

M Air TTM Isolator System

User Guide

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Introduction

The M Air T™ Isolator system is an innovative concept for monitoring bacterial contamination of isolator and closed system air. The system is designed to test air in m 3.5 (Class 100) clean rooms and isolators. The M Air T Isolator has recovery levels equivalent to those of the United States Pharmacopoeia (USP) recommended Slit to Agar method for clean rooms (Eighth supplement, USP-NF, p. 2099). It is also designed for isokinetic sampling in a laminar flow hood, as defined by the USP.

The M Air T Isolator system consists of a programmable, constant-flow suction pump and an independent sampling head that is compatible with the various sterilizing agents used to decontaminate isolators. The sampling head sieve has 611 micro-perforations, reducing the risk of colony overlap. The sampling head uses pre-filled, gridded, M Air T agar cassettes.

The M Air T agar cassettes have a unique design that maintains the nutritive properties at the surface of the gel. The M Air T cassettes have a consistent filling level and flat surface. The distance between the agar and the sieve stays constant, improving reproducibility. The M Air T cassette has a transparent cover and body with a gridded base dividing the surface into small zones to facilitate colony counting. The cassettes have “wings” on the outer edge, making them easy to handle and position on the sampling head.

This user guide covers the installation and use of the M Air T pump, sampling head and accessories that make up the M Air T Isolator system.

Typical Applications Using the M Air T Isolator System

Pharmaceutical

- Evaluation of microbiological quality of isolators
- Evaluation of microbiological quality of confined areas such as Blow Fill Seal (BFS) sterile showers and small laminar flow hoods
- Analysis of trends in aseptic conditions
- Evaluation of decontamination procedures

Food and Beverage

- Evaluation of decontamination of suspended material in the air, critical in Hazard Analysis by Critical Control Point (HACCP) procedures.

Hospitals

- Evaluation of microbiological quality of isolators and laminar flow hoods for preparation of sterile bags for pharmacy.
- Detection of pathogenic **micro**-organisms present in the air of pharmacy rooms, operating theaters or other critical treatment areas.

Electronics Industry

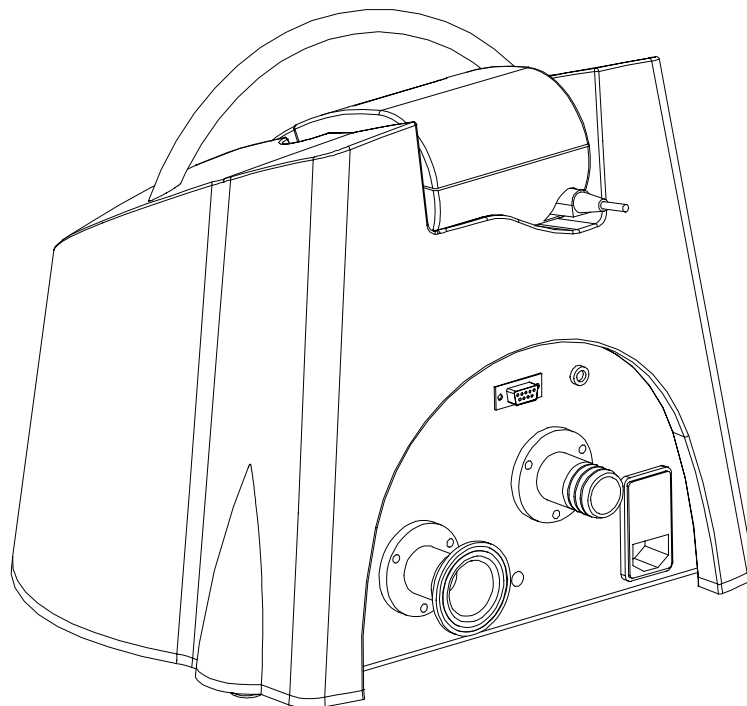
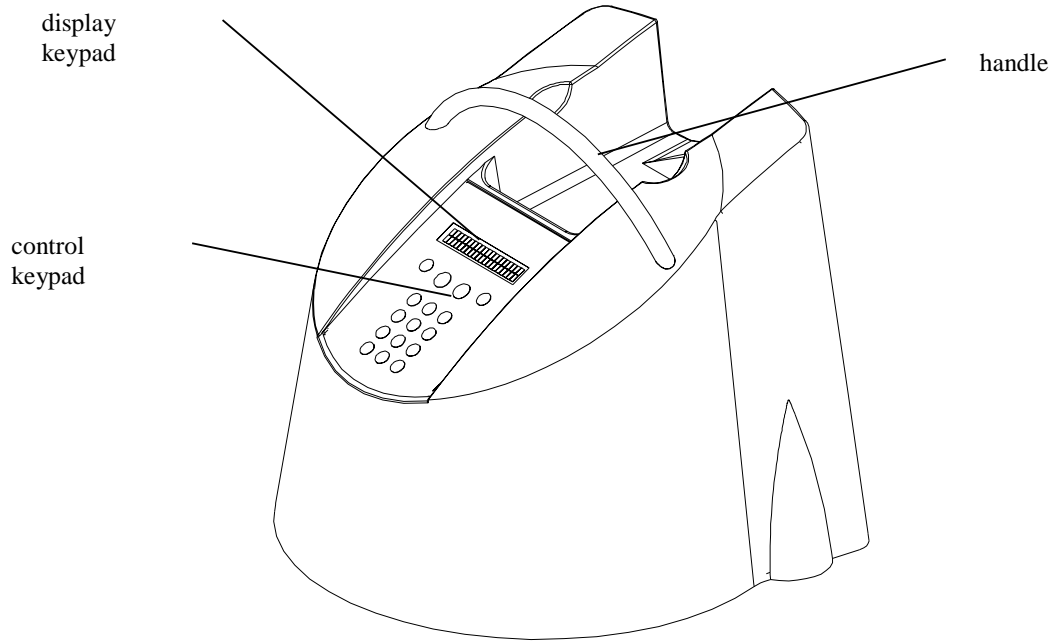
- Separation of particulate and microbial contaminants in clean rooms.

Diagram of the M Air T Isolator System Parts and Accessories

The following sections list and illustrate the M Air T Isolator system parts and accessories.

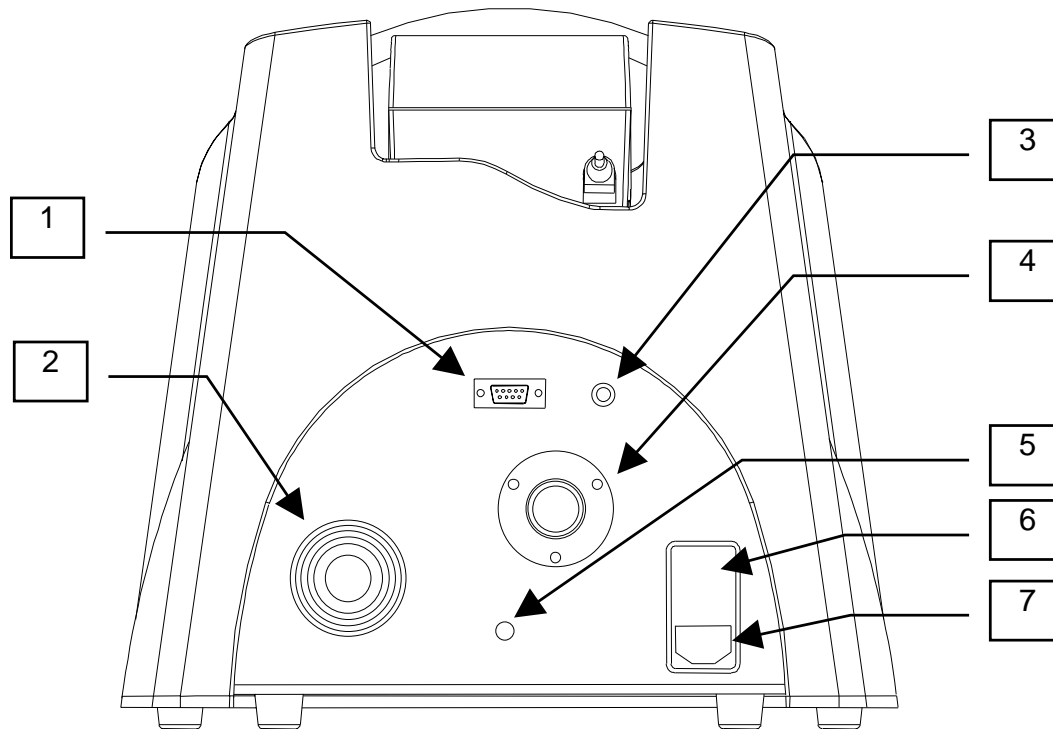
M Air T Isolator Pump

This is a diagram of the assembled pump with accessories:



