



Gel Dryer Model FB-GD-45 User's Manual

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Safety Information

Alert Signals



Warning

A warning alerts you to actions or conditions that can cause personal injury.



Caution

A caution alerts you to actions or conditions that can cause faulty results or product damage.



Note

A note informs you that a special condition exists or that a general rule should be followed.

Purpose

This manual applies to the FisherBiotech Gel Dryer. It is written for those people who use and maintain the Gel Dryer and its accessories.

Safety Information

Throughout this manual, visual cues are used to help you identify important information.

Unpacking



Caution

For proper operation and to ensure compatibility with your Gel Dryer, use only those accessories and options provided by Fisher which are designed specifically for the system.

Use only Fisher factory replacement parts. If you need parts for your Gel Dryer, contact Fisher's Instrument Service Division.

Plan the location of your Gel Dryer to allow for easy operation.

Protect against physical damage. The Gel Dryer should be protected from dirt, spray and airborne debris.

Ensure that the unit is set up to conform to local regulations and within the guidelines for good laboratory practice.



Caution

When not being used, the porous support pad and the plastic support mesh may be stored in the clear plastic bag supplied with the packaging. However, to avoid damage to the Gel Dryer's surface, never allow the clear plastic bag to contact the heated Gel Dryer surface.

Handle the Gel Dryer with care. Do not drop or subject the unit to mechanical shocks.

Receiving and Unpacking the Gel Dryer

Unpack the Gel Dryer and its accessories from the shipping container. Save this container for returning the unit in the event that service is required.

Check the cartons and components for signs of damage. Check the packing list to ensure all parts are present. Damaged or missing items should be reported to the shipping agent within 15 days.

If the Gel Dryer will not be set up immediately, store the Gel Dryer and accessories in their original shipping containers until ready for installation. The storage area should be clean and dry and should not subject the Gel Dryer to extremes in temperature.

Parts Supplied

The following is a list of the parts and documents supplied with the Gel Dryer.

1 power cord

3 vacuum hose connectors for 1/4", 3/8", and 1/2" I.D. hose

1 warranty card

1 porous support pad

1 plastic support mesh

1 user's manual

Set Up

Selecting a Location

The Gel Dryer should be set up on a level, stable laboratory bench or cabinet.

Locate the Gel Dryer so that there is at least 10 cm (4 inches) of clearance around the back, sides, and top of the Gel Dryer.

Select a location for your Gel Dryer which has an appropriate source of electrical power. The power source must correspond to the data plate mounted on the rear of the unit.

Select a location away from solvent vapors and flammables where no explosion hazard exists.

The Gel Dryer must be connected to a suitable vacuum source for operation (see Specifications). Select a location which will allow convenient access to the vacuum source.



Caution

Ensure that the timer knob is set to "0" before plugging the Gel Dryer into the power source.



Caution

Never allow the clear plastic bag to come in contact with the heated Gel Dryer surface.



Caution

The plastic support mesh must be in place in order for the Gel Dryer to perform properly.



Caution

Be careful not to over tighten the vacuum connector, as this may damage the connector.

Set Up Procedure

1. Remove the unit from the shipping carton and place it onto the laboratory bench.
2. Plug the power cord into the Gel Dryer on the right-hand side near the back of the unit.
3. Plug the unit into the power source.
4. Remove the plastic support mesh from the clear plastic bag and place it, smooth side up, on the platen of the Gel Dryer.
5. Based on the inner diameter of the vacuum hose you intend to use, select one of the two vacuum hose connectors. Connectors are provided for 1/4", 3/8", and 1/2" inside diameter hose.
6. Thread the selected connector into the vacuum outlet on the left side of the unit, in the clockwise direction. For this purpose, a 9/16" deep-well socket is recommended.
7. Connect the Gel Dryer to the vacuum source using thick-walled vacuum hose.

SET UP



Note

For the cover seal to seal automatically, the vacuum pump must be capable of achieving proper pressure and flow (see Specifications). Use of a high vacuum pump, such as the FisherBiotech diaphragm vacuum pump or the Fisher Maxima D2A, will provide the fastest, most consistent drying of your gels.



