



Agilent 1100 Series Autosampler Thermostat



Reference Manual



Agilent Technologies

Notices

© Agilent Technologies, Inc. 2002

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Manual Part Number

G1330-90002

Edition

Edition 07/02

Printed in Germany

Agilent Technologies
Hewlett-Packard-Strasse 8
76337 Waldbronn, Germany

Software Revision

This guide is valid for A.01.xx revisions of the Agilent 1100 Series Autosampler Thermostat software, where xx refers to minor revisions of the software that do not affect the technical accuracy of this guide.

Warranty

The material contained in this document is provided “as is,” and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

Software and technical data rights granted to federal government customers include only those rights customarily provided to end user Customers of Software. Agilent provides this customary commercial license in Software and technical data pursuant to FAR 12.211 (Technical Data) and FAR 12.212 (Computer Software) and, for Department of Defense purchases, DFARS 252.227-7015 (Technical Data - Commercial Items) and DFARS 227.7202-3 (Rights in Commercial Computer Software or Computer Software Documentation). If a federal government or other public sector Customer has a need for

rights not conveyed under these terms, it must negotiate with Agilent to establish acceptable terms in a written agreement executed by all relevant parties.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

In This Guide...

1 Theory of Operation

Theory of operation of mechanical hardware, electronics, and instrument interfaces

2 Installing the G1330B Thermostat

Site requirements and installation of the G1330B thermostat

3 Troubleshooting and Test Functions

The thermostatted autosampler's built-in troubleshooting and test functions

4 Repairing the ALS Thermostat Module

Instructions on repair procedures of the ALS thermostat

5 ALS Thermostat Parts and Materials

Lists for identification of parts and materials

6 Specifications

Performance specifications of the ALS thermostat

Contents

1 Theory of Operation

Introduction to the Thermostatted Autosampler	10
ALS Thermostat Operation	12
ALS Thermostat Control and Electronics	14
Temperature Controlled Autosampler Board (TCA)	15
Electrical Connections	17

2 Installing the G1330B Thermostat

Site Requirements	20
Unpacking the Autosampler	23
Optimizing the Stack Configuration	25
Controller Requirements	27
Installing the G1330B Thermostat	28
Stage 1: Preparing the ALS Thermostat and Autosampler	29
Stage 2: Power Cable and Interface Cable Connection	32
Stage 3: Flow Connections	35
Stage 4: Installing the Sample Tray	36
Stage 5: Installing Tray Cover and Front Cover	39
Stage 6: Turning on the Thermostatted Autosampler	40
Stage 7: Update of Control Module Firmware	40
Stage 8: Update of the Agilent ChemStation Software	41
Transporting the Thermostatted Autosampler	43

3 Troubleshooting and Test Functions

Overview of the Thermostat's Indicators and Test Functions	46
Status Indicators	47
Power Supply Indicator	48
Instrument Status Indicator	48
ALS Thermostat Error Messages	49
Fan Failed	50
Temperature Control Failed (1 - 4)	51
Temperature Sensor Failed (1 - 4)	52
Lost Contact to ALS Thermostat	53
Power Fail for ALS Thermostat Module	54
Temperature out of Range	55
Bad Cooling / Heating Performance	56

4 Repairing the ALS Thermostat Module

Introduction into Repairing the Thermostat	58
Using the ESD Strap	59
Overview of the Repairing the Thermostat	60
Exchanging the Power Supply Fuses	61
Exchanging Internal Parts	62
Removing the Top Cover and Foam	63
Exchanging Heat Exchanger Fan	65
Exchanging the Heatsink Fans	67
Exchanging the Sensors	69
Exchanging the TCA board	72
Assembling the Main Cover	75

5 ALS Thermostat Parts and Materials

Main Assemblies	78
Accessory Kit G1330-68705	79
Main Assemblies	80
Foam Parts	81
Plastic Parts	82
Heat Exchanger Fan Parts	83

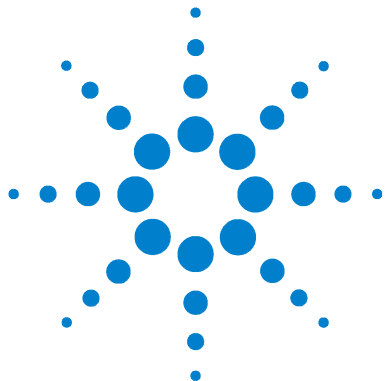
6 Specifications

Performance Specifications	86
----------------------------	----

A Safety Information

General Safety Information	88
Radio Interference	91
Sound Emission	92
Agilent Technologies on Internet	93

Index



1 Theory of Operation

Introduction to the Thermostatted Autosampler	10
ALS Thermostat Operation	12
ALS Thermostat Control and Electronics	14
Temperature Controlled Autosampler Board (TCA)	15
Electrical Connections	17



Introduction to the Thermostatted Autosampler

The Agilent 1100 Series autosampler is designed for use with other modules of the Agilent 1100 Series LC system, with the HP 1050 Series, or with other LC systems if adequate remote control inputs and outputs are available. The autosampler is controlled from the Agilent 1100 Series control module or from the Agilent ChemStation for LC systems.

The specially-designed thermostatable sample trays holds either 100 × 1.8 ml vials or two wellplates and 10 × 1.8 ml vials.

The ALS thermostat contains Peltier-controlled heat exchangers. A fan draws air from the area above the sample vial tray of the autosampler and is then blown through the fins of the cooling/heating module. There it is cooled or heated according to the temperature setting. The thermostatted air enters the autosampler through a recess underneath the specially-designed sample tray. The air is then distributed evenly through the sample tray ensuring effective temperature control, regardless of how many vials are in the tray.

In cooling mode condensation is generated on the cooled side of the Peltier elements. This condensed water is safely guided into the leak system.

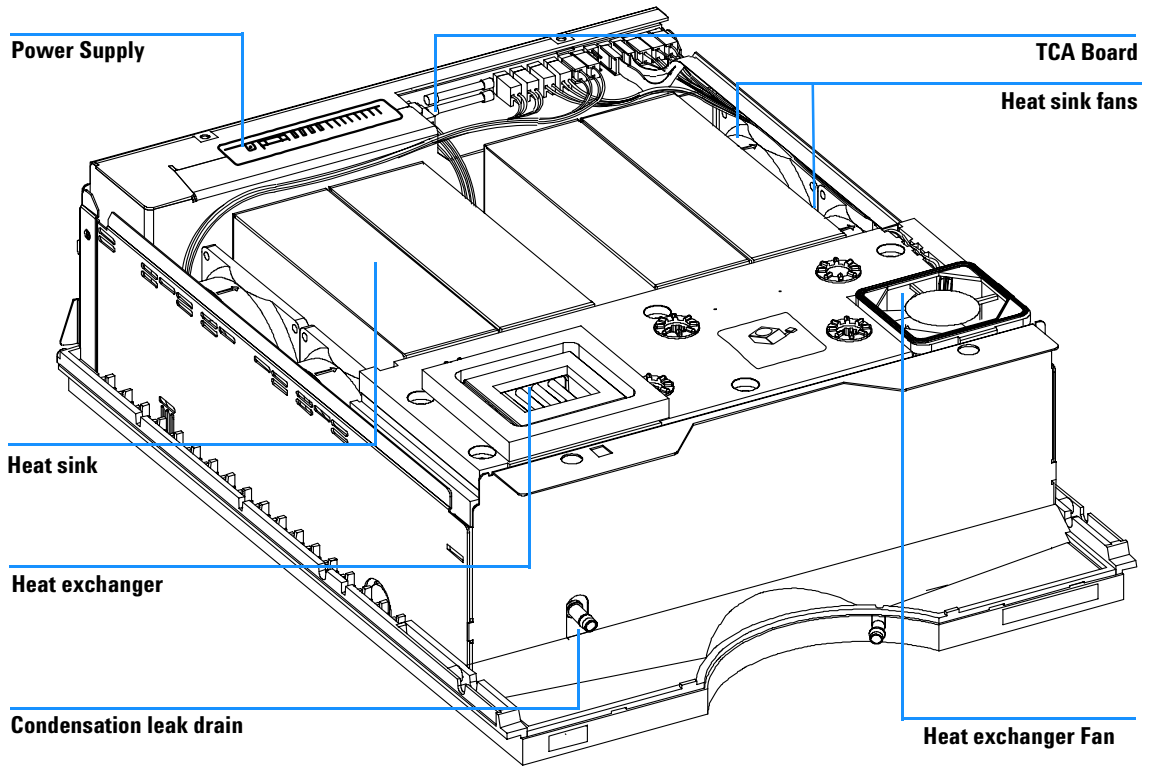


Figure 1 Overview of the ALS Thermostat

ALS Thermostat Operation

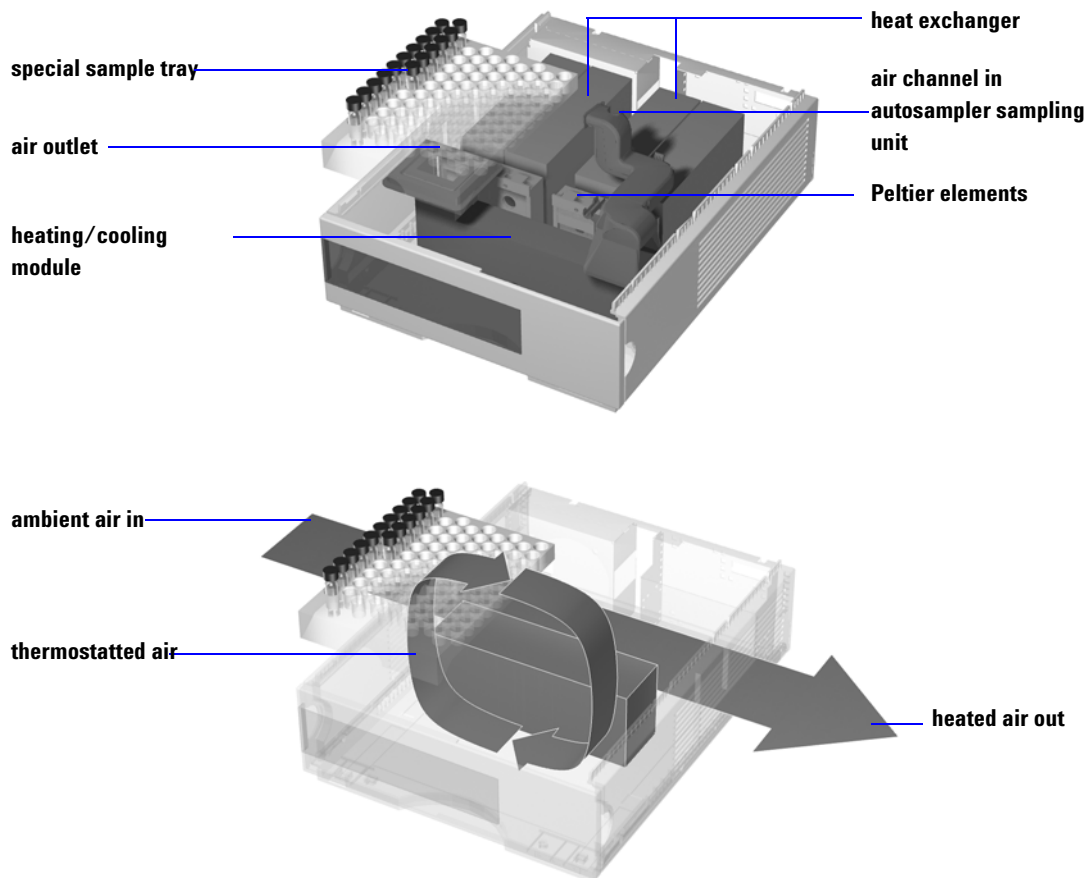


Figure 2 ALS Thermostat Principle

The thermostatted autosampler is equipped with a cooling/heating module which uses Peltier elements for efficient air cooling. When turned on the front side of the Peltier elements is heated/cooled according to the temperature setting. A fan draws air from the sample tray area and blows it through the channels of the heating/cooling module. The fan speed is determined according to the environmental conditions (e.g., ambient temperature, humidity). In the heating/cooling module the air reaches the temperature of

the Peltier elements and this thermostatted air is blown underneath the special sample tray where it is evenly distributed and streams back into the sample tray area. From there it is again drawn into the ALS thermostat. This “recycle” mode assures a very efficient cooling/heating of the sample vials.

In cooling mode the opposite side of the Peltier element will become very hot and to maintain the performance of the elements they have to be cooled down. This is done with large heat exchangers in the back of the ALS thermostat. Four fans blow air from left to right through the instrument to remove the heated air. The fan speed is controlled according to the temperature of the Peltier elements.

During cooling condensation will appear in the heating/cooling module. The condensed water will be guided out of the ALS thermostat.

ALS Thermostat Control and Electronics

The ASM board of the autosampler module provides all control signals for the ALS thermostat (e.g., temperature setting) and receives the sensor signals from the temperature and fan sensors.

The TCA board controls the internal assemblies in the ALS thermostat. This chapter describes the electronics of the TCA board.

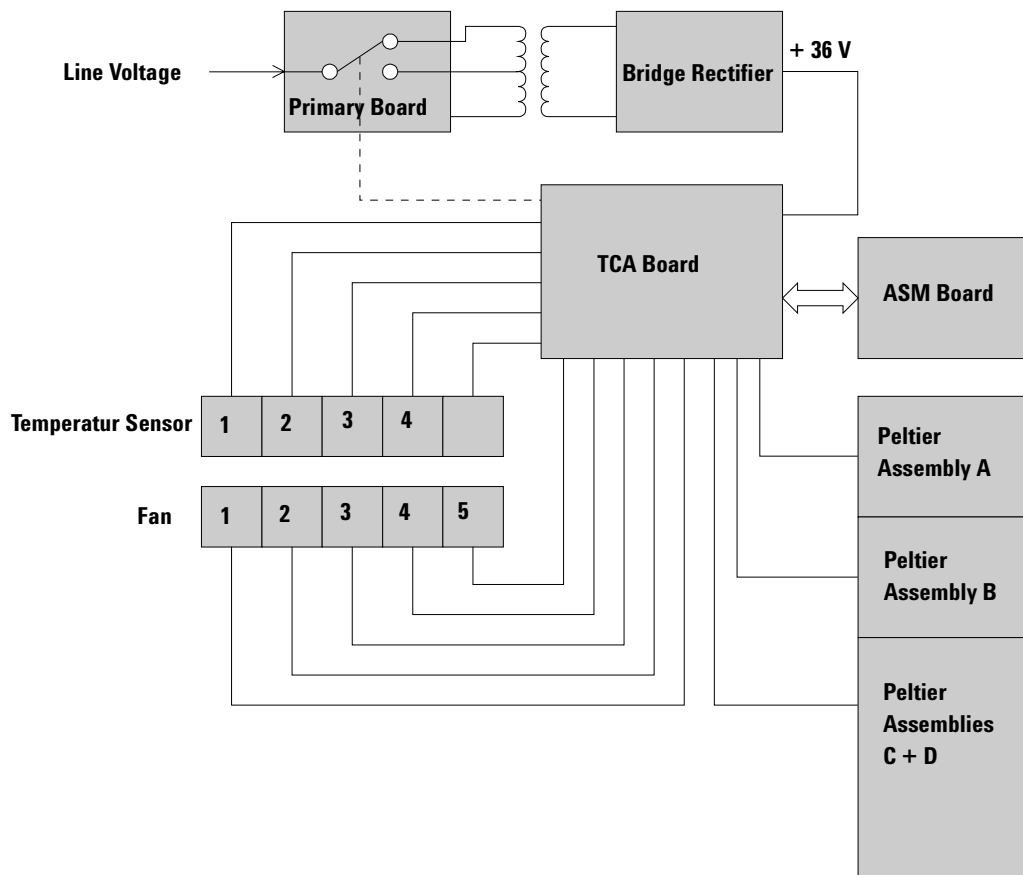


Figure 3 Block Diagram ALS Thermostat Electronics

Temperature Controlled Autosampler Board (TCA)

The board controls all information and activities of all assemblies within the ALS thermostat. The operator enters parameters, changes modes and controls the module through the control module or Agilent ChemStation, that is connected to the autosampler module. Autosampler and ALS thermostat are connected via a control cable for signal exchange.

Step Down Switcher

The four Peltier assemblies (A to D) are driven by synchronous step down switching regulators. Switcher 1 and 2 receive their power (+36V) from the ALS thermostat internal power supply. Switcher 3 receives its power (+24V) from the autosampler module via the interface cable. The maximum power consumption for all Peltier assemblies is approximately 180 Watts in cooling mode and 120 Watts in heating mode.

Regulators

The fans are equipped with hall sensors that allow to determination of the actual speed of the fans. The speed of the four heat sink fans is variable and will be set according to the actual temperature at the heat sink side of the Peltier assemblies. The heat exchanger fan is always running at highest speed. the speed will be reduced to a minimum when the sample tray is removed from the autosampler.

