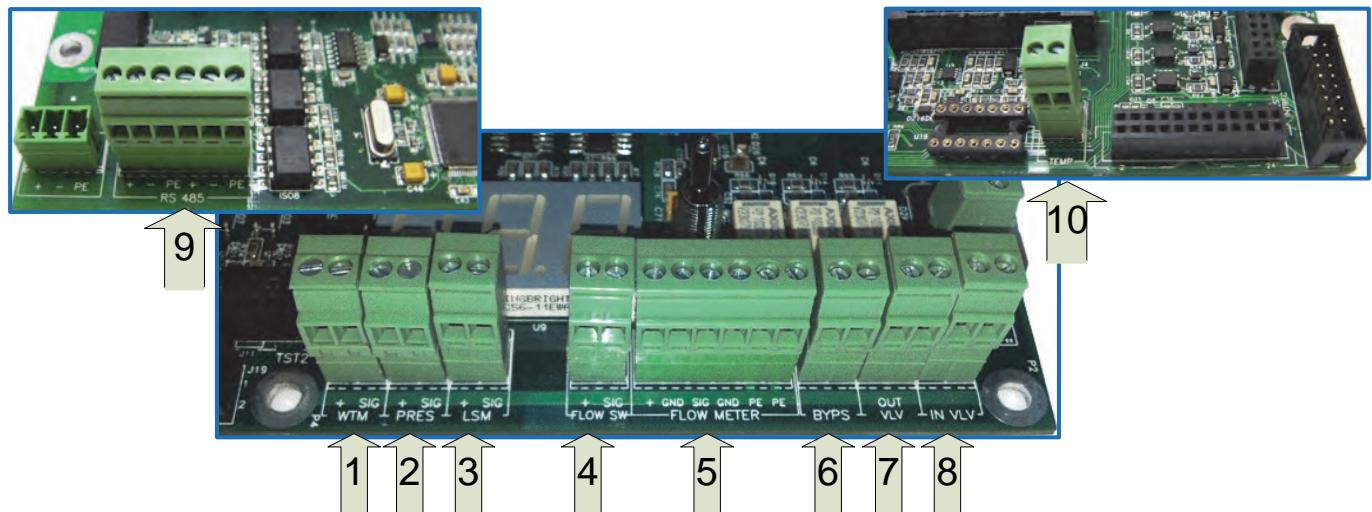


Figure 5-17: Ballast Module Signal Connections on Connection Box Card

Table 5-3: Ballast Module Signal Connections Key

#	Text on the Circuit Board	Description	Signal type	Value	Notes
1	WTM	UVT Analyzer input	Analog	4-20mA	already assembled
2	PRES	Pressure Transmitter input (Optional)	Analog	4-20mA	Optional
3	LSM	UVIS Sensor input	Analog	4-20mA	already assembled
4	FLOW SW	Flow switch input	Digital	Dry contact / Open collector	Either Flow Switch or Flow Meter
5	FLOW METER	Flow meter input	Analog	4-20mA	
6	BYPSS STR	Bypass valve output	Dry contact		Optional
7	OUT VLV	Output valve output	Dry contact		Optional
8	IN VLV	Inlet valve output	Dry contact		Optional
9	RS485	RS485 Port			
10	TEMP	Temperature sensor input	Analog		already assembled

Installing the Atlantium System

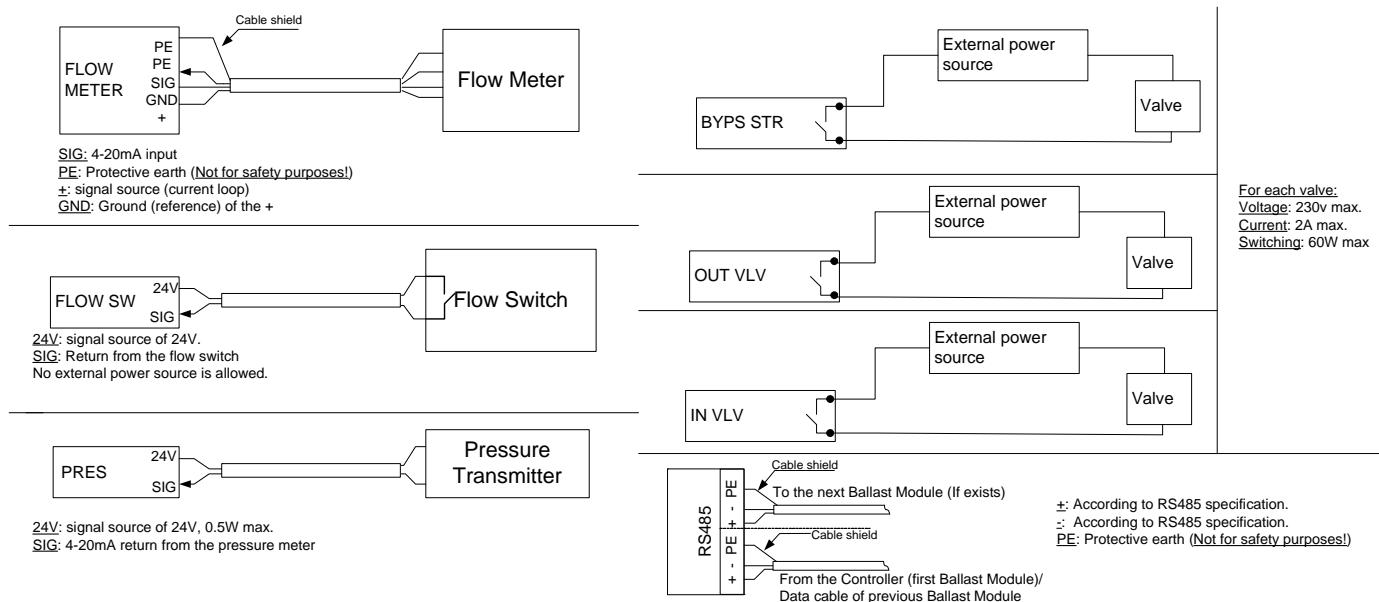


Figure 5-18: Ballast Module Signal Connections on Connection Box

⇒ To cable auxiliary components:

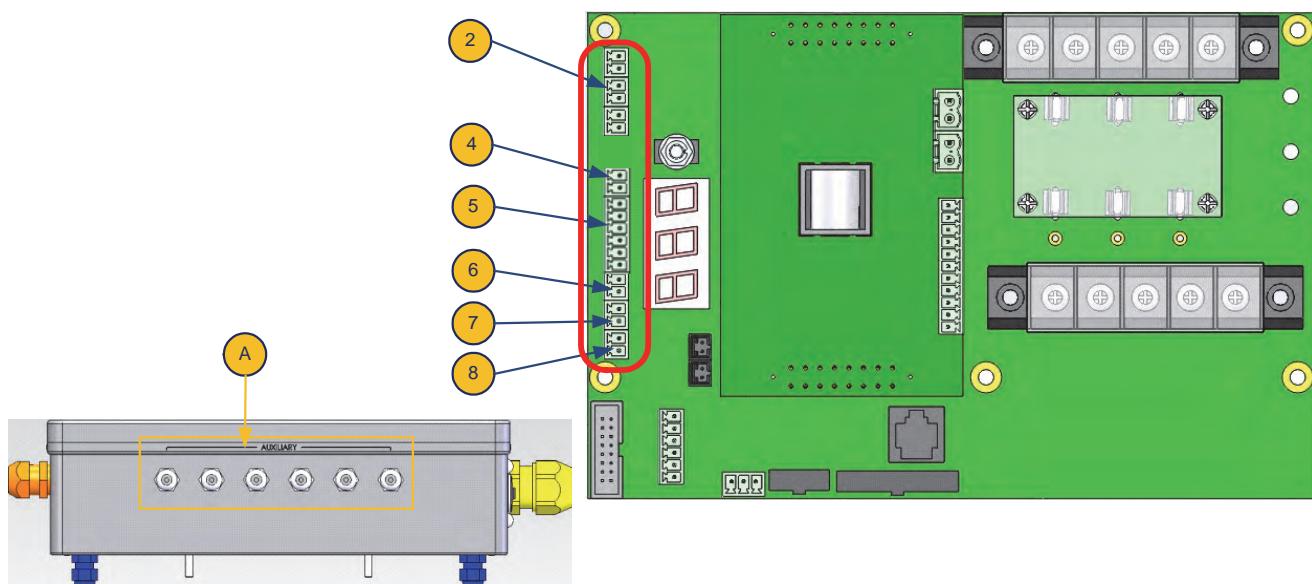


Figure 5-19: Connection Box Side and Inside View-Auxiliary Components Connections

- Step 1.** On the first Connection Box, remove the covers of holes (marked A in the diagram below) as needed for the auxiliary components in your system configuration.
- Step 2.** Add plastic glands to each hole to be used.
- Step 3.** For the (optional) **Inlet Valve** connection, the maximum voltage is **250 VAC**. The maximum current is **1.2 Amp**. The maximum switching capacity is **50 W**. On the first Connection Box, insert the **Inlet Valve** cable into one of the holes marked **A** and thread it up to the Dry Contact connectors labeled **IN VLV** (marked **8** in the diagram above.)
- Step 4.** For the (optional) **Outlet Valve** connection, the maximum voltage is **250 VAC**. The maximum current is **1.2 Amp**. The maximum switching capacity is **50 W**. On the first Connection Box, insert the **Outlet Valve** cable into one of the holes marked **A** and thread it up to the Dry Contact connectors labeled **OUT VLV** (marked **7** in the diagram above.)

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Step 5. For the (optional) **Bypass Valve** connection, the maximum voltage is **250 VAC**. The maximum current is **1.2 Amp**. The maximum switching capacity is **50 W**. On the first Connection Box, insert the **Bypass Valve** cable into one of the holes marked **A** and thread it up to the Dry Contact connectors labeled **BYPS STR** (marked **6** in the diagram above.)

Step 6. To connect the **Flow Signal**:

- For a **Flow Meter**, on the first Connection Box, insert the cable into one of the holes marked **9** and thread it up to the connectors labeled **FLOW METER** (marked **5** in the diagram above.) The standard current is 4-20mA. Connect the wires according to the manufacturer's instructions. The connectors are marked **PE**, **PE**, **SIG**, **GND**, and **+**. Typically, the cable is comprised of three wires and the shield. A wire connects to the **+** port and a second wire connects to the **SIG** port. The **GND** wire connects to the **GND** port. The Shield connects to one of the **PE** ports.



Use the **+** pin for the signal source (current loop) **ONLY**.

Do not use the **+** pin as the power source for the flow meter. For more information see **Flow Measurement/Detection** on page **3-17**.

- For a **Flow Switch**, on the first Connection Box, insert the cable into one of the holes marked **9** and thread it up to the connector labeled **FLOW SW** (marked **4** in the diagram above.) Connect the wires according to the manufacturer's instructions. The ports are marked **+** and **SIG**.

Step 7. Insert the (optional) **Pressure Transmitter** cable into one of the holes marked **9** and thread it up to the connector labeled **PRES** (marked **2** in the diagram above.) Connect the wires according to the manufacturer's instructions. The ports are marked **+** and **SIG**.

Step 8. Fasten the plastic nut of each of the cable glands.

5.11.2 Controller Connections

You can connect signal wires for the following peripheral equipment to the **Controller**'s terminal block:

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Atlantium Unit's Data Cable ■ System Ready ■ General Alarm ■ Shutdown Warning ■ High Temperature | <ul style="list-style-type: none"> ■ Low UVT ■ Low Status ■ External On/Off ■ Dose Output |
|--|---|



Avoid direct contact with the electronic circuit board which is sensitive to electrostatic discharge (ESD). Utilize best practices regarding ESD when replacing the power cable.

Installing the Atlantium System

To connect peripheral equipment:

- Step 1.** Using the attached key, open the screen panel of the **Controller**.
- Step 2.** Use the holes, adding plastic glands as needed, on the bottom (**B**) to insert cables.
- Step 3.** Use the hole (**C**), adding plastic glands as needed, on the bottom to insert the data cable from the Atlantium Unit.
- Step 4.** Thread the cables to the appropriate connector (**A**) according to the table below.
- Step 5.** For connecting to an external facility control via Modbus, see **Appendix A, Modbus Communication Protocol**. Add jumpers to any unused pins as shown in the diagram below.

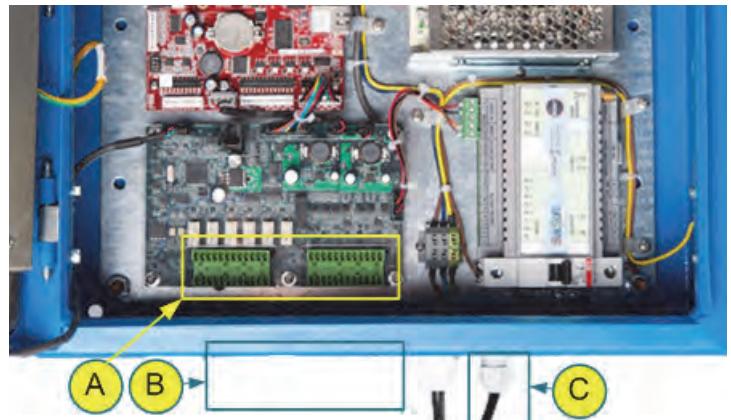


Figure 5-20: Controller Interior

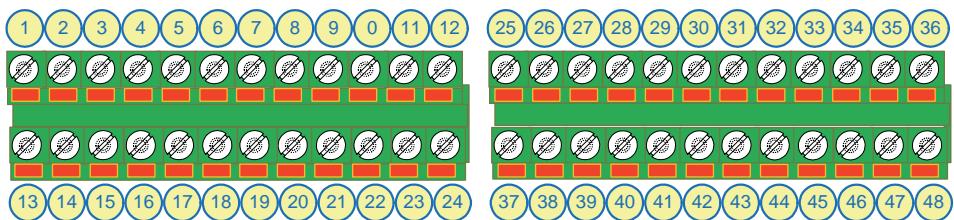


Figure 5-21: Controller Terminal Connectors

Communication Signals

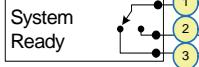
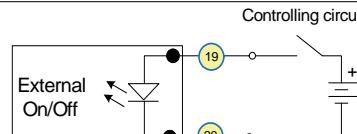
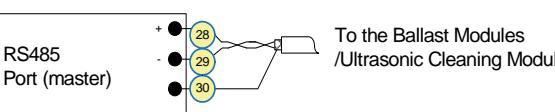
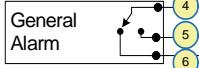
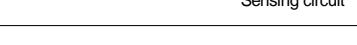
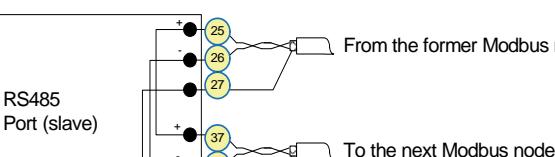
Digital Outputs	On/Off and DOSE Out	
<p>System Ready</p> 	<p>Controlling circuit</p> 	<p>To the Ballast Modules /Ultrasonic Cleaning Module</p> 
<p>General Alarm</p> 	<p>External On/Off</p> 	<p>From the former Modbus node</p> 

Figure 5-22: Controller Connections

Installing the Atlantium System

Table 5-4: Controller Terminal Block Connector Pins J35 (J3+J5)

	Function	Pin's Number	Values
Digital Outputs	System Ready COM	1	Dry Contacts Max. Voltage: 220VDC/250VAC Max. current: 2A Max. switching capacity: 60W
	System Ready N.O.	2	
	System Ready N.C.	3	
	General Alarm COM	4	
	General Alarm N.O.	5	
	General Alarm N.C.	6	
	Shutdown Warning COM	7	
	Shutdown Warning N.O.	8	
	Shutdown Warning N.C.	9	
	High Temperature COM	10	
	High Temperature N.O.	11	
	High Temperature N.C.	12	
	Low UVT COM	13	
	Low UVT N.O.	14	
	Low UVT N.C.	15	
	Spare	16	
	Spare N.O.	17	
	Spare	18	
Digital Inputs	External On/Off +	19	On: 10-48VDC Off: <1VDC See <i>External On/Off - Additional Notes</i> on page 5-18
	External On/Off -	20	
	Spare (Din 2) +	21	
	Spare (Din 2) -	22	
Analog Output	Dose Out	23-24	4-20mAADC, Max. Rsens= 200R
Modbus	P1 485 Rx / Tx+	25	Main Modbus connector

Table 5-4: Controller Terminal Block Connector Pins J35 (J3+J5)

	Function	Pin's Number	Values
Slave in	P1 485 Rx / Tx-	26	To make a Modbus daisy chain incoming connection from another Controller
	P1 485 PE	27	Earthing
Modbus	P2 485 Rx / Tx+	28	Connector for the Atlantium Unit's Data Cable
Master	P2 485 Rx / Tx-	29	
	P2 485 PE	30	
Modbus	P1 485 Rx / Tx+	37	Main Modbus connector See Modbus Communication Connections on page 5-19.
Slave out	P1 485 Rx / Tx-	38	To make a Modbus daisy chain outgoing connection to another Controller
	P1 485 PE	39	Earthing
Slave RS485	P1 Term_1	40	Termination connector
Termination	P1 Term_2	41	For the Controller that is last in a daisy-chain, insert a jumper here
Slave RS485	P1 MODEM/RS485 2B	42	Cellular Modem connector For systems that DO NOT utilize a cellular modem, insert a jumper here
SELECT	P1 MODEM/RS485 2A	43	
	P1 MODEM/RS485 1B	44	
	P1 MODEM/RS485 1A	45	

5.11.3 External On/Off - Additional Notes

For regular wiring:

- Positive voltage must be connected to pin 19 – IN+
- Negative (GND) must be connected to pin 20 – IN-

Table 5-5: External On/Off

Controller Screen External On/Off	Physical Connection		Lamp Control
	IN+	IN-	
Normally Open	0 VDC	0 VDC	Off
Normally Open	+24 VDC	0 VDC	On
Normally Closed	0 VDC	0 VDC	On
Normally Closed	+24 VDC	0 VDC	Off

5.11.4 Connecting the 48VDC Module

The 48VDC cable from the first Connection Box of the Atlantium Unit must be connected to the 48VDC Module.

⇒ **To connect the 48VDC cable:**

Step 1. Thread the 48VDC cable from the first Connection Box of the Atlantium Unit through the gland of the 48VDC Module (**A**).

Step 2. Connect the wires to the connectors (**B**):

- Brown wire to the red connector
- Blue wire to the brown connector

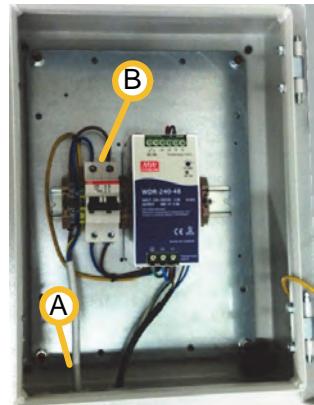


Figure 5-23: Connecting the 48VDC Cable

5.11.5 Connecting the Ultrasonic Cleaning Module

The Ultrasonic Cleaning cable from the first Connection Box of the Atlantium Unit must be connected to the Ultrasonic Cleaning Module.

⇒ **To connect the Ultrasonic Cleaning Module to the Mains:**

- Thread the cable through the gland (**A**) and connect it **L - N - PE** as shown as **B** in the diagrams below.



Figure 5-24: Ultrasonic Cleaning Cable Connection 1

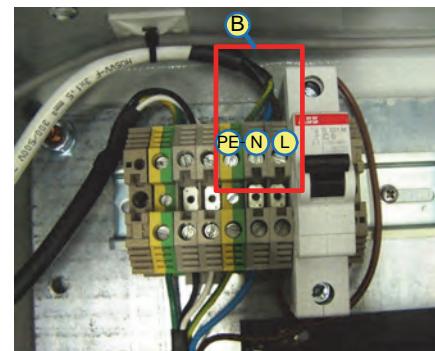


Figure 5-25: Ultrasonic Cleaning Cable Connection 2

5.12 Modbus Communication Connections

Modbus is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition systems.

The Atlantium system can be controlled directly from your facility control system via Modbus - RTU on RS485 (network) serial connection.

Installing the Atlantium System

To accomplish this:

- The Modbus Settings must be configured in the **Controller**. See *Configuring More Settings* on page 7-13.
- The Facility control system communication properties must be configured to match that of the Atlantium system. See *Setting Up the Facility System Communication Properties* on page 5-20.
- For the terminal block connectors for the Modbus in the **Controller**, see Table 5-4 *Controller Terminal Block Connector Pins J35 (J3+J5)* above.
- Signalling communication incoming to the facility control system is according to the Modbus Registers. [Appendix B, System Messages](#).



To ensure communications are operational, be sure to connect the cables **TX to RX** and **RZ to TX**.

5.12.1 Setting Up the Facility System Communication Properties

To properly configure communications between your Atlantium system and control network, set up the communication properties and **COM1** port settings at the facility control system as follows:

Node Address:	1 to 256 ***
Available Commands	Function codes
Function Codes: *	0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0xF, 0x10
Support IEEE Floating Point: **	NO (register/100)
Baud Rate:	4800, 9600, 19200, 38400, 57600, 115200 ***
2 Wire	
Parity:	None
# of Stop Bits:	1
# of Data Bits	8

(*) You can read all the registers in the system at once with **0x03** (includes coils, discreet coils, holding registers and input registers).

(**) Divide the desired parameter by 100 to calculate the real flow point.

(***) Must be the same in the controller setting

To view the Modbus Registers, which govern the signalling communication from the Atlantium system to the facility control system, see [Appendix B, System Messages](#).

5.13 Connecting TRACS

See the section, *Connection to Facility Control* on page 3-21.

5.14 Connecting the Atlantium System to the Mains



WARNING!!!

UNDER NO CIRCUMSTANCES



SHALL ELECTRICAL WORK BE CARRIED OUT WITHOUT VERIFYING THAT ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS ARE SET TO THE **OFF** POSITION AND THAT **NO ELECTRICAL FEED IS LIVE**.

DO NOT SET ANY MAIN CIRCUIT BREAKER OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS TO THE **ON** POSITION UNTIL **ALL** ELECTRICAL WIRING IS PROPERLY CONNECTED. UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.

ONLY AFTER ALL OF THE CONNECTION TO THE MAINS ARE CARRIED OUT DO YOU SET THE MAIN CIRCUIT BREAKERS TO THE **ON** POSITION.

The infrastructure of the electrical connections is to have been prepared according to *Preparing for the Electrical Wiring to the Mains* on page 3-13.

For installations that require the Power Module or the OVPD unit, the customer must provide the Power cable to the mains.

For information on the Electrical Requirements, see:

- **Section 2. About the RZ104 System** on page 2-9
- **Section 3. Getting Ready for Installation, Electrical Requirements** on page 3-7

Mains Connection Phases



Make sure the circuit breakers before the mains are set to the **Off** position. **BEFORE** connecting the Atlantium system to the mains.

AFTER all of components of the Atlantium system is connected to the mains, set the circuit breakers to the **On** positions.

Phase 1 Connect the **Controller** to the mains.

Phase 2 Connect the Atlantium Unit's 48VDC Module to the mains (if exists) or connect the Atlantium Unit's 115VAC connection to the mains (if exists)

Phase 3 Connect the Atlantium Unit's 115VAC connection to the mains (if exists).

Phase 4 Connect the Ultrasonic Cleaner Module to the mains (if exists).

Phase 5 Connect the Atlantium Unit's Power cable to the mains either directly or via the Power Module.



- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**

5.14.1 Connecting the Controller's Power Cable

The **Controller** comes with a power cable of 2m/6.5ft. length. For the electrical specifications, See *The Controller* on page 2-14. Prepare the appropriate plug for the electrical standards of your region. Considering the distance between the **Controller** and your electrical box, you may want to replace the electrical cable with a longer one.

Installing the Atlantium System

>To connect the Controller's power cable:

- Connect the appropriate plug for the electrical standards of your region.
- **Do not** plug in the **Controller** to an outlet until after the hardware installation is complete and the system is ready to be initialized. (See *Initializing the Atlantium System* on page 6-1.)

5.14.1.1 Replacing the Controller's Power Cable

You can order a longer cable from Atlantium or acquire one that conforms to the specifications in **Table 3-4** on page 3-22 from a local source.



Avoid direct contact with the electronic circuit board which is sensitive to electrostatic discharge (ESD). Utilize best practices regarding ESD when replacing the power cable.

To connect a longer power cable to the Controller:

- Step 1.** Using the attached key, open the screen panel of the Controller.
- Step 2.** Refer to the figure on the right. Locate the electrical connector (4).
- Step 3.** Disconnect the existing cable and loosen the plastic nut of gland (3).
- Step 4.** Pull the electrical cable out through the gland (3) at the bottom of the Unit.
- Step 5.** Insert the end of the longer power cable into the gland (3), pulling the cable through.
- Step 6.** Connect the cable's two power leads to phases or single phase plus neutral (**N**U + 1, 2, or 3), according to your voltage configuration and connect the ground lead to **GND**.
- Step 7.** Tighten the gland's plastic nut.

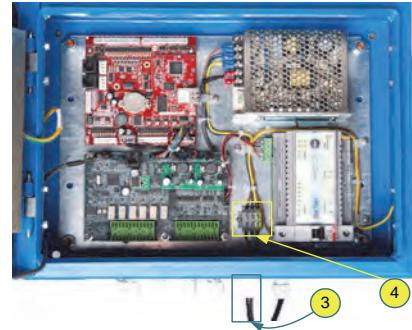


Figure 5-26: Controller's Circuit Board Power Connections

5.14.2 Connecting the 48VDC Module to the Mains

If your system includes the 48VDC Module, the voltage is 220V to 480V. The customer-supplied cables are to be connected either L-L or L-N. Refer to the appropriate diagram in *Preparing for the Electrical Wiring to the Mains* on page 3-10.

5.14.3 Connecting the 115VAC Wires to the Mains

If your system includes the secondary 115VAC connection, the wires are to be connected L-N for 115VAC or L-L for 200VAC (Non-Industrial network). Refer to the appropriate diagram in *Preparing for the Electrical Wiring to the Mains* on page 3-12.

5.14.4 Connecting the Ultrasonic Cleaning Module to the Mains

If your system includes the Ultrasonic Cleaning Module, the voltage is 220V – 240V. Refer to the appropriate diagram in *Preparing for the Electrical Wiring to the Mains* on page 3-13.

Installing the Atlantium System

5.14.5 Connecting the Atlantium Unit's Power Cable

The Atlantium Unit comes with a power cable of (5m/15ft.) or 10m/30ft (according to your order.) Prepare the appropriate plug for the electrical standards of your region. Considering the distance between the Atlantium Unit and your electrical box, you may want to replace the electrical cable with a longer one.



A certified electrician is required to perform these procedures. Follow your local regulations.

⇒ To connect the Atlantium Unit's power cable:

- If your system configuration requires a Power Module, see *Connecting the Power Module* on page 5-24
- IF none of the above, connect the appropriate plug for the electrical standards of your region and connect it to a mains outlet.
- **Do not** plug in the Unit's Power cable to an outlet until after the hardware installation is complete and the system is ready to be initialized. (See *Initializing the Atlantium System* on page 6-1.)

5.14.5.1 Replacing the Atlantium Unit's Power Cable



WARNING!

If you are replacing the electrical Power cable (to connect to the mains) with a longer cable, be sure to use the correct cable type (The Atlantium-supplied cable is 5-wire flexible cable of 4mm² each, 600V, HO7 RN-F 5G4 (Lapp, P/N 16001303)) and be sure to connect the wires of the cables according to the requirement of your local power distribution system as follows:

- **440/480 VAC:** 4-wire system that contains 3 phases and Ground
Ground must be wired to proper grounding in the same phase circuit.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Prepare the following:

- Replacement Connection Box card
- #5 Allen wrench
- #1 Phillips screwdriver

Installing the Atlantium System

>To replace the power cable:

- Step 1.** Using the appropriate Allen wrench, on the first Connection Box, open the Connection Box cover.
- Step 2.** Remove the plastic cover on the Power terminal (A).
- Step 3.** Using the appropriate screwdriver, carefully disconnect the Power cable from the Power terminal (A).
- Step 4.** Loosen the plastic nut of the Power cable's gland (B) and unthread the cable.
- Step 5.** Thread the replacement cable into the gland.
- Step 6.** Using the appropriate screwdriver, connect the replacement Power cable (A).
- Step 7.** Return the plastic cover to the Power terminal (A).
- Step 8.** Tighten the plastic nut of the gland (B).
- Step 9.** Using the appropriate Allen wrench, close the Connection Box cover.

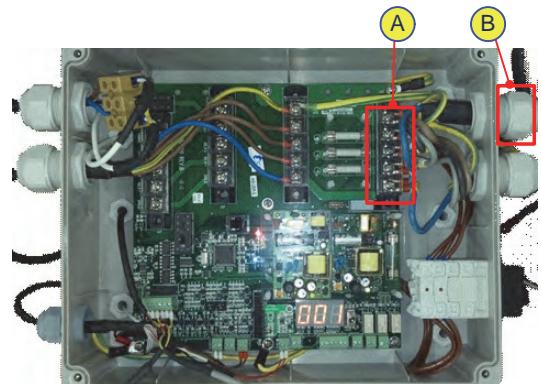


Figure 5-27: Location of the Connection Box Card's Main Cable (Generic)

5.14.6 Connecting the Power Module

If your system includes the Power Module, connect it according to the diagrams and instructions below.

The Power Module must be connected to the mains with a customer provided cable, that contains 3 phases and Ground according to local regulations. In calculating the length of this cable, consider the distance between the Power Module and your electrical box.

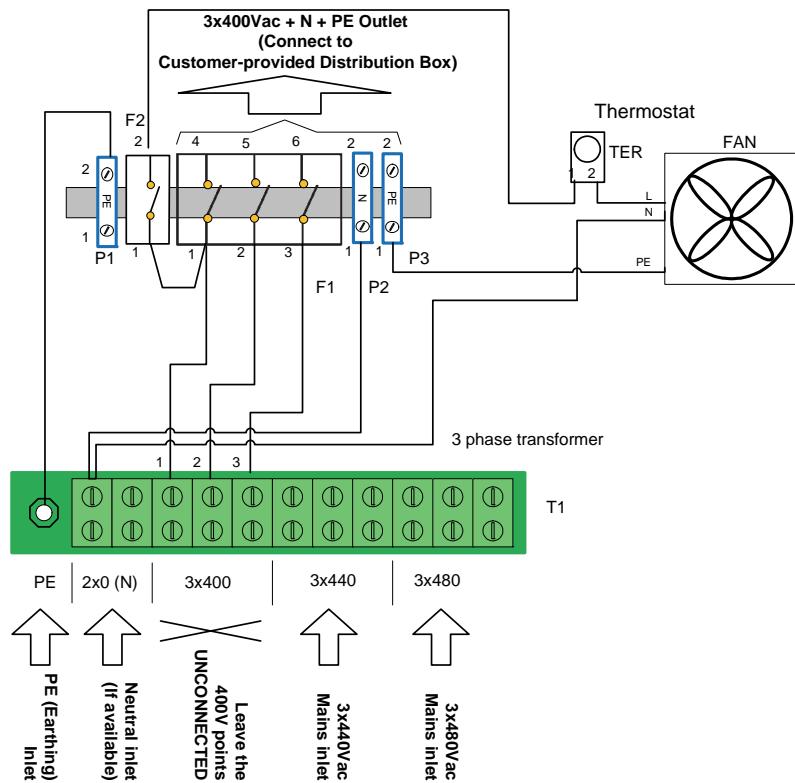


Figure 5-28: Typical Atlantium System Connections with Power Module for Locales with 440/480VAC

» **To connect the Power cable to the Power Module:**

Step 1. Open the door of the Power Module and locate the following:

- **C** - the two glands for threading the Power cables
- **D** - The circuit breakers to which the Power cable coming from the Atlantium Unit is to be connected
- **E** - The terminal block to which the Power cable from the mains (provided by the customer) is to be connected according to the relevant diagram above.

Step 2. Use the relevant diagram above to connect the cables.

Step 3. Thread cables into either gland as convenient.