Caution

It is strongly recommended that both a liquid pretrap and a cold condensation trap be used to prevent liquid or water vapor from damaging the vacuum pump. The condensation trap can be mechanically refrigerated unit, or one can be constructed using a Dewar flask and a cold finger, or a vacuum flask immersed in liquid nitrogen or packed dry ice. See Figure 1-2. If a diaphragm pump is used, a liquid trap alone may be sufficient to protect it, See Figure 1-3.

Figure 1-2. Set-up with a condensation trap.

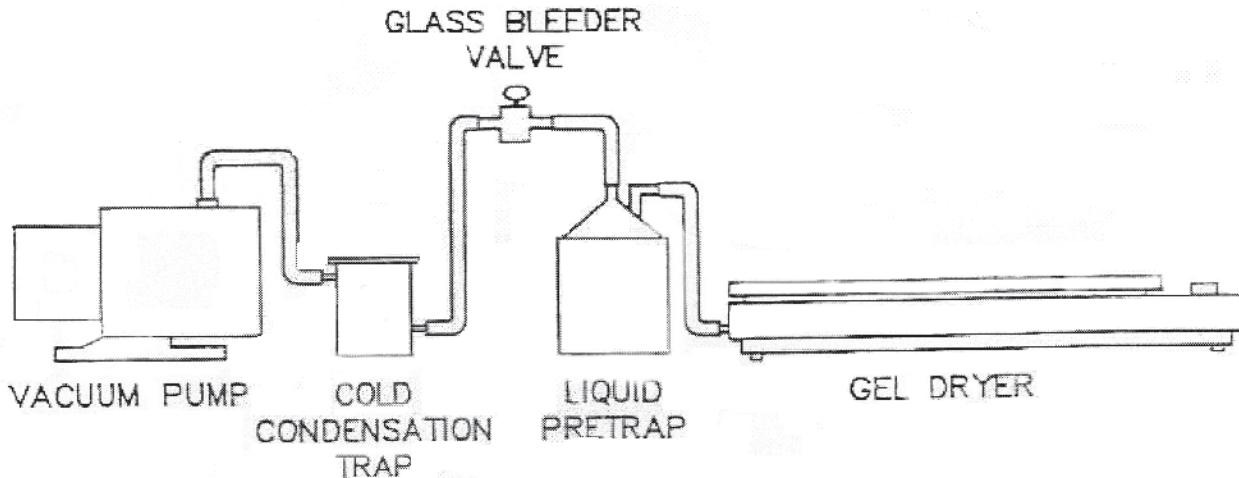
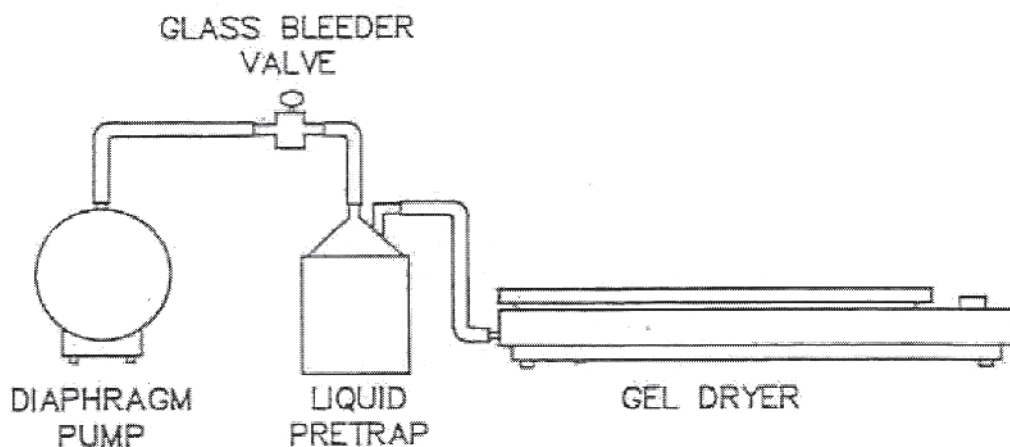


Figure 1-3. Set-up without a condensation trap.



Operation

Operation Procedure

1. Roll the cover seal up or lay it back over the control panel to expose the platen of the Gel Dryer.
2. Select a support for your gel and place it in the platen of the Gel Dryer.

The plastic support mesh is sufficient for most gels, and will allow for the shortest drying time. Very soft gels may be imprinted by the support mesh unless more than one sheet of filter paper is placed under the gel. Also, some filter paper residue may build up beneath the support mesh, but regular removal of this residue will prevent clogging of the system.

