

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Perkin Elmer TMA 7 and DMA 7e* at our website: ***Click HERE***

THERMAL ANALYSIS

Dewar Kit

N519-0792 TMA 7 Dewar Kit
N519-0514 DMA 7 Dewar Kit
N519-0617 TMA 7/DMA 7 Large Furnace Install Kit
N539-0141 DMA 7 High Temperature Furnace Install Kit

Installation Instructions

PerkinElmer™
instruments.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notice

The information contained in this document is subject to change without notice.

PERKINELMER MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. PerkinElmer shall not be liable for errors contained herein for incidental consequential damages in connection with furnishing, performance, or use of this material.

Copyright Information

Reproduction or publication in any form or format is prohibited without written permission of PerkinElmer, Inc.

Copyright © 2000 PerkinElmer, Inc.
All rights reserved.
Printed in the United States of America.

Release Information

Manual Part No.	Release	Release Date	Valid for Software Version
0993-8879	A	June 1993	

Trademarks

PerkinElmer is a trademark of PerkinElmer, Inc.

Registered names, trademarks, etc. used in this document, even when not specifically marked as such, are protected by law.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Contents

Introduction 1

Items in the Kit 1
DMA 7e Dewar Kit (P/N N519-0514) 2
TMA 7 Dewar Kit (P/N N519-0792) 3

Removing the Turbulent Chamber from the Analyzer 4
Prepare the Analyzer for Turbulent Chamber Removal 4
Removing the Turbulent Chamber 8
Removing the Furnace from the Turbulent Chamber 9

Installing the Furnace into the Dewar 11
Disassembling the Dewar 13
Installing the Furnace 13
Assembly of the Dewar 15
Connecting the Dewar to the Analyzer 18
Preparing the Dewar for Use 20

Using the Dewar with Liquid Nitrogen 22

List of Illustrations

Figure 1. Analyzer with the furnace in the fully lowered position. 5
Figure 2. The turbulent chamber attached to the analyzer. 6
Figure 3. Turbulent chamber cover with turbulent chamber, furnace and mounting ring. 8
Figure 4. Diagram of a large (28 mm) and a small (15 mm) furnace. 9
Figure 5. Turbulent chamber disassembly schematic. 10
Figure 6. Installing the furnace into the dewar. 12
Figure 7. Heatsinks for the large (28 mm) and small (15 mm) furnaces. 14
Figure 8. Attaching the "L" bracket to the lift arm assembly. 16
Figure 9. Centering the bracket assembly. 17
Figure 10. Connecting the heatsink and furnace to the analyzer. 18
Figure 11. Anti-diffusion cap with O-ring in place. 20
Figure 12. Split anti-diffusion cap resting on the top of the universal sample holder. 21

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Introduction

The Dewar Kit is used to obtain data in the ambient to subambient temperature range on the DMA 7e and TMA 7 analyzers. Liquid Nitrogen may be used in the dewar for operation from -170 °C and ice water may also be used in the dewar for operation from 25 °C. The standard furnace size for the DMA 7e is the large (28 mm) furnace, while the TMA 7 analyzer uses a small (15 mm) furnace. The temperature range is from -170 °C to 500 °C when using a large furnace and -170 °C to 1000 °C when using a small furnace. The Dewar Kit can also be used on the DMA 7 and older TMA 7 analyzers. Contact your Local PerkinElmer Representative for details.

The dewar is easily installed and removed from the analyzer, allowing the turbulent chamber and other environmental systems to be used. It is recommended that a second furnace be purchased if you will be switching between the dewar and the turbulent chamber on a regular basis. This will allow for a dedicated furnace in each assembly, making it even faster to change between the two.

The instructions found in this manual describe how to install the Dewar Kit and the instructions are valid for both the **DMA 7e and the TMA** 7. This manual also provides instructions for removing the turbulent chamber and installing the furnace in the new dewar.

A parts list for each Dewar Kit is also included:

- DMA 7e Dewar Kit (P/N N519-0514)
- TMA 7 Dewar Kit (P/N N519-0792)

Items in the Kit

Select the packing list below that applies to the model that you purchased and Check all items against the list. Each kit contains one dewar with the items and Instructions required to install the dewar on your analyzer. Report damaged or missing items to the carrier or PerkinElmer to receive the proper credit or replacements. Part number of items are preceded by P/N through this manual.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

DMA 7e Dewar Kit (P/N N519-0514)

Part Number	Description	Quantity
N519-0768	Dewar Liner	1
N519-0770	Cover Assy. - Top Dewar	1
N519-0771	Cover Assy. - Lower Dewar	1
N519-2130	Grommet - Lower Dewar	1
N519-2132	Gasket	1
N519-2102	Gasket - Dewar	1
N519-2136	Heatsink- Large Furnace	1
N519-2105	Plug - Filler	1
N519-2115	Anti-diffusion cap	1
N519-0789	Bracket Assy - Adapter	1
N519-0775	Funnel	1
0991-1144	Thumbscrew 8/32 x 5/8	3
0991-1245	Washer #8 SS	9
0992-1022	O-ring Silicone 2/228	1
0991-0499	Screw 10/32 x 7/8 SHC SS	2
0990-7617	Hex Nut 10/32 SS	2
0991-1268	Washer #10 SPL LOCK SS	2
0991-1246	Washer #10 SS	2
0993-8879	Instructions Dewar Kit	1
0990-2222	O-ring Silicone 2/113	2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

TMA 7 Dewar Kit (P/N N519-0792)

Part Number	Description	Quantity
N519-0768	Dewar Liner	1
N519-0770	Cover Assy - Top Dewar	1
N519-0771	Cover Assy - Lower Dewar	1
N519-2130	Grommet - Lower Dewar	1
N519-2132	Gasket	1
N519-2102	Gasket - Dewar	1
N519-2103	Heat-Sink - Small Furnace	1
N519-2105	Plug - Filler	1
N519-2115	Anti-diffusion cap	1
N519-0789	Bracket Assy - Adapter	1
N519-0775	Funnel	1
0991-1144	Thumbscrew 8/32 x 5/8	3
0991-1245	Washer #8 SS	9
0992-1022	O-ring Silicone 2/228	1
0991-0499	Screw 10/32 x 7/8 SHC SS	2
0990-7617	Hex Nut 10/32 SS	2
0991-1268	Washer #10 SPL LOCK SS	2
0991-1246	Washer #10 SS	2
0993-8879	Instructions Dewar Kit	1
0990-2222	O-ring Silicone 2/113	2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Removing the Turbulent Chamber from the Analyzer

The standard shipping version of the DMA 7e comes with a turbulent chamber, a large (28 mm) furnace, a three point bending measuring system, and a dewar. In order to install the Dewar Kit onto the DMA 7e, the turbulent chamber must be removed. If you only have one furnace, you will also have to remove the furnace from the turbulent chamber and install it into the dewar.

