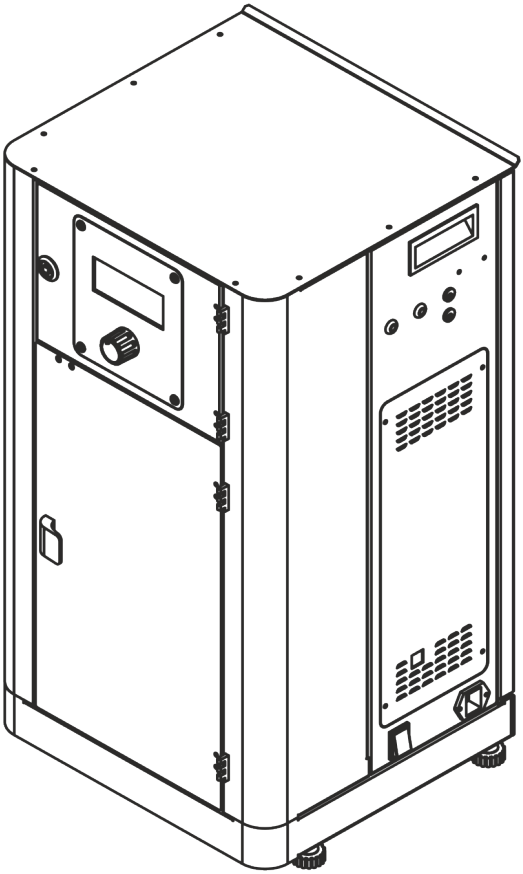
LABQUEST
BY BOROSIL®

KJELDAHL DISTILLATION

OPERATING MANUAL

KDI 030
KDI 040



DEALER :

THANK YOU NOTE

We Borosil, one of India's most customer oriented brands truly appreciate your business and express our gratitude for the trust you have placed on us.

We hope your choice serves you well in your scientific endeavors and aspire to have the pleasure of doing business with you for years to come.

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SPECIFICATIONS

PARAMETERS	KDI030	KDI040
Test tube volume	250ml	250ml
External dimensions (WxDxH)mm	350x380x725	350x380x725
Mains voltage	220v-240v	220v-240v
Current consumption	4.8A	4.8A
Power consumptions	1000W	1000W
Heater	Coil heater	Coil heater
Body material	MS powder coated	MS powder coated
Bottom tray material	SS304	SS304
Display	LCD	LCD
Temperature probe	PT-100	PT-100
Door close sensor	Yes	Yes
Test tube detection	Yes	Yes
Steam power	25% to100%	25% to100%
Dosing funnel	NA	NA
Glassware material	Borosilicate glass	Borosilicate glass
Max. Distillation time (In min/sample)	2-9 min	2-9 min
Frequency	50-60 Hz	50-60 Hz
Memory	50 user programmable program	50 user programmable program
USB port	Yes	Yes
Safety sensors	Door sensor,Test tube sensor	Door sensor,Test tube sensor
Sensor cooling water flow	Yes	Yes
Ambient temperature	15^0C to 40^0C	15^0C to 40^0C
Measuring range	0.1mg to 200mg	0.1mg to 200mg
Reproducibility	<1%	<1%
Recovery	>99.5%	>99.5%

PACKING LIST - BOX 1

1. Kjeldahl Distillation Unit ..... 01 No.
2. Power cable 5 Amps ..... 01 No.
3. Key for door ..... 02 Nos.
4. Leveling Rubber Shoe ..... 04 Nos.
5. Selection Knob ..... 01 No.
6. Drain Valve ..... 01 No.
7. T-Brass connector ..... 01 No.
8. S.S. Hose clamps ..... 06 Nos.
9. Silicone tube ..... 10 mtr
10. Braided hose pipe ..... 04 mtr
11. Operating Manual ..... 01 No.
12. Test Report ..... 01 No.
13. Cable tie 100mm ..... 05 Nos.
14. Drip Tray LH ..... 01 No.
15. Drip Tray RH ..... 01 No.
16. Brass connector male ..... 01 No.
17. Ammonium sulphate sample bottle 3ml ..... 01 No.
18. Oven mitts ..... 01 No.

PACKING LIST - BOX 2

1. Condenser ..... 01 No.
2. Dosing Head & Dosing holder ..... 01 No. each
3. Silicone Tubing for Dosing ID100mm length ..... 02 Nos.
4. Test tube (250 ml) ..... 02 Nos.
5. Teflon Tube ID 8mm x 440mm ..... 01 No.
6. Silicon Tube for condenser 8mm x 210mm ..... 01 No.
7. Teflon Tube ID 8mm x 440mm ..... 01 No.

PACKING LIST - BOX 3

1. Aspiration bottle with level sensor
   - KDI030 ..... 02 Nos.
   - KDI040 ..... 03 Nos.

SAFETY AND WARNING

Important operating and maintenance instructions

Read the accompanying text carefully.

Potential electrical hazards

Only qualified persons should perform procedures associated with this symbol.

Lifting hazard warning

- The Kjeldahl distillation unit wighs more than 30 kg. Take adequate safety measures when moving this device.
- Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.

