



Column Thermostat for HPLC and GPC STH 585

Operating Instructions

Version: 2.50

Date: 4/11/2000

© 2000 Dionex Softron GmbH

Doc.: STH585_OI_E_V250.doc

Table of Contents

1 Introduction	1
1.1 Description	1
1.2 Warranty.....	1
1.3 Information to the User	1
2 Installation.....	2
2.1 Positioning and Environment.....	2
2.2 Connections.....	2
2.3 Initiation	2
2.4 Operating Panel.....	3
2.5 Power-up	4
2.6 General Settings	5
2.6.1 Solvent Detector (Leak Sensor).....	5
2.6.2 T-Lock	5
3 Programming the Column Thermostat	6
3.1 Enter a Fixed Temperature (Isothermal)	6
3.2 Temperature Program with Internal Clock (Temperature Steps).....	7
3.3 Starting the Program	8
3.4 Linear Temperature Gradients	9
3.5 Solvent Detector.....	11
4 Operation via GynkoSoft/CHROMELEON™	12
4.1 General	12
4.2 Installing the Column Thermostat under CHROMELEON™.....	12
5 Error Messages	14
6 Important Notes	14
7 Technical Specification	15

1 Introduction

1.1 Description

The HPLC column thermostat is designed especially for the use in chemical and biological routine and research laboratories. Using thermoelectric elements (Peltier), the thermostat is able both, to heat and to cool. Thus, the temperature can be modified quickly and, in addition, the system is independent of the environmental temperature. Temperature control is either via the integrated processor-controlled controller or externally via PC. The program, especially created for HPLC, allows optimization of the analysis.

1.2 Warranty

The standard warranty coverage for the unit is in accordance with the corresponding terms of sale. Warranty is given for one year starting with the invoice date and covers material and labor, ex works. Please note that wear parts cannot be covered by the warranty.

The warranty coverage shall become invalid in any case identified as resulting from inappropriate use or service, operating error, or the implementation of non-specified spare parts. Similarly, the warranty coverage shall be invalidated in the event of inappropriate shipment, packaging or failure to remove aggressive or damaging solvent residues before shipment.

1.3 Information to the User

This equipment has been tested and found to comply with the limits for the Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2 Installation

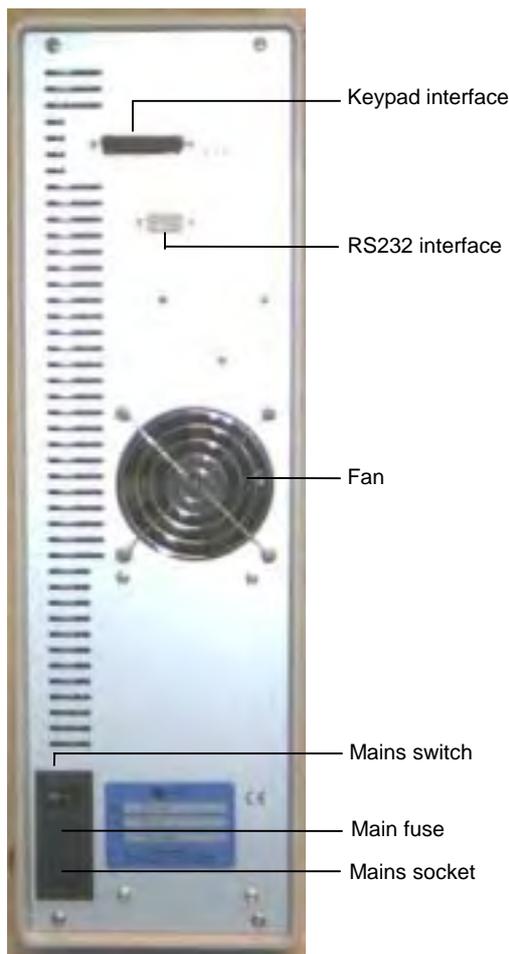
2.1 Positioning and Environment

The location of the column thermostat must be stable, even and free of vibrations. The room temperature should be between +17° and 28°C and the relative air humidity between 35% and 85% (not condensing). Do not expose the unit to intense heat, e.g. direct sunlight, or any corrosive, alkaline, or water vapors and ensure sufficient aeration.

