

INSTRUCTIONS FOR USE

A-dec[®] Syringes

Standard and Warm Water Syringes



A - DEC AUTOCLAVABLE STANDARD
AND WARM WATER SYRINGES

INSTRUCTIONS FOR USE

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

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Product Service

For service information, contact your local authorized A-dec dealer. To find your local dealer, go to www.a-dec.com.

Identification of Symbols

Symbol	Description
	Recognized by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1 (2601-1) and under mutual recognition agreement with CAN/CSA C22.2, No. 601.1.
	Classified by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1 (2601-1) and under mutual recognition agreement with CAN/CSA C22.2, No. 601.1.
	UL listed to UL 61010A-1, BS EN 61010-2-010 and Canadian (CAN/CSA C22.2, No. 1010.1-92) safety standards.
	Conforms to applicable European Directives (refer to Declaration of Conformity).
	Protective earth (ground).
	Functional earth (ground).
	Attention, consult accompanying documents. No user serviceable parts. Attention, line voltage. Only licensed electrician should remove cover.
	Type B applied part.
	Class II equipment.
	Caution: Metal surfaces can be hot during and following the dry cycle.

Classification of Equipment (EN-60601-1)

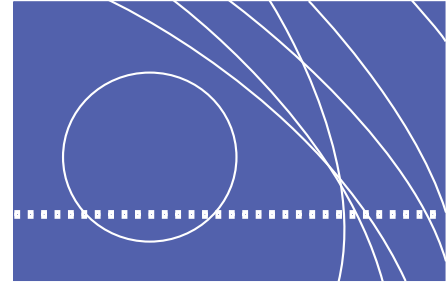
Type/Mode	Classification
Types of shock protection	CLASS I EQUIPMENT: Dental chairs, dental lights, and power supplies CLASS II EQUIPMENT: Chair, wall, and cart-mounted delivery systems
Degree of shock protection	TYPE B APPLIED PART: Delivery systems only
Degree of protection against water ingress	ORDINARY EQUIPMENT: All products
Mode of operation	CONTINUOUS OPERATION: All models except dental chairs CONTINUOUS OPERATION WITH INTERMITTENT LOADING: Dental chairs - 5% duty cycle
Flammable Gasses:	Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide, where such gasses may accumulate in concentration (closed space).

Electrical Rating

Type	Specification
Volts:	100/110-120/220-240 VAC
Frequency:	50-60 Hz
Current:	As configured and specified in equipment manual (products labeled 15A or greater require dedicated circuit, identified in distribution panel).

Environmental Specifications

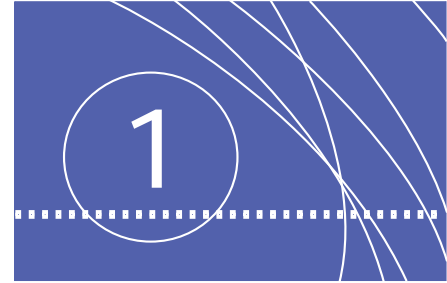
Temperature/Humidity	Specification
Storage/Transportation	Temperature: -40°C to 70°C (-40°F to 158°F) Relative humidity: 80% for up to 31°C, decreasing linearly to 50% at 40°C
Operating	Temperature: 10°C to 40°C (50°F to 104°F) Relative humidity: 80% for up to 31°C, decreasing linearly to 50% at 40°C.
Indoor Use:	Altitude up to 2,000M (6,563 ft.), installation category II, pollution degree 2. (UL 61010A-1 and CAN/CSA C22.2, No. 1010.1-92 only)



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INTRODUCTION

Welcome to the *A-dec Autoclavable Standard and Warm Water Syringes Instructions for Use*. This guide provides an easy-to-use source of technical information for operating and maintaining your A-dec Autoclavable Standard and Warm Water Syringes.

This guide is intended for doctors and dental staff.

Before using these *A-dec Syringes Instructions For Use*, read all cautions and warnings. Read the component descriptions, and become familiar with the locations of features and controls.