CAUTION :

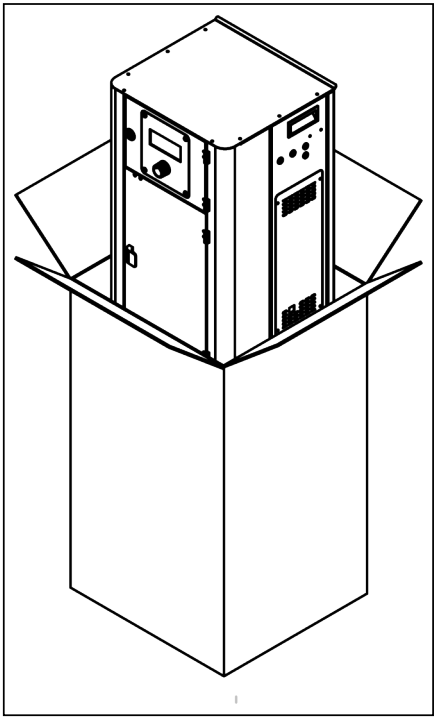
- Always use the proper protective equipments (clothing, gloves, goggles and face mask etc.)
- Always follow the good hygiene practices.
- Each individual is responsible for his or her own safety.
- Do not keep the unit on wet bench top.
- Do not wash the unit with water.
- Wipe the unit with dry cloth after usage.
- Ensure that no fluid is spilled on the top surface of the equipment.
- The unit should be plugged to standard 230V, 50HZ,6A, 3 pin power socket.
- The unit should be plugged into the power socket, having proper earthing.
- Use only distilled water to operate the unit.

WARNING :

Inadequate earthing at the installation facility can lead to hazardous electrical shocks. The manufacturer is not liable for any injury or death resulting from electrical hazards due to faulty earthing in the lab.

UNBOXING OF THE PRODUCT

UNPACKAGING INSTRUCTION



1. Remove the unit from the Box 1.

FOR ACCESSORIES :

1. Remove from the pouch.
    - Knob
    - Door keys
    - Hose pipe
    - Power cable - 6 Amp
    - Leveling Shoe
    - Brass Tee Connector
    - Drain Valve for Boiler
2. Remove from box 2.
    - Condenser
    - Dosing Head with teflon tube
    - Silicone tubing 10 ID and 8 ID
    - Test tube (300 ml)
    - Teflon Tube
3. Remove from box 3.
    - Remove Aspiration Bottles

PRODUCT IDENTIFICATION - KDI030

A. DOSING HEAD
B. DISTILLED WATER INLET
C. NaOH INLET
D. DOSING HEAD HOLDER
E. SAMPLE TEST TUBE
F. STEAM INLET TUBE
G. TEST TUBE LOADER
H. CONDENSER WATER DRAIN
I. CONDENSER
J. CONDENSER WATER INLET
K. CONDENSET COLLECTION TUBE
L. CONICAL FLASK 250 ml
M. DRIP TRAY LH & RH

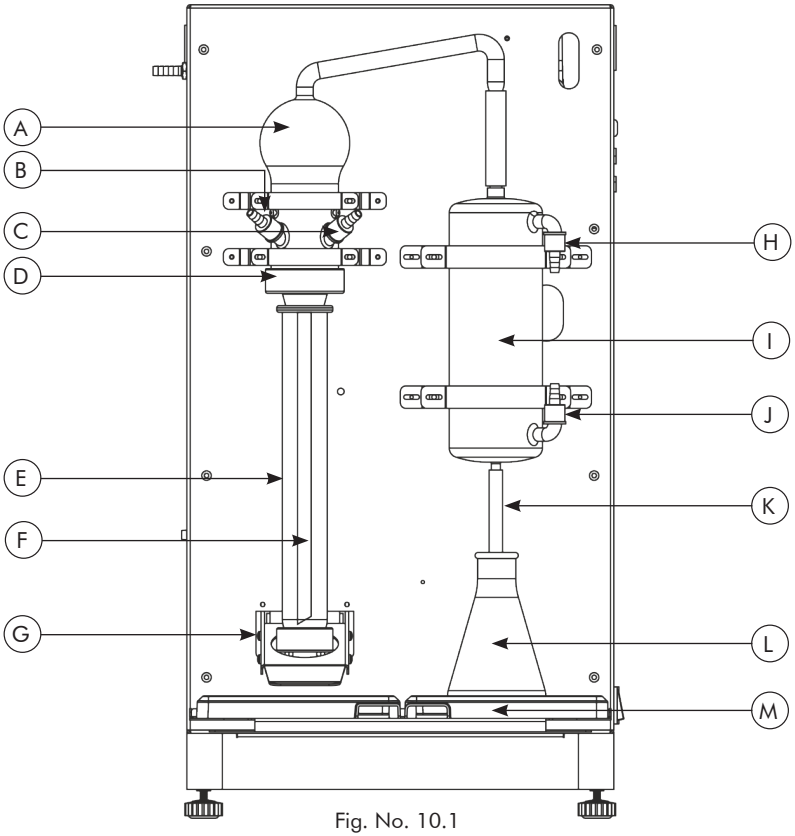


Fig. No. 10.1

PRODUCT IDENTIFICATION - KDI040

A. DOSING HEAD
B. DISTILLED WATER INLET
C. NaOH INLET
D. DOSING HEAD HOLDER
E. SAMPLE TEST TUBE
F. STEAM INLET TUBE
G. SAMPLE TEST TUBE LOADER
H. CONDENSER WATER DRAIN
I. CONDENSER
J. CONDENSER WATER INLET
K. CONDENSET COLLECTION TUBE
L. BORIC ACID INLET TUBE
M. CONICAL FLASK 250 ml
N. DRIP TRAY LH & RH