Auto Range

When the ALS thermostat power cable is connected to the module the auto range circuits checks the connected supply voltage. Default setting is a connection to a 220-240V supply. If the non-regulated 36V is below a certain limit the auto range circuit activates a switch on the primary board in the power supply and switches to 100-120V operation.

Multiplexer

The ALS thermostat is equipped with four digital temperature sensors for temperature control and diagnostics. Four are used to check the temperature on both sides of the Peltier elements. The temperature sensor signals and the signals from the hall sensors in the five fans are the input signals for the multiplexer. The output of the multiplexer is connected to the autosampler

1 Theory of Operation

main board via the 26 pin autosampler to ALS thermostat cable. The autosampler firmware checks the signals for correctness and initiates all needed activities.

EPROM

The EPROM stores all relevant data for the ALS Thermostat (e.g., serial number, board revision, etc.). This data are pre-set at the factory.

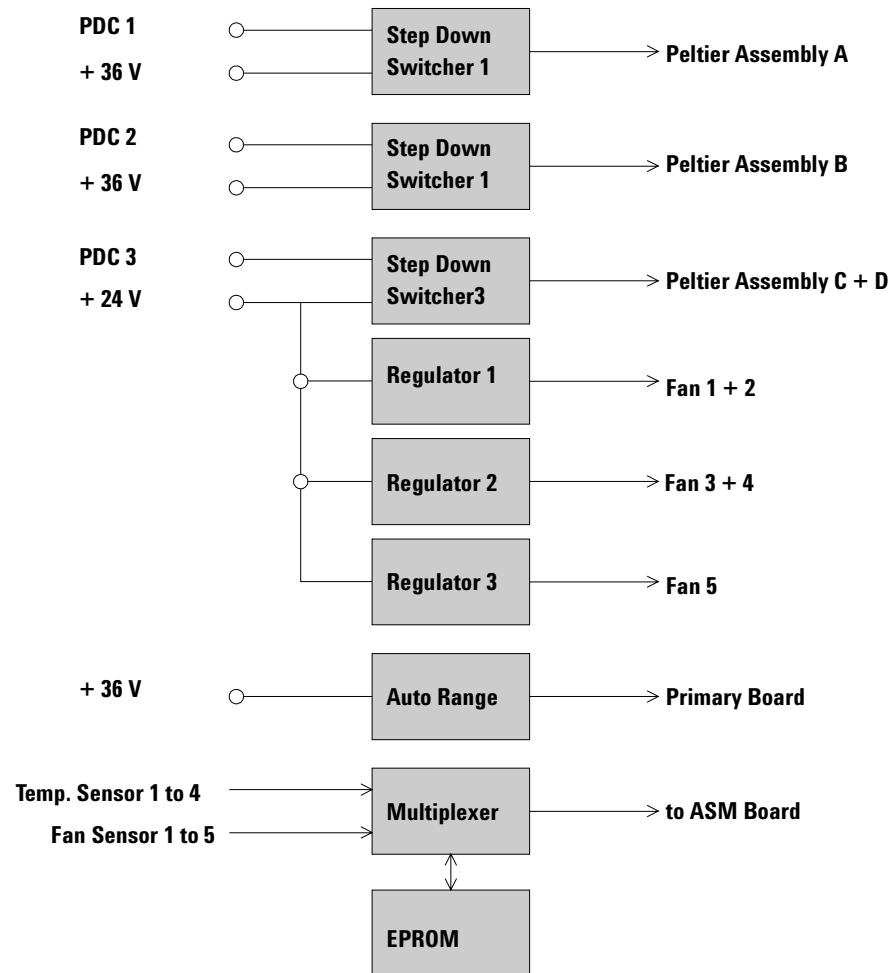


Figure 4 Block Diagram TCA Board

Electrical Connections

WARNING

Never use cables other than the ones supplied by Agilent Technologies to ensure proper functionality and compliance with safety or EMC regulations.

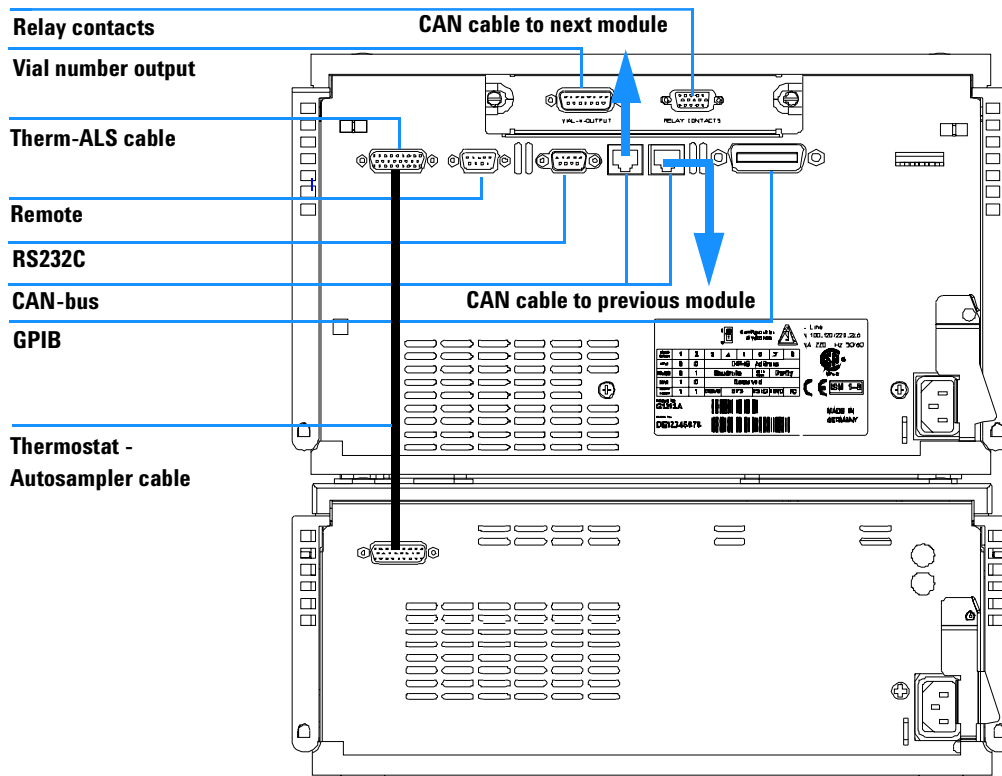


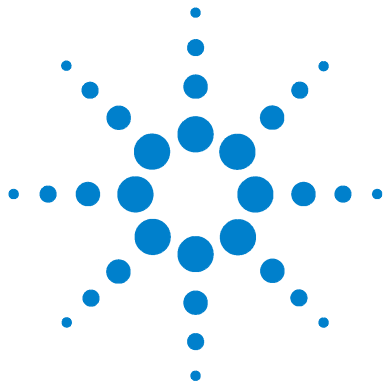
Figure 5 Electrical Connections

- The GPIB connector is used to connect the autosampler with a computer. The address and control switch module next to the GPIB connector determines the GPIB address of your autosampler. The switches are preset to a default address (see Autosampler Reference Manual) and this is recognized immediately after power on.
- The CAN bus is a serial bus with high-speed data transfer. The two connectors for the CAN bus are used for internal Agilent 1100 Series module data transfer and synchronization.
- The REMOTE connector may be used in combination with other analytical instruments from Agilent Technologies if you want to use features such as common shut down, prepare, and so on.
- The RS-232 connector may be used to control the autosampler from a computer through an RS-232 connection, using appropriate software. This connector needs to be activated by the configuration switch module next to the GPIB connector. The software needs the appropriate drivers to support this communication. See your software documentation for further information.
- The Thermostat-Autosampler connection is used for control signal transfer and synchronization of the two modules. The cable must be installed for operation of the ALS thermostat.

WARNING

DO NOT disconnect or reconnect the autosampler to ALS thermostat cable when the power cords are connected to either of the two modules. This will damage the electronics of the modules.

- The power input socket accepts a line voltage of 100–120 or 220–240 volts AC \pm 10 % with a line frequency of 50 or 60 Hz. Maximum power consumption of the autosampler module is 300 Watts (Volt-Amps). Maximum power consumption of the ALS thermostat module is 260 Watts (Volt-Amps). There are no voltage selectors on your autosampler because the power supplies have automatic selection capability. The autosampler module has no externally accessible fuses, because automatic electronic fuses are implemented in the power supply. The power supply of the ALS thermostat has two externally accessible fuses. The security lever at the power input socket prevents removal of the autosampler cover when line power is still connected.
- The interface board slot is used for external contacts, BCD output and for future use.



2 Installing the G1330B Thermostat

Site Requirements	20
Unpacking the Autosampler	23
Optimizing the Stack Configuration	25
Controller Requirements	27
Installing the G1330B Thermostat	28
Transporting the Thermostatted Autosampler	43

Site Requirements

A suitable site environment is important to ensure optimum performance of the autosamplers.

Power Consideration

The autosamplers comprises two modules, the autosampler module (G1329A, G1389A, G1367A, or G2260A) and the thermostat module (G1330B Therm). Both modules have a separate power supply and a power plug for the line connections. The two modules are connected by a control cable and both are turned on by the autosampler module.

The autosampler power supplies have automatic voltage selectors (see [Table 1](#) on page 22). Consequently there are no voltage selectors in the rear of the two autosampler modules. The autosampler module has no externally accessible fuses, because automatic electronic fuses are implemented in its power supply. The ALS thermostat power supply has two externally accessible fuses.

WARNING

To disconnect the autosampler from line power, unplug the power cord from the autosampler and the thermostat. The power supplies still use some power, even if the power switch on the front panel is turned off. Please make sure that it is always possible to access the power plug.

WARNING

Shock hazard or damage of your instrumentation can result if the devices are connected to a line voltage higher than specified.

Power Cords

Your autosampler modules are delivered with power cords which match the wall socket of your particular country or region. The plug on the power cords which connect to the rear of the two instrument is identical for all types of power cord.

WARNING

Never operate your instrumentation from a power outlet that has no ground connection. Never use a power cord other than the power cord designed for your region.

Bench Space

The autosampler dimensions and weight (see [Table 1](#) on page 22) allow the instrument to be placed on almost any laboratory bench. The instrument requires an additional 25 cm (10 inches) of space on either side for the circulation of air, and approximately 8 cm (3.1 inches) at the rear for electrical connections. Ensure the autosampler is installed in a level position.

If a complete Agilent 1100 Series system is to be installed on the bench, make sure that the bench is designed to carry the weight of all the modules. For a complete system including the thermostatted autosampler it is recommended to position the modules in two stacks, see "[Optimizing the Stack Configuration](#)" on page 25. Make sure that in this configuration there is 25 cm (10 inches) space on either side of the thermostatted autosampler for the circulation of air.

Environment

Your autosampler modules will work at ambient temperatures and relative humidity as described in [Table 1](#) on page 22.

CAUTION

Do not store, ship or use your autosampler under conditions where temperature fluctuations may cause condensation within the autosampler electronics. Condensation will damage the system electronics. If your autosampler was shipped in cold weather, leave it in its box, and allow it to warm up slowly to room temperature to avoid condensation.

2 Installing the G1330B Thermostat

Table 1 Physical Specifications - Thermostatted Autosampler

Type	Specification	Comments
Thermostat		
Weight	20.7 kg (45.6 lbs)	
Dimensions (height × width × depth)	140 × 345 × 435 mm (5.5 × 13.5 × 17 inches)	
Line voltage	100 – 120 or 220 – 240 VAC, ± 10 %	Automatic selection
Line frequency	50 or 60 Hz, ± 5 %	
Power consumption	Autosampler: 300 VA ALS Thermostat: 260 VA	Maximum Maximum
Ambient operating temperature	4 – 40 °C (41 – 131 °F)	see on page 22
Ambient non-operating temperature	-40 – 70 °C (-4 – 158 °F)	
Humidity	< 95 %, at 25 – 40 °C (77 – 104 °F)	Non-condensing;
Operating Altitude	Up to 2000 m (6500 ft)	
Non-operating altitude	Up to 4600 m (14950 ft)	For storing the autosampler
Safety standards: IEC, CSA, UL, EN	Installation Category II, Pollution Degree 2	

WARNING

Using the autosampler at environmental temperatures higher than 50 °C (122 °F) may cause the rear panel to become hot.

Unpacking the Autosampler

CAUTION

If you intend to ship or transport the autosampler, always park the transport assembly of the autosampler module before shipment (see “Transporting the Autosampler” in the corresponding manual).

Damaged Packaging

The two modules of the autosampler are shipped in separate boxes. Upon receipt of your autosampler, inspect the shipping containers for any signs of damage. If the containers or cushioning material are damaged, save them until the contents have been checked for completeness and the autosampler has been mechanically and electrically checked. If the shipping container or cushioning material is damaged, notify the carrier and save the shipping material for the carriers inspection.

CAUTION

If there are signs of damage to the autosampler, please do not attempt to install the autosampler.

Delivery Checklist

Unpack the two boxes of the autosampler. Ensure all parts and materials have been delivered with the autosampler and the ALS thermostat. The delivery checklist are shown in [Table 2](#). Please report missing or damaged parts to your local Agilent Technologies sales and service office.

If the thermostatted autosampler was ordered as an upgrade (G1395A) to an existing autosampler, the shipment will also contain the required software upgrades for your Agilent ChemStation.

Table 2 G1330B Thermostat Checklist

Description	Quantity	Part Number
ALS Thermostat G1330B	1	
Power cable	1	as ordered
Accessory kit (Table 3)	1	G1330-68705

2 Installing the G1330B Thermostat

Table 3 ALS Thermostat Accessory Kit Contents G1330-68705

Description	Part Number
Waste Tube	5063-6527
Waste Tube Assembly	G1330-67300

Optimizing the Stack Configuration

If your autosampler is part of a system, you can ensure optimum performance by installing the autosampler in the stack in the position shown in [Figure 6](#) and [Figure 7](#). This configuration optimizes the system flow path, ensuring minimum delay volume.

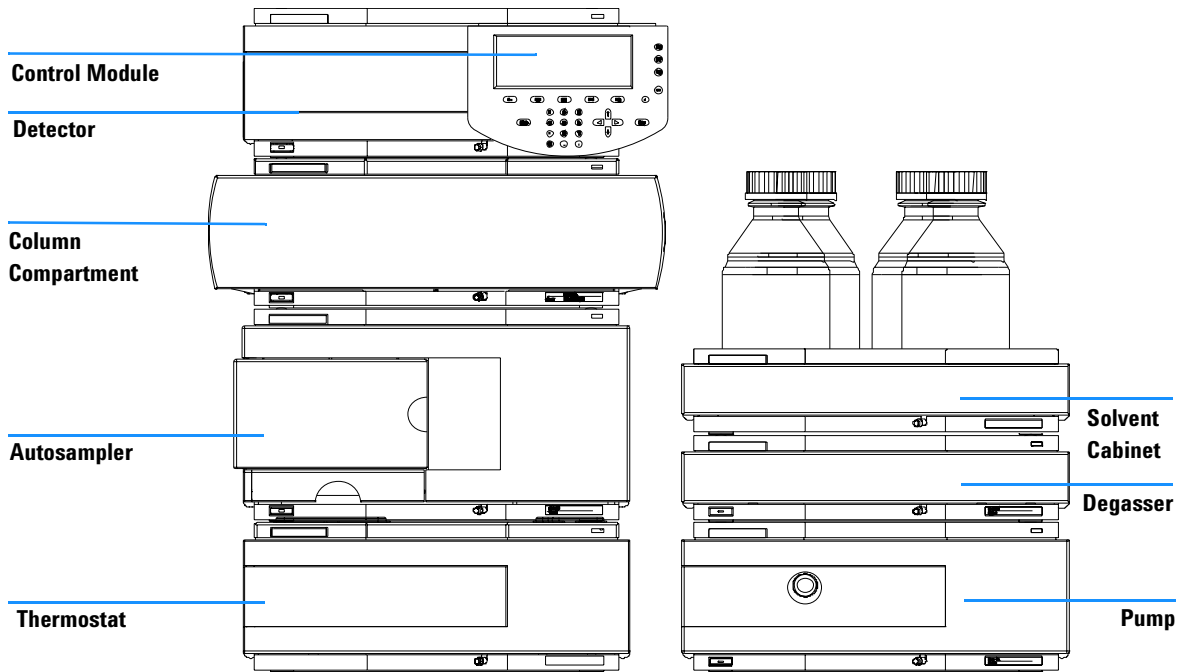


Figure 6 Recommended Stack Configuration (Front View)