In order to change from the large (28 mm) furnace to the small (15 mm) furnace on your DMA 7e analyzer, follow the disassembly and assembly instructions inserting the appropriate size furnace.

The standard shipping version of the TMA 7 comes with a turbulent chamber, a small (15 mm) furnace, a flat tip penetration measuring system, a quartz expansion measuring system, and a dewar. In order to install the Dewar Kit onto a TMA 7, the turbulent chamber must be removed. If you only have one furnace, you will have to remove the furnace from the turbulent chamber and install it into the dewar.

In order to change from the the small (15 mm) furnace to the large (28 mm) furnace on your TMA 7 analyzer, follow the disassembly and assembly instructions inserting the appropriate size furnace.

> **NOTE:** It is recommended that a second furnace be purchased if you intend on using both the turbulent chamber and the dewar. You may wish to use the Analyzer Utilities in conjunction with a furnace change (see Analyzer Utilities in your user's manual).

Follow the steps below to remove the turbulent chamber from the analyzer.

Prepare the Analyzer for Turbulent Chamber Removal

Turn off the power to the analyzer before disconnecting the turbulent chamber from the analyzer. In order to power off the analyzer follow the steps below.

1. It is not necessary to shut down the 7 Series/UNIX Thermal Analysis software and the TAC 7/DX. (Refer to either the *DMA 7 Users Manual* or the *TMA 7 Users Manual.*)

2. Turn off the power to the analyzer.

3. Remove the anti-diffusion cap.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. Completely lower the furnace. Ensure that the latch locks the furnace in the fully lowered position (see figure below).

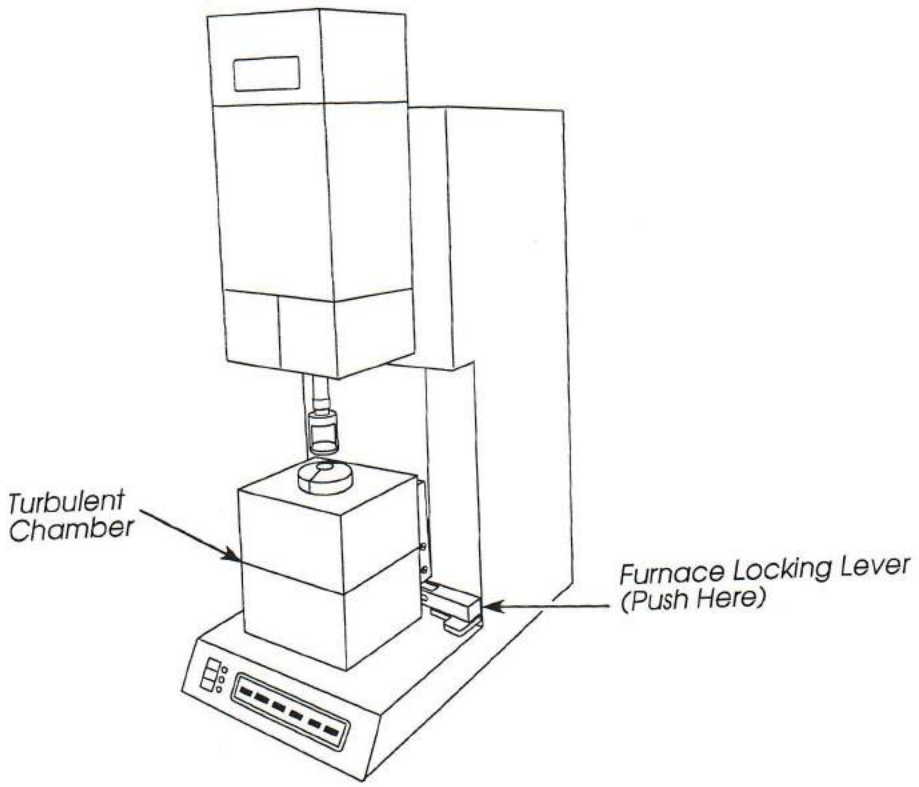


Figure 1. Analyzer with the furnace in the fully lowered position.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. Remove the top furnace cover with care, so as not to damage the measuring system. (If necessary, tilt the turbulent chamber cover toward you.)

6. Unplug the top white (4-pin) furnace connector which is on the left side of the furnace lifting arm housing cover.

7. Unplug the bottom white (3-pin) heatsink connector which is also on the left side of the furnace lifting arm housing cover.

