# Extraction COD
# Water Bathes
# PE-4300, PE-4301, PE-4302, PE-4303

## Data Sheet
## Operating Manual

Version 1.0EN dated 21.10.2015

**Part number:**
**1.75.50.0020**

Saint Petersburg
2015

# 1. General

1.1. The present data sheet combined with the technical description and operating manual is intended for familiarising the user with the construction and rules of operation of PE-4300 series water bathes.

1.2. Prior to operation of the water bath, read carefully the sections “Technical Specification”, “Operation” and “Safety Requirements”.

1.3. Due to continuous improvement of the products the construction of the product can be subjected to modifications not worsening its characteristics, which are not reflected in the Data Sheet.

# 2. Purpose

2.1. Intended for COD extraction test with concentric ring cover and glassware holder and frame, temperature range from ambient +5°C to 99.9°C.

# 3. Feature

3.1. FRAME: SPCC metallic body with heavy duty epoxy powder coating in white and green. Stainless Steel pipe frame and holder to fix COD extraction glassware.

3.2. INTERNAL BATH: Stainless Steel 304 (AISI 304).

3.3. LID: Lid: Stainless Steel 304 (AISI 304) concentric reduction ring cover set of 4. Diameter of Rings: Lid / 30 mm / 60 mm / 90 mm.

3.4. CONTROL SYSTEM: Digital PID microprocessor control system for temperature. 4 digits digital LED displays PV, SV and time. Wait off timer: 99min 59sec / 99hr 59min / 99day 23hr / continuous - time scale selectable. Class A PT100 control sensor.

3.5. SAFETY: Adjustable over-temperature cut-off safety: Thermostatic controller. Over current cut-off: Fuse.

# 4. Operating conditions

4.1. Ambient air temperature, °C ..... +5 to +35

4.2. Relative air humidity, % ..... up to 80

4.3. Supply voltage, V ..... 220±20

4.4. Power supply frequency, Hz ..... 48÷62

4.5. Allowable time of continuous work, hours ..... unlimited

## 5. Technical Specification

| Model | | PE-4300 | PE-4301 | PE-4302 | PE-4303 |
|---|---|---|---|---|---|
| Number of Extraction Holes | | 2 x 3 | 2 x 4 | 2 x 5 | 6 |
| Temper-ature | Range | Ambient + 5°C ~ 99°C | | | |
| | Accuracy | ± 0.1°C | | | |
| | Uniformity | ± 1.0°C | | | |
| Heater | | 3 KW | 3 KW | 4 KW | 3 KW |
| Controller | | Digital PID Controller with Timer and Auto-Tuning | | | |
| Wait off Timer | | mm:ss / hh:mm / dd:hh / Continuous Selectable | | | |
| Sensor | | PT 100 Ω | | | |
| Safety Device | Tempera-ture | Hydraulic Over Temperature Protection Safety Device | | | |
| | EL Leakage | Electrical Leakage Breaker or CG Fuse | | | |
| Dimen-sions W·D·H mm | Inner | 490·322·150 | 650·322·150 | 850·322·150 | 920·162·150 |
| | Outer | 685·315·260 | 845·360·260 | 1100·360·260 | 1115·200·260 |
| Material | Bath | Stainless Steel 0.8 T Polished (SUS304) | | | |
| | Body | Powder Coated Steel | | | |
| | Ring Cover | Stainless Steel (SUS304) | | | |
| Electrical Requirement | | 220V, 50/60 Hz | | | |

## 6. Scope of delivery

6.1. PE-4300 series Extraction COD Water Bath..... 1 pc

6.2. Stainless Steel 304 (AISI 304)
concentric reduction ring cover, set of 4 .....1 pc per hole

6.3. Heater cover ..... 1 pc

6.4. Stainless Steel Pipe Set of 4 ..... 1 pc

6.5. EB-PH Pipe Holder ..... 4 pcs

6.6. Data Sheet and Operating Manual ..... 1 pc

## 7. Device

PE-4300 series Extraction COD Water Bath (Figure 1) is consist of a main body 1 containing a stainless steel water bath with heaters and the cover with lids at the top and the control unit compartment 2 located at the right side. The control panel 3 is located in the front of control unit compartment. In the back part of the main body, there is 2 clamps for mounting a frame 4 for used glassware holding.