2 Installing the G1330B Thermostat

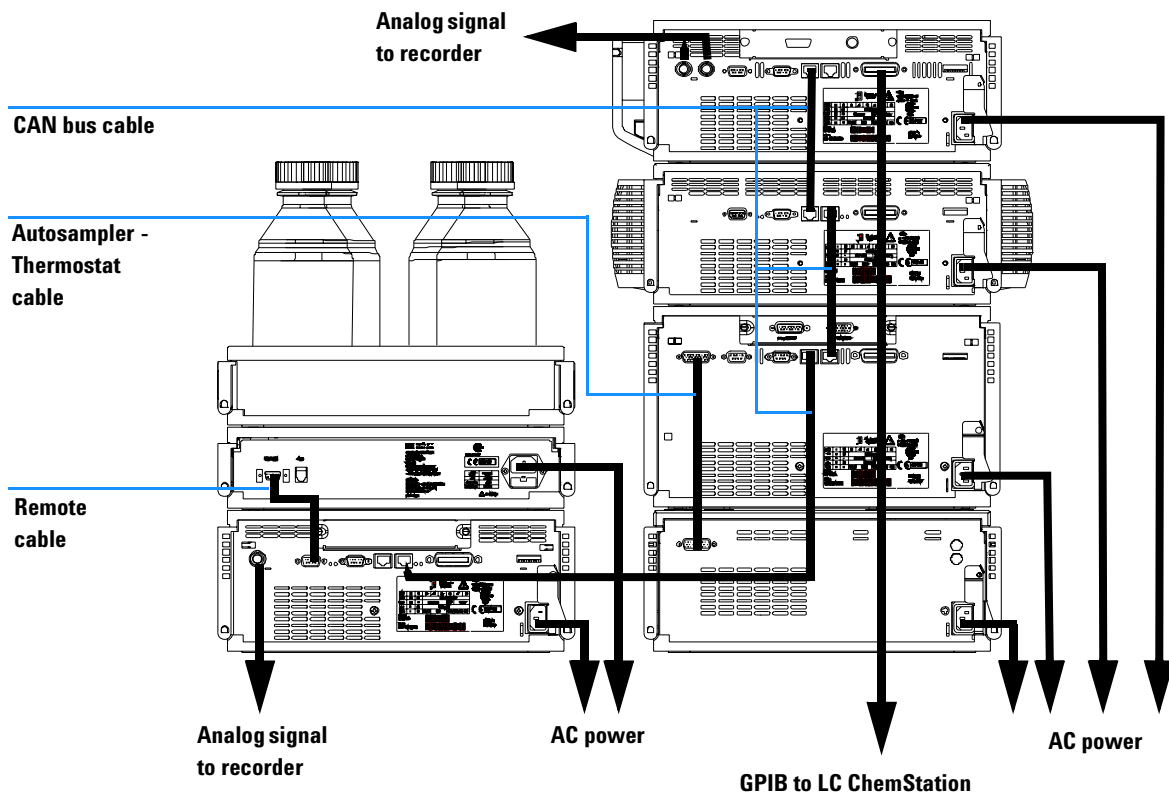


Figure 7 Recommended Stack Configuration (Rear View)

Controller Requirements

Agilent 1100 Series control module and Agilent ChemStation must have the latest revision firmware/software loaded to allow optimum operation with the thermostatted autosamplers. Older revisions might not recognize or have full functionality with the thermostatted autosampler.

Control Module Firmware requirements

The control module requires firmware revision A.01.30 or higher to control the thermostatted autosampler. Previous firmware revisions of the control module will not run with the thermostatted autosampler. If the control module was shipped together with the thermostatted autosampler the control module firmware does not require updating. The firmware update must be done with a PCMCIA card that has the newest revision loaded. The firmware is not part of the shipment of the thermostatted autosampler. Contact your local Agilent Technologies sales and service office for the firmware update of the control module. For the update procedure see "[Stage 7: Update of Control Module Firmware](#)" on page 40.

Agilent ChemStation Software requirements

To control the thermostatted autosampler from a PC, the Agilent ChemStation software version A.04.03, or A.05.02beta, or A.05.02 or higher is required. These software revision might however not support all ALS modules. The thermostatted autosampler will not run with any previous version of the Agilent ChemStation software. The software updates are part of the thermostatted autosampler shipment. For the update procedure see "[Stage 8: Update of the Agilent ChemStation Software](#)" on page 41.

Installing the G1330B Thermostat

WARNING

To avoid personal injury, keep fingers away from the needle area during autosampler operation. Do not bend the safety flap away from its position, or attempt to remove the safety cover (see [Figure 8](#)). Do not attempt to insert or remove a vial from the gripper when the gripper is positioned below the needle.

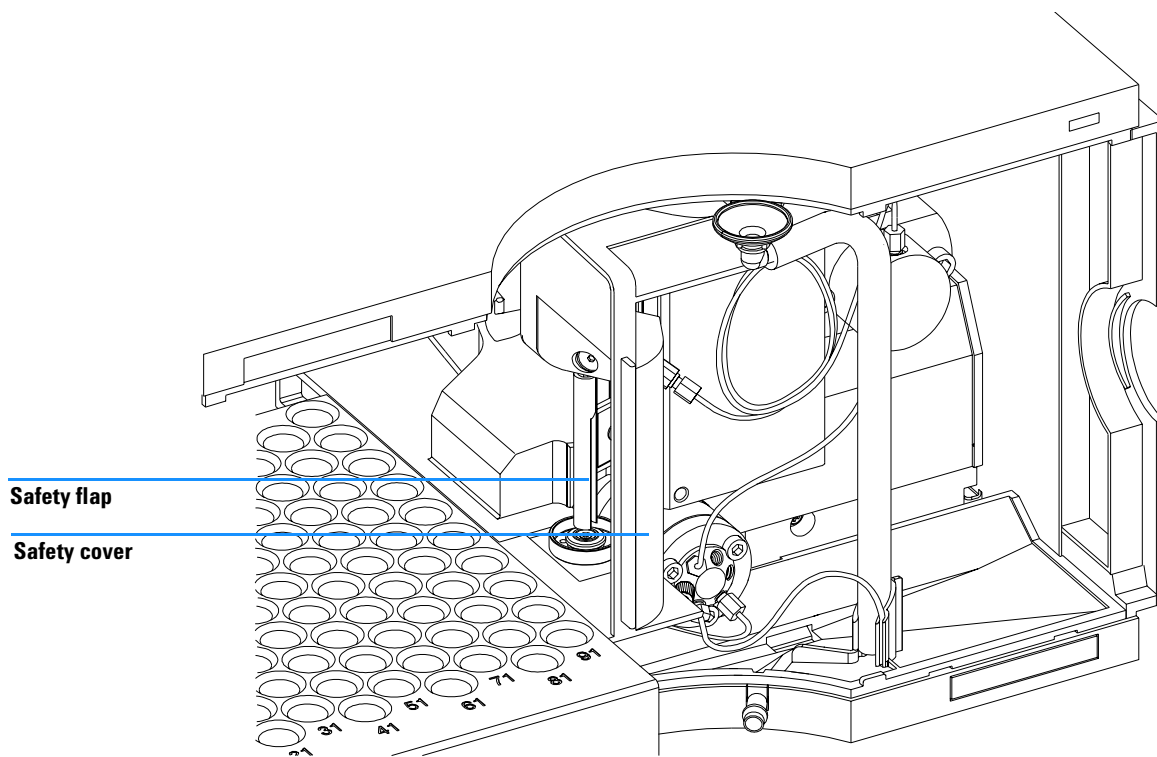


Figure 8 Safety Flap.

Stage 1: Preparing the ALS Thermostat and Autosampler

- 1 Place the ALS thermostat on the bench or in the stack.
- 2 Remove the front cover. Press the two snap fasteners on the sides of the cover and move it away.
- 3 If the ALS thermostat is located on top of another Agilent 1100 Series Module place the waste tube assembly into the top cover of the ALS thermostat and locate the other end in the waste funnel of the module beneath.

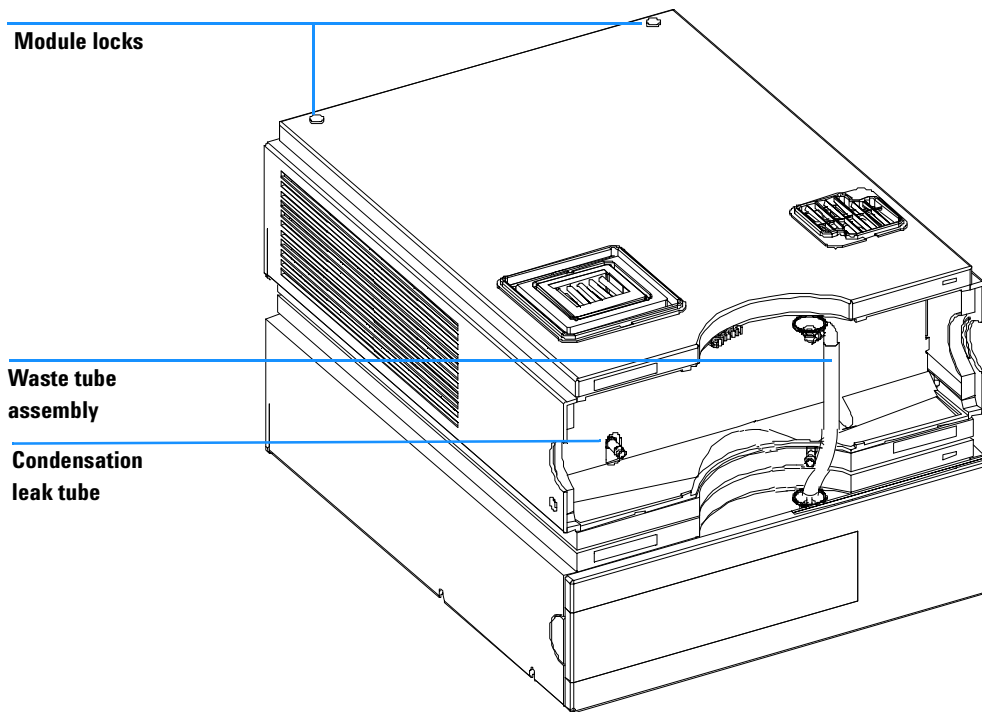


Figure 9 Preparation of the ALS Thermostat

2 Installing the G1330B Thermostat

- 4 Connect the condensation leak tube to the main waste exit of the ALS thermostat and place into an appropriate vessel. It is possible to either let the condensation leak tubing exit the module at the front or at the left side of the module. Make sure that the leak tube is fully fixed on the outlet.

WARNING

Make sure that the condensation tube is always above the liquid level in the vessel. If the tube is located in liquid the condensed water cannot flow out of the tube and the outlet is blocked. Any further condensation will then remain in the instrument. This may damage the instruments electronics.

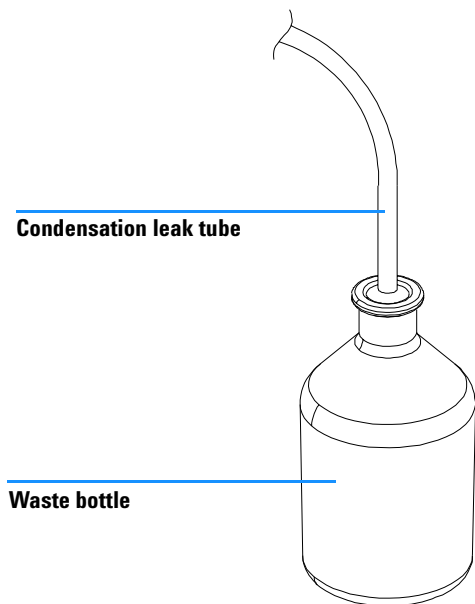


Figure 10 Condensation Leak outlet

- 5 Install the front cover of the ALS thermostat.
- 6 Place the autosampler module on top of the ALS thermostat. Make sure that the autosampler is correctly engaged in the ALS thermostat locks.

- 7 Place the air channel adapter into the autosampler tray base. Make sure the adapter is fully pressed down. This assures that the cold airstream from the ALS thermostat is correctly guided to the tray area of the autosampler.
- 8 If there is no Agilent 1100 Series module located beneath the ALS thermostat connect the waste tube to the central waste exit of the autosampler and place in a waste vessel.

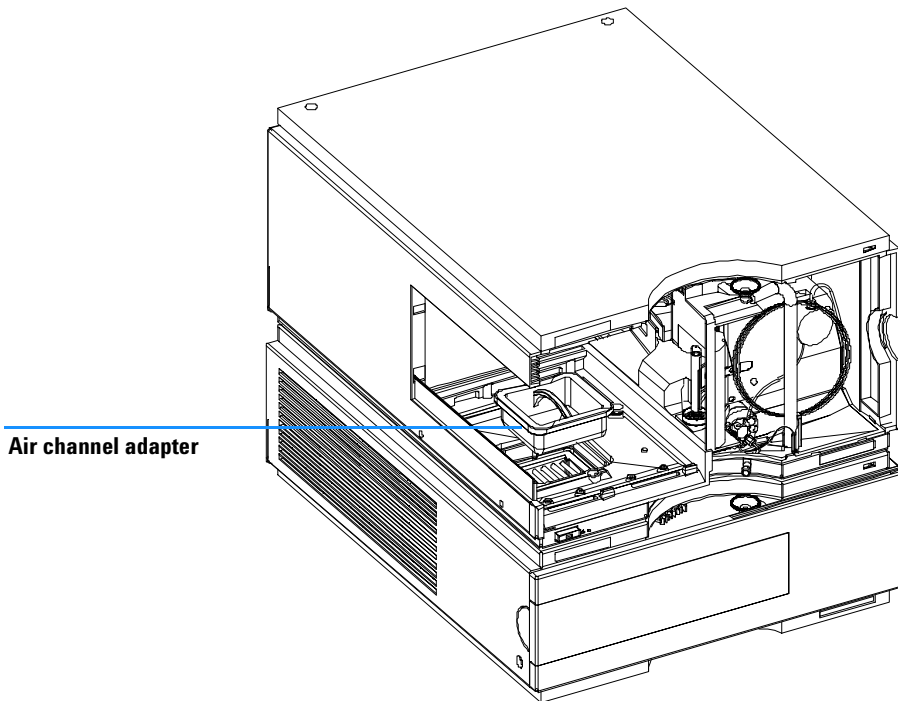


Figure 11 Preparation of ALS Thermostat and Autosampler

Stage 2: Power Cable and Interface Cable Connection

- 1 Ensure the power switch on the front of the autosampler is OFF and the power cables are disconnected.
- 2 Connect the cable between the autosampler and the ALS thermostat, see [Figure 5](#) on page 30.

WARNING

Do not disconnect or reconnect the autosampler to ALS thermostat cable when the power cords are connected to either of the two modules. This will damage the electronics of the modules.

- 3 Move the safety lever at the rear of the two modules to the right position, see [Figure 5](#) on page 30.
- 4 Connect the power cables to the power connectors.
- 5 Connect the CAN interface cables to other modules in the system (see [Figure 7](#) on page 26 and [Figure 13](#) on page 34).
- 6 If required, connect additional interface and control cables to the autosampler (see [Figure 7](#) on page 26 and [Figure 13](#) on page 34). Refer to the documentation of the Agilent 1100 Series control module or ChemStation for LC for more information.

NOTE

In an Agilent 1100 Series system, the individual modules are connected by a CAN cable. The Agilent 1100 control module can be connected to the CAN bus at any of the modules in the system. The Agilent Chemstation can be connected to the system by one GPIB cable at any of the modules, however, it is recommended to connect the GPIB cable to the detector. For more information about connecting the control module or ChemStation refer to the respective user manual. For connecting the Agilent 1100 Series equipment to non-Agilent 1100 Series equipment, see Autosampler manual).

7 Connect additional cables as required (see [Figure 13](#) on page 34).

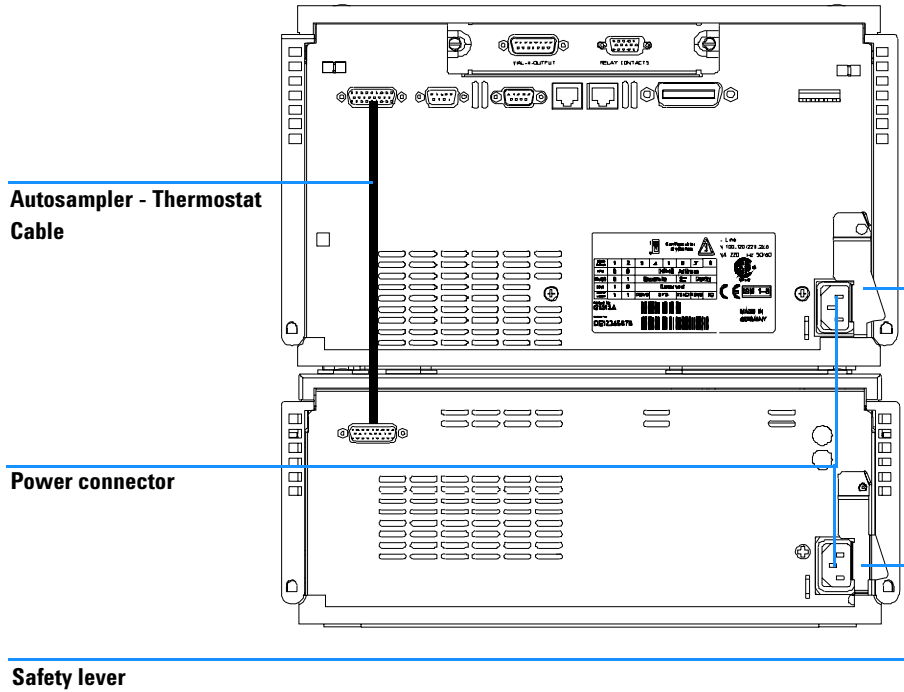


Figure 12 Power Connectors and Safety Levers at Rear of thermostatted Autosampler.