The porous support pad may be more desirable for very soft gels. However, drying time will be significantly longer, especially for agarose gels.

3. Place at least one sheet of moistened filter paper (or chromatography paper), cut slightly larger than your gel(s), on the selected gel support. When using the support mesh alone, two or three thickness of paper are recommended. Using thicker paper will require fewer layers. Center the filter paper on the Gel Dryer if drying only one gel
4. Place the gel(s) on the filter paper and smooth out any air bubbles.
5. Place a porous membrane over the gel(s) and remove any air bubbles from between the gel(s) and the membrane.
6. Place the cover seal over the gel(s) and smooth out any air bubbles.



Caution

When using the porous support pad, the plastic support mesh must still be in place on the bottom of the Gel Dryer platen in order for proper vacuum to be obtained.

The plastic support mesh and the porous support pad must each be used with its smooth side up.



Note

DNA sequencing gels which are already adhered to a sheet of filter paper can be placed directly on the support mesh.

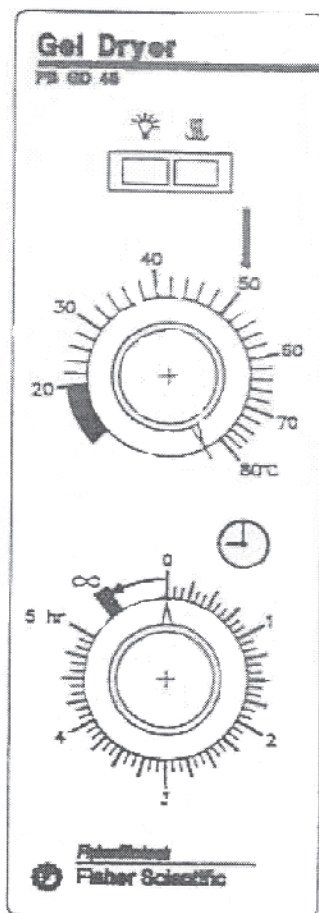


Caution

Failure to cover the gel with a porous membrane may cause the cover seal to stick to the gel, which may result in tearing of the gel.

OPERATION

Figure 2-1. Control Panel



7. Turn the temperature knob to the desired setting. The Gel Dryer is capable of heating from ambient temperature up to 80° C.

**Note**

If you wish to maintain a constant platform temperature below 20° C, place the Gel Dryer in a cold environment and turn the temperature knob to the white area below the 20° C mark.

**Note**

When timer knob is turned, the power indicator light illuminates to indicate that power is on. The heater indicator light illuminates when the heaters are activated. The heaters will cycle on and off once the set temperature is reached in order to maintain the set temperature.

The timer controls power to the heaters only. When the set time expires, only the heaters will turn off. The vacuum must be switched off manually.

**Caution**

Releasing the vacuum before the gel is completely dry may cause the gel to crack.

8. Use the timer control knob to turn on the power and set the desired heating time. Turn the knob clockwise to set time for up to 5 hours, or counterclockwise to 00 for continuous operation.
9. Turn on the vacuum source. The cover seal will automatically seal. The vacuum must be maintained until the gel is dry.
10. Turn off the heat and allow the gel to cool before releasing the vacuum. This will help minimize the dried gel.
11. Lift the cover seal before turning off the vacuum source.

Approximate Drying Times

Polyacrylamide Gels will dry in about one hour at the temperature setting of 80° C when run with pumps specified in the accessory section. Gels that are of higher concentration than a standard 6% Acrylamide Gel may require longer drying times. The drying time for these applications could be near 2 hours. Lower temperatures can be used for thick or gradient Gels. The drying time is reduced by having a good vacuum. The normal vacuum is in the range of 10-40 mm Hg.

Maintenance

**Warning**

NEVER immerse the Gel Dryer in water. Unplug the Gel Dryer before cleaning it.

**Caution**

Drying gels using only the plastic support mesh may cause a residue of filter paper dust to accumulate on the platen. Wipe this residue out of the platen with a damp cloth on a regular basis to prevent clogging of the vacuum port.

Both the plastic support mesh and the porous support pad are made of polypropylene, and may be damaged by exposure to certain organic solvents. They should be rinsed thoroughly with water after use and air dried. If infectious agents are spilled on them, they can be steam autoclaved to disinfect them.

