

# GUARDIAN AMALGAM COLLECTOR USER'S MANUAL



# FOREWARD

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This manual covers the installation of the various Guardian Amalgam Collector kits available from Air Techniques. Please read this document completely as it provides instructions for all Guardian Amalgam Collector usage configurations. These include:

- Replacing a **filled** Guardian Amalgam Collector.
- Adding to an **existing** Air Techniques STS Dry Vacuum System with a CAS Separator Tank.
- Adding to an **existing** Dry Vacuum System not using a CAS Separator Tank.
- Adding to **any existing** single or dual liquid ring vacuum system (VacStar 50, 80, or competitor).
- Installing as part of a **new** Air Techniques STS/CAS System.

The manual also provides maintenance instructions, as well as, troubleshooting and replacement parts information. Make sure to review and follow the information specific to your installation to ensure that the Guardian Amalgam Collector gives the highest level of service.

**Important:** Each kit described in this manual provides the necessary parts to connect 3/4-inch diameter hose using NPT fittings. If the existing tank needs different size fittings or hose lengths, they must be provided by the installer.

## TABLE OF CONTENTS

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Introduction . . . . .	.3
Specifications . . . . .	.3
Warranty . . . . .	.3
On-Line Warranty Registration . . . . .	.3
Amalgam Collector Kit Usage . . . . .	.4
Installation Information . . . . .	.6
Kit PN A1100 Installation Procedures . . . . .	.8
Kit PN A1200 Installation Procedures . . . . .	.10
Kit PNs A15C1 - A15C6 Installation Procedures . . . . .	.12
Kit PNS A1300 & A1400 Installation Procedures . . . . .	.14
Kit PN A1500 Installation Procedures . . . . .	.18
Maintenance . . . . .	.20
Scheduled Replacement and Proper Disposal . . . . .	.22
Collector Replacement Kit PN A1010 . . . . .	.23
Troubleshooting . . . . .	.24
Replacement Parts . . . . .	.26

## INTRODUCTION

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The Guardian Amalgam Collector is designed to remove in excess of 99% amalgam from a dental suction system's wastewater stream. The Guardian Amalgam Collector utilizes a sedimentation process where high-density particles (Amalgam) fall from suspension in the wastewater stream and become trapped within the Collector. The unit has been independently tested and certified to ISO 11143.

The Guardian Amalgam Collector is installed between the Dental Suction System Separator/Collection Tank and the building sewer drain.

## SPECIFICATIONS

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### Guardian Amalgam Collector System

Collector dimensions:	<u>Length</u> 10.5 in. (26.67 cm)	<u>Width</u> 6¼ in. (15.88 cm)	<u>Height</u> 7.5 in. (19.05 cm)
Collector volume:	3.4 liters (0.9 gallons)		
Effluent flow rate:	2.5 liters per minute		
Separator efficiency	Greater than 99%		
Expected time to fill	See page 4 -Scheduled Replacement & Proper Disposal		
Maximum positive pressure in Collector	2 psi, 4 foot water column		
Maximum negative pressure in Collector	20 In Hg		
Connection size	3/4 Insert (barb fitting)		
International Certification:	ISO 11143		

## WARRANTY

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This Air Techniques equipment is warranted to be free from defects in material and workmanship for a period of twelve months from the date of installation by authorized Air Techniques Dealer service personnel.

Any item returned to our factory during the warranty period through an Authorized Dealer will be repaired or replaced at our option at no charge provided that our inspection shall indicate it is defective. Dealer labor, shipping and handling charges are not covered by this warranty.

This warranty does not apply to damage due to shipping, misuse, careless handling or repairs by non-authorized service personnel. Warranty void if installed or serviced by other than authorized service personnel. Air Techniques, Inc. is not liable for indirect or consequential damages or loss of any nature in connection with this equipment.

This warranty is in lieu of all other warranties expressed or implied. No representative or person is authorized to assume for us any liability in connection with the sale of our equipment.

## ON-LINE WARRANTY REGISTRATION

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Quickly and easily register your new Guardian Amalgam Collector on-line. Just have your product model and serial numbers available. Then go to the Air Techniques website, [www.airtechniques.com](http://www.airtechniques.com), click the **warranty link** and complete the registration form. This on-line registration ensures a record for the warranty period and helps Air Techniques keep you informed of product updates and other valuable information.

# AMALGAM COLLECTOR KIT USAGE

Table 1. Guardian Amalgam Collector Replacement Kit

Sales Number	Included Components
<b>A1010</b>	Guardian Amalgam Collector Replacement Kit. See page 23 for replacement instructions. Includes one Amalgam Collector used as a direct replacement.

Table 2. Guardian Amalgam Collector Starter Kits

Sales Number	Included Components
<b>A1100</b>	Guardian Amalgam Collector Starter Kit A1. See page 8 for installation instructions. Use with <b>any</b> dry vacuum system (other than Air Techniques' STS/CAS) with a tank capacity of 8 gallons or less. Kit includes: 1 Guardian Amalgam Collector with required parts for installation. 1 Replacement Guardian Amalgam Collector, PN A1010.
<b>A1200</b>	Guardian Amalgam Collector Starter Kit A2. See page 10 for installation instructions. Use with any existing Air Techniques' STS/CAS (4 or 8-gallon CAS). Kit includes: 1 Guardian Amalgam Collector with required parts for installation. 1 Replacement Guardian Amalgam Collector, PN A1010.
<b>A1500</b>	Guardian Amalgam Collector Starter Kit A3. See page 18 for installation instructions. Use with the STS 15 or 30 (20-gallon CAS) or any dry vacuum system (other than Air Techniques' STS/CAS) with a tank capacity of 8 gallons or more. Kit includes: 2 Guardian Amalgam Collectors with required parts for installation. 2 Replacement Guardian Amalgam Collectors, PN A1010.
<b>A1300</b>	Guardian Amalgam Collector Starter Kit B1. See page 14 for installation instructions. Use with any single liquid ring vacuum system (VacStar 10, 20, 40, or competitor) Kit includes: 1 Guardian Amalgam Collector with required parts for installation. 1 Replacement Guardian Amalgam Collector, PN: A1010. 1 4-gallon CAS and tank stand assembly, PN 54800
<b>A1400</b>	Guardian Amalgam Collector Starter Kit B2. See page 14 for installation instructions. Use with any dual liquid ring vacuum system (VacStar 50, 80, or competitor). Kit includes: 1 Guardian Amalgam Collector with required parts for installation. 1 Replacement Guardian Amalgam Collector, PN A1010. 1 8-gallon CAS and tank stand assembly, PN 54380

**Note:** All kits include all materials needed to send filled Collector to a recycling company for disposal, free of charge.

## **AMALGAM COLLECTOR KIT USAGE**

Table 3. Vacuum Systems with Guardian Amalgam Collector Kits

<b>Sales Number</b>	<b>Included Components</b>
<b>A15C3</b>	<p>Complete STS-3 Dry Vacuum Single Pump System with 4-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>
<b>A15C4</b>	<p>Complete STS-3 Dry Vacuum Single Pump System with 8-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>
<b>A15C1</b>	<p>Complete STS-5 Dry Vacuum Single Pump System with 8-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>
<b>A15C5</b>	<p>Complete STS-6 Dry Vacuum Dual Pump System with 4-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>
<b>A15C6</b>	<p>Complete STS-6 Dry Vacuum Dual Pump System with 8-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>
<b>A15C2</b>	<p>Complete STS-10 Dry Vacuum Dual Pump System with 8-gallon CAS tank and Guardian Amalgam Collector Kit. See page 12 for installation instructions.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> <li>1 Guardian Amalgam Collector with required parts for installation.</li> <li>1 Replacement Guardian Amalgam Collector, PN A1010.</li> </ul>

**Note:** All kits include all materials needed to send filled Collector to a recycling company for disposal, free of charge.

# **INSTALLATION INFORMATION**

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## **All Guardian Amalgam Collector Models Except Kit PN A1100:**

- Once installation is complete and **all** connections have been made and BEFORE STARTING VACUUM PUMP, rotate the ¼ turn valve to the open position (so that the red handle is parallel to the direction of flow). This valve must remain open at all times except when the vacuum system or Guardian Amalgam Collector is being serviced by authorized dealer service personnel.
- The CAS Separation Tank is equipped with a vacuum relief valve that is factory preset to 10 in. Hg (inches of mercury). This is the reading observed from the vacuum gage when all HVE's and SE's are closed. If this setting needs to adjustment, contact your dealer.
- The CAS Separation Tank is designed to collect the materials evacuated during a normal operating day. If an excessive amount of fluids are collected in the CAS, a protective mechanism will interrupt vacuum flow, automatically draining the tank. Draining takes approximately 7 minutes for a 4-gallon tank (with an Amalgam Collector), about 12 minutes for an 8-gallon tank (with an Amalgam Collector) and about 20 minutes for a 20-gallon tank (with two Amalgam Collectors).
- Restore vacuum to full operation by turning off the power to the vacuum pump, waiting a minimum of 2 minutes, and then turning the power to the vacuum pump back on.
- Turn off the power to the vacuum pump at the end of the day. This will drain collected liquids in the CAS Separation Tank.
- The CAS Separation Tank automatically drains any time power to the vacuum pump is shut off.

## **Guardian Amalgam Collector Kit PN A1100:**

- Kit PN A1100 is **only** intended for a dry vacuum system with an existing separation tank that is **not** an Air Techniques CAS.  
**Caution:** Tanks **not** equipped with a vacuum shut-off mechanism may pass excess liquid, which can potentially damage the the vacuum source.
- Separation tanks other than an Air Techniques CAS **may not** be equipped with a protective mechanism that shuts off vacuum if the separation tank fills with an excessive amount of liquids. As a result, the excess liquids may travel to and reach the vacuum source.

## **Amalgam Collector Kits.**

Tables 1 through 3 list the unique Sales Numbers of the several different available configurations of Guardian Amalgam Collector kits along with the page number of the applicable installation instructions. As shown by Figure 1, each Collector package is designed to be installed between the Dental Suction System Separator/Collection Tank and the building sewer drain providing the same ISO 11143-certified cleansing of the dental suction system's wastewater stream.

**Spare Amalgam Collector.** Table 1 shows the basic core unit of the Guardian Amalgam Collector, PN A1010. This unit is sold without any connection fittings or hoses and is available as a direct replacement of a filled the Amalgam Collector previously installed in your system.

**Amalgam Collector Starter Kits.** Table 2 lists the available Guardian Amalgam Collector Starter Kits used to add the collector to the following systems:

- Any dry vacuum system (other than Air Techniques' STS/CAS)
- Any existing Air Techniques' STS/CAS dry vacuum system (4 or 8-gallon CAS).
- Air Techniques' STS 15 or 30 dry vacuum system (20-gallon CAS)
- Any single liquid ring vacuum system (VacStar 10, 20, 40, or competitor)
- Any single liquid ring vacuum system (VacStar 50, 80 or competitor)

**STS/CAS Systems with Collector Kits.** Table 3 lists the available Guardian Amalgam Collector Kits included with new Air Techniques STS/CAS dry vacuum systems.