2 Installing the G1330B Thermostat

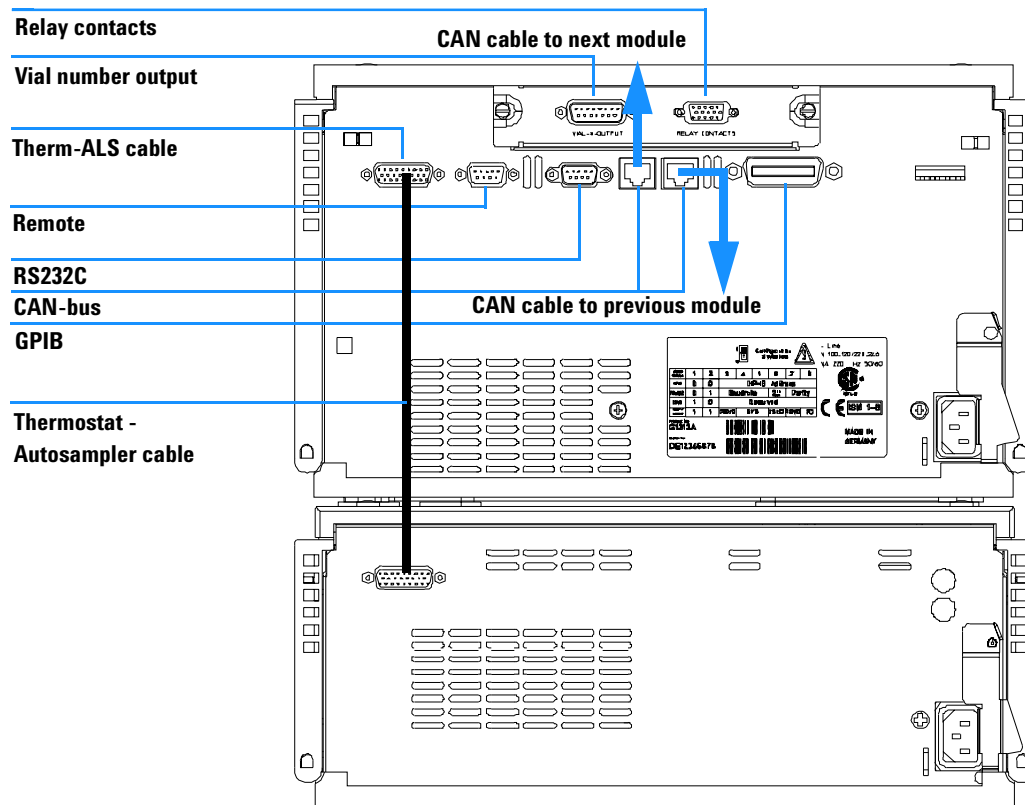


Figure 13 Cable Connections.

Stage 3: Flow Connections

WARNING

When opening capillary or tube fittings, solvents may leak out. Please observe appropriate safety procedures (for example, goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the solvent vendor, especially when toxic or hazardous solvents are used.

- 1 Connect the pump outlet capillary to port 1 of the injection valve.
- 2 Connect column-compartment inlet capillary to port 6 of the injection valve.
- 3 Ensure that the waste tube is positioned inside the leak channel.

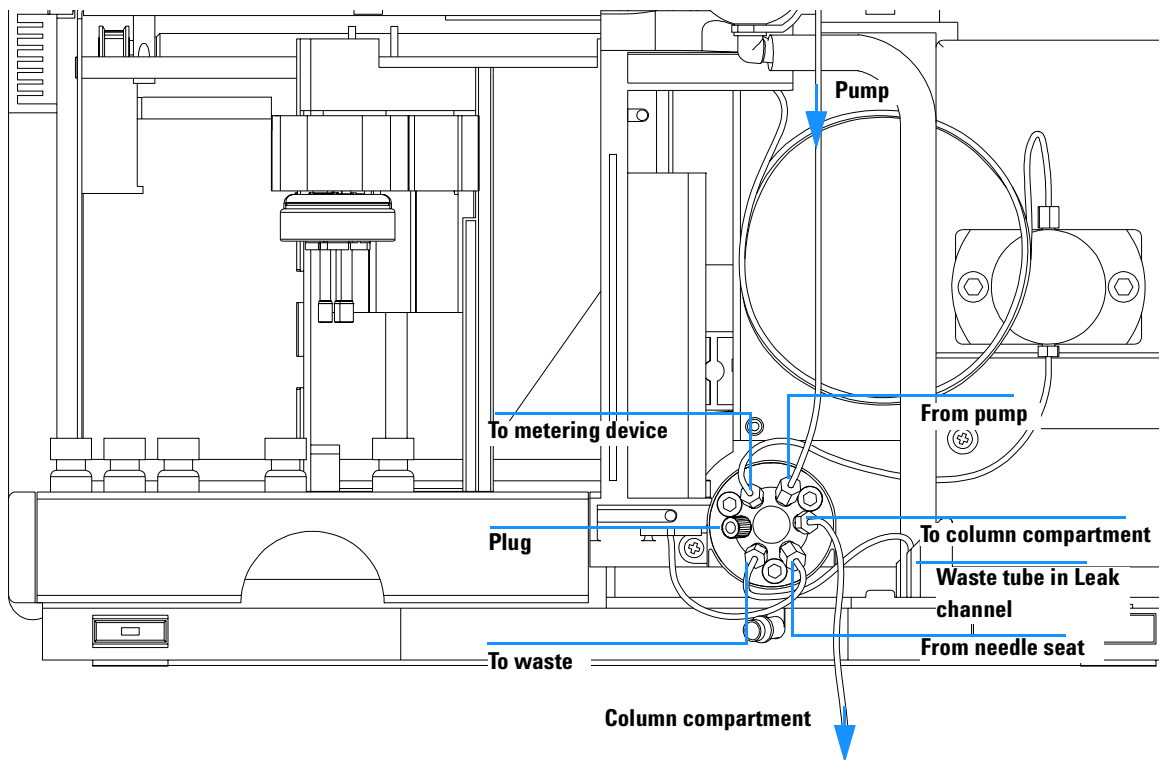


Figure 14 Hydraulic Connections

Stage 4: Installing the Sample Tray

- 1 Load the sample tray with sample vials as required.
- 2 Slide the sample tray into the autosampler so that the rear of the sample tray is seated firmly against the rear of the sample-tray area.
- 3 Press the front of the sample tray down to secure the tray in the autosampler. If the tray pops out of its position the air channel adapter is not inserted correctly.

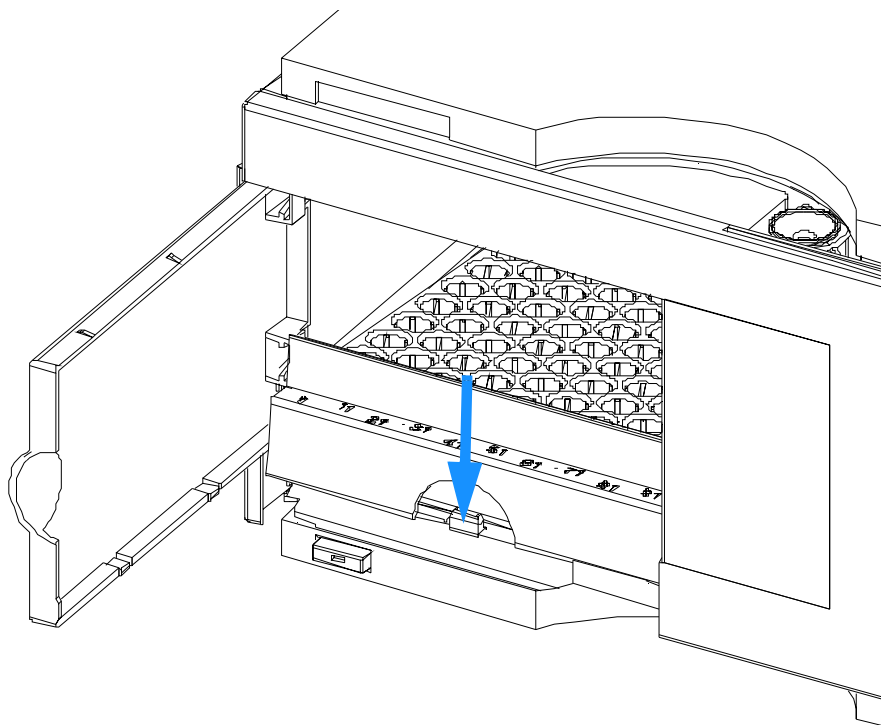


Figure 15 Installing the Sample Tray

Half-Tray Combinations

NOTE

In the autosampler only the 100 vial tray is supported for temperature control of the vials. Nevertheless the half trays of the standard autosampler (G1313A) can be used in the thermostatted autosampler as well. However when these trays are installed cooling or heating of the vials in the tray will not work.

Half-trays can be installed in any combination enabling both 1.8 ml-and 6 ml-vials to be used simultaneously.

Numbering of Vial Positions

The standard 100-vial tray has vial positions 1 to 100. However, when using two half-trays, the numbering convention is slightly different. The vial positions of the right-hand half tray begin at position 101 as follows:

Left-hand 40-position tray: 1–40

Left-hand 15-position tray: 1–15

Right-hand 40-position tray: 101–140

Right-hand 15-position tray: 101–115

2 Installing the G1330B Thermostat

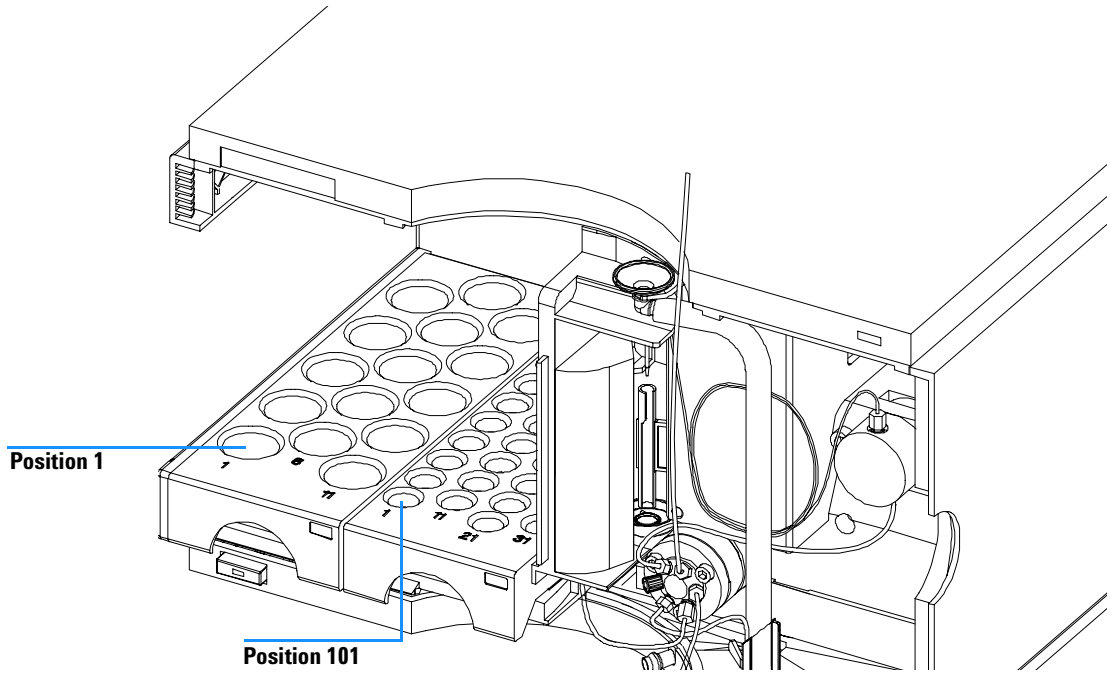


Figure 16 Numbering of Tray Positions.

Stage 5: Installing Tray Cover and Front Cover

- 1 Fix the tray cover in the clips of the left autosampler cover side by sliding it in position. Do not close the tray cover.
- 2 Position the front cover in the top left corner of the autosampler and turn it towards the instrument. Press the stop fastener to secure it in the right side cover of the autosampler.
- 3 Close the tray cover.

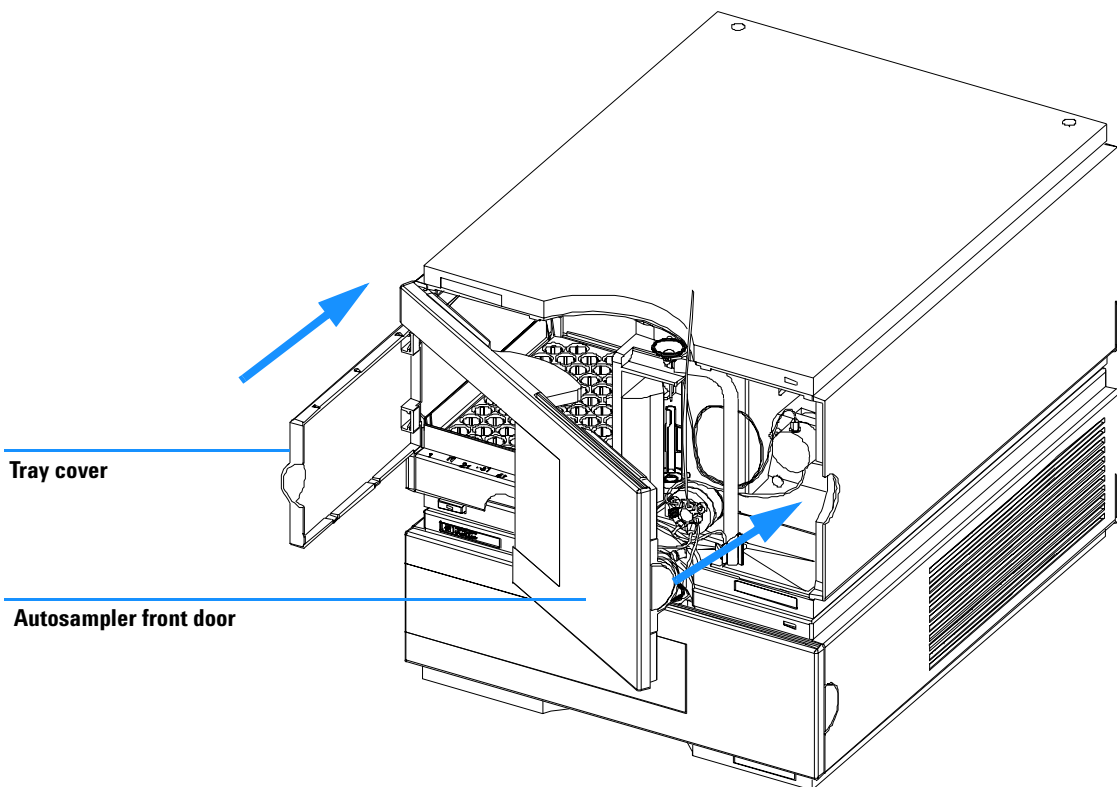


Figure 17 Installation of Tray Cover and Front Cover of the Autosampler

Stage 6: Turning on the Thermostatted Autosampler

- 1 Depress the power switch to turn on the two modules of the autosampler.

NOTE

The power switch stays depressed (1) and a green indicator lamp in the power switch is on when the autosampler is turned on. When the line power switch stands out (0) and the green light is off, the autosampler is turned off.

Stage 7: Update of Control Module Firmware

If the control module has a firmware revision A.01.30 or higher, you do not need to update the control module firmware.

If you have a control module version A.01.30 or lower, update the firmware as described.

- 1 Disconnect the control module before inserting the PC card.
- 2 Insert the PC card into the card slot of the control module.
- 3 Reconnect the control module for restarting it.
- 4 Press “System” (F5) - “Records” (F4). Highlight the LC-System line in the display using the up-down arrows.
- 5 Press “FW-Update” (F5).
- 6 Select the file for the firmware update (LCB202en.BIN).
- 7 Press “Execute” and select “Yes” to confirm loading of the new firmware. The control module reboots and loads the firmware indicated by (.) and (*) on the display. When finished with the update the control module reboots again.
- 8 Check that the correct firmware was loaded by pressing “System” (F5) - “Records” (F4).
- 9 Disconnect the control module and remove the PC card by pressing the card-eject button.

Stage 8: Update of the Agilent ChemStation Software

If you have a Agilent ChemStation software version A.05.02 or higher, you do not need to update your Agilent ChemStation software.

If you have a Agilent ChemStation software version A.05.01 or lower, please update your software as described.

Starting from revision A.04.01 or A.04.02 of the Agilent ChemStation

If you have ordered the G1395A Upgrade kit you will be provided with a A.04.02 and a A.05.01 update CD ROM, which gives you the choice of keeping your old major software version or updating to A.05.01 release.

