INSTRUCTION MANUAL
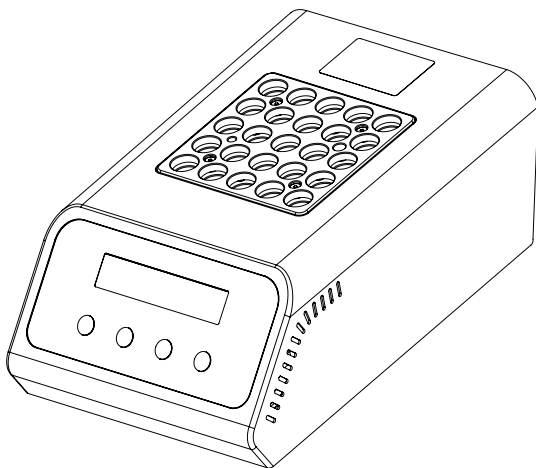
Chemical Oxygen Demand Reactor

Model No.

CR 25

ROCKER

Please read this instruction manual before using this product.

Table Of Contents

1. Important Notice

This instrument is designed for laboratory usage only. Please read this manual carefully before installing and operating. The instrument shall not be modified in any way. Any modification will void the warranty and may result in potential hazard. We are not responsible for any injury or damage caused by any non-intended purposes and modifying the instrument without authorization.

1. Check the voltage specified on the name plate and ensure it matches the line voltage in your location.
2. Install the instrument in a clean, dust-less and well-ventilated area under 40℃.
3. Please keep the instrument away from inflammables.
4. The surface temperature of the instrument is very high after work or during work, please do NOT touch it to avoid serious burns.
5. Review Safety Data Sheets (SDS) before handling reagents, as they may be hazardous.
6. Please discard packing material according to local related regulations.
7. Operating condition
   (a) Ambient temperature: 5~ 40 ℃
   (b) Relative humidity: 80% RH Max.
   (c) Power supply: 100~120V, 50/60Hz or 200~240V, 50/60Hz
   (d) Fuse: T4A, 250V for 100~120V or T2A, 250V for 200~240V
   (e) Altitude: up to 2000 m
   (f) Pollution degree: II
   (g) Indoor use

Caution: Hot surface

The equipment must be disconnected from the mains supply before replacing the fuse.

2. Unpacking

Please check if the package is complete without any damage before unpacking. When unpacking, please make sure you have all accessories that indicated on the list. If there is any problem, please keep the serial number along with packing case and contact your local distributor immediately for assistance.

Item	Content
1	CR 25 Main Unit
2	Power Cord
3	Instruction Manual

3. Main Part Diagram

(1). Main Part
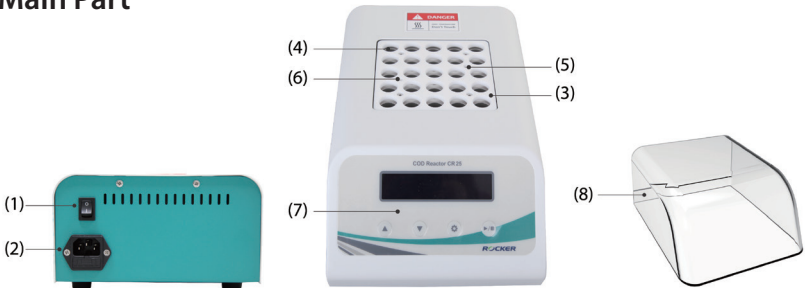
Item	Designation	Item	Designation
1	Power Switch	5	Hole for Mercury Thermometer
2	AC Socket and Fuse Holder	6	Hole for Digital Thermometer Probe
3	Anti-heat PTFE Plate	7	Operation Panel
4	Hole for 16 mm Digestion Vials	8	Protective Lid (Optional)

(2). Operation Panel
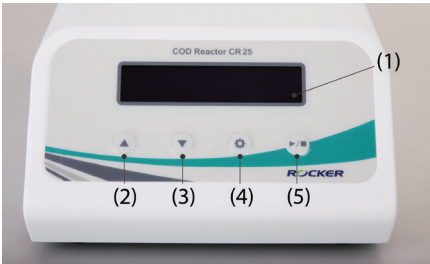
Position	Designation	Position	Designation
1	Display	4	Setting / Calibration Button
2	Up Button	5	Start / Stop Button
3	Down Button		

4. Button / Symbol / Display Explication

(1). Buttons

Button	Designation	Description
▲	Up Button	Select program or change setting value. (Hold the button to change value continuously)
▼	Down Button	Select program or change setting value. (Hold the button to change value continuously)
✿	Setting / Calibration Button	1. Program calibration (Temperature). 2. User program setting (temperature and timer)
▶ / ■	Start / Stop Button	1. Start or stop heating. 2. Stop setting or calibration.