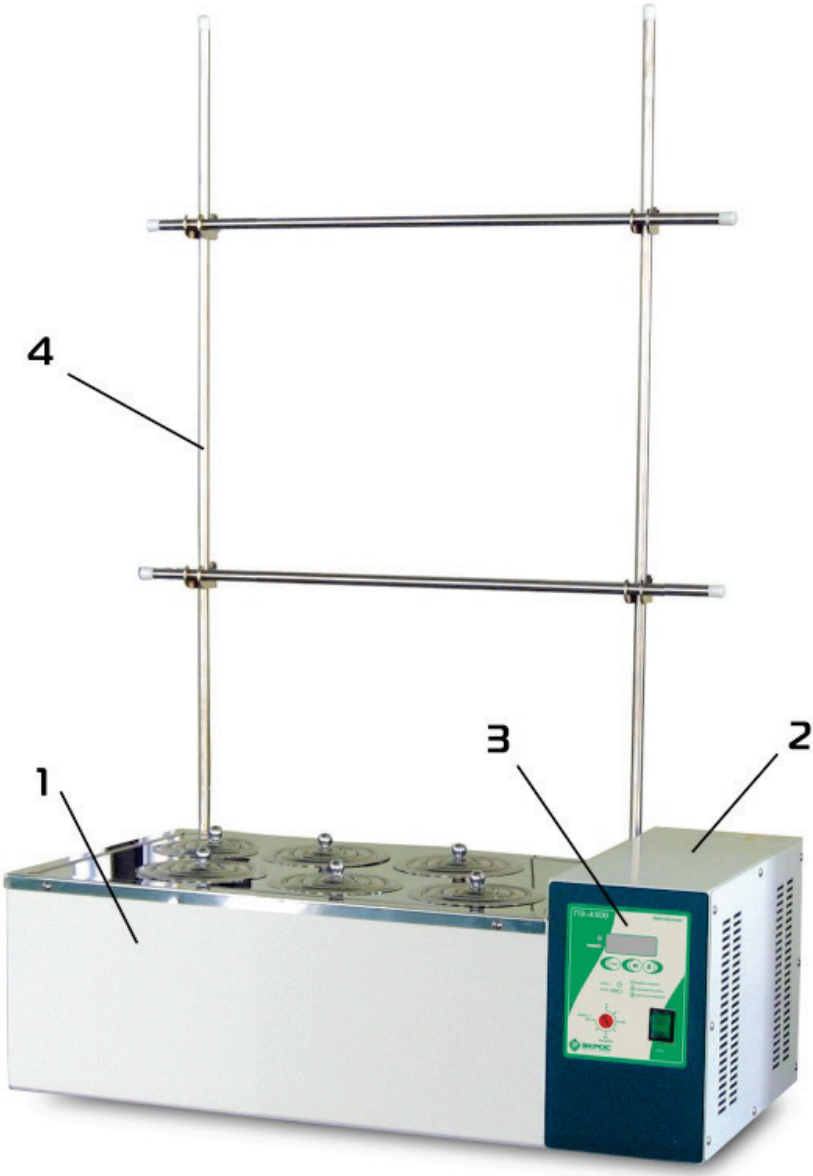



**Figure 1 – PE-4300 series Extraction COD Water Bath**

Main components: 1 – main body; 2 – control unit compartment; 3 – control panel; 4 – frame.

# 8. Main controller

All the controls and indication elements are located on the control panel (Figure 2).

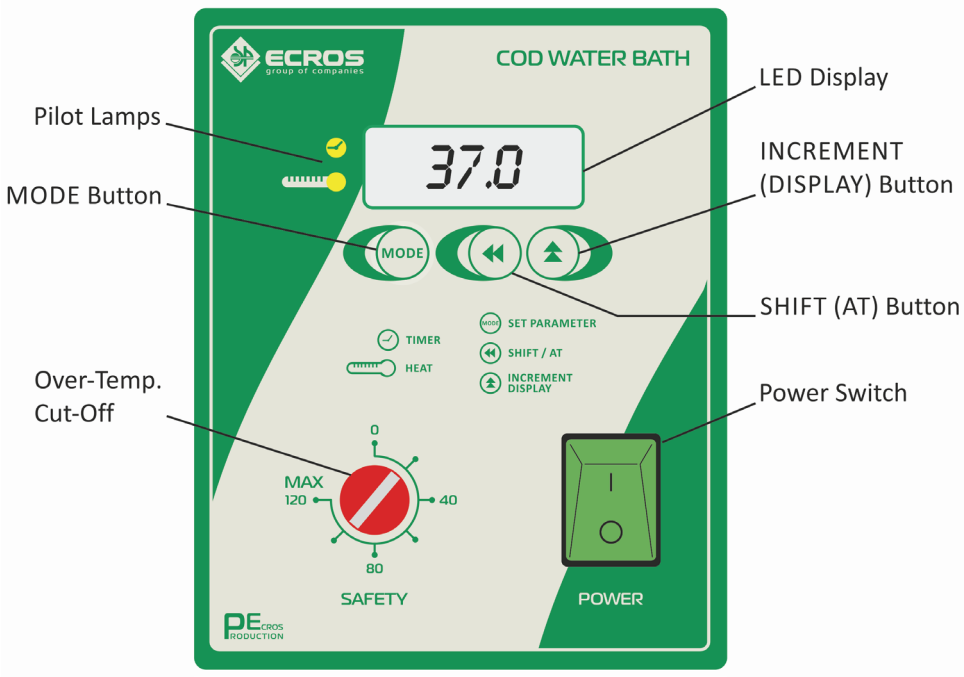
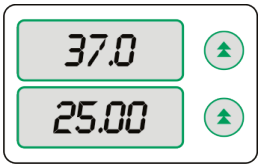