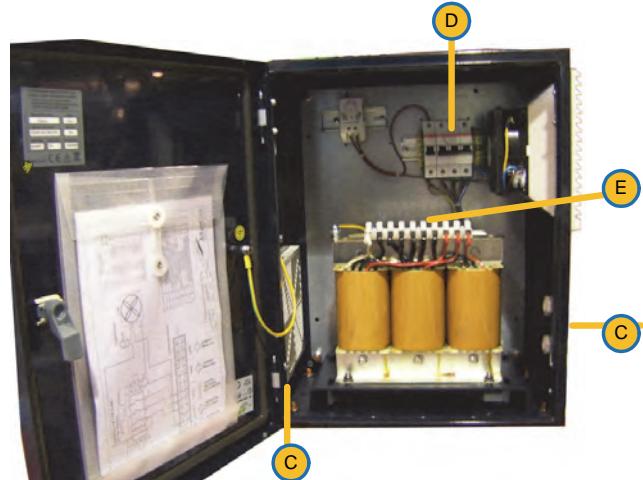


Figure 5-29: Power Module - Mounting Holes

5.15 Installation Check List

When you are ready to schedule the Atlantium technician to commission the Atlantium system, complete the check list below.

Send this check list together with digital photos of every angle of the installed system to your Atlantium representative. It generally requires at least 2 weeks after the check list has been completed to schedule the Atlantium commissioning.

Table 5-6: Atlantium System Installation Check List

Item	Done
■ The System is installed: <input type="checkbox"/> Vertically - Water is flowing upward <input type="checkbox"/> Horizontally	<input type="checkbox"/>
■ The Atlantium Unit, Ballast Module and other components are located in their final position	<input type="checkbox"/>
■ The Atlantium Unit and all of its components are not located where they may be in contact with direct water or chemical dripping	<input type="checkbox"/>
■ Ballasts are installed in a vertical position.	<input type="checkbox"/>
■ All Ballast Module connections are complete.	<input type="checkbox"/>
■ The electrical cables between components are not stretched.	<input type="checkbox"/>
■ All of the System components are securely installed and have sufficient service clearance on all sides (according to the ICDs).	<input type="checkbox"/>
■ All power preparations are complete and Power connects are wired as instructed in this guide.	<input type="checkbox"/>
■ Correct voltage was measured where the Power connects to the Ballast Module	<input type="checkbox"/>
■ Voltage rate _____ Number of phases _____	
■ The Atlantium Unit is connected to the water pipes according to the Installation plan developed by facility engineers and Atlantium personnel. Proper pipe lengths (Inlet - 10D, Outlet - 5D) are installed.	<input type="checkbox"/>
■ Water flows through the Atlantium Unit - The Unit has been checked while full of water and no bubbles or leaks exist in the system. The system is balanced, supported and pressure stable (no vibration, etc.). No known water hammers or pressure above 10 bars are on the line.	<input type="checkbox"/>
■ All piping accessories are installed and wired as instructed in this guide (e.g., Inlet/Outlet valves, sampling valves, draining valves, CIP valves, air release valve, etc.)	<input type="checkbox"/>
<input type="checkbox"/> Sampling Valves <input type="checkbox"/> CIP Ports <input type="checkbox"/> Draining Valves <input type="checkbox"/> Air Release Valves	

Installing the Atlantium System

Table 5-6: Atlantium System Installation Check List

Item	Done
<ul style="list-style-type: none"> ■ A flow meter or flow switch is installed and the electrical and data connection are complete. <ul style="list-style-type: none"> <input type="checkbox"/> If flow meter: 4 - 20 mA signal and Com wires are connected as instructed in this guide. <input type="checkbox"/> If flow switch: 2 wires from the flow switch are connected as instructed in this guide. <input type="checkbox"/> A 4 - 20 mA signal from the PLC is installed. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ■ The Controller connects is complete. All supporting features (e.g., General Alarm, External On/Off, etc.) and wiring were installed according to the Installation plan based on the instructions in this guide. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ■ All Connection Box connections are complete. All supporting features (e.g., flow meter or flow switch, auto valves open/close) and wiring were installed as instructed in this guide. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ■ For systems with TRACS, network connection was installed between TRACS the Controller. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ■ You are scheduling an electrician to be on site and available during the System commissioning (a must or the installation cannot be completed). 	<input type="checkbox"/>
<ul style="list-style-type: none"> ■ To be sent to Atlantium with this checklist, attach photos of the following: <ul style="list-style-type: none"> <input type="checkbox"/> Atlantium Unit <input type="checkbox"/> Ballast Module(s), Controller and other components <input type="checkbox"/> Accessories (Flow meter or flow switch, CIP ports, Sampling valves, etc.) 	
Customer Approval	
Name of Customer's authorized representative:	_____
Position:	_____
Signature of Customer's authorized representative:	_____
Date:	_____



6 Initializing the Atlantium System

The Atlantium system starts up with the initialization of the **Controller**.

>To start up the Atlantium system:

Step 1. Check that the Ballast Module power cable is connected to the main power source.

Step 2. Connect the power cable of the Controller to the main power source.

Step 3. Using the attached key, open the screen panel of the **Controller**.

Step 4. Locate the circuit breaker and turn it to the **On** position.

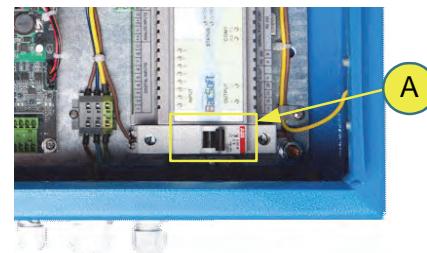


Figure 6-1: Controller

The system powers up and the **Controller's** touch-screen monitor is activated, displaying the Atlantium software's opening screen. The Atlantium **Controller** software's opening screen appears for a short time while the system performs its internal self-testing routines. A progress bar (**A below**) appears on the bottom of the screen. When the self-testing routines are complete, the **Main Operation** screen appears. The **Lamp Power** button on the top right is on the **Off** position. The **Ready** button turns red when the system is ready for operation.



Figure 6-2: Initial Main Operation Screen*

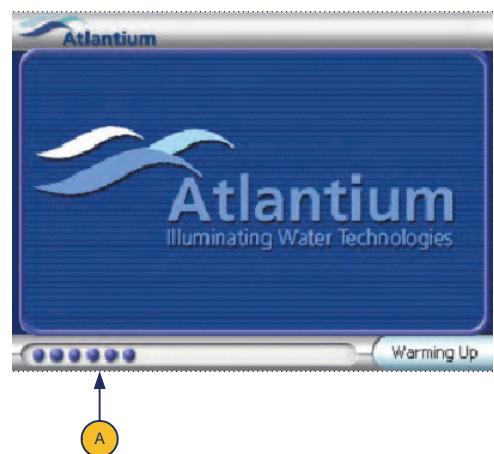


Figure 6-3: Controller Startup Opening Screen

*The screen is generic. The number of lamps on your Controller screen are according to the number of lamps in your Atlantium Unit.



7 Configuring the Controller

The Standard **Controller** controls the operations and dose measurements of the Atlantium system.

The regulatory application type determines sizing as well as software defaults and operational control options. This is set up at the original manufacturing facility and completed on site by the Atlantium technician.

- **EPA** mode, complying with EPA (Environmental Protection Agency) UVDGM November 2006 for all validations, alarms, calculations, control and record-keeping.
- **PMO** mode, complying with PMO (Pasteurized Milk Ordinance) 2009 for all criteria for UV systems as well as validations, alarms, calculations, control and record-keeping where required.
- The **Controller** provides a real-time display of operational data.



Figure 7-1: Initial Main Operation Screen*

* The screen is generic. The number of lamps on the screen are according to your the number of lamps in the Atlantium Unit.

Table 7-1: Main Screen Components

#	Item	Description
1	Main Unit Operation Button	ON/Off toggle button turns on/off the Atlantium unit. lamp(s), cooling system, computer control (UV power, etc.) startup is in an orderly manner.
2	Settings Screen Screens Access	To access the Settings screens - password protected.
3	Technician Settings Screens Access	To access the Technician screens - password protected.
4	Events Screen Access	To the Events screen.

Configuring the Controller

Table 7-1: Main Screen Components

#	Item	Description
5	Dose Gauge	Represents the total system dose. The gauge's red area represents off-spec dose. The dark green area represents the user's set maximum allowable dose. The indicator in the middle of the gauge points to the current dose. The gauge has two different linear functions - from the dose setting down and from the dose setting up. The minimum and maximum allowable dosage levels are user-defined. For PMO mode, the minimum dose is automatically set to 120 mJ/cm ² , so that the Unit directs diverts immediately should the dose fall below that value.
6	Status Indicator Bar	Displays the operational status of the lamps. This quantifies how much UV the lamp is generating compared to how much it generated at the same power level when it was new. Lamps are listed according to their set IDs.
7	Lamp status additional information	When a lamp is selected from the Status , the number of the selected lamp appears here and more information on the selected lamp is displayed. Displays the operational status of the selected lamp. This quantifies how much UV the lamp is generating compared to how much it generated at the same power level when it was new.
8	Current Lamp Information Viewing Button	Displays the current operating power and lamp age in text.
9	Power	Displays the current power Level
10	UVT (Transmittance)	Scale shows the amount of UV light transmitted through the water. If the UVT percentage factor is high, the transparency of the water in UV light is high, and vice versa. For those operating in EPA mode, the Atlantium Unit becomes off spec if the UVT goes lower than the validated UVT, in which case the system can be set to either divert (to drain or recirculation tank), shutdown, or operate off spec.
11	Water Flow	Scale exhibits the current rate of water flowing through the Unit.
12	Temperature Gauge	Displays the temperature of the Atlantium Unit. The Temperature sensor reads from an area that it is in direct contact with the water.
13	Selected Lamp On/Off Button	When a lamp is selected from the Status , the button can be used to turn off the selected lamp.
14	Current Lamp Hours	Displays the number of operational hours for the current lamp.
15	Alert Display	Displays system-generated messages.
16	Operate At (Dose Mode only)	The Operate At dose, is set by the user. at the desired operating dose. Confer with your Atlantium Representative, per the original sizing specifications. In some cases, this is 10-20% over the regulated or required dose. In other cases it depends on the variability of local conditions and the best strategy to assure reliable and effective operation. For PMO mode generally set the Operate at dose to include a safety factor above the PMO-required minimum of 120 mJ/cm ² .

Configuring the Controller

Table 7-1: Main Screen Components

#	Item	Description
17	External Operation Button	When the feature is enabled (blue/green button), this feature allows the system to be turned on or off from the External On/Off switching mechanism. When the feature is disabled (gray/black button), the system may be turned on or off only from this screen. This button appears on the main operating screen only if the External On/Off feature is activated in the main Settings screen either on the Controller or on TRACS . The External On/Off signal cable is attached to the Controller. When utilizing the External On/Off, notification of system activation is issued within ten seconds. If the button on the Controller or TRACS screen was press to turn off, no notification is issued to the external system upon attempt to activate.
18	Cleaning Button	Is displayed if the system contains the Ultrasonic Cleaning - used to manually activate/deactivate this feature.
19	Ready LED	When the system is ready for operations, the Ready LED turns red.
20	Top Header	For PMO applications displays either PMO Pasteurization eq(uivalent) or PMO Disinfection Lp Eq(uivalent) according to application settings.
21	CF	Regulated applications displays the correction factor value, instituted automatically when a UVIS sensor is out of calibration.

Configuring the Atlantium system is based on the Application type set for your industry and according to the parameters required for your facility's process.

Configuring the **Controller** begins with accessing the Settings screen and follows the general order of the screen components.

7.1 Accessing the Settings Screen

The settings screen is accessed during the installation and setup of the Atlantium system. In the Settings screen, the Operation Mode and Low Flow mode is configured, as well as settings for various external auxiliary components. During normal operations, an authorized facility technician may need to access certain functions, or view certain information, that appears on the Settings screen or on a screen that is accessed through it. Take care to assure that the configuration made via the Settings screen is not tampered with. Unauthorized changes may have a serious impact on the function of the Atlantium system. Only trained and authorized facility technicians are to access the Settings screens when instructed to do so by an Atlantium support engineer.

When accessing the Settings screen, you must enter a password.



Screens display values according to metric or US units according to customer localization.

Configuring the Controller

>To access the Settings screen:

Step 1. From the **Main Operations** screen, press . The **Password** screen appears.

Step 2. Using the numbered keys, enter the password (default password is **1234**) and press **OK**. The Settings screen appears.

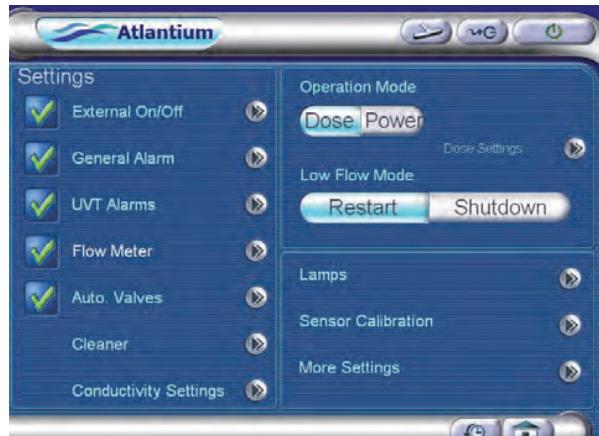


Figure 7-2: Settings Screen



Figure 7-3: Password Screen

7.2

Configuring the External On/Off

The Atlantium system offers the option of setting up an External On/Off switching mechanism to synchronize the Unit with the facility processes. This remote PLC is turns on/off the Atlantium Unit. For details about the External On/Off signal wiring, see [on page 5-6](#).

For example, the facility's SCADA (supervisory control and data acquisition) control system can send a signal to the Unit to start or stop its operation as needed. Using this setting, the Atlantium system recognizes this signal and turn the Unit on or off, as appropriate, without the need for manual intervention.



When the **External On/Off** sends a signal to activate the system, the Atlantium **Controller** sends a response within **10 seconds** that the command was received. If no response was received, it is likely that the **External Operation Button** on the **Controller** or the **TRACS** main screen was manually press to the **Off** position. Check this button and if needed manually press it to reinstate the **On** position, where as the **External On/Off** can again control the system activation. For details on setting the **External On/Off**, see [Configuring the External On/Off](#) on page [7-4](#).

Configuring the Controller

>To configure the External On/Off:

Step 1. Access the **Controller's** Settings screen as detailed above.

Step 2. To activate the **External On/Off**, press the adjacent indicator until it displays . This icon automatically deactivates when the system is shut down or restarted, and must be pressed again to activate and function properly.

Step 3. Press **External On/Off** . The External On/Off Settings screen appears.

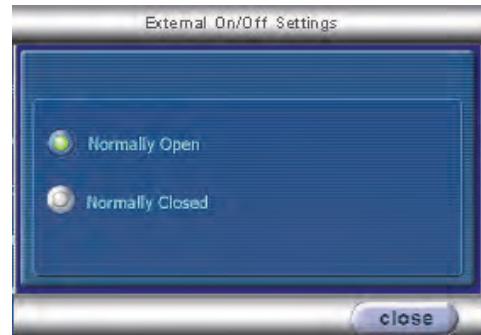


Figure 7-4: Configuration - External On/Off Screen

Step 4. Press the radio button of the desired connection status:

- For Dry Contact connections, whether the electronic polarity is **Normally Closed** or **Normally Open**.
- For regular wiring set according to the table in *External On/Off - Additional Notes* on page 5-18:
 - For IN+ select **Normally Closed**
 - For IN- select **Normally Open**

The selected option's button displays .

Step 5. Press . You are returned to the Settings screen.

7.3

Configuring the General Alarm

The Atlantium system offers the option of connecting a General Alarm mechanism, such as a flashing light, alarm, bell, or a call or message to a telephone. For details about the General Alarm signal wiring, see on page 5-6. When configured, in the event that the system experiences an error situation, the configured alarm is triggered.

To configure the General Alarm:

Step 1. Access the **Controller's** Settings screen as detailed on page 7-4.

Step 2. To activate the **General Alarm**, press the adjacent indicator until it displays .

Step 3. Press **General Alarm** . The Configure - General Alarm Settings screen appears.

Step 4. Press the radio button of the desired connection status, whether the electronic polarity is **Normally Closed** or **Normally Open**. The selected option's button displays .

Step 5. Press . You are returned to the Settings screen.



Figure 7-5: Configuration - General Alarm Screen

7.4

Configuring the UVT Alarms

You can configure the Atlantium system to deliver error messages to alert you about changing conditions. If the water quality decreases, or the UV transmission factor drops below a preset value, an alarm can be triggered. For example, if the source water is generally at 95% UVT, users might set a UVT alarm for the minimum UVT% of 93%

Configuring the Controller

and get a warning or caution as an indication of potential issues with the pre-treatment performance. Despite degradation of UVT, the unit could still achieve the required dose, but it may be an early warning sign of problems upstream.

⇒ To configure the UVT Alarms:

- Step 1.** Access the **Controller's** Settings screen as detailed on page 7-4.
- Step 2.** To activate the **UVT Alarms**, press the adjacent indicator until it displays .
- Step 3.** Press **UVT Alarms** . The Configure - UVT Alarms screen appears.
- Step 4.** For **Min UVT**, using the **◀ / ▶** buttons, set the threshold value for the UV transmission below which the system is to issue an alarm, warning of UVT degradation.



Figure 7-6: Configuration - UVT Alarm Screen

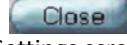
- Step 5.** For **Action**, using the **◀ / ▶** buttons, select the action to be performed if the factor falls below the **Min UVT** (configure above). The options are:

- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
- **Caution** - The caution alerts you to an anomaly based on the user preferences.
- **Warning** - One or more warning messages are issued.
- **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm (if configured, see **Configuring the General Alarm** on page 7-5).

For EPA Applications Only

- Step 6.** In the **Validated Min UVT** field, the validated minimum UVT for your system (whether **RZ104**, **RZ163**, etc.) is displayed. **DO NOT MODIFY THIS VALUE UNLESS GIVEN SPECIFIC INSTRUCTIONS TO DO SO. Consult your Atlantium Support Representative.**

- Step 7.** For **Action**, using the **◀ / ▶** buttons, select the action to be performed if the factor falls below the **Validated Min UVT** and becomes off-spec. The options are the same as above.

- Step 8.** Press . All unit measurements displayed on the **Controller** are set to this system. You are returned to the Settings screen.

7.5

Configuring the Flow Meter

If a flow meter is utilized, (for flow switch, see **Section 7.6 on** on page 7-8.), the **Controller** data must be configured to match the flow meter at the time the system is originally commissioned, but may need to be changed if a flow meter is changed, etc. The Max Flow setting provides a threshold to compare to the actual flow rate. If the actual flow rate exceeds this set Max Flow value, the system sends notification and triggers an alarm.

Configuring the Controller



This setting does not relate to off-spec or to the validation envelope. It is simply a setting used to alert that there are some increases in flow which may or may not be significant. For example:

- If the system is working in EPA/4 log virus and is validated to 900 GPM, it goes off spec at 901 GPM.
- However, if the source water generally flows at 700 GPM, you might set a flow rate alarm for the maximum flow of 725 GPM and receive a warning or caution.

The system is expected to still achieve the required dose, but the change may be an early warning sign of problems upstream.

⇒ To configure the Flow Meter:

Step 1. Access the **Controller's Settings** screen as detailed on page **7-4**.

Step 2. To activate the **Flow Meter**, press the adjacent indicator until it displays . **Flow Meter** is highlighted white.

Step 3. Press the **Flow Meter** . The **Flow Meter** Settings screen appears. The Current Flow indicator displays the current rate of water flowing through the Atlantium system.

Step 4. To ensure that the system does not operate on the basis of a discrepancy in the Current Flow readings, turn off the flow and then check the value for Current Flow. If it is not zero, adjust the **Flow Offset** value, by using the  /  buttons, until the Current Flow value is zero. Then resume the water flow.

Step 5. To set the **Flow Factor**, on the flow meter's datasheet, find the meter's maximum-allowed flow rate.

Step 6. Using the  /  buttons, in the **Flow Factor** field, enter the meter's maximum-allowed flow rate divided by 100. (If the max flow rate is 100 m³/h, enter the value **1**. Convert GPM values into m³/h values to make this calculation.)

Step 7. To ascertain the flow offset, stop the water flow and note if there is a value other than **0** displayed in the **Current Flow** field.

Step 8. In the **Flow Offset** field, using the  /  buttons, enter the a value noted from the **Current Flow** field.

Step 9. In the **Max Flow** field, using the  /  buttons, enter a value for the maximum water flow rate threshold. If the actual flow rate exceeds this threshold, the system delivers a notification message and an triggers an alarm.

Step 10. Using the  /  buttons, in the **Action** field, set the action to be performed if the water flow rate exceeds the value set in the **Flow Factor** field. The options are:

- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
- **Caution** - The caution alerts you to an anomaly based on the user preferences.
- **Warning** - One or more warning messages are issued.
- **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm (if configured, see **Configuring the General Alarm** on page **7-5**).

For EPA Applications Only

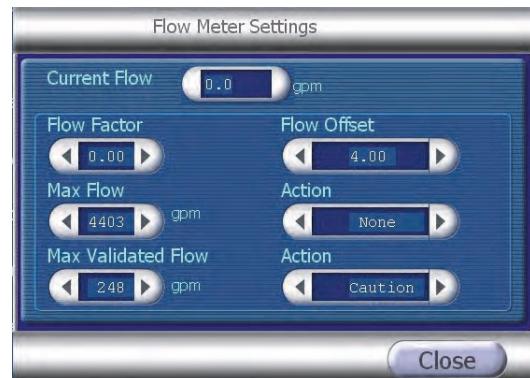


Figure 7-7: Configuration - Flow Meter Screen

Configuring the Controller

Step 11. For the **Validated Max Flow** field, the a value for the validated maximum water flow rate for your system (whether RZ104, RZ163, etc.) is displayed. **DO NOT MODIFY THIS VALUE UNLESS GIVEN SPECIFIC INSTRUCTIONS TO DO SO. Consult your Atlantium Support Representative.**

If the actual flow rate exceeds this set value, the system delivers a notification message and an triggers an alarm.

Step 12. Using the **◀ / ▶** buttons, in the **Action** field, set the action to be performed if the water flow rate exceeds the value set in the **Validated Flow Factor** field. The options are the same as above.

Step 13. Press . You are returned to the Settings screen.

7.6

Configuring the Flow Switch

If a flow switch is utilized, (for flow meter, see **Section 7.5 on** on page **7-6.**), the **Controller** data must be configured to match the flow switch connection status at the time the system is originally commissioned, but may need to be changed if a flow switch is changed, etc.

>To configure the Flow Switch:

Step 1. Access the **Controller's** Settings screen as detailed on page **7-4.**

Step 2. To deactivate the **Flow Meter** (thereby selecting the **Flow Switch**), press the adjacent indicator until it

displays . **Flow Switch** is highlighted white.

Step 3. Press the **Flow Switch** . The Flow Switch Settings screen appears.

Step 4. Press the radio button of the desired connection status, whether the electronic polarity is **Normally Closed** or **Normally Open**. The selected option's button

displays .

Step 5. Press . You are returned to the Settings screen.

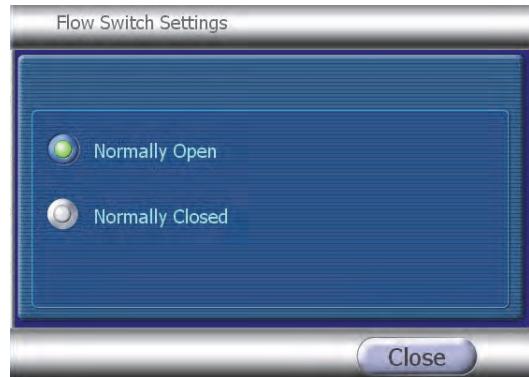


Figure 7-8: Configuration - Flow Switch Screen

7.7

Configuring the Auto Valves

The facility's electronically-controlled **Inlet** and **Outlet/Ready auto valves**, as well as the **Bypass valve** that control the water supply to the Atlantium unit are to be configured, to receive a control signal from the Atlantium system via the **Controller** (i.e. upon error or other situation), or may re-route the water supply to a different destination (i.e. water bypass system). The valves' statuses are identified as normally open (**N.O.**) or normally closed (**N.C.**).

These valves pertain to various facility processes relevant to the Atlantium system, such as:

- Assuring that no off-spec water is put into the distribution system (for EPA and PMO versions)
- Managing high flow conditions
- Divert requirements
- Bypassing when the water quality has degraded and the water is going to a different node
- Bypassing for cleaning chemicals that are not compatible with the quartz chambers

The system is activated or deactivated according to the settings on the **Configuration - Auto Valves** screen that govern the **Inlet** and **Outlet/Ready**, as well as **Bypass auto valves**.

When the system is activated (either manually via pressing the **Operation** button on the **Controller's** or **TRACS'** main screen, or via an external signal utilizing the **External On/Off**), within **10 seconds**, the **Controller** sends a signal that opens the **Inlet valve**. This signal can also be used to provide feedback that the system is activated.

Configuring the Controller

When all the lamps are ignited and ready to use, the **Controller** sends a signal to the **Outlet valve** to open. This signal can also be used to notify that the system is **ready**. The **Controller** also sends a signal to the **Bypass valve** to close.

Similarly, when the system is deactivated, (either manually via pressing the **Operation** button on the **Controller's** or **TRACS'** main screen, or via an external signal utilizing the **External On/Off**), the **Controller** sends a signal that closes the **Inlet** and **Outlet valves**, as well as opens the **Bypass valve**.

>To configure the Auto Valves:

Step 1. Access the **Controller's** Settings screen as detailed on page 7-4.

Step 2. To activate the **Auto Valves**, press the adjacent indicator until it displays .

Step 3. Press **Auto Valves** . The Auto Valves Settings screen appears.

Step 4. For the **Inlet** and **Outlet/Ready** valves, press the radio buttons of the desired connection status, whether the electronic polarity is **NO** (Normally Open) or **NC** (Normally Closed). The selected option's button displays .

Step 5. For the **Bypass** valve, press the radio button of the desired connection status, whether the electronic polarity is **NO** (Normally Open) or **NC** (Normally Closed). The selected option's button displays .

Step 6. For the Bypass valve's monitor, under **Bypass**, for **Close**, press the radio button of the desired connection status, whether the electronic polarity is **NO** (Normally Open) or **NC** (Normally Closed). The selected option's button displays .

Step 7. Press . You are returned to the Settings screen.



Figure 7-9: Configuration - Auto Valves Screen

7.8 Configuring the Operation Mode

The **Operation Mode** is configured in the **Controller** unless the Atlantium system includes **TRAC** software. If your system includes **TRACS**, you can configure in either the **Controller** or **TRACS**. Configuring via the **TRAC Software** is done at a later stage. See **Configuring the TRAC Software** on page 8-1.

The Atlantium system has two operational modes of control:

- **Power Mode** – The system is set at a particular power level. Under all circumstances, the system operates at the designated power level. Power mode is often chosen when the maximum disinfection power is needed at all times and concern that low flows might give high doses or that high flows might give lower doses is not an issue (i.e., maintaining a particular dose is not the objective).
- **Dose Mode** – The system is set at a particular dose. It maintains the designated dose as conditions allow.

To set the Operation Mode:

Step 1. Access the **Controller's** Settings screen as detailed on page 7-4.

Step 2. Under **Operation Mode**, press the desired mode:

- **Power**  - The **Power%** selector field appears to the right.
- **Dose**  - The  to access the Configuration - Dose and Alarms screen appears to the right.

The selected mode appears blue/green.

Configuring the Controller

>To configure Power Mode:

- On the **Controller's Settings screen**, under **Operation Mode**, use the **< / >** buttons of the **Power%** selector field to set the desired power level. The system is set to operate at this power level as a constant.

To configure Dose Mode:

Step 1. On the **Controller's Settings screen**, under **Operation Mode**, press  . The Configuration - Dose screen appears. The displayed units are in **metric** or **US** as per customer localization.

Step 2. For **PMO applications**, the **Dose Strategy** field is displayed at the top. Using the **< / >** buttons, select the desired Dose strategy, either **Pasteurization** or **Disinfection**. (see the figure to the right.)

Step 3. For **EPA applications**, press  . The EPA Settings screen appears. (See the figure below.)

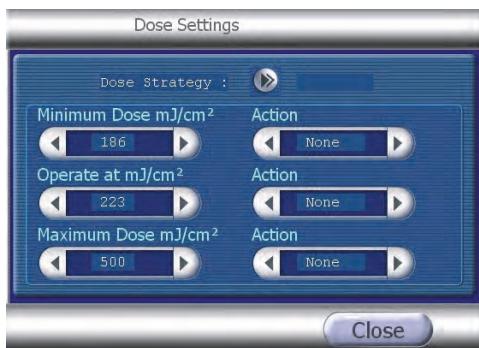


Figure 7-10: Configuration - Dose Screen for EPA

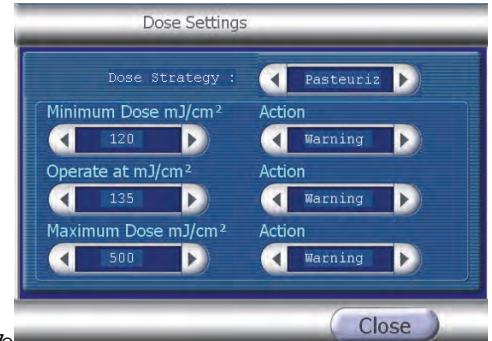


Figure 7-11: Configuration - Dose Screen for PMO

Step 4. For **Target Pathogens**, using the **< / >** buttons, select either **Cryptosporidium**, **Giardia**, or **Virus**.

Step 5. For **Log Inactivation**, using the **< / >** buttons, set the value. The range is from 0.5 to 4.0 in increments of .5. On the **Dose Settings** screen, the value of the **Minimum Dose** appears as shown in the table below.

For **Validation Factor**, mark the checkbox. For no validation factor, leave the checkbox unchecked.

Table 7-2: Dose Calculated via Target Pathogens X Log Inactivation

Target Pathogens	Log Inactivation							
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Cryptosporidium	1.6	2.5	3.9	5.8	8.5	12	15	22
Giardia	1.5	2.1	3.0	5.2	7.7	11	15	22
Virus	39	58	7.9	100	121	143	163	186

For All Applications



Figure 7-12: EPA Settings Screen

Configuring the Controller

Step 6. For **Minimum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the lowest dose under which you want the needle to move to the red zone to send a warning or shut down.

Step 7. For **Operate at mJ/cm²**, using the **◀ / ▶** buttons, set the general operating dose under which you want the system to send a warning. When the system is operating with that dose range the needle is in the center of the green zone.

Step 8. For **Maximum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the maximum UV dose limit, above which you want the system to send a warning or take other action. When the system operates above the maximum dose, the needle is in the dark-green zone.

Step 9. For the **Action** field corresponding to each of the above settings, using the **◀ / ▶** buttons, select the desired corresponding system response in the event that the set power level pushes the dose above or below the set values. The options are:

- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
- **Caution** - The caution alerts you to an anomaly based on the user preferences.
- **Warning** - One or more warning messages are issued.
- **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm. (See page **7-5** if configured.)

The system responds as designated here when, under the current operating conditions and required power level, the dose exceeds or falls below the set values.

Step 10. Press  . You are returned to the Settings screen.

Most operational settings used in Power mode provide information or shut-down the system. The system operates at the prescribed power level and does not change power level to achieve dose settings. The Monitor Screen displays the current dose but the system does not change the power level to achieve a specific **Set for** or **Operate at** dose. Set up the operating information scheme with the **◀ / ▶** buttons.

7.9 Setting the Low Flow Mode

The Atlantium system's response if a low water flow situation occurs is set via the Low Flow mode. Atlantium's unique feature minimizes the on/off cycles by allowing the system to operate at an extremely low flow value. The Atlantium Application Engineer defines this value according to the specific application. In some cases, this value can be zero flow for a pre-defined period of time. The options are:

- **Flow** – Displays the current flow and can be checked during system operations.
- **Restart** – (Default) The system assumes that low flow is not necessarily a sign of an error and assures that the system is ready to come up to full dose or power immediately when the flow rises.