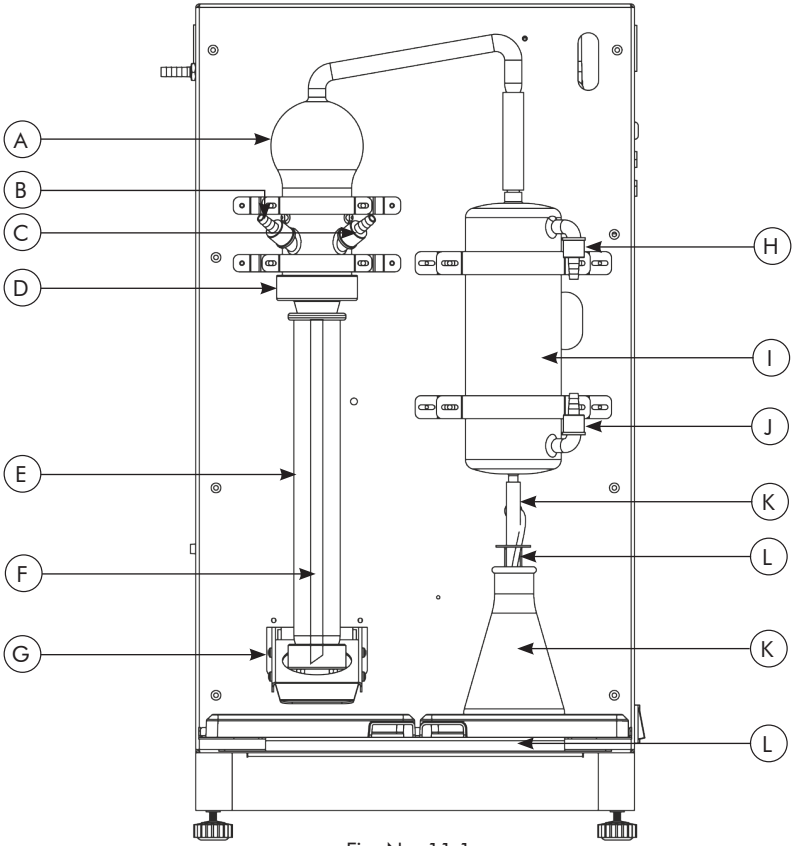


Fig. No. 11.1

PRODUCT IDENTIFICATION

A. DISPLAY PCB

B. LCD DISPLAY

C. SELECTION KNOB

D. FRONT ACRYLIC DOOR

E. DOOR HANDLE

F. LEVELING SHOE

G. B-TYPE USB SOCKET

H. CONTROLLER PCB

I. POWER PLUG SOCKET with FUSE (5 Amp)

J. POWER SWITCH

K. DISTILLED WATER INLET FOR BOILER

L. STEAM OUT

M. COOLING WATER INLET

N. BOILER DRAIN

O. EXCESS STEAM OUTLET

P. COOLING WATER OUTLET

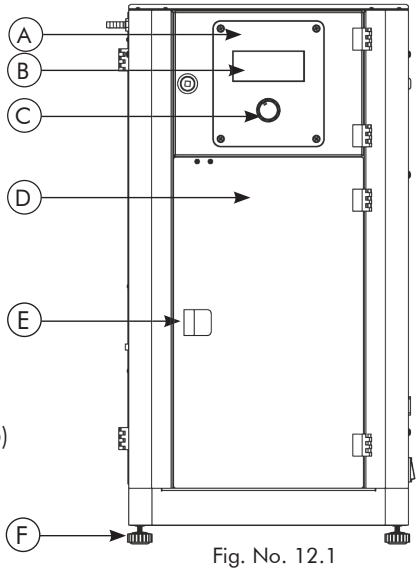


Fig. No. 12.1

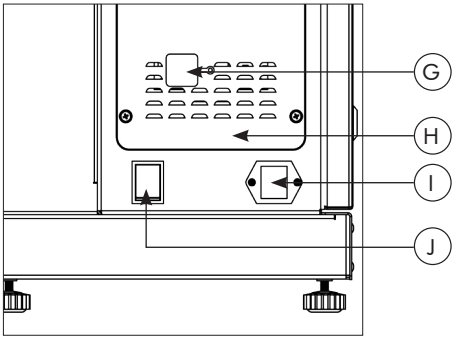


Fig. No. 12.2

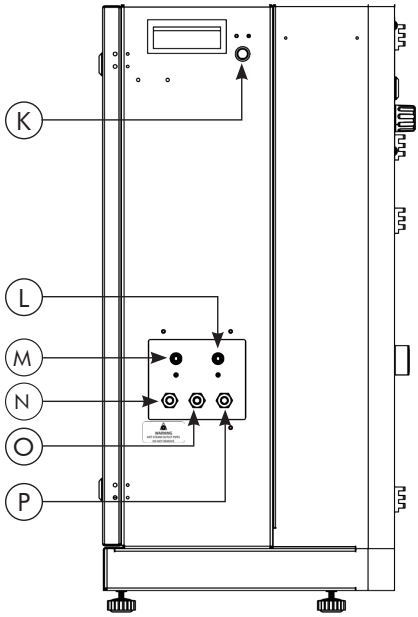


Fig. No. 12.3

PRODUCT IDENTIFICATION - KDI030

A. SOLENOID VALVE FOR STEAM IN
B. DISTILLED WATER INLET FOR BOILER
C. SOLENOID VALVE FOR BOILER FILLING
D. BOILER WITH HEATER
E. STEAM INLET FOR DOSING
F. FLOW SWITCH (COOLING WATER)
G. SOLENOID VALVE FOR (COOLING WATER)
H. BOILER DRAIN VALVE

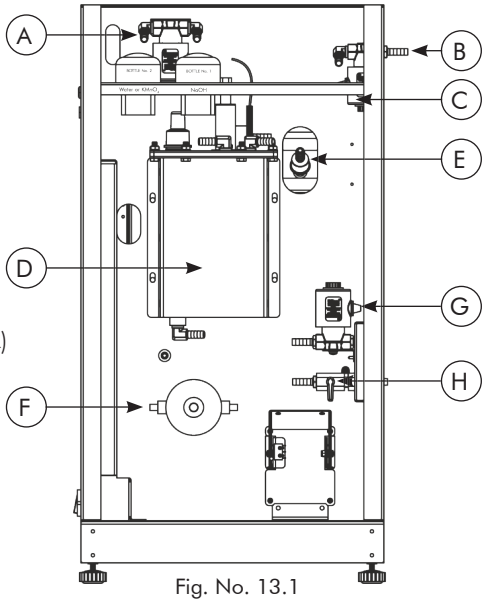


Fig. No. 13.1

PRODUCT IDENTIFICATION - KDI040

A. SOLENOID VALVE FOR STEAM IN
B. DISTILLED WATER INLET FOR BOILER
C. SOLENOID VALVE FOR BOILER FILLING
D. BOILER WITH HEATER
E. STEAM INLET FOR DOSING
F. FLOW SWITCH (COOLING WATER)
G. SOLENOID VALVE FOR (COOLING WATER)
H. BOILER DRAIN VALVE