(2). Symbols

Symbol	Description
T1 / T2	Hold down both ▲ and ▼ to switch Standard Timing Mode (T1) or Preheated Timing Mode (T2) during heating state.
🕐	Reach the set temperature, ready to start the program.
T↑	Heats the block to set temperature.
\ | / -	Timing state indication
T1 T1. T1: T1↑	Heating state indication, symbols alternate every 0.5 sec

(3). Display

① COD   150 °C   120'

                 OK ②

Program Display

COD   150 °C   120'

       30 °C   T1↑

       ③   ④
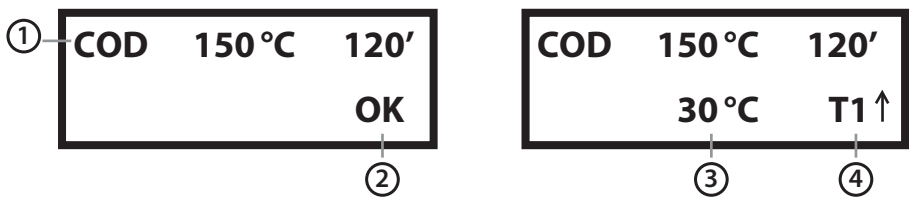
Heating Display

Position	Designation	Position	Designation
1	Program Name, Temp, Time	3	Actual Temperature
2	Program Standby Indication	4	Heating State

5. Operation

(1). Program Menu

Item	Description	Remark
1: COD	Heats for 2 hours at 150 °C.	Standard Timing Mode (T1)
2: COD2	Heats for 20 mins at 165 °C.	Preheated Timing Mode (T2).
3: TP	Heats for 30 mins at 150 °C.	Standard Timing Mode (T1)
4: TN	Heats for 30 mins at 105 °C.	Standard Timing Mode (T1)
5: TPN2	Heats for 30 mins at 120 °C.	Preheated Timing Mode (T2).
6: TOC	Heats for 2 hours at 105 °C.	Standard Timing Mode (T1)
7: PRG1	Program temperature and heating	User Program
8: PRG2	time are editable.	User Program

● **Timing Mode**

- T1 Standard Timing Mode:

Automatically counts down to zero when the instrument reaches to set temperature.

- T2 Preheated Timing Mode:

Reach and hold the set temperature and wait for further instruction.

● **Set Parameters**

Temperature: 30~200℃

Timer: 1~999 min and Continuous Mode (On)

(2). Program Operation

2.1 Predefined Programs - COD, TP, TN, TOC (Standard Timing Mode, T1)

Step	Operation	Screen Display
1	Switch on the instrument and LOGO shows on the screen.	C O D R e a c t o r
2	Program menu shows on the screen in 2 seconds.	C O D 1 5 0 ° C 1 2 0 ' O K
3	Select desired heating program by using 「▲」 or 「▼」 .	C O D 2 1 6 5 ° C 2 0 ' O K
4	Press 「 ▸/∎ 」 to start heating after confirming temperature and time of program.	C O D 1 5 0 ° C 1 2 0 ' 2 6 ° C T 1 ↑
5	In T1 Standard Timing Mode: 1 beep indicates set temperature has been reached and time will automatically count down.	C O D 1 5 0 ° C 1 2 0 / 2 6 ° C
6	The instrument will beep for 15 seconds to indicate the program is complete and stop automatically. Press any key to stop the audio alarm. Press 「 ▸/∎ 」 to return to the program menu for another new program.	C O D 1 5 0 ° C 0 0 0 ' 1 5 0 ° C

* More details, please refer to P.9 Note of Program Operation.

2.2 Predefined Programs - COD2, TPN (Preheated Timing Mode, T2)

Step	Operation	Screen Display		
1	Switch on the instrument and LOGO shows on the screen.	COD Reactor		
2	Program menu shows on the screen in 2 seconds.	COD	150°C	120' OK
3	Select desired heating program by using 「▲」 or 「▼」.	COD2	165°C	20' OK
4	Press 「▶/■」 to start heating after confirming temperature and time of program.	COD2	165°C 26°C	20' T2↑
5	In T2 Preheated Timing Mode: 2 beeps and ⏰ icon indicate the set temperature is reached.	COD2	165°C 165°C	20' ⏰
6	Place the test vials into the heating block, then press 「▶/■」 to start.	COD2	165°C 162°C	20' T↑
7	After reaching the set temperature or press 「▶/■」, the instrument will beep and count down automatically[1].	COD2	165°C 165°C	20/
8	The instrument will beep for 15 seconds to indicate the program is complete and stop automatically. Press any key to stop the audio alarm. Press 「▶/■」 to return to the program menu for another new program.	COD2	165°C 165°C	000'

(1) The temperature of heating block may slightly decline after inserting vials. The timer will start once it reaches the set temperature. To bypass the waiting process, press 「▶/■」 to count down immediately.

* More details, please refer to P.9 Note of Program Operation.