Atlantium allows the system to operate at a low flow rate that can be zero for a period of time as defined by Atlantium application engineer. With this setting, we reduce the amount of on/off and keep the integrity of the UV operation, preventing the flow of non-disinfected water into the line.

As long as the flow rate stays below the **Min Flow** for less than the amount of time set in **Flow Delay**, the Unit continues to operate in standby mode, generally at the lowest possible power.

However, if:

- The water flow rate drops below the **Min Flow** rate set here
- For a time that is longer than the **Flow Delay**, (which is the maximum flow delay set here)
 - ◆ The **Low Water Flow** warning is to be triggered
 - ◆ The lamps are to automatically shut down
 - ◆ An event notification is to be written to the event screen and log file
- When the water flow rate returns to a level above the **Min Flow**, the Unit automatically and instantly returns to full operation without any operator intervention or delay or cool down/warm up period.

Selecting **Restart**, the system automatically restarts, requiring no operator action to restart.

The restart allows the system to start itself automatically upon receiving the flow meter/flow switch signal without having to connect the system to high level controller.

The default values for the minimum flow rate and maximum flow delay appropriate for **Restart** mode are preset by Atlantium. These values may be changed based on local site requirements and conditions, but be sure to coordinate with the Atlantium representative.

- **Shutdown** – If the low flow is a sign of an upstream malfunction, in the event of low flow, the system immediate shuts itself down in an orderly fashion. An alarm is issued and logged. Troubleshoot the cause of the low flow contention before returning the system to normal operation. Operator intervention is required to restart.

However, if:

- The water flow rate drops below the **Min Flow** rate set here
- For a time that is longer than the **Flow Delay**, (which is the maximum flow delay set here)
 - ◆ The **Low Water Flow** warning is to be triggered
 - ◆ The lamps are to automatically shut down
 - ◆ An event notification is to be written to the event screen and log file

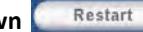
After the water is back to the proper Flow rate, the operator must turn on the Atlantium system.

Configuring the Controller

>To set the Low Flow mode:

Step 1. Access the **Controller's Settings screen** as detailed on page 7-4.

Step 2. Under **Low Flow Mode**, press the desired mode:

- **Restart**  
- **Shutdown**  

The selected mode appears blue/green.

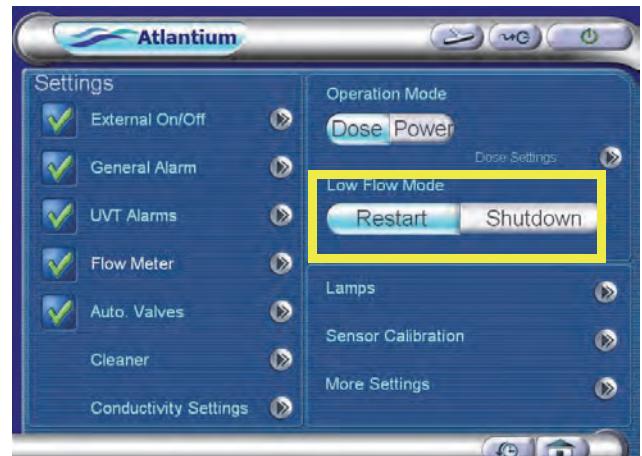


Figure 7-13: Settings Screen-Restart/Shutdown

7.10 Configuring More Settings

The **More Settings** screen contains the parameters for **Maximum Temperature Warning** and **Modbus**.

Maximum Temperature Warning

Since the System shuts down automatically if the water temperature reaches the maximum allowed. You can set the maximum temperature threshold for sending a warning notification so that you can take action to prevent the water from reaching the maximum temperature that triggers shutdown. It is recommended to set this threshold to 5% under the maximum temperature allowed for your system.

Modbus Parameters

The Modbus node address assigned to this system is configured in the **Controller**, as well as the appropriate baud rate for this system.

To configure More Settings:

Step 1. Access the **Controller's Settings screen** as detailed on page 7-4.

Step 2. Press **More Settings** . The **More Settings** screen appears.

Step 3. Under **Max. Temperature**, using the  /  buttons, set the maximum temperature threshold that when reached a warning notification is sent.

Step 4. Under **Modbus**, using the  /  buttons, set the Modbus address node to **1**.

Step 5. Under **Baudrate**, select the appropriate baud rate for this system. The options are:

- 115200
- 57600
- 38400



Figure 7-14: More Settings Screen

- 19200
- 9600

Step 6. Press . You are returned to the Settings screen.

Configuring the Controller

7.11 Configuring the Ultrasonic Cleaner (Optional)

The optional **Ultrasonic Cleaner** cleans the internal walls of the Unit with a sophisticated system utilizing ultrasonic waves. The frequency and duration for this cleaning system must be configured.

>To configure the cleaning system:

- Step 1.** Access the **Controller's Settings** screen as detailed on page 7-4.
- Step 2.** Press **Cleaner** . The Configure Cleaner Settings screen appears.
- Step 3.** In the bottom section, for **Operate Auto Every**, using the **◀ / ▶** buttons, set the intervals in minutes that the system cleaning process is to be performed.
- Step 4.** For **Operation For**, using the **◀ / ▶** buttons, set the duration in number of minutes that the System Cleaning process is to run.
- Step 5.** Press **OK**. The Cleaning system is activated for all lamps to run as per the intervals set.



Figure 7-15: Cleaner Settings Screen

7.12 Connectivity Settings

Connectivity settings are not applicable for your Atlantium system.

7.13 Verify the System Settings

The system settings are configured by Atlantium. As a precautionary measure, verify the system settings set in the **Controller's Technician Settings 2** screen.

To verify the system settings:

- Step 1.** On the **Controller**, to access the technician mode, press  and enter the password is **9999**. The Technician screen appears.
- Step 2.** At the bottom-right on the screen, press  until the **Technician Screen Setting 2** is displayed.
- Step 3.** Review the settings to verify that they are correct. Refer to Table 7-3 below.



Figure 7-16: Technician Settings 2 Screen



DO NOT leave the **Controller** unattended while in **Technician mode** even for a short time. Unauthorized changes to the **Technician mode** settings could damage the operation of the Atlantium system.

Configuring the Controller

Table 7-3: Technician Settings 2 Screen Elements

Setting	Description
SW Ver	The version of the installed software.
Display Ver	The version of the installed display software.
Dose Factor	Relevant for systems with high efficiency.
UVT Delta	For system with DPM only-Sets the minimum allowed UVT.
UVT Clean Min	For system with DPM only-When the minimum allowed UVT is reached, after this time delay, the system issues an alert that a full CIP procedure is to be performed.
Flow Switch	Sets the maximum flow, with which the system determines the Dose.
Min Flow	Sets the minimum allowed flow.
Flow Delay	When the minimum allowed flow is reached, after this delay, the system shuts down the lamps.
Upstream Delay	For systems with divert valve, this value is the maximum time it takes for water to empty between the Atlantium system and the divert valve + 20%. For systems with no divert valve, set. this value to 0.
Dose Delay	When the minimum dose is reached, after this delay, the system either alerts the customer, moves to a divert valve, or shuts down the water out-flow according to configuration.
Model	Sets the Atlantium system model.
Lamps	Sets the number of lamps according to the Atlantium system.
Branches	Sets the number of Atlantium system branches.
Application Type	Sets the type of system application: EPA, PMP, or validated.

7.14 Configuring the IP Address

To facilitate Network communications with your Atlantium system, your IT Administrator is to provide an IP address for the system, as well as the Subnet Mask address to be entered in the **Controller's Technician Settings 4** screen.

Configuring the Controller

>To configure the IP address:

- Step 1.** On the **Controller**, to access the technician mode, press  and use the password **9999**. The Technician screen appears.
- Step 2.** At the bottom-right on the screen, press  three times until the **Technician Screen Setting 4** is displayed.

Step 3. For **System IP**, click  and using the number keys, enter the IP address obtained from your IT Administrator.

Step 4. For **Subnet Mask**, click  and using the number keys, enter the Subnet Mask address obtained from your IT Administrator.

Step 5. For **System Time**, click  and using the number keys, enter the correct time according to your facility's global time settings.

Step 6. Press . The changes are saved.



Figure 7-17: Configuration - Technician Settings 4 Screen

7.15 Activating the Lamps

Each lamp contained in the Atlantium system must be enabled. You can also set the Atlantium system to restart automatically when power is restored after a facility-wide power failure, when it reactivates according to the configured settings via the **Auto Power On** setting.

To activate the lamps:

Step 1. Access the **Controller's** Settings screen as detailed on page **7-4**.

Step 2. Press the **Lamps** . The Lamps screen appears.

Step 3. Under Enable/Disable Lamps, starting with Lamp 1, for each lamp in your system, press its corresponding indicator until it displays 

Step 4. To activate the **Auto Power On**, press the adjacent indicator until it displays .



Figure 7-18: Lamps Screen

7.16 Changing a Password

For accessing each of the above-mentioned screens or shutdown function, via the password screen that appears a trained and authorized facility technician may change the password for the function. Atlantium issues the confidential Administrator's password to the customer authorized facility supervisor responsible for the Atlantium system.

⇒ **To change a password:**

Step 1. From the Password screen, press **Change**. The Administrator Password screen appears.

Step 2. Using the numbered keys, enter the Administrator's password and press **OK**. The Enter New Password screen appears.

Step 3. Using the numbered keys, enter the new password and press **OK**.
Be sure to keep a record of the new password.



Figure 7-20: Administrator's Password Dialog Box



Figure 7-21: Enter New Password Dialog Box



Figure 7-19: Password Dialog Box



8 Configuring the TRAC Software

The optional **TRAC Software (TRACS)** controls the Atlantium systems. The **TRAC Software** may be installed on a PC (provided by Atlantium) or on a computer terminal either on-site operating via direct connection or via Ethernet LAN, or from a remote location outside the facility using the Internet.

The **TRAC Software** logs all events and has no capacity restrictions. The database can be backed up and managed in accordance with site procedures and regulatory requirements.

- **Broad and deep analysis capabilities** – The **TRAC Software** is designed with an easy-to-use interface that enables users to obtain and analyze all sorts of system data – power consumption, lamp operation, and much more. It can email current or historical events, logs and graphs or send them to a local printer.
- **Automated reporting capabilities** – The database passes information to the pre-formatted reports to generate them efficiently and routinely. The reports comply with regulatory requirements per application type.

The **TRAC Software** typically includes two installations:

- The **TRACS Operating PC** (Atlantium-supplied laptop) collects real time data and stores it in the database. It provides a full configuration interface, analysis, and reporting functionality.
- The **TRACS Viewer PC** (customer-supplied computer) allows you to view the data collected from the **Operating PC** and analyze the data and produce reports. It is not directly connected to the currently operating units, which allows you to analyze data without interfering with the real-time data collection.



For the **TRACS Operating** computer, if you are using a laptop with battery pack, the battery pack can sustain operations for a reasonable period should your facility experience a power blackout. If you are using a desktop computer, add a UPS unit to provide protection in the event of a power blackout.

For minimum system requirements for installing the **TRAC Software**, see **TRAC Software Requirements** on page 3-21.



- If you are installing **TRAC Software** on a facility computer terminal (not provided by Atlantium) consult your IT administrator to assure SQL permissions are set to allow access, communications and recording.
 - The **TRAC Software** installation and configuration is typically carried out after the **Controller** is configured. See **Configuring the Controller** on page 7-1.
-

8.1 Installing TRACS

The **TRACS Operating PC** is generally a laptop supplied by Atlantium and is provided with **TRAC Software** pre-installed. However, you can use the instructions in this section for installing **TRAC Software** in a customer-supplied computer that is to be designated as the **TRACS Viewer PC** (as well as for reinstalling **TRAC Software** if the need arises.)



Remember: The **TRACS Viewer PC**, which can be on a desktop or laptop is used independently of the **TRACS Operating PC** so as not to interfere with real-time data collection.

The supplied installation disc contains the following:



Figure 8-1: **TRACS** Installation Package

- **dotNetFx40_Full_x86_x64.exe** - the dot net installation file
- **SQLEXPRESS.EXE** - the SQL Express installation file
- **Setup.exe** - the TRAC Software installation file
- **Setup.msi** - the TRAC Software
- **SQLServer2005_SSMSEE.msi** - the SQL Server Management Studio installation file for win XP & Win 7 32bit (Optional)
- **SQLServer2005_SSMSEE_x64.msi** - the SQL Server Management Studio installation file for Win 7 64bit (Optional)
- **PC_MONX.X#XXX**

⇒ To install the TRACS:

- Step 1.** Copy the installation folder from the supplied disk to your desktop.
- Step 2.** Double-click the **dotNetFx40_Full_x86_x64.exe** file. The Installation sequence is initiated. Follow the directions of the Installation wizard. The **dotNet** interface is installed on your computer.
- Step 3.** Double-click the **SQLEXPRESS.EXE** file. The Installation sequence is initiated. Follow the directions of the Installation wizard. SQL Express is installed on your computer.
- Step 4.** Double-click the **Setup.exe** file. The Installation sequence is initiated. Follow the directions of the Installation wizard. **TRACS** is installed on your computer and the **TRACS** icon is placed on your desktop.
- Step 5.** For a 32bit operating system, double-click the **SQLServer2005_SSMSEE.msi** file. The Installation sequence is initiated. Follow the directions of the Installation wizard.
- Step 6.** For a 64bit operating system, double-click the **SQLServer2005_SSMSEE_x64.msi** file. The Installation sequence is initiated. Follow the directions of the Installation wizard.
- Step 7.** From the **PC_MONX.X#XXX** folder, copy the file, **PC_MON2** to the folder, **C:\Program Files>Atlantium>Atlantium PC X.XX** and overwrite the older file if it exists.
- Step 8.** For Windows 7 only, to provide administrative privileges to the **TRACS** application, right-click each of the options below and select **Properties> Compatibility**. Mark the **Run this program as administrator** check box:
 - **C:\Program Files>Atlantium>Atlantium PC X.XX>Atlantium.exe**
 - **C:\Program Files>Atlantium>Atlantium PC X.XX>PC_MON2.exe**
- Step 9.** To enable generating reports in PDF format, install Acrobat Reader.

Configuring the TRAC Software

8.1.1 Change the PC Power Settings

For optimal performance, configure the Power settings on the PC where the **TRACS** is installed according to the directions in this section.

Windows XP

⇒ To change the PC Power settings:

- Step 1. From the Start menu, access **Control Panel >Power Options**.
- Step 2. Change the following settings to **Never**:
 - Turn off monitor
 - Turn off hard disk
 - System standby

Windows 7

⇒ To change the PC Power settings:

- Step 1. From the Start menu, access **Control Panel >Hardware and Sound >Power Options**
- Step 2. For any selected Power Option, click **Change Plan Settings**.
- Step 3. Change the following settings to **Never**:
 - Sleep Mode
 - Turn off display
 - Dim the display
- Step 4. Click **Change advanced power settings**. The Power Options Advanced Settings dialog box is displayed.
- Step 5. To expand **Hard disk**, click + and to expand **Turn off hard disk after**, click +.
- Step 6. Change the following settings to **Never**:
 - On battery
 - Plugged in
- Step 7. To expand **Sleep**, click + and to expand **Sleep After Allow hybrid sleep**, and **Hibernate After**, click +.
- Step 8. For each one, change the following settings to **Never**:
 - On battery
 - Plugged in

8.1.2 Change the Security Settings

For optimal performance, configure the security settings on the PC where the **TRACS** is installed according to the directions in this section.

⇒ To change the security settings:

- Step 1. Access the **Control Panel > System and Security > Windows Firewall > Customize Settings** and turn off all Firewall options.
- Step 2. Access the **Control Panel > User Accounts > User Accounts > Change user Account Control Settings** and set **Windows Notifications** slider to **Never notify**.

8.2 Activating the TRAC Software

In regular operation, when the **TRAC Software** is activated, communications is established with the **Controller** of each of the Atlantium units defined in the **TRAC Software** (See **Section 8.3 on** on page **8-4**). The **TRAC Software** receives the settings previously configured in the **Controller**.

⇒ **To activate the TRAC Software:**

- Restart the computer. The **TRACS** application opens automatically displaying the Monitor screen.

8.3 About the TRACS Screens



Figure 8-2: The **TRACS** Monitor Screen

The **TRAC Software** is organized into five principal screens:

- **Monitor** - Displays the current operation of the system in real time.
- **Events** - Displays all notable issues and events and provides trouble shooting guidance and assistance.
- **History** - Displays graphs all current operational data in real time as well as provides access to historical data.
- **Settings** - Provides the configuration options for operations to integrate with the overall plant.
- **Management** - Provides full maintenance, operation, compliance, reporting and communication functionality. Here the user can establish the connection, verify the communication, register the components and run reports.

8.4 Configuring the Atlantium Unit Communications ID

The Management tab displays the list of the Atlantium units that can be configured to be controlled by the **TRAC Software**. The **Controller** of each Atlantium unit has an assigned dedicated (DHCP) IP address which is used for communications with **TRACS** (See **Configuring the IP Address** on page **7-15**.). You must enter the IP address of each **Controller** into **TRACS** to establish communications.

The IP address for each of your Atlantium units must be entered in both the appropriate **Controller** and **TRACS PC**. The PWSID (Public Water System Identification) is the official EPA identifier for the public. The parameters Plant, Train and PWSID are used for EPA and other compliance reports. For non-EPA applications, you can designate some identifying information that refers to each unit individually to enable you to track the different units easily. For PMO, enter the name of the dairy in the PWSID field.



Figure 8-3: **TRACS** Management Tab

>To configure the Atlantium Unit Communications ID:

- Step 1.** On the **Management** tab > **Configuration** screen (if needed, using the **◀ / ▶** buttons, access the Configuration screen), beginning with Unit #1, mark the Unit number checkbox. (For configuring additional Atlantium units, mark the next vacant Unit number.)
- Step 2.** In the **Name** column, enter text to identify the Atlantium Unit.
- Step 3.** In the **IP Address** column, enter the IP Address of the **Controller** associated with the Atlantium unit. (See **Configuring the IP Address** on page 7-15.)
- Step 4.** If you entered a mistake in the IP address, click **Restore**. The previous IP address, defined the last time you clicked **Submit** appears.
- Step 5.** In the **Plant** column, enter the name of the PWSID plant where the Atlantium unit is located as it is to be listed on regulatory compliance reports.
- Step 6.** In the **Train** column, enter name of the PWSID train sub-process in which the Atlantium unit is located as it is to be listed on regulatory compliance reports.
- Step 7.** In the **PWSID** (Public Water System IDentification) field, enter the name that is to identify your system. This is the official EPA identifier for the public water system that has jurisdiction over the Unit.
- Step 8.** To save your changes, in the bottom right, click Submit. The changes are saved. The TRAC Software recognizes the **Controller** IP address. and remove the red **X** from the computer icon.
- Step 9.** To verify that communication is established between the **Controller** and **TRAC Software**, click the **Monitor** tab and note that realtime data is displayed in the Monitor screen components.

8.5 Configuring the Basic System Settings

The basic system settings of the **TRAC Software** include:

- Setting up the Units of measurements to be displayed
- Setting the time intervals for the collection of data from the system
- Enabling the backup and setting the database location
- Changing the password
- Setting the operation mode

⇒ To configure the basic System settings:



Figure 8-4: **TRACS** Advanced Configuration Window-
Systems Settings Tab

Step 1. From the **TRAC Software** main screen, click the **Management** tab. The Management screen appears.

Step 2. At the top-right, click . The Advanced Configuration dialog box appears. The System Settings tab is displayed.

Units of Measurement

Step 3. For **Flow Units**, select either **M³/h** or **GPM**.

Step 4. For **Temperature Units**, select **Celsius** or **Fahrenheit**.

Note that the settings govern the **TRACS PC** data and must be set separately in the **Controller**.

Step 5. If an occasion arises where there is a relevant problem, you may be asked by the Atlantium Technician to mark the **Debug Messages** checkbox to allow Debug messages to be sent to Atlantium.

Step 6. Click the **Update Intervals** tab.

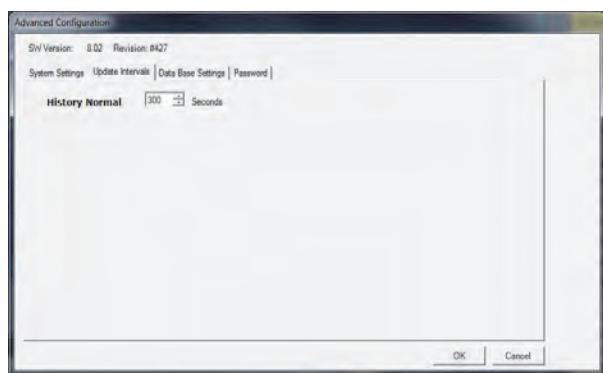


Figure 8-5: **TRACS** Advanced Configuration Window-
Update Intervals Tab

Intervals of Recording History

Step 7. Set the time interval in seconds for the following:

- **History Normal** - Determines when the system posts data when the system is working normally.
 - For a Normal application: 1800 seconds
 - For **EPA** application: 300 seconds
 - for **PMO** application: 5 seconds for up to two lamps (for systems with more than two lamps, consult Atlantium)

Configuring the TRAC Software

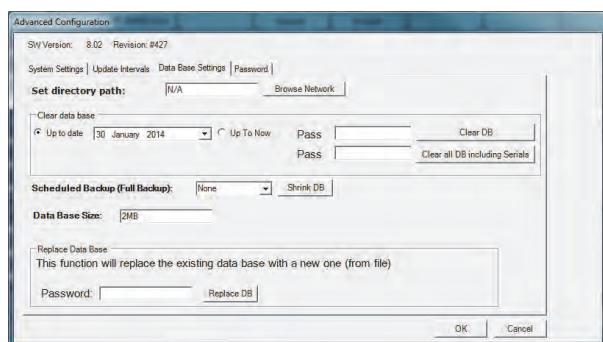


Figure 8-6: **TRACS** Advanced Configuration Window- Database Settings Tab

Database Settings

Step 8. Click the **Database Settings** tab. The Database settings help you review older data, control the size of the database, and comply with backup requirements and other rules.

Step 9. In the **Set directory path** field, for storing backup data, click **Browse Network** and navigate to **C:\Atlantium\Backup** or type in this location to create it. When scheduled backups are activated, the data is stored at this location. In addition, all manual backups, generated reports and history files are saved in this location.

Note that it is good practice to transfer the backup data to an alternative location such as a disc, flash drive, etc. to reduce the risk of data loss should the PC malfunction.

Step 10. To scheduled the automatic backup as per a specified interval, from the **Schedule Backup (Full Backup)** dropdown list, select the appropriate time interval (**None, Hourly, Daily, Weekly, or Monthly**).

Changing the Password

Step 11. Click the **Password** tab.

Step 12. For security purposes, change your **TRACS** password. In the **Old password** field, enter the current password. (The factory default password is **1234**.)

Step 13. In the **New password** field, enter the new password. In the **Confirm new password** field, enter it again.

Step 14. Make a note of this new password in a secure independent location for future access. (If you need to recover the password at any time, *Recovering the TRACS Password* on page 10-15)

Step 15. Click **Accept**. The password is changed.

Step 16. Click **OK**. The changes are saved and you are returned to the Management tab.

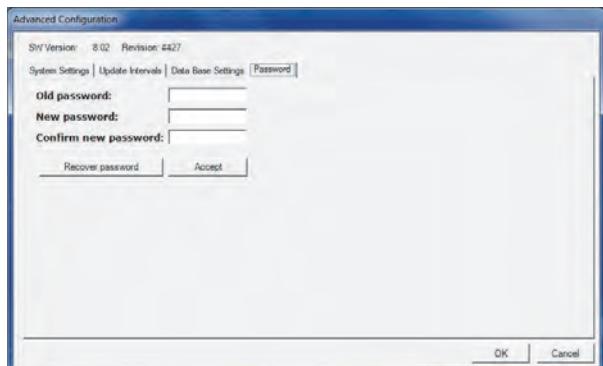


Figure 8-7: **TRACS** Advanced Configuration Window- Password Tab

8.5.1 Configuring the Operation Mode

The Atlantium system has two operational control modes:

- **Power Mode** – The system is set at a particular power level. Under all circumstances, the system operates at the designated power level. Power mode is often chosen when the maximum disinfection power is needed at all times and concern that low flows might give high doses or that high flows might give lower doses is not an issue (i.e., maintaining a particular dose is not the objective).
- **Dose Mode** – The system is set at a particular dose. It maintains the designated dose as conditions allow. Atlantium's **Dose Mode** is compliant with the **Good Manufacturing Practices (GMP)** which operates the Atlantium system in accordance with the **third party validation**. The default **Dose Mode** settings may require modification to conform to all of the **EPA** or **PMO** regulatory requirements, reporting or operating limitations. The system maintains the configured **Operate at** dose and performs the action defined in the settings if there is any anomaly.

Configuring the TRAC Software

>To access the Settings screen:

Step 1. Click the **Setup** tab.

The Please enter Password window appears.

Step 2. In the password field, enter the password.

Step 3. Click **OK**. The Settings screen is displayed.



Figure 8-8: **TRACS** Settings Screen*

To configure Power Mode:

Step 4. On the **Settings** screen, if needed, at the top of the screen, using the **◀ / ▶** buttons, access the screen for the desired unit.

Step 5. Under **Operation Mode**, click **Power** . The selected mode appears pressed in.

Step 6. Next to the **Operation Mode**, click . The Configuration - Dose Strategy screen appears.



Figure 8-9: Generic **TRACS** Power Mode Settings (parameters vary per application)

Step 7. On the **Power%** selector field, Use the **◀ / ▶** buttons to set the desired power level. The system is set to operate at this power level as a constant.

Step 8. For **Minimum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the lowest dose under which you want the needle to move to the red zone, select an action to be triggered if the dose goes below the minimum.

Step 9. For **Operate at mJ/cm²**, using the **◀ / ▶** buttons, set the general operating dose under which you want the system to send a warning. The system does not modify the power setting to achieve this dose. If the dose level is not met, the system performs the pre-set action. When the system is operating with that dose range the needle is in the center of the green zone.

Configuring the TRAC Software

Step 10. For **Maximum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the maximum UV dose limit, above which you want the system to send a warning or take other action. When the system operates above the maximum dose, the needle is in the dark-green zone.

Step 11. For the **Action** field corresponding to each of the above settings, using the **◀ / ▶** buttons, select the desired corresponding system response in the event that the set power level pushes the dose above or below the set values. The options are:

- **None** - No warning message is issued.
- **Caution** - The caution alerts you to an anomaly and appears on the bottom of the Monitor screen.
- **Warning** - Messages appear in a popup window and must be cleared to see the full screen.
- **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm (if configured, *Configuring the General Alarm* on page 7-5).

The system responds as designated here when, under the current operating conditions and required power level, the dose exceeds or falls below the set values.

⇒ To configure Dose Mode:

Step 1. On the **Settings** tab, if needed, using the **◀ / ▶** buttons, access the screen for the desired Atlantium unit.

Step 2. Under **Operation Mode**, click **Dose** . The selected mode appears pressed in.

Step 3. Next to the **Operation Mode**, click . The Configuration - Dose Strategy screen appears. The Configuration - Dose Strategy field displays either:

- **Validated Dose**
- **EPA Val Dose**
- **PMO**

(When this screen is accessed for the first time, the field may appear empty. Click a **◀ / ▶** button and the field displays correctly.)

Validated Dose



Figure 8-10: **TRACS** Dose Mode Settings - Validated Dose

Configuring the TRAC Software

PMO



Figure 8-11: **TRACS** Dose Mode Settings - PMO

Step 4. For PMO mode, to the right, using the **◀ / ▶** buttons, select the disinfection mode, either **Pasteurization Eq**, or **Disinfection LP Eq**.

EPA Val Dose



Figure 8-12: **TRACS** Dose Mode Settings - EPA

Step 5. Above the **Target Pathogens** table, for **Sync**, mark the checkbox. For no sync, leave the checkbox unchecked.

Step 6. For **Validation Factor**, mark the checkbox. For no validation factor, leave the checkbox unchecked.

Step 7. Under the **Target Pathogens** table, for the left field, using the **◀ / ▶** buttons, set the **Target Pathogen**, either **Cryptosporidium**, **Giardia**, or **Virus**.

Step 8. Under the **Target Pathogens** table, for the right field, using the **◀ / ▶** buttons, set the **Log Inactivation** or click the desired cell in the table above and the pre-configured appropriate number appears in the right field.

According to your selections, the fields on the left display pre-configured appropriate settings. If you want to modify these settings, follow the next five steps.

All Applications

Step 9. On the right, for **Minimum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the lowest dose under which you want the needle to move to the red zone and warn you to take some action.

Step 10. For **Operate at mJ/cm²**, using the **◀ / ▶** buttons, set the general operating dose under which you want the system to operate or take some action. When the system is operating with that dose range the needle is in the center of the green zone.

Step 11. For **Maximum Dose mJ/cm²**, using the **◀ / ▶** buttons, set the maximum UV dose limit, above which you want the system to warn you to take some action. When the system operates above the maximum dose, the needle is in the dark-green zone.

Configuring the TRAC Software

Step 12. For the **Action** field corresponding to each of the above settings, using the **◀ / ▶** buttons, select the desired response.

For EPA, note that the validation parameters also establish warnings and alarms based on the EPA configuration requirements.

Step 13. Press . The settings are saved and you are returned to the Settings screen.

8.6 Registering a Component's Serial Numbers

Register the serial numbers of the components.



For **TRACS** to be able to collect the data and generate reports on the lamps, sensors, ballasts, and their performance, their serial numbers must be registered in **TRACS**.

The Reference sensor must be registered for each Atlantium system connected to the **TRAC software**, even if you use the same Reference sensor for more than one system.

>To register a component's serial numbers:

Step 1. On the top of the **TRAC Software's Management** screen, use the **◀/▶** buttons, access the **Maintenance Registry** and select the appropriate component.

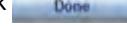
Step 2. Click **New/Replacement**. The Replacement Lamp section appears in the lower left corner.

Step 3. For **New Serial #**, enter the new lamp's serial number. It is on both the wrapping and the lamp itself.

Step 4. For **UV Unit**, select the correct Unit number from the list.

Step 5. For component **Number**, select the correct component position.

Step 6. For **Operator**, enter your name (for tracking purposes, the name of the person who is replacing the lamp).

Step 7. Click . The lamp usage hours are automatically reset.



a

9 First Time System Activation

Following controller and optional TRAC Software configuration, completing the system setup includes the following major steps:

- Cleaning the Atlantium Unit (See below)
- Introducing Water into the Unit (See below)
- Igniting the Lamps (See below)
- Initiating the Water Flow (See page 9-2)
- Adjusting the Auxiliary Equipment (See page 9-2)
- (For PMO/EPA installations) Calibrating the UVT Analyzer (See page 9-3)
- System Tuning (See page 9-2)
- Installation QA (See page 9-3)

9.1 Cleaning the Atlantium Unit

The inner surfaces of the Atlantium Unit are to be cleaned via the CIP process at installation, before starting up and proceeding with the commissioning phase. Follow the directions in **Cleaning In Place (CIP)** on page 11-2.

9.2 Introducing Water

The water is introduced into the unit before full activation.



Water hammer can cause damage to any hydraulic system, including the Atlantium Unit. **Make sure that water hammer is NOT present in your facility's water line.**

To prevent water hammer, consult your system engineer and check your facility system procedures, including:

- When starting the water flow when the lines are empty, keep valves open so that the air in the pipes has a simple release pathway.
- Sudden valve closures can cause water hammer. Make sure that valves close gradually enough to avoid this problem.
- Ensure that all pumps that impact the Atlantium system employ soft start-up procedures.

● To introduce water:

- Open the **Inlet valve** and using the **Viewport** on the Unit, check that the quartz chamber fills with water completely.

9.3 Igniting the Lamps

The lamps of the Atlantium Unit are ignited to commence live system operation.



■ Temporarily, the caps on the lamps must be open. During this time, use Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.

- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Where appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
- **DO NOT look directly into openings that emit UV light.**

➲ To ignite the lamps:

- Step 1.** Temporarily place Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Step 2.** Open each of the lamp's caps (2 on each side of a lamp). For the location of the lamps' caps, see Figure 11-25 , on page 11-23.