# INSTALLATION INFORMATION

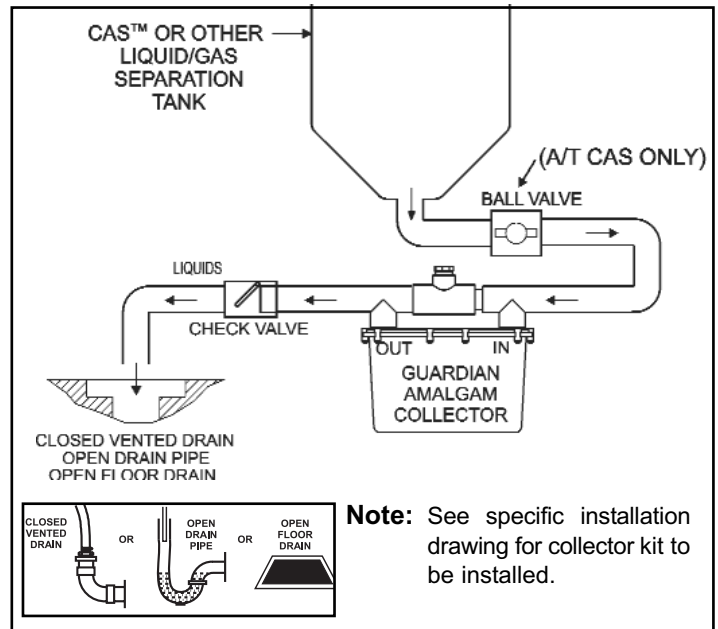
**Note:** All kits include all materials needed to send filled Collector to Bethlehem Apparatus, Inc. for recycling, free of charge.

## Installation Requirements

As shown by Figure 1, each collector package is designed to be installed between the Dental Suction System Separator/Collection Tank and the building sewer drain providing the same ISO 11143-certified cleansing of the dental suction system's wastewater stream.

The Guardian Amalgam Collector and the Separation Tank must be located so that the system will drain by gravity. In order to accomplish this, the system installation must meet the following 4 requirements:

1. The Guardian Amalgam Collector must be located so that the inlet of the Collector is a minimum of 6 inches below the outlet of the existing separation tank.
2. Users must also determine the height on their separator tank at which the maximum amount of liquids may accumulate. The Guardian Amalgam Collector must be located, such that the inlet of the Collector is no greater than 4 feet (48 inches) below the maximum height liquids may accumulate inside the existing separator tank.
3. The building drain must be located a minimum of 4 inches below the inlet of the Guardian Amalgam Collector.
4. The outlet of the Guardian Amalgam Collector must be connected to an open floor or vented drain (recommended drain pipe size is 1-1/2 inch diameter schedule 40).



**Figure 1.**  
**Guardian Amalgam Collector Flow Diagram**

## Guardian Amalgam Collector Installation

Refer to Tables 1 through 3, locate the Sales Number of the Guardian Amalgam Collector package to be installed and perform the installation in accordance with the instructions provided by the referenced page number for the corresponding collector package.

Refer to the following applicable documentation for specific vacuum system installation information as necessary.

<input type="checkbox"/> STS-3 and STS-6 Dry Vacuum Single Pump System	PN 54430
<input type="checkbox"/> STS-5 and STS-10 Dry Vacuum Single Pump System	PN 54340
<input type="checkbox"/> STS-15 and STS-30 Dry Vacuum Single Pump System	PN 54105
<input type="checkbox"/> STS Preinstallation Guide	PN 54360
<input type="checkbox"/> Vactstar User Manual (covers all models, 10 through 80)	PN 55151
<input type="checkbox"/> Vacstar Preinstallation Guide (Vacstar 10, 20, 40)	PN 55341
<input type="checkbox"/> Vacstar Preinstallation Guide (Vacstar 50, 50H, 80 & 80H)	PN 55349

# **KIT PN A1100 INSTALLATION PROCEDURES**

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## **Installation of Guardian Amalgam Collector Starter Kit, PN A1100**

The following instructions provide the information necessary to add a Guardian Amalgam Collector to a dry vacuum system with an existing separation tank that is **not** an Air Techniques CAS using Guardian Amalgam Collector Starter Kit, PN A1100. Kit PN A1100 is for systems that have tanks no larger than 8 gallons. Refer to kit, PN A1500 ( page 18), for collector installation on **non-CAS type** separator tanks over 8 gallons. This modification is to be performed by authorized Air Techniques Dealer service personnel. The kit provides the necessary parts to connect 3/4-inch diameter hose using NPT fittings. If the existing tank needs different fittings or hose lengths, they must be provided by the installer. Refer to Figure 2 and install the Guardian Amalgam Collector Starter Kit, PN A1100, as follows.

**Warning:** The following steps should be performed while wearing skin and eye protection. Any area where material from the tank has spilled, should be thoroughly disinfected.

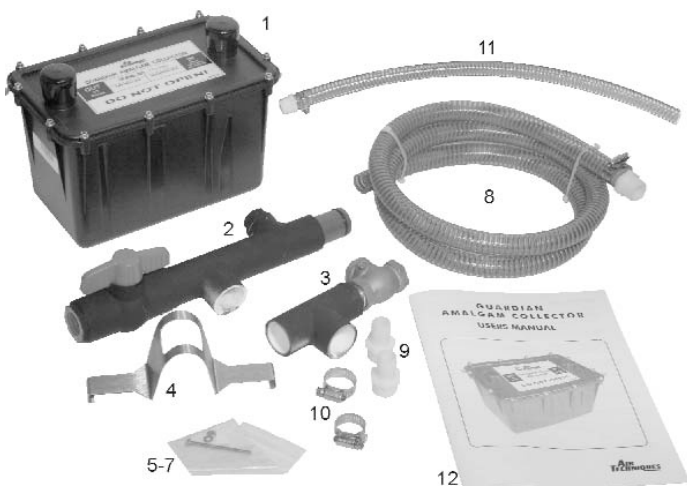
1. Shut off vacuum pump and allow tank to drain.
2. Assemble the manifold connector by pressing the Outlet Fitting Assembly (item 3) onto the Inlet Fitting Assembly (item 2) making sure that both connector fittings are facing the same direction.
3. Unpack the Guardian Amalgam Collector (item 1) and remove the two shipping caps. Make sure to keep the caps and packing material for future repackaging of the collector.
4. Align the manifold connector fittings to the inlet and outlet ports of the collector making sure that the inlet side fitting (red handle side) of the manifold connector corresponds to the collector inlet port (as labeled) while the outlet side fitting aligns with the labeled outlet port of the collector.
5. Connect the manifold connector by pressing the fittings onto the associated ports of the collector.
6. Install the manifold connector clamp (item 4) over the manifold and secure to the Amalgam Collector with the screw, washer and nut (items 5, 7 and 6).
7. Place the Amalgam Collector on a flat surface observing the installation requirements outlined on page 7 of this manual.
8. Disconnect and discard existing connection hose between tank drain and the drain of the facility.

**Note:** Kit PN A1100 provides the necessary parts to connect 3/4-inch diameter hose using NPT fittings. If the existing tank needs different size fittings or hose lengths, they must be provided by the installer.

Apply Teflon tape or pipe thread sealant to threaded surfaces prior to installation.

9. Measure the distance between the outlet of the tank drain fitting and the inlet fitting (red handle side) of the manifold connector. Cut the required length from the supplied 3/4-inch 2-foot hose (item 11) and install a 3/4-inch NPT fitting adapter (item 9) into the cut end of the hose and secure with hose clamp (item 10)
10. Install the length of the 3/4-inch diameter hose (item 11) with fittings between the outlet of the tank drain fitting and the inlet fitting (red handle side) of the manifold connector.
11. Cut the 3/4-inch 6-foot hose (item 8) to length as necessary to connect the collector output to the facility drain. Install a 3/4-inch NPT fitting adapter (item 9) into the cut end of the hose and secure with hose clamp (item 10).
12. Connect hose between the outlet fitting of the manifold connector and the facility drain, which must be an open floor or vented drain.
13. Rotate the 1/4-Turn (Red Handle) valve to the open position as shown. Re-start the vacuum system and check for leaks.

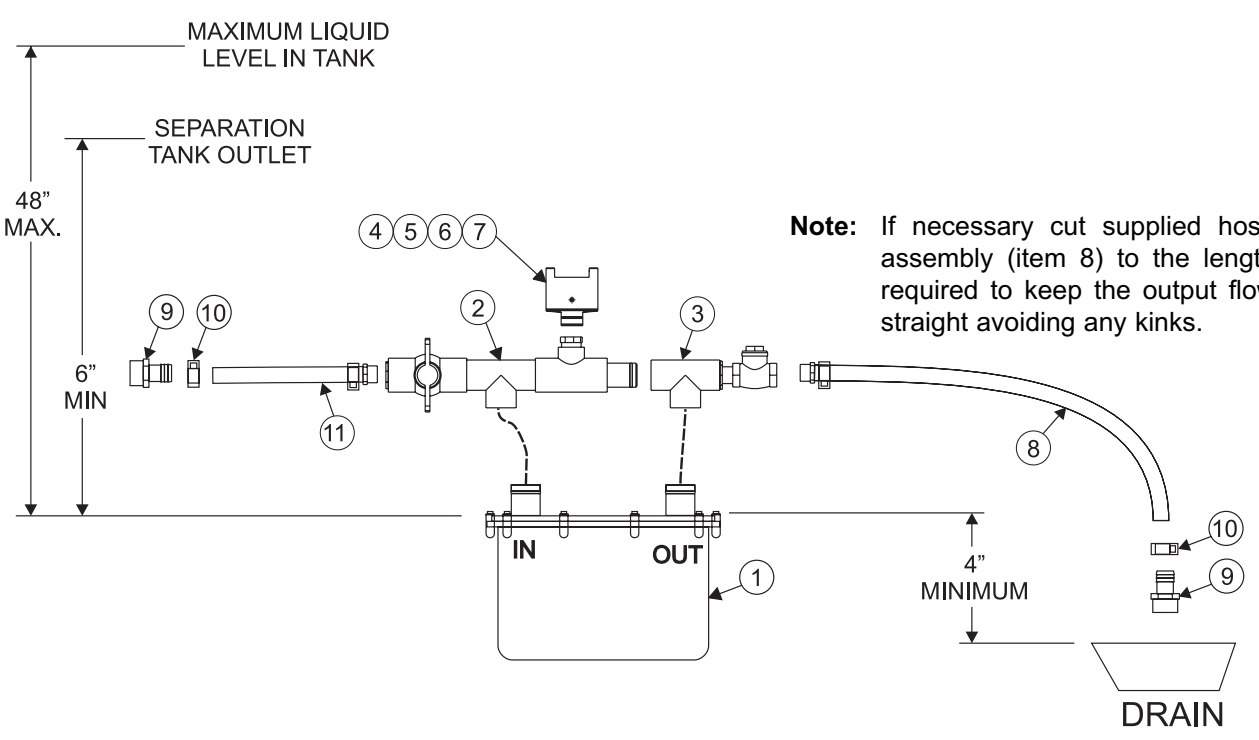
# KIT PN A1100 INSTALLATION PROCEDURES



Kit Components		
PART No.	DESCRIPTION	QTY.
1	A1010 Amalgam Collector	1
2	A1159 Inlet Fitting Assembly	1
3	A1161 Outlet Fitting with Check Valve Assembly	1
4	A1162 Clamp	1
5	30926 Screw 8-32x2 1/2- Inch length	1
6	31577 Nut 8-32	1
7	30028 Washer	1
8	A1182-2 6-foot Hose Assembly	1
9	55926 3/4-Inch Adapter	2
10	41211 Hose Clamp	2
11	A1182-1 2-foot Hose Assembly	1
12	A1208 User Manual	1