2.3 User Programs - PRG1, PRG2

Step	Operation	Screen Display
1	Switch on the instrument and LOGO shows on the screen.	COD Reactor
2	Program menu shows on the screen in 2 seconds.	COD 150°C 120' OK
3	Select PRG1 or PRG2 program by using 「▲」 or 「▼」.	PRG1 150°C 120' OK
4	Press 「✿」 to start parameter setting by using 「▲」 and 「▼」. Press「▶/■」 to complete the setting process. Temp: 30~200 °C Timer: 1~999 min or Continuous Mode (On)	PRG1 100°C 120' OK
5	Press 「▶/■」 to start heating after confirming temperature and time of program.	PRG1 100°C 120' 26°C T1↑
6	In T1 Standard Timing Mode: 1 beep indicates set temperature has been reached and time will automatically count down. • Timing Mode switch, refer to p.9.	PRG1 100°C 120 / 100°C
7	The instrument will beep for 15 seconds to indicate the program is complete and stop automatically. Press any key to stop the audio alarm. Press 「▶/■」 to return to the program menu for another new program.	PRG1 100°C 000' 100°C

* More details, please refer to P.9 Note of Program Operation.

2.4 Note of Program Operation

1. The instrument will memorize the last selected program and retain when powered on again.

2. **How to stop or select other program:**
    Press 「 ▶/■ 」 to prompt a "<u>STOP HEATING?</u>" message. Press 「 ▶/■ 」 again to stop heating and return to program list.

3. **How to switch Timing Mode:**
    During heating state, hold down 「▲」 and 「▼」 simultaneously to switch the mode.
    - <u>T1 Standard Timing Mode:</u> Automatically counts down to zero when the instrument reaches to set temperature.
    - <u>T2 Preheated Timing Mode:</u> Reach and hold the set temperature and wait for further instruction.

4. **How to calibrate temperature:**
    During heating state, hold down 「✿」 to enter temperature calibration of current program. Please refer to P.10 <u>Temperature Calibration</u> to calibrate the temperature.

(3). Temperature Calibration

Insert thermometer into 16 mm vial which filled with nearly 5 mL glycerol and touches the bottom of vial. Insert the vail on center of heating block as shown on the right. Calibrate temperature as following procedure.

- Digital or mercury thermometer can be used for calibration, please make sure thermometer is calibrated regularly or certified by standard organization to ensure the accuracy.
- General lab thermometers are often not accurate enough for calibration.

Step	Operation	Display
1	Hold down 「✿」 to enter temperature calibration mode of current program during heating state.	COD 150°C 120' OK
2	The calibration (1)(2) will be proceeded based on set temperature of current program and screen shows heating state at same time.	CAL 150°C 30°C Heating T↑
3	A 30-min timer for stabilization shows up after set temperature has been reached.	CAL 150°C 150°C Waiting 30 \
4	Adjust the actual temperature on thermometer by pressing 「▲」 and 「▼」. Then press 「✿」 to finish the calibration procedure.	CAL: ADJ 150°C

Note of Temperature Calibration

(1) The calibration parameters of each program are independent and have no impact on other programs when executing calibration procedure for specific program.

(2) If heating block is hotter than set temperature, you should wait for temperature declining.

(3) **How to stop calibration procedure:**

Press 「 ▶ / ■ 」 to prompt a "STOP HEATING?" message. Press 「 ▶ / ■ 」 to stop heating and return to program list, or 「 ✿ 」 to continue calibration.

6. Maintenance

1. Please operate the instrument in a well-ventilated area and keep it clean for reliable performance.
2. Before cleaning, please unplug the instrument and allow it to cool down.
3. In case of vial overflow or liquid spills, immediately switch off the instrument and unplug the power cord. Clean the instrument once it has cooled to prevent corrosion.
4. Please clean the surface with a damp cloth, mild soap, or 75% ethanol after cooling to room temperature.
5. Incorrect power source may cause fuse blew. A spare fuse is available in fuse holder and can be taken out with flathead screwdriver.

7. Troubleshooting

Problem	Reason and Solution
Fail to start or Abnormal Display	• Loose plug → Reconnect plug to power supply. • Blown fuse → Replace a new fuse. • Instrument is over temperature → Cool the instrument down and operate in well-ventilated circumstance. • Display or components failure → Contact distributor for assistance.
Liquid spilled during heating process	• Incorrect temperature setting → Reset heating temperature. • Incorrect temperature of block → Calibrate the temperature. • Loose vial cap → Change vial and tighten the cap • Incorrect sample volume → Change new vial and fill right volume • Improper reagent → Change new reagent, world renowned brand is suggested.
Other problems	• Please contact distributor for assistance

8. Ordering Information

179250-11(22)	CR 25, COD Reactor, AC110V,60Hz (AC220V,50Hz)
198200-01(02)	CD 200, COD Detector, AC100~240V adaptor, US plug (EU plug)
191100-01(02)	WD 100, Multiparameter Colorimeter, AC100~240V adaptor, US plug (EU plug)
179250-43	Protective Lid
AWE770110	1000~5000 ul Pipette (Adjustable)
SSI 5000-50	5 ml Pipette Tip (50/PK)