Step 3. On the **Controller** main screen, press  and wait approximately 3 minutes for the **Ready Lamps On** signal to transmit.



Figure 9-1: Lamp Settings Screen

Step 4. On the **Controller** main screen, press the **Lamps**  . The Lamps screen is displayed. Verify that all of the lamps in your system are marked .

Step 5. On the **Controller** main screen, press the Lamps  . The Event log screen is displayed. Verify that an Event log item showing that the lamps have been ignited is displayed. The event may take a few seconds to appear on the screen.

Step 6. Press  . You are returned to the main screen.

Step 7. Let the system operate for at least one hour.

Step 8. Continue with Section 9.4 and Section 9.5 below. There is no need to wait for the system to complete the first hour's operation.

Step 9. Close all of the lamps' caps and remove the Caution floor signs.

9.4 Initiating the Water Flow

When initiating the water flow, the water may be set to drain out or collect in a tank until the system is fully operational. Once the entire installation and QA testing is complete, the water is set to flow normally as part of the facility operation.

➲ To initiate the water flow:

- Step 1.** Open the relevant valve that allows water to flow through the Atlantium unit. This may be the draining valve or bypass valve.
- Step 2.** Open the viewport and verify that the Unit is completely filled with water and that no air gaps and no air bubbles exist.
- Step 3.** On the Controller, verify that the Flow reading on the right is within normal range. If it is not, check the connections between the Atlantium system and the Flow meter. See **Cabling Auxiliary Components** on page 5-12.

9.5 Adjusting the Auxiliary Equipment

All relevant auxiliary equipment must be adjusted at this time, i.e., flow meter, automatic valves, PLC, etc. Refer to the manufacturers' user documentation of the relevant equipment.

If your configuration includes a flow meter, check that the value of the flow displayed on the **Controller** matches the reading on the flow meter. See page 7-7 if they do not match.

9.6 Calibrating the UVT Analyzer (For Regulated Applications)

For regulated applications, such as PMO and EPA, the UVT Sensor require calibration to set the base line for commencing operation. For directions, see ***Sending the Reference Sensor for Recalibration*** on page 11-14.



For PMO and EPA regulated applications, repeat the system calibrations after 100 hours of operation. (Refer to the sections contained in, ***Calibration Tasks*** on page 11-7, and the section, ***Adjusting the Auxiliary Equipment*** on page 9-2.

9.7 System Tuning

The Atlantium system must be tuned via the **Controller**. Follow the instructions in ***To replace an adjustable UVIS sensor:*** on page 11-26.

9.8 Installation QA

Atlantium personnel performs a quality assurance procedure following which the Atlantium system is ready for regular facility operation.



10 Operating the Atlantium System

This section details how to operate the system and handle basic and periodic routines to be carried out by Atlantium trained the local staff.

For system without **TRAC software** and/or optional **Ultrasonic Cleaning**, disregard the irrelevant sections.



- Unauthorized servicing or modification of this system in a manner not specified in this manual could expose personnel to potential electrical or other hazards.
- Improper use or adjustment of this system may invalidate the service warranty agreement.

10.1 Operational Guidelines

Follow these guidelines for smooth Atlantium System operations:

- **Incoming Water Supply** - Be alert about incoming water supply. If you do not have pre-treatment, be alert to reports of contamination by upstream slugs of mud, particles, oil, etc.
If the water source was not previously in operation or the line is new, - flush the line prior to introducing water into the Atlantium system
- **Avoid chemicals that are harmful to UV systems** - Avoid caustic soda and other corrosive chemicals that can degrade gaskets and o-rings
- **Prevent Water Hammer** - Water hammer can cause damage to any hydraulic system, including the Atlantium unit. Take steps to ensure that this phenomenon does not occur in your facility's water line. To prevent water hammer, consult your system engineer and check you facility system procedures for following:
 - Avoid filling empty lines with water without keeping valves open for releasing the air from the pipes and the system.
 - Avoid rapid closure of water lines by sudden closure of valves.
 - Before introducing the water, ensure that all pumps that impact the Atlantium system employ soft start-up procedures.
- **Avoid vibrations on upstream and downstream piping** - Make sure that the piping to be attached to the Atlantium Unit is reinforced to protect the Unit against vibration.
 - A high vibration level can cause damage to any hydraulic system, including the Atlantium unit.
 - High vibration can be caused by an unbalanced pump or by sudden valve close.

10.2 Basic Operational Tasks

- Shutting down the Atlantium system - See below
- Starting up the Atlantium system - See page 10-2
- Viewing Recent Events in **TRACS** - See page 10-4
- Monitoring events - See page 10-4
- Handling Events that Require Corrective Action in TRACS - See page 10-5
- Taking microbial samples - See page 10-7
- Ultrasonic Cleaning System (if included) - See page 10-7

10.2.1 Shutting Down the Atlantium System

In a non-emergency situation, you can shut down the Atlantium system from either the **Controller** or (if included) **TRACS**. Be sure to enable the **Auto Power On** function in the **Controller** if you want the system to save your settings. (See *Activating the Lamps* on page 7-16.)

- ⦿ **To shut down the Atlantium system from the Controller:**

- Step 1.** On the Main screen of the **Controller**, press . The Password dialog box appears.
- Step 2.** Enter the password (the default password is **9999**) and press **OK**. The Atlantium system is turned off.
- Step 3.** Using the viewport on the Atlantium Unit, check that the lamps are indeed turned off.
- Step 4.** Check the main screen of the **Controller** and verify that the system parameter for **Power** is **0%**.

- ⦿ **To shut down the Atlantium system from TRACS:**

- Step 1.** On the Main screen of **TRACS**, press . A confirmation dialog box appears. (See above.)
- Step 2.** Select the reason for shutdown and click **OK**. The information you supply is written to the shutdown event report and the system's log file. The Atlantium system is turned off.
- Step 3.** Using the viewport on the Atlantium Unit, check that the lamps are indeed turned off.
- Step 4.** Check the main screen of the **Controller** or of **TRACS** and verify that the system parameter for **Power** is **0%**.

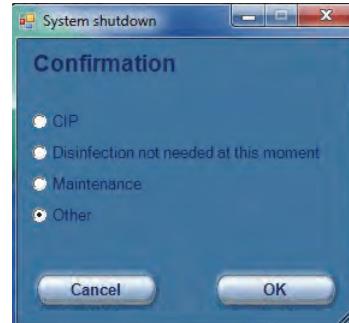


Figure 10-1: TRACS Shutdown Screen

10.2.1.1 Shutting Down TRACS

For systems with **TRACS**, if you shut down **TRACS** for PC maintenance or other reasons while the system is operating, no system data (volume, events, etc.) is recorded or stored in the database that feeds the reporting functions. If communication has been disrupted, it is important to check volume and operation counters for anomalies in totals. The basic configuration and settings are preserved for the system restart.

If both the Atlantium unit and TRACS are shut down as a result of a power failure, check **TRACS** and restart manually as part of the Unit startup process. Configuration and settings are saved from before the power failure and are implemented upon restart.

- ⦿ **To shut down TRACS:**

- Step 1.** From the **TRACS Monitor** screen, click the **Management** tab. The Management screen appears.
- Step 2.** In the upper-right, click . **TRACS** closes.

10.2.2 Starting up the Atlantium System

You can start up the Unit via the **Controller** or, if included, via the **TRACS Monitor** screen and then check the water and system parameters.

Operating the Atlantium System

>To start up the Atlantium system:

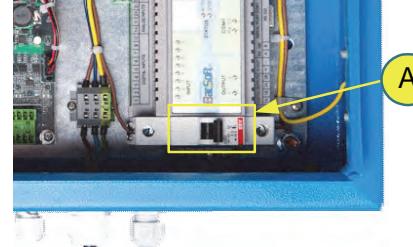
- Step 1.** Check that the power cable of the Ballast Modules is connected to the main power source.
 - Step 2.** Connect the power cable of the Controller to the main power source.
 - Step 3.** Using the attached key, open the screen panel of the **Controller**.
 - Step 4.** Locate the circuit breaker and turn it to the **On** position.
- 
- Figure 10-2: Controller
- Step 5.** On the Main screen of the **Controller**, press .
 - Step 6.** Wait 10 minutes for lamps to turn on and the system to stabilize.
 - Step 7.** Open the viewport and check that there are no air bubbles in the water flow. If necessary, release all air bubbles from within the system.
 - Step 8.** Check the main screen of the **Controller** or of the **TRACS** application (if included) and verify that the Atlantium system parameters for **Power**, **Flow**, and **UVT** are within wanted acceptable range (see the table below to enter your expected values).
- Notify the executive maintenance engineer in case the values are out of range.

Table 10-1: Abbreviation of Table in **Appendix C. Checking the System Parameters**

	Parameter	Expected Value	
		Minimum	Maximum
1	Power		
2	Flow Rate		
3	UVT		
4	UV Dose		
5	Lamp Status		



For periodic checks on Atlantium system parameters, a convenient check list is supplied in **Appendix C, Checking the System Parameters**.

10.3 Viewing Recent Events in TRACS

Every defined event is written to the event log of the **Controller** and **TRACS** (if included). You can view the data log of 70 recent events in the **Events** screen of the **Controller** and all of them in the **Events** tab of **TRACS**.

The color of the icon expresses the state of the event:

- A green  icon indicates a normal event that requires no corrective action.
- A red  icon indicates an error situation that must be corrected.



The **Controller's Event Log** database is limited to **70** events. Once the database is full, every new event overwrites the oldest event entry.

⇒ To view the Controller's Event log:

Step 1. At the bottom-right of the **Controller**

screen, press . The Event Log screen appears displaying information about the most recent events in the following columns:

- **Red or Green icon** - indicates if corrective action is required.
- **Status** - the status of the Unit that results from the event, either **On** or **Off**.
- **Time** - date and time stamp of the event.
- **Details** - a short remark describing the event.

Status	Start Time	End Time	Details
	14:42:26 12/05/11	14:42:26 12/05/11	UV dose card
	14:43:27 12/05/11	14:43:30 12/05/11	UV dose
	14:46:51 12/05/11	14:46:54 12/05/11	UV dose
	14:09:41 12/05/11	14:09:44 12/05/11	UV dose
	14:08:33 12/05/11	14:08:36 12/05/11	UV dose

Figure 10-3: Controller Events Screen

Step 2. To read more information about the event, press . A Dialog box appears with additional information.

Step 3. To scroll back and forward through the list of events, under the list of events, press the  or  buttons.

Step 4. To return to the **Main Operation** screen, press 

⇒ To view the TRACS Event log:

Step 1. For systems with **TRACS**, from the **TRACS** main screen, click the **Events** tab. The Events screen appears displaying information about the most recent events in the following columns:

- **Index** - System-generated code
- **Status** - indicates a **Red** icon if corrective action is required or a **Green** icon if no action is required.
- **Type** - the type of event
- **State** - the status of the Unit that results from the event, either **On** or **Off**.
- **Date** - date stamp of the event.
- **Time** - time stamp of the event.
- **Description** - a short remark describing the event.
- **Unit No.** - which Atlantium unit had this event.



Figure 10-4: TRACS Events Screen

- Step 2.** To view additional information about the event, select an event. In the box under the list of events, additional details are displayed.
- Step 3.** To filter the display according to general Event type, from the **Type** dropdown menu at the top-left, select the desired type. The screen displays as per your selection.
- Step 4.** To filter the display according to Event definition, from the **Event** dropdown menu at the top, select the desired Event definition. The screen displays as per your selection.
- Step 5.** To filter the display according to a date range, click the **From** menu at the top. A **Calendar picker** is displayed. Select the desired beginning. Click the **To** menu and from the **Calendar picker**, select the end date. The screen displays events from that date range.
- Step 6.** Set the number of records displayed on the screen at one time, on the top-right, from the **Records** dropdown menu.
- Step 7.** To view additional Event details, on the bottom-left, click **Event Details**. The details are displayed in the box below.

10.3.1 Handling Events that Require Corrective Action in TRACS

For systems with **TRACS**, for events that require corrective action, the **TRACS** Events screen includes recommendations and instructions that are relevant to the event, as well as a list of spare parts that may be needed.

⇒ To handle events that require corrective actions:

- Step 1.** From the **TRACS** main screen, click the **Events** tab. The Events screen appears
- Step 2.** To view recommendations on the actions to be taken, on the bottom of the screen, click **Recommendations**. The information is displayed in the box below.
- Step 3.** To view additional instructions that are to be carried out, on the bottom of the screen, click **Instructions**. The information is displayed in the box below.
- Step 4.** To view a list of spare parts that may be needed, on the bottom of the screen, click **Parts**. The information is displayed in the box below.

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Step 5. To view Customer Service Contact information, on the bottom-right, click **Customer Service**. The information is displayed in the box below.

10.4 Taking Microbial Samples

The designated aseptic sampling valves (i.e., EGMO ESV valves) are the **Inlet** and **Outlet Sampling Points** located on the sides of the Atlantium Unit. Before taking a microbial sample, a valve is sterilized internally with Ethanol 70%, as well as with flame.

Required Equipment

- Sampling containers that are clean, laboratory-grade, sampling bottles with a volume no less than 100ml (3.38oz).
- Ethanol 100-70%
- Bunsen Burner and lighter
- Permanent marker
- Sterile gloves
- Proper Sampler attire according to local laboratory protocol



- Use gloves during sampling and treat them with Ethanol 70%.
- Use **sterile disposable** sampling containers.
- Prevent contact between the sampling containers and the valves' surfaces.
- Be sure that no foreign matter or liquids fall into the sampling containers.
- Perform the sample collection as fast as possible to minimize environmental contamination of the sample.
- **Use open flame to treat the surrounding air while sampling.**



⇒ To take a microbial sampling:

- Step 1.** Open the Sampling valve and allow water to flow for 2-3 minutes. Then close the valve.
- Step 2.** If the sampling valve contains a cover at the top, open its cover and place it in a clean place.
- Step 3.** Spray all over the Sampling valve and inside it thoroughly with Ethanol 70%.
- Step 4.** Using a Bunsen burner, apply the flame comprehensively over the entire Sampling valve surface from its connection to the main pipe to its spout.
- Step 5.** Spray the cap thoroughly with Ethanol 70% and place it on the Sampling valve.
- Step 6.** Open the valve and allow the water to flow for 2 minutes. If you have applied the flame properly, vapor emerges from the spout. (If there is no vapor, application of the flame was insufficient. Repeat the previous step.)



Figure 10-5: Cleaning the Sampling Valve with Ethanol



Make sure never to touch the opening at the Sampling container's neck.
While the Sampling container is open, do not turn the cap upside down.

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Step 7. On the Sampling container, with one hand, remove its cap carefully, avoiding touching the inside of the cap with fingers or any other object. **Do not turn the cap upside down.**

Step 8. With your other hand position the Sampling valve under the water stream and take a water sample. Make sure never to touch the valve's opening or the opening at the container's neck. Fill the sampling container, leaving ample air space in bottle (at least 2.5 cm).

Step 9. Carefully replace the container's cap and tighten it to avoid cross contamination.



Figure 10-6: Taking a Sample

Step 10. Labeled the Sampling container with the following data:

- Sampling site
- Sampling point
- Sampler name
- Date the sample is taken

Step 11. Close the Sampling valve.

Step 12. Spray the sampling container thoroughly with Ethanol 70%.

Step 13. Store the water samples in a dark, refrigeration unit at a temperature of 2-8°C (35.6-46.4°F) until they are examined.

10.4.1 Microbial Analysis Guidelines

The microbial analysis is to be conducted according to the company guidelines which are used in the local microbiology laboratory.

- Atlantium's recommendation is to use the microbial filtration method for the testing.
- If a number of consecutive anomalous microbiological results are obtained in one of the sampling points, take the samples only after performing CIP with a disinfection chemical (peracetic acid is recommended). It is important to let the chemicals clean and sanitize the aseptic valves, as well by letting the cleaning solution flow through them. See **Cleaning In Place (CIP)** on page 11-2.
- In the event that system outlet counts are higher than the inlet counts, the results are to be considered as a sampling error.
- In the event that the microbial counts are not proportional in different dilutions, the results are to be considered as a laboratory error.
- For further guidance regarding microbial sampling and analysis, contact the Atlantium Application department.

10.5 Ultrasonic Cleaning (Optional)

For systems with the optional Ultrasonic Cleaning System, for whatever reason, you may want to manually disable the Ultrasonic Cleaner. Using the manual control temporarily overrides the configured settings. Manually re-enabling resumes the ongoing automatic Ultrasonic Cleaning cycles as pre-configured in the settings.

⇒ To run the Ultrasonic Cleaner from the Controller:

- On the **Controller's** main screen, press . The Ultrasonic Cleaner is activated/deactivated. Activation is for the duration set for this function. See **Configuring the Ultrasonic Cleaner (Optional)** on page 7-14.

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>To run the Cleaner on a particular lamp:

- Step 1.** Access the **Controller's** Settings screen as detailed on page [7-3](#).
- Step 2.** Press **Cleaner** . The Cleaner Settings screen appears.
- Step 3.** Under **Lamp**, using the **◀ / ▶** buttons, select the lamp to be cleaned.
- Step 4.** Press . The Cleaning system is activated for the designated lamp. The Cleaning process runs according to the preset Operations settings.
- Step 5.** To perform the cleaning process on another lamp, when the process is finished, carry out **Steps 3** and **4** again.



Figure 10-7: Cleaner Settings Screen

To run the Cleaner from the TRACS:

- For systems with **TRACS**, on the top of the **Controller's** main screen, click . The Ultrasonic Cleaner is activated/deactivated. Activation is for the duration set for this function. See **Configuring the Ultrasonic Cleaner (Optional)** on page [7-14](#).

10.6

Backing up the TRACS Database



For systems with **TRACS**, the maximum size of the database is 4 GB. This mean that after 4 GB of data, the system does not check if the database is saving correctly which could mean a data loss. Therefore, it is imperative to backup the databases on a monthly basis (typically 250 MB). Every first day of the month, you should back up the database of the previous month. Working with a light database, **TRACS** also works faster and more efficiently, generating reports faster.

To backup the TRACS database:

- Step 1.** From the **TRACS** main screen, click the **Management** tab. The Management screen appears.
- Step 2.** At the bottom-right, click **Backup Database**. The Backup Database dialog box notifies you that the database is successfully backed up and specifies the location of the Backup file (as it is configured in the Advanced Configuration settings. See page [8-6](#).)
- Step 3.** Click **Finish**. You are returned to the Management screen.

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>To backup the TRACS database according to a specified time period:

Step 1. From the **TRACS** main screen, click the **Management** tab. The Management screen appears.

Step 2. On the top-right, click . The Advanced Configuration window appears. The System Settings tab is displayed.

Step 3. Click the **Database Settings** tab.

Step 4. Select the **Export from date** (the first day of the month), the **Until date** (the last day of the month) and click **Export Data Base**. *Once you have exported the database to a disc or other media for viewing and report writing and archiving, you can go to the next step.*

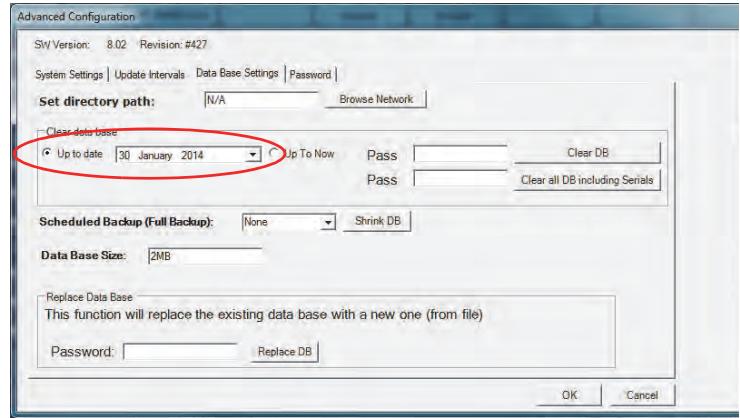


Figure 10-8: TRACS Advanced Configuration Window-Database Settings Tab - Export Database

Step 5. Now that you have an independent backup of the database, clear the data base up to one month before the current month date. Under Clear database, mark **Up to date** and click the dropdown arrow. The Calendar picker appears.

Step 6. Select the first day of the month of two months ago. For example, if today is July 15, select May 1 or April 1, depending on how many units you have on the system. April 1 means you work with a smaller database, advisable if you have two or more units on the same **TRACS**.

Step 7. Click **Clear Data Base**. After a brief period, a message box notifies you that the **Database cleared successfully**. The data base is cleared up to the current period.

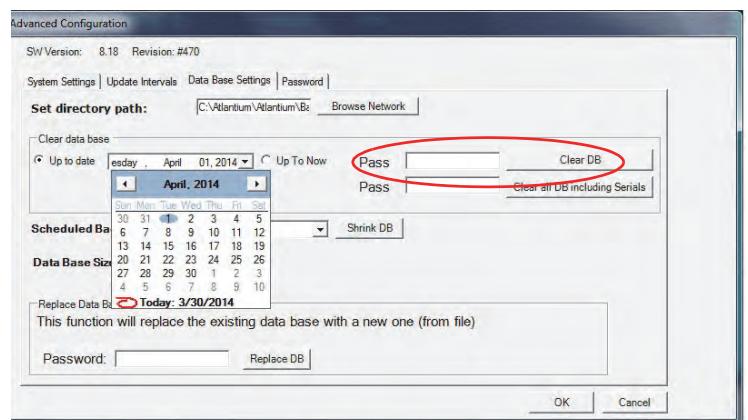


Figure 10-9: TRACS Advanced Configuration Window-Database Settings Tab - Clear Database

To shrink the database:

- On the **TRACS** main screen> **Management** tab> **Advanced Configuration**> **Database Settings** tab, click **Shrink DB**. The backup of the database is compressed into a smaller file. Refer to **Figure 10-8** on page **10-9**.

10.6.1 Working with a Lighter TRACS Database

For systems with **TRACS**, even if you have neglected to backup the database for a long interval, you can remedy this by backing up the collected data. Then, from now on work with a lighter database (up to 2 month maximum).

With a lighter database, reports are generated faster and **TRACS** also work faster and more efficiently.

To backup and reduce a large database:

Step 1. To back up the database in quantities by month, access the **TRACS** main screen >**Management** tab > **Advanced Configuration**  >**Database Settings** tab.

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- Step 2.** For a previous month to be backed up, select the **Export from date** (the first day of the month), the **Until date** (the last day of the month) and click **Export Data Base**.
- Step 3.** Repeat for each monthly period that is to be backed up.
- Step 4.** To clear the data base up to one month before the current working date, under Clear database, mark **Up to date** and click the dropdown arrow. The Calendar picker appears.
- Step 5.** Select the date day before the current period.
- Step 6.** Click **Clear Data Base**.



Clicking the **Clear Data Base** button erases all existing data! Proceed only if you have already stored the data you need in another location.

After a brief period, a message box notifies you that the **Database cleared successfully**. The data base is cleared up to the current period.

10.7 Replacing the TRACS Database

Generally, you can view old data while the system is in operation on the **TRACS Viewer PC**. For the purposes of data security and to avoid accidental loss of data, replacing the database is a password-protected function and should be done only on the **TRACS Viewer PC**.



Do not use this function on the **TRACS Operating PC** to see old data while the system is operation and collecting current data. This would cause the system to store current data in an old database and make it difficult to locate, identify and use for reporting.

>To replace the TRACS database:

Step 1. On the **TRACS Viewer PC**, access the **TRACS** main screen >**Management** tab >

Advanced Configuration  >**Database Settings** tab.

Step 2. In the **Replace DataBase** section, in the **Password** field, type in the password.

Step 3. To replace the full database, click the **Full Database** radio button. To replace a partial database, click the **Partial Database** radio button.

Step 4. Click **Replace DB**. An Explorer dialog box appears.

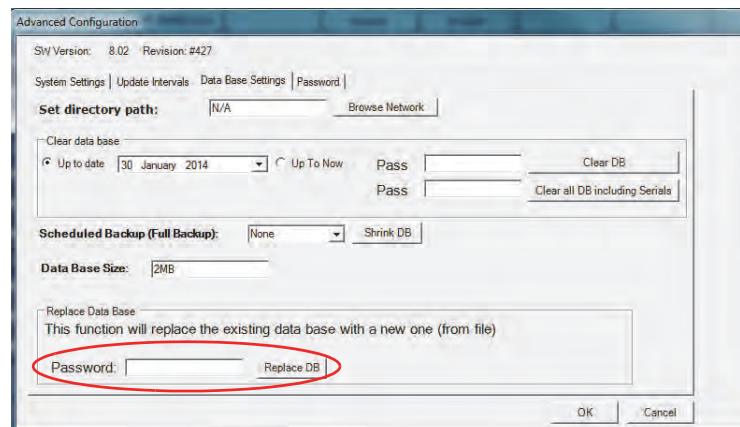


Figure 10-10: TRACS Advanced Configuration Window-Database Settings Tab

Step 5. Navigate to the desired backed-up database file you wish to restore and select it. You are prompted to confirm replacing the database.

Step 6. To confirm, click **Yes**. The database is replaced accordingly. Now you can view the old data and generate reports and graphs.

10.8 Producing Reports in TRACS

TRACS contains full reporting features that enable you to produce reports as needed. The reports draw upon the data collected in the database.

10.8.1 TRACS Compliance Reports

The following reports can be generate:

- Daily Operating Log
(Required for EPA Compliance)
- Off-Specification Calculation Worksheet
(Required for EPA Compliance only)
- UVT Sensor Calibration
- UVI Sensor Calibration
- Summary Monthly Report
(Required for EPA Compliance)
- UVI Sensor CF Worksheet
- PMO Report (Required for PMO Compliance and Pasteurization only)
- Exceptions Report
- Settings Report

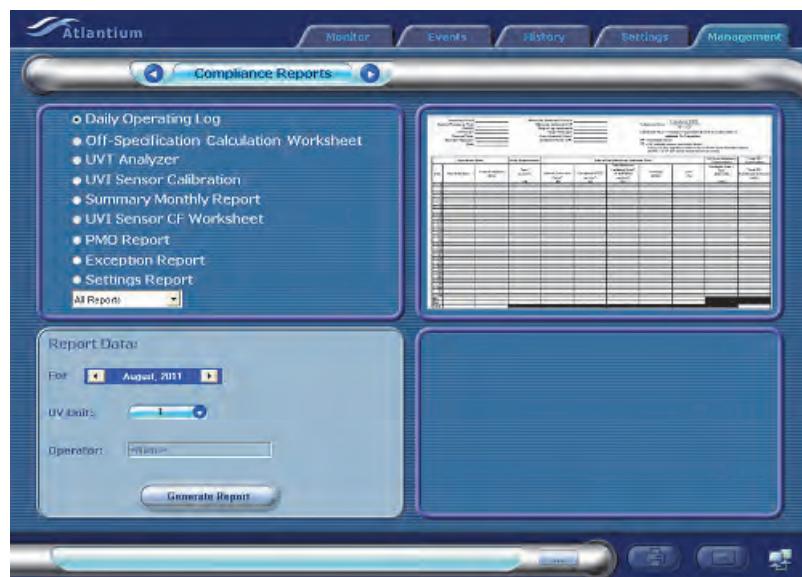


Figure 10-11: TRACS Management - Compliance Reports Screen

To generate a Compliance report:

- Step 1. From the TRACS main screen, click the **Management** tab.
- Step 2. Using the **◀ / ▶** buttons, access the Compliance Reports screen. The Password dialog box appears.
- Step 3. Enter the password and press **OK**. (For information on setting the password, see **Configuring the Basic System Settings** on page 8-6.)
- Step 4. At the bottom of the Upper-left box, from the dropdown list, select the desired Reports group. The options are:
 - **All Reports** - The full list of report options.
 - **EPA Reports** - The report package required for EPA validation compliance.
 - **PMO Reports** - The report package required for PMO standards compliance.
 - **Pasteurization Reports** - The report package for industries that require pasteurization but do not require PMO standards compliance.
 - **Validated Dose Reports** - The report package for industries that require validated dose but do not require EPA validation compliance.

The list of reports appears accordingly.

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- Step 5. Select the desired report.
- Step 6. To set the time period for the report, depending on the Report type, either select the month, by clicking the **◀ / ▶** buttons, until the desired month appears, or set the date range using the Calendar pickers for the **From** date and **To** date.
- Step 7. For **UV Unit**, select **All UV Units** or a particular one.
- Step 8. In the **Operator** field, enter your name. Your name is listed on the report to identify who generated it.
- Step 9. Click **Generate Report**. The report is generated and presented in your default Internet browser from which it can be printed or emailed according to the PC settings.

10.8.2 TRACS Maintenance Registry Related Reports

From the Maintenance Registry screen, you can generate reports for the following components:

- Lamps
- UVI (Intensity) Sensor
- UVT Sensor
- Ballast
- Reference UVI (Intensity) Sensor

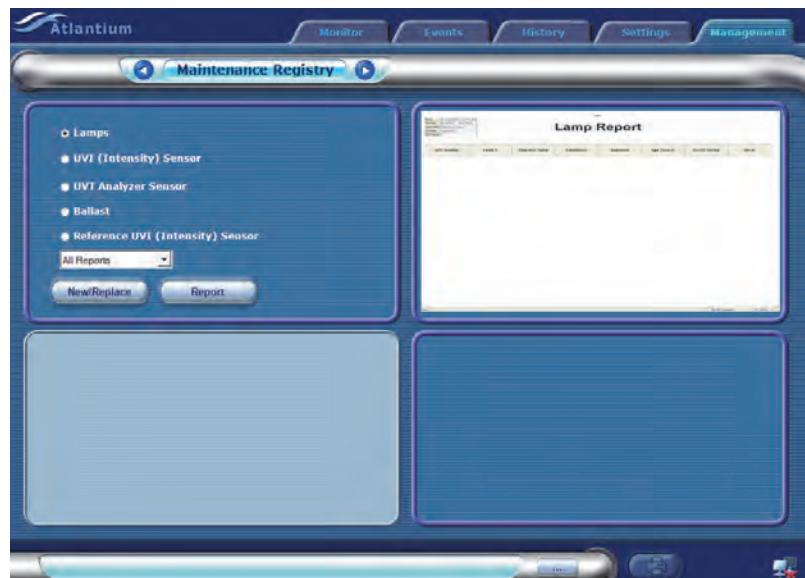


Figure 10-12: TRACS Management - Maintenance Registry Screen

⇒ To generate a Maintenance Registry-related report:

- Step 1. From the **TRACS** main screen, click the **Management** tab.
- Step 2. Using the **◀ / ▶** buttons, access the Maintenance Registry screen.
- Step 3. For systems with Pasteurization, from the dropdown list, select Pasteurization. Only **Lamps** is displayed.
- Step 4. Select the component for which you want to generate a report.
- Step 5. To display the Report Data section, click **Report**. The Report Data section appears in the bottom-left. (After the first time the Report Data section is displayed, it remains on the screen until you move off of the Maintenance Registry screen.)
- Step 6. To set the time period for the report, for the **From** date and **To** date, use the **◀ / ▶** buttons, until the desired months appears.
- Step 7. For **UV Unit**, depending on the Atlantium UV units controlled by **TRACS**, select the desired unit.
- Step 8. In the **Operator** field, enter your name. Your name is listed on the report to identify who generated it.

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Step 9. Click **Generate Report**. The report is generated and presented in your default Internet browser from which it can be printed or emailed according to the PC settings.

10.9 Display History in TRACS

The **TRACS** History screen displays a graph of data either in real-time or previously collected. You can display the date of any of the Atlantium units controlled by **TRACS**. Or, you can compare the data of more than one of the Units.



Figure 10-13: TRACS History Screen

⇒ To display data from one or more signal:

- Under the **Legend** section to the right, mark the checkbox of the signals for which you want to display data. Each signal is displayed in a unique color.

⇒ To display data filtered by one or more Atlantium units and other parameters:

- Step 1.** At the bottom of the screen, click any of the **Units**, **Single Units**, **Export History** and **Custom** options. The Options field underneath displays additional options.
- Step 2.** Click the desired options. The graph displays accordingly.

⇒ To increase/decrease the display units:

- On the left, click the - / + buttons.

⇒ To set the time period to be displayed:

- Step 1.** Under the graph, click the arrow in the **From** field, and from the Calendar picker that is displayed, select beginning of the date range.