This document contains the following information:

- Features
- Operations
- Adjustments
- Asepsis, Maintenance, and Troubleshooting

About A-dec Autoclavable Standard and Warm Water Syringes

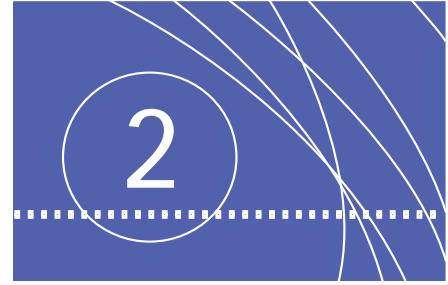
A-dec standard and warm water syringes are designed to provide you with years of reliable service.

Figure 1 A-dec Autoclavable Standard and Warm Water Syringes



Customer Service

For service information, contact your local authorized A-dec dealer.



FEATURES

The A-dec Autoclavable Syringe is a three-way air and water syringe with a patented quick-disconnect autoclavable tip system. This section describes the following features for A-dec Autoclavable Standard and Warm Water Syringes:

- Syringe buttons
- Syringe tip retainer assembly
- A-dec syringe tip
- Warm water syringe
- Quick disconnect syringe terminal

Syringe Buttons

All A-dec autoclavable syringes feature buttons that provide modulated control of syringe water, air, and spray functions.

Icons for air and water indicate the button functions (see Figure 2).

Figure 2 Syringe Air and Water Icons



Air

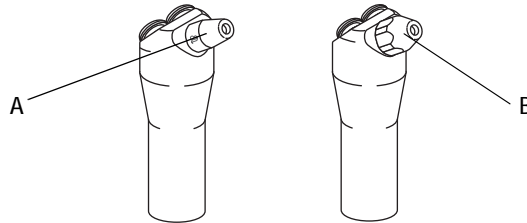


Water

Syringe Tip Retainer Assembly

A-dec syringes are factory equipped with a non-locking syringe tip retainer assembly. A locking retainer assembly is optional.

Figure 3 Syringe Non-Locking and Locking Tip Retainer Assemblies



(A) Non-locking retainer; (B) Locking retainer

Non-Locking Retainer Assembly

The non-locking syringe tip retainer has a smooth exterior surface and allows you to easily remove and install the syringe tip.



NOTE The non-locking retainer assembly is not appropriate for use as a cheek retractor because it allows the syringe tip to rotate.

Locking Retainer Assembly

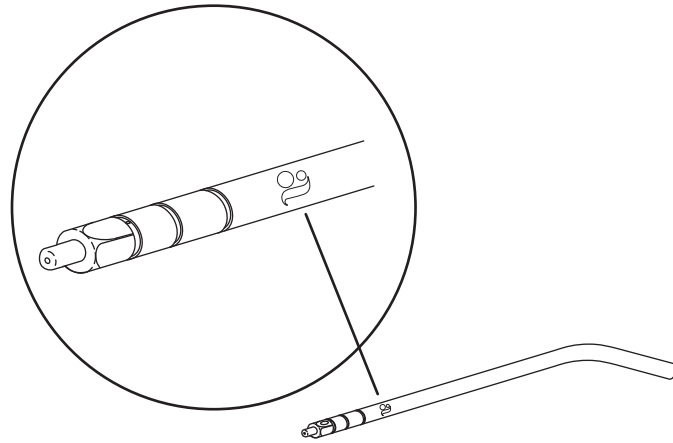
The locking retainer has a hex-shaped exterior that allows the nut to be tightened, preventing the tip from easily rotating. The tip can then be used for cheek retraction.



A-dec Syringe Tip

Your A-dec syringe is packaged with two specially designed A-dec syringe tips. These tips have three locking grooves which hold the tip in place when properly installed and prevent ejection of the tip during use. A-dec tips have the distinguishing mark of the A-dec “a” printed on them.

Figure 4 Distinguishing Mark of an A-dec Tip



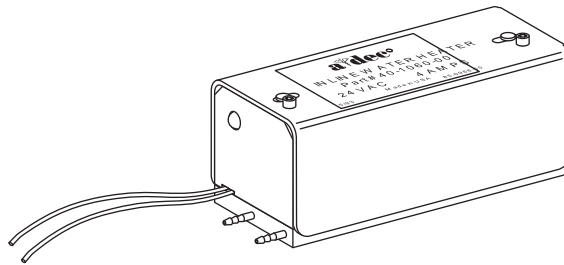
WARNING Use only A-dec syringe tips in A-dec syringes. A-dec syringe tips have been engineered and manufactured for use with A-dec syringes. Using syringe tips manufactured by a company other than A-dec can result in syringe tip ejection. Tip ejection may result in ingestion or aspiration of the tip, requiring immediate medical attention.

A-dec Warm Water Syringes

An A-dec warm water syringe delivers warm water to the oral cavity, eliminating the discomfort that can be caused by spraying cold water on sensitive tissues.

A-dec offers two systems for heating syringe water. Cascade® and older model delivery systems and post boxes use an in-line water heater and syringe tubing heated by resistance wiring. The water temperature on a Cascade or older delivery system is not adjustable (see Figure 5).

Figure 5 In-Line Low Voltage Water Heater for Cascade and Older Delivery Systems

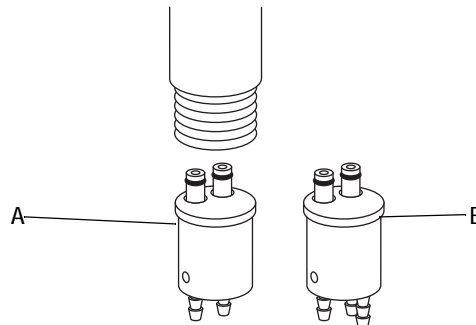


A-dec 300™ and A-dec 500® delivery systems and assistant's instrumentation use syringe tubing heated by resistance wiring and have five temperature settings.

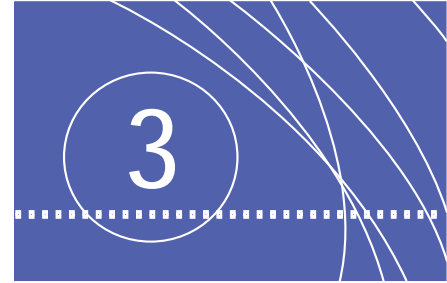
Quick-Disconnect Syringe Terminal

An A-dec quick-disconnect terminal allows a syringe to be removed from the delivery system without turning the system off. Figure 6 shows A-dec quick-disconnect syringe terminals.

Figure 6 A-dec Quick-Disconnect Syringe Terminals



(A) Standard quick-disconnect; (B) Quick-disconnect for recirculating water



OPERATION

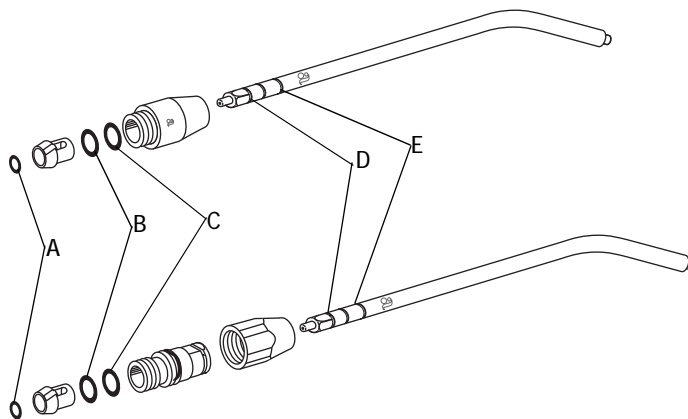
This section describes how to operate A-dec syringes. The following procedures are included in this section:

- Install the Syringe Tip
- Restrict Tip Rotation
- Use the Syringe
- Disconnect the Syringe

Syringe Tip

A-dec designed the syringe tip with three grooves and the syringe tip retainer assembly with three O-rings to ensure that the syringe performs properly. The first O-ring prevents water from entering the air tubing in the syringe tip. The second groove seats the second O-ring to prevent tip ejection from the syringe. The third O-ring acts as a seal. The third groove is an indicator of proper installation and is not visible when the tip is properly installed (see Figure 7).

Figure 7 Syringe tip grooves



(A) Water/air separator O-ring; (B) Tip retainer O-ring; (C) Seal O-ring; (D) O-ring seating groove; (E) Indicator groove

■ Install the syringe tip

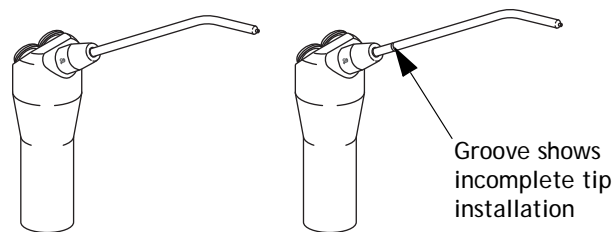
Tip installation is the same for both the standard and locking retainer assemblies.

1. Push the syringe tip into the syringe tip retainer assembly and feel two “clicks.”



WARNING If you do not feel two “clicks” as you install the syringe tip, do not use the syringe. The O-rings inside the syringe tip retainer assembly are damaged and may allow the syringe tip to be ejected. Replace the O-rings before using the syringe.

Figure 8 Tip Installation



Complete and incomplete (groove still showing) tip installation in a syringe retainer nut assembly.

2. Point the syringe at the floor and press the air button several times to be sure the tip is properly installed.
3. Remove the syringe tip by pulling the tip straight out of the syringe.

■ Restrict tip rotation

Your syringe tip rotates to spray in different directions. However, if you use your syringe tip for cheek retraction and you have the hex-shaped retainer nut, you may adjust the nut so the tip does not rotate easily.

1. Install the syringe tip properly, according to the instructions.
2. Tighten the hex nut until the tip does not rotate easily. Use the plastic wrench provided with the hex nut.



CAUTION Tightening a hex retainer nut on an improperly installed syringe tip crushes the internal collect, making removal of the syringe tip difficult and installation of a new tip impossible.

3. Remove the tip by turning the hex nut 1/4 turn left and pulling the tip straight out of the syringe.



Syringe Head

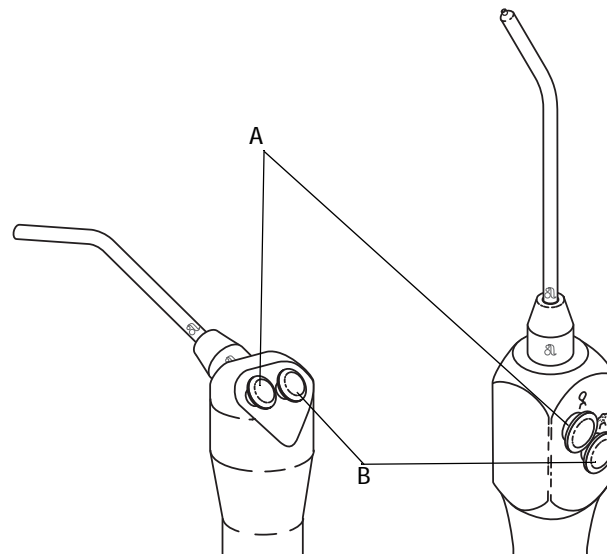
The syringe can deliver:

- air only
- water only
- air/water spray

■ Use the syringe

1. Press the air button to produce air coolant (see Figure 9).
2. Press the water button to produce water coolant.
3. Press both the air and water buttons simultaneously to produce a spray.

Figure 9 Syringe Buttons



(A) water Button; (B) Air Button

■ Disconnect the syringe

1. Flip the master toggle OFF.
2. Operate the syringe air and water buttons to relieve the system air and water pressure.
3. Unscrew the syringe handle until the syringe head separates from the syringe terminal. When the syringe is disconnected, any water remaining in the syringe head drips out.



CAUTION Remove the water bottle before disconnecting the syringe on units without a quick-disconnect syringe terminal. Water bottles located above the height of the syringe can siphon the water bottle contents.

Standard Operating Parameters (duty cycle)

Expected temperature at the syringe handle is 37.5 °C for the following duty cycle:

Start

30 seconds ON

2 minutes OFF

Repeat 4 times beginning at the start then continue.

5 minutes OFF

30 seconds ON

1 minute OFF

30 seconds ON

5 minutes OFF

Repeat the entire process above, beginning at the start.





ADJUSTMENTS

This section describes how to adjust the A-dec syringes. The following procedures are included in this section:

- Adjust flow with a pinch valve
- Adjust flow with a flow control valves
- Adjust flow with adjustment screws

A-dec syringes are adjustable for air and water flow. A-dec warm water syringes for the A-dec 500 product also have a temperature adjustment.

Air and Water Flow

A-dec uses three different methods to adjust syringe air and water flow. Use the table below to identify the location and method of adjustment for your A-dec delivery system or assistant's instrumentation.

Table 4 Location and Methods of Flow Control

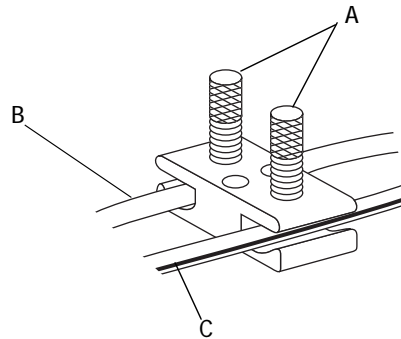
Model	Location of Flow Control	Method of Adjustment
A-dec 532, 533, 541 and 542 delivery systems	Control head and control center	Pinch valve
Cascade 2140, 2150, 2270 and, 2280 delivery systems	Control block inside the control head	Flow control valves on the control block
Radius® 2122 and 2132 delivery systems	Control block inside the control head	Flow control valves on the control block
Cascade assistant's instrumentation	Post box	Pinch valve
Radius 7115 assistant's instrumentation	Lift arm of chair	Pinch valve
Radius 7285 assistant's instrumentation	Cuspidor support housing	Pinch valve

Model	Location of Flow Control	Method of Adjustment
Excellence, Decade®, Mini-Trol and Auto-Trol delivery systems	Faceplate or side of the control head	Adjustment screw
Solo and older A-dec delivery systems	Inside the chair back or control head	Pinch valve
Older assistant's instrumentation	Inside the post box, floor box, chair back or cabinet	Pinch valve or adjustment screw

■ **Adjust flow with a pinch valve**

1. Turn the adjustment screw for the water tubing right to reduce water flow, or left to increase the flow (see Figure 10).
2. Turn the adjustment screw for the air tubing right to reduce air flow, or left to increase the flow.
3. Press both syringe buttons to test the spray.

Figure 10 Pinch Valve



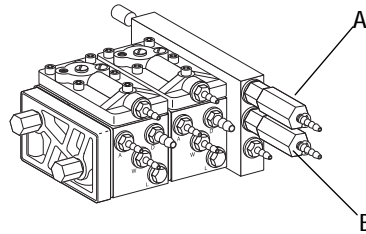
(A) Adjustment screws; (B) Water tubing is red or non-ribbed; (C) Air tubing is yellow or ribbed



■ Adjust flow with a flow control valve

1. Turn the top flow control valve right to decrease water flow or left to increase water flow (see Figure 11).
2. Turn the bottom flow control valve right to decrease air flow or left to increase air flow.
3. Press both syringe buttons to test the spray.

Figure 11 Flow Control Valves on a Control Block

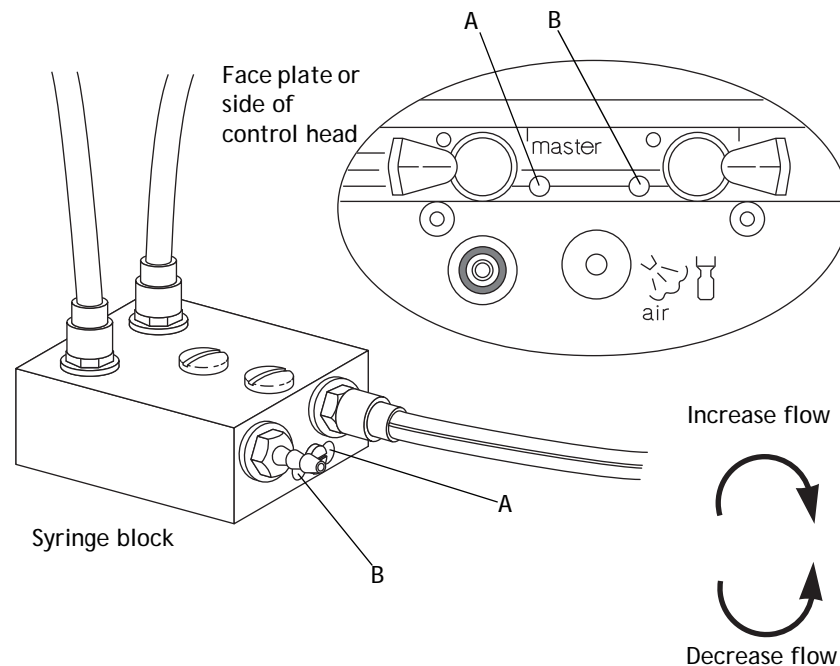


(A) Water flow control valve; (B) Air flow control valve

■ Adjust flow with an adjustment screw

1. Use a 3/32" hex key to turn the water adjustment screw right to reduce or left to increase water flow (see Figure 12).
2. Use a 3/32 hex key to turn the air adjustment screw right to reduce or left to increase air flow.
3. Press both syringe buttons to test the spray.

Figure 12 Flow Adjusting Screws on a Face Plate, the Side of a Control Head or a Syringe Block

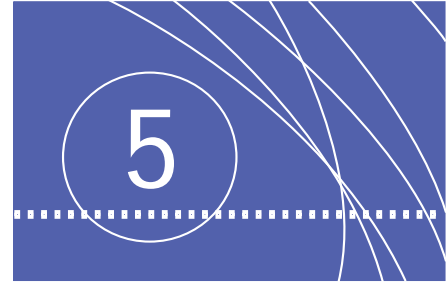


(A) Air adjustment screw; (B) Water adjustment screw

Temperature

The A-dec warm water syringe has 5 temperature settings. Contact your Authorized A-dec Dealer to have your water temperature adjusted.





ASEPSIS AND MAINTENANCE

This section describes the following asepsis and maintenance tasks:

- Disconnect the syringe
- Pre-clean the syringe and tip
- Sterilize the syringe and tip
- Lubricate the syringe
- Replacement parts

Asepsis

All syringe tips are considered critical items and must be heat sterilized between patients. A-dec has designed syringes and syringe tips to be autoclavable or heat sterilized. Remove the syringe and syringe tips from the delivery system for sterilization.

- **Disconnect the syringe**
 1. Flip the master toggle OFF.
 2. Operate the syringe air and water buttons to relieve the system air and water pressure.
 3. Unscrew the syringe handle until the syringe head separates from the syringe terminal. When the syringe is disconnected, any water remaining in the syringe head drips out.

Precleaning

Pre-clean the syringe and tips before sterilization. This prevents the sterilization process from adhering the accumulated debris onto the syringe and tip.

- **Pre-clean the syringe and tip**
 1. Gently brush the syringe threads with a nylon or brass bristle brush.
 2. Remove the tip from the syringe.

3. Immerse the tip in a holding solution until ready for ultrasonic cleaning.
4. Clean the tip ultrasonically, following the ultrasonic manufacturer's instructions.
5. Purge all cleaning agents from the syringe and tip before sterilization.

Sterilization

Sterilize the syringe and tip at a maximum temperature of 275°F (135°C).

■ Sterilize

1. Rinse the syringe and syringe tips in clear water.
2. Flush the tips with isopropyl alcohol or Harvey's Vapo-Steril.
3. Sterilize the syringe and tips:
 - Sterilize syringes using chemical vapor or steam autoclave at a maximum 275°F (135°C) for four minutes.
 - Sterilize syringe tips using dry heat, chemical vapor or steam autoclave at a maximum 275°F (135°C) for four minutes.



CAUTION Sterilizing equipment at higher temperatures reduces the O-ring life-span.

Maintenance

The syringe is designed to be easily serviced in the operatory. The syringe parts subject to wear under normal use are provided in a syringe repair kit which can be ordered from your authorized A-dec dealer.

Proper care and maintenance of your A-dec syringe is critical to ensure the safety of your patients and the reliability of this precision instrument.

A-dec Silicone Lubricant

Use only A-dec Silicone Lubricant to lubricate the syringe button assemblies and the O-rings used in the syringe tip retainer assembly.



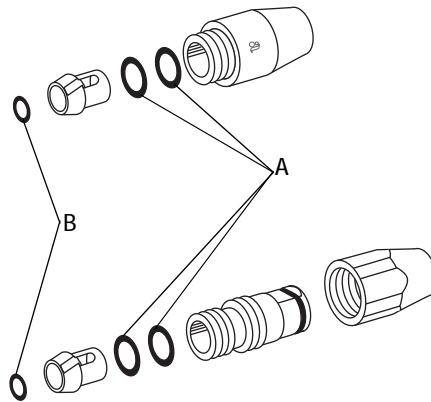
CAUTION The use of petroleum-based lubricants (jellies, creams, or lotions) causes the O-rings in the syringe to swell and/or deteriorate, resulting in syringe malfunction or failure.

A-dec Replacement Parts

A-dec replacement parts have been precisely designed for your A-dec syringe and ensure that the syringe functions properly.

As a means of preventive maintenance, A-dec recommends you replace the two internal O-rings and the small O-ring in the syringe tip retainer assembly at least once a year. Lubricate the O-rings with A-dec silicone lubricant at the time of replacement.

Figure 13 Syringe Retainer Nut Assembly O-Rings



(A) Internal O-rings; (B) Small O-ring

Troubleshooting

Use the following troubleshooting table to identify and solve problems with the syringe:

Table 5 Troubleshooting

Problem	Possible Cause	Action
Syringe leaks air or water from a button	Faulty O-rings on the button	Replace the button assembly
Syringe tip drips when the syringe is not in uses	Faulty O-rings on the water buttons	Replace the water button
A short burst of water sprays from the tip when the air button is pressed	Improperly installed or damaged syringe tip.	Pull out and reinstall the syringe tip correctly. Replace the syringe tip if it still leaks
Water or air leaks from the syringe handle	Syringe handle is not tightly connected to the syringe	Tighten the syringe handle onto the syringe
	O-rings on the terminal are damaged	Replace the O-rings on the terminal and lubricate with A-dec silicone lubricant
Air leaks from the top of the tip retainer assembly	Syringe tip is damaged	Replace with a new tip.
	Retainer internal O-rings are damaged	Replace the two inner O-rings of the retainer assembly
Syringe tip is difficult to install	Retainer internal O-rings have been lubricated with a petroleum-based lubricant	Replace the O-rings and remove remaining lubricant from the retainer. Use A-dec silicone lubricant on the new O-rings
	The tip retainer assembly has been damaged	Replace the tip retainer assembly
Water leaks from base of tip retainer assembly	Tip is not fully installed	Push tip completely into place with the third groove hidden
	Small O-ring in the retainer assembly has failed	Replace the O-ring or replace the retainer assembly
Syringe tip is loose in the retainer assembly	A non-A-dec syringe tip is in use	Replace with an A-dec syringe tip
	Retainer O-rings are worn or damaged	Replace the O-rings





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