2.2 Connections

At the instrument's location, a socket with protective contact (90-230V, 50-60 H) and a 10A fuse protection must be available and installed according to the regulations. The socket should be next to the unit and clearly visible. Do not connect the instrument to a multiple socket which is used to connect other devices to the mains as well. In addition, only use the supplied mains cable.

2.3 Initiation



Connect the unit to the mains and the operating panel to the keypad interface on the rear.

Switch on the unit via the mains switch on the rear. The unit performs a self-test and indicates its readiness by displaying "**choosefunction**".

Open the thermostat door and insert the column(s) into the provided brackets. Clear the desired inlet and outlet openings by removing the respective covers or by pushing through them.

Now, you can set the temperature. The column thermostat is ready for operation.

Fig. 1: Rear panel

2.4 Operating Panel

The operating panel is a 4x4 matrix keypad with a two-line display with background lighting.

At the bottom of the operating panel there is small opening. Use a small screwdriver to readjust the display intensity, if necessary.

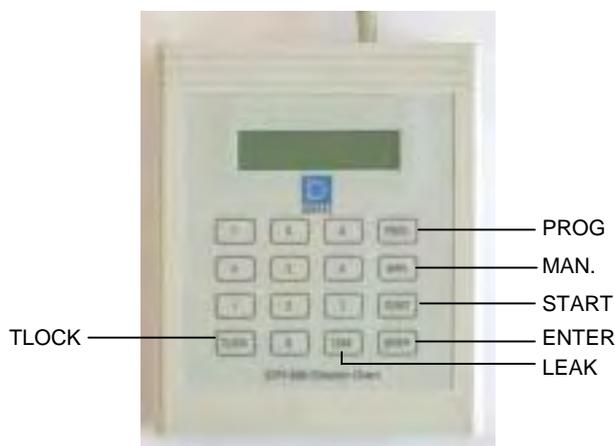


Fig. 2: Operating Panel

Key	Description
PROG	activates the program mode for entering temperature programs
MAN.	activates the manual mode for entering a fixed temperature
START	starts the programs
ENTER	confirms inputs and returns you from the manual mode to standby
LEAK	adjusts the sensitivity of the solvent detector, the sensitivity is set in per cent (00% = detector switched off, 99% = maximum sensitivity)
TLOCK	sets the T-Lock temperature = temperature at which the heating / cooling elements switch off to prevent unintentional overheating of the column(s).

The displayed messages and the specific functions of the individual keys during the programming of the column thermostat are described in more detail in the following chapters. All inputs which are requested via the keypad are given "**bold**".

2.5 Power-up

When the unit is switched on, the display temporarily shows the following message:

```
*JETSTREAM Plus S*
*Ser#90634*
```

The 5-digit number indicates the unit's serial number.

```
Actualsettings
Leak-V:90%
```

Next, the actual sensitivity of the integrated solvent detector (leak sensor) is given. After power-up, the detector is automatically in operation reaching its full operability after about 2 minutes. Set the sensitivity by pressing "LEAK" on the keypad (→ page 5).

Please keep in mind that the sensitivity slightly changes with the temperature so that re-adjusting may be necessary. If you hear the warning beep, the power supply to the heating/cooling elements is automatically interrupted. Having eliminated the leak, press "ENTER" and the unit will operate as usual.

```
Actualsettings
T-Lock:70°
```

Then, the actual T-LOCK temperature is given. At the displayed temperature, the unit will automatically interrupt the power supply to the heating/cooling elements and a warning beep will be heard. This is to prevent unintentional overheating of your column(s) (→ page 5).

```
Selfchecking
*****
```

Now, the system performs a self-test. Do not press any keys while the test is running!

```
choosefunction
```

indicates that the test was performed successfully.

```
**ERROR**
keyboard
```

indicates that the test failed. If a button was pressed while the test was running, switch the unit off and on.

```
**ERROR**
tempsensor
```

If this message is displayed, return the unit to the Dionex service.

2.6 General Settings

2.6.1 Solvent Detector (Leak Sensor)

To set the sensitivity of the solvent detector proceed as follows:

Key/Input

Key "LEAK"

Display

```
*Leaksensor*  
Leak. : 90%
```

Enter the desired solvent detector sensitivity in the range of 00% - 99% wherein:

00% = detector switched off

99% = maximum sensitivity

Enter "3" "0"

```
*Leaksensor*  
Leak. : 30%
```

"ENTER"

```
choosefunction
```

2.6.2 T-Lock

To set the desired T-LOCK temperature proceed as follows:

Key/Input

"T-LOCK"

Display

```
*T-LOCKinput*  
temp. : 80
```

Enter the desired T-LOCK temperature in the range of 05° - 85°C. With temperatures below 5°C and over 85°C the T-LOCK function is deactivated.