- Step 2.** To set the starting time, click the up and down arrows of the time field.

- Step 3.** From the **Range** field, set one of the following:

- | | |
|----------------|------------|
| ■ Half an Hour | ■ 3 Weeks |
| ■ Hour | ■ Month |
| ■ Day | ■ 3 Months |
| ■ Week | ■ Year |

- Step 4.** Click **Apply**. The History graph updates accordingly.

⇒ **To display a system generated graph:**

- Click **Default**. The History graph displaying according to system default criteria.

10.10 Exporting TRACS History to MS Excel

You can export the data collected via a specified period in the History screen in MS Excel format.

⇒ **To export history to MS Excel:**

Step 1. Towards the bottom-right of the **TRACS** History screen, click **Export History**. The display area underneath

shows the  button.

Step 2. Click . The Export History dialog box appears.

Step 3. To set the date range, for both the **From** and **To** date fields, click the arrow and from the Calendar picker that appears, select the desired date.

Step 4. Mark the checkbox of the Atlantium Units (as per your system configuration) for which you want to export data.

Step 5. Click . An Excel data file is generated and automatically opens MS Excel (provided it is installed on the computer).



Figure 10-14: History Screen - Export History Button



Figure 10-15: History Screen - Export History Button

10.11 Printing TRACS Information

You can print information from the **TRACS** History screen and the Events screen directly to any printer defined on the PC.

To print reports, use the print function from the Internet browser in which the reports are generated. (See *Producing Reports in TRACS* on page 10-11.)

⇒ **To print History or Settings:**

Step 1. At the bottom-right of the History or Settings screen, click . A Print Preview is displayed.

Step 2. To display the desired page, From the page picker  select the desired page number.

Step 3. To change the number of pages displayed together, select a display mode . The pages are displayed accordingly.

Step 4. To zoom the display in or out, click the  dropdown list and select the desired percentage.

Step 5. To print, click .

Step 6. To close the Print Preview, click **Close**. You are returned to the History screen.

⇒ **To print from the Event screen:**

Step 1. At the bottom-right, click . The Event Print Selection dialog box is displayed.

Step 2. To print the list of events (as displayed according to the filter settings), select **Print Events List**. Or, to print a selected event, select **Print Selected Event**. A Print Preview is displayed according to your selection.

Step 3. To change the displayed view, follow the directions above for **Printing History** in **Step 2.** to **Step 4.**

Step 4. To print, click .

Step 5. To close the Print Preview, click **Close**. You are returned to the Events screen.



Figure 10-16: Event Print Selection Dialog Box

10.12 Emailing Information from TRACS

You can email the information in the **TRACS** History, Settings and Events screens.

⇒ **To email information:**

- At the bottom-right of the relevant screen, click . According to the displayed screen (for Events the Event Print Selection dialog box opens for you to select what is to be included), a message is activated in the default email client defined in the PC.

10.13 Recovering the TRACS Password

If you have inadvertently misplaced the password to **TRACS**, you can recover it.

⇒ **To recover the TRACS password:**

Step 1. Access the **TRACS** main screen

>**Management** tab > **Advanced Configuration** 
>**Database Settings** tab.

Step 2. Click the Password tab.

Step 3. Click the **Restore Password** button. The Recover Password dialog box opens.

Step 4. Click **Generate number**. The generated number appears in the field under the button.

Step 5. Supply the generated number to your Atlantium Service Representative, who will supply you with a PIN code.

Step 6. In the **Please enter the pin code** field, type in the supplied PIN Code.

Click **Reset Password**. The Reset Password dialog box allows you to reset the password.

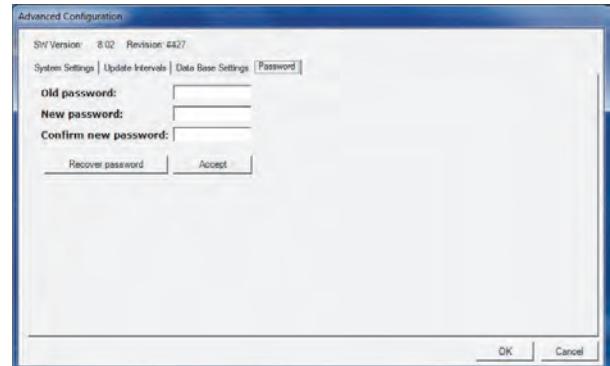


Figure 10-17: TRACS Advanced Configuration Window-Password Tab



Every three months (on a quarterly basis) or according to the local HACCP plan, you must check the Divert valve, which is performed via **TRACS**.

⇒ To check the Divert valve:

- Step 1.** To access the Settings screen, click the **Settings** tab. The Please enter Password window appears.
 - Step 2.** In the password field, enter the password.
 - Step 3.** Click **OK**. The Settings screen is displayed.
 - Step 4.** In the lower, right section, next to the **Check Divert valves**, click . In the lower, left section, the **Check Divert Valves** button appears.
 - Step 5.** Click the **Check Divert Valves** button. This causes the Atlantium Unit to assume that the dose is too low and diverts.
- The divert is recorded in the **TRACS** PMO report and in the exception report. If the Atlantium Unit is set to shut down on a low dose divert, the Unit does that and records both events in the PMO report – a low dose divert and a shut down event.

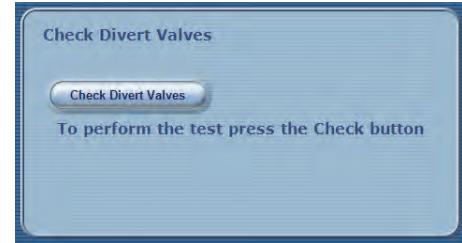


Figure 10-18: TRACS Registry- for UVIS or UVT

10.15 Using the Validation Verification Tool (EPA Only)



The Validation Verification tool assist the EPAPMO inspector to test the Atlantium system's parameters.

⇒ To verify validation:

- Step 1.** On the **Controller** main screen, note the parameters for **Power**, **Flow**, and **UVT**.
- Step 2.** Access the **TRACS** main screen >**Settings** tab.
- Step 3.** At the top-left of the screen, using the **◀ / ▶** buttons, access the Atlantium Unit to be verified.
- Step 4.** In the lower-right quadrant, locate **Validation Verification** and click its . The Validation Verification tool appears in the lower-left quadrant.
- Step 5.** Using the **◀ / ▶** buttons, for **P[%]** (Power), **Flow [gpm]**, and **UVT [%]**, enter corresponding parameters noted from the **Controller**.
- Step 6.** Click . The systems calculates the parameters for **RED Calc**, **VF** (Validation Factor), and **Credited RED** according to industry Validation directives. The inspector compares the results to the industry standards requirements.



Figure 10-19: TRACS Validation Verification

10.16 Viewing Off-spec Tracking Settings (EPA Only)



TRAC software detects when parameters may stray off spec. According to the Validated Dose settings you selected, the System calculates off-spec parameters and sets notification actions according to the Validation Envelop.

⇒ **To view the Off-spec Tracking settings:**

- Step 1. Access the **TRACS** main screen >**Settings** tab.
- Step 2. At the top-left of the screen, using the **◀ / ▶** buttons, access the Atlantium Unit to be verified.
- Step 3. In the lower-right quadrant, locate **Off-spec Tracking** and click its . The Off-spec Tracking parameters appear in the lower-left quadrant.



Figure 10-20: Generic TRACS Off-spec Tracking

10.17 Changing Time Settings

You may want to change the time settings in the Atlantium system for Daylight Saving Time. For Atlantium systems that include **TRACS**, **TRACS'** time settings are taken from the time settings of the computer on which it is installed. If the computer's time settings are synchronized via an external clock source, it is most likely set to automatically adjust of Daylight Saving Time. If it is not, you can change the time in the computer's clock settings. **TRACS** is constantly synchronizing with the **Controller**'s settings. When the time is updated on the **TRACS'** computer, the **Controller**'s time settings are synchronized accordingly.

For systems with out **TRACS**, you can change the time settings in the **Controller**.

⇒ **To change the Controller's time settings:**

- Step 4. On the **Controller**, to access the technician mode, press  and use the password is **9999**. The Technician screen appears.
- Step 5. At the bottom-right on the screen, press  three times until the **Technician Screen Setting 4** is displayed.
- Step 6. For **System Time**, click the adjacent Arrow.
- Step 7. Using the number keys, enter the correct time according to your facility's global time settings.
- Step 8. Press . The changes are saved.



Figure 10-21: Configuration - Technician Settings 4 Screen



11 System Maintenance

To keep the Atlantium system in peak form, preventive and periodic routine maintenance is essential. During commissioning, Atlantium trains your local staff how to do the tasks on a prescribed schedule or as needed.



WARNING!

- Unauthorized servicing or modification of this system in a manner not specified in this manual could expose personnel to potential electrical or other hazards.
- Improper use or adjustment of this system may invalidate the service warranty agreement.



Before you begin a procedure, carefully read through it so that you can anticipate the steps efficiently.

The periodic routine maintenance schedule is:

- Weekly Maintenance Tasks:
 - Walk-Around Inspection Tour - see below
 - Calibrating the Sensors (weekly is required for regulated applications, other application are as needed)(See page [11-7](#))
- Monthly Maintenance Tasks:
- Yearly Maintenance Tasks:
 - Cleaning the Quartz Tube (See page [11-21](#))
 - Replacing the Quartz Tube O-rings (See page [11-21](#))
 - Calibrating the Reference Master Sensor (required for regulated applications only)(See page [11-14](#))
- Maintenance Tasks Performed as Needed:
 - Cleaning In Place (CIP) (See page [11-2](#))
 - Replacing a Lamp (See page [11-14](#))
 - Checking/Replacing a Sensor (See page [11-23](#))
 - Tuning the Atlantium System (See page [11-27](#))
 - Checking/Replacing the Quartz Tube (See page [11-21](#))
 - Cleaning/Replacing a UVIS Mirror (See page [11-19](#))
 - Replacing the Temperature Sensor (See page [11-31](#))
 - Replacing the Temperature Converter Card (See page [11-32](#))

System Maintenance

11.1 Walk-Around Inspection Tour



Walk-Around and inspect the Atlantium system once a month to check for water leaks, visible damage to the cables and harnesses, or any other part of the system. Report any problem you find to an authorized technician.

⇒ To perform a Walk-Around inspections:

- Step 1. Walk around the Atlantium unit and inspect it. Look for leakage at the incoming and outgoing pipes.
- Step 2. Inspect the **Cable Harness** and cables running between the Unit and the Ballast Module(s) and Controller for signs of fraying and any other visible damage.
- Step 3. Inspect the Ballast Module(s) and Controller for any signs of damage.
- Step 4. Report any leakage or damage to an authorized technician immediately.

11.2 Cleaning In Place (CIP)



The CIP procedure consists of two parts:

- Cleaning to remove the accumulated particles that collect on the quartz tube over time
- Disinfectant cleaning to sterilize the quartz tube (not applicable to some Municipal installations)

Clean the Atlantium Unit's inner surfaces and quartz tube generally on a monthly basis. However, if the system performance is on target and the UVT Sensor readings are stable, you can clean using this process less frequently, depending on the specific chemistry of your water.

A CIP recirculation system is available from Atlantium as an optional CIP Kit. Connect the recirculation system to the CIP ports to create a closed-loop flow line that pumps a diluted solution through the Unit.

The estimated time for the CIP process is 1.5 hours.

Prepare the following:

- Protective chemical-safe goggles, clothing and gloves
- An external pump-driven recirculation system with a built-in 100 liter reservoir (26.5 US gallons) or Atlantium's CIP Kit including its accessories (See **CIP Valves and CIP Kit** on page 3-17.)
- Cleaning solution (See below)
- Disinfectant cleaning solution (not applicable to some Municipal installations) (See page 11-3)

11.2.1 Selecting the Correct Chemicals for CIP

It is **critically important** to select the correct cleaning and disinfecting chemical for the CIP process. It must be powerful enough to clean the inner surfaces of the Atlantium unit, while at the same time:

- Does not harm the components of the Unit that it comes into contact with (stainless steel 316, quartz and Viton® o-rings).
- Does not contaminate the product for which the water being treated by the system is used.

System Maintenance



- The chemicals selected and the concentrations used must be approved for use by the facility's quality assurance and safety officials, and must comply with the written protocols and procedures set in place by those departments.
 - Use and handle in strict accordance with their manufacturer's instructions, product information sheets, and material safety data sheets (MSDS).
 - It is strictly forbidden to use of NaOH (Caustic Soda) as it causes irreversible damage to the quartz. Any use of this material requires an analysis of temperatures, concentration, frequency and duration and written approval from Atlantium's application engineer.
-



- All chemicals must be obtained locally.
 - Atlantium does not supply chemicals - get them locally from commercial chemical suppliers.
-

Recommended Cleaning Solutions

The following chemicals have been tested and found to be very effective for cleaning and are recommended for use when cleaning the Atlantium system:

- Phosphoric acid (H_3PO_4) 2% diluted solution
- Nitric acid (HNO_3) 2% diluted solution
- HCl 2% diluted solution - recommended for metal based (rust-colored) deposits
- Sulfamic acid (H_3NSO_3) 1.5% diluted solution - recommended for calcium based deposits

Recommended Disinfectant Solutions (not applicable to some Municipal installations)

(The Disinfectant CIP process is not applicable to some Municipal installations)

The following have been tested and found to be very effective for disinfection and are recommended for use when disinfecting the Atlantium system:

- Peracetic acid-based chemicals - 30 min. contact time, for example:
 - P-3 Oxonia Active 150 - 0.5% diluted solution according to manufacturer's recommendation
 - Divosan Forte - 0.5% diluted solution according to manufacturer's recommendation
 - Hot water at 85°C (185°F) for 30 min.
-



The use of any other cleaning and disinfection chemicals requires Atlantium's approval.



DO NOT use caustic soda in the Atlantium system. If your facility uses caustic soda in a CIP process, use a by-pass line to prevent caustic soda contact with the Atlantium unit.

11.2.2 Preparing the Chemical Solution

For both cleaning and disinfecting, the liquid in the reservoir must contain the desired percentage of the chemical additive (see above). Therefore, the purchased chemical solution must be diluted and added to the reservoir. Calculate the correct amount of chemical solution to be used for the CIP process.



- The concentrations refer to room temperature.
 - The diluted solution values denote the required dilution of the chemical circulating through the Atlantium Unit.
 - While calculating the diluted volumes, consider all volumes including the Unit, pipes and the recirculation tank.*
-

⇒ To calculate the correct amount of chemical solution:

- Step 1.** Calculate the total volume you need for the CIP* by adding the water volumes in:
- The Atlantium unit volume (measurements in liters/gallons) - Refer to the **Physical Specifications** Table in **Atlantium System Footprint** on page 2-7
 - The pipes between the Atlantium Unit and the **Inlet** and **Outlet Valves**
 - The CIP recirculation system
 - The hoses between the Unit and the recirculation system

- Step 2.** Calculate the amount of chemical additive to be added to the reservoir to achieve the desired dilution.
Use this formula:

$$C = \frac{A * V_t}{B}$$

A - The target concentration for the liquid (chemical substance + water) in %
 B - The concentration of the chemical substance to be added in %
 C - Volume of the chemical substance to be added in liters/gallons
 V_t - Volume of the water in the Unit + piping + CIP Reservoir (as described above*) in liters



* If you intend to collect the solution into the CIP reservoir or other container, the total volume of the cleaning solution must not exceed the volume of the CIP reservoir or container.

11.2.3 Performing the CIP Process

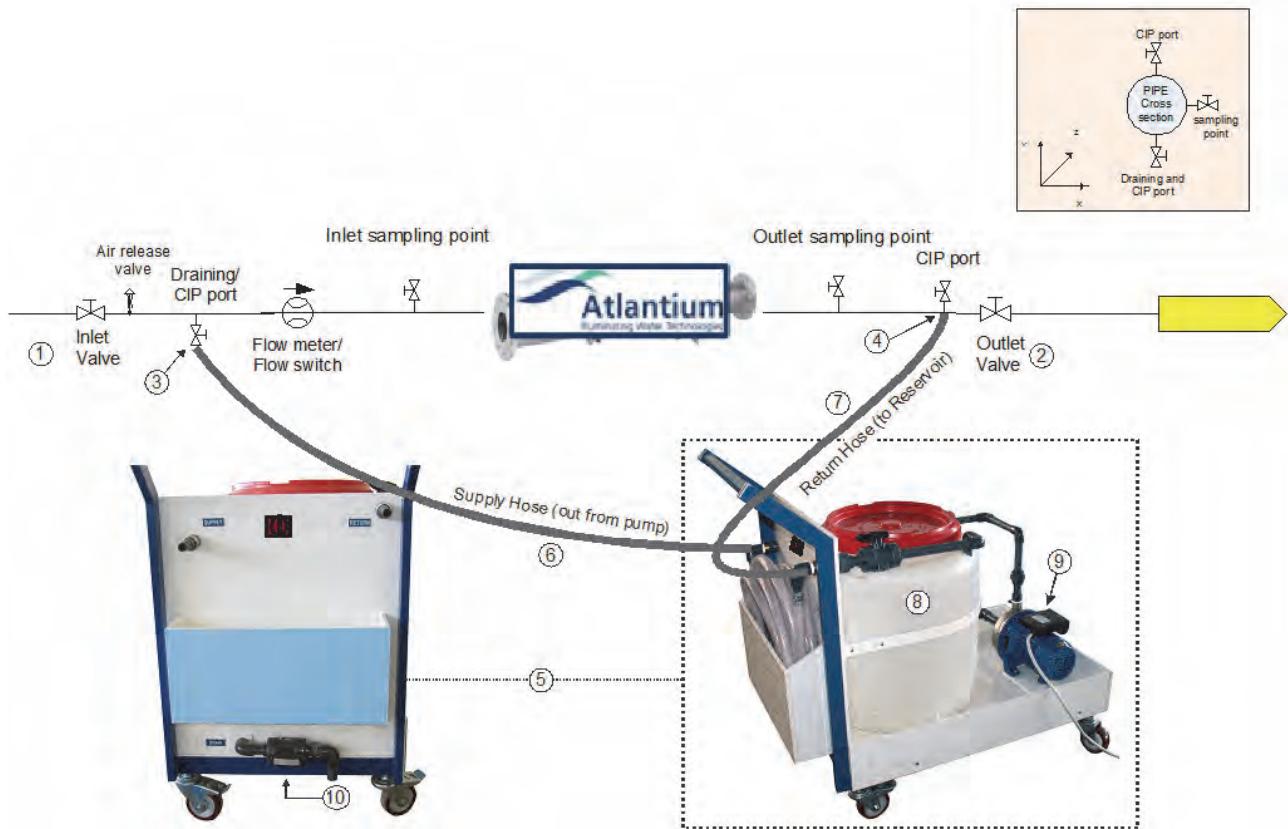


Figure 11-1: Recommended CIP Setup

To Perform CIP:

Shutting Down the System

Step 1. Shut down the Atlantium system, on the **Controller**, by pressing the **Main ON/OFF Operation** button in the upper-right corner.

Step 2. On the Connection Box next to each lamp, turn the switch to the **Off** position.

Step 3. Close the Unit's inlet isolating valve **(1)** and outlet isolating valve **(2)**.

Step 4. Remove the caps covering the CIP ports **(3 & 4)**.

Connecting the CIP Hoses

Step 5. Using the CIP cap's tri-clamp, connect the recirculation system's supply hose **(6)** to the CIP port **(3)** and the CIP recirculation system's Supply port **(B)**.

Step 6. Connect the recirculation system's return hose **(7)** to the CIP port **(4)** and the CIP recirculation system's Return port **(C)**.

Filling the CIP Reservoir

Step 7. To fill the CIP reservoir **(A)** with water:

- **Filling option 1:**

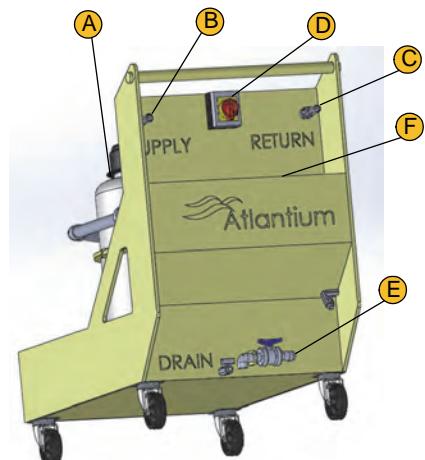


Figure 11-2: CIP Recirculation System Components

System Maintenance

- Slightly open the Unit's inlet isolating valve **(1)** and open the CIP port on the outlet side **(3)** and allow the facility's water to fill the recirculation system's reservoir **(8)**.
- There is a full line indicator on the reservoir **(A)**. Make sure the water in the reservoir is up to the 100 liter (26.5 US gallons) level.
 - ◆ Close the Unit's inlet isolating valve **(1)**.
 - ◆ Close the CIP port **(4)**.
- **Filling option 2:**
 - Using an external water source, fill the recirculation system's reservoir **(A)** with 100 liters (26.5 US gallons) of room-temperature tap water ($\pm 25^{\circ}\text{C}/75^{\circ}\text{F}$).
 - There is a full line indicator of the reservoir. Make sure the water in the recirculation system's reservoir **(8)** is at the 100 liter (26.5 US gallons) level.

Preparing the Chemical Solution

Step 8. Add the prepared chemical solution to the water in the reservoir. (See *Selecting the Correct Chemicals for CIP* on page 11-2.)

Starting the CIP Circulation Process

Step 9. Open both of the CIP ports **(3 & 4)**.

Step 10. To start the recirculation system's electric pump, on the CIP recirculation system, turn the switch **(D)** to the **On** position and allow the solution to circulate through the Unit for **the period of time specified in the chemical's Use instructions, but not less than 30 minutes**.

Step 11. As the solution is circulating through the Unit, open and close the sampling valve several times to make sure they also get full of CIP chemical solution.

Step 12. If the draining valve is separate from the CIP ports, open and close the draining valve several times as well.

Step 13. After the chemical solution has circulated through the Unit for a sufficient duration, it must be drained from the system.

If regulations and physical setup permit draining the chemical solution to the facility's sewage system, close the inlet CIP port **(3)**, to stop the CIP recirculation pump **(9)**, on the CIP recirculation system, turn the switch **(D)** to the **Off** position, and open the CIP recirculation system's drain valve **(E)**. The water with the chemical solution begins to drain out. Connect the recirculation system's drain valve **(E)** to the facility's sewage system.

Use the Draining/CIP port to drain the solution in the system into a external container according to local regulations.

Or, use the CIP reservoir **(A)** to collect the chemical solution. Close the inlet CIP port **(3)**, to stop the CIP recirculation pump **(9)**, on the CIP recirculation system, turn the switch **(D)** to the **Off** position. Allow the chemical solution to drain entirely into the CIP reservoir **(A)**. Dispose of the contents according to regulations.

Refilling the System

Step 14. Open the Inlet valve **(1)** and refill the Atlantium Unit with water. Use the View on the Atlantium Unit to see when the Unit is full. When full, close the Inlet valve **(1)**.



Make sure that the Atlantium Unit is filled with water before powering it up and turning on the lamps.

Step 15. Turn on the Atlantium system at 100% power and wait until the system has stabilized and indicates that it is ready.

Rinsing the System

Step 16. To rinse the Atlantium system thoroughly, slightly open the inlet valve **(1)**. Open the CIP recirculation system's drain valve **(E)** and completely drain the CIP reservoir **(A)**.

System Maintenance

Step 17. To assure that all of the chemicals are flushed out of the system, draw some water from the Sampling valve and test it using an appropriate indicator for the chemical used, such as measuring the pH, consult your chemical supplier).

Step 18. Close the CIP recirculation system's drain valve (**E**).

Performing CIP Disinfection

Step 19. If you are planning to perform an additional CIP process using the disinfectant solution, refer to **Preparing the Chemical Solution** on page **11-3** and return to **Step 7**.

Or, to return to normal operating status, proceed to the next step.

Ending CIP and Draining the System

Step 20. Open the isolating outlet valve (**2**) and close the CIP port on the outlet side (**4**).

Step 21. To avoid hammer effect if there is air trapped in the system, carefully open the inlet valve (**1**) completely and resume normal operation.

Step 22. Using the CIP cap's tri-clamp, disconnect the CIP recirculation hoses from CIP ports and close the CIP ports with their caps.

Step 23. Open the CIP recirculation system's drain valve (**E**) and completely drain the CIP reservoir (**A**).

Step 24. Close the CIP recirculation system's drain valve (**E**).

Step 25. Roll up the CIP recirculation hoses and return them to their storage pocket (**F**).

Returning Power to the Lamps

Step 26. On the Connection Box next to each lamp, turn the switch to the **On** position.

Step 27. Turn on the Atlantium system, on the **Controller**, by pressing the **Main ON/OFF Operation** button in the upper-right corner.

11.3 Calibration Tasks

As required in regulatory applications, the Calibration tasks provide a way to audit the performance of the UVIS sensor and UVT analyzer. To verify that the UVIS Sensor is indeed detecting the intensity of the ultraviolet light correctly, it is calibrated against a Reference Master sensor. To verify that the UVT Analyzer is indeed measuring the UVT correctly, it is calibrated against an independent water sample test using a spectrophotometer.

For regulated applications such as EPA and PMO, keeping the sensors calibrated is required.

Once the sensors are registered in the **TRACS** maintenance registry, reports can be generated from the **TRACS software**.

11.3.1 Registering a Sensor's Serial Number in TRACS

Make sure that all of the installed sensors (all UVIS Duty sensors, Reference sensor, and UVT Analyzers) are registered in **TRACS**.



For **TRACS** to be able to collect the data and generate reports on the sensors, the sensors' serial numbers must be registered in **TRACS**.

System Maintenance

>To register a sensor's serial number:

Step 1. On the top of the **TRAC Software's Management** screen, use the **◀/▶** buttons, access the **Maintenance Registry** and select either:

- UVI (Intensity) Sensor
- UVT Analyzer Sensor
- Reference UVI (Intensity) Sensor

Step 2. Click **New/Replacement**. The Replacement Sensor section appears in the lower left corner.

Step 3. For **New Serial #**, enter a new sensor's serial number. It is on both the wrapping and the sensor itself. (**For the Reference sensor, it is on the bottom.**)

Step 4. (**For Reference Sensor only**) for **Valid until**, enter the expiration date of the validation.

Step 5. For **UV Unit**, select the correct Unit number from the list.

Step 6. (**For UVIS or UVT only**) for **Lamp #**, enter a number of the Lamp with which the sensor is associated.

Step 7. For **Operator**, enter your name (for tracking purposes, the name of the person who is replacing the sensor).

Step 8. Click **Done**.



Figure 11-3: TRACS Registry- for UVIS or UVT

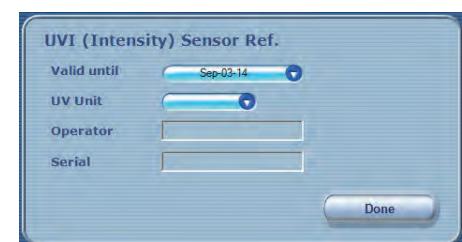


Figure 11-4: TRACS Registry for Reference Sensor



When calibrating both the UV Intensity Sensor and the UVT Analyzer, calibrate the UV Intensity Sensor first.

11.3.2 Calibrating the UV Intensity Sensor



The installed UV Intensity sensor (UVIS) (the Duty sensor) is calibrated with a Reference Master sensor that comes in a special box, protected against overexposure to light. According to the UVDGM, the UVIS is to be calibrated monthly or as frequently as state regulators require. If the normally operating Duty sensor has consistently maintained its calibration over a period of time, regulations usually provide for a reduced calibration frequency.

The reading of the UVIS sensor (operational Duty sensor) is compared to the Reference Master sensor. The allowed difference between the two sensor readings cannot be more than 20%. If the reading is within the 20% tolerance, the sensor is adjusted to the correct calibration. If the reading is more than the allowed tolerance, the system immediately initiates a correction factor, which is utilized until the malfunctioning Duty sensor is replaced.

System Maintenance



The UVIS calibration must be performed under normal operating conditions. The calibration process begins with opening the **Controller's Calibration** screen, which causes the system to freeze the Power settings in order to assure that the dose does not change during the sensor removal/replacement and calibration process.



- Atlantium supplies the Reference Master sensor (required for EPA/PMO applications, optional for other applications) in a light-tight box with documentation. The Sensor is DVGW/NIST traceable and expires one year from testing/shipment.
- UVIS Duty sensors have no specific life span - and can be used as long as they hold their calibration. It is not unusual for sensors to maintain their calibration for two years and then need factory re-calibration or replacement. At the same time, many sensors that are calibrated regularly continue to report correct readings for 4 years or more.
- A Reference Master sensor can be used to replace a Duty sensor after its expiration date or sent to Atlantium for recalibration.

Prepare the following:

- Reference Master sensor
- Wrenches # 24 and # 30 (for the adjustable UVIS sensor)

>To calibrate the UVIS sensor:

Preparing for Calibration

Step 1. Since any condensation that may have collected on the sensor's lens diminishes the sensor's detection capacity, remove the **UVIS Duty sensor** and check it for condensation.

Step 2. Make sure the Duty sensor is dry and return it to its place.

Step 3. On the **Controller Main** screen, make a note of the current Power reading.

Step 4. Accessing the UVIS Calibration Screen

Step 5. On the **Controller Main** screen, press **Sensor**

Calibration . The Sensor Calibration screen appears.

Step 6. Press . The UVIS sensor Calibration screen appears.

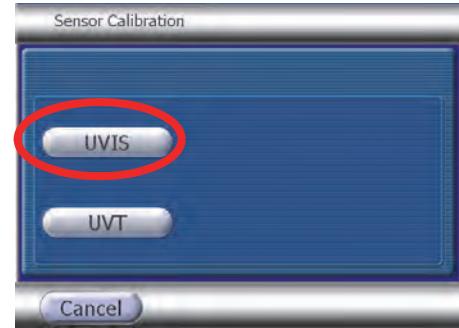


Figure 11-5: Calibration Screen

#	Description
1	Current power reading
2	Lamp number
3	Duty sensor (Local) UVIS reading*
4	The icon shows the local reading is locked
5	The icon shows the local reading is still unlocked
6	Reference sensor (Master) UVIS reading*
7	Ratio between the Local (Duty sensor) reading and that of the Reference sensor (Master)
8	Save button
9	Close button

* this number represent the relative UV sensor reading



Figure 11-6: UVIS Calibration Screen

Locking UVIS Sensor Reading

Step 7. Select the lamp (2) for which its UVIS sensor is to be calibrated using the \blacktriangleleft / \triangleright buttons.

Step 8. Verify that the **Power** level (1) is at the same value that you noted on the **Controller**'s main screen. During this procedure, the Power level is frozen by the system. (If the value is not the same, or varies during this procedure, you can still calibrate, but send an email to your Atlantium service representative.)

Step 9. The current reading of the sensor appears in the **Local** field (3). Lock the reading, by touching the adjacent lock (4). (The icon becomes (5)).

Replacing the UVIS Duty Sensor with the Reference Master Sensor

Step 10. Disconnect and remove the **UVIS duty sensor** and install the **Reference Master sensor** in its place. Detach the sensor's cable, remove the duty sensor, and insert the Reference Master sensor making sure the pinhole is included properly.

Lock the Reference Master Sensor Reading

Step 11. On the **Controller Calibration** screen, the reading of the Reference Master sensor now appears in the **Master** field (6). To lock this reading, press (7).

Calibration Results

In less than a minute, the system calculates the ratio between the Master reading (4) and the **Local** reading (3) and displays in the **Ratio** field (7) and determines if it is within the required tolerance range.

System Maintenance

Pass: If the ratio is within **20%**, the system adjusts the sensor reading to reflect the Reference Master sensor reading.

Fail: If the ratio is more than **1.20**, a correction factor (**CF**) is implemented as required by EPA rules. The **CF** appears on the **Controller's** main screen. The correction factor remains in force until the Duty sensor is replaced or a successful calibration performed.

Saving the Results

Step 12. Press  (8). The UVIS sensor Calibration Event is reported in the Event screen and stored in the database. The information is included in the report generated from **TRACS**.