**Figure 2 – Control panel**

## 8.1. Controls




**LED DISPLAY**

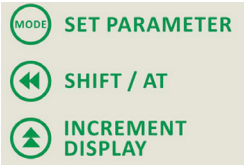
**Digital LED Display.** Displays current bath temperature when turned on. Press INC (DSP) button to display temperature and time alternatively.


**PILOT LAMPS**

**TIMER:** Lamp blinks or turned on when wait-off timer activated.

- Lamp blinks until temperature reach to operating temperature.
- Lamp turned on to start count down.

**HEAT**: Lamp blinks when heater activated.




## BUTTONS

**MODE Button**:

- Push to change temperature and time setting.
- Push to change parameters.

Push and hold for 20 seconds to enter parameter mode.

**REMARK.** Operating parameters are set before shipment. Do not change without understanding of each function of parameters.

**SHIFT (AT) Button:**

- Shift to left digit
- AUTO-TUNING Function

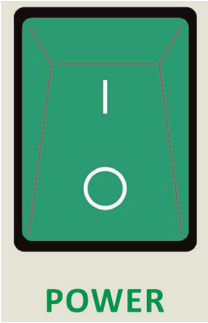
Press and hold for 30 seconds to start auto-tuning.
Auto-tuning was finished before shipment.

**INC (DSP) Button:**

- Increase value when setting temperature and timer.
- Press to display temperature and timer alternatively in normal display mode.


## SAFETY

Safety dials for over temperature cut-off.
Set dial 10-20% higher than operating temperature.
If temperature rises over operating temperature, safety automatically cut-off heater output to prevent overheating.




## POWER SWITCH

Serves for switching the bath on and off.

# 9. Operation

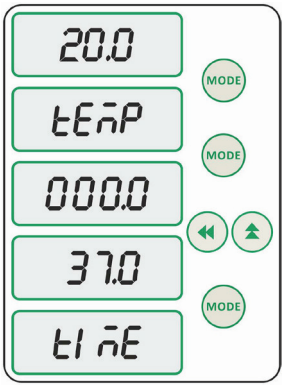
## 9.1. Before operation

1. Check electrical requirement on the name plate before connect to consent.
2. Place your bath on the flat and level surface.
3. Remove packing material in the bath.
4. Connect power plug between AC inlet consent on the left side panel and wall mount receptacle.

## 9.2. Getting Started

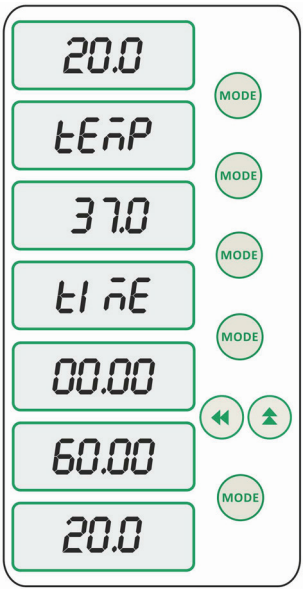
1. Assemble stainless steel pipe frame for extraction flasks.
2. Place heater cover on the bottom of your bath.
3. Pour water into the bath. Do not fill water over 70% of bath height.
4. Distilled Water highly recommended.
5. Turn the circuit breaker on located in the back of the bath. Turn the POWER switch on. The Digital LED READOUT displays current temperature of the bath.

## 9.3. Setting the Temperature




1. Normal display mode (Current Temp. displayed).
2. Press MODE button.
3. LED displays "TEMP" symbol and prompt user input.
4. Press MODE button again.
5. LED displays set temperature to operate.
6. Input new operating temperature by using SHIFT and INCREMENT button.
7. You can input operating temperature range from ambient +5°C to 99°C.
8. Press MODE button to set timer.
9. Press model button three times to skip timer setting.
10. Back to normal display mode and controller starts temperature control.