Pump Connections

This diagram illustrates the connections at the back of the pump

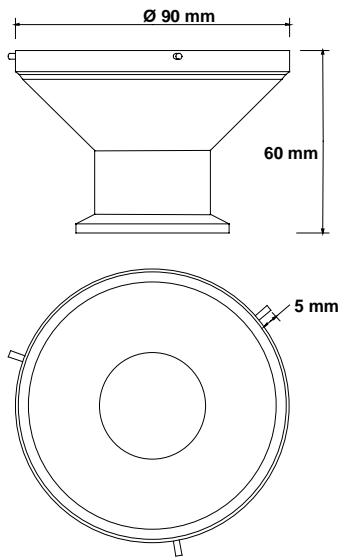


1. Printer connection (SubD9)
2. Delivery connection for Tri-Clover (TC) 1.5" connector
3. Printer connection (jack, dia 3.5 mm)
4. Splined suction connection for 25 mm (1") pipe
5. Pedal connection (Din x pin)
6. Power unit with ON/OFF switch and fuse
7. Power supply cord connection (format CEE 22)

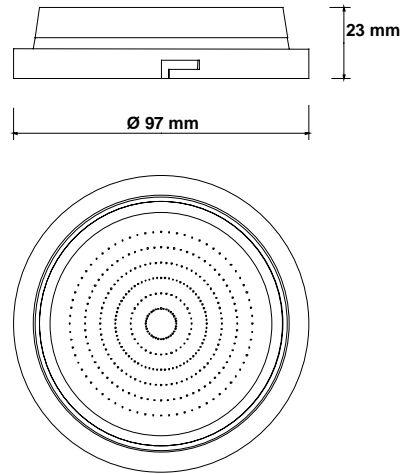
M Air T Sampling Head, with Sieve

This is a diagram of the sampling head and sieve, side and over-head views.

Head

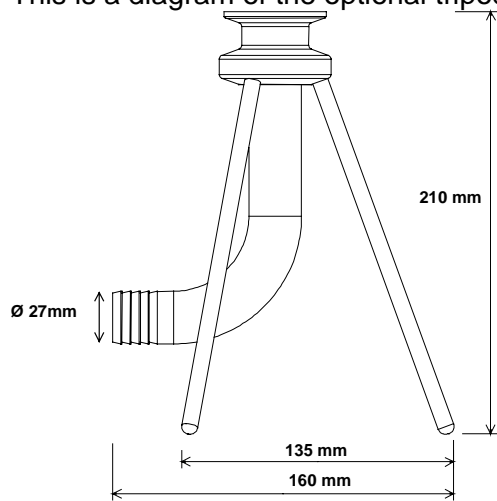


Sieve



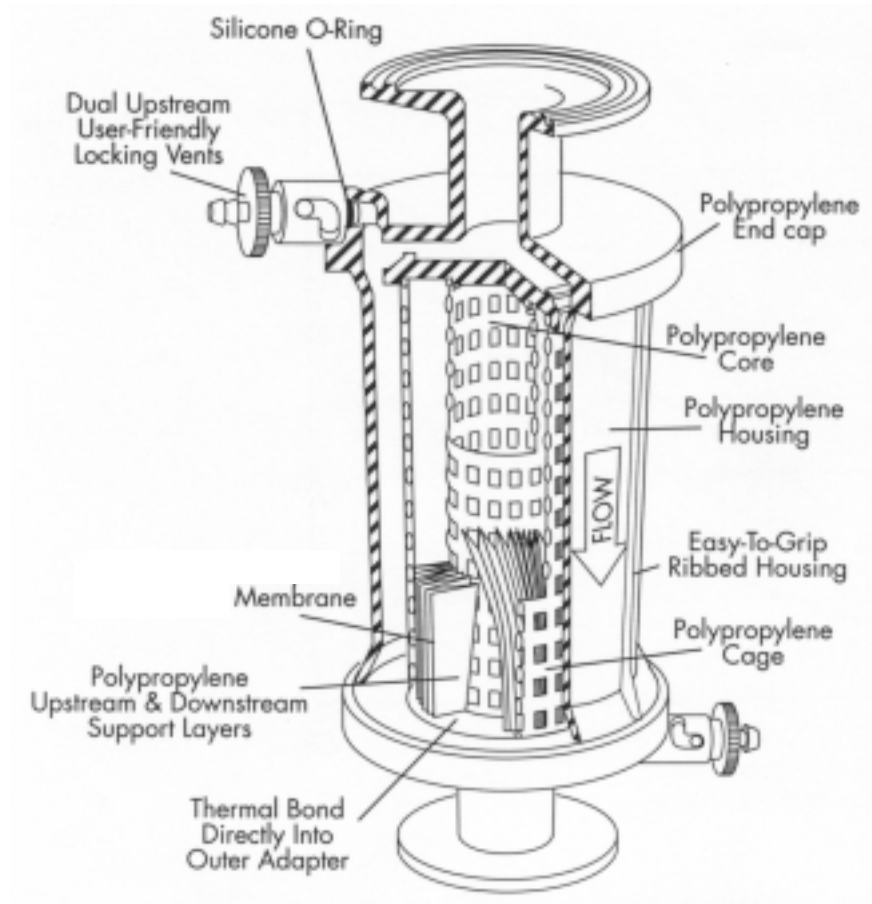
M Air T Tripod

This is a diagram of the optional tripod.



Opticap Filter

This is a diagram of the opticap filter.



Precautions and Limitations

- Connect the pump to a electrical system with a grounded circuit.
- Leave clear access to the power supply connection so the power supply can cut off.
- **Do not** use the pump without its outer casing: there are dangerous electrical currents inside.
- Install a circuit breaker downstream from the power supply.
- The electrical installation must comply with current standards and requirements in your country.
- The electrical socket must be close to the unit. Avoid multiple connections that can disrupt operation.
- The pump complies with: European Economic Community (EEC) Directive 89/336/CEE, modified 92/31/CEE and 93/68/CEE (Electromagnetic compatibility)
- Make sure all pump connections are correctly installed. If you have any doubts or worries about safety of the pump, contact Millipore Technical Service or the office nearest you.
- Use only pre-filled M Air T Cassettes with the M Air T pump.
- Do not start the pump until all the accessories required for air sampling are installed.
- Autoclave all parts before introducing them into an isolator. The recommended sterilization method is autoclaving at 121 °C for 20 minutes. All accessories are compatible. After autoclaving, place all accessories in the transfer or working isolator according to your standard procedure.
- For use under a flow hood, only the sampling head and its sieve need to be autoclaved.
- Before using the M Air T pump, decontaminate the outer surfaces using tissues and alcohol.
- Replace the Opticap filter after 30 autoclaving cycles of 30 minutes at 135 °C.
- A trained Millipore service technician must perform all maintenance and repairs.
- Using the pump in a manner other than that described in this user guide can affect the warranty.

SAFETY SYMBOLS

These symbols are found at different points on the pump. Only qualified Millipore technicians are authorized to repair the pump and it's accessories.



Direct current



Alternating current



Alternating and direct currents



Grounding pin



Protective grounding pin



ON (power supply)



OFF (power supply)



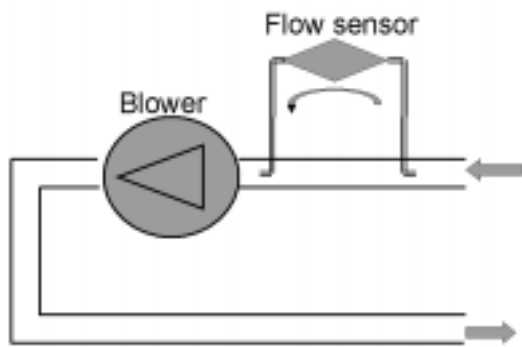
Attention

How the M Air T Isolator System Works

This section gives an overview of how the system works.

Flow Circulation

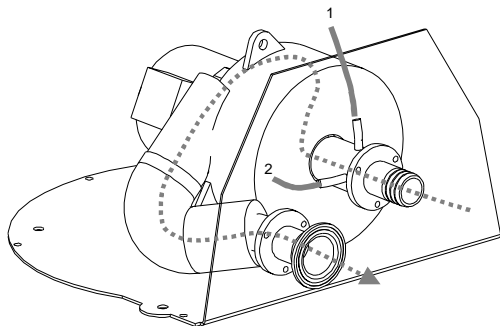
The air is drawn in by the blower and blown to the outside of the pump using a closed circuit. Some of the air flow goes to a flow sensor used for regulation.



