



# OPERATING MANUAL

## Peltier Controlled Fluid Circulator (P/N: N1015158)

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## N1015158: OPERATING MANUAL

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## **1. GENERAL INFORMATION**

### **1.1. General Warnings**

Check the voltage selector

Always disconnect the mains plug before starting any work  
inside the instrument

Set the temperature to the  
required values on power on

If using substances dangerous for health and  
the environment, observe the laws and  
the standards in force in the laboratory where this instrument is used

If using flammable or explosive substances take the necessary  
precautions

### **Quality, Reliability and Safety**

This equipment has been designed with emphasis on QUALITY, RELIABILITY and SAFETY, and Perkin Elmer will accept responsibility for these aspects only if the following conditions are met:

- a) Electrical installation of the room or building in which the equipment is to be used must comply with regulations specified in the country where the equipment is to be used.
- b) The equipment must be used in accordance with the instructions for use provided by Perkin Elmer.
- c) All modifications and repairs to the equipment must be carried out by DBS or its authorised Agents.
- d) Modifications must not be carried out unless they conform to approved Engineering Service Information issued according to the appropriate Perkin Elmer procedure.
- e) The equipment installation must be carried out in accordance with local requirements for responsibility and warranty.

### **1.3. Safety makings**

#### **CE mark**

The "CE" mark for this product makes reference to the directives

- 89/336/EEC amended by 93/68/EEC for electromagnetic compatibility
- 73123/EEC amended by 93/68/EEC for low voltage

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## **2. INSTRUMENT DESCRIPTION**

### **2.1. Instrument description**

The N1015158 is a Peltier effect thermostating system using an internal sealed liquid circuit allowing full compatibility and connection to all thermostatable accessories.

The Peltier effect is based on the reversed thermoelectric effect. This is a phenomenon in which a temperature difference is caused by a flow of current through a closed circuit consisting of two different metals.

The N1015158 provides temperatures ranging from 20 °C to 60 °C with  $\pm 1$  °C stability and  $\pm 0.1$  °C repeatability. The features of the PCB-1500 include:

- Peltier effect for heating and cooling the liquid of circulation
- Internal flow pump to circulate the liquid
- The N1015158 can operate in either manual or remote control via a USB port
- The N1015158 is supplied with one set of thermally insulated connection tubes to connect the N1015158 to any thermostatable accessory
- The N1015158 is supplied with a water level sensor to ensure correct operation
- The N1015158 is supplied with high temperature sensor to avoid damaging the system and malfunctions

## **2.2. N1015158 front and rear panel**

The front and the rear panel have grids to dissipate the heat generated in the unit. Two fans force the air movement. These grids must be free to guarantee the instrument specifications.

The front panel features the display with keypad.

The rear panel features the mains power connection with mains voltage selector, the USB connector for remote control, the mains switch and the "Water Fill" inlet and outlet connections.

## **2.3. Specifications**

### **2.3.1. Keypad/Display Unit**

The keypad/display unit has a LCD screen. All programmable parameters can be displayed in specific menus.

Three buttons are used to access the various functions and change the set parameters.

### **2.3.2. Programmable Parameters**

- Temperature

### **2.3.3. Displayed Values**

- the current thermostat temperature
- the set temperature
- the heating/cooling power

### **2.3.4. Operating Specifications**

- Temperature range from 20°C to 60°C
- Temperature accuracy better than  $\pm 0.15$  °C from 20 °C to 60 °C
- Temperature repeatability typically  $\pm 1$  °C
- Temperature stability typically  $\pm 0.1$  °C
- Specifications valid for ambient temperatures from 15°C to 35°C

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### **2.3.5. External Control Possibilities**

- USB as standard.

### **2.3.6. Dimensions**

**Width:** 170 mm **Height:** 280 mm **Depth:** 430 mm **Weight:** 6 kg

### **2.3.7. Electrical data**

- Mains supply: 115/120 V or 220/240 V  $\pm$  10% (factory setting 220/240 V)
- Frequency: 50/60 Hz
- Power: 120 VA
- CE marked

### **2.3.8. Description of Symbols**



Caution (Refer to accompanying documents).