Cleaning

The platen of the Gel Dryer is coated with Teflon. Use only mild soap and water and a soft cloth for cleaning it. DO NOT use abrasive cleaners or scouring pads.

Troubleshooting

This table guides you in tracking down the cause of a problem based on a symptom description.

| Symptom | Probable Cause | Recommended Action |
|---|---------------------------------------|--|
| Power Indicator light does not illuminate | Timer not set | Turn timer knob past set point or 1 hour, then set point. |
| | Power cord not plugged in | Make sure power cord is plugged into wall outlet. |
| | Power cord not plugged into Gel Dryer | Make sure power cord is plugged into Gel Dryer. |
| | Faulty or blown fuse | Check fuse, replace if necessary. |
| | Faulty power cord | Replace power cord. |
| | Timer defective | Call Fisher Service. |
| | Defective power indicator light | Call Fisher Service. |
| Failure to heat | Temperature not set above ambient | Set temperature above ambient. |
| | Timer not set | Turn timer knob past set point or 1 hour, then to set point. |
| | Electrical system failure | Call Fisher Service. |
| Platen heats to 95° C, then shuts down | Temperature controller failure | Call Fisher Service. |
| Platen heats, but heater indicator does not light | Defective heater indicator light | Call Fisher Service. |
| Cover seal does not seal | Cover seal misaligned | Reinstall cover seal. |
| | Cover seal damaged | Replace cover seal. |
| | Vacuum pump not functioning | Check pump. |
| | Vacuum tubing leaks | Check tubing for leaks. |
| | Vacuum tubing clogged | Check tubing for clogs |

Replacing the Cover Seal

If the cover seal becomes misaligned or damaged, sufficient vacuum may not be attainable. The cover seal must be reinstalled or replaced to correct the problem.

Removing the Cover Seal

A metal bar is used to hold the cover seal onto the platen. To remove the cover seal, perform the following procedure:

1. Remove the five Phillips head screws securing the metal bar.
2. Remove the bar and lift off cover seal.

Installing the Cover Seal

To install the replacement cover seal, reverse the steps in the removal section taking care to align the holes in the cover seal with the holes in the platen. Check to make certain the cover seal is aligned over the platen edges to insure proper vacuum seal.

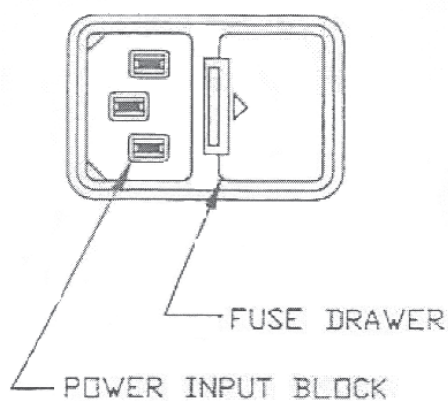
Replacing the Vacuum Hose Connector

The vacuum hose connector supplied with the Gel Dryer may be replaced if necessary for repair or to install another vacuum hose connector for a different sized vacuum hose.

Removal of the Vacuum Hose

To prevent damage to the vacuum hose connector, use a 9/16 inch deep well socket for removal, turning the connector in the counter-clockwise direction.

Figure 3-2. Power Input Block



Installation of the Vacuum Hose

Install the vacuum hose connector using a 9/16 inch deep well socket, turning the connector in the clockwise direction. To protect the connector from damage, do not over-tighten.

Replacing Fuses

To inspect and/or replace the fuses, perform the following procedure:

1. Remove the power cord from the wall outlet and from the socket in the power input block. Locate the fuse drawer in the power input block. See Figure 3-2.
2. Insert a small flat-bladed screwdriver or your fingernail under the right edge of the fuse drawer and slide the fuse drawer out.
3. Turn the fuse drawer over and you will see the fuses inside. Pull the fuses out and inspect them. If defective, replace with fuses of same type and rating only.
4. After replacing or reinserting the fuses, slide the fuse drawer into the power input block until it snaps into place.
5. Reinsert the power cord into the power input block.

Fisher Service

Fisher Scientific actively supports the products it manufactures and distributes.

Instrument Service

Fisher Instrument Service representatives are skilled at troubleshooting and repairing the Gel Dryer. Service is available at any of the Instrument Service District Offices located throughout the country. For service, or for information regarding service contracts or parts. Please call your Fisher Scientific Service District Office.