Enter "3" "0"

```
*T-LOCKinput*  
temp. : 30
```

"ENTER"

```
choosefunction
```

3 Programming the Column Thermostat

3.1 Enter a Fixed Temperature (Isothermal)

Key/Input	Display
"ENTER"	choosefunction
"MAN."	*Manualmode* set00°
Enter the desired temperature, e.g. 39°C	
Enter "3" "9"	*T-LOCKinput* temp.:39
"ENTER" (the unit exits the manual mode and returns to standby).	ManualHEAT set39°act:25°
	act:xx = indicates the current temperature

Instead of entering the temperature via the number keys you can also use the "TLOCK" and "LEAK" keys. Pressing "TLOCK" once decreases the set value by one degree. Keep "TLOCK" pressed to decrease the set value by one degree per second. Pressing "LEAK" once increases the set value by one degree. Keep "LEAK" pressed to increase the set value by one degree per second.

In addition, the current status is indicated in the display:

HEAT
COOL
IDLE (stabilized)

3.2 Temperature Program with Internal Clock (Temperature Steps)

The following example describes how to create temperature programs. In program no. 0 the thermostat shall keep a temperature of 22°C for 10 minutes and then increase the temperature to 30°C with program no. 1.

Step	Key/Input	Display
1	"ENTER"	choosefunction
2	"PROG"	*Programmode* prog.#00
3	Enter the program number: "0"	*Programmode* prog.#00
4	"ENTER"	*Programmode* temp.00°
5	Enter the desired temperature in °C (range 5°-85°C), here "2" "2"	*Programmode* temp.22°
6	"ENTER"	*Programmode* time00
7	Enter the program duration in minutes (range 01-98 min), here "1" "0"	*Programmode* time10
8	"ENTER" (no input required (→ section 3.4, page 9))	*Programmode* deltaT00
9	"ENTER" (completes the entry of the first program)	choosefunction

To enter the next program, just repeat the steps 1 - 9. Enter 01 as program number (Prog#) and 30 as the temperature (temp.). Max. 99 programs are possible.

By creating several successive programs you can create temperature sequences.

time 00 = return to program no. 0, the sequence is automatically repeated.

time 99 = stay on the program or the temperature set in the CL (closed loop, page 11).

The order in which the programs are processed is determined by the program number. Enter the program number to start with. All subsequent programs will then be processed in succession (see below).

3.3 Starting the Program

Start the program as follows:

Step **Key/Input**

1 "START"

2 Enter the desired program number here "0"

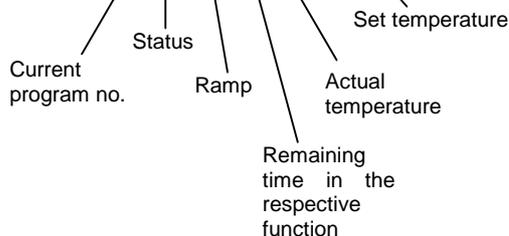
"ENTER"

Display

```
selectprogram
prog.#00
```

```
*Programmode*
prog.#00
```

```
P00↑10`set30°
HEAT act:25°
```



Display during program execution

Pxx current program no.

Ramp:

- ↑ A positive ramp is executed.
- ↓ A negative ramp is executed.
- ↕ Ramp is complete, active time function

Time Remaining time in the respective function.

Status:

- HEAT The instrument is heating.
- COOL The instrument is cooling.
- IDLE The instrument is stabilized.

Possibilities to influence program execution

- with the two ramp functions \uparrow and \downarrow :
 - "ENTER" Terminate the ramp function and change to the time function.
- with the time function \updownarrow :
 - "ENTER" Exit the program function.
 - "TLOCK" Decrease the program number by one number.
 - "LEAK" Increase the program number by one number.

Please allow sufficient time to reach the desired temperature. Typically, the temperature increase is 2 - 3°C per minute. If the entered time is too short to reach the desired temperature, the program continues and the thermostat will reach the desired temperature later.