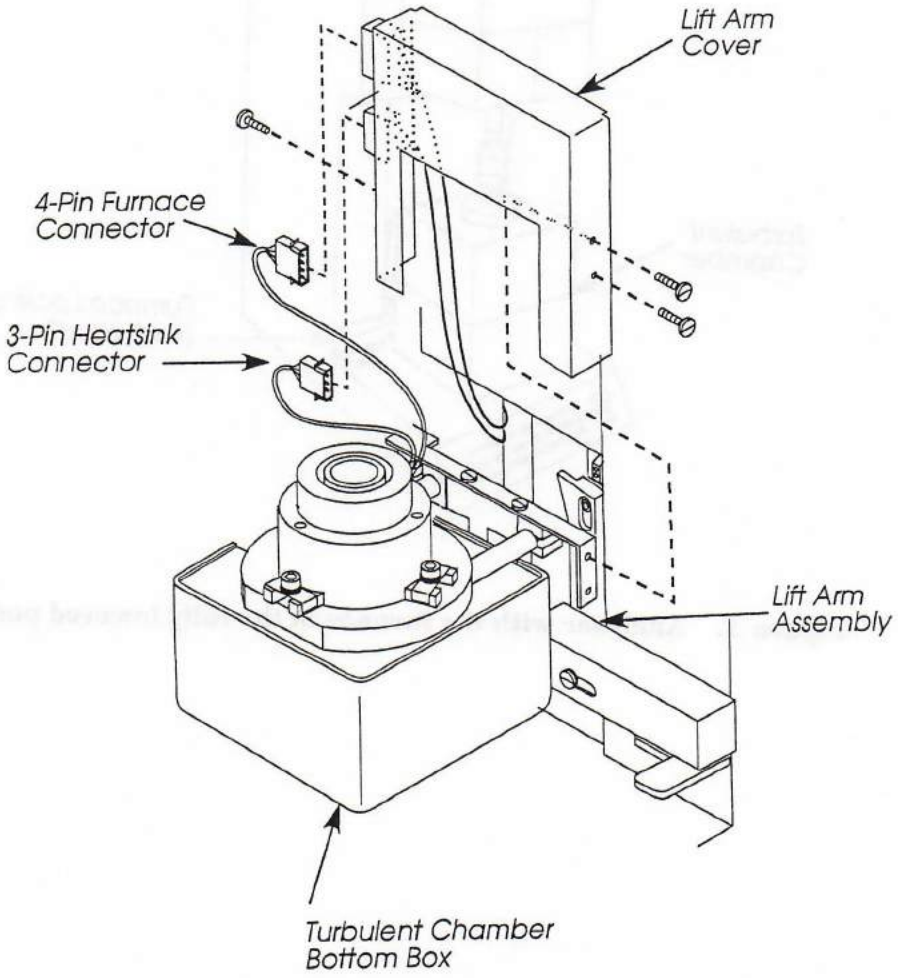


Figure 2. The turbulent chamber attached to the analyzer.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8. Remove the three flat head screws on the furnace lifting arm housing cover. (Refer to the figure above.) Use caution to assure the screws do not drop inside the analyzer.

9. Remove the furnace lifting arm housing cover by lifting it straight up and to one side. Ensure all wires have been cleared out of the way.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Removing the Turbulent Chamber

Follow the steps below to remove the turbulent chamber from the analyzer.

1. Locate the two 3/8-inch mounting hex bolts which are attached to the mounting ring and furnace assembly lift arm.

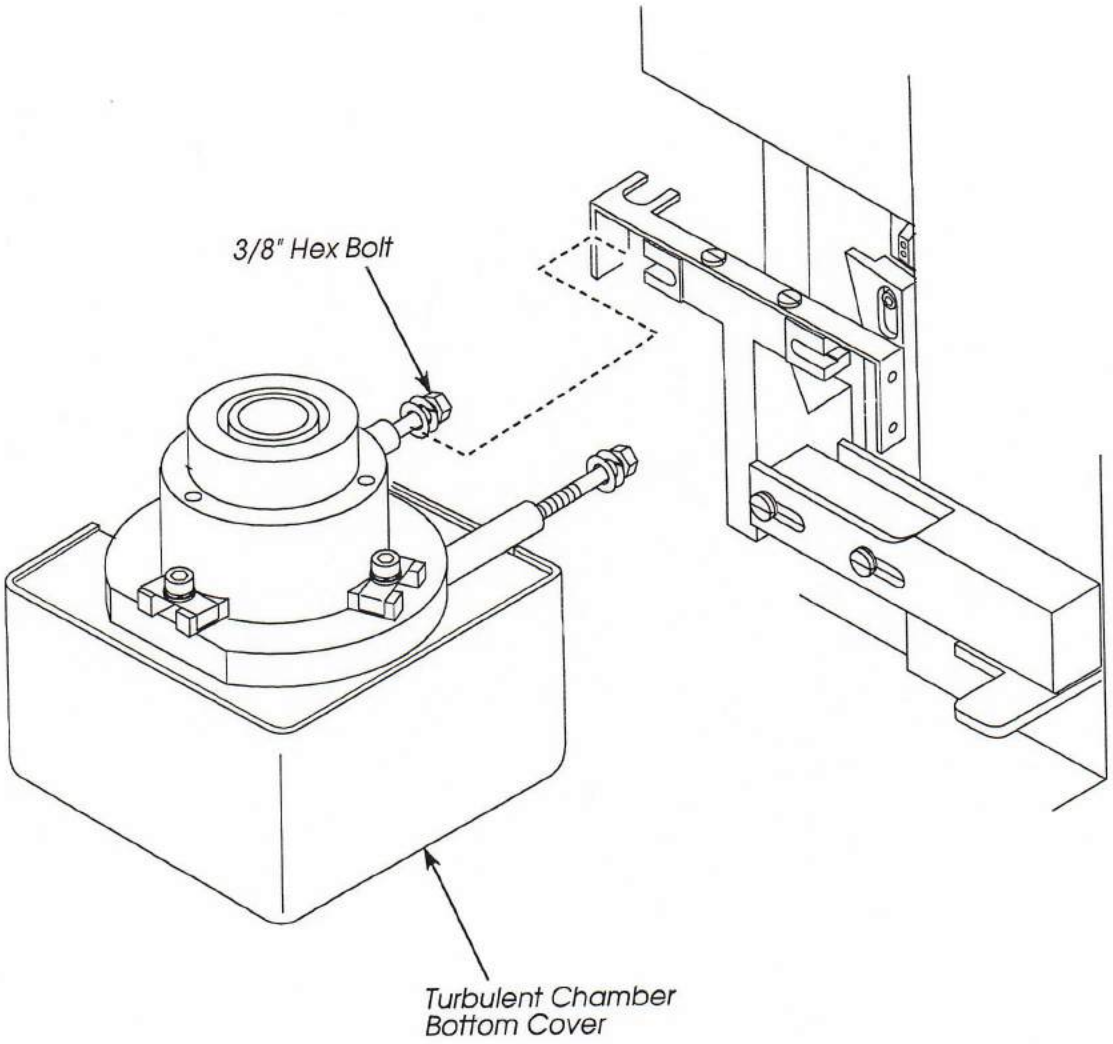


Figure 3. Turbulent chamber cover with turbulent chamber, furnace and mounting ring.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Completely loosen and remove the bolt which is the farthest on the left by turning the wrench clockwise.