The sensor regulates the air flow by varying the rotational speed of the blower.

Flow Circulation Diagram:

1. To flow sensor outlet
2. To flow sensor inlet

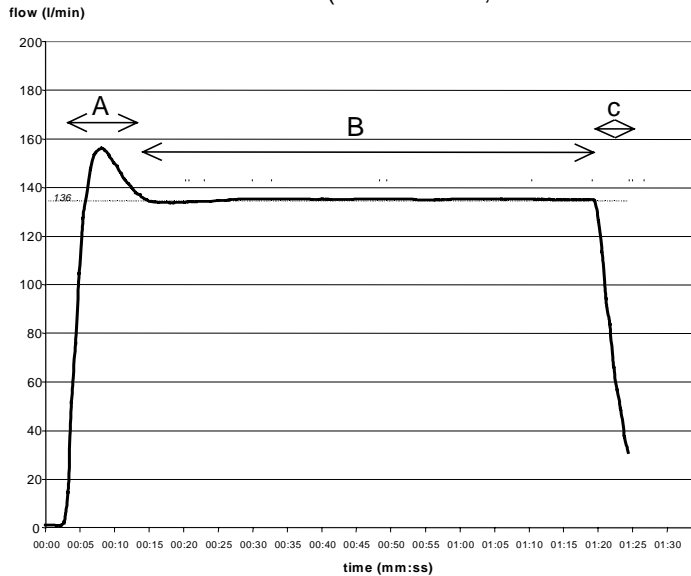


Flow Regulation

The pump regulates the flow rate to its nominal value $\pm 5\%$.

- A: blower start-up portion
- B: effective sampling portion
- C: blower stopping portion.

Typical regulation curve for sampling at 150 Liters
(flow in L/min, time in minutes and seconds)



The volume of air sampled is counted from the moment the air flow is stabilized in the $136 \pm 5\%$ portion (portion B)

- The characteristics of portion A and C depend on the fluid configuration.
- The duration of portion B is calculated by the software by dividing the volume to be sampled by the flow rate (136 L/min)

Fluid Characteristics

Millipore guarantees these fluid characteristics based on an installation similar to those shown in the "Installing the Isolator System in and Isolator" section.

- Flow rate = 136 L/min $\pm 5\%$ after stabilization of flow (manufacturer's calibration)
- Volume sampled = Programmed volume $\pm 5\%$ after stabilization of flow in 136 L/min $\pm 5\%$ range (with manufacturer's calibration)

Sampling Parameters

Name	Unit	Adjustable range	Pitch
Volume drawn	Liter	From 25 to 9999L	1 Liter
Test start delay	Minute	From 0 to 999	1 minute
No. of cycles in test	Numerical value	From 1 to 9	1 unit
Delay in the cycle (for multiple cycles)	Minute	From 0 to 999	1 minute
Test time	Minute		1 minute

Installing the M Air T Isolator System

The following sections describe installing the M Air T Isolator system in an isolator and a laminar flow hood. These sections include a list of the parts required for each installation.

Unpacking the Pump

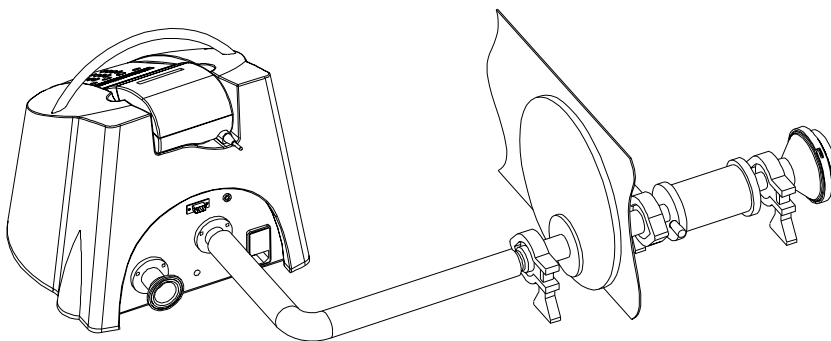
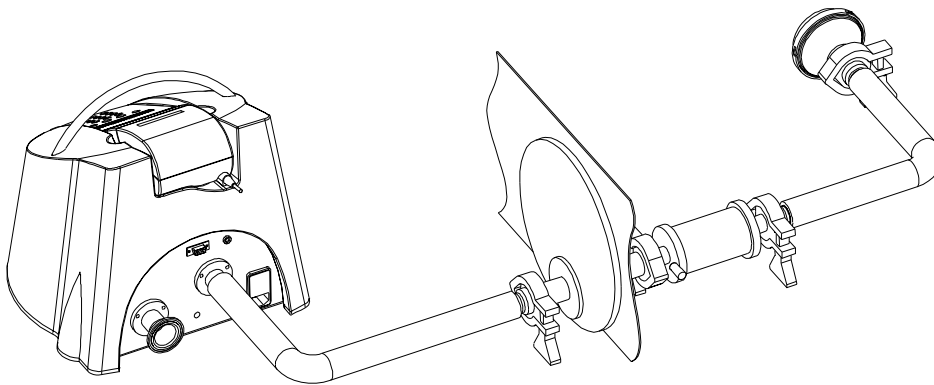
1. Remove the following accessories from the box:
 - 1 EU power cord
 - 1 US power cord
 - 1 compliance and calibration certificate
 - 1 set of spare fuses
 - 1 User Guide
2. Grasp the pump handle and lift it out of the box.
NOTE: Do not lift the unit by the foam packing frames.

Installing the Isolator System in an Isolator

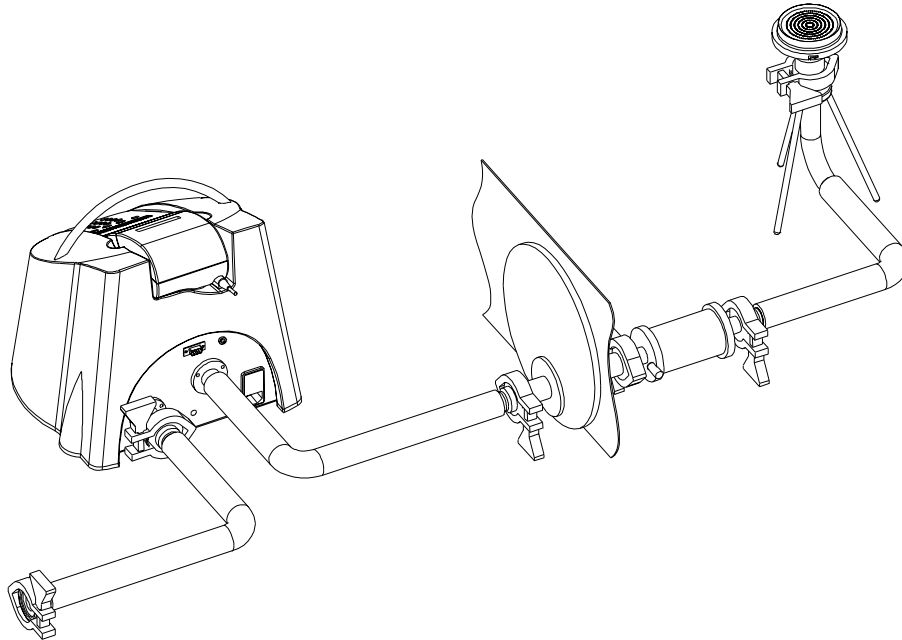
The following diagrams illustrate typical installations in laminar or turbulent flow isolators, depending on isolator configuration.

Typical Installations in an Isolator

The following diagrams show the configurations recommended for turbulent flow isolators:



This diagram shows the configuration recommended for a laminar flow isolator:



Necessary Equipment

The following parts are required for sampling in an isolator:

Part	Catalogue Number
M Air T Isolator pump	ATBP UMP 01
M Air T sampling head	ATBH EAD 01
Opticap filter	KTGR 04T C3
Tri-Clover (TC) 1.5" connector, qty 4	PF 01501
Clamp for TC 1.5" connector, qty 5	YY20 040 45
Silicone seals for TC 1.5" connector, qty 5	YY20 040 55
3-m reinforced silicone tube	ATBT UBE 01
M Air T Cassettes, appropriate for your testing	ATSM TTB 24 ATSM TPB 24

The following accessories are optional:

Part	Catalogue Number
M Air T tripod	ATBF EET 01
M Air T printer	ATBP RNT 01

NOTE: Autoclave all parts before putting them into the isolator. Millipore recommends assembling the equipment inside the isolator first, then connecting the pump.