**Note:** Additional (replacement) Guardian Amalgam Collector, PN A1010, not shown.

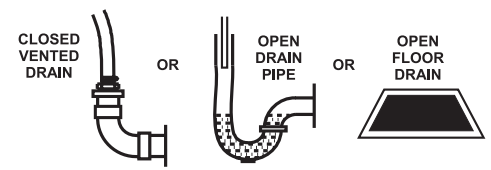


**Note:** If necessary cut supplied hose assembly (item 8) to the length required to keep the output flow straight avoiding any kinks.

**Important:** It is required that the outlet of the Guardian Amalgam Collector be connected to an open floor or vented drain. See Installation Requirements page 7.

**DRAIN INSTALLATION**



**Figure 2. Installation and Parts of Guardian Amalgam Collector Starter Kit, PN A1100**

# **KIT PN A1200 INSTALLATION PROCEDURES**

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## **Installation of Guardian Amalgam Collector Starter Kit, PN A1200**

The section provides the information necessary to add a Guardian Amalgam Collector to an existing Air Techniques STS Dry Vacuum System with a 4 or 8 gallon CAS Separator Tank using Guardian Amalgam Collector Starter Kit, PN A1200. Kit PN A1200 is for systems that have tanks no larger than 8 gallons. Refer to kit, PN A1500 (page 18), for collector installation on CAS type separator tanks over 8 gallons. This modification is to be performed by authorized Air Techniques Dealer service personnel. Refer to Figures 4 through 6, and install the Guardian Amalgam Collector Starter Kit, PN A1200, by performing the procedures below. When an existing STS Dry Vacuum System has a painted (Old Style) CAS tank, the tank must be relocated as described below.

**Note:** Performed tank relocation first only on systems with an (Old Style)CAS tank.  
For systems with new style CAS tanks, proceed directly to the procedures on page 14.

## **Old Style/New Style CAS Tank Relocation for Kit PN A1200 Only**

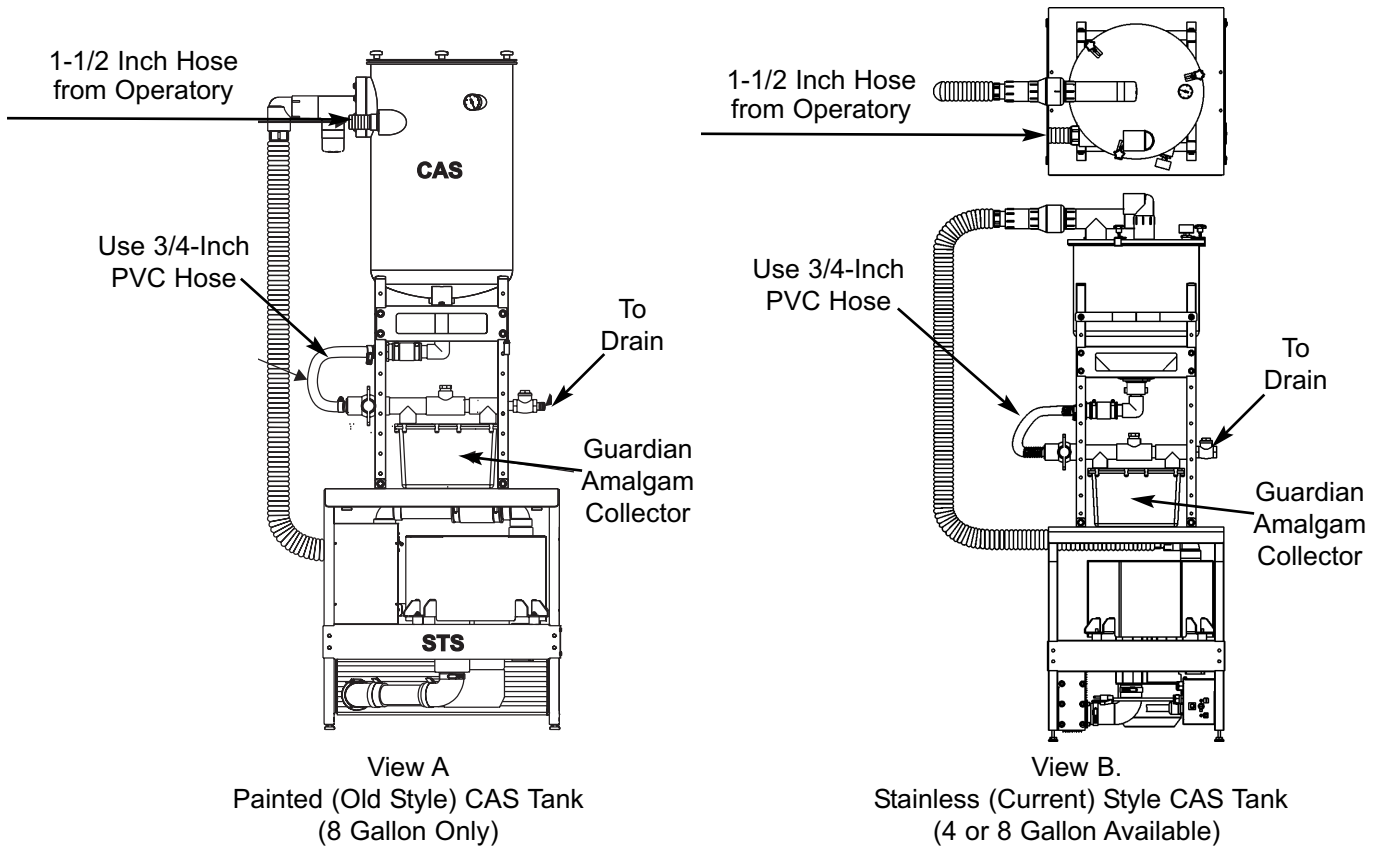
STS legacy systems were supplied with two different CAS Separator Tanks shown by Figure 4. Previous (first generation) STS-5 and STS-10 models were supplied with an old style CAS tank. The old style CAS is a painted 8 gallon tank with side-mounted inlet and outlet connections. All current STS units ship with the new style CAS tanks, which are non-painted stainless steel tanks available in 4 and 8 gallon capacities. When adding a Guardian Amalgam Collector to an existing STS Dry Vacuum System with a painted (Old Style) CAS tank, the tank must be relocated to an elevated position on the stand in order to fit the collector underneath. This modification should be performed by authorized Air Techniques Dealer service personnel. Refer to Figures 3 and 4, and perform the following procedures.

**Warning:** The following steps should be performed while wearing skin and eye protection.  
Any area where material from the tank has spilled, should be thoroughly disinfected.

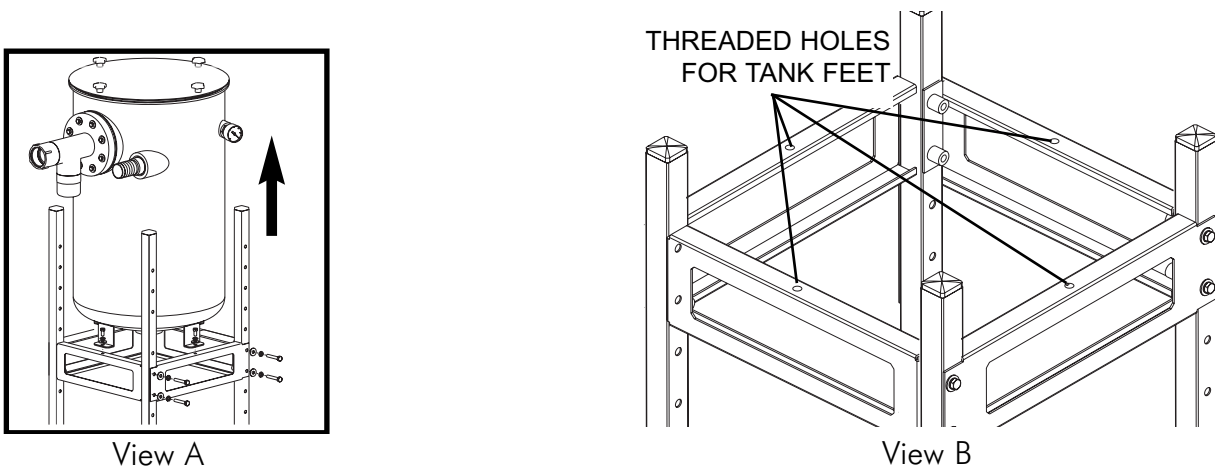
1. Shut off vacuum pump and allow CAS Separator Tank to drain.
2. Disconnect and discard existing connection hose and check valve between tank drain and the drain of the facility.
3. Label the suction and return hoses that are connected to the tank. These hoses must be reconnected to each original location after the tank is re-installed.
4. Disconnect the suction and return hoses from the tank and place those hoses aside.
5. Prepare a safe location to set the separation tank aside when it is removed.
6. Unscrew the four bolts that fasten the tank feet to the frame, carefully lift the tank from the frame and place it in that location (see Figure 4, View A).
7. The horizontal frame components must be relocated to the top two holes of the legs. As shown by Figure 4, unscrew the bolts from these components and locate the components to the elevated position.
8. Install the 4 components in the same orientation as before, making sure the threaded holes for the tank feet are on the top of the frame (see Figure 4, View B). Re-install the tank on the stand.
9. Reconnect the suction and return hoses to their prior location on the CAS Tank. Use 1-1/2 diameter hose, PN 54118, (ordered by the foot) if additional hose is required.
10. Install the Amalgam Collector by performing the installation procedure on page 12.

