TECHNE® UCAL400+ Calibrator

OPERATOR'S MANUAL

Please read all the information in this booklet before using the unit.

Unit Serial number: _____

4/02 Issue 1

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THE UCAL 400+

Introduction

Techne's UCAL400+ calibrator heater provides a safe, dry, constant temperature source. It is fast and economical and can be used either on a bench top or as a portable field unit. The weight of the unit is only nine pounds/four kilograms. The unit covers the temperature range from 5°C above ambient up to 430°C using a machined aluminum insert block as the heat transfer medium. The temperature control circuit is built into the unit.

Features include:

- 10 insert formats available
- Maximum temperature of 430°C/806°F
- An independent over-temperature cutout
- Temperature sensor burnout protection

Even though the unit heats up rapidly, highly efficient insulation ensures that the case remains cool enough to handle even at maximum operating temperatures. Techne's calibrator has been designed to comply with all relevant Radio Frequency interference and electrical safety regulations.

Specification

Figures quoted are at the base of the well at the time of calibration.

Temperature range: 5°C/9°F above ambient to 430°C/806°F
Over-temperature limit: 450°C/842°F (approximately)
Display resolution: 0.1°

	200 degrees C	400 degrees C
Accuracy	±0.3°C	±0.5°C
Stability (after 15 minutes)	±0.03°C	±0.05°C
Well to well uniformity	0.015°C	0.025°C

Heat up time 20° C to 400°C: 12 minutes
Cool down 400°C to 100°C: 21 minutes
Immersion Depth: 4.5" (114.3mm)
Fan Cooling: Automatic
Weight: 9 lbs (4 Kg)
Dimensions* (H x W x D): 8.75 x 8 x 8 inches/222.25 x 203.2 x 203.2 mm
*excluding the carrying strap

Electrical supply

Voltage	*Cycles*	*Power*
230V	50/60Hz	900W
120V	50/60Hz	900W

Note: The above specifications are quoted for an ambient temperature range of 10°C/50°F to 30°C/86°F. Outside this range, the quoted figures may deteriorate but the unit will still work safely.

Working environment

The calibrator units are designed to work safely under the following conditions:

Ambient temperature range: 5°C/9°F to 40°C/104°F
Humidity: Up to 95% relative humidity, non-condensing

Warning

Warning:	HIGH TEMPERATURES ARE DANGEROUS
Avertissement:	DANGER DE TEMPERATURES ELEVEES
Warnung:	HOHE TEMPERATUREN SIND GEFÄHRLICH
Aviso:	LAS TEMPERATURAS ELEVADAS SON PELI

HIGH TEMPERATURES ARE DANGEROUS: They can cause serious burns to operators and ignite combustible material. Techne has taken great care in the design of these units to protect operators from hazards, but operators should pay attention to the following points:

- USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS
- DO NOT put hot objects on or near combustible objects
- DO NOT operate the unit close to inflammable liquids or gases
- DO NOT place any liquid directly in your unit
- At all times USE COMMON SENSE

Operator Safety

All operators of Techne® equipment must have available the relevant literature needed to ensure their safety. It is important that only suitably trained personnel operate this equipment in accordance with the instructions contained in this manual and with general safety standards and procedures. If the equipment is used in a manner not specified by Techne, the protection provided by the equipment to the operator may be impaired. All Techne® units have been designed to conform to international safety requirements and are fitted with a preset over-temperature cutout. If a safety problem is encountered, switch off at the mains socket and remove the plug from the supply.

Installation

1. All Techne units are supplied with a power cable.

2. Before connecting the mains supply, check the voltage against the rating plate. Connect the mains cable to a suitable plug according to the table below. Note that the unit must be earth grounded to ensure proper electrical safety.

Electrical connections:

	220V-240V	***110V-120V***
Live	Brown	Black
Neutral	Blue	White
Earth ground	Green/yellow	Green

The fused plug supplied with the mains lead for use in the UK is fitted with the following value fuse to protect the cable: 230V UK 4 AMP

The fuse in the unit protects the unit and the operator

Note that units marked 230V on the rating plate work at 220V; units marked 120V work at 110V. In both cases, however, the heating rate will degrade by approximately 8%. The rating plate is on the rear of the unit.

3. Plug the mains cable into the socket on the rear of the unit.

4. Place the unit on a suitable bench or flat workspace, or in a fume cupboard if required, ensuring that the air inlet vents on the underside are free from obstruction.