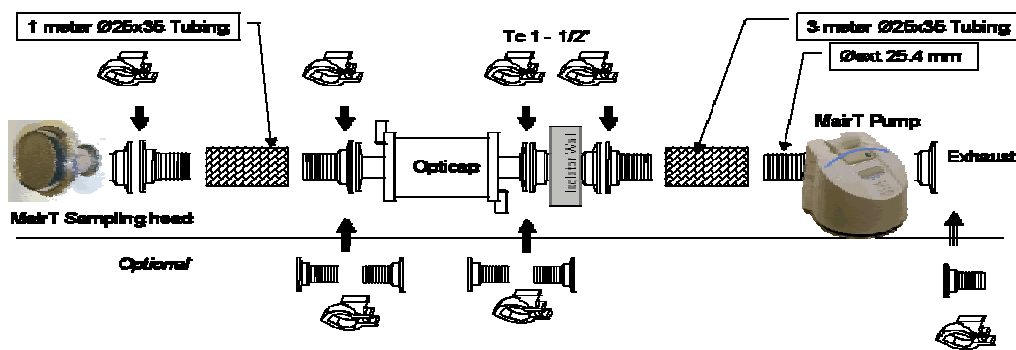
Assembly of Parts Inside the Isolator

1. Using the TC 1.5" connectors, connect the sampling head to the silicone tube. Clamp the tube onto the splined end fitting.
2. Connect the silicone tube to the Opticap filter.
NOTE: Install the Opticap filter with the arrow pointing in the direction of the air flow.
Depending on the type of isolator, the Opticap filter can be placed either at the isolator inlet, or connected directly to the sampling head.
3. Connect the Opticap filter to the isolator's TC 1.5" inlet.

Assembly of Parts Outside the Isolator

1. Connect the pump to the isolator's TC outlet using the silicone tube.
2. Connect the power cord to the pump and plug it into the power source.

The following illustrates a typical system set-up after installation in an isolator:

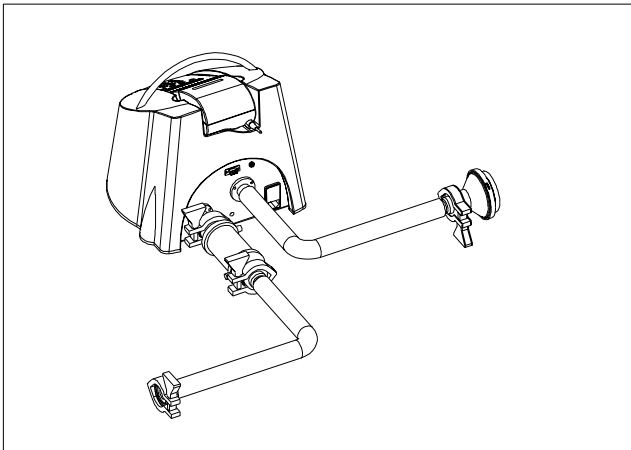
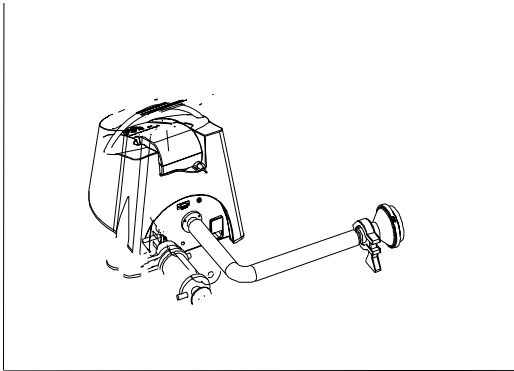


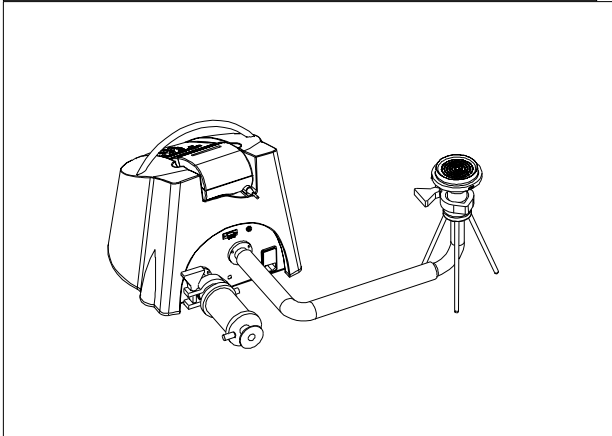
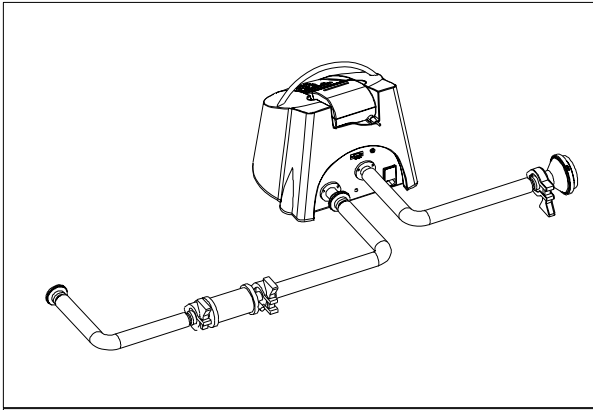
Installing the Isolator System Under a Laminar Flow Hood

The following diagrams illustrate typical installations under a laminar flow hood, depending on flow hood configuration. Placing an Opticap filter on the pump outlet reduces the particle contamination in the area where the pump is placed.

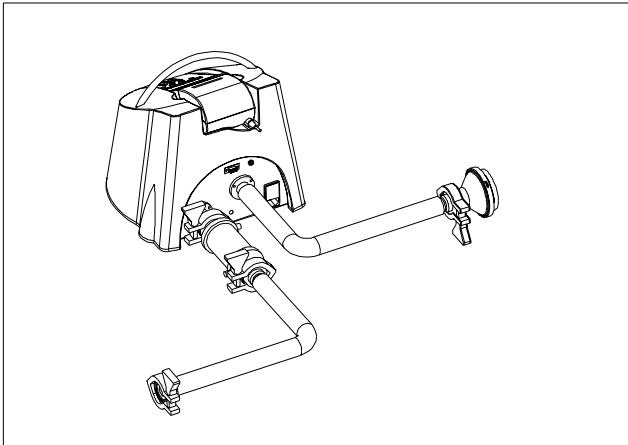
Typical Installations Under a Laminar Flow Hood

These installations are recommended for a horizontal laminar flow hood:





This installation is recommended for a vertical laminar flow hood:



Necessary Equipment

The following parts are required for sampling under a laminar flow hood:

Part	Catalogue Number
M Air T Isolator pump	ATBP UMP 01
M Air T sampling head	ATBH EAD 01
TC 1.5" connector, qty 2	PF 01501
Opticap filter	KTGR 04T C3
Clamp for TC 1.5" connector, qty 1	YY20 040 55
Silicone seals for TC 1.5" connector, qty 3	YY20 040 55
3-m reinforced silicone tube	ATBT UBE 01
M Air T Cassettes	ATSM TTD 60

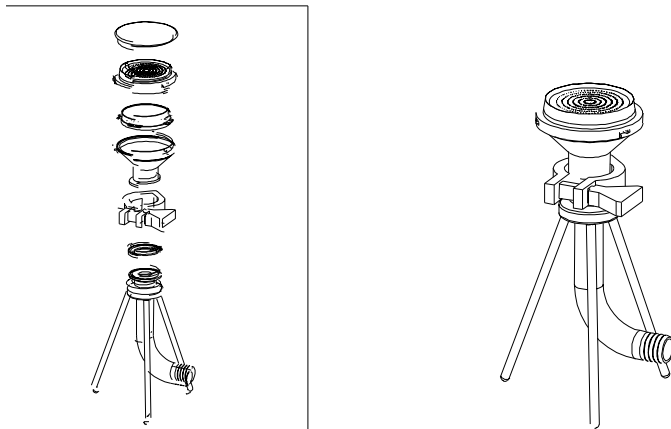
The following parts are optional:

Part	Catalogue Number
M Air T tripod	ATBF EET 01
M Air T printer	ATBP RNT 01

NOTE: For this configuration, Millipore recommends using the M Air T Tripod for isokinetic air sampling.

