

Digestion Furnace *KDN-12D* User Manual



Please read the manual before installation and operation.

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Respected customers,

Thank you for choosing our company's product. In order to obtain satisfactory using experience, please read the product manual carefully before starting the apparatus. If you have any questions, please contact us in time, we will serve you wholeheartedly. This product manual is completed by the company's technicians, we strive to make it comprehensive and easy to understand, if you find there are problems or something omitted, or you have new ideas, please feel free to let us know, we would be sincerely thankful to you.

Security Warning

Danger!!! It may cause property damage or body injury, please use as instructed!



SPECIAL POWER SOURCE



GROUNDED



FLAMMABLE and EXPLOSIVE



NO RENOVATION

- a. Please use required power supply and voltage for this product--AC220V/50HZ.
- b. The device must be grounded safely and kept away from electromagnetic interference(neutral wire or third wire mustn't be grounded.)
- c. Please use independent power socket for this product, and confirm the plug and power socket are well grounded.
- d. It is not allowed to unplug the power plug while the apparatus is in operation.
- e. Don't repair without permission, entrusted repair must be instructed by a professional.
- f. There mustn't be dust or inflammable, explosive gas in the working environment.

- g. The device should work under conditions of 10-45°C, relative humidity \leq 80%.
- h. The device must be installed in a place without direct sunlight.
- i. Reagents and other solutions are corrosive, please wear protective outfit and pay attention to safety when operating.

Product Introduction

1.features

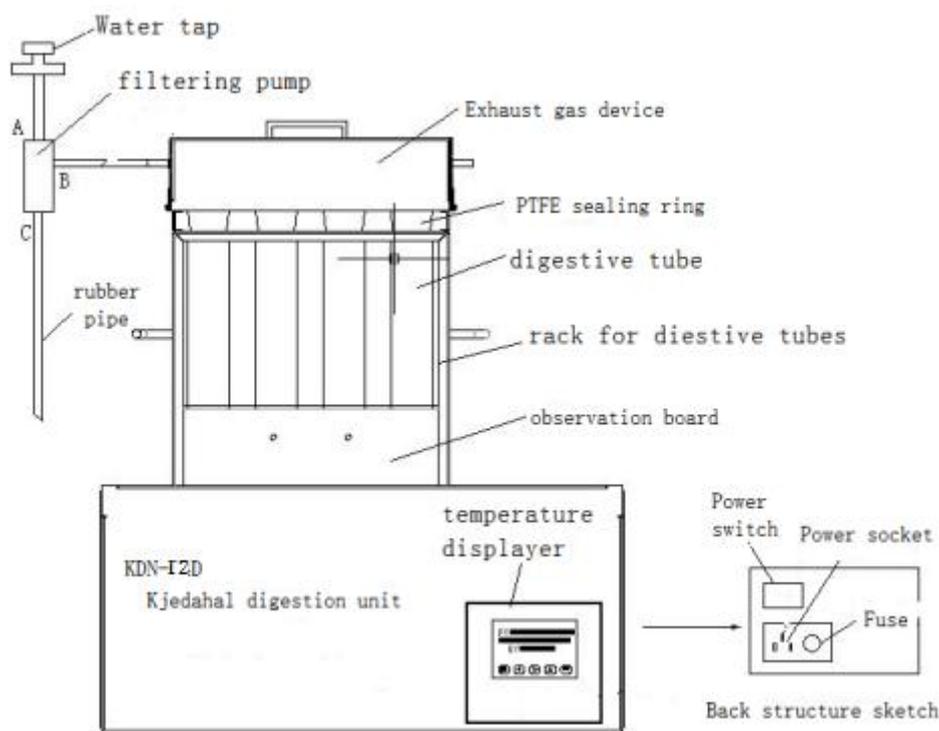
- a. heater(module) is infrared quartz tube, it's burst-proof, resists strong acid and strong base, provides long service life.
- b.large heating area of digestive tube and slim temperature deviations between furnace holes guarantee high heating efficiency and digestion uniformity.
- c. use the newest digital-display temperature-control device, precise temperature control and fast heating.
- d. beautiful appearance, light structure and easy to use.

2.technical parameters

- a. determination quantity: 12/batch;
- b. sample volume: solid $\leq 5\text{g/per}$, liquid $\leq 20\text{ml/per}$;
- c. capacity of digestive tube: 300ml (standard);
- d. determination range: 0.1-240 mgN;
- e. temperature range: ambient to 550°C;
- f. heating rate: 50 degrees/min;
- g. temperature accuracy: $\pm 1^\circ\text{C}$
- h. power consumption: digester (12 holes 2000W);
- i. power source: 220 (V) +/-10%, 50~60HZ;
- j. dimensions:650*380*230 (mm);
- k. weight:15kg;

Taking advantage of the Kjeldahl method, the device is widely used in the digestion of cereals, feed, food, dairy products, beverages, soil, water, medicine, sediment and chemicals. It tests precisely, safe and easy to operate. SO₂ and other poisonous gas escaping from digestion tube will pass gas eduction tube, discharged to sewer from water through air-bleed tee, effectively restraining the harmful gas from escaping(please note this apparatus is of simple structure).

Connection Method



A, B, C end of the gas extraction tee should be connected by rubber hose to the tap, the exhaust gas absorption bottle and the sewer respectively. Rubber hose of the B end shouldn't be too long, and the flow of tap water should be at proper rate(3-4L/min) when discharging pollutants, ensuring the suction force of gas extraction tee, to discharge exhaust gas and tap water to the sewer.(In addition to the above standard connection, our company also provides a high level one:simply connect vacuum pump, filter and exhaust gas absorption bottle with rubber hose.This method is easy to operate, can neutralize SO₂ and other poisonous gas. If the customer has fume cupboard, he can put the digestion unit into the fume cupboard directly.)