CAUTION

If you decide to update to A.05.01, ensure that your PC hard- and software meets the requirements for A.05.01. A.05.01 requires Windows 95 or Windows NT 4.0 as operating system and a Pentium PC with a minimum of 24 MB (NT -systems require also GPIB board Agilent 82341C). Publication 12-5965-6805E gives detailed information about the PC requirements. The application note can be obtained from the Internet (<http://www.chem.agilent.com/cag/literature/apglit.html>) or your local Agilent Technologies sales office.

- 1 If you decide to update your A.04.01 Agilent ChemStation to A.05.01, use the provided A.05.01 CD-ROM and follow the steps described in the Installing your ChemStation manual, provided as portable document format (PDF) file on the A.05.01 CD-ROM in the directory MANUALS\INSTALL\LC. If you do not already have the Adobe Acrobat reader installed, use the file MANUALS\READER\AR32e30.EXE to install the reader.
- 2 After you have updated your system, insert the 3.5" floppy labeled 'Driver update Disk (A.05.02 Beta)' and open a DOS prompt by selecting Start->RUN and typing command. At the DOS prompt type A: and press Enter and then HPUUPDATE and press Enter only if your Agilent ChemStation is installed in the directory C:\HPCHEM. If your Agilent ChemStation is installed in a different directory, e.g. D:\HPCHEM, you need to type HPUUPDATE D:\HPCHEM and press Enter.

2 Installing the G1330B Thermostat

- 3 If you decide to update to A.04.02, insert the A.04.02 CD-ROM and select **SETUP** on the CD-ROM using File Manager or Explorer. Select **Yes** to continue with the update.
- 4 After you have updated your system, insert the 3.5 inch floppy labeled Driver update Disk (A.04.03) and open a DOS prompt by selecting **Start->RUN** and typing `command`. At the DOS prompt type `A :` and press **Enter** and then `HPUPDATE` and press **Enter** only if your Agilent ChemStation is installed in the directory `C:\HPCHEM`. If your Agilent ChemStation is installed in a different directory, e.g. `D:\HPCHEM`, you need to type `HPUPDATE D : \HPCHEM` and press **Enter**.

Starting from revision A.05.01 of the Agilent ChemStation

If you already have the Agilent ChemStation A.05.01 installed, you only need to install the update to A.05.02 Beta. This update comprises only the driver for the thermostatted autosampler, no other changes are made.

- 1 Insert the 3.5" floppy labeled Driver update Disk (A.05.02 Beta) and open a DOS prompt by selecting **Start->RUN** and typing `command`. At the DOS prompt type `A :` and press **Enter** and then `HPUPDATE` and press **Enter** only if your Agilent ChemStation is installed in the directory `C:\HPCHEM`. If your Agilent ChemStation is installed in a different directory, e.g. `D:\HPCHEM`, you need to type `HPUPDATE D : \HPCHEM` and press **Enter**.

Transporting the Thermostatted Autosampler

When moving the autosampler around the laboratory, make sure that any condensed water inside the thermostat is removed. Tilt the module to the front, so that the water inside the thermostat can safely flow into the leak funnel. Otherwise no special precautions are needed for the modules.

NOTE

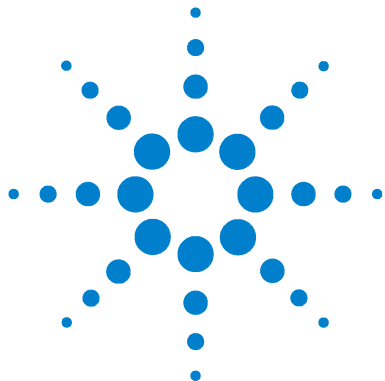
The ALS thermostat is heavy (20.7 Kg, 45.6 lbs). Carry the module, by putting your hands under the side covers in a central position of the unit.

If the autosampler needs to be shipped to another location via carrier, ensure:

- The two modules are shipped in separate boxes.
- The transport assembly of the autosampler is parked, see “Park Arm (Park Gripper)” in your respective *Reference Manual*.
- The vial tray is secured.

If the autosampler is to be shipped to another location, the transport assembly of the autosampler must be moved to the park position to prevent mechanical damage should the shipping container be subjected to excessive shock. Also, ensure the vial tray is secured in place with suitable packaging, otherwise the tray may become loose and damage internal components.

2 Installing the G1330B Thermostat



3 Troubleshooting and Test Functions

Overview of the Thermostat's Indicators and Test Functions 46

Status Indicators 47

ALS Thermostat Error Messages 49



Overview of the Thermostat's Indicators and Test Functions

Status Indicators

The thermostatted autosampler is provided with two status indicators which indicate the operational state (prerun, run, and error states) of the instrument. Both are located on the autosampler module. The status indicators provide a quick visual check of the operation of the thermostatted autosampler (see "[Status Indicators](#)" on page 47).

Error Messages

In the event of an electronic, mechanical or hydraulic failure, the thermostatted autosampler modules generate an error message in the user interface. For each message, a short description of the failure, a list of probable causes of the problem, and a list of suggested actions to fix the problem are provided. This chapter shows only the error messages that are generated for the ALS thermostat. For detailed description of the autosampler error messages see "Autosampler Error Messages" in your *corresponding Reference Manual*.

Status Indicators

Two status indicators are located on the front of the autosampler. The lower left indicates the power supply status, the upper right indicates the thermostatted autosampler status.

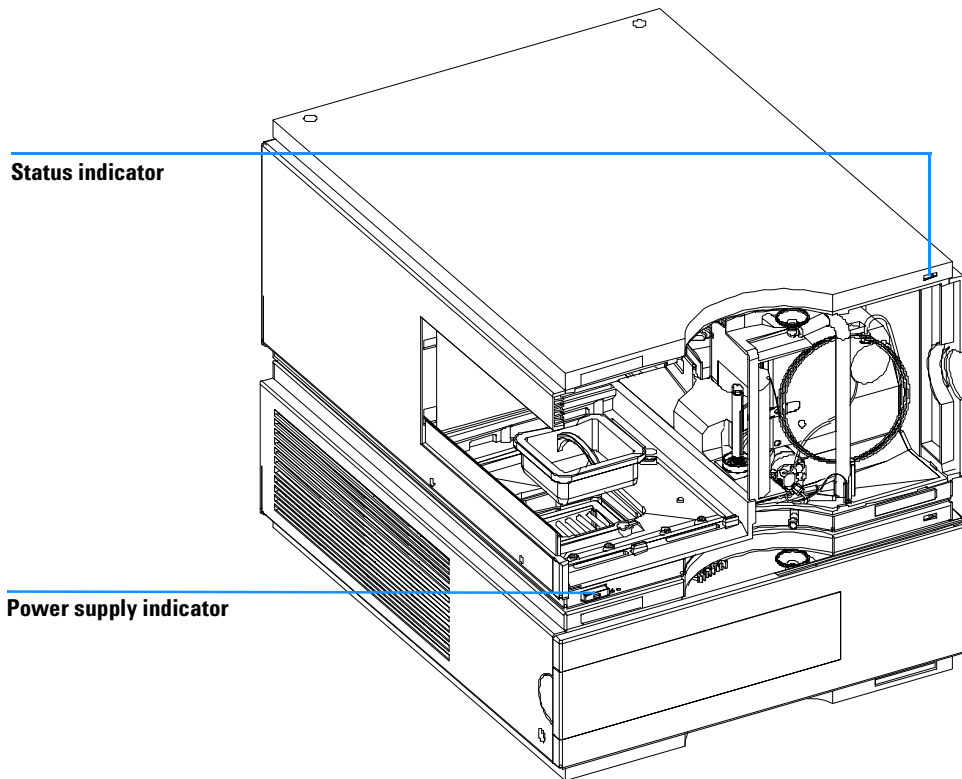


Figure 18 Location of Status Indicators

Power Supply Indicator

The power supply indicator is integrated into the main power switch. When the indicator is illuminated (*green*) the power is ON.

Instrument Status Indicator

The instrument status indicator indicates one of four possible instrument conditions:

- When the status indicator is *OFF* (and power switch light is on), the instrument is in a *prerun* condition, and is ready to begin an analysis.
- A *green* status indicator, indicates the instrument is performing an analysis (*run* mode).
- A *yellow* indicator indicates a *not-ready* condition. The instrument is in a not-ready state when it is waiting for a specific condition to be reached or completed (for example, front cover not installed), or while a self-test procedure is running.
- An *error* condition is indicated when the status indicator is *red*. An error condition indicates the instrument has detected an internal problem which affects correct operation of the instrument. Usually, an error condition requires attention (for example, leak, defective internal components). An error condition always interrupts the analysis.

ALS Thermostat Error Messages

Error messages are displayed in the user interface when an electronic failure occurs with the ALS thermostat module which requires attention. In the event of such a failure, the red status indicator at the front of the thermostatted autosampler is switched on, and an entry is written into the instrument log book.

This section describes the meaning of ALS thermostat module error messages, and provides information on probable causes and suggested actions how to recover from error conditions.

Fan Failed

Each fan in the ALS thermostat is equipped with a speed sensor, that allows monitoring and control the speed of the fans. If the sensor shows no signal, when the fan is activated, it is very likely that the fan is defective. The number in brackets indicates the fan position. Position numbers of the fans are as follows (seen from front of the ALS thermostat)

fan failed 1 - left side, fan in front position

fan failed 2 - left side, fan in back position

fan failed 3 - right side, fan in back position

fan failed 4 - right side, fan in front position

fan failed 5 - small cooler fan on top of cooling / heating module

Probable Causes:

- One of the 4 heat-sink fans is defective.
- The cooling heating module fan is defective

Suggested Actions:

- ✓ See Exchange "[Exchanging the Heatsink Fans](#)" on page 67 or "[Exchanging Heat Exchanger Fan](#)" on page 65.

Temperature Control Failed (1 - 4)

There are four Peltier elements build into the ALS thermostat for efficient cooling / heating. The electronics monitor the current through the Peltier elements. If the Peltier current is out of a specified limit the Peltier element is defective.

Probable Causes:

- One of the four peltier elements is defective.

Suggested Action:

- ✓ contact the Technologies service organization

Temperature Sensor Failed (1 - 4)

The ALS thermostat is equipped with four sensors to monitor the performance of the instrument. The sensors are connected to both sides of the Peltier elements for control of the cooling / heating efficiency. As the positioning of the sensor is critical to meet the performance requirements of the ALS thermostat the single sensors cannot be replaced separately.

Probable Causes:

- Temperature sensor is defective

Suggested Action:

- ✓ See "[Exchanging the Sensors](#)" on page 69".

Lost Contact to ALS Thermostat

The autosampler control electronics continuously checks whether the ALS thermostat is active or not.

Probable Causes:

- Bad cable connection between autosampler and ALS thermostat
- Cable between autosampler and thermostat module not connected
- Defective electronic board in autosampler or ALS thermostat

Suggested Actions:

- ✓ Check cable connection between autosampler and ALS thermostat
- ✓ Connect cable between autosampler and ALS thermostat
- ✓ Exchange ASM board in the autosampler
- ✓ Exchange TCA board in the thermostat
- ✓ contact the Agilent Technologies service organization

Power Fail for ALS Thermostat Module

The +36V that is generated in the ALS thermostat power supply is checked by the autosampler electronics. If this voltage is missing the error message will be generated.

Probable Causes:

- ALS thermostat module not connected to line power
- ALS thermostat module fuse(s) defective
- ALS Thermostat power supply defective

Suggested Actions:

- ✓ Check correct power line connection
- ✓ Check fuse(s) and replace if defective
- ✓ contact the Agilent Technologies service organization

Temperature out of Range

To protect the Peltier elements for damage their working range is limited to -3°C to 65°C. The error message is generated when at least one of the three Peltier elements exceeds this limit.

Probable Causes:

- The four main heat exchanger fans are not able to blow enough air through the ALS thermostat
- Ambient temperature too high / low

Suggested Actions:

- ✓ Clean the air filters and heat exchanger fins in the ALS thermostat. Switch off the thermostat and wait 10 min for the peltier elements to equilibrate
- ✓ Make sure that there is enough space on left and right side of the ALS thermostat and that the air channel inlets and outlets are not blocked
- ✓ Make sure that the ambient air temperature is within its specified limits (4°C to 55°C)

Bad Cooling / Heating Performance

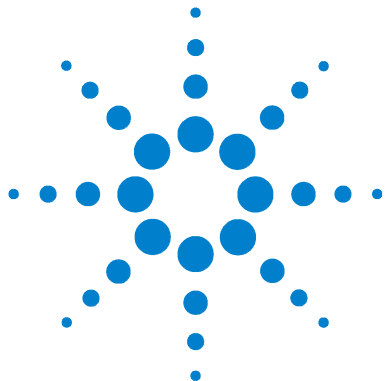
When turned on the ALS thermostat Peltier elements are activated according to the given setpoint or to given setpoint change. The electronics check whether there actual temperature is moving in the correct direction (e.g., decreasing when cooled down).

Probable Causes:

- Peltier element(s) defective
- Peltier element(s) not connected or incorrectly connected (e.g., after repair or maintenance)
- The four main heat exchanger fans are not able to blow enough air through the ALS thermostat

Suggested Actions:

- ✓ Check connections of the Peltier elements
- ✓ Clean the air filters and heat exchanger fins in the ALS thermostat. Switch off the thermostat and wait 10 min for the peltier elements to equilibrate
- ✓ Make sure that there is enough space on left and right side of the ALS thermostat and that the air channel inlets and outlets are not blocked
- ✓ contact the Agilent Technologies service organization



4

Repairing the ALS Thermostat Module

Introduction into Repairing the Thermostat 58

Overview of the Repairing the Thermostat 60

Exchanging Internal Parts 62



Introduction into Repairing the Thermostat

Simple Repairs

The ALS thermostat is designed for easy repair.

Exchanging Internal Parts

Some repairs may require exchange of defective internal parts. Exchange of these parts requires removing the ALS thermostat from the stack, removing the covers, and disassembling the ALS thermostat. The security lever at the power input socket prevents that the Thermostat cover is taken off when line power is still connected.

WARNING

To prevent personal injury, the power cable must be removed from the ALS thermostat before opening the Thermostat cover. Do not connect the power cable to the ALS thermostat while the covers are removed.

CAUTION

Electronic boards and components are sensitive to electrostatic discharge (ESD). In order to prevent damage always use an ESD protection (for example, the ESD wrist strap from the accessory kit) when handling electronic boards and components.

WARNING

Do not disconnect or reconnect the autosampler to ALS thermostat cable when the power cords are connected to either of the two modules. This will damage the electronics of the modules.

Cleaning the Thermostat

The thermostat covers should be kept clean. Cleaning should be done with a soft cloth slightly dampened with water or a solution of water and a mild detergent. Do not use an excessively damp cloth that liquid can drip into the autosampler.

Using the ESD Strap

Electronic boards are sensitive to electronic discharge (ESD). In order to prevent damage, always use an ESD strap supplied in the standard accessory kit (see "[Accessory Kit G1330-68705](#)" on page 79) when handling electronic boards and components.

- 1 Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
- 2 Unroll the rest of the band and peel the liner from the copper foil at the opposite end.
- 3 Attach the copper foil to a convenient and exposed electrical ground.

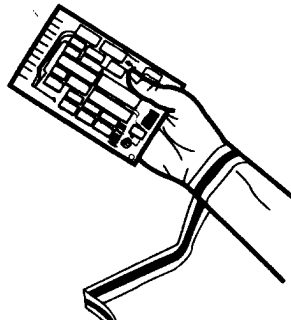


Figure 19 Using the ESD Strap

Overview of the Repairing the Thermostat

Figure 20 shows the main assemblies and their locations which can be repaired.

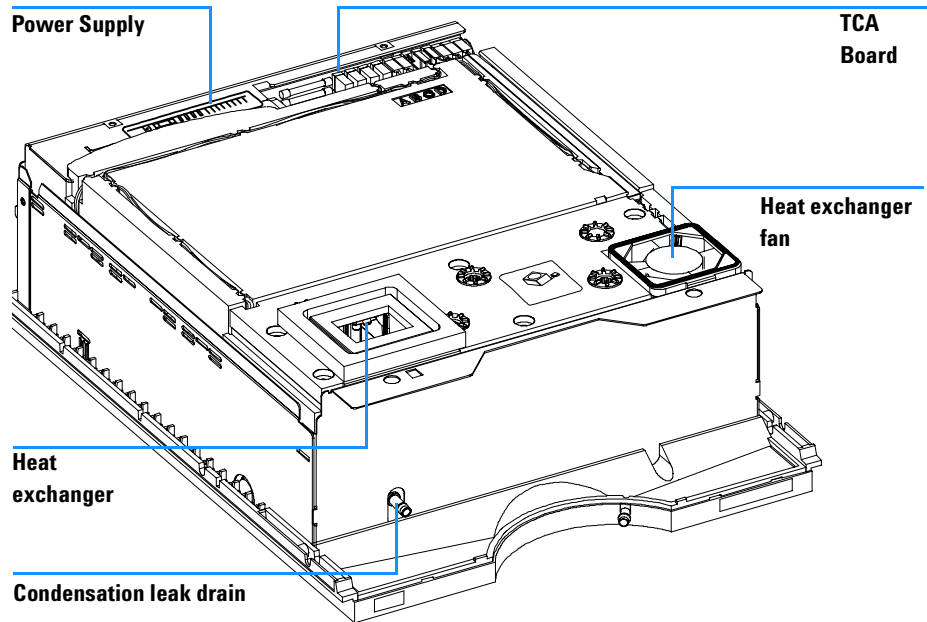


Figure 20 Main assemblies

Exchanging the Power Supply Fuses

Frequency	When defective
Tools required	Flat head screwdriver
Parts required	Fuses T2.5 A/250V (CSA, UL listed), 2110-0015

The fuse holders are located on the rear panel of the ALS thermostat.