Installing the Sampling Head and Pump

1. Install the sampling head on the tripod.



2. Connect the M Air T tripod to the pump inlet using the silicone tube

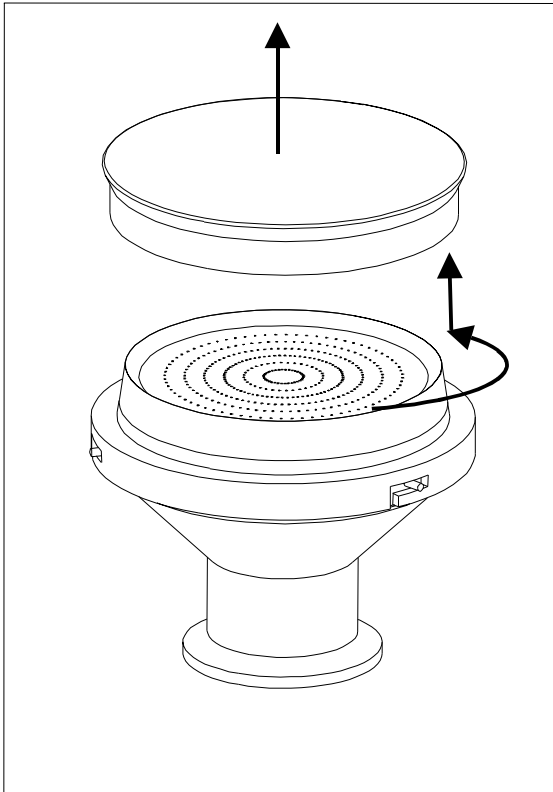
3. Connect the Opticap filter to the pump outlet to avoid any risk of particle contamination.

NOTE: Install the Opticap with the arrow pointing in the direction of the air flow.

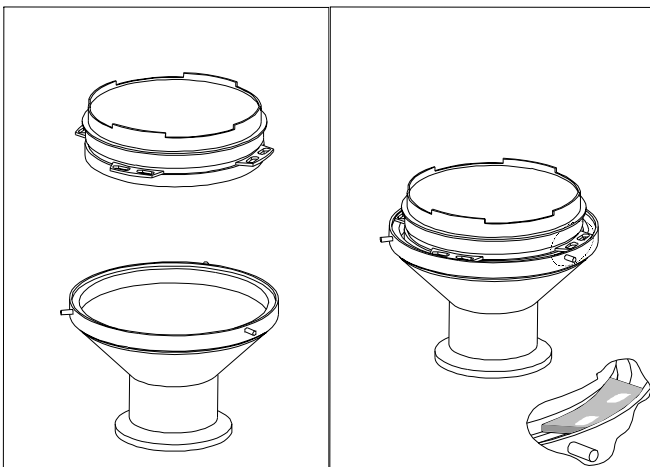
Installing the M Air T Cassette

The M Air T cassette, in its sterilized double gamma packaging, has been qualified and validated to be compatible with common sterilizing agents used for sterilizing isolators.

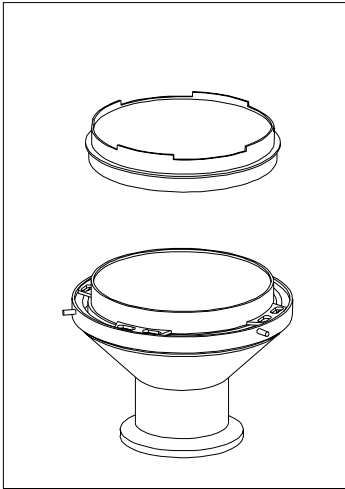
1. Remove the cover. Loosen and remove the sieve from the analyzer by twisting it counter-clockwise.



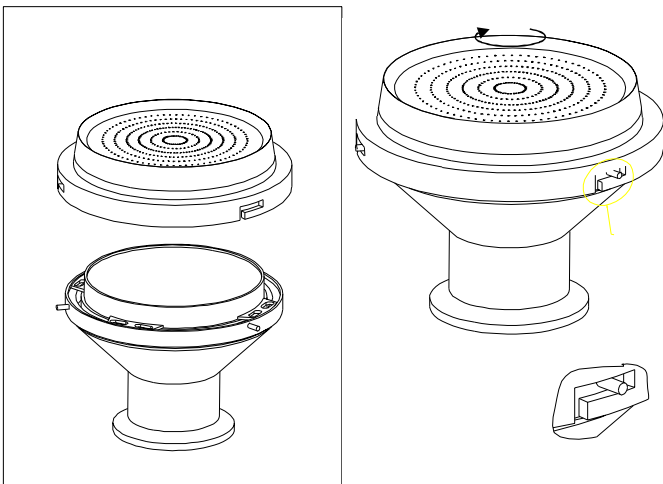
2. Grasp the cassette wings and place it on the sampling head. Lock the cassette into place.



3. Remove the cover and place it on a work surface with the inside facing down.

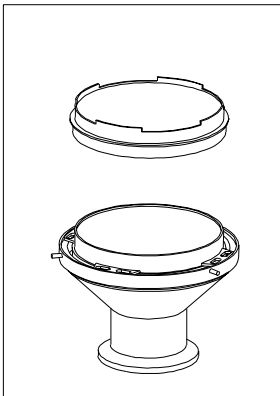


4. Place the sieve over the cassette and lock it into position.

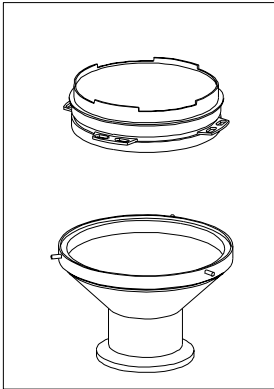


5. Take the sample (see “Using the M Air T Isolator Pump” section).

6. After sampling, loosen the sieve and remove it. Then replace the cassette cover.



7. Remove the cassette by grasping the “wings” and lifting it off the sampling head.



8. Label the cassette.

NOTE: Incubate the cassette upside down.

Using the M Air T Isolator Pump

The following sections outline the procedure for starting the pump and using the various modes for sampling and testing the pump's functionality. The M Air T Pump can only be used with pre-filled M Air T Cassettes.

Do not start the pump until all of the accessories required for air sampling are installed.

Control Keypad Description



START: starts the action displayed on screen

STOP: stops the action displayed on screen

PARAM: accesses the fields for entering sampling parameters

PRINT: prints the ticket

←: deletes characters entered

ENTER: go to next screen

When scrolling through data entry screens (values or text), the cursor flashes after the last character entered.

Example:

S	A	M	P	L	I	N	G		V	O	L	U	M	E	?				
L	I	T	E	R	S	:			1	0	0	0							

Parameters can be changed using the ← key to delete information.

Starting the Pump

1. Turn on the pump using the switch on the back of the pump.
2. The following message displays on the screen:

M	I	L	L	I	P	O	R	E		M	A	I	R	T		I	S	O	L
V	E	R	S	I	O	N	:			X	X	X	X	X	X				

and the following tests:

T	E	S	T																
S	E	N	S	O	R		S	U	P	L	Y	-	>	O	K				

```
TEST
MAIN FREQUENCY - > OK
```

```
TEST
RTC CLOCK - > OK
```

```
TEST
TEMPERATURE - > OK
```

```
TEST
FLOW SENSOR - > OK
```

3. The pump automatically runs an auto-test. After 5 seconds the following message displays :

```
MILLIPORE MAIRT ISOL
AUTO TEST OK
```

Note: If the printer is not connected to the pump an error message displays:

NO PRINTER

CONNECT, PRESS PRINTER

If you are using the printer, connect the printer and press ENTER.

If you are not using the printer, press ENTER to clear the message.

4. The last calibration date appears after 5 seconds:

```
LAST CALIBRATION
DATE : DDMMYY
```

5. After 2 seconds the following screen automatically displays:

```
VOLUME SAMPLED SINCE
LAST CALIB : XXXXXXL
```

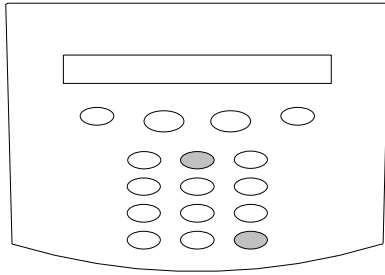
Then the screen displays the parameters of the last sample taken.

```
READY DDMMYY HR : MN
VOL : XXXXL CYCLE : X
```

Service Mode

This mode allows you to check the operation of the pump's automatic start/stop function, flow regulation, and timed delayed start function. This mode also allows you to perform the pump installation qualification tests. For more detailed instructions for each test, see the M Air T System Validation Protocol.