3. Loosen the remaining bolt (on your right) by turning the wrench clockwise.

4. Gently move the turbulent chamber bottom box, which contains the circulator and furnace, to the right and remove it from the analyzer.

5. Gently remove the bolt from the analyzer and replace it into the mounting ring for storage.

Removing the Furnace from the Turbulent Chamber

If you don't have a second furnace to install into the dewar, then the furnace from the turbulent chamber will have to be removed and installed in the dewar. Follow the instructions below to remove the furnace. The instructions below work the same for removing a large (28 mm) furnace and a small (15 mm) furnace.

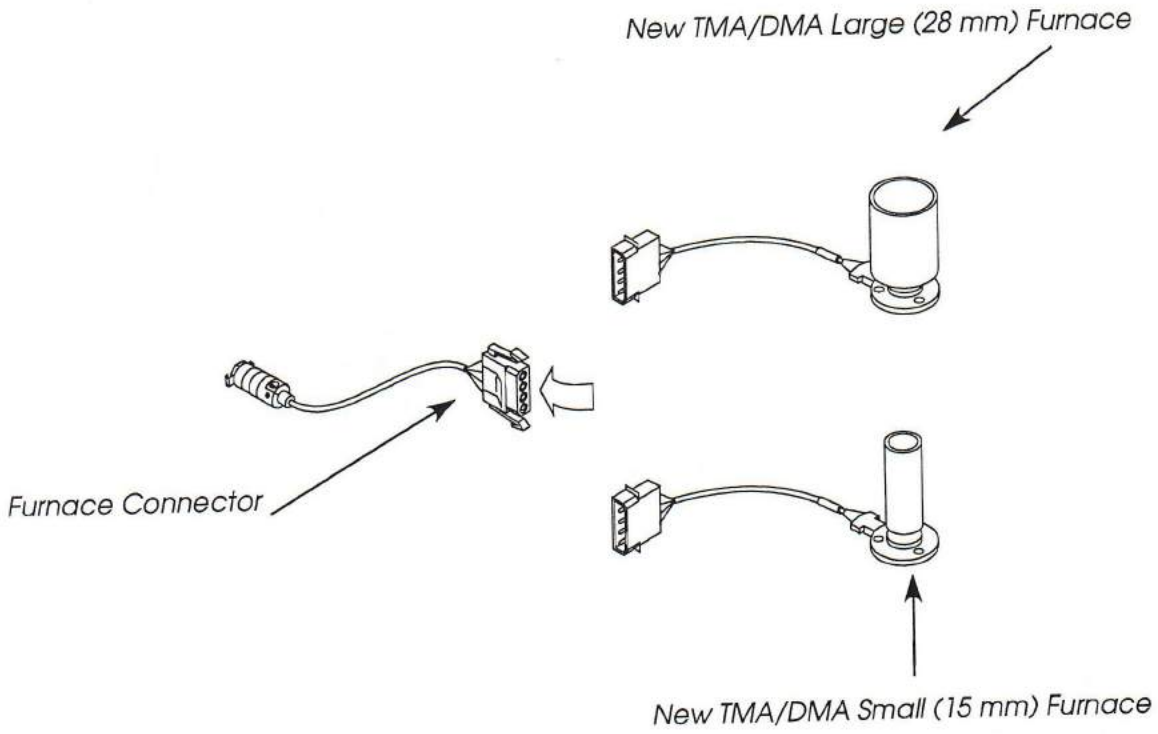


Figure 4. Diagram of a large (28 mm) and a small (15 mm) furnace.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