## 9.4. Setting the Timer




1. Press MODE button three times to set timer.
2. LED displays "TIME" symbol and prompt user input.
3. Press MODE button again.
4. LED displays current timer setting (ex. 00:00).
5. Input new wait-off timer value by using SHIFT and INCREMENT button.
6. Default time scale is HH:MM.
7. For continuous operation set timer at 00.00.
8. You can input timer range from 1min to 99hr 59min.
9. Press MODE button back to normal display mode.

**REMARK.** Timer can be changed in different scale by changing parameter
1) mm : ss 99 min 59 sec
2) hh : mm 99 hr 59 min
3) dd :hh 99 days 23 hr.

refer parameter setting to change time scale
MODE 0, N1 : time scale selection parameter
0 : MM:SS
1 : HH:MM
2 : DD:HH

## 9.5. Over Temperature Protection


User must set the over temperature protection before operation.
Turn over temperature protection dial with screw driver.
Set temperature about 10-20% higher than the operating (user set) temperature.
If over-temperature protection value is under the operating temperature, temperature cannot be reach up to operating temperature.

**Temperature range of Safety Thermostat is 0 – 40 – 80 – 120 Max.**

### 9.6. Start Temperature Control

1. After setting temperature and timer, Bath start heat up water in the bath to operating temperature.
2. Put samples in the bath.
3. Close lid if necessary.

## 10. Frequently Asked Questions

**Temperature keep increasing and decreasing under operating temperature.**

**Cause:** SAFETY setting is lower than operating temperature.

**Solution:** Turn SAFETY setting clockwise higher than operating temperature.

**LED displays uuuu and beep.**

**Cause:** Over heat higher than 100°C. Check water level.

**Solution:** Your water bath cannot be used over 100°C.

If the temperature increases over 101°C, controller warning high temperature and cut-off heater.

## 11. Controller Parameters

### 11.1. Parameter set 1

To go to the mode of viewing and editing of this group of parameters, hold down the MODE button for 5 seconds.

To change the values of the parameters, use the ◀◀ and ▲ buttons.

To go to the next parameter, press the MODE button.

To exit the mode of viewing and editing of the parameters, press the MODE button and hold it down for 5 seconds.

| Display indication | Parameter description | Range | Factory setting | Set by the user |
|---|---|---|---|---|
| ALH | Upper alarm limit | 00.0÷99.9°C | 0.2 | |
| ALL | Lower alarm limit | 00.0÷99.9°C | 3.0 | |
| HYS | Hysteresis | 00.0÷99.9°C | 0.2 | |
| BEEP | Buzzer time | 0÷9999 s | 30 | |

| | | | | |
|---|---|---|---|---|
| ADJ | Temperature calibration | -99.9÷299.9°C | 0 | |
| LOC | Locking the keys, data and parameters | 0000÷1111 | 0000 | |

## 11.2. Parameter set 2

To go to the mode of viewing and editing of this group of parameters, hold down the MODE button for 30 seconds.

After the first 5 seconds, the **ALH** lettering will appear on the display; continue holding down the button for 25 seconds more.

To change the values of the parameters, use the ◀◀ and ▲ buttons.

To go to the next parameter, press the MODE button.

To exit the mode of viewing and editing of the parameters, press the MODE button and hold it down for 5 seconds.

| Display indication | Parameter description | Range | Factory setting | Set by the user |
|---|---|---|---|---|
| RMT | Upper limit of the temperature setting | -99.9÷299.9°C | 101 | Do not alter |
| ACTP | Timer activation temperature (the parameter can be only altered, if the value N2 of the parameter Mode0 is equal to 1)<br>The timer begins the countdown, if<br>(Tcurrent – Tset) > ACTP | -00.0÷99.9°C | 0 | |
| PRD | Period:<br>(interval of giving the control signal) | 1÷99 s | 7 | Do not alter |
| P | Proportional component | 0÷6999 | obtained during the autotuning | Do not alter |
| I | Integral component | 0÷6999 | obtained during the autotuning | Do not alter |
| A | Anti-integrand component | 0÷6999 | obtained during the autotuning | Do not alter |
| D | Differential component | 0÷6999 | obtained during the autotuning | Do not alter |