1. Turn the pump on and wait 15 seconds for the main screen to display. Then, press the ENTER and the number 2 key at the same time.



2. The date and time display on the screen.

```

DD  M  MM  YY      HR : MN
SERV ICE  MODE
  
```

Press ENTER.

3. The following screen appears.

```

TIME ADJUST > START
DD  MM  YY      HR : MN
  
```

To continue checking the pump's operation press ENTER and go to Step 4.

To change the time and date, press START. The following screen displays.

```

DD  M  M  YY      HR : M N
XX  X  X  XX      XX  X  X
  
```

Change the time or date by pressing the ← key to delete existing information and enter new values from the keypad. Then, press ENTER.

4. The screen displays the total volume sampled since the pump's installation.

```

TOTAL VOLUME SAMPLED
XXXXXXXXXX LITERS
  
```

Press ENTER.

5. The following screen displays.

```
NON STOP RUN
PRESS > START
```

This step allows you to check reliability of the pump's automatic start and stop function.

NOTE: Millipore recommends running this test for one hour when the pump is first installed.

To test this function, press START to run the pump automatically for 7 minute intervals, with 2 minute stops in between each interval. When the test is complete, press ENTER to go to step 6.

To skip this test and continue to the next step press ENTER.

6. The REGULATION TEST step diagnoses a failure and analyzes operation.

```
REGULATION TEST
PRESS > START / STOP
```

Press START to start the pump.

Press ENTER to skip this test and go to step 8.

7. The screen displays the frequency of operation of the motor for a nominal flow rate of 136 L/min and the flow rate setting value. This checks the efficiency of the pump's auto-regulation.

```
MOTOR ORDER : XXXXX
FLOW XXXX CALIB : XXXX
```

At the end of the test, press the STOP key to stop the motor. Then, press ENTER.

8. This screen displays:

```
CLOCK TEST
PRESS > START
```

This step checks the operation of the pump's clock.

Press START to run the test.

Press ENTER to skip this step and return to the main screen.

9. Pressing start displays the following screen.

```
ENTER TIME XX : XX
> START END > ENTER
```

Enter the test time from the keypad and press ENTER. Press START to start the countdown. To stop, press ENTER.

10 Repeat the clock test (steps 8 and 9) twice, waiting five minutes between each test.

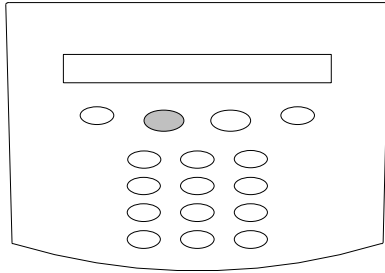
11. Press ENTER to return to the main screen after completing the clock test.

If you are using the optional printer, press "Print" to print a ticket confirming correct operation of the pump and the printer. Then press enter to return to the main screen.

Standard Mode

This mode allows you to enter the sampling parameters.

1. Start the pump following the steps in the “Starting the Pump” section. Then press the PARAM key.



2. Enter the total volume of the sample.

```
SAMPLING VOLUME?  
LITERS: XXXX
```

Press ENTER.

3. Enter the starting time for beginning the test.

```
START DELAY?  
MIN: XXX
```

Press ENTER.

4. Enter the cycle number.

```
NUMBER OF CYCLE?  
X
```

Press ENTER.

If the cycle is one, go to Step 5.

If the cycle number is greater than 1, the following display appears:

```
DELAY WITHIN CYCLE?  
MIN:
```

Enter the time between cycles.

```
DELAY WITHIN CYCLE?  
MIN: XXX
```

Press ENTER.

5. Enter the sampling location.

```
ENTER LOCATION:  
XXXXXXXXX
```

Press ENTER.

6. Enter the operator's name.

```
OPERATOR NAME :  
XXXXXXXXXX
```

Press ENTER.

7. Enter the batch number.

```
SAMPLING LOT NUMBER :  
XXXXXXXXXX
```

Press ENTER.

8. The main screen re-appears indicating the total sampling time, the total sampling volume and number of sampling cycles:

```
SAMPLING REM : XXX MIN  
VOL : XXXXL CYCLE : X
```

Press START to begin sampling.

9. During sampling, the screen shows the remaining sampling time, the volume to be sampled and the number of cycles, as indicated in the example below

```
SAMPLING REM : 8 MIN  
VOL : 1000L CYCLE : 1
```

10. When sampling is complete, if the pump is connected to the printer, a ticket is printed automatically and the screen displays:

```
PRINTING
```

If the printer is not connected the screen automatically goes to step 11.

11. The screen then returns to the main menu when sampling is complete.

```
READY DDMMYY HR : MN  
VOL : XXXXL CYCLE : X
```

Checking Parameters or Stopping the Pump During Sampling

To check the parameters during pump operation, press the PARAM key. The following display appears:

```
START DELAY  
MIN : X
```

```
LOCATION  
XXXXXXXXXX
```

```
OPERATOR NAME  
XXXXXXXXXX
```

To stop a sampling run, press the STOP key. The screen displays the following message:

```
SAMPLING ABORTED  
VOL SAMPLED : XXXXL
```

Alternating with this screen:

R E S U M E	>	E N T E R
A B A N D O N	>	S T O P

Press ENTER to restart sampling.

Press STOP to stop sampling and return to the main menu.

Calibrating the M Air T Isolator Pump

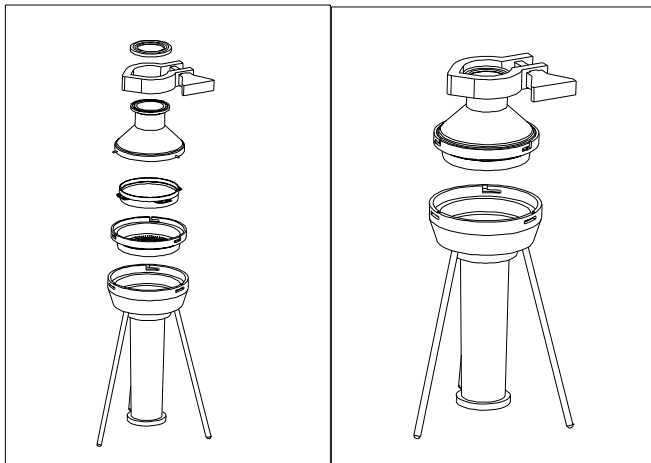
You can calibrate the M Air T isolator pump with the M Air T Calibration Kit, catalogue number ATAC AL0 01. It allows you to check and calibrate the pump to $\pm 10\%$ accuracy, if your measuring instruments have a resolution of: ± 1.1 mbar for pressure and ± 0.5 °C for temperature.

NOTE: Millipore also recommends that your M Air T Isolator system be calibrated by a Millipore Service Specialist at one of our calibration centers, located in the U.S., France and Japan. Millipore calibration equipment is highly accurate; it is the same equipment used for product release. The system will be returned to you within a week, along with a complete calibration certificate.

Installing the Calibration Kit

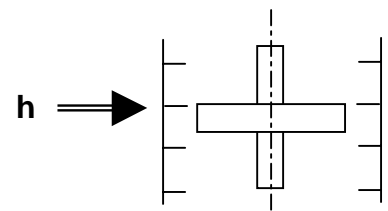
Do not start calibration until all the parts required for air sampling in your configuration are installed, including the M Air T Cassette.

1. Place a cassette in the sampling head, as outlined in the "Installing the M Air T Cassette" section.
2. Mount the sampling head onto the Calibration Kit as shown:

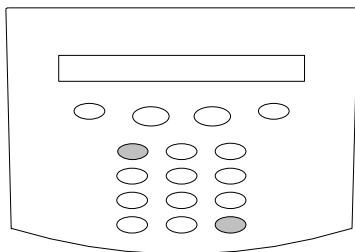


Calibrating Using the Calibration Mode

1. Note atmospheric pressure (P_a in mbar) and temperature (T_a in °C).
2. Allow the flow to stabilize for around 30 seconds, then note the average deviation "h" of the calibration tool float.



- Calculate the correct deviation of “h” with the equations from the calibration certificate or the calibration tables provided with the kit. For more details, see the “M Air T Calibration Kit User Guide” and the M Air T Calibration Kit calibration certificate, specific to the M Air T Pump.
- Turn the pump on. When the main screen displays, switch to the calibration mode by pressing the 1 key and ENTER key at the same time.