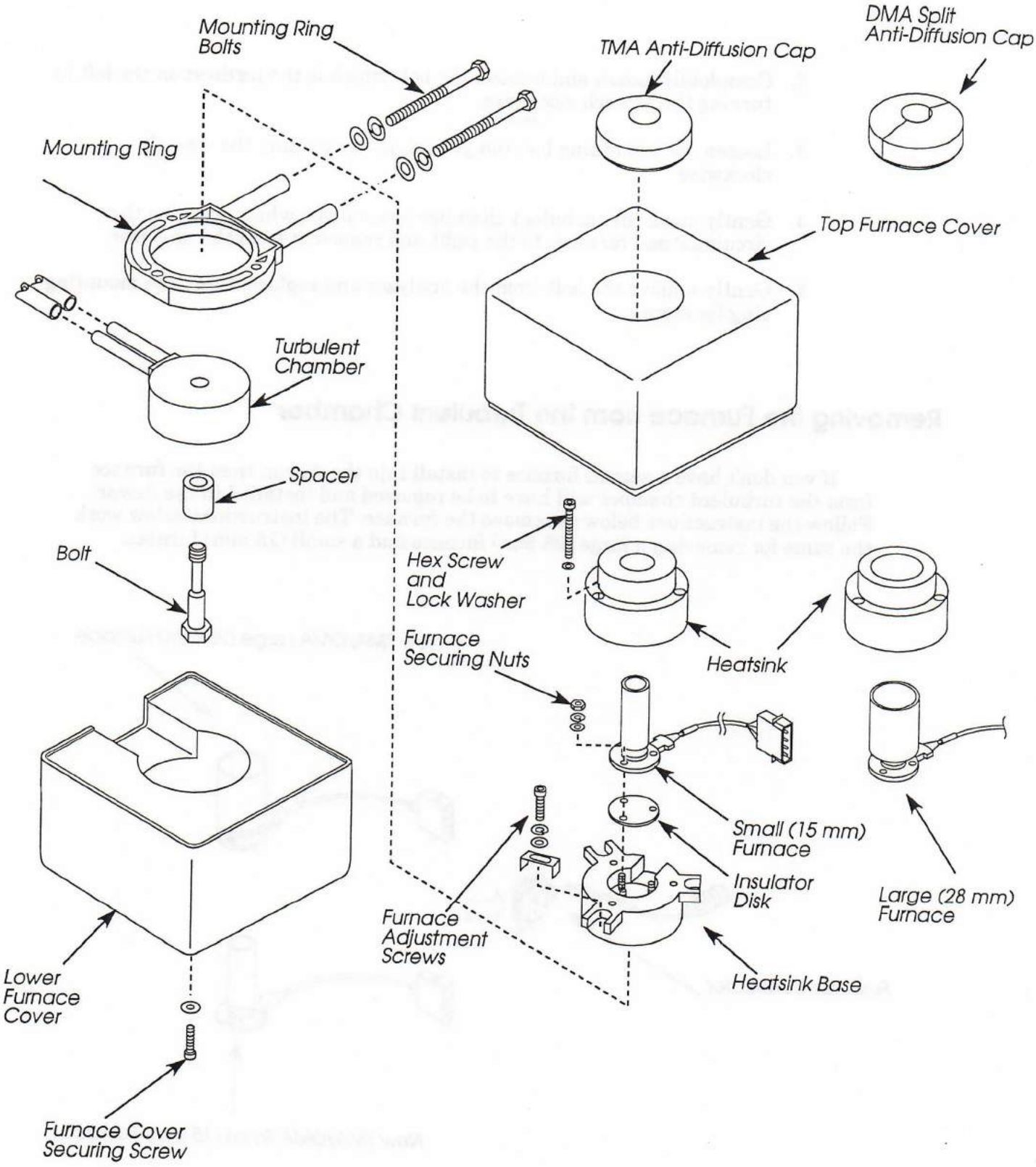


Figure 5. Turbulent chamber disassembly schematic.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The steps below assume that the turbulent chamber has been removed from the analyzer. If you have not already removed the turbulent chamber, then follow the procedure for removing the turbulent chamber from your instrument before continuing with this procedure.

Refer to the turbulent chamber disassembly schematic (figure above) as needed when removing the furnace from the turbulent chamber.

1. Remove the heatsink by loosening the three 9/64-inch hexhead screws.
2. Carefully lift off the heatsink from the heatsink base so as not to bump the sides of the furnace. Keep the heatsink upright to prevent losing the screws and lockwashers.



The furnace can be broken easily.

The furnace is now exposed.

3. Use a 1/4-inch open-end wrench to loosen the three nuts that hold the furnace in place.

   NOTE: The size of the furnace will determine the type of mounting screw used.

4. Gently lift the furnace straight up and off the three setscrews.
5. Replace the three nuts onto the setscrews so that they don't get lost.

Now that the furnace has been removed, it can be installed into the dewar. Turn to the next section for instructions on installing the furnace into the dewar assembly.

Installing the Furnace into the Dewar

This section describes how to install a furnace into the dewar. The same instructions can be used for installing either the large (28 mm) furnace or the small (15 mm) furnace. Refer to the diagram below as needed when performing the procedure.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