Returning the UVIS Duty Sensor

Step 13. Disconnect and remove the Reference Sensor and install in its place the duty sensor that was just calibrated. Detach the sensor's cable, remove the Reference sensor, and insert the Duty sensor making sure the pinhole is included properly



If the Duty sensor calibration fails, you can replace the failed Duty sensor with the Reference sensor. By recalibrating using the Reference sensor as both the Duty sensor and Reference sensor, the CF factor is avoided, however you must get a new Reference sensor immediately.

The system does not remove the CF until a successful calibration is performed.

Step 14. To exit the calibration window, press  (9). This unfreezes the Power level.

11.3.3 Calibrating the UVT Analyzer

For regulated applications The UVT value is an important component in calculating the dose. Regulated application preform UVT Analyzer Calibration weekly, until a pattern has been established. Depending on the extent of fluctuations, consistency and accuracy of the UVT readings, an alternate schedule can be determined. The calibration compares the UVT reported by an external calibrated spectrophotometer and the UVT the Unit reports.



The rules allow four calibration failures in a row before the unit is off-spec. The system registers each in the internal counter.



The UVT calibration must be performed under 100% power. Once the calibration process begins, the system brings the Power settings to 100% and freezes it to assure that the power setting is stable during the calibration process.

Prepare the following:

- Spectrophotometer
- Clean containers for water samples
- Sample of fresh distilled water
- Dry lens cloth

⇒ To perform UVT Analyzer calibration:

Noting the UVT% Reading

Step 1. On the **Controller Main** screen, make a note of the UVT% reading.

Obtaining an Independent Reading

Step 2. Use an external spectrophotometer and, according to the manufacturers instructions, calibrate it using a sample of fresh distilled water.

System Maintenance

Step 3. Obtain a sample of the water immediately before it enters the Atlantium Unit.

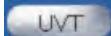
- a Open the sample port and let it run for a few seconds
- b Fill a regular cup with water.

Step 4. Test the water sample with the external spectrophotometer.

Access the UVT Calibration Screen

Step 5. In the **Controller Main Settings** screen, press

Sensor Calibration . The Sensor Calibration screen appears.

Step 6. Press . The UVT Analyzer Calibration screen appears.

The system automatically powers up to 100%. Note the **Power** display (**3 below**).



Figure 11-7: Calibration Screen

#	Description
1	UVT Bench value in %
2	Lamp number
3	Current power
4	System detected UVT%
5	Error comparison
6	Done button
7	Close button

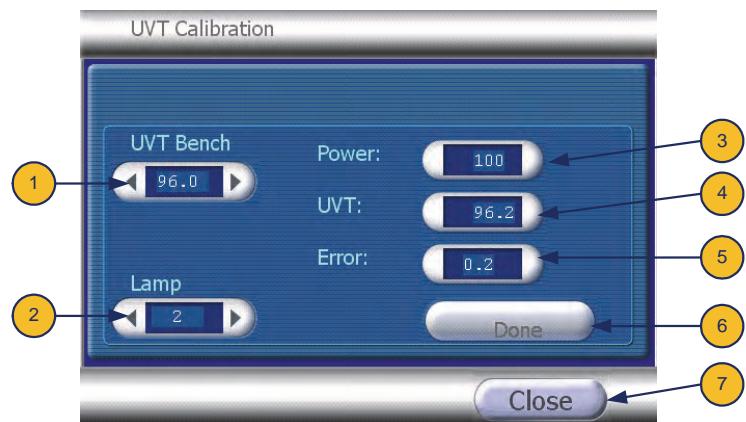


Figure 11-8: UVT Calibration Screen

Calibration

Step 7. To select the desired lamp, use the  /  buttons (**2**). The readings for the selected UVT analyzer are displayed.

Step 8. In the **UVT Bench** field (**1**), enter the external UVT value obtained using the  /  buttons. Enter it.

The **UVT%** value (**4**) displays the current UVT as measured by the system. The **Error** display (**5**) displays the difference between the value in the **UVT Bench** field (**1**) and the **UVT%** value (**4**).

The system compares the calculated error to the allowable error and, the system adjusts the calibration to reflect the spectrophotometer reading. A countdown of the time it takes for the system to do this appears on the button.



The rules allow four calibration failures in a row. The fourth calibration failure in a row puts the unit off-spec. The system registers each in the internal counter. The system warns you after the third failure in a row that the system becomes off spec if there is another calibration failure.

Troubleshooting: If the error is more than 2%:

System Maintenance

- Ensure that the spectrophotometer produced the correct UVT reading by using it to test an additional independent distilled water sample.
 - If the results are the same as the previous test, go to the next step. If they are different, change the Bench value and see if the error is less than 2%. If it is, press **Done**.
 - If it is more than 2%, continue below.

- Check the sensor.
 - Pull out the UVT sensor and see if the sensor's lens is foul or damaged. Clean the lens with a dry lens cloth and reinsert it.



The UVT sensor may have a pinhole. Ensure that the pinhole is reinserted properly.

- Check for air bubbles.
 - If there are air bubbles, use the air release valve.
 - If there are no air bubbles, the UVT error may be caused by a build-up of deposits. The CIP cleaning process must be performed. *See Cleaning In Place (CIP) on page 11-2.*
- Check that the UVIS sensor' is clean and its reading is appropriate for the age of the lamp. Consult with Atlantium technical support for additional steps.



After pursuing the troubleshooting issues, you can perform the calibration again.

If you do not have sufficient time to pursue troubleshooting when the deviation error is $\pm 2\%$, you can continue with the calibration and find time during the coming week to troubleshoot before the next calibration is required.

Step 9. Press **Done (6)**. The UVT Calibration Event is reported in the Event screen and stored in the database. The information is included in the report generated from **TRACS**.

Step 10. To exit the calibration window, press  (7).

11.3.4 Sending the Reference Sensor for Recalibration



The Reference (Master) sensor is used when calibrating the UVIS sensor. Reference Sensors are certified for one year. After its expiration date, it may be returned to Atlantium for factory recalibration or used as spare (normal operations) duty sensor.

11.4 Replacing a Lamp



The UV lamp can be used as long as it provides the required dose and efficient service. (Generally, a lamp service status of 80% or more is considered efficient service.) A lamp should be replaced ONLY when necessary.

Each lamp's performance is measured directly by a dedicated UV Intensity Sensor. Each lamp's performance is measured directly by a dedicated UV Intensity Sensor. Replace a lamp when:

- Its status or performance declines and the lamp no longer provides the required performance at the appropriate electrical cost
- Once its rated hours expire, be alert to any changes in efficiency that could indicate the need to change the lamp

In the **Controller** and **TRAC** Software tracking application (if included), you can set a margin to assure notification as status declines and a warning is sent to the operator at both the user setting level and the internally coded minimum.

For systems with multiple lamps, the system may continue to operate while any one of the lamps is being replaced.



- Allow the old lamp at least 10 minutes to cool down before starting.
- Read carefully the instructions provided in the new Lamp package.
- Wear white cotton gloves.
- Before installing a new lamp, verify that it is clean and free of grease.
If not, rub it gently with the provided lens tissue. Never touch the lamp with your bare hands - hold it only by the end-connectors. Oily residues from fingerprints can damage the lamp.



- The UV lamps are designed with high internal positive pressure. Wear protective eye-wear while replacing a lamp. Pay strict attention to the safety warnings and precautions in the **Safety Overview** on page 4-1 in the front of this manual.
- In case of lamp breakage, refer to the Safety instructions in **Safety Overview** on page 4-1.



Generally, a lamp is replaced after shutting down the entire Atlantium system. However, in a facility where there is no redundancy UV purification, and you require minimizing system downtime, you can replace a lamp while other lamps continue operation provided you follow these safety requirements:

System Maintenance

- Shutdown the electricity supplied to the lamp to be replaced.
- During the time when the lamp's caps are removed, use Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Wear appropriate eye protection.
- Do not look directly into the lamp enclosure or into any openings that emit UV light during the entire lamp replacement procedure.



Prepare the following:

- Replacement lamp
- Lamp cleaning cloth (comes with the lamp)
- White cotton gloves
- Eye protection
- #3 Allen wrench
- #4 Allen wrench
- Caution signs

⇒ To shut down the entire system:

- Step 1. On the Main screen of the **Controller**, press . The Password dialog box appears.
- Step 2. Enter the password (the default password is **1234**) and press **OK**. The Atlantium system is turned off.



A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp's switch before you proceed to replace the lamp.

- Step 3. Open the **Controller** using the attached key and locate the circuit breaker. Turn the circuit breaker to the **OFF** position.
- Step 4. For the lamp that is to be replaced, on the connection box, turn the lamp switch to the **Off** position.
- Step 5. Continue with the procedure, **To replace a lamp** below.

System Maintenance

>To shut down electricity to a single lamp:

Step 1. Deactivate the lamp to be replaced:

- a From the **Main Operations** screen, press . The **Password** screen appears.
- b Using the numbered keys, enter the password (default password is **1234**) and press **OK**. The **Settings** screen appears. Press the **Lamp** . The **Lamps** screen appears.
- c Locate it the lamp or pair of lamps on the screen and press the corresponding arrow(s) indicator until it displays , turning it off.
- d Press **OK**. You are returned to the **Settings** screen.



Figure 11-9: Lamps Screen



- A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp's switch before you proceed to replace the lamp.

- Step 2. For the lamp that is to be replaced, on the connection box, turn the lamp switch to the **Off** position.
 Step 3. Continue with the procedure, **To replace a lamp**, below.

To replace a lamp:

If you are replacing a lamp while other lamps are still in operations, follow these safety requirements:



- During the time when the lamp's caps are removed, use **Caution floor signs at a distance of 1m/40inch from the Atlantium Unit** that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Where appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
- **DO NOT** look directly into the lamp enclosure during the entire lamp replacement procedure.



While carrying the steps of this procedure, check that the O-rings on the components, such as the lamp housings and holders, are not damaged. If damaged, replace them before refastening the component in place.

Turning Off Electricity to the Lamp

- Step 1. Shut down the electricity to the lamp as detailed above.
 Step 2. Allow the old lamp at least 10 minutes to cool down before starting.

System Maintenance

Accessing the Lamp

Step 3. Using a #3 Allen wrench, remove the four Allen screws (1) that secure the lamp's connector assembly (2) and remove the connector assembly. Each screw has a washer.

Step 4. To prevent any damage to the lamp, make sure you pull the lamp's connector assembly straight out and not at an angle.

Step 5. Using a #4 Allen wrench, remove the 4 screws (3) of the lamp's housing (4). Each screw has a washer.

Step 6. Grasp the lamp's housing and rotate it clockwise and counterclockwise until it loosens. **Make sure the housing is not tilted against the quartz tube while rotating it.**

(The O-Ring on the sleeve stopper between the holder and the stopper may cause the two parts to stick due to the heat. The slight rotation releases it).

To prevent any damage to the lamp and quartz tube, make sure you pull the lamp's housing straight out and not at an angle.

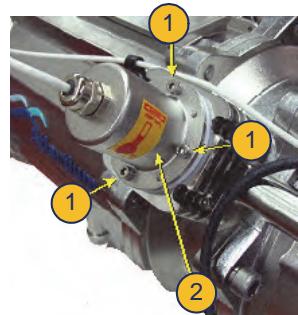


Figure 11-10: Lamp Replacement (Generic View 1)

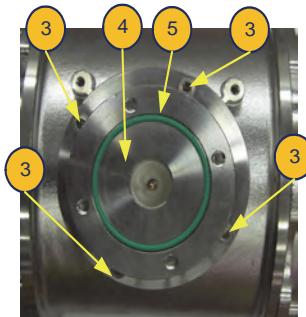


Figure 11-11: Lamp Replacement (Generic View 2)

Removing the Faulty Lamp



The lamp is hot! DO NOT touch the lamp with bare hands, particularly the quartz portion.

Wait at least ten minutes until the lamp has cooled down or use an appropriate pair of long-nose pliers to carefully pull out the lamp.

Step 7. Wearing appropriate cotton gloves and skin covering, and using a suitable long-nose pliers, pull the lamp straight out of the quartz tube in the Unit and set it aside on a stable surface.

Step 8. Check the inner surface of the quartz tube for residual moisture or high humidity. If any visible moisture exists, using a lens cleaning cloth, dry it.

Step 9. Verify that the internal sensor's mirror is clean. See *Cleaning/Replacing the UV Intensity Sensor's Mirror* on page 11-19..

Installing the Replacement Lamp

Step 10. Unpack the new UV lamp from its vacuumed sealed package.

Step 11. Make a note of the serial number of the new lamp. For systems with TRACS, this serial number must be recorded later in the **TRACS Maintenance Registry**.



Figure 11-12: Lamp Replacement (Generic View 3)

Step 12. Clean the new lamp using the cleaning pad provided with the lamp. Verify that no visible fingerprint or dust is on the lamp.

Step 13. Insert the new lamp into the quartz tube in the Unit, all the way until it stops. Ensure that the male contact point (6) on the end of the lamp has meshed with the female contact point (4) in the lamp's housing on the other side of the Unit.

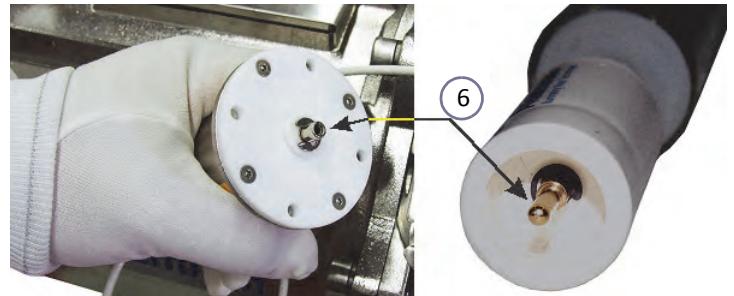


Figure 11-13: Lamp Replacement (Generic View 4)

Assembly

Step 14. Check that the lamp housing's O-ring is in place, clean, dry and undamaged. Replace if necessary.

Step 15. Insert the lamp's housing that you removed in above. Ensure that the male contact point on the end of the lamp has meshed with the female contact point in the lamp's housing on the other side of the Unit.

Step 16. Replace the lamp's housing and, using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.

Step 17. Replace the lamp's connector assembly pushing it straight in and using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.

Observing the Lamp Efficiency

Step 18. Place Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.

Step 19. Unscrew and remove the two+*/ caps (5) on each side of the lamp. (See the figure to the right.)

Reactivating the Lamp

The newly replaced lamp must be tested to verify that it is in working order.

Step 20. On the **Controller's Settings>Lamps** screen, enable the newly replaced lamp by pressing until it is marked .

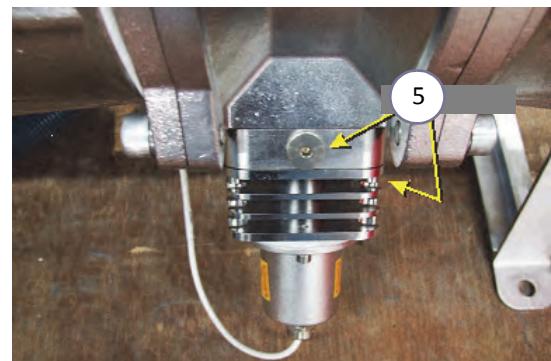


Figure 11-14: Lamp's Caps (Generic View 5)

Reactivation the Lamp

Step 21. To Activate the new lamp from the **Controller**:

- Return to the **Controller's Lamps** screen and activate the replaced lamp by pressing the replaced lamp's button until it displays .
- Access the **Lamps** screen via the **Settings** screen. For **Lamp Age** at the bottom, press . The number of ignitions on the left is reset to zero.
- Press **OK**. You are returned to the **Settings** screen.

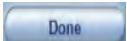
Step 22. For the lamp that is replaced, on the connection box, turn the lamp switch to the **On** position. Check that the lamp ignites properly.

Step 23. Operate the system without the lamp's caps for one hour.

Step 24. Return the lamp's caps (5) and remove the Caution floor signs.

Step 25. Perform system tuning according the instructions on page 11-27.

Registering the Lamp's Serial Number in TRACS

- Step 26.** For systems with **TRACS**, to register a new lamp's serial number:
- a On the top of the **TRAC Software's Management** screen, use the **</>** buttons, access the **Maintenance Registry** and select **Lamps**.
 - b Click **New/Replacement**. The Replacement Lamp section appears in the lower left corner.
 - c For **New Serial #**, enter the new lamp's serial number. It is on both the wrapping and the lamp itself.
 - d For **UV Unit**, select the correct Unit number from the list.
 - e For **Lamp Number**, select the correct lamp position.
 - f For **Operator**, enter your name (for tracking purposes, the name of the person who is replacing the lamp).
 - g Click . The lamp usage hours are automatically reset.

Recording Lamp's Serial Number (for Systems without TRACS)

- Step 27.** For systems without **TRACS**, gather the following information about the old lamp you replaced:

- lamp's serial number
- system model
- the number of hours on the lamp usage clock when you changed the lamp
- the number of ignitions of the lamp
- the status of the lamp when you changed it

- Step 28.** Email this information to:support@atlantium.com.

Observing Lamp Efficiency

- Step 29.** Observe the system's efficiency for **100 hours**. If after this period there is a performance degradation of more than 5%, remove the UV intensity sensor and check for humidity. Clean if necessary. For the adjustable UVIS sensor, see the instructions on page [11-24](#).

- Step 30.** Perform **System Tuning** according the instructions on page [11-28](#).

11.5

Cleaning/Replacing the UV Intensity Sensor's Mirror



For each lamp in the Atlantium Unit, there is a small internal mirror for directing UV light into the sensor. The UV Intensity Sensor's Mirror must be cleaned every time the lamps are replaced.

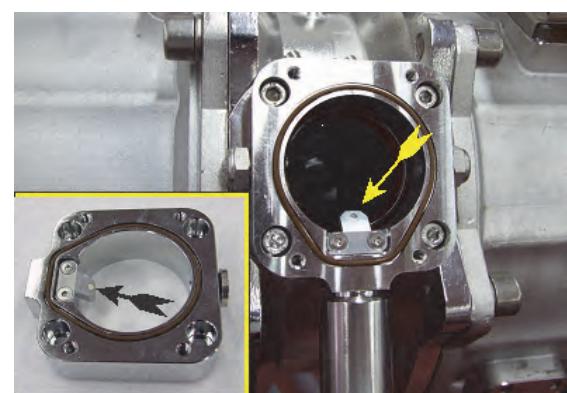


Figure 11-15: Generic Cleaning the UV Intensity Sensor's Mirror

Prepare the following:

- Replacement UV Intensity Sensor's Mirror
- Isopropanol and lint-free lens cleaning paper
- Small Phillips screwdriver



While carrying the steps of this procedure, check that the O-rings on the components, such as the lamp housings and holders, are not damaged. If damaged, replace them before refastening the component in place.

⌚ To clean the mirror:

- Step 1.** No particular parts need be removed from the Unit in order to access the mirror for cleaning, once the lamp has been removed. See page **11-14** for instructions on replacing the lamp.
- Step 2.** Clean the reflective side of the mirror – the side facing into the Unit – with isopropanol and lint-free lens cleaning paper.
- Step 3.** Ensure that the mirror is completely dry before re-assembling the UV lamp.
- Step 4.** Examine the mirror's surface after cleaning and before you close the UV lamp' housing. Fingerprints or other stains may cause erroneous UV intensity sensor readings. If the mirror's surface is damaged, it must be replaced.

⌚ To replace the mirror:

- Step 1.** Once the lamp has been removed, you can replace a damaged mirror. See page **11-14** for instructions on replacing the lamp.
- Step 2.** Using a small Phillips screwdriver, remove the two screws holding the mirror in place and remove the mirror.
- Step 3.** Clean the reflective side of the replacement mirror with isopropanol and lint-free lens cleaning paper.
- Step 4.** Examine the mirror's surface after cleaning and before you install it to make sure it is damage-free.
- Step 5.** Carefully place the new mirror in position and using the screwdriver, fasten it securely.
- Step 6.** Before you close the UV lamp' housing, examine the mirror's surface it make sure it is free of fingerprints or other stains, which may cause erroneous UV intensity sensor readings. Clean it again if necessary.
- Step 7.** Ensure that the mirror is completely dry before re-assembling the UV lamp.



Figure 11-16: Removing the Mirror



Figure 11-17: Cleaning the Replacement Mirror

11.6 Cleaning/Replacing a Lamp's Quartz Tube and O-rings



The quartz tube is cleaned as needed according to the UVT Sensor readings and when deposit collects on the quartz tube. **The quartz tube's rubber O-rings must be replaced when dismantling the quartz tube.**

Under normal environmental conditions, the quartz tube's rubber O-rings (as shown in **Figure 11-18** below) must be replaced once a year even if they pass visual inspection. For environments where the water temperature is above 70°C (160°F), the quartz tube's O-rings must be replaced quarterly, for which after the first year, O-rings may require replacement less frequently. For more information, consult your Atlantium representative.

Depending on the quality of the water being treated by the Atlantium Unit, the exterior surface of the quartz tube that houses a lamp may require periodic cleaning or replacement if after the optional Cleaning system and the CIP process the quartz tube is still not sufficiently clean. This is to be determined by the quality control officer at the facility.

Prepare the following:

- Replacement quartz tube (if replacing)
- Two O-rings (See view **B** in **Figure 11-18** below)
- #3 Allen wrench
- #4 Allen wrench
- Protective gloves
- Appropriate cleaning cloth. A mild, household cleaning solution
- Alcohol



While carrying the steps of this procedure, check that the O-rings on the components, such as the lamp housings and holders, are not damaged. If damaged, replace them before refastening the component in place.

⇒ To clean or replace the quartz tube:

Powering Down the System

Step 1. On the Main screen of the **Controller**, press . The Password dialog box appears.

Step 2. Enter the password (the default password is **1234**) and press **OK**. The Atlantium system is turned off.



A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp's switch before you proceed to replace the lamp.

Step 3. Open the **Controller** using the attached key and locate the circuit breaker. Turn the circuit breaker to the **OFF** position.

Step 4. For the lamp that is to be replaced, on the connection box, turn the lamp switch to the **Off** position.

Isolating the Unit

Step 5. To isolate the Unit, close the Inlet and Outlet valves.

Step 6. Using the Drain valve, drain the water from the Unit.

Accessing the Quartz Tube

System Maintenance

Step 7. Quartz tube removal requires that the lamp connector assemblies, lamp housings (on both ends of the lamp) and the lamp be removed. Follow **Step 3.** to **Step 7.** on page 11-17 and remove the lamp connector assembly and lamp housing from the other side of the Unit, as well as the lamp, placing them in a secure location until they need to be reinstalled.



While pulling the lamp housing away, DO NOT tilt it and DO NOT pull it away from the lamp/sleeve axis at an angle.

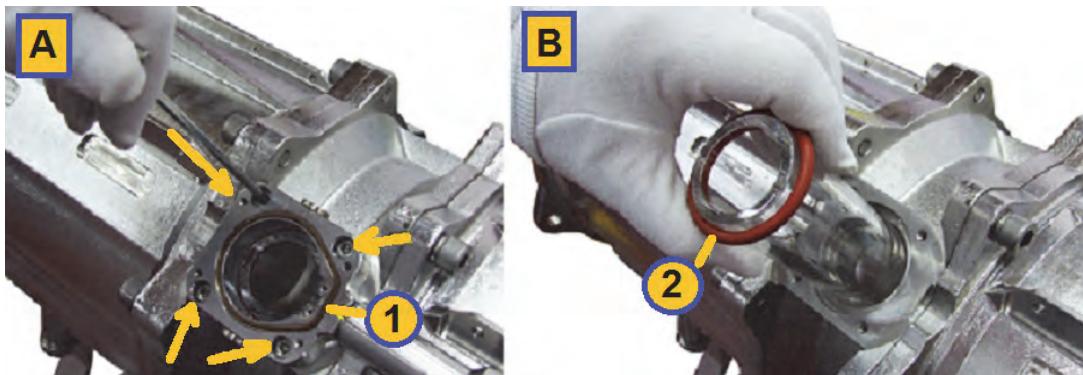


Figure 11-18: Replacing the Quartz Tube (Generic View 1)

Step 8. On one side of the quartz tube, using a #4 Allen wrench, remove the four Allen screws, opening them in a diagonal pattern (i.e. upper left, lower right, upper right, lower left) (arrow indicate the screws in view A) that secure the tube's holding ring to the Unit. Loosen one screw gradually (2 turns) on one side and do the same on the screw at the diagonal opposite side of the tube (2 turns).

Step 9. Continue to alternate until both tube holders are loose, and then remove the screws completely.

Step 10. On the other side of the quartz tube, repeat **Step 7.** to **Step 9.**

Removing the Quartz Tube



Wear protective gloves. To protect the quartz tube, do not touch the internal surface with your bare hands.

Step 11. On one side of the quartz tube, place the gloved palm of your hand over the quartz tube and gently push in. The quartz tube shifts inward. The O-ring on the side where you pushed slips out (if not, take it off).

Step 12. On the other side of the quartz tube, the tube sticks out slightly. **To prevent any damage to the quartz tube, make sure you pull the lamp's connector assembly straight out.** Carefully pull out the quartz tube and remove the O-ring (shown in view B above).



While pulling the connector assembly away, DO NOT tilt it and DO NOT pull it away at an angle.

Cleaning the Quartz Tube

Step 13. If there is a deposit buildup on the tube's exterior surface, clean it with a mild, household cleaning solution.

Step 14. Clean the exterior and interior surfaces with alcohol. If the tube cannot be cleaned to a pristine condition, replace it with a new one.

Step 15. Ensure that there is no residual moisture or high humidity on the inner surface of the quartz tube. If any visible moisture exists, dry it before inserting it in place.

Installing the Quartz Tube

Step 16. Mount the new O-ring onto the quartz tube (as shown in view B in **Figure 11-10** above) and insert the tube into the Unit. Make sure it is centered.

Step 17. Add the second new O-ring on the other side of the quartz tube.

Step 18. Install the quartz tube holder on the side without the UVIS mirror and close it loosely with 4 screws in a diagonal pattern (upper left, lower right, upper right, lower left). **Do not tighten the screws!!**



Figure 11-19: Replacing the Lamp's quartz tube
(Generic View 2)

Assembly

Step 19. Install the quartz tube holder on the opposite side – the one with the UVIS mirror.

Step 20. Using a #4 Allen wrench, close the screws in diagonal pattern and tighten them.

Step 21. To reinstall the lamp, follow from above.

Powering Up the System

Step 22. Open the Inlet and Outlet valves.

Step 23. For the replaced lamp. on its corresponding Connection Box, turn the switch

Step 24. On the Main screen of the **Controller**, press .

Step 25. Wait 10 minutes for lamps to turn on and the system to stabilize.

Step 26. Open the viewport and check that there are no air bubbles in the water flow. If necessary, release all air bubbles from within the system.

Step 27. Check the main screen of the **Controller** or of the **TRACS** application (if included) and verify that the Atlantium system parameters for **Power**, **Flow**, and **UVT** are within wanted acceptable range and record is using the Table in **Appendix D. Checking the System Parameters** on page **D-1**.

Notify the executive maintenance engineer in case the values are out of range

11.7 Checking/Replacing Sensors

From time to time, sensors may need to be checked (most frequently for condensation). During the Calibration process, the UVIS sensor also requires to be removed and temporarily replaced with a Reference Master sensor during. At times a sensor needs to be replaced. There are two types of UVIS sensors. The sensor itself is the same in both types. The difference is the sensor casing and how it is fastened to the Atlantium Unit. The two types are:

- **Adjustable UVIS sensor** - The Sensor's position is adjustable and its casing is fastened with nuts. See below.
- **Fixed UVIS sensor** - The sensor's casing screws into a fixed position. This type of sensor may contain a pinhole. See **Replacing/Checking a UVT Analyzer or Fixed UVIS Sensor** on page **11-27**.

11.7.1 Checking an Adjustable UVIS Sensor

Performed
as needed

Before removing the UVIS sensor to check it for moisture, do one of the following:

If you do not have a caliper measurement tool: You must mark the placement of the sensor so that you can replace it in the correct position.

If you have a caliper: You must measure the position of the sensor. (See *Sending the Reference Sensor for Recalibration* on page 11-14.) or by using a marker to mark the position before removal.

Prepare the following:

- Wrenches # 24 and # 30
- Caliper measuring tool or thin marker

>To check an adjustable sensor (using a marker):

Step 1. In the Controller, note the value for UVIS for the lamp on which the sensor to be replaced. For details on finding the Controller screen with this information, see the section, *System Tuning* on page 11-28.

Step 2. Mark the placement of the sensor so that you can replace it in the correct position. Use the thin marker to mark the position before removal.

Mark the sensor in two places, a line along the nut and across the nut and perpendicular to the first line, as shown in (1).

Step 3. Check the sensor's lens for condensation. If present, using a dry lens cloth, dry the lens thoroughly.

Be sure that the lens is completely dry before it is returned to its place.

Step 4. When you return the sensor to its place, make sure the thin lines line up to the nut and align together.

Step 5. In the Controller, check that the value for UVIS for the lamp on which the sensor was replaced is identical to the value before the sensor was removed. For details on finding the Controller screen with this information, see the section, *System Tuning* on page 11-28.

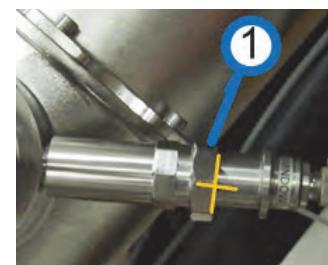


Figure 11-20: Marking the Sensor

⦿ **To check an adjustable sensor (using a caliper):**

Step 1. Place the measurement tool on the UVIS sensor as show in **Figure 11-21** below. Use the screw to adjust the placement of the caliper measurement tool.



Figure 11-21: Measuring the UVIS sensor

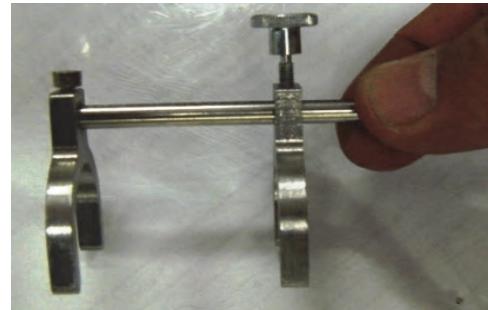


Figure 11-22: Caliper Measurement Tool

Step 2. Carefully remove the caliper, taking care not to accidentally change its position, and set it aside.

Step 3. Remove the sensor according to the relevant steps in *Replacing an Adjustable UVIS Sensor* on page 11-25.

Step 4. If you are in the midst of a Calibration process for the UVIS sensor, replace the original UVIS sensor with the Reference sensor.

Step 5. Check the sensor's lens for condensation. If present, using a dry lens cloth, dry the lens thoroughly.

Be sure that the lens is completely dry before it is returned to its place.

Step 6. When you insert a Reference Master sensor or return a sensor to its place, using the set caliper (calibrated to the original UVIS sensor's position) adjust the sensor so that it is set to the position of the original. Refer to **Figure 11-23** to the left.



Figure 11-23: Adjusting the Reference sensor

11.7.2 Replacing an Adjustable UVIS Sensor



Before removing the UVIS sensor when calibrating it against the Reference Master sensor or checking for moisture, you must mark the placement of the sensor so that you can replace it in the correct position. This is accomplished using the caliper measurement tool (See *Sending the Reference Sensor for Recalibration* on page 11-14.) or by using a marker to mark the position before removal.

Replacing the UVIS sensor involve the loosening of the nut holding it in place.

Prepare the following:

- Replacement UVIS sensor or appropriate type
- Wrenches # 24 and # 30
- Caliper measuring tool or thin marker

To replace an adjustable UVIS sensor:

Step 1. To disconnect the harness connector (shown in view **A** in **Figure 11-25**), unscrew the sensor's threaded locking nut.

Step 2. Grip the Sensor casing with wrenches # **24** and # **30**, as shown in view **B** below. The inset shows the wrench #**24** in the left hand gripping the casing's left band and wrench #**30** in the right hand gripping the casing's large nut on the right.

Step 3. Holding the left wrench #**24** steady, twist the right wrench #**30** to loosen the nut.