- The screen displays this message for 5 seconds:

```
CALIBRATION  M O D E
LAST CALIB :  D D M M Y Y
```

and then goes to the following screen:

```
CONNECT CALIB TOOL
AND PRESS START
```

- Press START. The following screen displays:

```
ADJUST FLOW
1 > up  3 > down  > ENTER
```

Using keys 1 and 3, adjust the pump flow rate so that the float deviation in mm corresponds to 136 L per minute. When the flow rate is adjusted, press ENTER.

- The following screen displays:

```
RESUME > START      X X X X
ABORT > ENTER  END > STOP
```

Press:

START: to re-start calibration, the pump re-starts automatically.

ENTER: to cancel calibration and return to main screen.

STOP: to validate calibration with the date, completing calibration. If using a printer, go to the next step.

- If you are using the optional M Air T printer, the screen displays the following message:

```
OPERATOR NAME :
```

Enter the operator's name and press ENTER.
The following screen displays:

C A L I B U N I T N U M B E R

Enter the serial number of the Calibration Kit and press ENTER. A calibration ticket is automatically printed.

Using the M Air T Printer

This section outlines the procedure for installing and using the optional M Air T printer.

Parts List

The printer includes:

- Printer
- Cable (to connect to the pump)
- Power supply cord

Installing the Printer

1. Place the printer in the slot on the top of the pump.
2. Connect the printer to the pump using the cable.
3. Connect the power cord to the pump.
4. Plug the power cord into the power supply.

Installing the Paper Roll

1. Discard a few turns of the new paper roll in case they are damaged or have glue on them. Make sure the edge is clean and straight.
2. Open the printer cover. Mount the roll between the spools. (The right-hand spool is on a sprung support.)
NOTE: The paper must flow from the bottom of the roll.
3. Guide the edge of the paper into the feed. The target point is just above a bright metal strip. The paper should be straight and pointing forward into the printer.
4. When the feed grips the paper, press the paper feed button until the paper advances through the exit slot. Then close the lid.
5. Make sure the paper advances properly by pressing the feed button a few times. Tear off any excess paper by pulling it toward you across the serrated edge.



Removing Paper or Clearing a Jam

To remove the paper from the mechanism, (for example when replacing the paper before the end of a roll, or to clear a paper jam) follow these steps:

CAUTION: Do not pull the paper in the reverse direction out of the printer. This can cause permanent damage to the mechanism.

1. Open the printer cover and remove the paper roll carefully, allowing it to unroll as it is removed.
2. Cut the paper straight across between the roll and the mechanism.
3. Using the paper feed button, advance the remaining paper until it is completely out of the mechanism. If the mechanism and paper are jammed, carefully pull the paper by hand in the normal feeding direction, taking care not to tear the paper or apply excessive force to any part of the mechanism.
4. Reload the paper or install a new roll (see "Installing the Paper Roll").
5. Press the paper feed button a few times to make sure it is advancing properly.

CHANGING THE INK CARTRIDGE

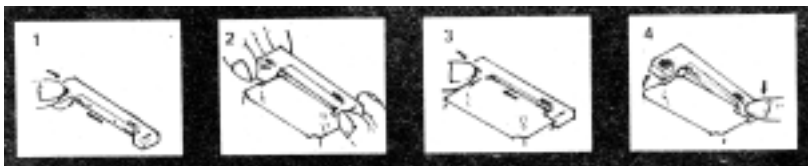
The ink cartridge can be removed and replaced, either with or without paper in the mechanism. The exposed part of the cartridge ribbon must lie between the front side of the paper (facing the operator) and the paper feed. To change the ink cartridge:

1. Open the printer cover and snap the cartridge out by pressing down on the right side marked "PUSH".
2. Carefully lift the cartridge so that the ribbon comes away from between the paper (if paper is in place) and the paper feed.
3. Fit the new cartridge into place, making sure the ink ribbon lies neatly between the mechanism and the paper.

NOTE: If the exposed ribbon is not wound tightly on the cartridge, wind it up using the small knob.

If the paper is already in place, thread the paper through the loop of the ribbon.

4. Press the paper feed button to advance the paper to make sure the paper and ribbon are moving freely. Advance enough paper to feed it through the exit slot.
5. Close the lid. Tear off any excess paper by pulling it toward you across the serrated edge.
6. Perform a test print to make sure the new ink cartridge is working properly.



PAPER LOW SENSOR

The paper sensor is on the left side of the paper roll and when a few meters of paper remain the LED color changes to orange. To avoid false “paper low” reports, make sure the roll is installed correctly on the spools, and the paper support on the right is in the vertical position.

NOTE: A foam pad is fitted on some models to maintain appropriate pressure.



Troubleshooting

This section describes how to troubleshoot problems that may occur when using the M Air T Isolator System. It is divided into the following sections:

- Pump and printer problems and Solutions
- Changing fuses

NOTE: If you continue to experience problems after trying the suggested solutions contact Millipore Technical Service or the office nearest you.

Pump and Printer Problems and Solutions

Problem	Possible Cause	Solution
Pump not operating, switch in "ON" position.	No power supply to unit. Blown fuse. Overheating of the unit has tripped temperature safety.	Check supply and connections. Change the fuse. Restart unit. Start cycle by pressing start. If the pump starts, the display is faulty. Contact Millipore Technical Service. If the pump is overheating, let it cool and restart.
Sampling interrupted "OUT OF LIMITS" message displays	Pressure drop on fluid circuit varied during sampling. Unit no longer able to regulate.	Check if one of the suction or delivery components is blocked. Check presence of Opticap filter in fluid circuit and direction of flow. If necessary, change the filter. Remove parts causing a restriction. (See "Flow Regulation" section)
Display incomplete or incomprehensible.	Software disturbed by electronic interference.	Restart pump. Switch to "service" mode and initialize RAM.
ERROR MESSAGE WHEN STARTING		
MAINS VOLTAGE ERROR	10-V supply to circuit board faulty.	Restart pump. If error persists, contact Technical Service.
MAINS FREQUENCY ERROR	Unit cannot detect power source.	Restart pump. If error persists, contact Technical Service.
CLOCK ERROR	Pump's internal clock faulty.	Restart pump. If error persists, contact Technical Service.
OVERHEAT SENSOR ERROR	Motor electrical supply faulty.	Restart pump. If error persists, contact Technical Service.
FLOW SENSOR ERROR	Flow sensor faulty.	Restart pump. If error persists, contact Technical Service.
No printing, "PRINTER ERROR"LED (on printer) not illuminated.	Printer not connected.	Check printer to pump connection. Check that the printer mechanism is operational by advancing paper with green button. Make sure the pump is plugged in to power source. Restart pump.

No printing, orange "PRINTER ERROR" LED illuminated.

Paper roll is empty.

Replace or tension the paper roll.
Reposition the paper roll to trigger the paper sensor.

No printing on ticket.

Toner cartridge empty or incorrectly installed.

Replace or reposition the toner cartridge.

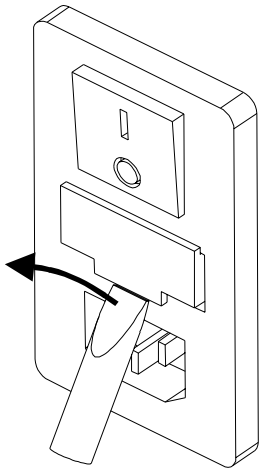
CHANGING FUSES

Replacement of a fuse **is not** part of regular maintenance. Blown fuses mean there are exceptional external circumstances, such as power surges or lightning, or serious problems with the pump, such as a short circuit.