Symbol identifying the use of substances dangerous for health and environment. For these substances reference must be made to the laws and standards in force in the laboratory where this instrument is used. If using flammable or explosive substances take the necessary precautions.

Note: Connection to the protective ground is ensured through the power supply cable which has to be in accordance with CEE 7 (IEC 23-5).

### **2.3.9. Environmental conditions**

Performance and safety of the N1015158 are guaranteed at all times if it is operated under the following environmental conditions:

- Installation category II with smaller transient over voltages (standard IEC 664)
- Pollution degree 2 (standard IEC EN 61010-1)
- The instrument is designed for internal use and altitudes below 2000 m
- Mains voltage fluctuations must not exceed  $\pm$ 10% of the nominal voltage
- In locations where the relative humidity is lower than 80%
- In locations free from dust or vapours of solvents and acids

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- Room temperature between 10°C and 35°C

### **2.4. User interface**

The menu-driven interface of the N1015158 allows the user to set the temperature and to view the configuration.

Three buttons are used to access the various functions and change the set parameters.

The multi-functional controller with its display is described below under manual operation.



### 3. INSTALLATION

#### 3.1. Checking the serial number

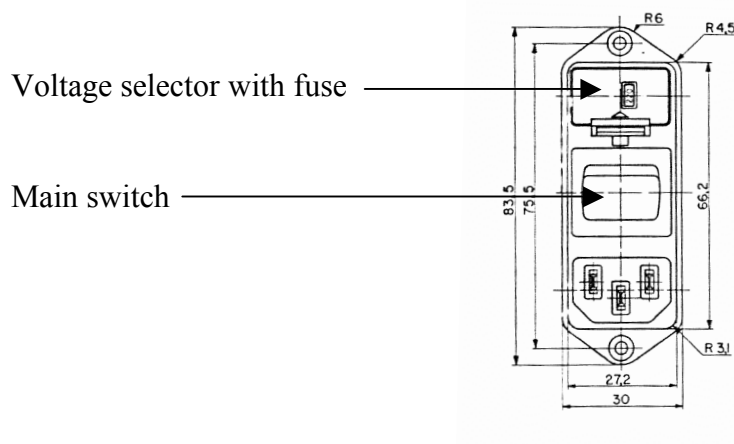
The plate containing the serial number is located on the rear panel at the base of the unit. Check that this number is identical to the serial number on the delivery note. If not, please inform Perkin Elmer immediately.

#### 3.2. Checking mains supply and fuses

The N1015158 is factory set to operate at 220 VAC.  
For operation at a voltage of 120 VAC, the voltage selector at the rear of the controller unit must be reset as described below.

Power supply	Type of fuse - 250 V
240 V	T 1A, slow-blow
120 V	T 2A, slow-blow

Adjustment for frequency change between 50 and 60 Hz is not necessary.



*Fig. 3-1: Selecting the voltage*

### **3.2.1. Changing the Mains Voltage Setting and Fuses**

The voltage set is shown in the window of the voltage selector below the mains input connection. To change this setting switch off the unit at the mains switch, remove the mains cable and proceed as follows:

- Slide out the fuse holder by inserting a small screwdriver alternatively into the two slots at the left and right and pulling it out of the housing.
- Remove the original fuses and replace with those of correct rating (see above) and push the holder back in position.
- Move the slider of the voltage selector with a screwdriver to the desired value. The new selected voltage will be now visible.

### **3.3. Instrument set-up**

#### **3.3.1. Start up**

The N1015158 is supplied completely assembled. It is only necessary to make the appropriate connections.

Before starting the N1015158 you should familiarize yourself with the key functions as described in section 4.

- Position the N1015158 at a suitable position in your system
- Leave at least 5 cm in front and the back of the N1015158 for free air circulation.
- Unscrew the tap on the "Vent" connector.
- Mount the "Vent" connector supplied with the instrument.
- Connect the supplied tubes to "Water in" and "Water out" fast connections.
- Connect the tubes to the accessory to be thermostatted.
- Switch on the N1015158.
- The instrument initializes and after one minute it is ready to go.
- Check the system for water level ("Water level alarm sensor").

### **3.3.2. External Connections**

The N1015158 has no special electrical external connections which would allow relay control etc.

Operations are performed either manually or via remote control using the USB connections. Contact Perkin Elmer for further information about the remote control functions.

## 4. OPERATING INSTRUCTIONS

### 4.1. Manual operation

#### Main page and functions of the buttons

Page		Display	L button	Middle button	R button
Stand by		Stand by		On	
Main	Normal status	Current temperature Set temperature Heating / cooling power (R)	Menu	Off	Modify the temperature setpoint
	Temperature setpoint	Flashing selected parameter	Down	Up	Change
	Alarm status	Alarm description	Menu	Beep on / off	Reset alarm / Change (1)
Menu		Menu selection	Scroll	Select	Exit

(1) only if the manual alarm reset option has been configured

#### Menu page and functions of the buttons

Menu	Description	L button	Middle button	R button
Parameter	User parameters	Scroll	Select	Exit
Configure	Configuration parameters	Scroll	Select	Exit
Diagnostic	Diagnostic values	Scroll	Select	Exit

#### Parameters setting

##### *User parameters and functions of the buttons*

Number	Description	Default value	L button	Middle button	R button
P-01	Temperature unit of measure	°C	Scroll	Select	Change
P-02	Auto start (after switching on)	NO	Scroll	Select	Change
P-03	Contrast	5	Scroll	Select	Change
P-04	Beep on/off	YES	Scroll	Select	Change
P-05	Manual alarm reset	NO	Scroll	Select	Change

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### *Configure parameters*

A password is required to enter this menu. CAUTION: all these parameters are correctly set in the factory: no changes should be made by the user!!!

### *Diagnostic parameters*

Description	Unit of measure
Cell temperature	°C
Radiator temperature	°C
Water resistance	Kohm
Power	%
Cell voltage	Volt

## **5. MAINTENANCE**

The N1015158 requires very little routine maintenance by the user.



Any operation that requires the units to be opened must only be performed by Perkin Elmer technicians or authorized personnel.

Always unplug from the mains when opening the units

### **5.1. Cleaning the instrument**

For normal cleaning operations on the instrument only use a cloth dipped in water or neutral detergent, do not use organic or abrasive solvents.

### **5.2. Water level alarm**

Check for signs of water level. It is recommended that this is done prior to starting analysis. If a "Water level" alarm is signalled immediately check for spillage in the accessory compartment and remove it with appropriate measures. Using the refilling bottle supplied to fill the system with liquid via the inlet or outlet connectors until the light turns off.

## **6. TROUBLESHOOTING**

The N1015158 is able to indicate malfunctions and incorrect use. The messages available are directly visible on the display, indicated audibly or transmitted via USB for remote communication.

### **6.1. Audible alarm**

The N1015158 will send an audible alarm if either a leakage was detected or another failure occurs.

#### **6.1.1. Water level Alarm**

The N1015158 is equipped with a "Water level" sensor. This means even small leakage will be detected.

After the leakage is signalled on the N1015158 press the RESET ALARM button and remove the leakage immediately by checking all connections and fill up the system with distilled water.

#### **6.1.2. Other system Alarms**

The following alarms are available:

- Cell temperature too high
- Radiator temperature too high
- Cell temperature sensor failure
- EEPROM memory failure

If one of these alarms is activated, the N1015158 will signal the failure by an audible signal and display relative messages on the display.

Action: Switch off the instrument immediately!  
If the failure does not disappear after the instrument is switched on again, contact service.

**IMPORTANT!**

**THE N1015158 IS SHIPPED ALREADY FILLED WITH DISTILLED WATER. DURING INSTALLATION, WHEN CONNECTING THE TUBING THE WATER LEVEL IN THE TANK WILL DROP AND WILL NEED TO BE TOPPED UP. ONLY USE THE DISTILLED WATER SUPPLIED IN THE SEPARATE 200CC CONTAINER INSIDE THE PACKAGING TO TOP UP THE WATER IN THE UNIT.**

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