# KIT PN A1200 INSTALLATION PROCEDURES

**Note:** The tank must be raised on the stand to add a collector to systems with the Old Style CAS tank.



**Figure 3. Typical Stacked Configuration with a Guardian Amalgam Collector Kit, PN A1200 Installed**



**Figure 4. Raising the Old Style CAS on the Tank Frame**

# **KIT PN A1200 INSTALLATION PROCEDURES**

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**Note:** Make sure to perform tank relocation procedures on page 10 before installing the Amalgam Collector if system has an Old Style CAS tank.

## **Guardian Amalgam Collector Installation Procedure**

The following instructions provide the information necessary to add a Guardian Amalgam Collector to an existing Air Techniques STS Dry Vacuum System with a 4 or 8 gallon CAS Separator Tank using Guardian Amalgam Collector Starter Kit, PN A1200. Refer to Figure 5, and perform the procedures

**Warning:** The following steps should be performed while wearing skin and eye protection. Any area where material from the tank has spilled, should be thoroughly disinfected.

1. Shut off vacuum pump and allow tank to drain if necessary.
2. Assemble the manifold connector by pressing the Outlet Fitting Assembly (item 3) onto the Inlet Fitting Assembly (item 2) making sure that both connector fittings are facing the same direction.
3. Unpack the Guardian Amalgam Collector (item 1) and remove the two shipping caps. Make sure to keep the caps and packing material for future repackaging of the collector.
4. Align the manifold connector fittings to the inlet and outlet ports of the collector making sure that the inlet side fitting (red handle side) of the manifold connector corresponds to the collector inlet port (as labeled) while the outlet side fitting aligns with the labeled outlet port of the collector.
5. Connect the manifold connector by pressing the fittings onto the associated ports of the collector.
6. Install the manifold connector clamp (item 4) over the manifold and secure to the Amalgam Collector with the screw, washer and nut (items 5, 7 and 6).
7. Place the Amalgam Collector on a flat surface observing the installation requirements outlined on page 7 of this manual.
8. Disconnect and discard existing connection hose and check valve between tank drain and the drain of the facility.

**Note:** Apply Teflon tape or pipe thread sealant to threaded surfaces prior to installation.

9. Install Flexible Rubber Coupling (item 8) to the tank drain fitting and secure by tightening the supplied hose clamp.
10. Install the 3/4-inch 2-foot hose (item 9) into the Flexible Rubber Coupling (tank drain) and secure with the supplied hose clamp. Install the other end of hose (item 9) onto the inlet fitting (red handle side) of the manifold connector.
11. Cut the 3/4-inch 6-foot hose (item 10) to length as necessary to connect the collector output. Install a 3/4-inch NPT fitting adapter (item 11) into the cut end of the hose and secure with hose clamp (item 12).
12. Connect hose between the outlet fitting of the manifold connector and the building drain, which must be an open floor or vented drain.
13. Rotate the 1/4-Turn (Red Handle) valve to the open position as shown. Re-start the vacuum system and check for leaks.

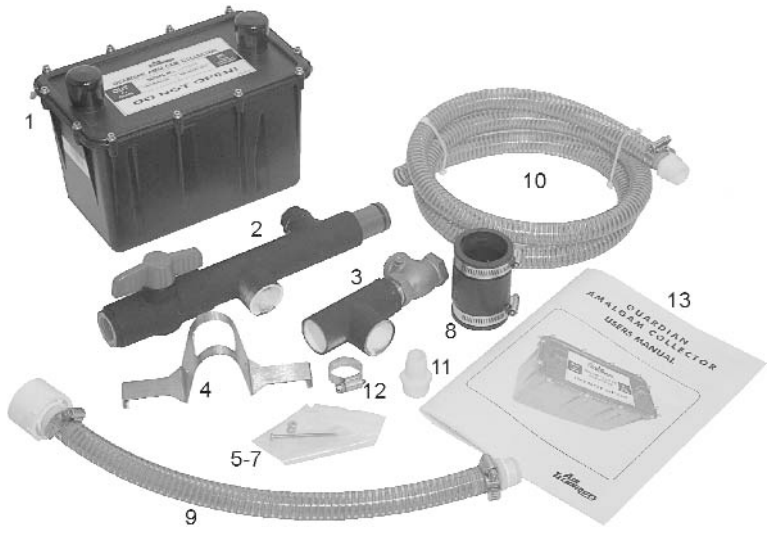
# **KITS PNs A15C1 - A15C6 INSTALLATION PROCEDURES**

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## **Installation of Systems with Guardian Amalgam Collector Kits, PNs A15C1 - A15C6**

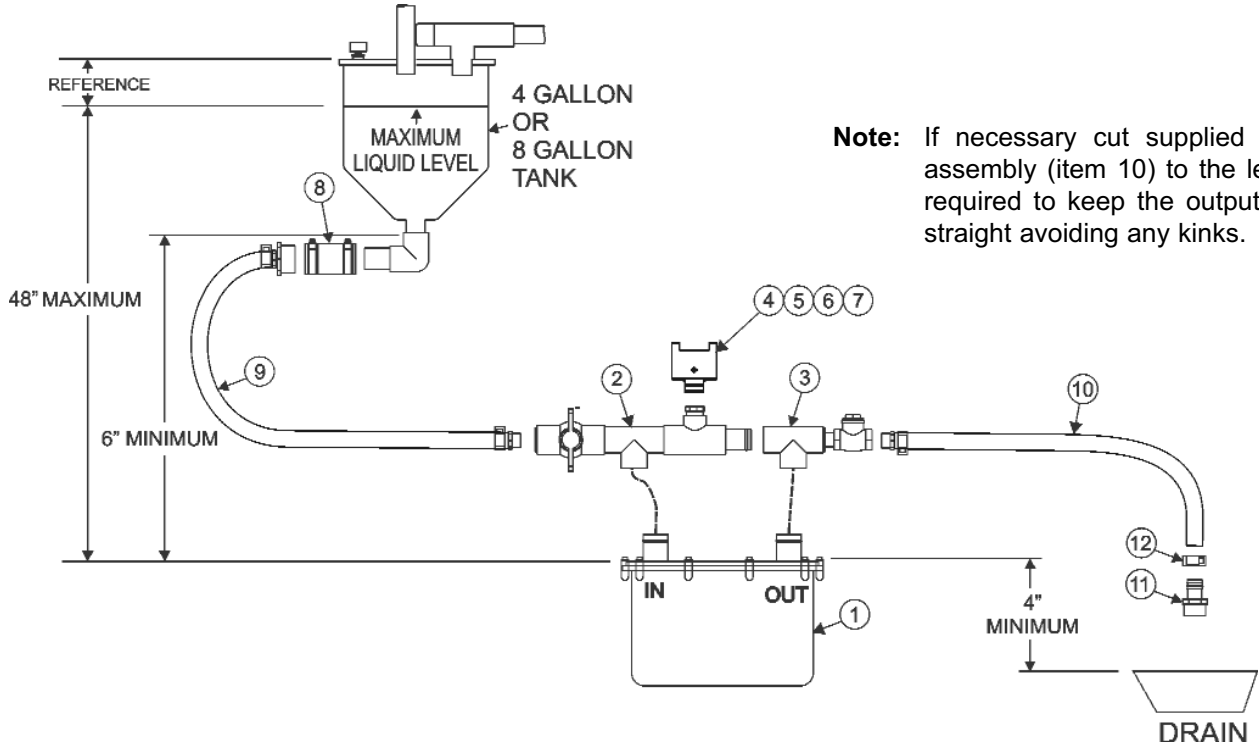
This installation category pertains to Kit PNs A15C1 through A15C6 listed in Table 3. Each kit includes a Guardian Amalgam Collector as part of a new Air Techniques STS/CAS System with 4 or 8 gallon CAS Separator Tanks (new type). Installation procedures for PN A15C1 through A15C6 are identical to the procedures for the Guardian Amalgam Collector Starter Kit, PN A1200, above. All installations are to be performed by authorized Air Techniques Dealer service personnel.

# KIT PN A1200 INSTALLATION PROCEDURES



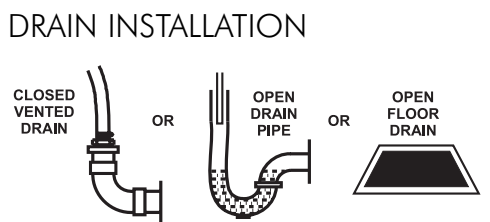
Kit Components		
PART No.	DESCRIPTION	QTY.
1	A1010 Amalgam Collector	1
2	A1159 Inlet Fitting Assembly	1
3	A1161 Outlet Fitting with Check Valve Assembly	1
4	A1162 Clamp	1
5	30926 Screw 8-32x2 1/2" length	1
6	31577 Nut 8-32	1
7	30028 Washer	1
8	57238 Flexible Rubber Coupling	1
9	A1146 Hose Assembly	1
10	A1182-2 6 foot Hose Assembly	1
11	55926 3/4" Adapter	1
12	41211 Hose Clamp	1
13	A1208 User Manual	1

**Note:** Additional (replacement) Guardian Amalgam Collector, PN A1010, not shown.



**Note:** If necessary cut supplied hose assembly (item 10) to the length required to keep the output flow straight avoiding any kinks.

**Important:** It is required that the outlet of the Guardian Amalgam Collector be connected to an open floor or vented drain. See Installation Requirements page 7.



**Figure 5. Installation of Guardian Amalgam Collector Kit, PNs A1200, A1300 and A1400**

# **KIT PNs A1300 & A1400 INSTALLATION PROCEDURES**

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**Warning:** The following steps should be performed while wearing skin and eye protection.  
Any area where material from the tank has spilled, should be thoroughly disinfected.

## **Installation of Guardian Amalgam Collector Starter Kits, PN A1300 and A1400**

The following instructions provide the information necessary to add a Guardian Amalgam Collector between operatory suction line and the intake of any existing single or dual liquid ring vacuum system such as Air Techniques VacStar or an competitor's system using Guardian Amalgam Collector Starter Kits, PNs A1300 and A1400. PN A1300 is used on any single liquid ring vacuum system (VacStar 10, 20, 40, or any competitor's system) while PN A1400 is for any dual liquid ring vacuum system (VacStar 50, 80, or any competitor's system). This installation should be performed by authorized Air Techniques Dealer service personnel.

Additionally since liquid ring vacuum systems do not use a separator tank, each kit includes a CAS Separator Tank and Stand Assembly with the Amalgam Collector. PN A1300 includes a 4 gallon CAS Separator Tank and PN A1400 includes a 8 gallon CAS Separator Tank. Figure 6 shows the overall dimensions of 4 and 8 gallon CAS Separator Tank installations

The installation of the the Guardian Amalgam Collector Starter Kits, PNs A1300 and A1400, consists of installing a CAS Separator Tank and then connecting the Amalgam Collector to the CAS Tank drain as follows.