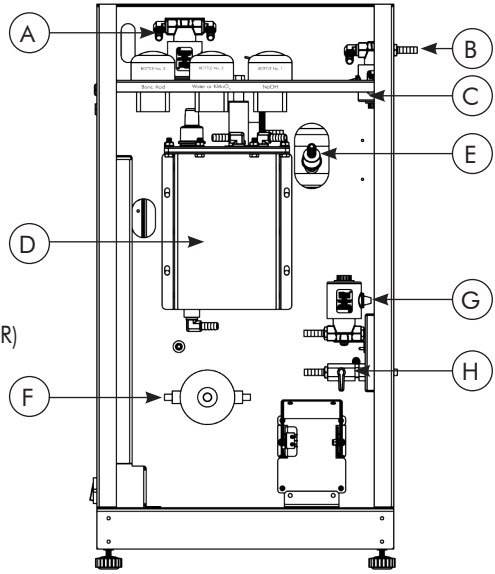


Fig. No. 13.2

PRODUCT IDENTIFICATION

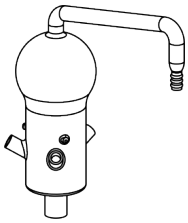


Fig. 14.1

Dosing Head
Product code :- BLG0DOH000KJDLDIST

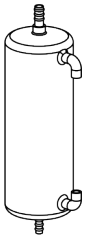


Fig. 14.2

Condenser
Product code :- BLG0CON000KJDLDIST

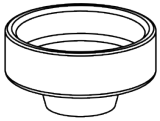


Fig. 14.3

Dosing Head Holder
Product code :- BLM0DHH0000KD100V4

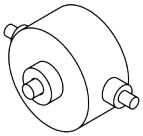


Fig. 14.4

Flow Switch
Product code :- BLMOFLS10000000KD1

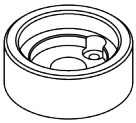


Fig. 14.5

Test Tube Loader
Product code :- BLGAFUT010PTFEDI1

Fig. 14.6

Test Tube
Product code :- BLGATTQ01041250290

DOSING REAGENT BOTTLE CONNECTION - KDI030

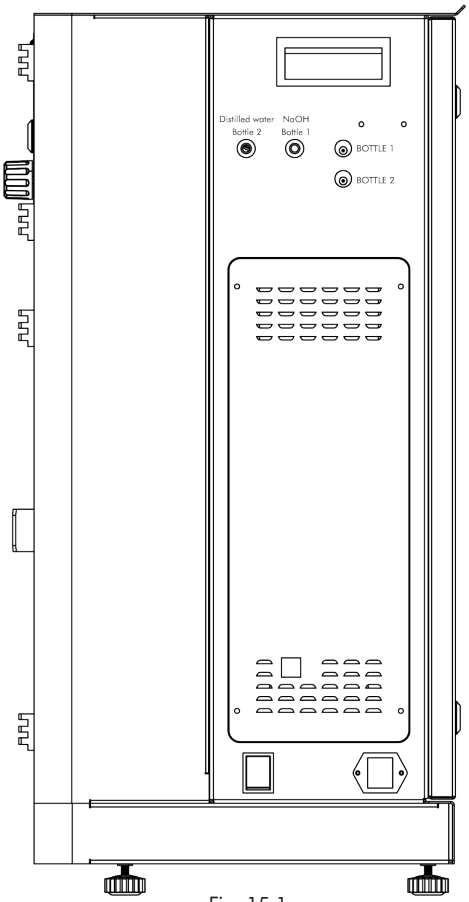


Fig. 15.1

1. Connect Bottle 1 level sensor wire to BOTTLE 1.
2. Connect Bottle 2 level sensor wire to BOTTLE 2.

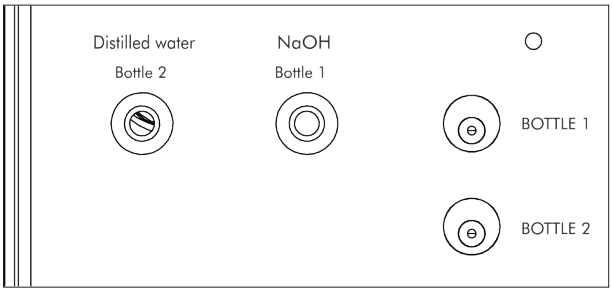
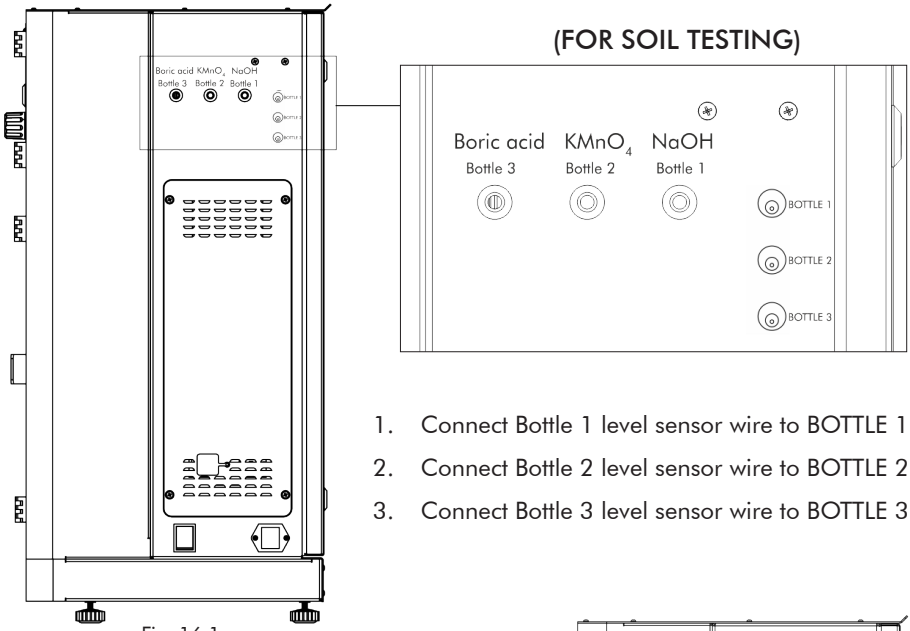