- 1** Switch off the power switch at the front of the thermostatted autosampler.
- 2** Remove the power cable from the two modules.
- 3** Insert the flat head screwdriver in the fuse holder, slightly press and turn counter clockwise to release the fuse holder from the socket.
- 4** Pull the fuse holder out of the socket.
- 5** Remove the fuse from the fuse holder.
- 6** Insert a new fuse in the fuse holder.
- 7** Reinsert the fuse holder and fix with the screwdriver.
- 8** Reinsert the power cables.
- 9** Switch on the power switch.

Exchanging Internal Parts

WARNING

The following procedures require opening the main cover of the ALS thermostat. Always ensure the ALS thermostat is disconnected from the line power when the main cover is removed. The security lever at the power input socket prevents that the pump cover is taken off when line power is still connected.

WARNING

To disconnect the ALS thermostat from line, unplug the power cord. The power supply still uses some power, even if the switch on the front panel is turned off.

WARNING

When opening capillary or tube fittings solvents may leak out. Please observe appropriate safety procedures (for example, goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the solvent vendor, especially when toxic or hazardous solvents are used.

NOTE

The electronics of the ALS thermostat will not allow operation when the top cover and the top foam are removed. A safety light switch on the main board will inhibit the operation of the ALS thermostat. Always operate the ALS thermostat with the top foam and top covers in place.

CAUTION

Internal components may be sensitive to electrostatic discharge (ESD). Always use an ESD kit when handling internal parts.

The procedures in this section describe how to exchange internal parts. You must remove the ALS thermostat from the stack in order to open the main cover.

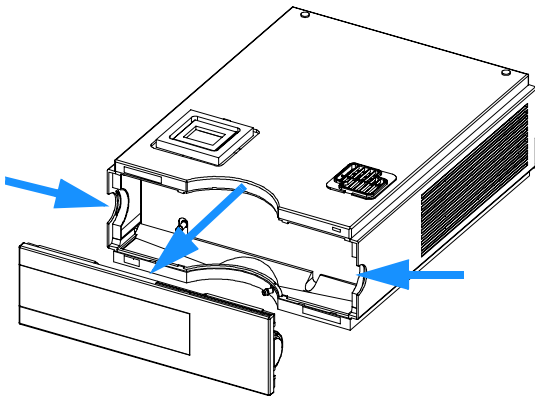
Removing the Top Cover and Foam

Tools required Screwdriver Pozidriv #1
Preparations for this procedure Switch off ALS at the main power switch. Disconnect ALS and ALS thermostat power cords. Remove ALS to ALS thermostat cable, and remove thermostat from stack.

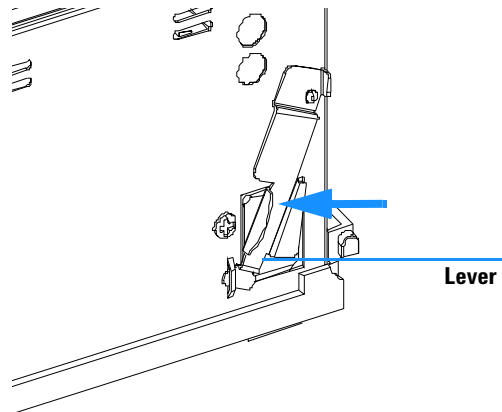
WARNING

Do not disconnect or reconnect the autosampler to ALS thermostat cable when the power cords are connected to either of the two modules. This will damage the electronics of the modules.

1 Remove the front cover by pressing the both clip fasteners on both sides of the cover.

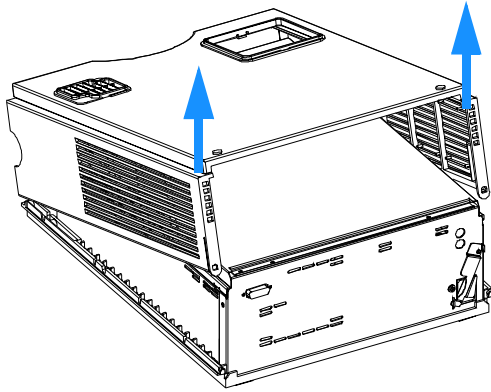


2 Move the lever towards the power socket.

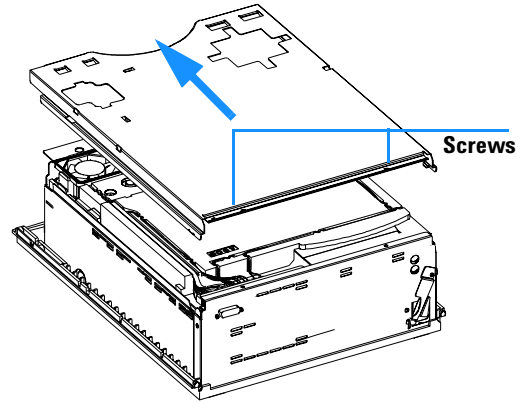


4 Repairing the ALS Thermostat Module

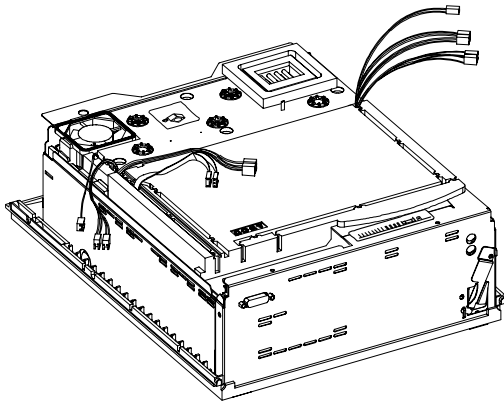
3 Lift the clips on both sides of the top cover (1). Remove the top cover (2).



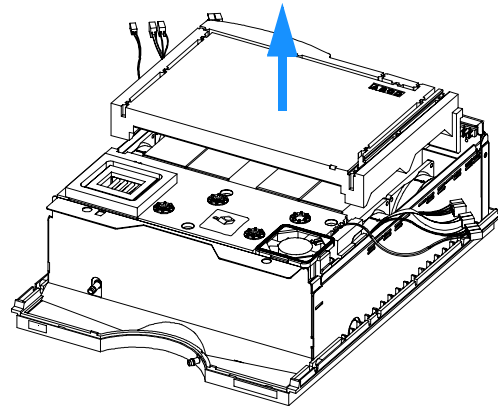
4 Unscrew the screws on the top plate and remove the plate by lifting its back first and then sliding to the front.



5 Unplug all wires at the TCA Board and remove them from top foam.



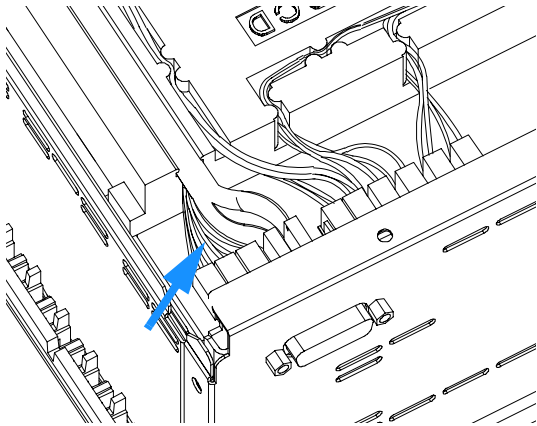
6 Remove the top foam.



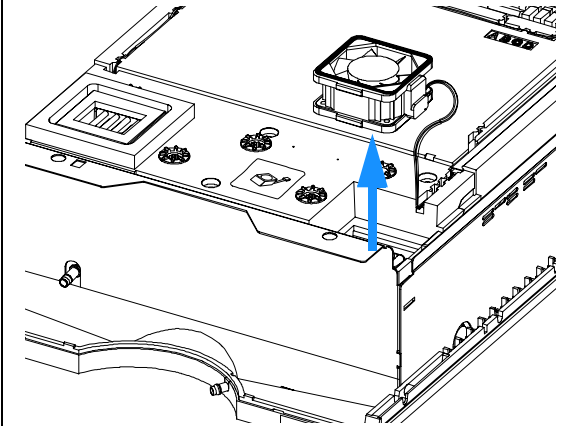
Exchanging Heat Exchanger Fan

When required When defective
Preparations for this Removing the Top Cover and Foam (see "Removing the Top Cover and Foam"
procedure on page 63) item 1 to 4.
Parts required Fan, PN 3160-1079

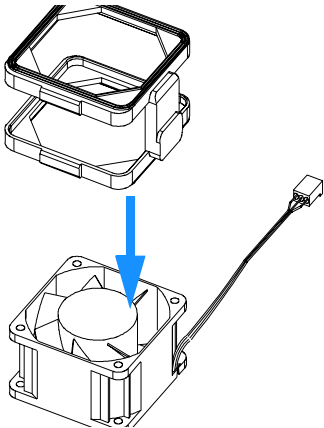
1 Unplug the connector at the TCA board and remove the wire from the Top Foam.



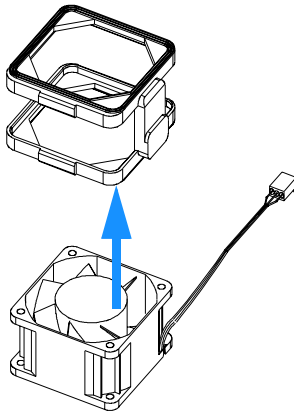
2 Carefully lift the Fan upwards.



3 Remove the Fan from the Fan Gasket.

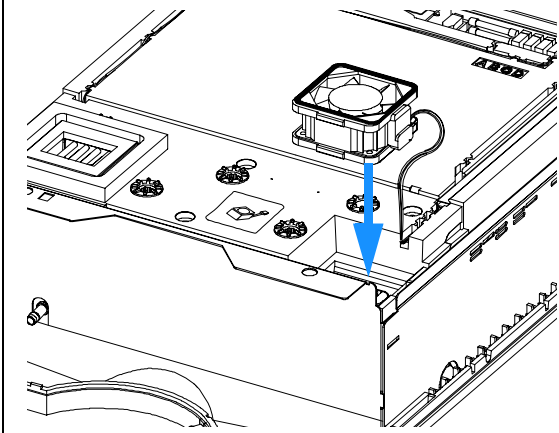


4 Insert the new Fan in the Fan Gasket. See arrow at the side of Fan for correct airflow direction.

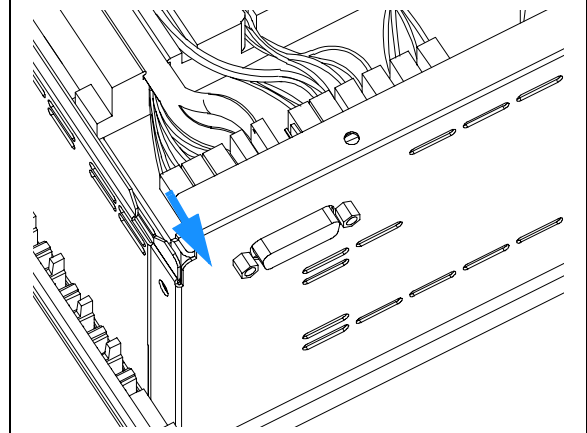


4 Repairing the ALS Thermostat Module

5 Reinstall the fan and route the wire in the appropriate guide channel.



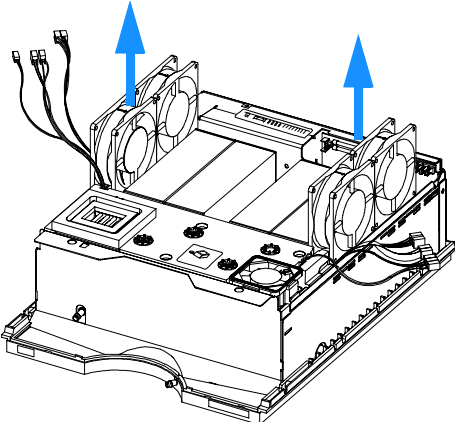
6 Reconnect the wire to the connector.



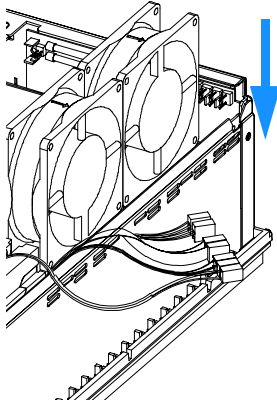
Exchanging the Heatsink Fans

When required Fan not running
Preparations for this procedure Removing the Top Cover and Foam (see "Removing the Top Cover and Foam" on page 63).
Parts required Fan, part number 3160-0884

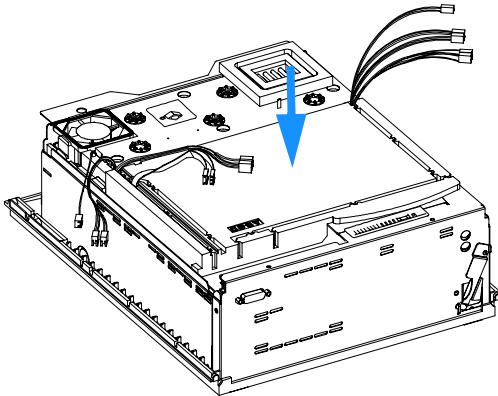
1 Carefully lift the pair of Fans upwards.



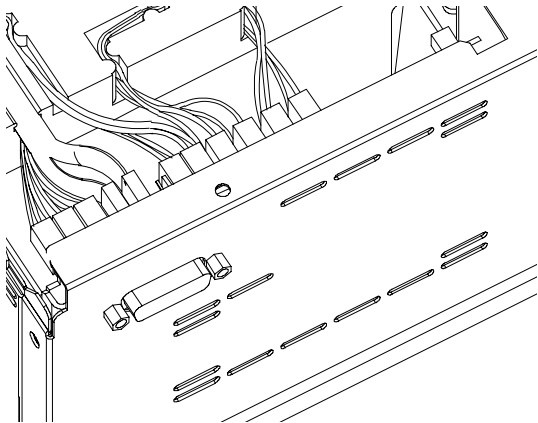
2 Replace the defective fan, and reinsert the pair of Fans. Note the orientation of the fans.



3 Reinsert the Top Foam and route the cables in the guide channels in the Top Foam.

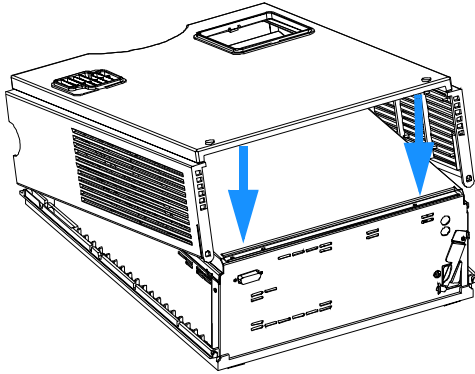


4 Reconnect the connectors in the correct order (See label on top of Power Supply).



4 Repairing the ALS Thermostat Module

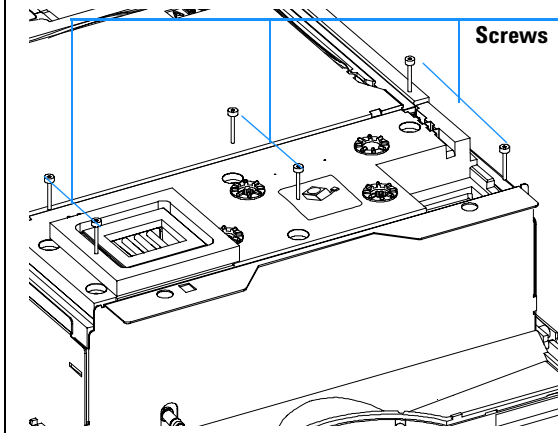
5 Replace the metal cover and top cover.