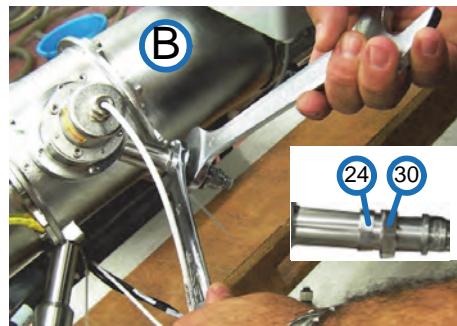


Figure 11-24: Replacing the Sensors (Generic View 2)

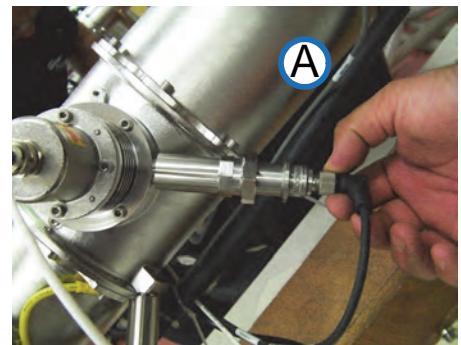


Figure 11-25: Replacing the Sensors (Generic View 1)

Step 4. Carefully pull the sensor out of the housing (**C**). The Large nut comes off together with the sensor.

Step 5. To enable the system to track relevant data about the sensor, make a note of the serial number of the replacement sensor (for later use).

Step 6. Verify that the sensor lens (**1**) is clean. If needed, using a lens cloth, clean it. (See below.)

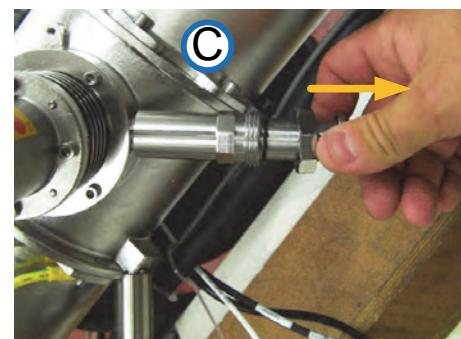


Figure 11-26: Replacing the Sensors (Generic View 3)

Step 7. Position the nut (2) on the sensor as shown above. Then position the washer (3) on the sensor as shown above.

Step 8. Insert the sensor into the housing.

- If you are replacing the sensor, positioning it about 2/3 the way in. Fasten the nut onto the housing.
- If you are returning a sensor that was removed for checking or calibration, see **To check a sensor or remove it for calibration** on page 11-24.

Step 9. Grip the Sensor casing with wrenches # 24 and # 30, as shown in view B above. The inset shows the wrench #24 in the left hand gripping the casing's left band and wrench #30 in the right hand gripping the casing's large nut on the right.

Step 10. Holding the left wrench #24 steady, twist the right wrench #30 to tighten the nut.

Step 11. Reconnect the harness's threaded cap to the new sensor.

Step 12. For a replacement sensor, in the **Controller**, In the **Controller**, perform **System Tuning**, see the section, **System Tuning** on page 11-28.

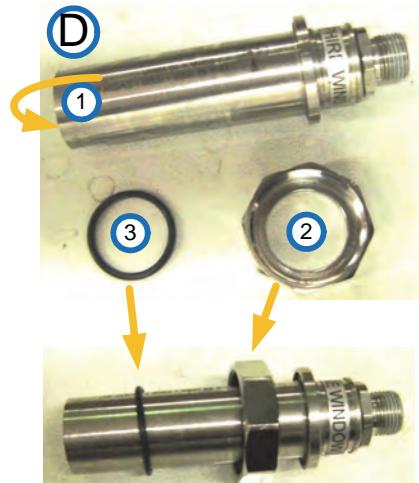


Figure 11-27: Sensor, washer and nut

11.7.3

Replacing/Checking a UVT Analyzer or Fixed UVIS Sensor

Performed
as needed

For system may contain a fixed UVIS sensors, this sensor-replacement procedure is required. If your system contains the adjustable UVIS sensor, see **Checking an Adjustable UVIS Sensor** on page 11-24.

For some of the sensors, there is an pinhole located on the sensor's window. This pinhole is calibrated by Atlantium for the specific measurement point. Do not switch disks between ports. Before inserting the sensor, be sure to include the pinhole if present.

Prepare the following:

- Replacement sensor

>To replace a sensor:

Step 1. To disconnect the harness connector (shown by the arrow in view A below), unscrew the sensor's threaded locking nut.

Step 2. Unscrew the sensor's threaded locking nut from the bottom of the sensor housing, as shown in view B.



Figure 11-28: Replacing the Sensors 2 (Generic View 2)



Figure 11-29: Replacing the Sensors 2 (Generic View 1)

- Step 3.** Carefully pull the sensor out of the housing (**C**).
Step 4. If an pinhole (**E**) is present it slides out.
Step 5. Unpack the new sensor (**D**) and (if it is supplied) the sensor pinhole.



Figure 11-30: Replacing the Sensors 2 (Generic View 4)



Figure 11-31: Replacing the Sensors 2
 (Generic View 3)

- Step 6.** To enables the system to track relevant data about the sensor, make a note of its serial number.
Step 7. Verify that the sensor lens (**F**) is clean. If needed, using a lens cloth, clean it.
Step 8. If an pinhole (**E**) is present, insert it.
Step 9. Insert the sensor into the housing, and screw the threaded cap back into the housing to secure the sensor.
Step 10. Reconnect the harness's threaded cap to the new sensor.
Step 11. In the **Controller**, perform **System Tuning**, see the section, **System Tuning**, below.
Step 12.
Step 13. For systems with **TRACS**, to register the new sensor's serial number, See page **11-7**.

11.8 System Tuning



System tuning is performed on these occasions:

- As the last step in system installation
- As the last step when lamps are changed and after 100 operating hours (as needed)
- Upon advice of an Atlantium Service Representative when the system is reset

⇒ **To tune the Atlantium system:**

- Step 1.** Just prior to calibration, obtain a water sample from the sampling valve on the inlet side of the Atlantium Unit. Test the water sample in an external spectrophotometer. Write down the results. If a spectrophotometer in not available, record the current UVT value shown on the system's display.
- Step 2.** To shutdown the Atlantium system, on the **Controller** main screen, press and wait approximately three minutes for the **Ready Lamps Off** signal to transmit.
- Step 3.** On the Atlantium Unit, locate each UVIS and UVT Intensity Sensor.
- Step 4.** On each sensor (refer to the figures in the section, **System Tuning** on page **11-28**):
- Unscrew the locking nut and gently pull out the sensor.
 - With a dry and clean lint free cloth, wipe the UVIS sensor's quartz window.
 - Reinsert the sensor and replace the locking nut.
- Step 5.** To turn on the Atlantium system, on the **Controller** main screen, press and wait approximately 3 minutes for the **Ready Lamps On** signal to transmit.

Step 6. On the **Controller**, to access the technician mode, press  The Password dialog box appears. Enter the password (default password is **9999**) and press **OK**. The Technician Settings 1 screen appears.



DO NOT leave the **Controller** unattended while in **Technician mode** even for a short time. Unauthorized changes to the **Technician mode** settings could damage the operation of the Atlantium system.

Step 7. Verify that the lamps are on (the number of lamps listed in the display is according to the number of lamps in your system configuration). The

checkbox displays . If needed, to ignite all of the lamps, press the top-most . Then press the top-most .

Step 8. At the top, using the  /  buttons, turn each lamp up to **100%** power

Step 9. Wait a few minutes to allow the system to stabilize.

Step 10. Verify that the P. KW value is approximately (marked **A** in the adjacent figure).



Figure 11-32: Technician Settings 1 Screen (Actual numbers vary according to system configuration)

Step 11. To verify that the Sensor readings are stable, observe the reading for a few seconds to see that they remain the same numbers. For the UVIS sensor, see the UVIS column (marked **B** in the figure above). For the UVT Intensity sensor, see the UVTS column (marked **C**). If the numbers are not stable, unscrew and remove the two caps on each side of the lamp. (See Figure 11-14 , on page 11-18.)

Step 12. Leave the caps open for 30 minutes to make sure no humidity is present in the lamp housing. Then replace the caps and check the sensor reading again.



When the Lamp's caps are removed, do not look directly into the opening without appropriate eye protection. The UV light emitted via the opening is a danger to the eyes.

Step 13. To access the **Technician**

Setting 3 screen, press  (one by one) until it displays.

Step 14. Verify that the temperature readings in the **Temp** column are within acceptable temperature range.

Step 15. Verify that the **Length Factor** value is set to . If it is not correct use the  /  buttons to correct it.

Step 16. Press  . The Tuning Wizard dialog box appears.



Figure 11-33: Technician Settings 3 screen (Actual numbers vary according to system configuration)

Step 17. To calibrate the Lamp efficiency, and UVT, press .

You can calibrate any of these individually by marking only one or two with .

Step 18. For Lamp, press  for the lamps to be calibrated.

Step 19. For Current UVT, enter the current UVT value obtained from the spectrophotometer that you wrote down in **Step 1.** above (or the recorded current UVT value).

Step 20. Press **OK**. The process takes about 6 to 15 minutes.

Step 21. When System Tuning is complete, the **OK** button appears. Click it. You are returned to the previous screen.

Step 22. To return to the **Technician Setting 1** screen,

press  (one by one) until it displays.

Step 23. Verify that the Lamp efficiency is 100% (see the **Eff.** column) and that the UVT is the number you set previously (see the **UVT** column).



Figure 11-34: Calibration Wizard

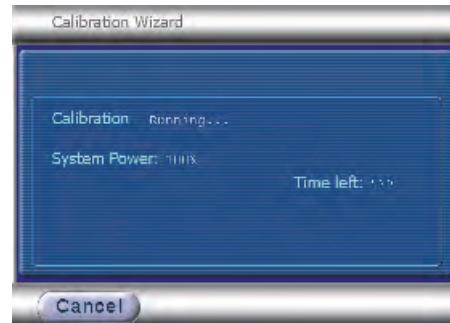


Figure 11-35: Calibration Wizard Screen

11.9 Advance Maintenance

The advanced maintenance procedures require opening the Connection Box. **Local regulations may require a certified electrician to perform any of these procedures.**

This section contains:

- **Replacing the Temperature Sensor** on page 11-31
- **Replacing the Temperature Converter Card** on page 11-32

11.9.1 Replacing the Temperature Sensor



In the event that the Temperature sensor requires replacement, this section details the procedure.



Follow your local regulations regarding whether a certified electrician may be required to perform this procedure.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Prepare the following:

- Replacement Temperature sensor
- #5 Allen wrench
- #3 Flat screwdriver
- #2 Phillips screwdriver

⇒ To replace the Temperature sensor:

Connection Box Card 1300

- Step 1. Turn the Mains circuit breaker to the **Off** position.
- Step 2. Using the appropriate Allen wrench, open the Connection Box cover.
- Step 3. Verify with volt meter that there is no power in first Connection Box card and that no LED is lit on the card.
- Step 4. Locate and disconnect the Temperature Sensor connector **(A)**.
- Step 5. Detach the wire from the terminal connector and remove the wire from the Connection Box via the gland.
- Step 6. Using a #2 Phillips screwdriver, detach the temperature sensor **(C)** from the Atlantium Unit.

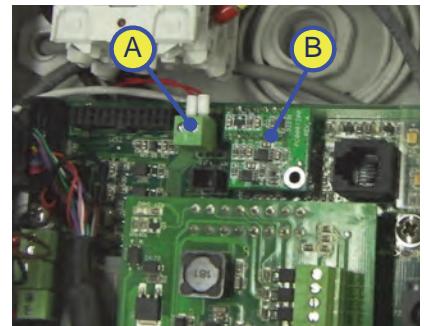


Figure 11-36: Location of the Temperature Sensor Connector

- Step 7. Attach the replacement Temperature sensor **(C)** to the Atlantium Unit.
- Step 8. Thread the wire through the gland and attach it to the terminal connector.
- Step 9. Insert the connector **(A)** to its socket on the terminal block.
- Step 10. Return the Connection Box cover and using the Allen wrench, fasten the screws. Tighten them in a diagonal pattern.
- Step 11. Turn the Mains circuit breaker to the **On** position.

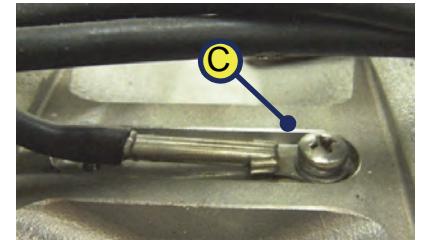


Figure 11-37: Location of the Temperature Sensor on the Atlantium Unit

11.9.2 Replacing the Temperature Converter Card



In the event that the Temperature sensor card requires replacement, this section details the procedure.



Follow your local regulations regarding whether a certified electrician may be required to perform this procedure.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Prepare the following:

- Replacement Temperature Converter card
- #5 Allen wrench
- #2 Phillips screwdriver

⇒ **To replace the Temperature sensor card:**

Step 1. Turn the Mains circuit breaker to the **Off** position.

Step 2. Using the appropriate Allen wrench, on the first Connection Box, open the Connection Box cover.

Step 3. Verify with volt meter that there is no power in first Connection Box card and that no LED is lit on the card.

Step 4. Locate and carefully pull off the Temperature Sensor card (**C**).

Step 5. Aligning the pins of the replacement Temperature Sensor card (**C**) with the connector (on the board) on the Connection Box card, carefully insert the small card into the connector of the Connection Box card.



Figure 11-38: Replacing the Temperature Sensor Card

Step 6. Return the Connection Box cover and using the Allen wrench, fasten the screws. Tighten them in a diagonal pattern.

Step 7. Turn the Mains circuit breaker to the **On** position.



12 Troubleshooting

The sections here are comprised of messages headers that appear as error messages in the **Controller**. Utilize the following safety notes when reviewing the troubleshooting issues:



The solution to the problem might involve exposure to UV light.

The system generates ultraviolet (UV) light within the Atlantium Unit, which can cause serious eye damage or blindness if you stare at it directly when it is working.

Do not look directly into the lamp enclosure during system operation, or while examining or servicing the system's internal components when the system is operating, or when a lamp's caps are open.



The solution to the problem might involve working in a high-voltage environment.

Before replacing a UV lamp or other components, and during any maintenance requiring lamps to be turned off, **make sure the switch on the ballast of the relevant lamps are turned OFF**.

Place a sign on the relevant Ballast Modules and **Controller** alerting others **NOT** to touch the switch and touch screen during maintenance so that no one can inadvertently turn it on while maintenance is in progress.



The solution to the problem might involve working in an enclosure with moving parts.

Before working on the DPM, replacing parts, or during any other maintenance procedure, turn off all power supplied to the DPM mechanism.



The solution to the problem might involve working with hot surface.

Do not touch the UV lamp with your bare hands. Lamps can reach a temperature of 1,000°C under operating conditions.

Wait at least 10 minutes until the lamp is cooled down before replacing it.

Use appropriate protective gloves both to protect your hands and to avoid skin oils that leave fingerprints and/or harm the UV lamp.

Troubleshooting issues

The dose is above the maximum dose on page 12-2

UVT is too low! on page 12-5

The UV dose is too low on page 12-2

The temperature is too high on page 12-3

The temperature is too high on page 12-3

Temperature sensor fault on page 12-8

Temperature is critically high! on page 12-3

The UV Dose is below the set level on page 12-7

The rate of the water flow is too low on page 12-5

Ballast module communication error on page 12-11

The rate of the water flow is too high on page 12-5

Ballast module communication error on page 12-11

The rate of the water flow is too high on page 12-5

TRACS connection lost on page 12-12

Troubleshooting

12.1 The dose is above the maximum dose

Event Index	Controller displays this warning message
1	The dose is above the maximum defined in the system settings

	Possible Cause	Solution
1	The current flow rate is too low. An upstream process has obstructed the flow rate.	Check the upstream piping and the components installed there, such as the pumps, filters.
2	The Max Dose parameter is set too low.	In the Controller , raise the High Dose setting. See <i>Configuring the Operation Mode</i> on page 7-9.
3	The system is set for a constant power that is too high given the current water flow.	In the Controller , change the Operation Mode from Power to Dose setting. See <i>Configuring the Operation Mode</i> on page 7-9.

12.2 The UV dose is too low

Event Index	Controller displays this warning message
2	Dose too low! Below minimum

!

	Possible Cause	Solution
1	The lamp's life has expired.	Check the Lamp's hours displayed on the Controller's main screen and replace the lamp if needed. See <i>Replacing a Lamp</i> on page 11-14.
2	The Water flow rate is too high.	Check the water flow on the Controller's main screen. If it is higher than normal, decrease the rate of the water flow through the system. See <i>Configuring the Flow Meter</i> on page 7-6.
3	UV lamp efficiency has dropped due to condensation.	 Check the UVIS sensors and clean them if necessary.
4	UVT has declined because of chemicals (chlorine, etc.) or solids (sand, silt, etc.) in the water flow.	Carry out cleaning procedures. See <i>Cleaning In Place (CIP)</i> on page 11-2. Try to improve the water condition. Check on the status of upstream filtering equipment and upstream chemical processes.
5	The UVT sensor has malfunctioned.	 Switch between the UVT and UVIS sensors and see if the reading increased. If the reading is increased, switch the sensors back and replace the UVT sensor. See <i>Checking/Replacing Sensors</i> on page 11-23.
6	The system is operating on Power mode instead of Dose mode .	If the system settings are in Power mode, in the Controller , access the Settings screen and change the Operation Mode from Power to Dose setting. Or, change the Power mode settings to allow higher power to respond to operating conditions. See <i>Configuring the Operation Mode</i> on page 7-9.

Troubleshooting

12.3 The temperature is too high

Event Index	Controller displays this warning message
4	The lamp's temperature getting too high - check water flow

	Possible Cause	Solution
1	The Max temperature value is too low.	Check the system's Max Temperature settings. See <i>Configuring More Settings</i> on page 7-12.
2	The water flow has significantly decreased.	Check the flow reading in the Controller 's main screen to see if it has deviated from normal flow. Check the flow via the flowmeter. Check the water source for a problem.
3	There are air bubbles or the system is not fully filled with water.	Verify this by looking through the Atlantium Unit's view port.
4	You did not install a designated air release valve at the highest point on the inlet side of the system.	Release the air by installing a designated air release valve at the highest point on the inlet side of the system.

12.4 Temperature is critically high!

Event Index	Controller displays this warning message
5	The lamp's temperature is too high and the unit will shut down

	Possible Cause	Solution
1	If this message appeared right after a BM Communication Error message (and both messages refer to the same lamp) and the temperature display on the monitor is 165°C/329°F, then most likely the communication between the Controller and the Connection box is lost.	Follow the solutions offered in <i>CRC error</i> on page 12-8.
2	The temperature reading dropped to 0°C / 32°F due to a short-circuited in the Temperature sensor, Temperature converter card or Connection Box Card	 Replace the temperature sensor. See <i>Replacing the Temperature Sensor</i> on page 11-28. If the problem persists replace the Temperature Converter card. See <i>Replacing the Temperature Converter Card</i> on page 11-29. If the problem still persists replace the Connection Box card. See <i>Replacing the Connection Box Card</i> on page 11-30.
3	The Max temperature value is too low.	Check the system's Max Temperature settings. See <i>Configuring More Settings</i> on page 7-12.
4	There is no water flow.	Check the flow reading in the Controller 's main screen to see if it has deviated from normal flow. Check the flow via the flowmeter. Check the water source for a problem.

Troubleshooting

	Possible Cause	Solution
5	There are air bubbles or the system is not filled with water to capacity.	Verify this by looking through the Atlantium Unit's view port.
6	You did not install a designated air release valve at the highest point on the inlet side of the system.	Release the air by installing designated air release valve at the highest point on the inlet side of the system.
7	The Temperature jumper is missing.	 Verify the existence of the Temperature jumper in its designated location on the Connection Box card #1. On the last Connection Box, open the top cover and locate Jumper J32 as shown marked A in the figure. 
8	The Temperature sensor is faulty.	 Replace the temperature sensor. See <i>Replacing the Temperature Sensor</i> on page 11-28.
9	The Temperature Converter card is faulty.	 If the problem persists replace the Temperature Converter card. See <i>Replacing the Temperature Converter Card</i> on page 11-29.

12.5 Temperature sensor fault

Event Index	Controller displays this warning message
6	Fault on lamp temperature sensor

	Possible Cause	Solution
1	If this message appeared right after a BM Communication Error message (and both messages refer to the same lamp) and the temperature display on the monitor is 0°C/32°F, then most likely the communication between the Controller and the Connection box is lost.	Follow the solutions offered in <i>CRC error</i> on page 12-8.
2	The temperature reading dropped to 0°C / 32°F due to a short-circuited in the Temperature sensor, Temperature converter card or Connection Box Card	 Replace the temperature sensor. See <i>Replacing the Temperature Sensor</i> on page 11-28. If the problem persists replace the Temperature Converter card. See <i>Replacing the Temperature Converter Card</i> on page 11-29. If the problem still persists replace the Connection Box card. See on page 11-30.

Troubleshooting

12.6 The rate of the water flow is too low

Event Index	Controller displays this warning message
9	The water flow rate is lower than the minimum flow rate. Check the water flow

	Possible Cause	Solution
1	There is an obstruction in the upstream system or pump malfunction.	If this is a planned decrease or temporary stop, change the Low Flow mode settings from Shutdown mode to Restart . See <i>Setting the Low Flow Mode</i> on page 7-10. This sets the system to Standby. Check pumps, filters and system feed and increase the flow rate. See <i>Configuring the Flow Meter</i> on page 7-6.
2	There is no water running through the system.	If this is a planned stop, change the Low Flow mode settings from Shutdown mode to Restart . See <i>Setting the Low Flow Mode</i> on page 7-10. This sets the system to Standby.
3	The flow meter/flow switch is faulty or a wire has been disconnected.	Check the wires connecting the flow meter/flow switch and reconnect or replace if damaged. Replace the flow meter/flow switch if faulty.

12.7 The rate of the water flow is too high

Event Index	Controller displays this warning message
10	The water flow rate is higher than the maximum flow rate allowed. Check the water flow

	Possible Cause	Solution
1	The water flow rate into the system is too high.	Decrease the rate of water flow from the facility to the Atlantium Unit.
3	Maximum allowable flow rate parameter is too low.	Increase the setting of the Maximum allowable flow rate parameter to the maximum allowable flow rate.

12.8 UVT is too low!

Event Index	Controller displays this warning message
11	UVT is below the required value.

	Possible Cause	Solution
1	Minimum allowable UVT parameter is too high.	Decrease the setting of the Minimum allowable UVT parameter to the minimum allowable UVT.
2	The UVT sensor's lens is fouled.	 Pull out the UVT sensor and see if the sensor's lens is foul or damaged. Clean the lens with a dry lens cloth. If it is damaged, replace the sensor with a new one and perform System Tuning according.
3	Deposit has collected in the disinfection chamber or lamp's quartz tube.	Look through the Atlantium Unit's view port. If the color of the light is in a shade of green or yellow, it probably indicate there is deposit present. Perform CIP. See <i>Cleaning In Place (CIP)</i> on page 11-2.

Troubleshooting

	Possible Cause	Solution
4	There are air bubbles or the system is not filled with water to capacity.	Verify this by looking through the Atlantium Unit's view port.
5	You did not install a designated air release valve at the highest point on the inlet side of the system.	Install air release valve at the highest point on the inlet side of the system.
6	There is a leak inside the disinfection chamber	 Look through the Atlantium Unit's view port and check if there is condensation on the inner side of the view port and/or if there is water collected between the quartz tube and the stainless steel underneath. If you see this, contact Atlantium support for further instruction.
7	The UVT sensor has malfunctioned.	 Switch between the UVT and UVIS sensors and see if the reading increased. If the reading is increased, switch the sensors back and replace the UVT sensor. See Checking/Replacing Sensors on page 11-23.

12.9 UV Lamp ignition failed!

Event Index	Controller displays this warning message
14	The UV lamp has failed to ignite due to an electronic fault. The UV lamp may be burnt out or a wire may be disconnected.

	Possible Cause	Solution
1	The system is set to the wrong model.	In the Controller , access Technician screen #2 . Verify that the system is set to the correct model, number of lamps and branches. See Verify the System Settings on page 7-13.
2	One or more connectors are burnt out.	 Turn off the system's main power source On each Connection Box, turn the switch to the Off position. Disconnect and thoroughly inspect the Ballast Module connectors. If replacement is needed, contact Atlantium Technical Support.
3	The power supply inside the Ballast Module is faulty.	  In a system with more than one lamp, if possible, switch between the Ballast Module connectors in order to verify the Ballast is faulty, if so replace the Ballast Module. In a system with only one lamp, replace the Ballast Module with a new one. See Connecting the Ballast Module Cables on page 5-19 and Ballast Module Installation on page 5-14
4	A lamp is faulty/burned out.	  In a system with more than one lamp, switch between the lamps in order to verify the lamp is faulty, if so replace the lamp. In a system with only one lamp, replace the lamp with a new one. See Replacing a Lamp on page 11-14.

Troubleshooting

	Possible Cause	Solution
5	The ID number of the Connection Box card does not match ID number of the Ballast Module.	 <p>On each Connection Box, open the top cover and locate the 3-digit display (as shown on the right). Check that the set number is identical to the number marked on corresponding Ballast Module. If not identical, use the switch to change it to the correct number.</p> 
6	One or more of the fuses in the Connection Box is burned out.	 <p>Replace the burned out fuse in the Connection Box. Contact Atlantium support for further instructions.</p>
7	The Connection Box card is faulty.	 <p>On the Connection Box, open the top cover and check that the 3-digit display and LEDs are lit. If they are dark, replace the Connection Box card. Contact Atlantium support for further instructions.</p>

12.10 The UV Dose is below the set level

Event Index	Controller displays this warning message
41	Dose too low! Below minimum

	Possible Cause	Solution
1	The lamp's life has expired.	Check the Lamp's hours displayed on the Controller's main screen and replace the lamp if needed. See Replacing a Lamp on page 11-14.
2	The water flow rate is too high.	Decrease the water flow rate. See Configuring the Flow Meter on page 7-6.
3	UVT has declined because of chemicals (chlorine, etc.) or solids (sand, silt, etc.) in the water flow.	Carry out cleaning procedures. See Cleaning In Place (CIP) on page 11-2 Try to improve the water condition; check on the filter status and upstream chemical processes.
4	UV lamp efficiency has dropped due to condensation.	 <p>Check the UVIS sensors and clean them if necessary. See Checking/Replacing Sensors on page 11-23.</p>
5	The system is operating on Power mode instead of Dose mode .	Change the system settings to allow higher power to respond to operating conditions. See Configuring the Operation Mode on page 7-9. In the Controller , access the Settings screen and change the Operation Mode from Power to Dose setting.

Troubleshooting

12.11 Temperature sensor fault

Event Index	Controller displays this warning message
42	All the temperature sensors in branch [number] of the system have malfunctioned. Lamps will shutdown.

	Possible Cause	Solution
1	If this message appeared right after a BM Communication Error message (and both messages refer to the same lamp) and the temperature display on the monitor is 0°C/32°F, then most likely the communication between the Controller and the Connection box is lost.	Follow the solutions offered in <i>CRC error</i> on page 12-8.
2	The temperature reading dropped to 0°C / 32°F due to a short-circuited in the Temperature sensor, Temperature converter card or Connection Box Card	 Replace the temperature sensor. See <i>Replacing the Temperature Sensor</i> on page 11-28. If the problem persists replace the Temperature Converter card. See <i>Replacing the Temperature Converter Card</i> on page 11-29. If the problem still persists replace the Connection Box card. See <i>on page 11-30</i> .

12.12 The UV Lamp unexpectedly shut down

Event Index	Controller displays this warning message
43	Lamp shut down.

	Possible Cause	Solution
1	A short power failure (up to 15 seconds) to the Atlantium Unit only while the Controller still had power.	Turn the lamps back on using the On/Off button on the Controller 's main screen.
 This situation can happen only in installations were the Controller and the Atlantium Unit have separate power sources.		

12.13 CRC error

Event Index	Controller displays this warning message
44	System error, parameters and counters might be reset to factory defaults. Please check

	Possible Cause	Solution
1	While writing parameters into the Controller 's flash storage, the system encountered a problem due to an unexpected power failure or software upgrade.	Reenter all system parameters from scratch. Contact Atlantium support for further instructions. See <i>Configuring the Controller</i> on page 7-1.

Troubleshooting

12.14 Malfunction 45 power supply fault

12.14.1 MAINS_FAIL

Event Index	Controller displays this warning message
45	Ballast fault, error code: 2

	Possible Cause	Solution
1	Mains Fail issue: The ballast does not receive enough power from the mains.	 A certified electrician is required to verify that the Ballast Module receives the proper voltage feed from the Mains via the Connection Box.
2	One or more of the fuses in the Connection Box is burned out.	 A certified electrician is required to replace the burned out fuse in the Connection Box. Contact Atlantium Technical Support.

12.14.2 LAMP_TEMP

Event Index	Controller displays this warning message
45	Ballast fault, error code: 4

	Possible Cause	Solution
1	The Connection Box environment's temperature is above 80 degrees Celsius.	 Check the environment temperature in the Connection Box area, open the connection box and look for a possible cause for the heating. See Cabling Auxiliary Components on page 5-22.

12.14.3 LAMP_MAINS_FAIL_AND_TEMP

Event Index	Controller displays this warning message
45	Ballast fault, error code: 8

	Possible Cause	Solution
1	A combined problem inside the Ballast Module regarding power feed and temperature.	Contact Atlantium support for further instructions.

Troubleshooting

12.14.4 LAMP_UNKNOWN

Event Index	Controller displays this warning message
45	Ballast fault, error code: 16

	Possible Cause	Solution
1	Lamp Unknown: The lamp was unexpectedly shutdown due to one of the following reasons:	
2	There is a power interruption (for micro seconds) that caused the Ballast Module to stop working while the Connection Box Card still held power.	Turn the lamps back on using the On/Off button on the Controller's main screen.
3	The Lamp burned out during operation.	  Replace the Lamp. See <i>Replacing a Lamp</i> on page 11-14.
4	The Lamp's connector(s) burned during operation.	  Replace the connectors. Contact Atlantium support for further instructions.
5	Ballast Module malfunctioned during operation.	 Replace the Ballast Module. <i>Connecting the Ballast Module Cables</i> on page 5-19, <i>Ballast Module Installation</i> on page 5-14.

12.14.5 COMM

Event Index	Controller displays this warning message
45	Ballast fault, error code: 32

	Possible Cause	Solution
1	Communication Error: The communication between the I/O card (ISO) and Connection Box card was lost while the lamp was on or during the ignition process.	 Verify that all Connection Box cards have power and the communication wire is connected properly on both ends. If the problem persist, contact Atlantium support for further instructions.

Troubleshooting

12.14.6 LAMP_UNSET

Event Index	Controller displays this warning message
45	Ballast fault, error code: 64

	Possible Cause	Solution
1	Lamp Unset: The System is set to the wrong system model. (Example: System is RZ300 , but the Controller settings read EP600 .)	<p>In the Controller, access the Technician screen #2. See Verify the System Settings on page 7-13.</p> <p>Verify that the system is set to the correct system model, number of lamps and branches.</p> <p>If the system is already set to the correct model, you might need to refresh the selection:</p> <ul style="list-style-type: none"> Step 1. Change the model to a different one (e.g. if your system is RZ300, change the selection to EP600). Step 2. Exit the Technician screen and close the Controller circuit breaker. Step 3. Open the Controller circuit breaker and enter Technician screen. Step 4. Change the model back to the correct model of your system. Step 5. Exit the technician screen and close the Controller circuit breaker. Step 6. Open the Controller circuit breaker and turn the lamps on.