3.4 Linear Temperature Gradients

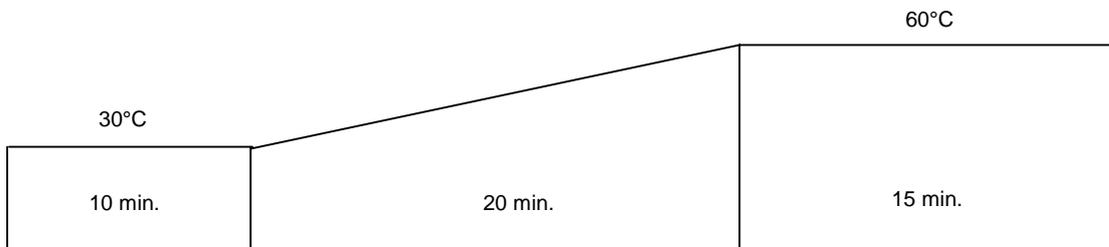
The following example illustrates how the controller calculates and executes a linear rise/fall in temperature:

Step	Key/Input	Display
1	"ENTER"	choosefunction
2	"PROG"	*Programmode* prog.#00
3	Enter the program no., here "0"	*Programmode* prog.#00
4	"ENTER"	*Programmode* temp.00°
5	Enter the desired temperature in °C here "2" "2"	*Programmode* temp.22
6	"ENTER"	*Programmode* time00`
7	Enter the retention time following the rise (01-98 min), here "1" "0"	*Programmode* time10`

Step	Key/Input	Display
8	"ENTER"	<code>*Programmode* deltaT00`</code>
9	Enter the time to reach the temperature (ramp, range 01 - 98 min), here "1" "0"	<code>*Programmode* deltaT10`</code>
10	"ENTER"	<code>choosefunction</code>

Example:

A temperature of 30°C shall be kept for 10 minutes before being increased to 60°C within 20 minutes and kept at 60°C for another 15 minutes.



Pr.00 (Temperature at 30°C for 10 minutes)

Step	Key/Input	
1	"ENTER"	
2	"PROG"	
3	"0"	(Program no.)
4	"ENTER"	
5	"30"	(Temperature)
6	"ENTER"	
7	"1" "0"	(Time)
8	"ENTER"	
9	"0" "0"	(deltaT)
10	"ENTER"	

Pr.01 (Rise temperature to 60°C, then keep temperature for 15minutes)

Step	Key/Input	
1	"ENTER"	
2	"PROG"	
3	"0" "1"	(Program no.)
4	"ENTER"	
5	"6" "0"	(Temperature)
6	"ENTER"	
7	"1" "5"	(time)- retention time following the rise, if 99 is entered, the instrument will remain at the temperature, minimum 1 minute
8	"ENTER"	
9	"2" "0"	(deltaT t) - rise time from 30°C to 60°C, the instrument calculates a rise of 1.5°C/min.
10	"ENTER"	

Now, enter the next program or program a "closed loop" as follows:

To perform a closed loop, enter prog. #2 with time 00. START the program chain with program #0.

3.5 Solvent Detector

After power-up, the integrated solvent detector is automatically in operation reaching its full operability after about 2 minutes. Set the sensitivity by pressing "**LEAK**" on the keypad (→ page 5). Enter 00% to switch the solvent detector off, enter 99% to set the unit to its maximum sensitivity.

Please keep in mind that the sensitivity slightly changes with the temperature so that re-adjusting may be necessary. If you hear the warning beep, the power supply to the heating/cooling elements is automatically interrupted. Having eliminated the leak, press "**ENTER**" and the unit will operate as usual.

4 Operation via GynkoSoft/CHROMELEON™

4.1 General

The column thermostat can be controlled via the Dionex chromatography data systems **GynkoSoft™** and **CHROMELEON™**. The respective RS232 interface (9 pin connecting socket) is located on the rear of the unit. The interface parameters are as follows:

Baud Rate:	4800
Data Bits:	8
Parity:	none
Stop Bits:	1
Handshake:	off

Controlling of the column thermostat can be activated only, if the thermostat is in the operating mode "**choosefunction**".