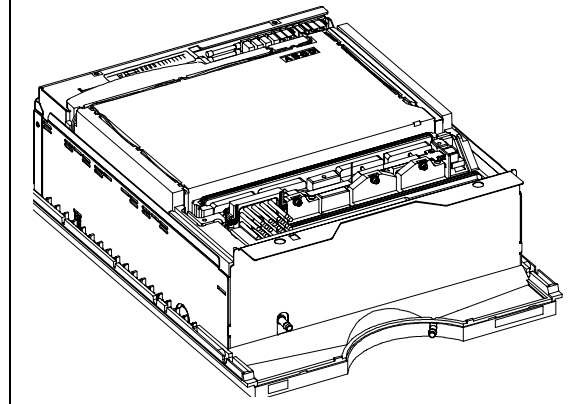
Exchanging the Sensors

When required	Sensors defective
Preparations for this procedure	Removing the Top Cover and Foam (see "Removing the Top Cover and Foam" on page 63).
Parts required	Sensor flexboard, PN G1330-66504 Heatsink Compound, PN 6040-0454

1 Unscrew the six holding screws on top of the hardfoam encapsulation.

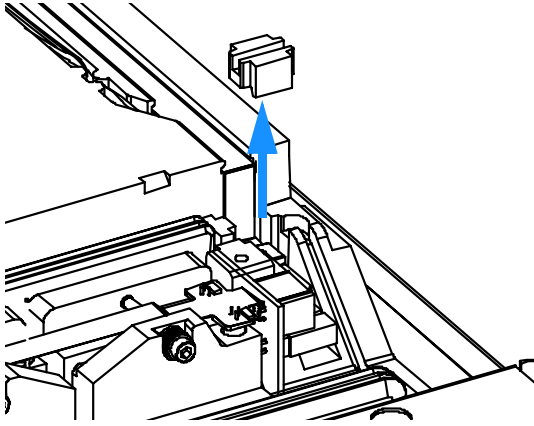


2 Carefully lift the upper part of hardfoam encapsulation away.

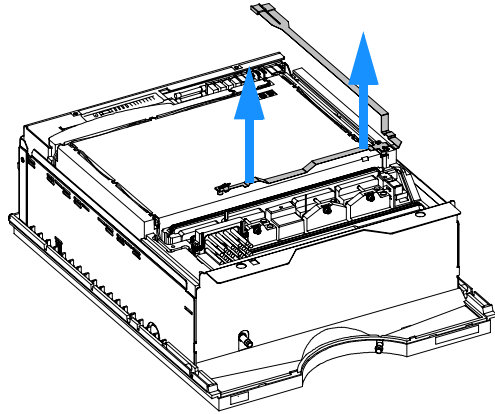


4 Repairing the ALS Thermostat Module

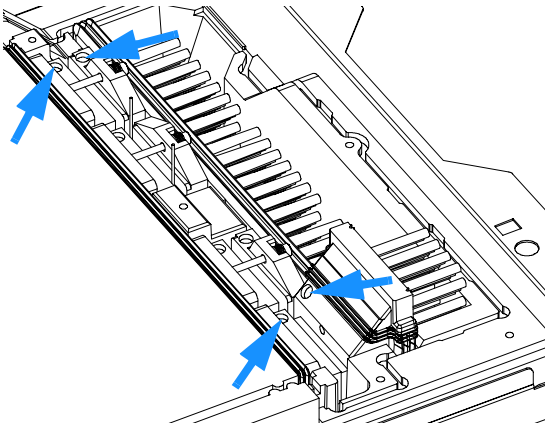
3 Remove the sealing adapter by carefully sliding it out of the seat.



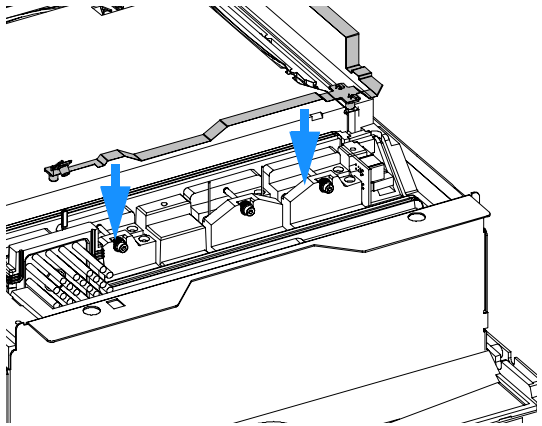
4 Unplug the connectors at the TCA Board, careful lift the sensors out of their seat and remove the sensor flexboard.



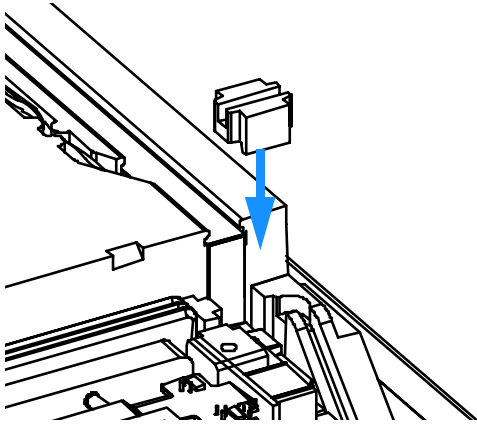
5 Insert some Heatsink Compound into the four sensor seats, to assure good contact.



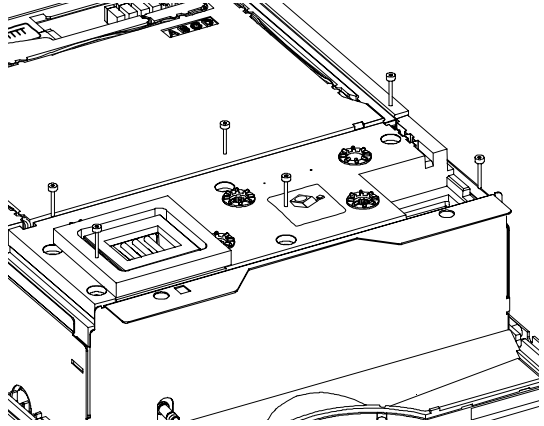
6 Install the new sensor flexboard carefully by pressing each sensor individually into the seats, and then route the flexboard through the sealing adapter channel.



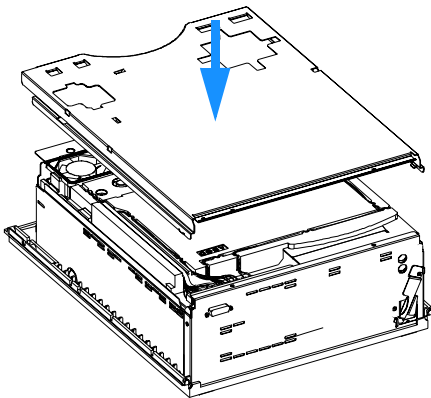
7 Reinsert the sealing adapter by carefully sliding it in to the seat.



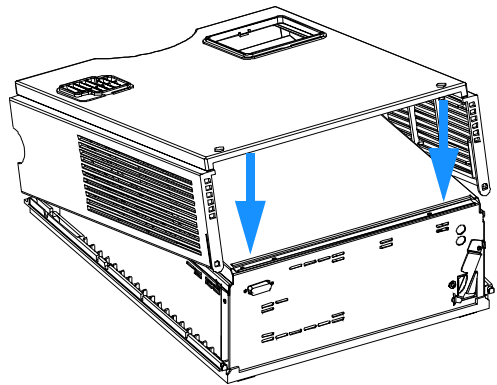
8 Reinstall the hardfoam encapsulation.



9 Route the cables in the guide channels and reconnect the connectors in the correct order (See label on Power Supply).



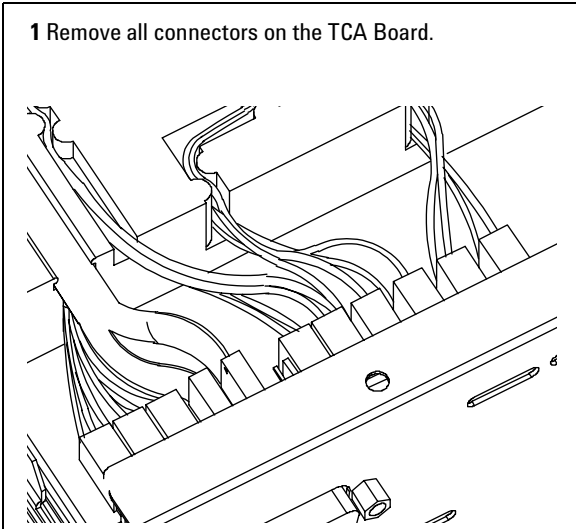
10 Reinstall the Top Plate and the Top Cover.



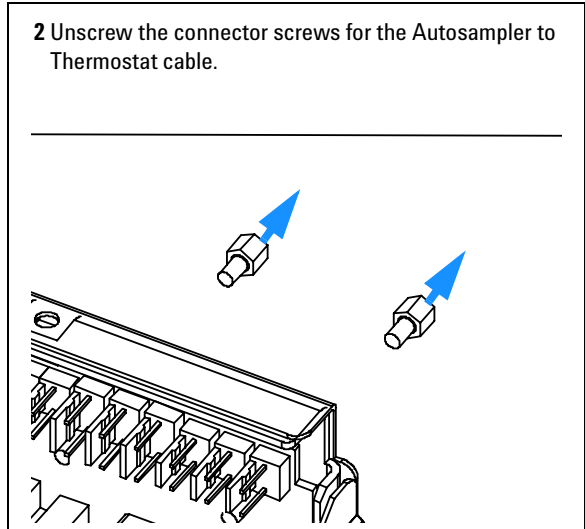
Exchanging the TCA board

When required	TCA Board defective
Preparations for this procedure	Removing the Top Cover and Foam (see "Removing the Top Cover and Foam" on page 63), item 1 to 4.
Parts required	TCA board, part number G1330-66500

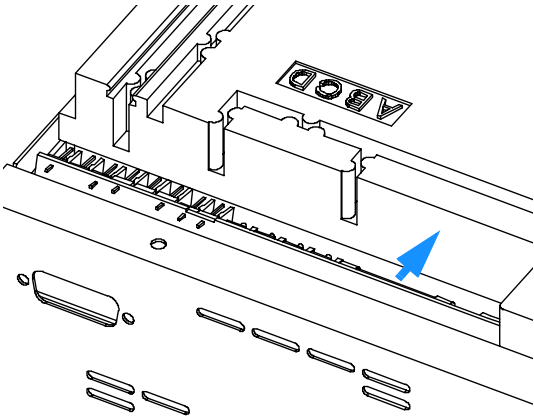
1 Remove all connectors on the TCA Board.



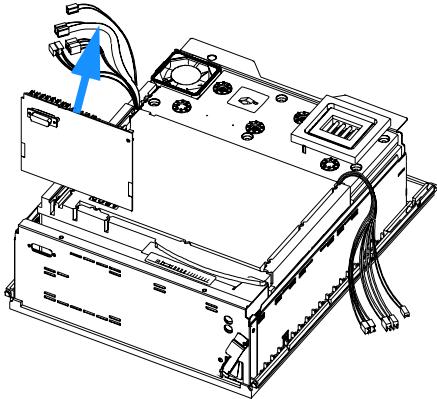
2 Unscrew the connector screws for the Autosampler to Thermostat cable.



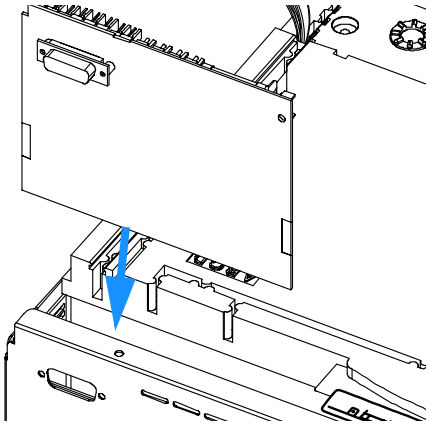
3 By carefully pulling back on the upper part of the TCA board unsnatch it from the holder.



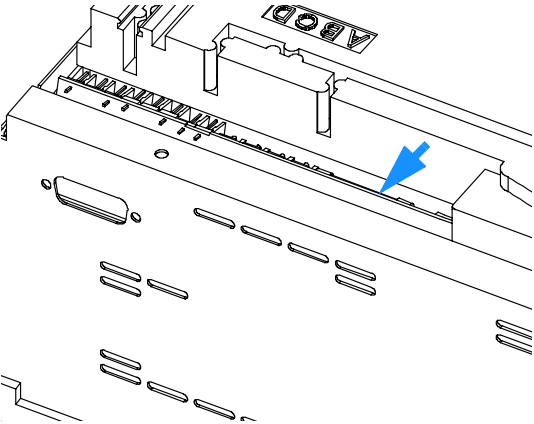
4 Remove the TCA board.



5 Reinsert the new TCA board.

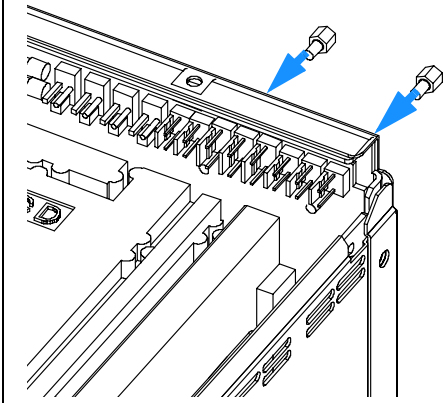


6 Gently push forward on the upper part of the board, until it snatches into place.

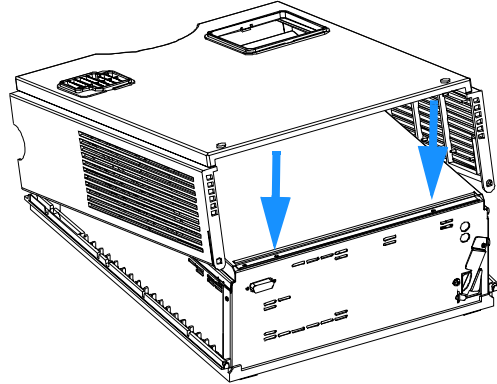


4 Repairing the ALS Thermostat Module

7 Refit the connector screws and reconnect all connectors.



8 Replace the top foam section, metal cover and top cover.



Assembling the Main Cover

When required	If cover is broken
Tools required	None
Parts required	Cover kit G1330-68703 (includes base, top, left and right)

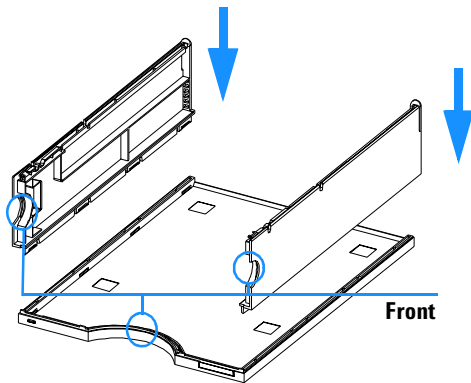
NOTE

The cover kit contains all parts, but it is not assembled.

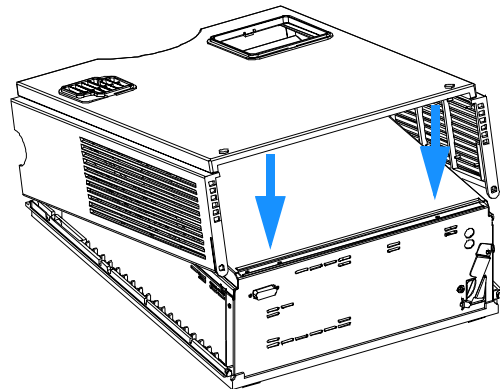
WARNING

In case you insert the left or right side in the opposite position, you may not be able to remove the side from the top part.

1 Place the top part on the bench and insert the left and right side into the top part.



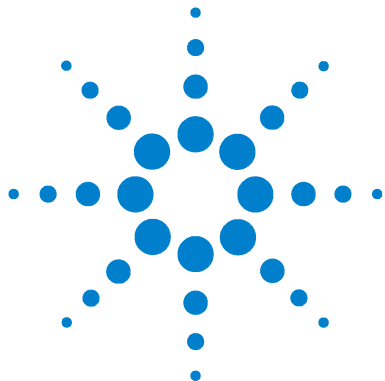
2 Replace the cover.