Technical Service

Fisher maintains a technical support organization which is available for help regarding use and maintenance of your Gel Dryer. Our technical support group is staffed with courteous and competent personnel trained in the use of the Gel Dryer.

Fisher Technical Service-Hot-Line can be reached by dialing: **1-800-388-8355**

Specifications

| | |
|-------------------------------------|--|
| Line Voltage | 115 VAC 230 VAC |
| Line Frequency | 50/60 Hz |
| Power Consumption | 720 watts |
| Dimensions | H x W x D 3-7/8 x 25-13/16 x 17-3/4 inches 9.8 x 65.5 x 45.1 centimeters |
| Drying Surface | 14-1/2 x 18-1/2 inches 36.8 x 47 centimeters |
| Weight | 25.5 lbs (11.6 kg) |
| Temperature Control | ambient to 80° C |
| Timer on Heater | Zero to five hours; hold position for continuous operation |
| Vacuum Pump Requirements | Ultimate pressure; 10.7 mm Hg Free air displacement; 29.5 L/min |
| Vacuum Hose Connectors | Accepts 1/4", 3/8" or 1/2" vacuum hose |

Replacement Parts & Accessories

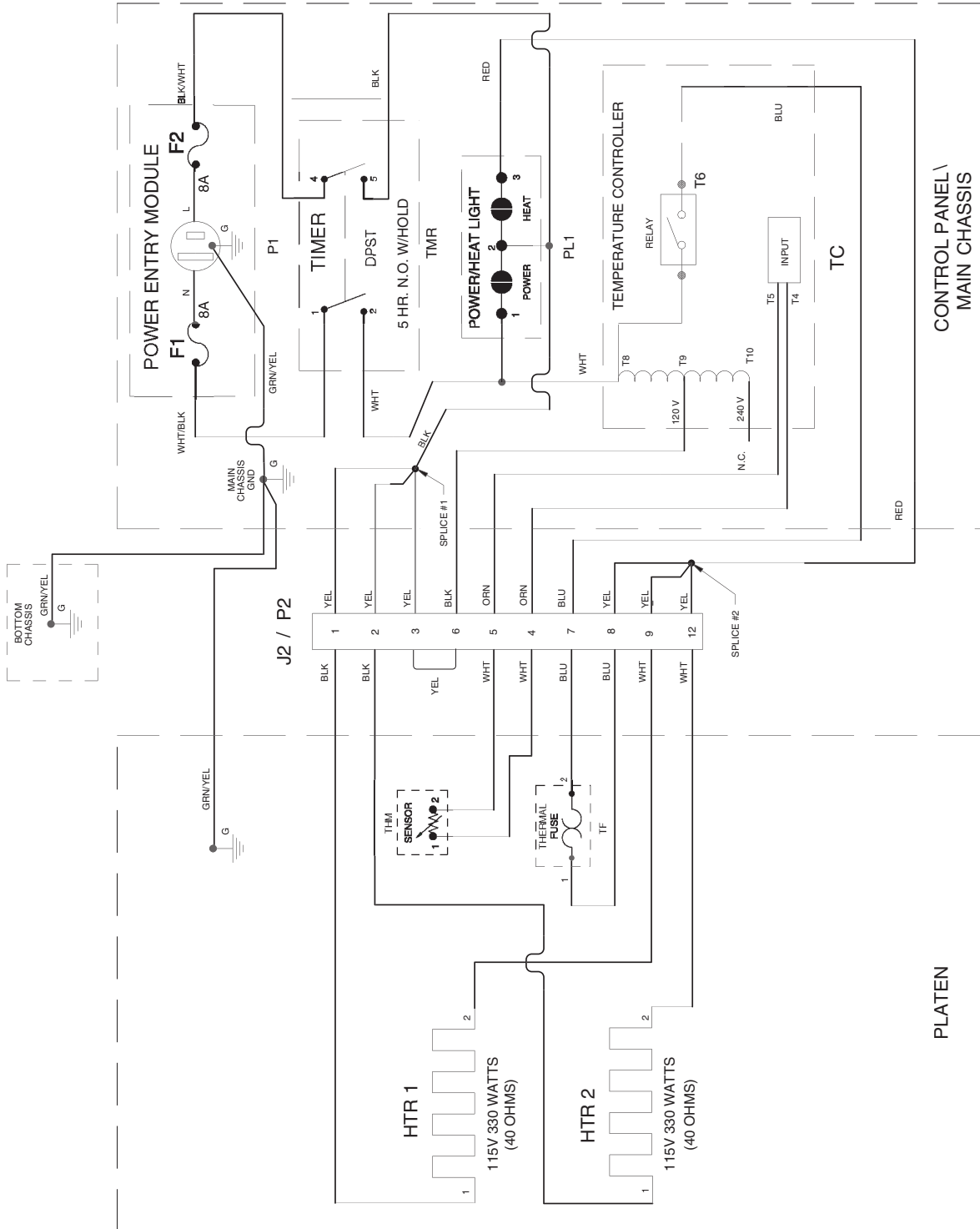
Replacement Parts

| Description | Number | Reference |
|--|---------------|------------------|
| Fuses (115 V) | SPN 13775 | F1, F2 |
| (230 V) | SPN 83105 | F1, F2 |
| Fuse Drawer (115 V) | SPN 76867 | Fig. 3-2 |
| (230 V) | SPN 83104 | Fig. 3-2 |
| Power Input Block | SPN 76866 | Pi |
| Timer | SPN 76820 | TMR |
| Power/Heat Indicator Light (115 V) | SPN 76865 | PLI |
| (250 V) | SPN 93106 | PLI |
| Heaters | SPN 76821 | HTR I, HTR 2 |
| Thermal Fuse | SPN 76868 | TF |
| Sensor | SPN 76825 | THM |
| Temperature Controller (115 V) | SPN 83010 | TC |
| Temperature Controller (230 V) | SPN 83188 | |
| Power Cord (North America) | 15-188-37 A | |
| Vacuum Hose Connector (1/4" hose I.D.) | FB-GD-20 | |
| Vacuum Hose Connector (3/8" hose I.D.) | FB-GD-21 | |
| Vacuum Hose Connector (1/2" hose I.D.) | Fb-GD-25 | |
| Plastic Support Mesh | FB-GD-22 | |
| Porous Support Pad | FB-GD-23 | |
| Cover Seal | FB-GD-24 | |

Accessory Items

| Description | Fisher Catalog Number |
|---|------------------------------|
| Vacuum Pump (Fisher Maxima D2A) (110 volt 50/60 Hz) | 01-057-2A |
| Diaphragm Vacuum Pump (110 volt 50/60 Hz) (220 volt 50 Hz) | FB-DVP-353 FB-DVP-353A |
| Liquid Trap | FB-GDT-45 |

Wiring Diagram



Warranty