Note: You can observe the heating condition of the digestion furnace by moving the observation board up and down (wearing gloves when the temperature is high), and put down the observation board in the working state.

The diagram of the single connection of the black fluorine rubber hose extending from the faucet, the exhaust tee and the sewage cover is described, the actual connection is divided into 2 pipelines (the device requires a total of 2 faucets) : the sewage cover on the extension of 2 black fluorine hose and faucet, air pumping tee connection.

Temperature Control

D-type digital-display Kjeldahl digestion unit, uses the new generation of digital-display temperature controller, can display the target temperature and the actual temperature, user can change the heating temperature according to actual

needs.

1. keys of temperature controller

- 1.1. "MAIN" indicator: This light is on during normal operation (non-set status), otherwise it is off.
- 1.2. "SET" indicator: This light is on in the setting state, otherwise it is off (set the required temperature value (time) / enter the instrument to view, set the parameters, confirm and modify the set parameters);
- 1.3. "TUN & STOP" indicator: The "RUN" light is on during operation and the "STOP" light is on when stopped.
- 1.4. "HEAT" indicator: This light is on when the output is heated, and vice versa;
- 1.5. "∧" "∨" "add" and "decrease" key: to increase or decrease value when setting parameters

2. Reference and setting of temperature and time

In the non-setting state, click the \llbracket SET \rrbracket button, the display window displays SP00 (starting temperature point); ST01 (required time), SP01 (target temperature setting value); . . . STn, SPn; ST (n + 1).

Explanation:

- 1) SP0 is the measured value at the start of operation, only for recording and viewing, and cannot be modified;
- 2) ① If $ST_n > 0$: it means the rise and fall time of this segment;
② If $ST_n = 0$: it means that the controller will increase and decrease the temperature to the target setting value of the current segment at the fastest speed based on the premise of ensuring the best control effect;
③ If $ST_n = -1$: it means that the controller always runs at the target temperature set value in the previous section;
④ If $ST_n = -2$: indicates that the run ends after reaching this segment
- 3) In the setting process, press and hold the \llbracket SET \rrbracket key for 3 seconds to exit, and the set value is automatically saved.
- 4) In the setting process, first hold down the \llbracket Shift \rrbracket key, and then click the \llbracket SET \rrbracket key to view or modify the previous setting value.

3. temperature setting

If the temperature is raised from room temperature to 80 degrees after 20 minutes, after 30 minutes of constant temperature at 80 degrees, the temperature is raised to 120 degrees after 40 minutes, and then heated to 160 degrees after 50 minutes, and after 60 minutes of constant temperature of 160 degrees.

Setting method: SP0 (starting temperature point, not modifiable);

ST1=20; SP1=80;

ST2=30; SP2=80;

ST3=40; SP3=120;

ST4=50; SP4=160;

ST5=60; SP5=160;

ST6=-2.

3. Run and stop

Press and hold the “R/S” button for n seconds to start or stop the operation.

Operating Steps

- a. Plug digestive tube containing sample in the rack, and place exhaust gas absorption bottle on the rack(hold the bottle with two hands, cover the mouth of digestive tube with the sealing ring of exhaust gas absorption bottle.)
- b. Connect tap water, gas extraction tee (sucking & filtering pump) and waste gas absorption unit as the above figure, adjust water flowing to proper rate (3/4L/min). First open water tap then the digestion unit, to make heating and digestion.
- c. Connect the power cord of the accessories, start the ship-shaped main switch.
- d. To digest sample, this apparatus would heat twice at different temperatures: first set a temperature between 200-300 degrees, keep heating for 20-40min after reaching the required temperature, then reset it, among 350-450, continue heating for 30-60min, later the sample will stop boiling gradually and its color changes, keep heating for 10-30min when the sample turns into completely transparent blue-green liquid, till then, the digestion is finished. (if the sample is of high water content, or there is black materials within the digestive tube when heating, prolong the heating until the sample changes into transparent.)
Generally, it requires 60-120min from starting up the machine to the sample thoroughly digested, determined by the sample.
- e. When the digestion finishes, move the rack for digestive tubes and exhaust gas absorption device to tube cooling rack to cool them(Watch out! Thermal-insulation gloves must be worn to prevent scalding.).

Precautions

- a. When connecting gas extraction tee (sucking&filtering pump) , make sure its three nozzles are smooth, that is, the inner hole of B end must be interlinked with inner holes at A end and C end, ensuring exhaust gas inside the digestive tube can be drew off. If there is obvious gas leakage, check this place, rotate B end can adjust the pump's position.
- b. When installing exhaust gas absorption bottle, see to the joint between sealing ring

of the bottle and the nozzle of digestive tube, to prevent waste gas overflowing. (when removing the exhaust gas absorption bottle, first tilt the bottle, then take the whole off, so as to avoid high atmospheric pressure pulling up the digestive tube.)

c. In digestion process, there is little temperature deviation between digestive tubes at different places, especially those at the edge and the centre, so part of the tubes may change colors first; in order to ensure complete digestion, extending appropriate digestion time or increasing heating temperature may be required.

d. After digestion, during the cooling phase, don't close the water tap, otherwise there will be residual waste gas overflow.

List of Attachments

No.	Components	Specifications	Quantity
1	digester	main body	1
2	rack for digestive tubes	4 holes	1
3	cooling rack for digestive tubes	4 holes	1
4	digestive tubes	Φ 40*300mm	12
5	Exhaust gas ring		1
6	gas extraction tee	teflon	2
7	Gloves	pair	1
8	power cable	AC 220V	1
9	fuse tube	5A	2
10	6*11 rubber hose	meter	4
11	Certification card	piece	1

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