3 Replace the ALS thermostat into the stack and reconnect the cables and capillaries.

4 Turn on the ALS thermostat.

4 Repairing the ALS Thermostat Module



5 ALS Thermostat Parts and Materials

Main Assemblies	78
Accessory Kit G1330-68705	79
Main Assemblies	78
Foam Parts	81
Plastic Parts	82
Heat Exchanger Fan Parts	83



Main Assemblies

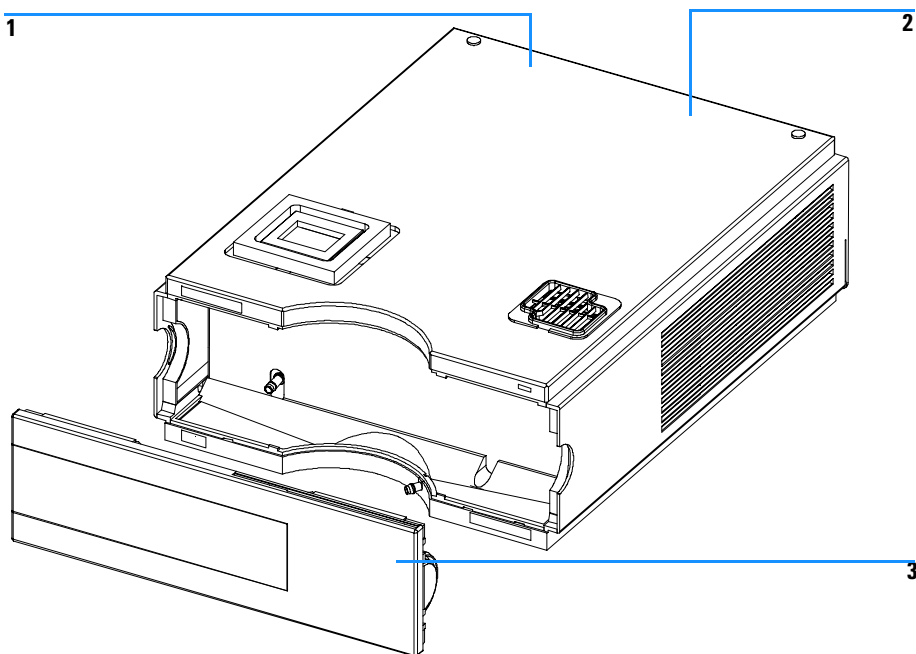


Figure 21 Main Assemblies

Table 4 Main Assemblies

Item	Description	Part Number
1	Fuse - Power Supply (T2.5A/250V; CSA, UL listed)	2110-0015
2	Fuse TCA - Board (T3A/250V; CSA, UL listed)	2110-0029
3	Front Cover	5062-8582
	Cable, autosampler - ALS thermostat	G1330-81600

Accessory Kit G1330-68705

Table 5 Accessory Kit

Item	Description	Part Number
1	Waste Tube*	5062-2463
2	Waste Tube Assembly	G1330-67300

* Reorder Number (5 m)

Main Assemblies

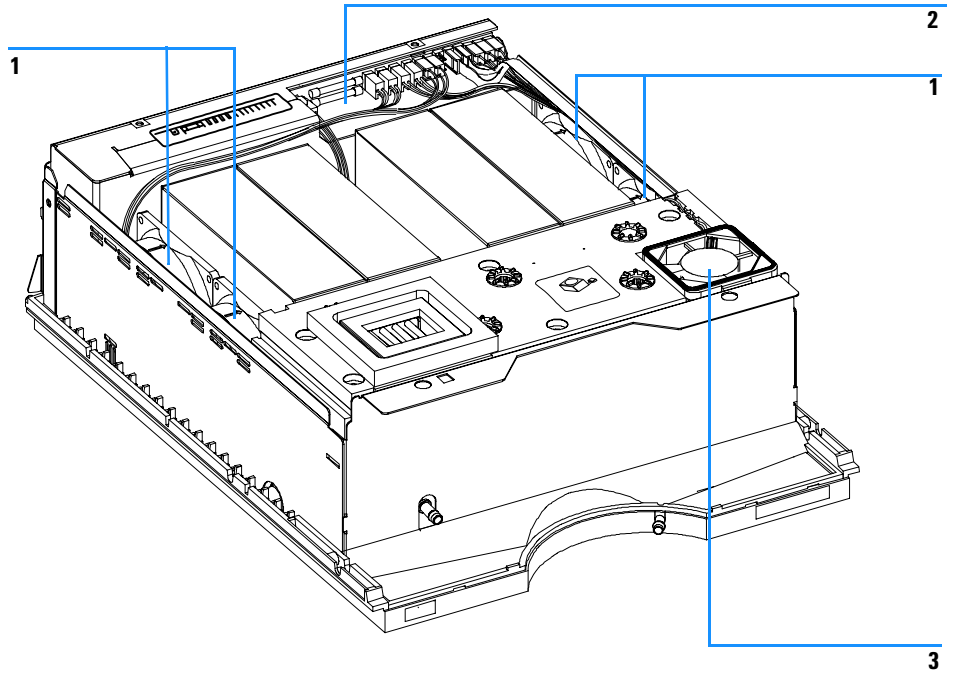


Figure 22 Main Assemblies

Table 6 Main Assemblies

Item	Description	Part Number
1	Heat sink fans	3160-0884
2	TCA Board	G1330-66500
3	Heat exchanger fan	3160-1079

Foam Parts

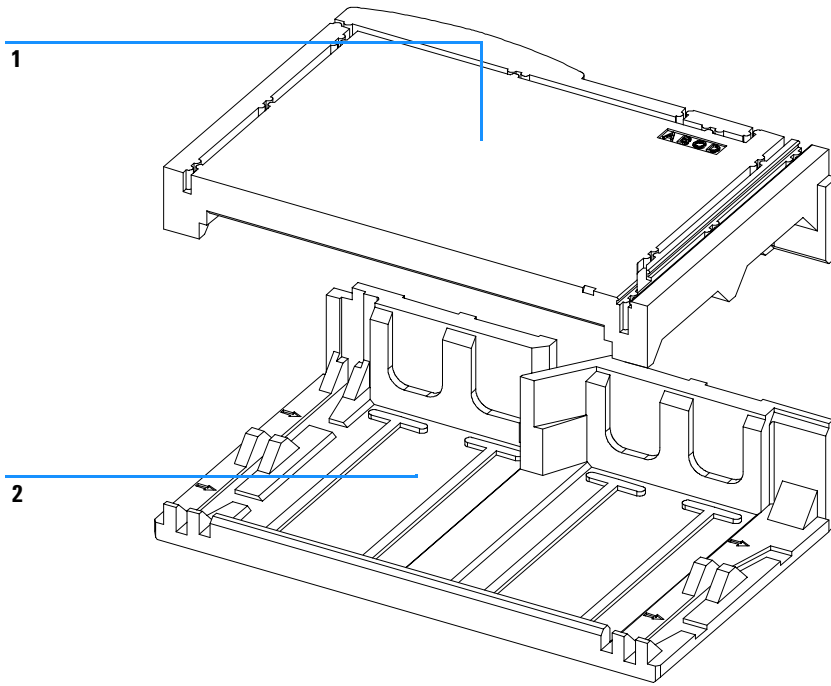


Figure 23 Foam Parts

Table 7 Main Assemblies

Item	Description	Part Number
1	Top Foam	G1330-40102
2	Bottom Foam	G1330-40103

Plastic Parts

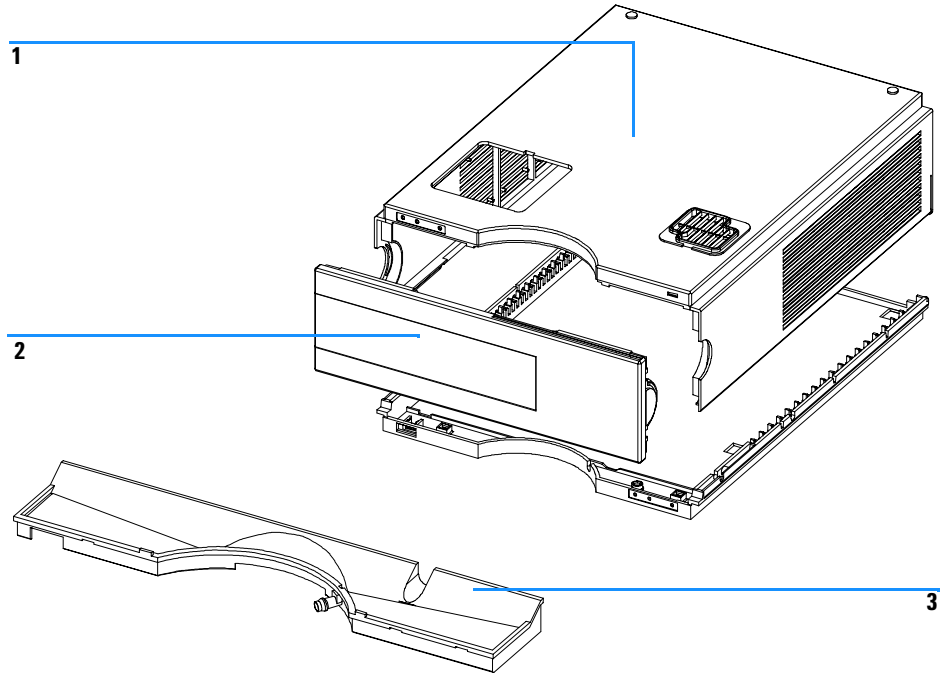


Figure 24 Plastic Parts

Table 8 Main Assemblies

Item	Description	Part Number
1	Cabinet Kit, includes base, top and sides	G1330-68703
2	Front Cover	5062-8582
3	Leak Pan	5042-1307

Heat Exchanger Fan Parts

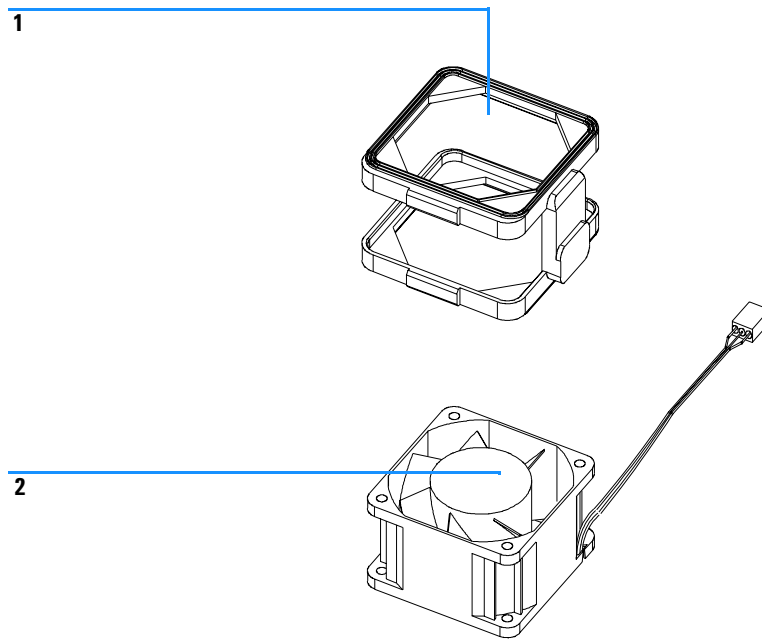
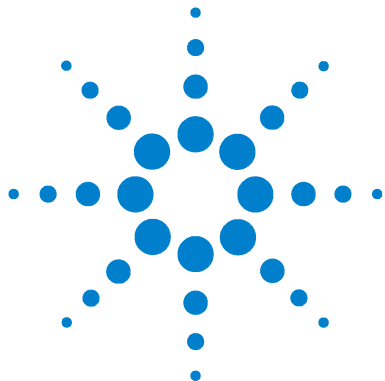


Figure 25 Heat Exchanger Fan Parts

Table 9 Main Assemblies

Item	Description	Part Number
1	Fan Gasket	G1330-44104
2	Heat Exchanger Fan	3160-1079

5 ALS Thermostat Parts and Materials



6 Specifications

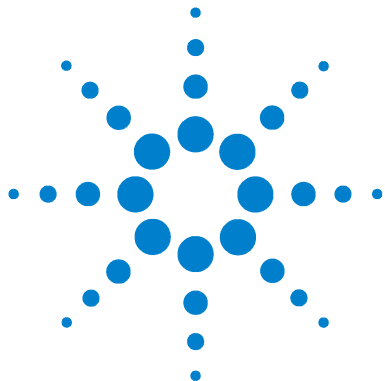
Performance Specifications 86



Performance Specifications

Table 10 Performance Specifications Agilent 1100 Series thermostatted autosampler

Type	Specification
Temperature range:	setable from 4°C to 40°C in 1° increments



A **Safety Information**

General Safety Information	88
Radio Interference	91
Sound Emission	92
Agilent Technologies on Internet	93



General Safety Information

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

General

This is a Safety Class I instrument (provided with terminal for protective earthing) and has been manufactured and tested according to international safety standards.

Operation

Before applying power, comply with the installation section. Additionally the following must be observed.

Do not remove instrument covers when operating. Before the instrument is switched on, all protective earth terminals, extension cords, auto-transformers, and devices connected to it must be connected to a protective earth via a ground socket. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in serious personal injury. Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any intended operation.

Make sure that only fuses with the required rated current and of the specified type (normal blow, time delay, and so on) are used for replacement. The use of repaired fuses and the short-circuiting of fuseholders must be avoided.

Some adjustments described in the manual, are made with power supplied to the instrument, and protective covers removed. Energy available at many points may, if contacted, result in personal injury.

Any adjustment, maintenance, and repair of the opened instrument under voltage should be avoided as much as possible. When inevitable, this should be carried out by a skilled person who is aware of the hazard involved. Do not

attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present. Do not replace components with power cable connected.

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

Do not install substitute parts or make any unauthorized modification to the instrument.




Capacitors inside the instrument may still be charged, even though the instrument has been disconnected from its source of supply. Dangerous voltages, capable of causing serious personal injury, are present in this instrument. Use extreme caution when handling, testing and adjusting.

When working with solvents please observe appropriate safety procedures (e.g. goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet by the solvent vendor, especially when toxic or hazardous solvents are used.

Safety Symbols

Table 1 shows safety symbols used on the instrument and in the manuals.

Table 1 Safety Symbols

Symbol	Description
	The apparatus is marked with this symbol when the user should refer to the instruction manual in order to protect the apparatus against damage.
	Indicates dangerous voltages.
	Indicates a protected ground terminal.

WARNING

A warning alerts you to situations that could cause physical injury or damage to the equipment. Do not proceed beyond a warning until you have fully understood and met the indicated conditions.

CAUTION

A caution alerts you to situations that could cause a possible loss of data. Do not proceed beyond a caution until you have fully understood and met the indicated conditions.

Radio Interference

Manufacturer's Declaration

This is to certify that this equipment is in accordance with the Radio Interference Requirements of Directive FTZ 1046/1984. The German Bundespost was notified that this equipment was put into circulation, the right to check the series for compliance with the requirements was granted.

Test and Measurement

If test and measurement equipment is operated with equipment unscreened cables and/or used for measurements on open set-ups, the user has to assure that under operating conditions the radio interference limits are still met within the premises.

Sound Emission

Manufacturer's Declaration

This statement is provided to comply with the requirements of the German Sound Emission Directive of 18 January 1991.

This product has a sound pressure emission (at the operator position) < 70 dB.

- Sound Pressure $L_p < 70$ dB (A)
- At Operator Position
- Normal Operation
- According to ISO 7779:1988/EN 27779/1991 (Type Test)

Agilent Technologies on Internet

For the latest information on products and services visit our worldwide web site on the Internet at:

<http://www.agilent.com/go/chem>

A Safety Information

Index

A

Agilent on internet, 93
air circulation, 21
ALS thermostat accessory kit, 24
ALS thermostat accessory kit contents, 24
ALS thermostat operation, 12
ALS thermostat parts and materials
 accessory kit, 79
 main assemblies, 78, 79
ALS thermostat repairs
 power supply fuses, 61
assembling the main cover, 75
autosampler control, 14

B

bench space, 21

C

cleaning the ALS thermostat, 58
condensation, 10, 21

D

damaged packaging, 23
damper, 65
damping unit, 65
delay volume, 25
delivery checklist, 23

E

electrical connections, 17
 CAN, 17
 GPIB, 17
 Remote, 17
 RS-232, 17
 thermostat - autosampler, 17
electronics, 14
electrostatic discharge (ESD), 58
environment, 20, 21
error messages, 46
 ALS thermostat, 49
 bad cooling / heating performance, 56
 lost contact to ALS thermostat, 53
 power fail ALS thermostat, 54
 temperature control failed, 51
 temperature out of range, 55
 temperature sensor failed, 52
 therm fan failed, 50
ESD (electrostatic discharge) strap, 59
exchanging
 damper, 65
 fan, 67, 69, 72
 internal parts, 58, 62

F

failure, 46
fan, 67, 69
 exchanging, 72
flow path, 25
fuses, 20, 61

H

half-tray combinations, 37

I

injection valve, 10
installing the thermostatted
 autosampler, 28
 flow connections, 35
 preparation, 29
 power cable and interface cable, 32
 sample tray, 36
 tray cover and front cover, 39
 turning on the instrument, 40
 update of firmware or software, 40, 41
instrument status indicator, 48
internal parts, 62
internet, 93
introduction to the autosampler, 10

M

missing parts, 23
multi-draw option, 10

O

optimizing the stack configuration, 25

P

park transport assembly, 23, 43
parts and materials, 23
performance specifications, 86
physical specifications, 22
power consideration, 20
power cords, 20
power requirements, 20
power supply indicator, 48

Index

R

repairs, 58
 using the ESD strap, 59

S

sample tray, 10
sample trays
 numbering of vial positions, 37
screwdriver, pozidriv #1, 67, 69, 72
security lever, 58
shipping, 23, 43
simple repairs, 58
site requirements, 20
specifications, 22, 86
status indicator, 46
status indicators, 47
storage, 21

T

temperature, 21
top cover, 75
transport, 43
transport mechanism, 10

U

unpacking, 23
unpacking the autosampler, 23

V

vial racks, 10
vial tray, 43
vials, 10

W

weight, 21



In This Book

This manual contains information about the Agilent 1100 Series thermostatted for autosamplers. Information for the individual autosamplers can be obtained from the corresponding autosampler reference manual. This supplemental manual describes the following:

- installing the thermostat,
- theory of operation,
- troubleshooting the thermostat,
- repair procedures for the thermostat,
- parts and materials for the thermostat.