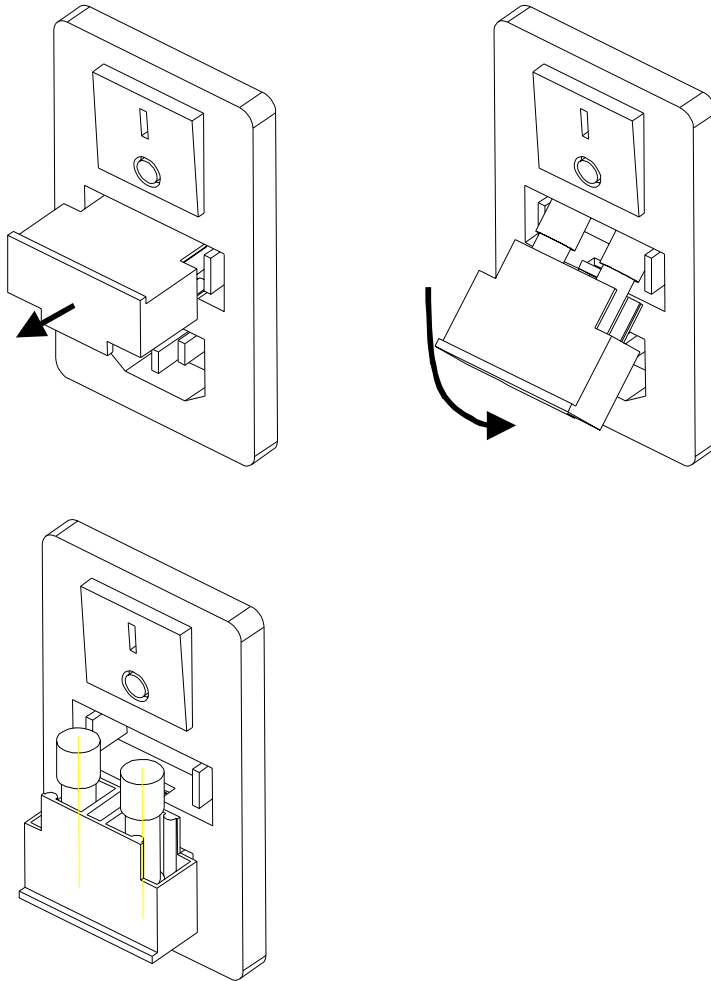
Always identify the origin of a fault before replacing fuses. Only use fuses with the same rating as the original ones.

NOTE: Blown fuses must be reported to Millipore Technical Service.

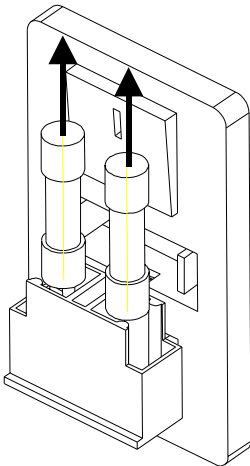
1. Turn off the pump and unplug the power cord from the power source.
2. Disconnect the power cord from the power cord connection on the back of the pump.
WARNING: Failure to turn off the pump and unplug the power cord from the power source before replacing the fuses can cause injury.
3. Open the plastic cover with a flat-tip screwdriver.



4. Remove the fuse holder by gripping the small groove on the upper surface.



5. Replace used fuses with new ones.



6. Re-install the fuse holder and plastic cover.

Specifications

This section lists the specifications for the M Air T System parts, including the optional printer and tripod.

M Air T Isolator Pump

Dimensions

Width: 325 mm

Length: 340 mm

Height: 200 mm

Weight (without accessories): 9.3 kg

Materials of construction

Frame: 304 AISI stainless steel sheet, 2 mm thick

Blower (parts in contact with flow): sheet steel, epoxy paint

Splined suction connector for 25 mm (1") tube: 304 AISI stainless steel

Blowing connector for TC 1.5" connector: 304 AISI stainless steel

Blower tube: PVC

Casing: Polyurethane – outside paint: acrylic lacquer – inside paint: conducting, with copper.

Handle: Aluminum – epoxy paint

Keypad: Polycarbonate

Power supply unit with fuse: ABS

Electrical characteristics

Power supply: 240/100 VAC, 50 / 60 Hz.

Consumption: 700 watt max.

Fuses: 2.5 AT (2 fuses, 5x20 mm or 6.35"x ...).

Power supply connection: Connector CEE 22

Software characteristics:

microcontroler from Motorola: MC68331

LCD interface

Operating conditions

Temperature: 16 to 40°C

Relative humidity: <90%

Altitude: to 3000 m

Compliance with standards: The unit is certified as complying with:

EEC Directive 89/336/CEE, modified 92/31/CEE and 93/68/CEE (Electromagnetic compatibility)

M Air T Isolator Sampling Head, with Sieve

Dimensions

Sampling Head: Width, 90 mm

Height, 60 mm

Sieve: Width, 97 mm

Height, 23 mm

Materials of construction

Head and sieve: 316 AISI stainless steel

Sieve cover: Polyacetal

M Air T Tripod

Dimensions

Height: 210 mm

Leg Span: 135 mm

Width, including tube and legs: 160 mm

Materials of construction

Tube: 316 AISI stainless steel

Legs: 304 AISI stainless steel

Opticap Filter

Membrane PTFE Aervent 0.2 μ m

Length: 172 mm

Maximum pressure inlet at 25° C: 5.5 Bars, autoclavable 30 times at 135 ° C for 30 minutes.

Printer

Dimensions

Width: x 104 mm (4.1")

Length: x 158 mm (6.25")

Height: x 82 mm (3.25")

Weight: 0.415 kg

Mechanism: The AP85an EPSON model M-180 printer mechanism with a moving (shuttle) print head.

Electrical characteristics

Printer power supply requirements:

The Ap850 has internal power supply regulator circuits that deliver the special low voltages from a higher voltage external supply. The recommended range of voltages is from +9 V DC to +13 V DC, between 100 mA and 5 A. The external supply must have an output voltage that remains within this range between these current extremes. The acceptable upper voltage depends on the printing density, as a higher voltage increases power dissipation within the printer.

Lower or higher input voltages reduce performance:

-Below about 8 V, the printer may not operate reliably.

-Above about 12 V, heat dissipated in the internal regulator may become excessive at high printing density, and lead to electrical malfunction.

EMC statement:

The Ap850 is fully EMC (Electro-Magnetic Compatibility) compliant and is CE marked accordingly. The printer is in accordance with the EMC Directive 89/336/EEC (and as amended).

Power supply: 2V DC (minimum: 9VDC maximum 13VDC).

Consumption: 24 VA max

Connection: Fiche mini-DIN 6 point.



Pin	Function	Cable Color
1	P-LOW Output	Red
2	BUSY Output	White
3	RX Data Input	Black
4	RESET Input	Yellow
5	Ground (0V)	Blue
6	Power (+12V)	Green
Screen	Frame Ground	Screen

Operating Conditions

Temperature: 16 to 30°C

Humidity: <90%

Altitude: up to 3000 m

Product Ordering Information

This section lists the catalogue numbers for the M Air T Isolator System. See the Technical Assistance section for information about contacting Millipore. You can also buy Millipore products on-line at www.millipore.com/purecommerce.

M Air T Isolator system equipment:

Description	Qty/Pk	Catalogue No.
M Air T Isolator Pump	1	ATBP UMP 01
M Air T Isolator Sampling Head, with sieve	1	ATBH EAD 01
M Air T Isolator Tripod	1	ATBF EET 01
M Air T Isolator Printer	1	ATBP RNT 01
M Air T Isolator Tubing,3 meters, with 4 clamps	1	ATBT UBE 01
Accessories		
Foot control, optional	1	TNTA C00 02
Sieve, 611 holes	1	ATBS EVE 01

Expendables

Description	Qty/Pk	Catalogue No.
For use in isolator		
M Air T Cassette, pre-filled TSA, double wrapped in isolator packaging, gamma irradiated	24	ATSM TTB 24
M Air T Cassette, pre-filled TSA + peroxide, double wrapped in isolator packaging, gamma irradiated	24	ATSM TPB 24
Opticap filter, PTFE membrane, 0.2 µm,EO sterile.	3	KTGR 04T C3

For use in a laminar flow hood

M Air T Cassette, pre-filled TSA, double wrapped, gamma irradiated	60	ATSM TTD 60
M Air T Cassette, pre-filled Sabouraud dextrose double wrapped, gamma irradiated	60	ATSM SDD60
M Air T Cassette, pre-filled TSA + Pnase double wrapped gamma irradiated	60	ATSM PND 60
M Air T empty cassette, EO sterilized.	114	ATSM C01 14
Opticap filter, PTFE membrane, 0.2 µm,EO sterile.	3	KTGR 04T C3

Technical Assistance

For more information, contact the Millipore office nearest you. In the U.S., call **1-800-MILLIPORE** (1-800-645-5476). Outside the U.S., see your Millipore laboratory catalogue for the phone number of the office nearest you. You can reach us by e-mail at tech_service@millipore.com or visit our web site (www.millipore.com). Millipore Corporation is pleased to provide internet access to Material Safety Data Sheets (MSDS) for its products that contain hazardous materials. To obtain any MSDS documents that may be associated with this product, go to the MSDS page of our website (www.millipore.com/msds.nsf/home).

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