To ensure correct communication between the data system and the STH585, please note the following:

Before switching off the column thermostat or the computer, disconnect the thermostat via "**System/Unload GynkoSoft**" under **GynkoSoft™** or via "**Disconnect**" under **CHROMELEON™**. If, by mistake, the column thermostat was switched off without being disconnected before the shutdown, wait for 40 seconds and reconnect the unit with "**Connect**". If the computer was switched off while the column thermostat was still connected, switch the thermostat off and on before starting the data system again.

4.2 Installing the Column Thermostat under CHROMELEON™

Please proceed as follows to install the column thermostat:

- On the Windows desktop, click the button "**Start**" to open the 'Start' Menu. Move the cursor to the menu item "**Programs**" and wait until the individual submenus are displayed.
- Move the mouse cursor to the submenu "**Chromeleon**" and select "**Server Monitor**". "**Start**" the Server Monitor.
- Via "**Start**" / "**Programs**" / "**Chromeleon**", select the menu item "**Server Configuration**" in the "**Chromeleon**" submenu.
- In the left window section, click on a timebase and select "**Add Device...**" in the "**Edit**" menu.
- In the opening driver list, select "**Dionex STH Column Oven**" and confirm your selection with "**OK**".

Make the necessary settings in the opening dialog window:

- On the "**General**" tab, define the port for the serial communication. Make sure to uncheck the "**Demo Mode**" box. Do not change the default name "**ColumnOven**" as otherwise the links to the respective control panels may no longer be available.

Controlling the column thermostat under **CHROMELEON™** can be in two ways:

- directly via the icon and menu bars or via the controls in the corresponding control panel.
- via programs (PGM files or programmable buttons)

The following commands are available

Command	Description
Connect	connects the unit to the column thermostat (comp. Connected, Disconnect).
Connected	indicates whether the unit is connected to the data system, i.e. under computer (comp. Connect, Disconnect).
Disconnect	disconnects the unit from the column thermostat (comp. Connect, Connected).
LowerLimit	lower temperature limit (range 5-85°C)
UpperLimit	upper temperature limit (range 5-85°C)
Temperature	nominal temperature the temperature must be set within the current limits, otherwise the command will not be executed.

For further information please refer to the **CHROMELEON™** manual and the Online Help.

5 Error Messages

In case of an error, the respective error message is displayed and a warning beep can be heard. Having eliminated the error, press "**ENTER**" and the thermostat will operate as usual. The following error messages may occur:

```
****T-LOCK****  
****ALARM****
```

The set temperature limit has been exceeded. Check and, if necessary, change the setting (→ page 5).

```
**LEAKSENSOR**  
****ALARM****
```

Solvent leaks out. Check the system for tightness.

```
***T-SENSOR***  
****ALARM****
```

If this message is displayed, contact the Dionex service.

6 Important Notes

Controller Display

The displayed temperature may deviate from the set temperature as control is very sensitive. However, in the column exactly the desired temperature will be available.

Display Intensity

At the bottom of the operating panel there is small opening. Use a small screwdriver to readjust the display intensity, if necessary.

How to Delete Programs and Entries

Programs or entries are deleted by overwriting them, i.e. by a new entry under the respective program number.

Internal Fan

The internal fan switches off after about 2 to 3 minutes if the thermostat is not in operation.

Power Shutdown

Not required. When the power is switched off, stored programs will not be lost.

Standby

The "**Choosefunction**" display indicates that the system is in standby. The heating and cooling elements are switched off, the internal fan switches off automatically after about 2 minutes. The power consumption is reduced to the external fan and the controller supply.

Temperature Calibration

To ensure the accuracy of the unit, the temperature calibration should be performed by the Dionex service only.

Temperature Profile

The temperature in the column changes at about 2° to 3°C per minute. Allow sufficient time for the unit and the column to stabilize.

7 Technical Specification

Temperature Range	5 - 85°C
Temperature Accuracy	± 0,5°C
Temperature Stability	± 0,15°C (measured in a 25cm test column)
Temperature Change	2 - 3°C/min.
Nominal Voltage	100 - 230 V AC
Rated Frequency	47 - 63 Hz
Power Draw	max. 100 W

Technical specification subject to alteration without notice. Date: December 1999

The main fuse is located in a cartridge next to the power socket. Draw out the fuse cartridge using a small screwdriver and replace the fuse, if necessary.

RS232 Interface

The 9 pin connecting socket is located on the rear of the thermostat. The RS232 protocol is explained in a separate description.

Pin 2: R x D

Pin 3: T x D

Pin 5: GND