**Note:** Kit PNs A1300 and A1400 only provides the 3/4-inch hose necessary to connect the Amalgam Collector to the tank. They do not provide the hose necessary to connect the CAS tank to the pump suction lines. Any additional hose must be provided by the installer. Refer to the documentation for the specific liquid ring vacuum system being modified.

Apply Teflon tape or pipe thread sealant to threaded surfaces prior to installation.

## **CAS Separator Tank Assembly Installation Procedure**

Refer to Figures 6 through 9 and install the CAS Separator Tank (4 or 8 gallon) at the input of the liquid ring vacuum system as follows.

1. Install the drip shield to the tank stand per supplied Instruction Sheet P/N 54168.
2. Locate the CAS Separator Tank to the installation area between the operatory suction line and the liquid ring vacuum system intake. Level the assembly as necessary.
3. Remove the suction line hose from the liquid ring vacuum system intake port.
4. Relocate the suction line hose to the tank suction intake (See Figure 8), remove any excess length and secure hose to the tank suction intake.
5. Install the excess length of the suction line hose or a new hose between the Suction Out connection (See Figure 8) and the intake port of the liquid ring vacuum system.

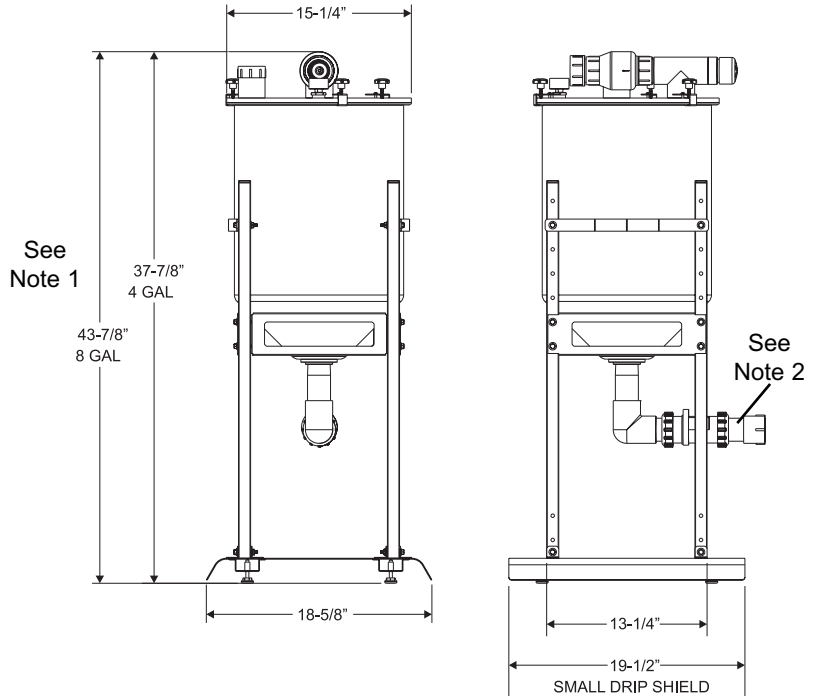
## **Guardian Amalgam Collector Installation Procedure**

Installation procedures for the Guardian Amalgam Collector provided in starter kits, PNs A1300 and A1400 are identical to the procedures for installing the Guardian Amalgam Collector Starter Kit, PN A1200. Refer to Figure 5 and install the Amalgam Collector to the previously installed 4 or 8 gallon CAS Separator Tank by performing the procedures on page 12.

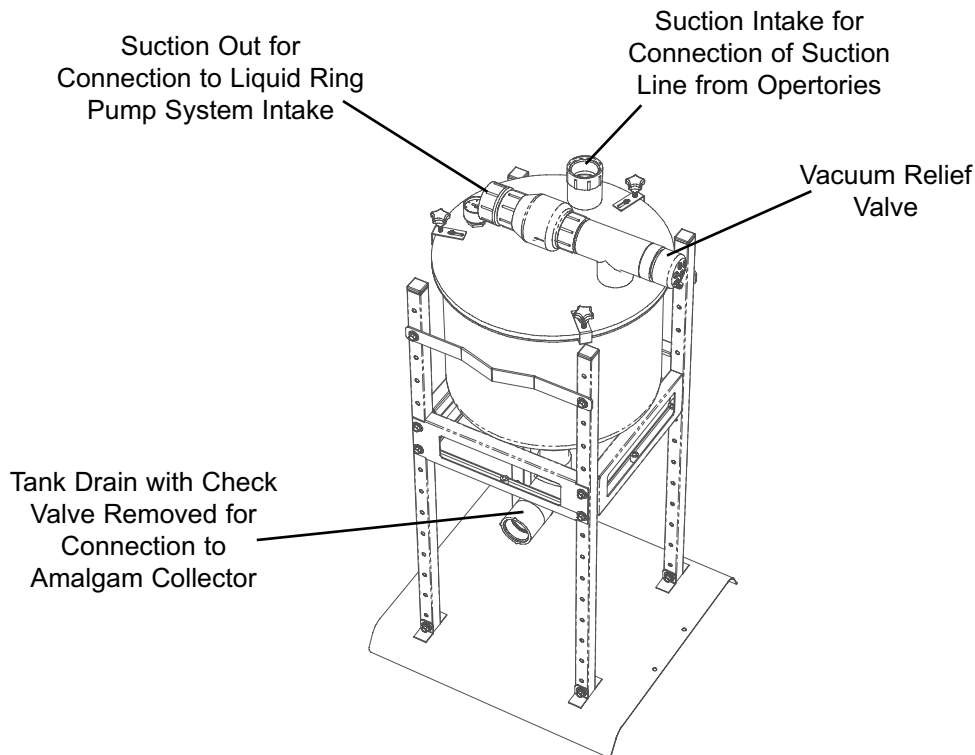
# KIT PNs A1300 & A1400 INSTALLATION PROCEDURES

**Notes:**

1. The 8 gallon CAS is 6 inches taller than the 4 gallon CAS.  
All other dimensions are common between the 4 and 8 gallon units.
2. Check Valve not needed. Remove and discard.

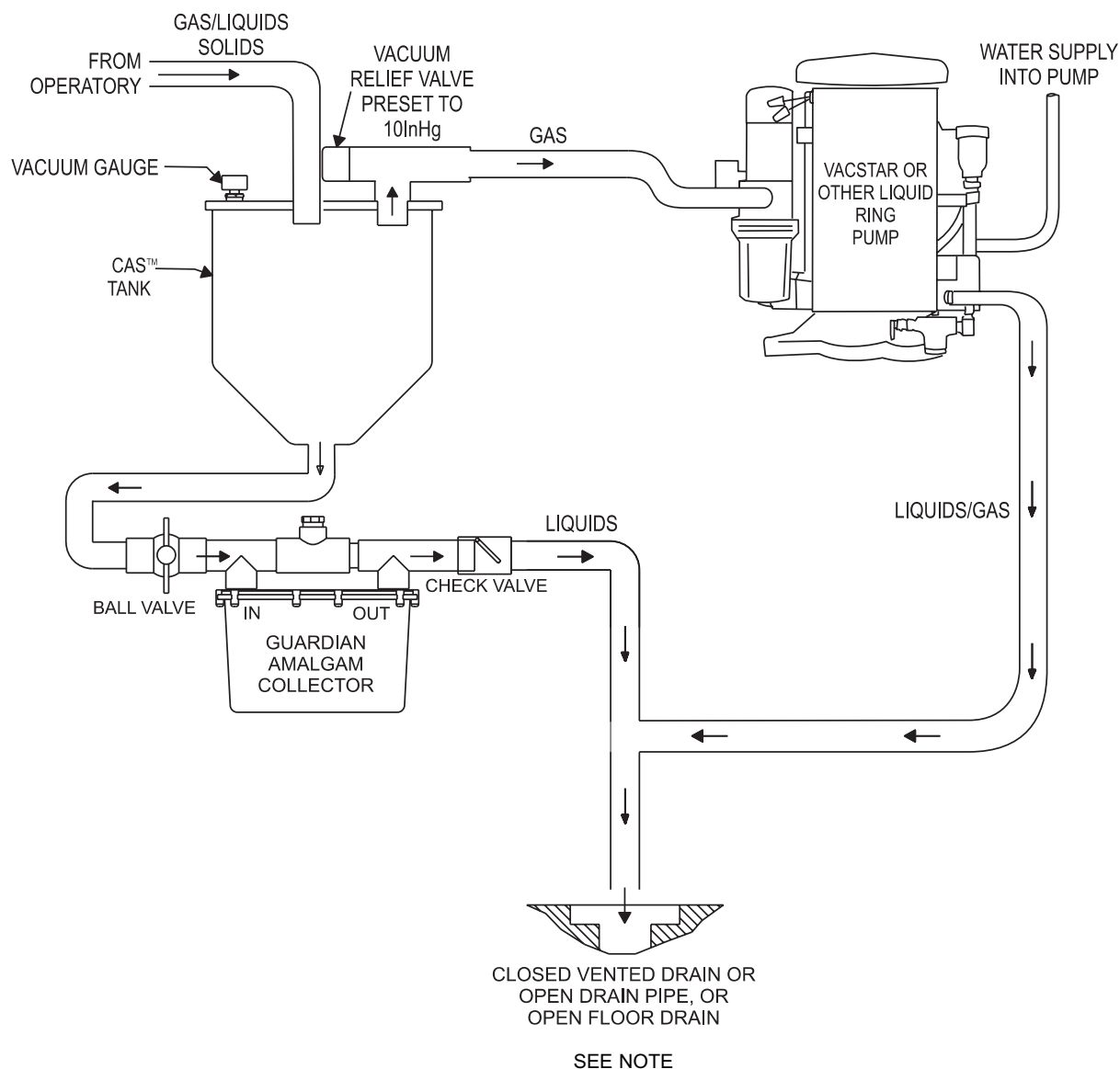


**Figure 6. CAS Tank and Stand Assembly Overall Dimensions  
(8 gallon tank of kit A1400 shown)**



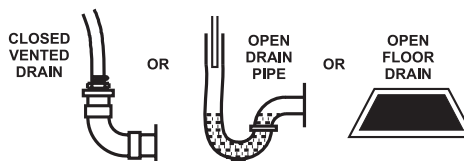
**Figure 7. CAS Tank and Stand Assembly Connections  
(4 gallon tank of kit A1300 shown)**

