COLUMN TEMPERATURE BOX

LCT 5100

User manual

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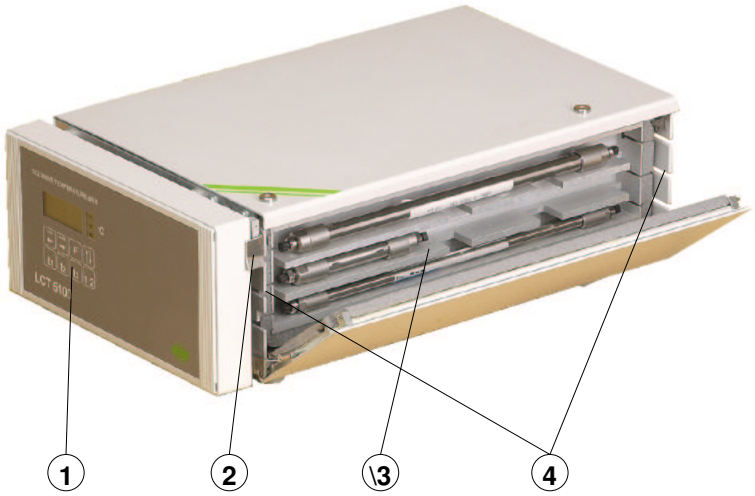
1. INTRODUCTION

1.1 Functions of the instrument and specification

The Column Thermostat is designed for maintaining the temperature of the liquid chromatograph columns. The control module of the Column Thermostat is also capable, besides its actual thermostat functions, of measuring and possibly controlling the temperature at two other places.



1. Keypad
2. Lever for the opening of the column area
3. Column area
4. Grooves for the installation of pipes to the columns

Fig. 1. Column Thermostat

1.2 Technical characteristics

Working temperature	0°C to 80°C
Thermostat area	Divided into three sections
	320 x 25 x 24 mm
	320 x 25 x 16 mm
	320 x 25 x 13 mm
Measurement range of additional regulators	0°C to 100°C
	at request 0°C to 200°C
Power output of the additional controllers	Only heating 24V, 1A
Communication	RS485 for CHROMuLAN, at request RS232
Power supply	230V, ± 10%, 50Hz
Overvoltage category in the installation	II.
Power input	max. 200 VA
Weight	9 kg
Dimensions (w x l x h)	120 x 240 x 400 mm

1.3 Technical description

The instrument consists of a box formed by the thermostat area, the frontal part of the instrument contains a keypad with a display, the rear part contains a mains switch and connectors. The distribution system of the heating energy is implemented through an aluminium block. The temperature is controlled at two places, with regard to the length of the column. Heating and cooling functions are ensured through Peltier elements.

The control system is implemented either through the keyboard or through a computer and the CHROMuLAN program, for non-standard sets it is possible to switch the instrument on and ensure its readiness through TTL signals.

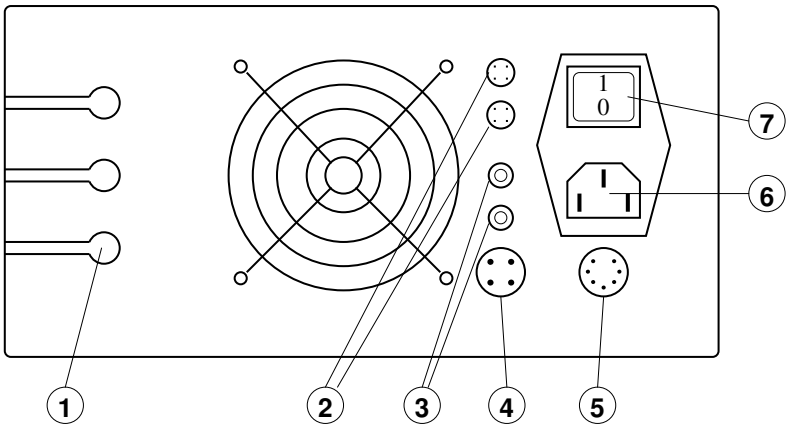
2. PUTTING INTO OPERATION

2.1 Unpacking the instrument

Unpack the instrument from the transport container, check the instrument surface and check for all items by using the delivery note. If the instrument is damaged or if an item is missing, contact the manufacturer or your supplier.

2.2 Instrument assembly

1 By using the side door insert a column into the thermostat, conduct the column pipes through the grooving (fig. 1).
2 Connect the cable network into a mains socket (fig. 2)
3 If you are using the instrument in a set with a computer, interconnect the communication facility RS485.
4 If you are using additional controllers, connect them into the appropriate connectors, see Chapter 2.4.



1. Grooves for conducting pipes to the columns
2. RS485 communication connectors
3. Connectors of sensors of additional controllers t_2 and t_3
4. Connector of TTL inputs and outputs
5. Connector of the additional controller heating t_2
6. Mains inlet
7. Switch

Fig. 2. Rear panel

2.3 Instrument controls

The instrument can be put into operation by switching on the mains switch situated in the rear part of the instrument

(fig. 2). The display will be lit after the switching the instrument on.

The t1 key is used for switching on/off the temperature control in the thermostat area.

The correct function is indicated with a permanent illumination in the upper part of the button. A failure is signalled by flashing.

The key with the symbol t2 and t3 serves for additional controllers, see Chapter 2.4.

The F key is a redundancy for a special function at the customer's request.

1 2 is a key for the memory where it is possible to save two settings of parameters of the temperature. The function memory is indicated by illumination in the left (right) upper part of the button.

The keys LESS and MORE serves for setting the temperature.

The key with arrows serves for switching over between the displays of individual controllers.

The current situation is indicated by LED diodes on the right side of the display.

2.3.1 Setting the controlled temperature

By using the switch-over key switch to the temperature which you want to set (for columns this is t1). The temperature value pre-set will be displayed for a while, then the real temperature is displayed. With the help of the keys LESS or MORE it is possible to change the temperature required. If you hold down the keys for a longer time, the rate of change of the data to set progressively rises.

During the setting phase, the required temperature will be displayed, after about 3 s the display will switch over to the current temperature.

2.3.2 Saving the pre-set values in the memory

The pre-set values can be saved in the memory. At the same time the system saves requested values for all controllers. The instrument makes it possible to save two sets of values.

For the purpose of controlling the memory use the key 1 2, LED diodes in the key indicate an active memory. For the switching over of the memory and calling out of the values saved, press shortly the key 1 2. By holding it down for a while (longer than for 5s) you will save the pre-set values in the memory. If you press the button, the LED goes off, and the saving of the values is indicated by its being lit again.

When you switch on the instrument, the settings saved in memory 1 are called out.

2.4 Additional controllers

The electronic equipment of the instrument contains four independent controllers. The first two of them feature a joint value required (t1) and serve for controlling the column area. The other two (t2 and t3) can be used by the user for controlling or just for temperature measurement. The inputs of the controllers are adapted for connection of platinum thermometers Pt100, which are connected through the connectors situated on the rear panel (fig. 2).

The output from the first additional controller (t2) is of a power output type 24V, 1A and is conducted to pins 1 and 2 of the four-pin connector on the rear panel of the instrument (fig. 2). This controller may heat only.

The output from the second additional controller (t3) is of a TTL type and is conducted to a 7-pin connector on the rear panel of the instrument (fig. 2). The switching on of this connector is as follows:

1 - output 1 heating t3
2 - output 2
3 - grounding
4 - output 3 indication of reaching the temperature required
5 - output 4
6 - input 1
7 - input 2

2.5 Maintenance

Avoid leaving aggressive substance spillage on the surface of the instrument. This could damage the varnish on the instrument. Clean the surface of the instrument with a clean soft cloth. The cloth may be moistened but not wet. For cleaning it is also possible to use ordinary detergents.

Caution: If you want to clean the instrument with a moistened cloth, switch off the power supply and disconnect it from the mains first!

2.6 Troubleshooting

The instrument does not respond when switched on. Check the fuse, possibly replace with a new one with the same parameters. Illumination of key t1. Switch off and on the instrument mains switch. Press key t1 again.

2.7 Operation safety

Operation safety is ensured in an electronic manner.

2.8 Operation conditions

The instrument is designed for work in ordinary laboratory conditions at temperatures of 10 to 35C and air humidity up to 80%. Power supply 230 V, 1 A, 50 Hz. The inlet mains cable is to be connected into a socket circuit with protection of 10 or 16 A.

Attention! If the temperature of the columns exceeds 40C, use protection gloves while handling the columns. Pay increased attention while handling the instrument.

3. ACCESSORIES AND SPARE PARTS

3.1 Standard accessories

1 piece Mains cord
1 piece RS485 communication cable
2 pieces Fuse T 1.6 A

4. WARRANTY

The product is covered by the manufacturer's warranty period of one year from the day when the product has been handed over to the customer.

The instrument may only be used in the manner specified in this manual. The instrument may not be used in any other manner than the one specified in this manual, otherwise the operation safety could be threatened. If you fail to comply with the conditions of this manual, the manufacturer will not be liable for the damage incurred.

4.1 Repairs

All warranty and after-warranty repairs are carried out by the manufacturer or by an organisation authorised by the manufacturer.

Unless specified otherwise in the delivery note, please contact the manufacturer in the case of repair requirements.

4.2 Waste disposal

When the instruments operating life is over dispose it in respect to valid regulations, also it can be returned to the vendor or producer for liquidation.

Warning: Instrument contains parts (PCB's) which are rated as hazardous waste.

5. TABLE OF CONTENTS

5.1 List of picturtes and tables