Fig. 15.2

DOSING REAGENT BOTTLE CONNECTION - KDI040



1. Connect Bottle 1 level sensor wire to BOTTLE 1.
2. Connect Bottle 2 level sensor wire to BOTTLE 2.
3. Connect Bottle 3 level sensor wire to BOTTLE 3.

Fig. 16.1

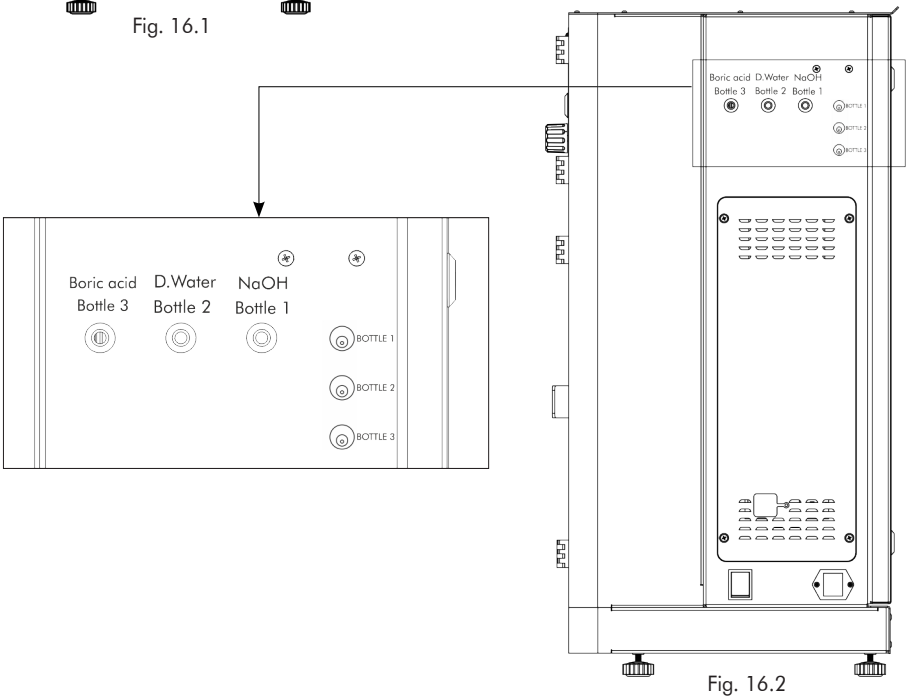


Fig. 16.2

INSTALLATION OF UNIT

CHECK BELOW POINTS BEFORE INSTALLATION OF THE UNIT.

1. The required water pressure for the unit should be around 5-6bar (70psi)
2. TDS value should be between 300ppm-500ppm, if the TDS value is more than 1200ppm, it is recommend to install the water softener or the appliance protection filter to/for the unit.
3. It is recommend to connect chiller to condenser unit for better results.
4. Distilled water is recommend for boiler to prevent scaling.
5. Boiler should be drained frequently after completing 10-20 cycles.

INSTALLATION OF DOSING HEAD AND CONDENSER

1. Remove dosing head and condenser from box - 2.
2. Fix them with the unit as shown in the figure.
3. Connect Condenser water drain & Condenser water inlet with silicone tubing from the unit (Ref. fig. 13.1).
4. Connect Chemical dosing tubes (Ref. fig. 13.1) & Steam inlet tube to Dosing Head. (Ref. fig. 20.2)
5. Connect Boiler water inlet with hose pipe for operating the unit.
6. For connection of Dosing reagent bottles, insert tubings in their respective cans with level sensor connection on to the unit.
   (Ref page no. 17 &18)

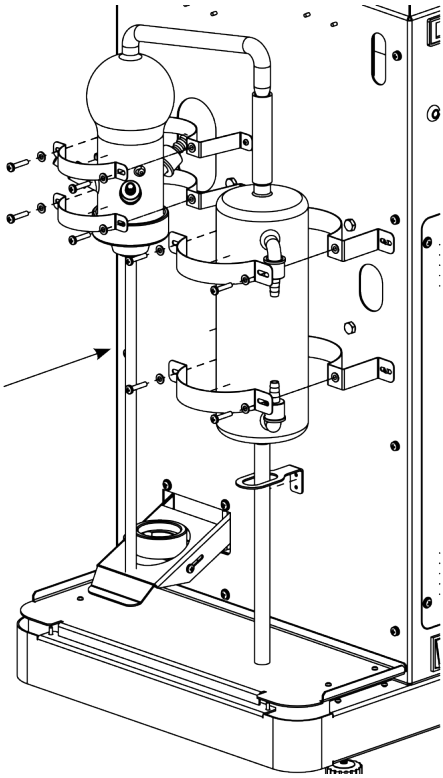


Fig. No. 17.1

INSTALLATION WITH DOSING HEAD AND CONDENSER

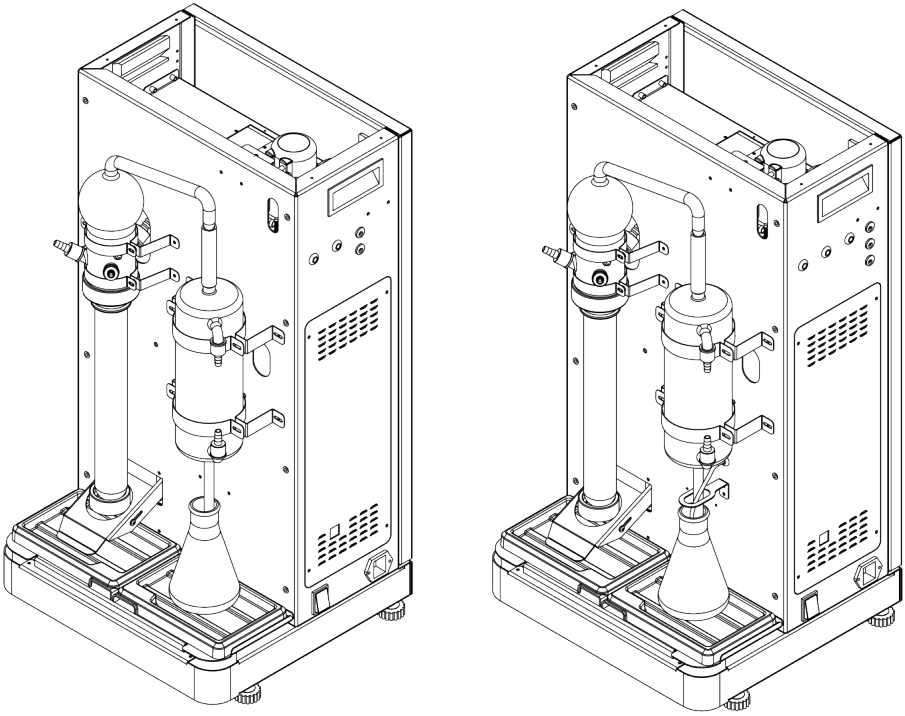


Fig. 19.1

OPERATING THE UNIT

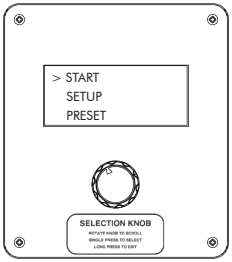


fig. no.20.1

- **Main Menu** (fig. no.20.1)

1. Rotate the knob clockwise and anti-clockwise for menu scroll.
2. Cursor on the left shows the position.
3. To select the particular menu “SINGLE PRESS“ the knob.

SELECTION KNOB
ROTATE KNOB TO SCROLL
SINGLE PRESS TO SELECT
LONG PRESS TO EXIT

- **START Menu** (fig. no.20.2)

1. “SINGLE PRESS“ to scroll down through the parameters, rotate the knob clockwise to increase the value of the parameter and rotate the knob counterclockwise to decrease the value of the parameter.
2. The arrow symbol “ > ” in the left of the display indicates the cursor position. “SINGLE PRESS“ the knob after setting the last parameter value to START the distillation process.
3. “LONG PRESS“ the knob to go to the first parameter of the window. “LONG PRESS“ when on the first parameter to return back to the MAIN MENU window.

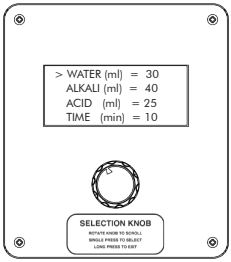


fig. no.20.2

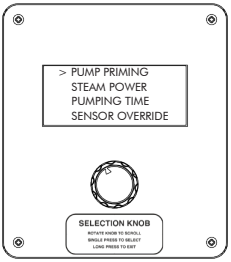


fig. no.20.3

- **SETUP Menu** (fig. no.20.3)

1. Rotate the knob clockwise and anti-clockwise for menu scroll.
2. Cursor on the left shows the position.
3. To select the particular menu “SINGLE PRESS“.

- **PRESET MENU** (fig. no.21.1)

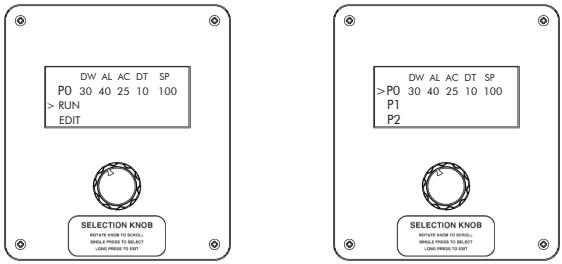


fig. no.21.1

1. There are 50 programmable programs from P0 to P49. The symbol " > " indicates the cursor. User can edit and save the programs as per their sample requirements.
2. "SINGLE PRESS" the knob to select the program to run or edit it. Rotate the knob clockwise and anticlockwise to scroll through the preset menu programs.
3. After selecting a particular program user can RUN or EDIT the program.

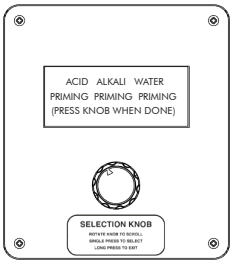
   i) **RUN** -

   User will be directed to the user input menu where all the parameters values will be taken as of the program selected. "SINGLE PRESS" the knob to start the distillation process.
   To edit the existing parameter values "LONG PRESS" the knob. User can see the cursor ">" on the first parameter and can change the values for the same. "SINGLE PRESS" & rotate the knob to scroll the parameters.

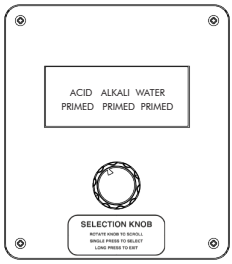
   ii) **EDIT** -

   User can edit the parameters value and save the same value in EDIT function. After selecting the edit option the parameter value which is seen on the display above will blink and user can identify that he/she is on which parameter. "SINGLE PRESS" the knob to scroll through the parameters and rotate the knob to change the values of the parameters. "SINGLE PRESS" the knob after setting the last parameter value i.e. SP (Steam Power) to save the changes made.

- **PUMP PRIMING** (fig. no.22.1)



1st STAGE



2nd STAGE

fig. no.22.1

1. Load test tube and conical flask before pump priming.
2. "SINGLE PRESS" to start pump priming.
3. User have to visually see the chemical coming in the test tube by "SINGLE PRESS" of the knob.
4. "SINGLE PRESS" every time will switch on the pump for priming.
5. "SINGLE PRESS" the knob to prime the next pump, then the previous pump will stop priming.

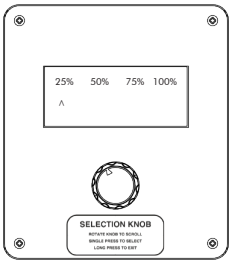


fig. no.22.2

- **STEAM POWER** (fig. no.22.2)

1. Rotate the knob to shift from one % power to another % (use cursor to locate the position)
2. To select a particular steam power between 25,50,75,100 rotate the knob & take the cursor below that value and "SINGLE PRESS".
3. Once set, the user will not have to set it again unless the user wants to change the steam power.
4. "LONG PRESS" for auto return.

- **PUMPING TIME (FOR SERVICE ENGINEER)** (fig. no.22.3)

1. This has to set to 2 sec.
2. One can change the value by rotating the knob.
3. To save this value "SINGLE PRESS"

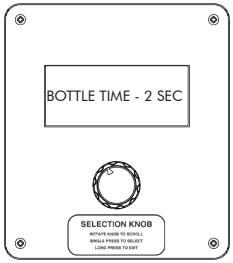


fig. no.22.3

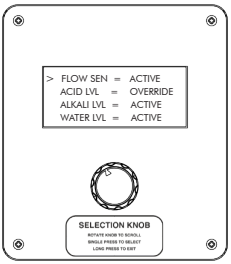


fig. no.23.1

- **SENSOR STATUS** (fig. no.23.1)

1. "SINGLE PRESS" the knob on SENSOR STATUS parameter in SETUP menu to select the setting. The arrow on the leftmost side of the screen indicates the cursor position. "SINGLE PRESS" to scroll down through the parameters. Here are two states in every parameter.
   i. **Override** - To override the sensor or to disable the sensor.
   ii. **Active** - To enable the sensor.
3. To save the changes done in sensor status "SINGLE PRESS" the knob when the cursor is on the last parameter, the changes made will be saved and will be retained even if the Instrument is powered OFF and ON.
4. To exit the setting without saving "LONG PRESS" the knob. It will exit and come to the previous screen / menu.

- **BOILER FILLING** (fig. no.23.2)

1. This indicates that the boiler is filling.
2. If there is no water flow at the inlet it will show the error of "INCREASE THE FLOW"

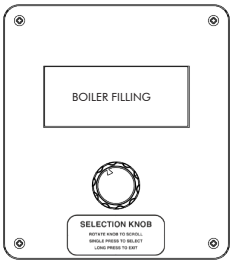


fig. no.23.2

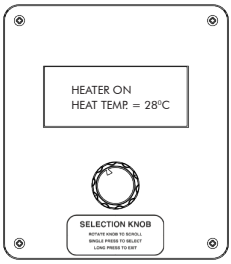


fig. no.23.3

- **HEATER ON** (fig. no.23.3)

1. The heater is turned on.
2. User can see the current temperature of boiler on the screen.
3. The heater will remain ON until the temperature of the boiler reaches to 98^0 C .

- **DOSING REAGENT** (fig. no.24.1)

1. This window indicates the automatic dosing of acid, alkali and water for KDI040 .
2. It indicates automatic dosing of alkali and water for KDI030 .

fig. no.24.1

- **PROCESS** (fig. no.24.2)

1. This window shows the starting of steam dosing and distillation process.
2. It will display the input values provided by the user and dosing time.
3. The dosing time is the indication of remaining time for the process to be completed.
4. When flow rate is reduced in condenser error is displayed.(INCREASE FLOW RATE)

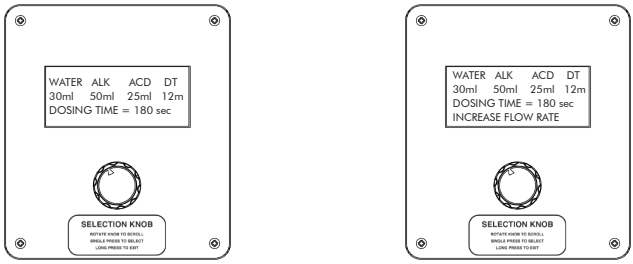


fig. no.24.2

NOTE :

- User have to increase the flow within 60 sec after display of message showing flow error.
- If user fails to increase the flow, the process will be automatically terminated after 60 sec.

5. After completion of steam dosing it will return to the main menu on the display and user can remove the conical flask and the test tube.
6. For next sample of distillation load the next test tube on loader and place the conical flask.
7. After placing the test tube, single press the selection knob it will automatically start the next distillation process.

- **AFTER COMPLETION OF STEAM DOSING**

1. Remove the conical flask and “SINGLE PRESS“ the knob to end the process. (fig. no.25.1)

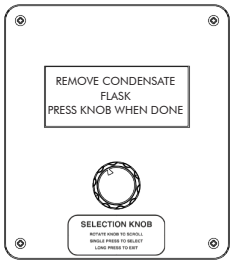
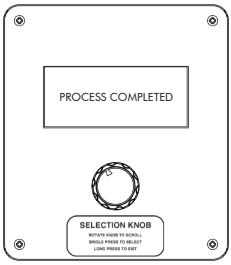


fig. no.25.1



2. This window indicates the completion of steam dosing process, with buzzer indication. (fig. no.25.2)

fig. no.25.2

3. Remove the test tube when this window appears. (fig. no.25.3)

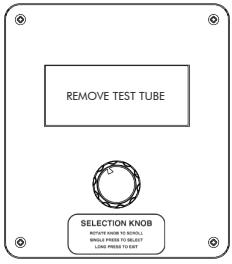
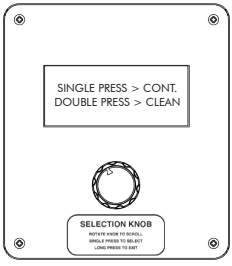


fig. no.25.3



4. “SINGLE PRESS” the knob to continue next process.
5. “DOUBLE PRESS” the knob to start the cleaning cycle.
6. The cleaning cycle is of 4 min. (fig. no.25.4)

fig. no.25.4

ERRORS

- **DOOR CHECK** (fig. no.26.1)

1. This error window will appear when the door is open during the process.
2. This window will disappear after closing the door and the process will be resumed.

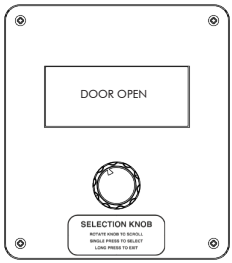


fig. no.26.1

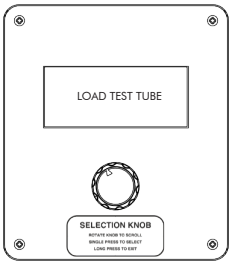


fig. no.26.2

- **TUBE CHECK** (fig. no.26.2)

1. This error window will appear when test tube is not loaded into the loader before the process starts.
2. In process test tube removed.

- **FLOW CHECK** (fig. no.26.3)

1. This error window will appear when the flow rate is less in the condenser during the process & before the process starts.

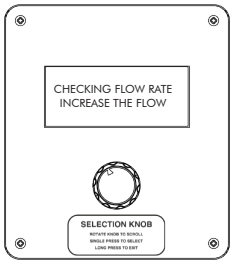


fig. no.26.3

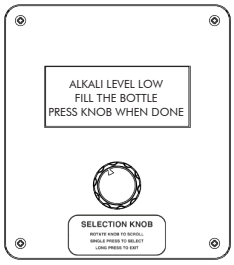


fig. no.26.4

- **LEVEL CHECK (ACID, ALKALI, WATER)**

(fig. no.26.4)

1. This error window will appear when the level of reagents is less in the reagent bottle.
2. This window will disappear after filling the bottle with reagent (“SINGLE PRESS“ the knob).

TROUBLESHOOTING

1. If the unit is not turning ON.
   - Check the power supply in AC mains.
   - Make sure power cable is inserted to the socket properly.
   - Check whether the main switch is ON or OFF.
   - Check if the illuminated switch is OFF.
   - Ensure the main switch is ON.

2. If the fuse is blown.
   - Remove the power cable from unit.
   - Remove the holder from the back side of the equipment, in the control panel box .
   - Check the fuse, if it is damaged please change the fuse.

WARRANTY REGISTRATION

Please handover this registration form to the distributor from where you have purchased this product. The warranty is valid only when this warranty registration form is received by us within 30 days from the date of purchase.

Product : KDI030 ☐ KDI040 ☐ Product Sr. No.: _____

Date of Invoice : _____ Invoice No.: _____

Customer name & address

Name : _____

_____

Address: _____

_____

_____

_____

Telephone: _____

E-mail: _____

Customer sign & seal

Dealer name & address

Name : _____

_____

Address: _____

_____

_____

_____

Telephone: _____

E-mail: _____

Dealer sign & seal

BOROSIL®
Scientific
STATEMENT OF WARRANTY

Borosil confirms that this product has been manufactured in accordance with our technical specifications and quality requirements.

- Borosil warrants the product from manufacturing and workmanship defects for a period of 12 months from the date of invoice.
- Warranty is void, if equipment and apparatus is not operated as prescribed in the operating manual supplied along with the unit.
- To be covered under warranty.
  - » Units have to be connected to standard 230V 50Hz, 6A wall sockets with proper earthing.
  - » Warranty does not cover rust and physical damage to metal parts due to corrosive environment in the lab and breakage of glass parts.

Terms :

- » In the event of malfunction due to defect, the buyer will have to follow the Borosil's service process.
- » Certain units can not be serviced / rectified at the buyer's place and the units may have to be brought to Borosil's service center as advised by Borosil's representatives.
- » In no event shall Borosil be liable for consequential or incidental damages.

INVOICE DATE	BUYER	AFFIX SERIAL NUMBER
INVOICE#		

Dealer name & address	Dealer sign & seal

LABQUEST BY BOROSIL®

: MANUFACTURED BY :

Borosil Scientific Limited

Plot No. 7, Sr. No. 234, 235 & 245,
Indialand Global Industrial Park,
Hinjewadi Phase 1, Pune - 411057.
Write to us on above address.

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1101, G-Block, Parinee Crescenzo,
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: CUSTOMER CARE CONTACT :

Phone : 1800 22 4551 | Email : lab.support@borosil.com

Website : www.borosilscientific.com