Laboratory instruments and equipment manufactured by Fisher Scientific Company L.L.C. – Laboratory Equipment Division (hereinafter called “the Company”) are warranted only as stated below.

Subject to the exceptions and upon the conditions specified below, the Company agrees, at its election, to correct by repair, by replacement, or by credit to the purchaser, any defect of materials or workmanship which develops within one year (13 months for refrigerator and freezer products) from the date of purchase by the original purchaser by the Company or by an authorized dealer of the Company provided that investigation or factory inspection by the Company discloses that such defect developed under normal and proper use

The exceptions and conditions mentioned above are the following:

- a. The Company makes no warranty concerning components or accessories not manufactured by it, such as tubes, batteries, etc. However, in the event of the failure of any component or accessory not manufactured by the Company, the Company will give reasonable assistance to the purchaser in obtaining from the respective manufacturer whatever adjustment is reasonable in the light of the manufacturer’s own warranty.
- b. The Company shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own service personnel or authorized dealer personnel unless such repairs by others are made with the written consent of the Company.
- c. **THE COMPANY MAKES NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, EITHER IN FACT OF BY OPERATION OF LAW,...STATUTORY OR OTHERWISE.**
- d. The above warranty and the above obligations to repair, replace, or credit are complete and exclusive and the Company expressly disclaims liability for lost profits or for special, indirect, incidental, consequential, or exemplary damages of any nature whether attributable to contract, warranty, negligence, strict liability, or otherwise even if the Company has been advised of the possibility of such damages.
- e. Representations and warranties made by any person, including dealers and representatives of the Company, which are inconsistent or in conflict with the foregoing warranty shall not be binding upon the Company unless reduced to writing and signed by an officer of the Company.



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