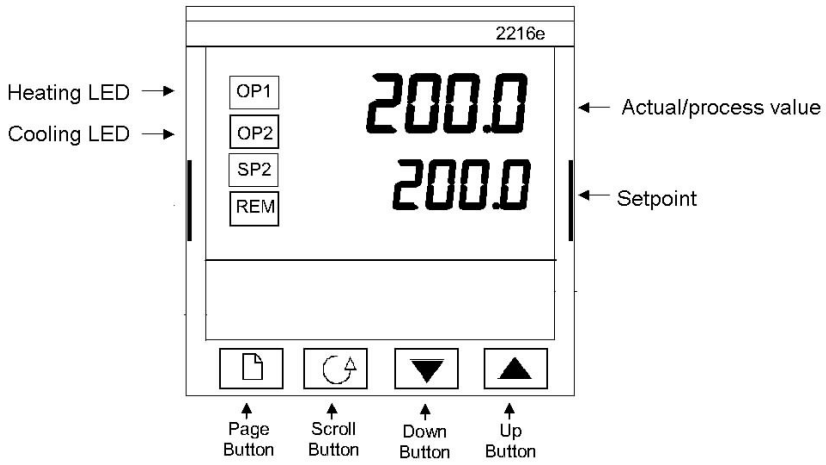
After use, when you have finished heating samples, remember that parts of the unit may be very hot. Take the precautions listed earlier.

OPERATION

Preparation

1. The heater design, temperature sensor and control circuit give good temperature control and uniformity, but make sure that there is a close fit of the probes in the block to allow efficient heat transfer.
2. Plug the power cable into the socket in the back of the unit. Connect the mains cable to the electricity supply.

UCAL 400+ Controller Front Panel Layout



Setting the operating temperature

1. To set the temperature required, press and hold either the up or down button depending on the direction you need to take the set point.
2. When you have the correct set temperature displayed, release the up or down button and the unit will start to heat or cool to the set point.
3. Once the process value/actual temperature reaches the set point, allow the block to stabilize for 15 minutes before performing a calibration.
4. The controller is factory pre-set and only the set-temperature should be changed.

THE CONTROLLER MUST NOT BE SET TO CONTROL ABOVE 430°C/806°F OR DAMAGE TO THE UNIT MAY RESULT.

After use

1. When you have finished calibrating, remember that parts of the unit and the probe may be very hot, so precautions should be taken to prevent injury.
2. For safety, set the set temperature and allow the unit to cool to below 50°C/122°F before placing the unit in a carrying case or shipping carton.

Changing from °C to °F

The controller is preset to display/operate in degrees C; however it may be changed to read in Degrees F. Refer to section 5-2 of the 2216E Eurotherm Controller manual for instructions on changing from *°C to °F.*

Be careful not to change any of the other settings in the configuration menu as performance will be affected and/or damage to the unit will occur!

Operator maintenance

NOTE THAT THIS EQUIPMENT SHOULD ONLY BE DISMANTLED BY PROPERLY TRAINED PERSONNEL. REMOVING THE FRONT OR REAR PANELS EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES. THERE ARE NO OPERATOR MAINTAINABLE PARTS WITHIN THE EQUIPMENT.

In the unlikely event that you experience any problems with your unit which cannot easily be remedied, you should contact your supplier and return the unit if necessary. Please include any details of the fault observed and remember to return the unit in its original packing. Techne will accept no responsibility for any damage to units that are improperly packed for shipment. If in doubt, contact your supplier. See the Decontamination Certificate supplied with your unit.

1. Cleaning: Before cleaning your unit, ALWAYS disconnect it from the power supply and allow it to cool below 50° C. Your unit can be cleaned by wiping with a damp soapy cloth. Care should be exercised to prevent water from running inside the unit. Do not use abrasive cleaners.
2. Fuses: Your unit is protected by two fuses. They should only be changed by suitably qualified personnel. If the fuses blow persistently, a serious fault is indicated and you may need to return the unit to your supplier for repair.

ADDITIONAL INFORMATION

The controller is factory preset. See the Controller book for further details.
For safety reasons, the configuration settings of the controller are password protected.
Please contact your dealer for further information.
Listed below are important control parameters for the unit with the serial number listed on the first page of this manual.

Pb = 7.0	Lcb = 16.0
Ti = 68.0	Hcb = 10.0
Td = 11.0	RelC= 3.0

Replacement Parts

The following parts may be obtained from your Techne dealer if replacements or alternatives are required:

Part Number	*Description*
FCABLEUK	UK 240 volt Mains cable with 13amp UK plug (5 amp fuse)
FCABLEEU	Euro style 240 volt Mains cable with R/A Schuko plug
7002705	US 120 volt Mains cable
7032722	insert extractor
7002712	UCAL instruction manual
7032718	Carrying case

Available inserts

Part Number	*Insert well Sizes*
7022533	insert 5 x 1/4”
7032534	insert 1 each 1/8”, 3/16”, 1/4”, 5/16”, 3/8”
7032535	insert 2 x 1/4” & 2 x 3/8”
7032536	insert 2 x 1/4” & 2 x 1/2”
7032537	insert 1 x 1/4”
7032538	insert blank
7032574	insert 1 x 9/16” & 1 x 1/4”
7032575	insert 1 x 5/8” & 1 x 1/4”
7032576	insert 1 x 11/16” & 1 x 1/4”
7032577	insert 1 x 3/4” & 1 x 1/4”

Spare Parts

Part Number	*Description*
7002695	225 watt, 120 volt heater
7002694	2216E Eurotherm controller
7032725	RS232 Coms Module
7002697	PRT
7002698	Solid state relay
7007201	8 amp fuse (120 volt units)
6500131	4 amp fuse (240 volt units)

Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.

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Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.