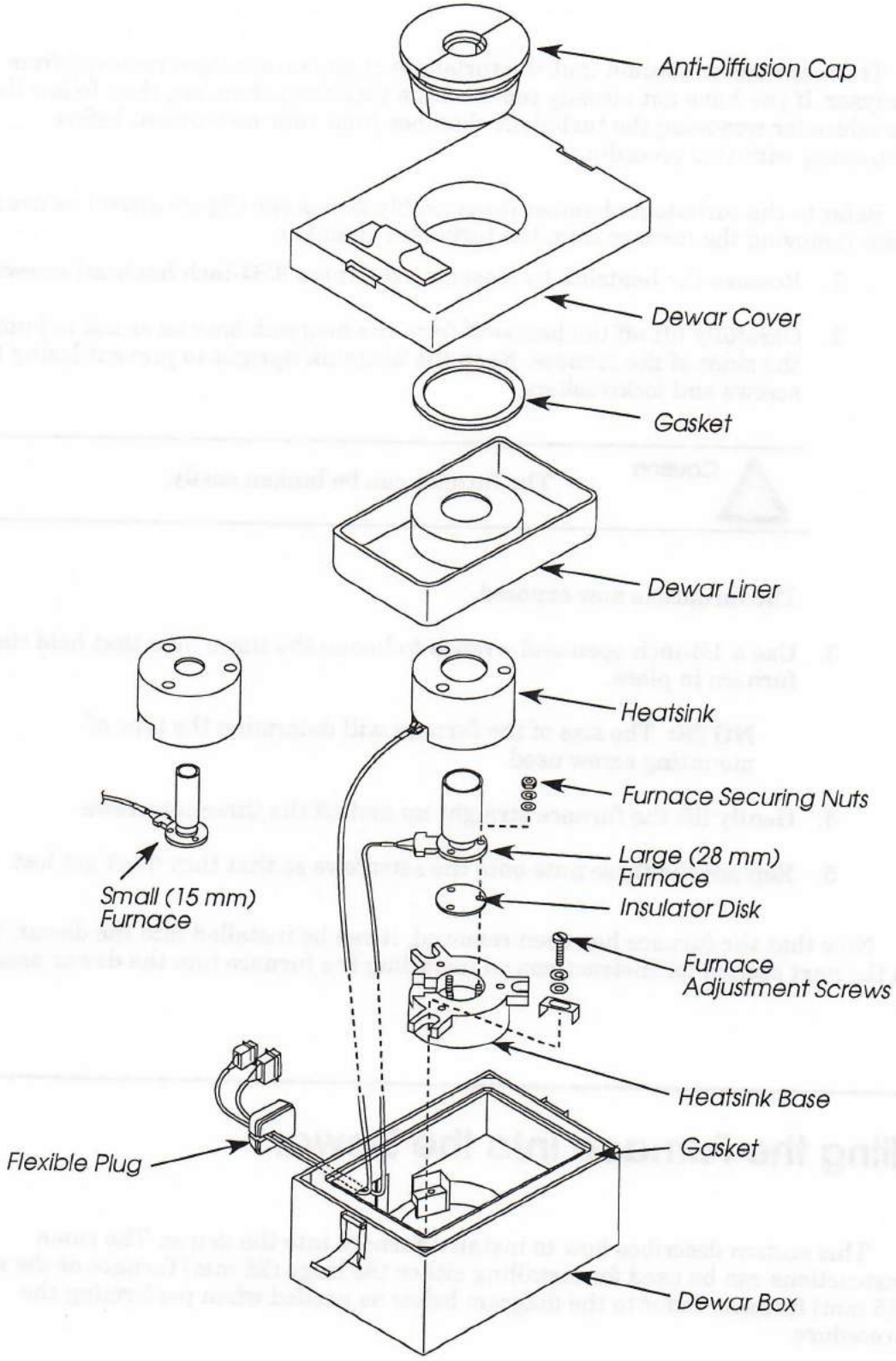


Figure 6. Installing the furnace into the dewar.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Disassembling the Dewar

1. Remove the cover of the dewar by lifting the two latches on the sides of the dewar box.
2. Remove the two gaskets that are present.

   One is on top of the dewar liner and the other is on top of the dewar box.
3. Lift the dewar liner out of the dewar box, exposing the heatsink.
4. Loosen the three 9/64-inch hex screws from the heatsink.
5. Lift the heatsink out of the dewar box, taking care to keep the heatsink upright to prevent losing the washers.

   The heatsink base is exposed. If a furnace is installed in the dewar box, it will be exposed also.



Caution The furnace can be broken easily.

6. Remove the three flat head screws from the heatsink base, and then lift the heatsink base out of the dewar box.
7. Place the insulator gasket over the three setscrews of the heatsink base. Take care not to tear the insulator.

Installing the Furnace

1. Place the furnace onto the heatsink base by lining up the three holes on the furnace with the three setscrews on the heatsink base.
2. Place a flat washer, a lock washer, and a 1/4-inch hex nut onto each setscrew. Tighten the hex nut carefully until it is snug.

   NOTE: DO NOT overtighten the hex nuts, as the furnace could break.

   NOTE: You may wish to have a second furnace so that the dewar and the turbulent chamber can each have a dedicated furnace.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE: The Thermal Analysis Software, Version 2.21 and above, supports multiple furnaces and calibration sets. This is very useful when having to swap furnace configurations on a regular basis. Refer to the *Analyzer Utilities* section which can be found in your user's manual.

3. Place the heatsink over the furnace onto the heatsink base. Be sure you select the heatsink for the appropriate furnace (see figure below).

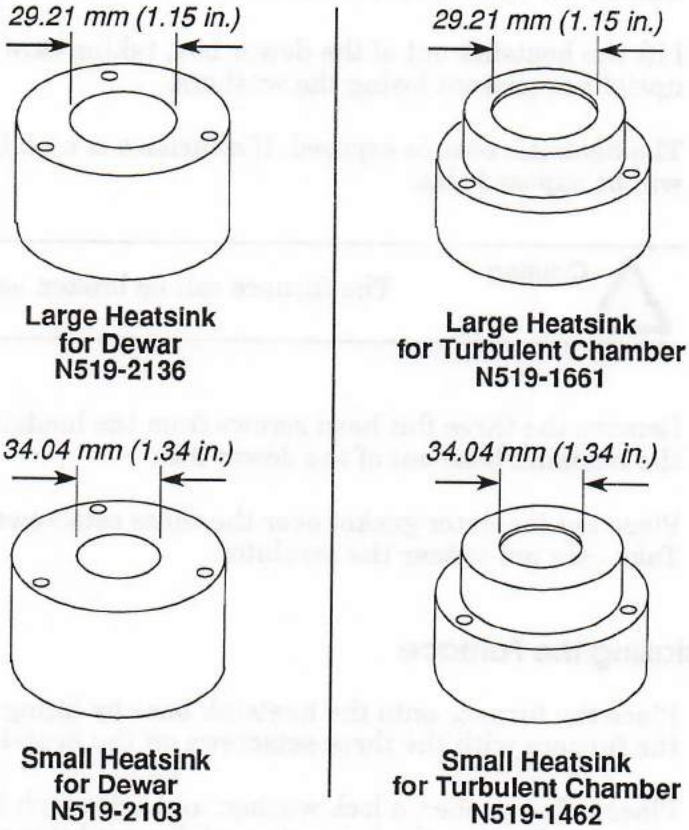


Figure 7. Heatsinks for the large (28 mm) and small (15 mm) furnaces.

4. Place the three lock washers and 9/64-inch hex screws into the heatsink and tighten them.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Assembly of the Dewar

At this point the furnace has been installed into the heatsink assembly. In the instructions below we will be talking about the heatsink and it will be assumed that we are referring to the furnace also.

1. Thread the electrical connectors for the furnace and the heatsink through the hole in the back of the dewar box.

2. Place the heatsink base (with furnace and heatsink) into the bottom of the dewar box.

3. Install the three brackets, washers and flat head alignment screws; be sure to secure them in place. (Do not overtighten; we will be moving the assembly to align the furnace later.)

4. Place the flexible plug over the wires in back of the dewar box, pressing in the plug into the hole at the back of the dewar box.

   When the plug is properly seated, it will "snap" into place.