# KIT PN<sub>s</sub> A1300 & A1400 INSTALLATION PROCEDURES



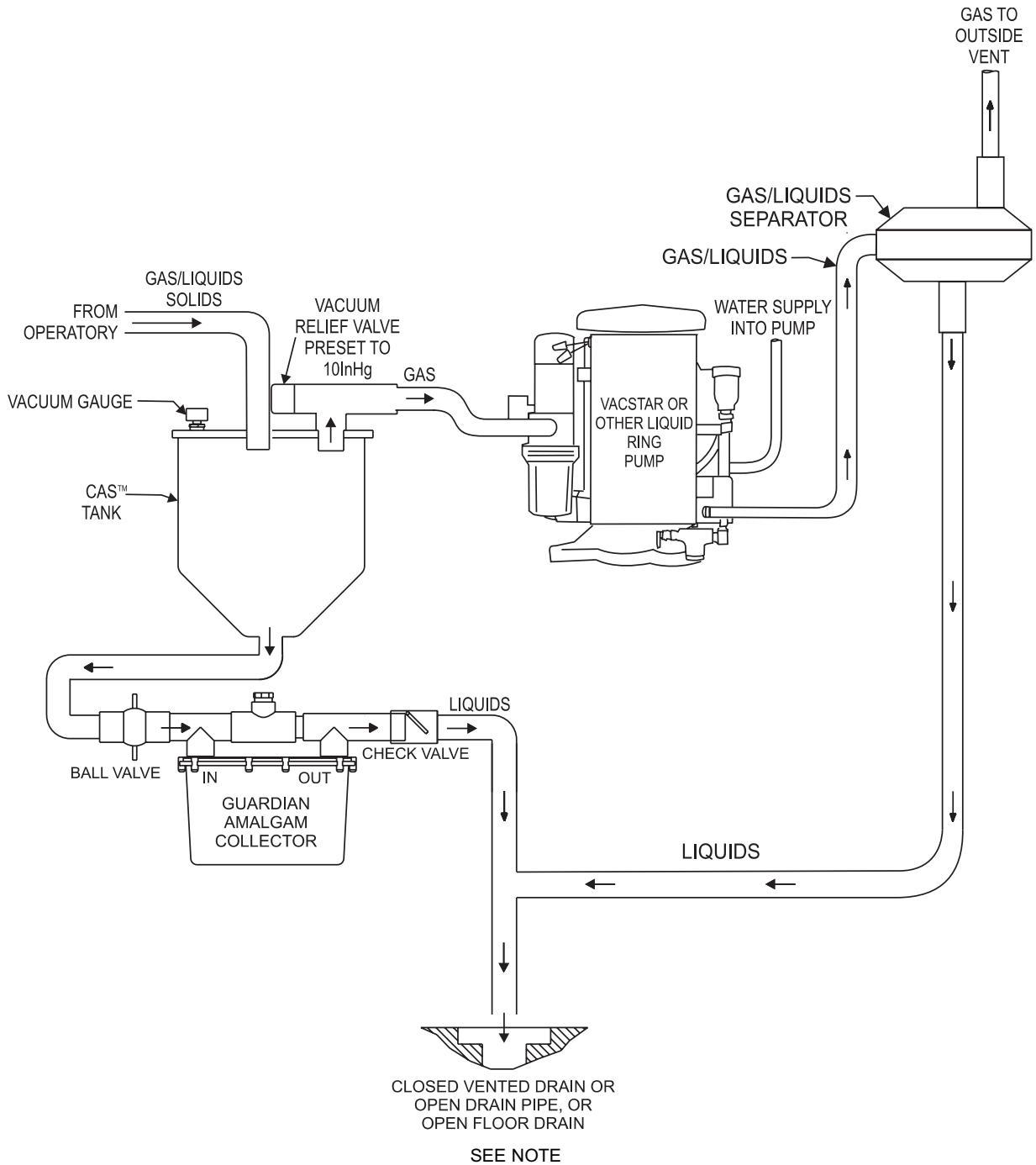
**Note:** It is required that the outlet of the Guardian Amalgam Collector be connected to an open floor or vented drain. (See installation, connection details, page 6).

## DRAIN INSTALLATION



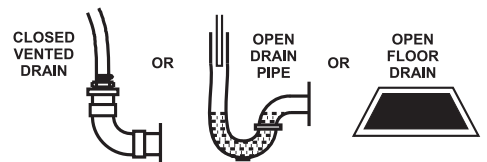
**Figure 8. Flow Diagram of Guardian Amalgam Collector Connected to a VACSTAR (or other Liquid Ring Pump)**

# KIT PNs A1300 & A1400 INSTALLATION PROCEDURES



**Note:** It is required that the outlet of the Guardian Amalgam Collector be connected to an open floor or vented drain. (See installation, connection details, page 6).

## DRAIN INSTALLATION



**Figure 9. Flow Diagram of Guardian Amalgam Collector Connected to a VACSTAR (or other Liquid Ring Pump and a Liquid /Gas Separator)**

# **KIT PN A1500 INSTALLATION PROCEDURES**

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## **Installation of Guardian Amalgam Collector Starter Kit, PN A1500**

The following instructions provide the information necessary to add a Guardian Amalgam Collector to an **existing** Air Techniques STS Dry Vacuum System with a 20 gallon CAS Separator Tank or on **non-CAS type** separator tanks over 8 gallons using Guardian Amalgam Collector Starter Kit, PN A1500. This modification is to be performed by authorized Air Techniques Dealer service personnel. Refer to Figure 10, and install the Guardian Amalgam Collector Starter Kit, PN A1500, as follows.

**Warning:** The following steps should be performed while wearing skin and eye protection. Any area where material from the tank has spilled, should be thoroughly disinfected.

1. Shut off vacuum pump and allow tank to drain.

**Note:** Kit PN A1500 provides two Amalgam Collectors to handle the output of the larger capacity tanks. Perform steps 2 through 7 for each collector to be installed.

2. Assemble the manifold connector by pressing the Outlet Fitting Assembly (item 3) onto the Inlet Fitting Assembly (item 2) making sure that both connector fittings are facing the same direction.
3. Unpack the Guardian Amalgam Collector (item 1) and remove the two shipping caps. Make sure to keep the caps and packing material for future repackaging of the collector.
4. Align the manifold connector fittings to the inlet and outlet ports of the collector making sure that the inlet side fitting (red handle side) of the manifold connector corresponds to the collector inlet port (as labeled) while the outlet side fitting aligns with the labeled outlet port of the collector.
5. Connect the manifold connector by pressing the fittings onto the associated ports of the collector.
6. Install the manifold connector clamp (item 4) over the manifold and secure to the Amalgam Collector with the screw, washer and nut (items 5, 7 and 6).
7. Place the Amalgam Collector on a flat surface observing the location requirements outlined on page 7 of this manual.
8. Disconnect and discard existing connection hose between tank drain and the drain of the facility.

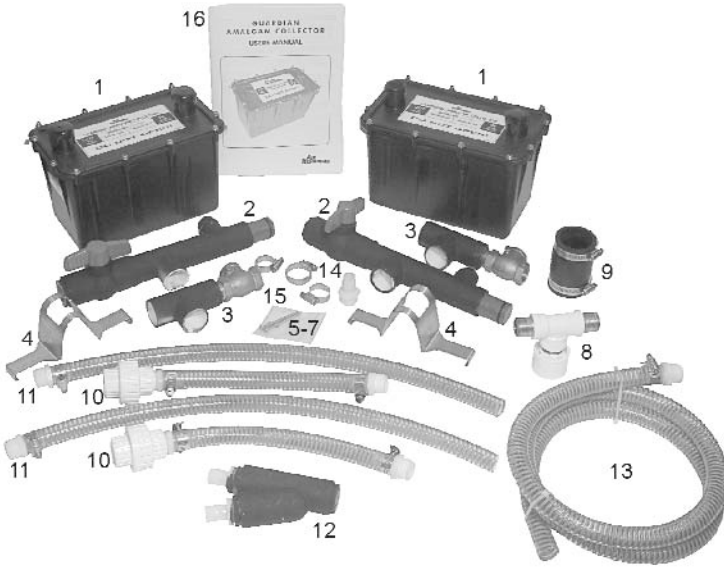
**Note:** Apply Teflon tape or pipe thread sealant to threaded surfaces prior to installation.

9. Install the Flexible Rubber Coupling (item 9) to the 1-1/2-inch elbow fitting of the tank drain and secure by tightening the hose clamp.
10. Install the Tee Fitting Assembly (item 8) onto the Flexible Rubber Coupling (item 9) and secure by tightening the hose clamp supplied with the Flexible Rubber Coupling.
11. Install each hose assembly (item 10) between each outlet of the Tee Fitting Assembly (item 8) and the inlet fitting (red handle side) of the associated manifold connector.
12. Connect each hose assembly (item 11) to the outlet fitting of the associated manifold connector.

**Note:** If necessary cut supplied hose assemblies (items 11 and 13) to the length required to keep the output flow straight avoiding any kinks.

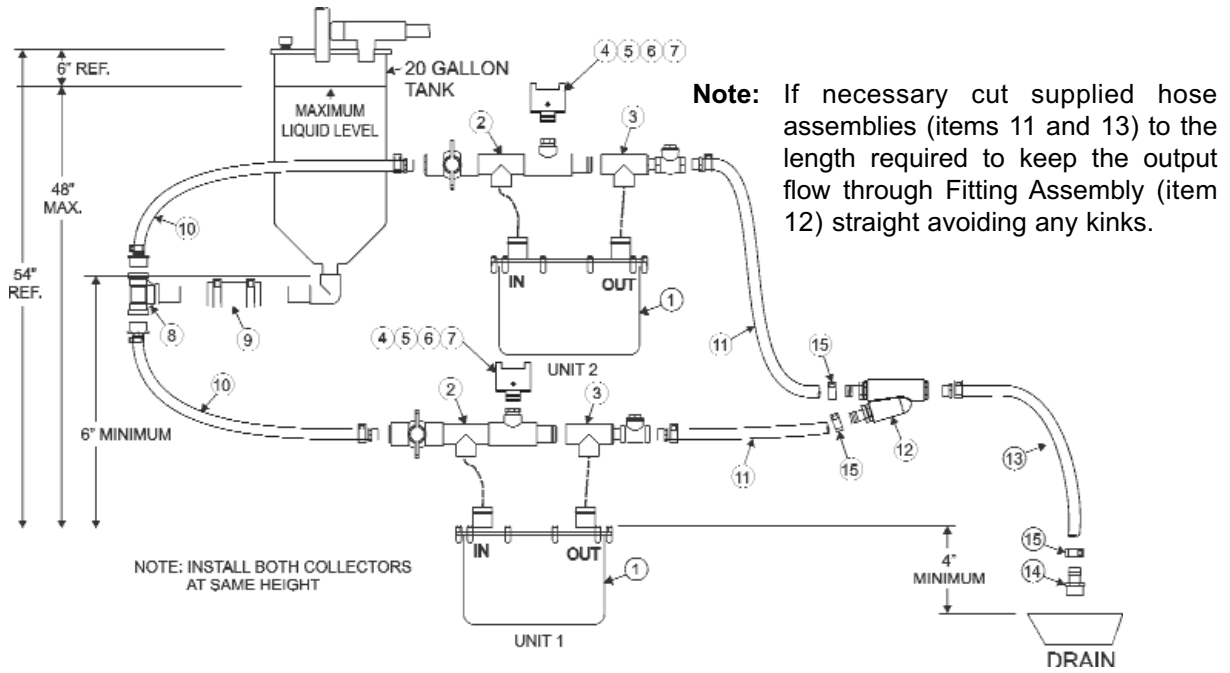
13. Connect each hose assembly (item 11) connected to the outlet of the associated manifold connector to one of the two inputs of WYE Fitting Assembly (item 12) and secure with hose clamp (item 15).
14. Install a 3/4-inch NPT fitting adapter (item 14) into hose (item 13) and secure with hose clamp (item 15). Connect hose (item 13) between the outlet of Fitting Assembly (item 12) and the building drain, which must be an open floor or vented drain.
15. Rotate the 1/4-Turn (Red Handle) valve to the open position as shown. Re-start the vacuum system and check for leaks.

# KIT PN A1500 INSTALLATION PROCEDURES



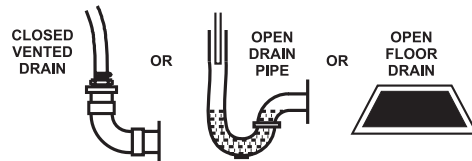
Kit Components		
PART No.	DESCRIPTION	QTY.
1	A1010 Amalgam Collector	2
2	A1159 Inlet Fitting Assembly	2
3	A1171 Outlet Fitting with Check Valve Assembly	2
4	A1162 Clamp	2
5	30926 Screw 8-32x2 1/2" length	2
6	31577 Nut 8-32	2
7	30028 Washer	2
8	A1173 Fitting Assembly Tee	1
9	57238 Flexible Rubber Coupling	1
10	A1126 Hose Assembly Union x MNPT, 1-foot lngth	2
11	A1182-1 Hose Assembly 2 Foot Lngth	2
12	A1172 WYE Fitting Assembly (2 in, 1 out)	1
13	A1182-2 6 foot Hose Assembly	1
14	55926 3/4" Adapter	1
15	41211 Hose Clamp	3
16	A1208 User Manual	1

**Note:** 2 additional (replacement) Guardian Amalgam Collectors PN A1010, not shown.



**Important:** It is required that the outlet of the Guardian Amalgam Collector be connected to an open floor or vented drain. See Installation Requirements page 7.

### DRAIN INSTALLATION



**Figure 10. Installation of Guardian Amalgam Collector Kit, PN A1500**

# MAINTENANCE

**Preventive Maintenance.** Whenever a service technician fulfills a repair call at the customer site routine checks should also be performed to detect general overall wear, and replacement of parts should be made if necessary before a failure causes a prolonged shut-down. This preventive maintenance program will aid in dependable equipment operation and help reduce breakdown.

**Initial Maintenance.** The CAS uses patented technology to provide cyclonic action cleaning within the tank. After installation, clean the vacuum lines with Clean Stream™ Cleaner. This is especially necessary when a new system is being installed into existing dental system piping. Using Clean Stream™ Cleaner helps the STS™ system to remove any built up deposits in the piping system.

**Daily Maintenance Recommendation.** Further, to maintain the cleanliness of the CAS™, including all the vacuum lines and tubing in the dental system, Air Techniques recommends that the dental office personnel be instructed to use Clean Stream™ Cleaner daily as part of the overall preventive maintenance program.

**Yearly Maintenance.** Although the CAS uses patented technology to provide cyclonic action cleaning within the tank during operation of the STS™ system, the tank does need to be inspected and cleaned yearly to insure proper operation. Procedures to inspect and clean the new and old style CAS tanks are provided by the following pages. Perform the procedures corresponding to the installed tank style to remove any solids trapped in the tank.

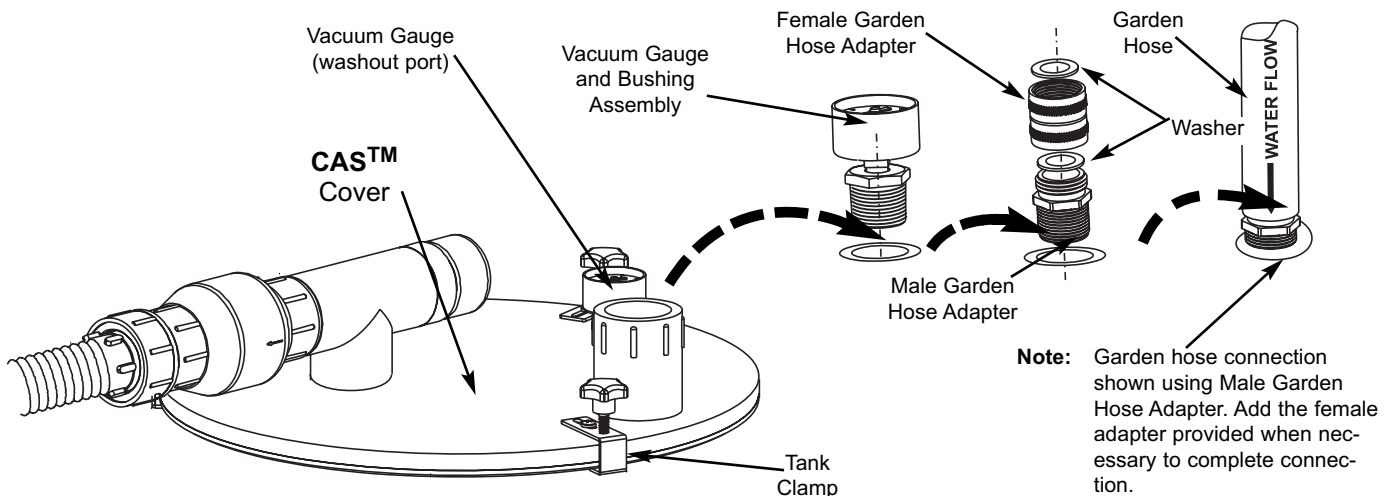
**Maintenance-Free STS Pumps.** All STS pumps are designed for maintenance-free operation. The pump features a powerful permanent split capacitor motor, with a highly reliable contactor and powerful transformer. The motor is completely water and oil-free and provides a dependable operation requiring no scheduled maintenance.

**Yearly Tank Maintenance Procedure.** Refer to Figure 11 and perform the procedures to remove any solids trapped in the tank.

1. Turn OFF the power to the STS™.
2. Remove the vacuum gauge and bushing assembly from the washout port.
3. Install the male garden hose adapter to the wash-out port on the CAS cover

**Note:** A Female Garden Hose Adapter is also provided to complete the connection to the male-end of the garden hose if required.

4. Making sure to include washers, connect the garden hose to the associated adapter(s)
5. Turn ON the water source and let the water run through the CAS for approximately 5 minutes.
6. Remove the male garden hose adapter from the CAS and re-install the gauge and bushing assembly using teflon tape.



**Figure 11. Stainless CAS Washout Port Detail**



Over or under adjustment of the Vacuum Relief Valve can degrade overall system operation. Adjustments should only be made to keep the suction level at the factory-set 10 InHg level, which is adequate to provide optimum operation.

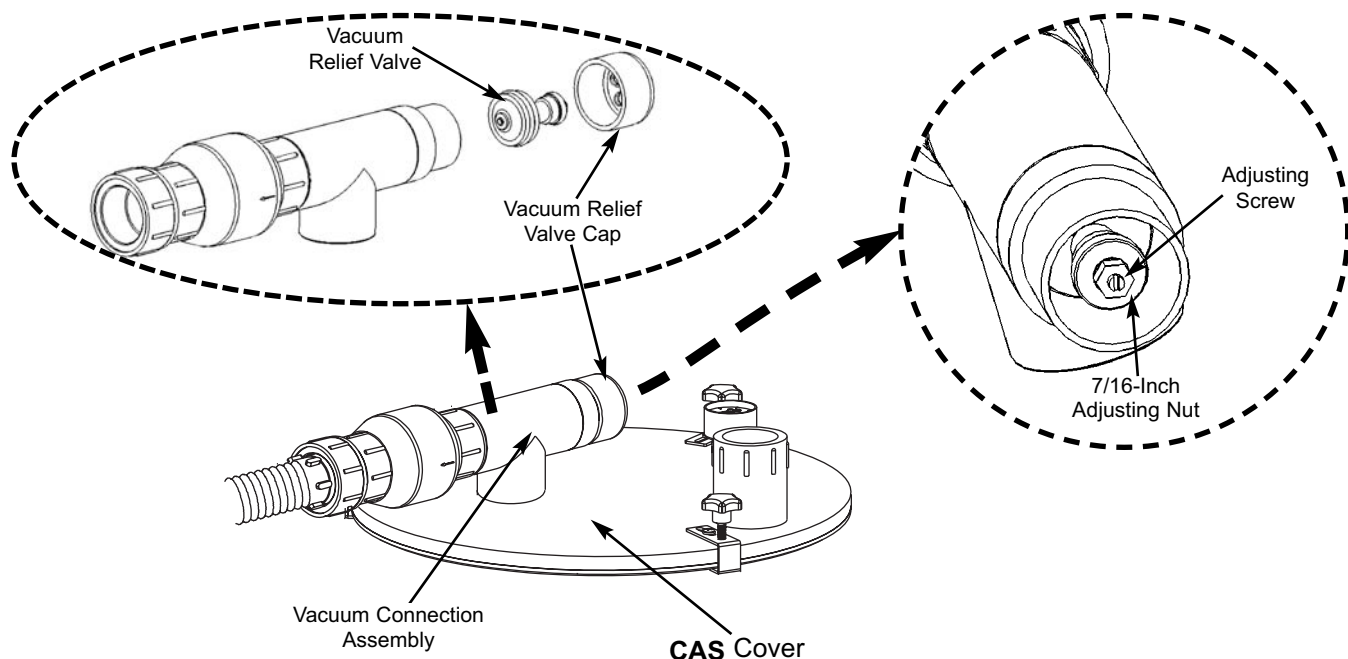
## Vacuum Relief Valve Adjustment

The STS™ system vacuum level is factory set at 10 InHg (inches of Mercury) as shown by the Vacuum Gauge. This suction level is more than adequate to provide a properly sized system service for a multiple-user dental facility. Whenever the suction level varies above or below the factory set point, adjustments can be made as necessary via the Vacuum Relief Valve. Refer to Figure 12 and adjust the system suction level by performing the following:

1. Access Vacuum Relief Valve by removing Vacuum Relief Valve Cap from the Vacuum Connection Assembly.
2. Hold Adjusting Nut with a 7/16-inch open-end wrench.
3. Using a flat screwdriver, adjust suction level as follows:
  - a. Increase suction by turning adjusting screw clockwise in no more than 1/4 increments.
  - b. Decrease suction by turning adjusting screw counterclockwise in no more than 1/4 increments.

## Vacuum Relief Valve Cleaning

A dirty or clogged Vacuum Relief Valve degrades the STS™ system suction level. Clean the Vacuum Relief Valve by removing Vacuum Relief Valve Cap and carefully pulling the valve from the Vacuum Connection Assembly. Blow out accumulated solid deposits using clean low pressure compressed air.



**Figure 12. Vacuum Relief Valve Adjustment and Cleaning Detail**

# **SCHEDULED REPLACEMENT & PROPER DISPOSAL**

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**Important:** The Guardian Amalgam Collector is not to remain in use for a period longer than 12 months (one year) from the date of installation.

**Caution:** DO NOT use Chlorine Bleach or solutions of sodium Hypochlorite to clean or disinfect the vacuum system or Guardian Amalgam Collector. Sodium Hypochlorite (Bleach) will reduce effectiveness of the Guardian Amalgam Collector.

## **Disposal of Your Guardian Amalgam Collector**

The use period for a Guardian Amalgam Collector is 12 months or less based on the table below. At the end of the use period, arrangement **must** be made for proper disposal of the Guardian Amalgam Collector and its contents in accordance with all local, state and/or federal laws and regulations. This includes disinfecting the Amalgam Collector prior to disposal using products registered with the Environmental Protection Agency (EPA) as a disinfectant agent.

Shipping non-disinfected materials is a violation of many local, state and/or federal regulations. Spray the outside surface of the Amalgam Collector with a disinfectant prior to packaging it for shipment.

**Note:** The Guardian Amalgam Collector may **fill faster** than expected especially after a new vacuum pump is installed. A new vacuum pump may have the capability to remove built up deposits from the vacuum lines that would inevitably fill the Collector in less time than anticipated.

The Guardian Amalgam Collector is not to remain in use for a period longer than 12 months (one year) from the date of installation. Effectiveness of the Guardian Amalgam Collector is reduced after 12 months due to the common growth of organic material within the Collector. The following provides a guideline to predict when to replace Guardian Amalgam Collector.

1 to 2 users	9 to 12 months
3 to 4 users	6 to 9 months
5 to 7 users	6 months or less

**Important:** DO NOT use Chlorine Bleach or solutions of sodium Hypochlorite to clean or disinfect the vacuum system or Guardian Amalgam Collector. Sodium Hypochlorite (Bleach) will reduce effectiveness of the Guardian Amalgam Collector.

## **Daily Maintenance**

To ensure proper separation of amalgam, the vacuum system must be kept clean to help prevent the growth of detrimental organic materials within the Amalgam Collector. The system must be cleaned daily, with a non-foaming cleanser such as CleanStream™. This will also maintain the cleanliness of the CAS™ (if so equipped) as well as the vacuum lines and tubing throughout the dental vacuum system.

## **Replacement Kit**

A Guardian Amalgam Collector Replacement Kit (PN: A1010) is available from Air Techniques to replace the used Amalgam Collector on either an **existing** Dry Vacuum System or Liquid Ring Pump System. The kit also includes instructions for disinfecting (Instruction Sheet, PN A1031) and an offer to provide you with complete recycling service for the spent Amalgam Collector, including transportation and recycling work at no charge. Refer to the procedures (page 23) to replace the Amalgam Collector. This replacement should be performed by authorized Air Techniques Dealer service personnel. Make sure to read the disinfecting instructions provided by Instruction Sheet, PN A1031 included with the Guardian Amalgam Collector Replacement Kit.

# COLLECTOR REPLACEMENT KIT PN A1010

## Guardian Amalgam Collector Replacement Kit, PN A1010

As shown by Figure 13, there are two types of connection methods used to install the Amalgam Collector between the Dental Suction System Separator/Collection Tank and the building sewer drain. While both methods connect directly to the inlet and outlet ports of the collector, the original method uses two separate elbow connectors (Figure 13, view A) and the new current design uses a single manifold held down with a clamp (Figure 13, view B). Refer to Figure 13 and replace the filled Amalgam Collector by performing the procedure corresponding to the connection method below.

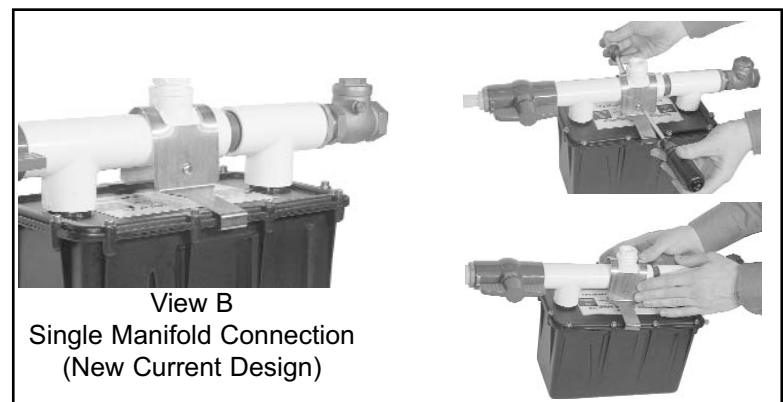
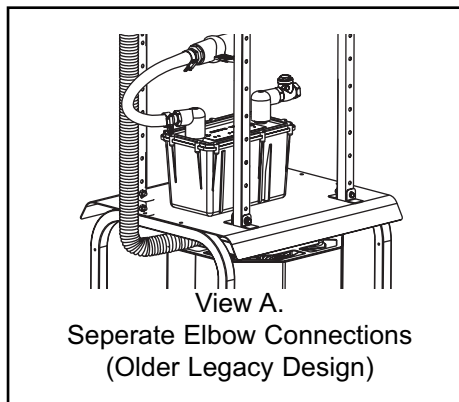
**Important:** Make sure to follow the disinfecting instructions provided by Instruction Sheet, PN A1031, included in kit, PN: A1010.  
Make sure to wear skin and eye protection when performing the following replacement procedures. Keep Amalgam Collector upright to prevent spills.

**Separate Elbow Connections.** Replace the filled Amalgam Collector by performing the following steps.

1. Shut off vacuum pump and allow Separator Tank to drain. After the separator tank has drained, close the ¼ turn valve (if used) between the tank and the collector.
2. Disconnect each elbow connector from the inlet and outlet ports of the collector to be replaced by carefully pulling straight up from the collector port with a slight twisting motion.
3. Remove the collector and replace with new collector in the same location.
4. Connect the tank hose elbow connector to the inlet port of the new collector and connect the drain hose elbow connector to the outlet port of the new collector.

**Single Manifold Connection.** Replace the filled Amalgam Collector by performing the following steps.

1. Shut off vacuum pump and allow Separator Tank to drain. After the separator tank has drained, close the ¼ turn valve between the tank and the collector.
2. Using a screwdriver and open end wrench, loosen the screw, washer and nut securing the manifold connector clamp to the Amalgam Collector. Remove the clamp.
3. Disconnect the whole manifold connector from the inlet and outlet ports of the collector to be replaced by evenly pulling the manifold straight up from the collector.
4. Remove the collector and replace with new collector in the same location.
5. Connect the manifold connector to the new collector making sure that the correct orientation is observed. The drain hose end of the manifold connector to the outlet port side of the new collector while the tank end is at the inlet port side.
6. Install the manifold connector clamp over the manifold and secure to the Amalgam Collector with the screw, washer and nut.



**Figure 13. Guardian Amalgam Collectors Replacement**

# TROUBLESHOOTING

Table 5. Guardian Amalgam Collector Troubleshooting

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
No suction	<p>Pump not turned on.</p> <p>Pump not running.</p> <p>Vaccum lines reversed.</p> <p>Kinked or collapsed suction hose.</p> <p>CAS Separator Tank full.</p> <p>CAS Separator Tank is full and will not drain.</p>	<p>Turn pump on.</p> <p>Call your authorized Air Techniques dealer for repair service.</p> <p>Check hose connections to Separator Tank. Hose from vacuum pump inlet must be connected to swivel tee fitting on a CAS Tank.</p> <p>Check the suction line from the unit to the Separation Tank and the Separation Tank to the opertory line. If clogged, collapsed or kinked call your authorized Air Techniques dealer for repair service.</p> <p>Shut unit "OFF" for 2 minutes then turn back "ON".</p> <p><b>SEE BELOW.</b></p>
CAS Separator Tank is full and will not drain.	<p>Separator Tank must be connected to an open or vented drain.</p> <p>Check valve located in the drain (after Guardian Amalgam Collector Outlet) clogged or stuck closed.</p> <p>Separator Tank outlet clogged.</p> <p>Guardian Amalgam Collector filled to capacity.</p> <p>Clogged building drain.</p>	<p>If Tank is not connected to an open or vented drain, call your authorized Air Techniques dealer for repair or service.</p> <p>Call authorized Air Techniques dealer for replacement, or service.</p> <p>If check valve is <u>NOT</u> stuck, see other possible causes below.</p> <p>Call your authorized Air Techniques dealer for repair or service.</p> <p>Replace Guardian Amalgam Collector.</p> <p>Call your local plumber.</p>

Table 5. Guardian Amalgam Collector Troubleshooting

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>POSSIBLE SOLUTION</b>
Poor or low suction	Restricted air exhaust	Check air exhaust pipe to make sure it conforms to specs. Check and clear possible restrictions in exhaust line.
	Restricted air suction.	Check the suction line from the unit to the Separation Tank and the Separation Tank to the opertory line. If clogged, collapsed kinked call your authorized Air Techniques dealer for repair service.
	Relief valve set low or stuckopen	Call your authorized Air Techniques dealer to readjust setting.
Excessive suction	Relief valve set high or stuck closed.	Call your authorized Air Techniques dealer for repair or service.
	Relief valve screen clogged.	Call your authorized Air Techniques dealer for repair or service.

## **REPLACEMENT PARTS**

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The following lists the ordering number and description for components necessary to install or maintain the Guardian Amalgam Collector. Contact your authorized dealer for information.

**Note:** All Fastening hardware is available at any hardware store.

Description	Part No.
Inlet Fitting Assembly	A1159
Outlet Fitting Assembly use with 4 & 8 gal. tank.	A1161
Outlet Fitting Assembly use with 20 gal. tank.	A1172
Manifold Connector Clamp (Secures assembled inlet and outlet fittings to top of Amalgam Collector)	A1162
Screw 8-32x2 1/2-inch length	30926
8-32 Nut	31577
#8 Flat Washer	30028
Replacement Amalgam Collector	A1010
O-Ring Amalgam Collector	54131
Rubber Cap (shipping seal for inlet and outlet ports of Amalgam Collector)	A1139
Hose 3/4 - Inch diameter	55949
Hose Clamp mates to 3/4-Inch hose	41211
Hose 1 - Inch diameter	55948
Hose Clamp mates to 1-Inch diameter hose	55717
Hose 1-1/2 - Inch diameter	54118
Hose Clamp mates to 1-1/2-Inch hose	57169



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- Guardian™ Amalgam Collector
- Peri-Pro®
- Provecta 70™
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