| | | | | |
|---|---|---|---|---|
| MODE0 | Working mode control 0<br>N3 0 = KS, JIS Pt 100<br>1 = DIN Pt 100<br>N2 0 = ALH (relative)<br>1 = AALH (abs.)<br>N1 0 = ALL (relative)<br>1 = AALL (abs.)<br>N0 0 = 000 °C<br>1 = with decimals (000.0 °C) | N3 N2 N1 N0<br>0 0 0 0<br>1 1 1 1 | 0001 | Do not alter |
| MODE1 | Working mode control 1<br>N3 0 = PID-controller<br>1 = Positional controller<br><br>N2 0 = Timer OFF<br>1 = Timer ON<br><br>N1 0 = Timer MM:SS<br>1 = Timer HH:MM<br>2 = Timer DD:HH<br><br>N0 0 = Restoration on switching on disabled<br>1 = Restoration on switching on enabled | N3 N2 N1 N0<br>0 0 0 0<br>1 1 1 1 | 0111 | |
| MODE2 | Working mode control 2<br>Not enabled | N3 N2 N1 N0<br>0 0 0 0<br>1 1 1 1 | 0000 | Do not alter |
| DRAN | Fix the drift of the temperature indications within the set value | | 0.7 | |
| | The temperature drift takes place for various reasons during the operation. To exclude the temperature drift, set the value DRAN to fix the temperature within these limits. | | | |
| LBAT | Not enabled | | 0000 | |

**Remarks:**

1) RNT: upper limit of the specified temperature. The user cannot set the temperature exceeding this value. Factory setting: 101. Do not alter this value.
2) ADJ: Corrective adjustment of the temperature indications. Sometimes the real temperature value slightly differs from that indicated on the display. In this case, the indicated value can be corrected using a verified thermometer.

**Examples:**

| Indication of the verified thermometer | Display indication | Necessary value ADJ |
|---|---|---|
| 38.0°C | 37.0°C | 1.0 |
| 36.0°C | 37.0°C | -1.0 |

## 12. Troubleshooting

| Error Symbol | Cause | Solution |
|---|---|---|
| When switching on the power supply, the display is not illuminated | Fuse blown | Replace the fuse |
| | Faulty power cord | Replace the power cord |
| | No mains voltage | Contact the technical service department |
| The display shows the symbols “uuuu” and the audible signal is heard | The temperature exceeding 100°C | Contact the service department |
| The display shows the symbols “nnnn” | The temperature circuit is broken | Contact the service department |

## 13. Safety Requirements

13.1. Prior to connecting the device to the power mains, make sure that the power cord and other components is free of mechanical damages.

13.2. As regards the method of protection of a human against electric shock, the water bath corresponds to class I to GOST 12.2.007.0 standard.

13.3. When operating the water bath, the “Rules for Operation of Customers' Electrical Installations” and “Safety Rules for Operation of Customers' Electrical Installations” approved by the State Power Supply Inspectorate (Gosenergonadzor) shall be observed and the requirements of GOST 12.2.007.0 standard shall be met.

13.4. The persons allowed to operate the water bath shall have necessary qualification and be trained in the safety regulation as well as shall have studied the present Operating Manual.

## 14. Storage and Transportation Rules

14.1. Within the guaranteed storage life, the bath shall be stored in the manufacturer's package at a temperature of +5 ~ +40°C and relative humidity of 80%.

14.2. The unpacked bath should be stored at ambient air temperature of +10 to +35°C and relative humidity of 80%.

14.3. The water bath may be transported by any transportation mode in roofed vehicles within the temperature range of -40 to +50°C and relative humidity of not more than 95%.

## 15. Warranty

15.1. The manufacturer guarantees the operability of the instrument provided the transportation, storage and operation conditions are met.

15.2. The warranty period is 1 year from the date of sale of the product as determined by the date of the bill of lading. Within this period, the supplier undertakes to repair the defective parts or replace them with new ones free of charge.

15.3. The warranty rights of the consumer are recognised within the specified period provided the consumer meets all the requirements for transportation, storage and operation of the product.

15.4. Should any faults of the water bath be detected, the report with indication of the faults and contact telephones of the user should be drawn up. This report shall be sent to the manufacturer's address:

Ecohim Co. Ltd.
22 17th Line, building I, Suite 406, Vasilyevsky Island, Saint Petersburg 199178
Phone: (812) 448-76-10, fax: (812) 448-76-00
E-mail: info@ecohim.ru
URL: www.ecohim.ru

## 16. Certificate of Acceptance

PE-430__ Extraction COD Water Bath, serial No. **4K30__P_____** has been verified for compliance with the requirements of the technical documentation and recognised to be suitable for operation.

Date of manufacture _____

Stamp of the Technical
Control Department

Inspector _____