5. Attach the "L" bracket to the lift arm assembly by placing a 10-32 allen screw in the left hand hole of the of the "L" bracket. Secure the allen screw by placing a lock washer, a washer, and a hex nut on the back of the screw and tighten the hex nut (see figure below).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

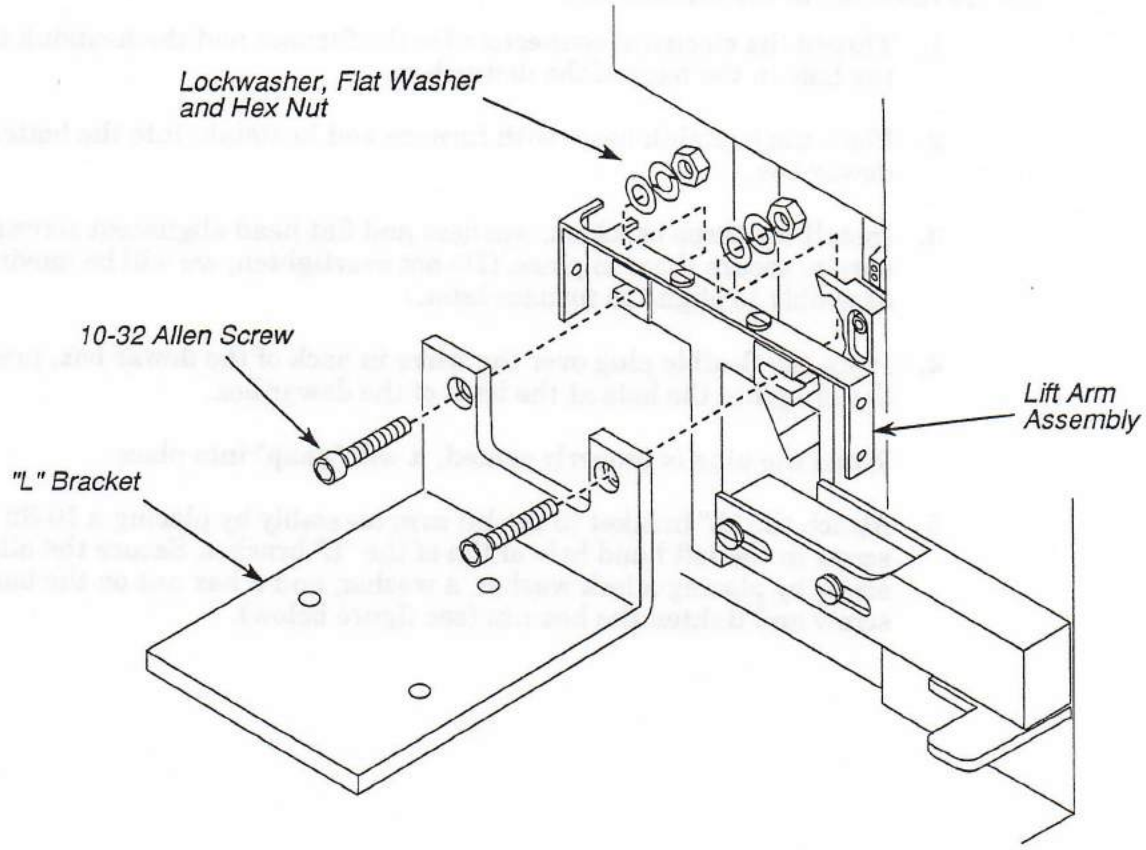


Figure 8. Attaching the "L" bracket to the lift arm assembly.

6. Place a 10-32 allen screw in the right hand hole of the of the "L" bracket. Secure the allen screw by placing a lock washer, a washer, and a hex nut on the back of the screw and tighten the hex nut

7. Adjust the bracket so that it is centered, (refer to the figure below). Once the bracket is centered, tighten the screws.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

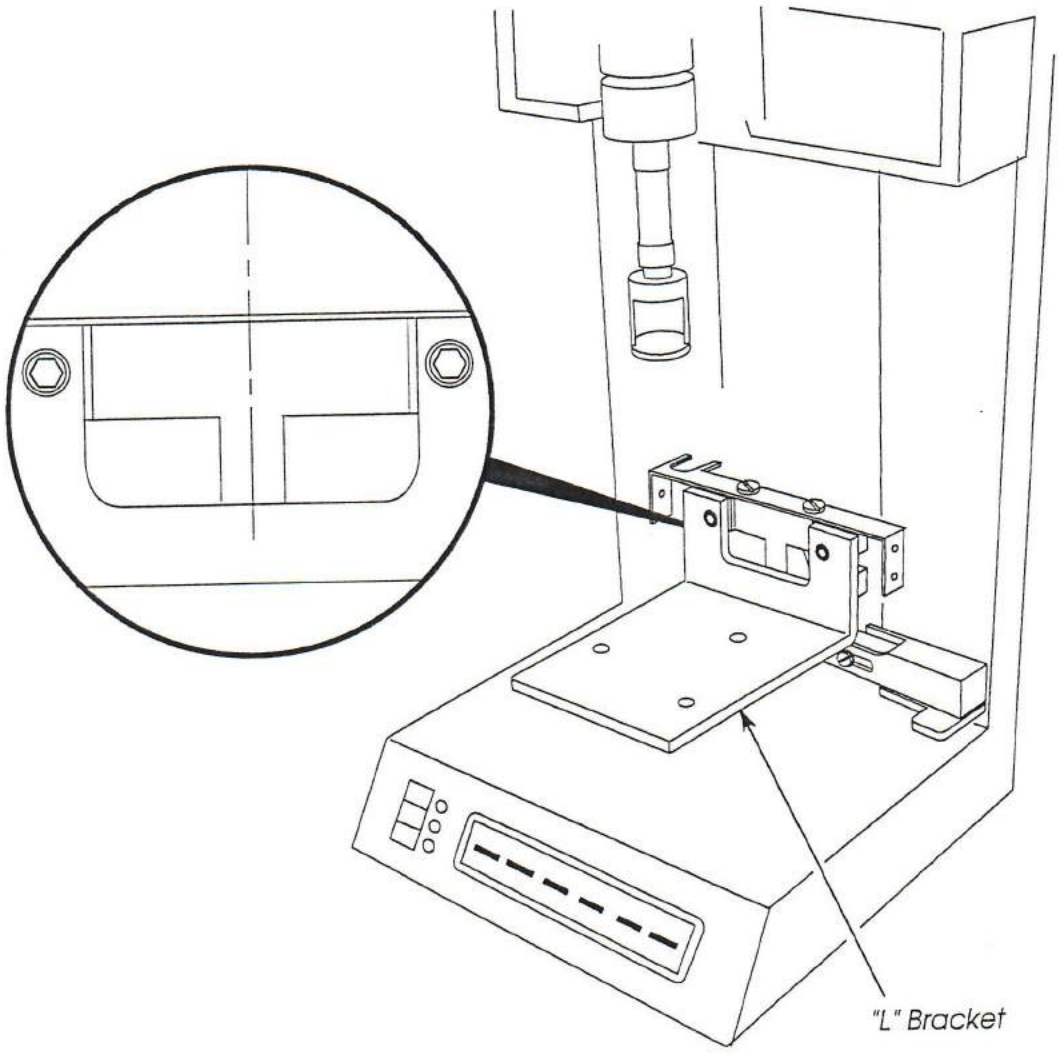


Figure 9. Centering the bracket assembly.