12.15 Ballast module communication error

Event Index	Controller displays this warning message
46	The Controller lost communication with the Ballast Module Ballast fault, error code: 64

	Possible Cause	Solution
1	No power is feeding into the Connection Box.	 <p>Open the Connection boxes and verify that all Connection Boxes have power. See Cabling Auxiliary Components on page 5-22.</p>
2	A wire is loose.	 <p>With a small flat screwdriver go over all the communication screws in the Controller and Connections Boxes and make sure all wires are located properly in their place and are well tightened. Controller Connections on page 5-8 and Cabling Auxiliary Components on page 5-22.</p>

Troubleshooting

	Possible Cause	Solution
3	A jumper is missing.	A communication jumper might need to be installed, contact Atlantium Support for further instruction.
4	Ground is not connected to the Controller's power inlet.	 A certified electrician is required to verify that the Controller is properly grounded. Controller Connections on page 5-8
5	There is a Hardware problem in the Controller's I/O (ISO) or in the Connection Box.	Contact Atlantium support for further instructions.

12.16 TRACS connection lost

Event Index	Controller displays this warning message
51	The Controller lost connection with the TRACS

	Possible Cause	Solution
1	The TRACS program was closed or the computer was turned off.	Check in the computer that the TRACS program is running, if not re-open it (in Win 7 Computers make sure to run the TRACS as Administrator). See Activating the TRAC Software on page 8-3 .
2	The LAN Ethernet cable was disconnected either from the Controller or from the computer. Or, the LAN Ethernet cable is damaged.	Reconnect the cable and make sure you see the connection LEDs blinking on both connectors.
3	The Unit check box in the TRACS Management tab is unchecked.	Look on the TRACS Management tab and make sure the check box is checked (enabled).
4	The IP Address or Subnet Mask was changed (either on the computer, TRACS or the Controller).	Make sure the IP Address and Subnet Mask are identical both on the Controller and on TRACS .



Appendix A Modbus Communication Protocol

Modbus is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks.

Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition systems.

For information on how to configure the communication properties and make the cable connections, see *Installation Check List* on page 5-25.

A.1 Modbus Registry Map

The table on the following pages provides the information you need to help you configure your network to properly communicate with the Atlantium system.

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
204	Dose	: 1		Actual dose	mJ/cm ²	R
205	System On/Off		Coil Bit			R/W
227	UVT	: 100		Actual Dose	%	R
228	Power	: 1			%	R
229	Flow	: 1			m ³ /h	R
4	Flow in FS Mode	: 1		In Flow Switch mode, the flow is displayed	m ³ /h	R/W
5	Min Flow	: 100			m ³ /h	R/W
6	Max Flow	: 1			m ³ /h	R/W
Lamp 1						
35	UVIS	: 100			4-20 mA	R
36	UVTS	: 100			4-20 mA	R
38	Lamp Current	: 100			Amper	R
40	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
42	Lamp UVT	: 100			%	R
43	Lamp Status	: 100			%	R
46	Lamp Age	: 1			Hour	R
51	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W

Appendix A: Modbus Communication Protocol

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
52	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
53	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 2						
54	UVIS	: 100			4-20 mA	R
55	UVTS	: 100			4-20 mA	R
57	Lamp Current	: 100			Amper	R
59	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
61	Lamp UVT	: 100			%	R
62	Lamp Status	: 100			%	R
65	Lamp Age	: 1			Hour	R
70	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W
71	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
72	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 3						
73	UVIS	: 100			4-20 mA	R
74	UVTS	: 100			4-20 mA	R
76	Lamp Current	: 100			Amper	R
78	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
80	Lamp UVT	: 100			%	R
81	Lamp Status	: 100			%	R
84	Lamp Age	: 1			Hour	R
89	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W

Appendix A: Modbus Communication Protocol

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
90	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
91	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 4						
92	UVIS	: 100			4-20 mA	R
93	UVTS	: 100			4-20 mA	R
95	Lamp Current	: 100			Amper	R
97	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
99	Lamp UVT	: 100			%	R
100	Lamp Status	: 100			%	R
103	Lamp Age	: 1			Hour	R
108	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W
109	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
110	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 5						
111	UVIS	: 100			4-20 mA	R
112	UVTS	: 100			4-20 mA	R
114	Lamp Current	: 100			Amper	R
116	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
118	Lamp UVT	: 100			%	R
119	Lamp Status	: 100			%	R
122	Lamp Age	: 1			Hour	R
127	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W

Appendix A: Modbus Communication Protocol

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
128	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
129	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 6						
130	UVIS	: 100			4-20 mA	R
131	UVTS	: 100			4-20 mA	R
133	Lamp Current	: 100			Amper	R
135	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
137	Lamp UVT	: 100			%	R
138	Lamp Status	: 100			%	R
141	Lamp Age	: 1			Hour	R
146	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W
147	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
148	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 7						
149	UVIS	: 100			4-20 mA	R
150	UVTS	: 100			4-20 mA	R
152	Lamp Current	: 100			Amper	R
154	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
156	Lamp UVT	: 100			%	R
157	Lamp Status	: 100			%	R
160	Lamp Age	: 1			Hour	R
165	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W

Appendix A: Modbus Communication Protocol

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
166	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
167	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Lamp 8						
168	UVIS	: 100			4-20 mA	R
169	UVTS	: 100			4-20 mA	R
171	Lamp Current	: 100			Amper	R
173	Lamp On		Coil Bit	The lamp is on Coil is a binary value 0 or 1		
175	Lamp UVT	: 100			%	R
176	Lamp Status	: 100			%	R
179	Lamp Age	: 1			Hour	R
184	Lamp Enabled		Coil Bit	Coil is a binary value 0 or 1		R/W
185	Turn On/Off		Coil Bit	When turning on the lamp, need to Set Register to 0 and then to 1 (the feedback from this Register is always 1) Coil is a binary value 0 or 1		R/W
186	Lamp State			7 -> lamp off, 6 -> Lamp Ignition, 4-> Lamp On		
Valves						
200	Bypass Valve		Coil Bit	Coil is a binary value 0 or 1		R
201	Inlet Valve		Coil Bit	Coil is a binary value 0 or 1		R
202	Outlet Valve/Ready		Coil Bit	Coil is a binary value 0 or 1		R
Alarms						
203	General Alarm		Coil Bit	Coil is a binary value 0 or 1		R
207	Min Dose #2		Coil Bit	Coil is a binary value 0 or 1		R
208	High Temp #4		Coil Bit	Coil is a binary value 0 or 1		R
209	Over Temp #5		Coil Bit	Coil is a binary value 0 or 1		R
210	Status Low #6		Coil Bit	Coil is a binary value 0 or 1		R
211	Status Min #7		Coil Bit	Coil is a binary value 0 or 1		R

Appendix A: Modbus Communication Protocol

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Registry address	Registry name	Divide	Type	Comment	Units	Read/Write
212	UVIS < 15 #8		Coil Bit	Coil is a binary value 0 or 1		R
214	High Flow #10		Coil Bit	Coil is a binary value 0 or 1		R
224	Under the Set Dose #41		Coil Bit	Coil is a binary value 0 or 1		R



Appendix B TRACS Upgrade and Troubleshooting

B.1 Upgrading TRACS

Periodic upgrades may be issued for the **Total Reporting Analysis & Control Software (TRACS)**. The upgrades recognize and incorporate the current database.

TRACS Upgrading Phases

Phase 1 Backup the **TRACS** database (see below).

Phase 2 Clear the database. See page **B-2**.

Phase 3 Document all **TRACS** settings and configurations (IP, History intervals, Names etc.) Access the screens using the directions in **Configuring the TRAC Software**, starting from **Configuring the Atlantium Unit Communications ID** on page **8-4** and continuing through **Configuring the Basic System Settings** on page **8-6** and **Registering a Component's Serial Numbers** on page **8-11**.

Phase 4 Uninstall **TRACS** using the **Control Panel** of the computer.

Phase 5 From the installation folder, run **setup.msi**. Follow the wizard.

Phase 6 If an upgrade of the PC Monitor program is required, from the installation folder, copy the file, **PC_MON2** to the folder, **C:\Program Files>Atlantium>Atlantium PC X.XX** and overwrite the older file.

Phase 7 For Windows 7 only, to provide administrative privileges to the **TRACS** application, right-click each of the options below and select **Properties> Compatibility**. Mark the **Run this program as administrator** check box:

- **C:\Program Files>Atlantium>Atlantium PC X.XX>Atlantium.exe**
- **C:\Program Files>Atlantium>Atlantium PC X.XX>PC_MON2.exe**

Phase 8 Restart the computer. The **TRACS** application opens automatically.

Phase 9 Re-enter all of the settings and configuration information you saved in Phase 3 above, following the directions in **Configuring the Atlantium Unit Communications ID** on page **8-4** and continuing through **Configuring the Basic System Settings** on page **8-6** and **Registering a Component's Serial Numbers** on page **8-11**.

Phase 10 Exit **TRACS** and wait for it to reopen automatically.

Phase 11 RUN **TRACS** for one hour and verify that data is collecting properly.

Phase 12 Change the security settings. See **Change the Security Settings** on page **B-2**.

Appendix B: TRACS Upgrade and Troubleshooting

B.1.1 Backing up the TRACS database

⇒ **To backup the TRACS database:**

Step 1. From the **TRACS** main screen, click the **Management** tab. The Management screen appears.

Step 2. At the bottom-right, click **Backup Database**. The Backup Database dialog box notifies you that the database is successfully backed up and specifies the location of the Backup file (as it is configured in the Advanced Configuration settings. See page 8-6.)

Step 3. Click **Finish**. You are returned to the Management screen.

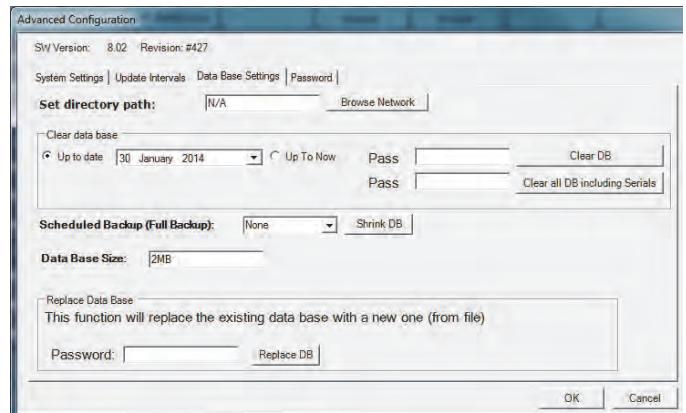


Figure B-1: TRACS Advanced Configuration Window-Database Settings Tab - Export Database

B.1.2 Clearing the TRACS database

⇒ **To clear the TRACS database:**

Step 1. From the **TRACS** main screen, click the **Management** tab. The Management screen appears.

Step 2. On the top-right, click . The Advanced Configuration window appears. The System Settings tab is displayed.

Step 3. Click the **Database Settings** tab.

Step 4. Under **Clear database**, mark the **Clear all** option.

Step 5. In the **Pass** fields, enter the password and press **Clear Data Base**. After a brief period, a message box notifies you that the **Database cleared successfully**.

B.1.3 Change the Security Settings

For optimal performance, configure the security settings on the PC where the **TRACS** is installed according to the directions in this section.

⇒ **To change the security settings:**

Step 1. Access the **Control Panel > System and Security > Windows Firewall > Customize Settings** and turn off all Firewall options.

Step 2. Access the **Control Panel > User Accounts > User Accounts > Change user Account Control Settings** and set **Windows Notifications** slider to **Never notify**.

B.2 TRACS Troubleshooting Issues

For systems with **TRACS**, should you encounter problems during TRACS installation and operation, see the following:

- ***Running Atlantium TRACS failed*** - below
- ***Second Installation Troubleshooting*** on page **B-5**
- ***Second Installation Troubleshooting*** on page **B-5**
- ***TRACS cannot communicate with the Atlantium system*** on page **B-6**
- ***SQL service cannot access the data base*** on page **B-7**
- ***Restoring backed up database failed*** on page **B-7**
- ***Restoring backed up database failed*** on page **B-7**
- ***TRACS cannot find the path to the Data Safe file*** on page **B-8**
- ***Wrong TCP connection signal*** on page **B-8**
- ***Finding the local network area in Win7*** - on page **B-9**
- ***TRACS failed to connect the local controller*** - on page **B-9**
- ***Finding the local network area in Win7*** on page **B-9**
- ***Adobe Acrobat cannot open a report document*** on page **B-10**

B.2.1 Running Atlantium TRACS failed

Running Atlantium TRACS failed - The program cannot establish connection to the SQL. One of the following error message appears:

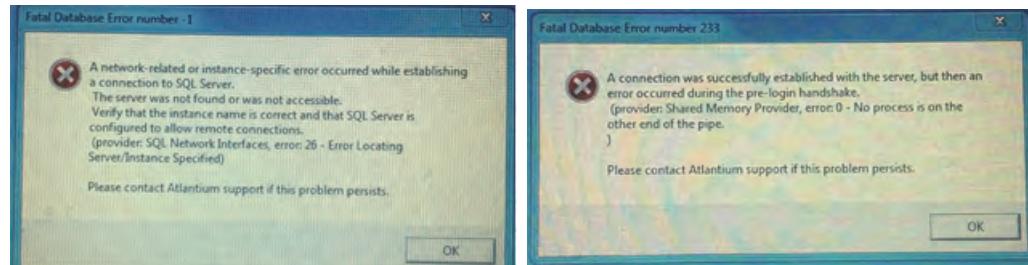


Figure B-2: Possible Error Messages

Possible Cause	Solution
The SQL service has stopped working.	<ul style="list-style-type: none"> ■ Access the Task Manager > Processes and locate and restart the sqlserver.exe service. ■ Restart the TRACS application.

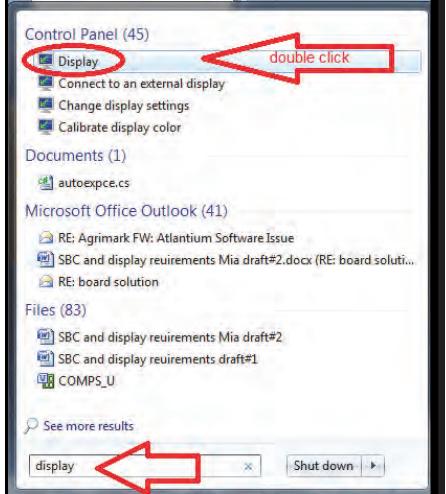
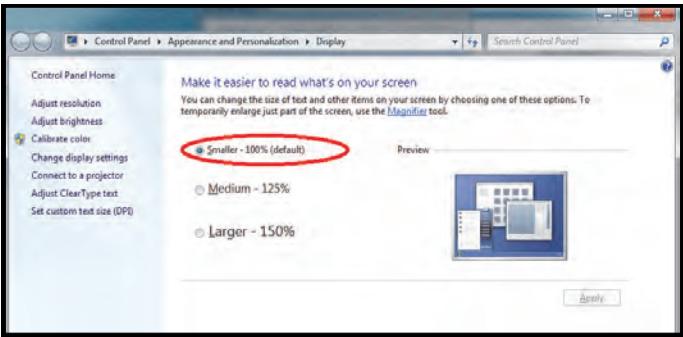
Appendix B: TRACS Upgrade and Troubleshooting

B.2.2 The TRACS display is messy

If the **TRACS** screen display is skewed, the screen display is not set correctly.



Figure B-3: Example of a Skewed Display

Possible Cause	Solution
Windows is set to small display mode.	<p>➊ To correct the display:</p> <p>Step 1. From the Start menu, select Control Panel>Appearance and Personalization>Display.</p>  <p>The screenshot shows the Windows Control Panel with the search bar at the bottom containing the word "display". A red arrow points to the "Display" link under the "Control Panel (45)" heading, which is highlighted with a red oval. Another red arrow points to the search bar.</p> <p>Figure B-4: Windows Control Panel Display Options</p> <p>Step 2. Select Smaller - 100% (Default).</p>  <p>The screenshot shows the "Display" settings page in the Control Panel. Under "Make it easier to read what's on your screen", the "Smaller - 100% (default)" radio button is selected and highlighted with a red oval. Other options include "Medium - 125%" and "Larger - 150%". A preview window on the right shows a desktop with smaller icons.</p> <p>Figure B-5: Windows Control Panel Display Options</p>

B.2.3 Second Installation Troubleshooting

One of the following popup windows appears:

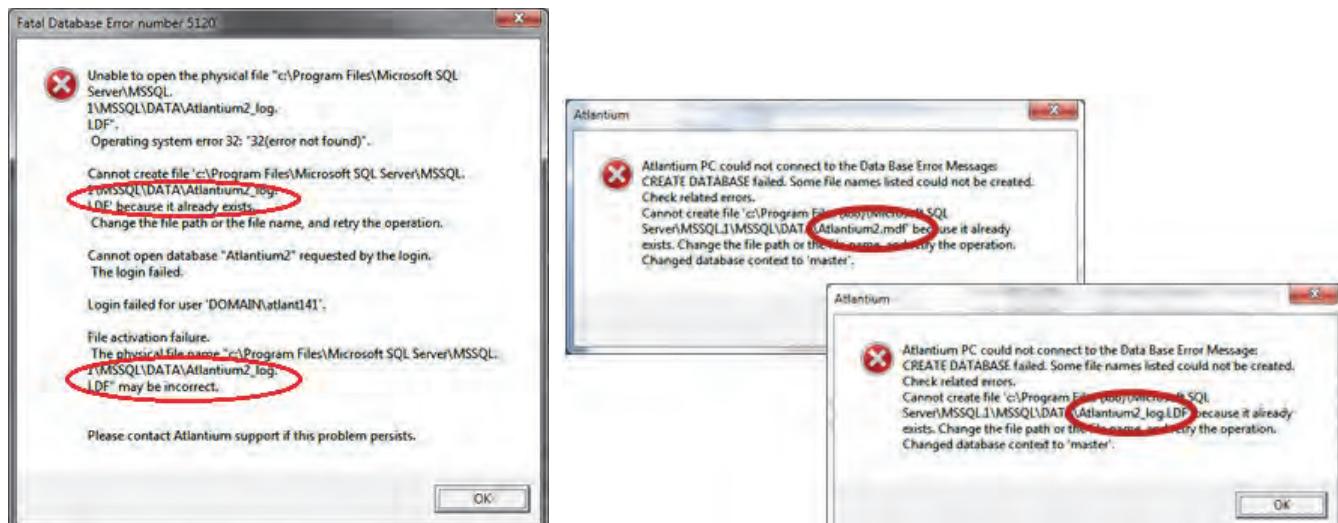


Figure B-6: Possible Error Messages

Possible Cause	Solution
This error message is issued if this is not the first time you installed TRACS on this computer and some of the old files from the previous installation could not be deleted automatically.	<p>Follow the path that is shown in the error message box and delete the files: atlantium2.mdf and atlantium_log.Ldf.</p> <p>If you cannot delete the files, access Services and stop the SQL Server (SQLEXPRESS) service. Then delete the files. When the delete is complete restart the service again.</p>

Figure B-7: Windows Services Screen

Appendix B: TRACS Upgrade and Troubleshooting

B.2.4 TRACS cannot communicate with the Atlantium system

Connection between the TRACS and the Atlantium system cannot be established.

Possible Cause	Solution
The LAN Ethernet cable is disconnected either from the Controller or from the computer or it is damaged.	Make sure that the Ethernet cable is not damaged and is connected properly on both ends. Check that the Connection LEDs are blinking on both connectors.
The Unit check box in the TRACS Management tab is unchecked.	Access the TRACS Management tab and check the Unit check box. See <i>Configuring the Basic System Settings on page 8-6</i> .
The IP Address or Subnet Mask was changed (either on the computer, TRACS or the Controller).	Check that the Atlantium system's IP address and subnet mask are set correctly in the Controller , TRACS and other relevant locations. If you are not familiar with the procedure, contact your local IT personal or Atlantium support for assistance.
You are not running the TRACS as an administrator (In Win 7 only).	For Windows 7 only, to provide administrative privileges to the TRACS application, right-click one of the options below and select Properties>Computability , Mark the Run this program as administrator check box: <ul style="list-style-type: none"> ■ On the Desktop, the TRACS icon, Atlantium PC X.XX ■ On the Start Menu>All Programs>Startup>Atlantium PC Monitor ■ C:\Program Files>Atlantium>Atlantium PC X.XX>Atlantium.exe
Another TRACS program is already connected to the system.	Make sure that there is no other TRACS program that is already connected to the system.

B.2.5 Replacing the part's serial number failed

One of the following error message appears:

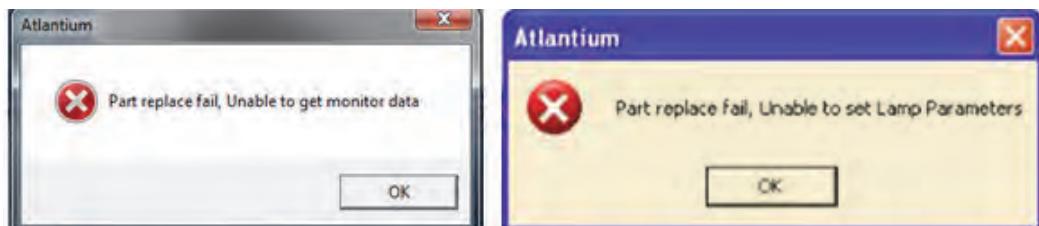


Figure B-8: Possible Error Messages

Possible Cause	Solution
The TRACS computer is not connected to the Controller .	Make sure there is a live connection between the TRACS computer and the Controller .
You may be trying to connect the TRACS computer and the Controller while it is still legacy database data that is interfering.	Via SQL Management , clear all DB tables (Parts, Settings, History etc.) Contact Atlantium's Software department for instructions.

Appendix B: TRACS Upgrade and Troubleshooting

B.2.6 SQL service cannot access the data base

The following error message appears:

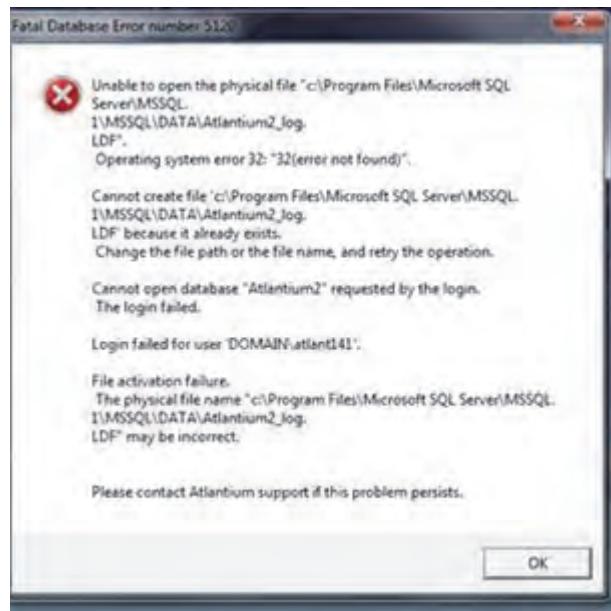


Figure B-9: Database Error Message

Possible Cause	Solution
The SQL service is not responding or is stuck.	Reset the SQL Service. From the Start Menu>Services , locate the SQL Server (MSSQLSERVER) service and restart it.

B.2.7 Restoring backed up database failed

The following error message appears:

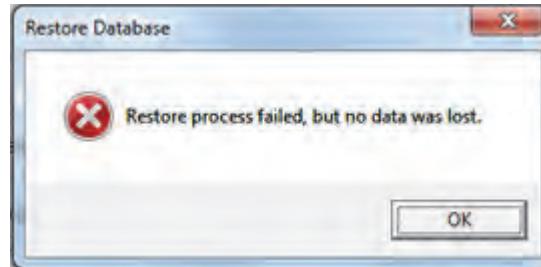


Figure B-10: Possible Error Message

Possible Cause	Solution
The backup file is in an inaccessible location, such as the Desktop or a flash drive.	Make sure that the backup file is in an accessible location such as on a local drive (e.g., C:\)

Appendix B: TRACS Upgrade and Troubleshooting

B.2.8 TRACS cannot find the path to the Data Safe file

The following error message appears:

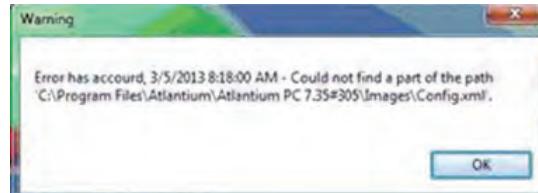


Figure B-11: Possible Error Message

Possible Cause	Solution
The TRACS application cannot find the path to the Data Safe file. You may be trying to upgrade to a new version a computer with the old Watchdog mechanism.	Access Control Panel>Programs>Programs and Features and locate a program called Atlantium Data Safe and remove it.

B.2.9 Wrong TCP connection signal

Wrong TCP connection signal - The computer is not connected to any remote controller but still you can see the connection icon is enabled.



Figure B-12: TRACS Main Screen Disabled Except for the Connection Icon

Possible Cause	Solution
You are not running the application as administrator mode, therefore, you are not allowed to use the TCP/IP connection protocol.	Close the application and run it again as administrator. Or, Restart the computer and run the Atlantium TRACS again as an administrator.

Appendix B: TRACS Upgrade and Troubleshooting

B.2.10 Finding the local network area in Win7

Type on the command line: **view network connection** and double click on the result.



Figure B-13: View Network Connections

B.2.11 TRACS failed to connect the local controller

TRACS failed to connect the local controller although the Ethernet cable is connected

- Close **TRACS**.
- Disconnect the Ethernet cable at the pc side.
- Connect it again and check that there is a green led signal.
- Open View Network Connections and see if the local area connection reports an **unplugged cable**.
 - If yes, you should change Ethernet cable or make sure the physical connection is set right.
 - If not, continue to the next step
- Click Properties and set the TCPIPv4

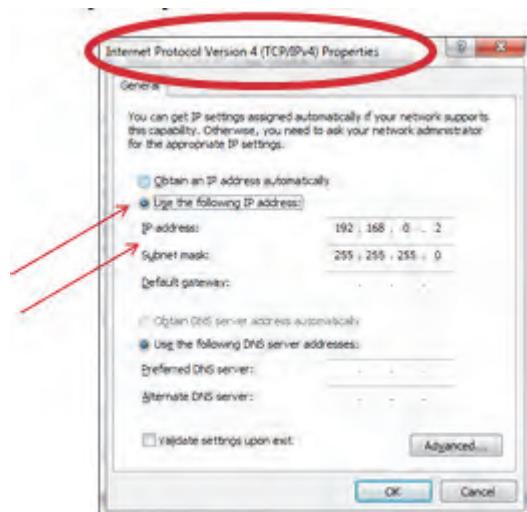


Figure B-14: Internet Protocol Version 4 Properties

- Set the IP address again at the **Controller** and press save.
- Open **TRACS**, set the IP address again and press **Submit**

Appendix B: TRACS Upgrade and Troubleshooting

B.2.12 TRACS failed to restore from an old database backup file

TRACS failed to restore old data base backup file.

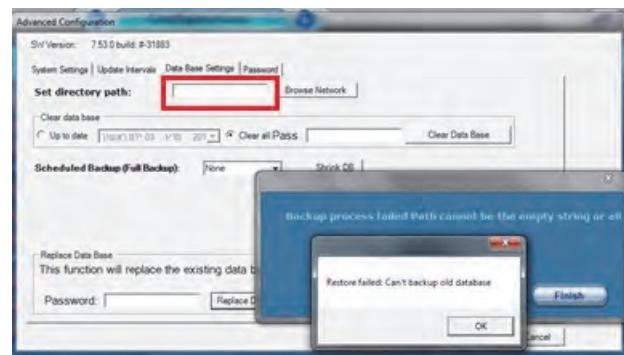


Figure B-15: **TRACS** Configuration Screen Showing Failure Popup

Possible Cause	Solution
TRACS cannot find a location to save the Backup Before Clear DB file because the Directory Path wasn't set.	Set the Directory Path for TRACS to save the backup files, then close the TRACS and re-open it. See <i>Configuring the Basic System Settings</i> on page 8-6.

B.2.13 Adobe Acrobat cannot open a report document

The following error message appears:

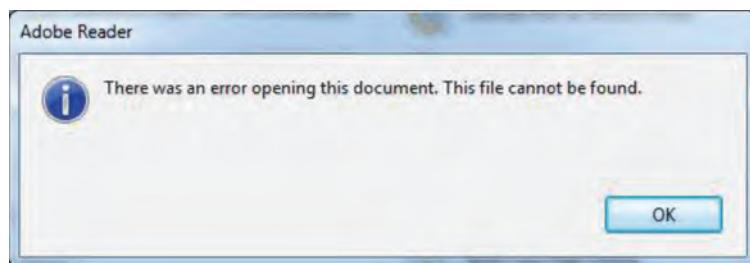


Figure B-16: Possible Error Message

Possible Cause	Solution
You are using a new version of Adobe Acrobat Reader (version XI or higher)	<p>Step 1. Launch Adobe Acrobat Reader XI</p> <p>Step 2. From the Edit menu, select Preferences > Security (Enhanced)</p> <p>Step 3. Uncheck Enable Protected Mode at startup.</p> <p>Step 4. You are prompted to restart Adobe Acrobat for the change to take effect. Click Yes.</p> <p>Step 5. To save your change, click OK.</p> <p>Step 6. Exit Adobe Reader.</p>



Appendix C Checking the System Parameters

You can use the checklist below to keep a record of your checks on Atlantium system parameters. [Print this page.](#)

Table C-1: Atlantium System Parameters Checklist



Appendix D Glossary of Terms

Term	Definition
Auxiliaries	Valves, flow devices, etc. essential to the workings of the Atlantium system but not directly a part of the Atlantium system.
Ballast	The power supply that translates the electrical power to UV power.
Connection Box	The box that sits on top of each lamp unit and holds the circuit board for the Electrical Cabinet or Ballast Module electrical configurations. Not relevant for Ballast Module/Cable-style.
Controller	Controller that controls operations and dose measurement. Comes in two versions: Standard and Premium. The Standard has a monochromatic screen and several key features. The Premium has a color screen can accommodate a full complement of reporting and trending features.
Cooling System	The system that controls the cooling of the lamp to assure its optimal operation.
DPM Cleaner	The Deposit Prevention Mechanism for cleaning the quartz tubes.
External On/Off	This enables an external source (SCADA, PLC, Process) to turn the Atlantium system on and off.

Electrical configuration styles:

Atlantium provides a choice of electrical configurations.

Electrical Cabinet-style (EC)	EC - Electrical Cabinet.
Ballast Module	Waterproof case for the ballast which connects via a consolidated plug from the circuit board which sits on top of each lamp unit.
General Alarm	This enables the Atlantium unit to send an alarm to a buzzer, cell phone or other destination.
Inlet/Outlet Valves	Isolating Valves on the Inlet/outlet sides.
Lamp Chamber	The chamber which holds the lamp.
Lifting Support	The lifting element which can also be used to help support the Unit.
Pinhole	This is a small disc that is fitted for each sensor port to assure that the right amount of light penetrates.
Portable CIP System	The portable unit Atlantium sells that connects to the Unit to clean and disinfect it without disassembling. It includes several kits – a valve kit, an accessories kit and the CIP kit itself.
Quartz Chamber	The quartz pipe in which the disinfection occurs.
System Ready Signal	The signal the Atlantium unit provides to tell the production system that the machine is ready to supply properly disinfected water.

Appendix D: Glossary of Terms

Term	Definition
System Tuning	This process is performed when key components are replaced or changed to synchronize them.
TRAC Software	Total Reporting Analysis & Control Software System ; the software application that controls dose measurement and maintenance, and stores, analyzes and reports real time; enables viewing and controlling operations remotely for up to 9 Atlantium systems on one TRAC System. Provides full validated control and One-Touch pre-programmed reports for regulatory compliance with EPA and PMO rules.
Triangle Support Brackets	RZ-Series only- brackets that can be used to support and balance a unit.
Ultrasonic Cleaner	Ultrasonic cleaning system.
UV Intensity Sensor	The sensor that measures the UV intensity in the Lamp chamber and feeds the real time dose calculation.
UVIS Calibration	This is the EPA required process to check that the UV Intensity Sensor is reading correctly and has not drifted beyond the 20% tolerance allowed by the UVDGM.
UVT Analyzer	The sensor that measures the lamp UV intensity through the water. Together with the UV Intensity sensor and the Controller, it analyzes, tracks and reports the water quality.
UVT Analyzer Calibration	This is the EPA required process to check that the UVT Analyzer is reading within 2% of the actual UVT.
Validation Envelope	This is the matrix of flow, power and UVT values that are covered by the EPA validation.