8. Replace the furnace lifting arm cover with the three flat head screws.

Connecting the Dewar to the Analyzer

1. Plug the heatsink's 3-pin connector into the left side of the analyzer (see figure below).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Preparing the Dewar for Use

1. Slide an O-ring over the two halves of the split anti-diffusion cap. The O-ring will slip into the groove which is under the lip of the cap.

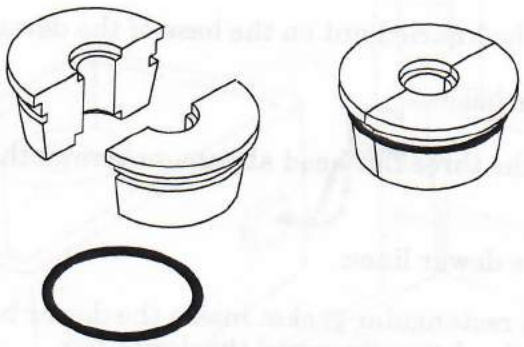


Figure 11. Anti-diffusion cap with O-ring in place.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Place a small O-ring over the measuring system and slide it up the shaft of the universal sample tube.

3. Stretch the two halves of the split anti-diffusion cap open so that it can fit around the measuring system. Now slide the anti-diffusion cap up the universal sample tube so that the cap rests on top of the universal sample tube. (Refer to the figure below.)

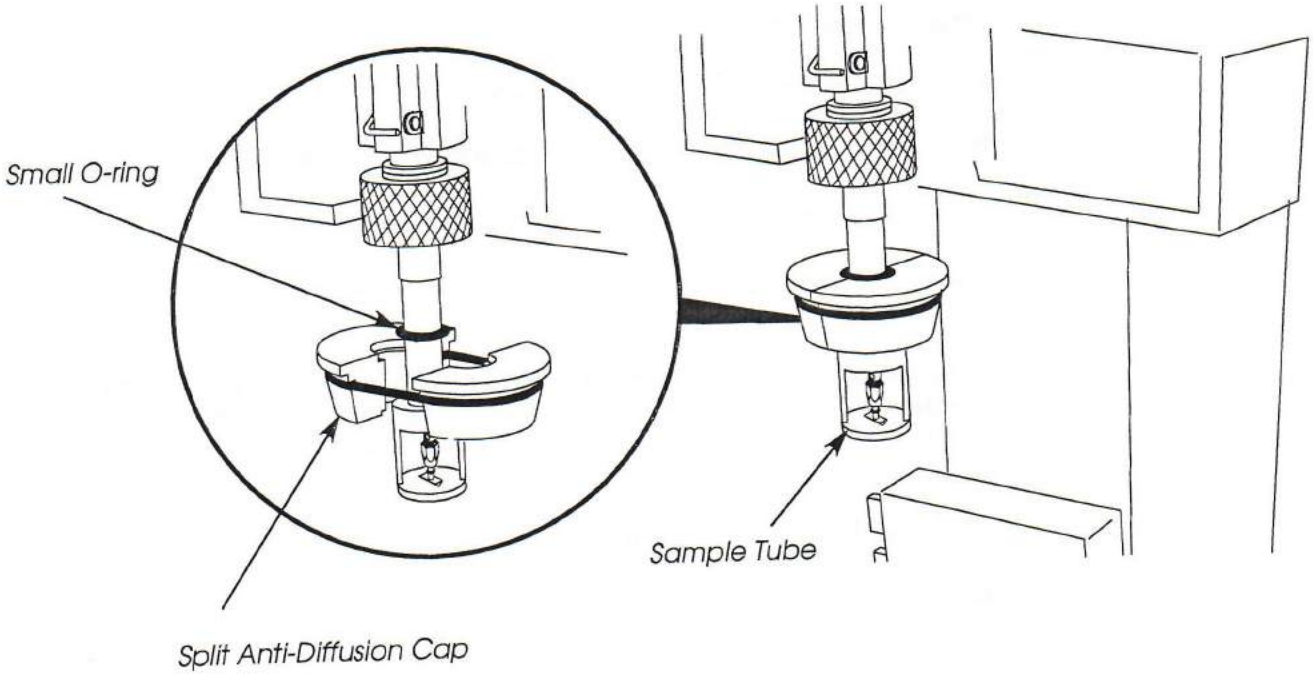


Figure 12. Split anti-diffusion cap resting on the top of the universal sample holder.

4. Roll the small O-ring down into the anti-diffusion cap.

5. If the coupling access cover is open, close it.

6. Raise the furnace, and, if necessary, press the O-rings into place.

The system is now ready to use; follow the instructions in your analyzer user's manual to power-up the system. The Ready and Down lights on the analyzer should come on. If any other lights on the analyzer come on, then something isn't connected properly. Check the cables and connections. If necessary, disassemble the dewar and reassemble it making sure to follow all of the steps in the procedure.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Using the Dewar with Liquid Nitrogen

Follow the steps below when using the liquid nitrogen subambient capability.. Refer to your user's manual as necessary for more detailed instructions on general operation of the analyzer.

1. Program the furnace to -180 °C.
2. Fill the dewar with LN_2 using the funnel.
3. Wait a few minutes for the heatsink to cool and equilibrate.
4. Continue to top off the dewar as necessary as the analyzer cools.

   The dewar is ready for use when minimal filling is required to top off the dewar.
5. Program the furnace to your starting (minimum) temperature. Wait a few minutes for the analyzer to reach the programmed temperature. The programmed temperature is reported in the status window or the status line.
6. Program the method parameters.
7. Mount the sample.
8. Begin the run.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP