

# User's Manual

## High Vacuum Diaphragm-type Dry Teflon Vacuum Pump

Model: DTC-60



### Request to Users

Please read this manual thoroughly to ensure safe and effective use of the equipment.

Keep this manual in a safe place.

Due to periodic improvements in performance, the equipment described in this manual is subject to changes in dimensions and specifications without prior notice.

**ULVAC KIKO,Inc.**

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Pages with a shaded background are those which contain items related to safety.

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## **Before Using the Equipment**

Thank you for purchasing this product. Your custom is very much appreciated. This pump is designed solely for vacuum discharge, and may malfunction or cause accidents if not handled appropriately. Read the manual thoroughly, and pay due attention to inspections, maintenance, and safety.

### **Personnel Handling the Equipment**

Only persons who have read this manual thoroughly, and have sufficient understanding of safety, pump specifications, and method of operation, may operate this pump.

### **Read the Manual Thoroughly**

Read the manual thoroughly in order to use the equipment correctly. Read the section on Safe Use particularly closely.

### **Keep This Manual in a Safe Place**

After reading this manual, be sure to keep it in a safe place which is readily accessible to others needing to use it.

### **Copying This Manual Is Prohibited**

No part of this manual may be copied for use by a third party without the express permission of the manufacturer.

### **Statutory Requirements for Disposal**

Follow all statutory and local authority regulations when disposing of this pump.

### **Safety During Repair**

Please provide a full description of the circumstances of use (particularly the use of dangerous materials) for the safety of repair personnel when requesting the manufacturer for repairs to the pump. Your request for repair of may be refused if these circumstances are unclear.

## Checks When Opening Packaging

Check the following after opening the packaging.

- (1) Is the product as you requested?
- (2) Are the accessories and necessary parts included?

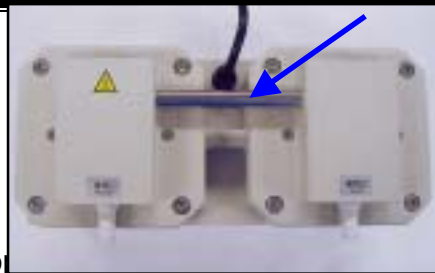
Standard accessories

User's manual	-----	x 1
Inlet and outlet caps (fitted to inlet and outlet)	-----	x 2
Power plug adapter (attached to power cord)	-----	x 1

- (3) Is the pump damaged in any way?
- (4) Are any external screws or inlet and outlet pipes loose? Are any components missing?

Contact your agent or the sales division of the manufacturer if there are any problems with the pump.

### Note



Do not grip or pull the protector pipe on the top of the pump when removing it from the packing.

## Using the Pump Safely

To ensure that the pump is handled correctly, read this section thoroughly before use.

This manual and the warning labels on the pump include safety icons as an aid to understanding safety requirements.

These safety icons warn the operator and others of possible dangers and damage and should always be followed.

### Safety icons

The meanings of the safety icons are as follows.

#### **Danger**

Incorrect handling of the equipment is very likely to result in death or serious injury to the operator.

#### **Warning**

Incorrect handling of the equipment may result in death or serious injury to the operator.

#### **Caution**

Incorrect handling of the equipment may result in light or medium injuries to the operator or damage to the equipment.

#### **Note**

Incorrect handling of the equipment may result in damage to the equipment and hinder its correct operation.

#### **High Temperatures**

Some components reach surface temperatures in excess of 60°C during pump operation. Burns may result if these components are touched during operation.

#### **Electric Shock**

To prevent electric shock, always shut-off the primary power supply before working on electrical wiring, or engaging in any electrical work.

## Cautions for Safety in Use

### **Danger**

#### Applications

- (1) This pump is not designed to be explosion-proof, and should therefore not be used to discharge explosive gases.
- (2) In addition to discharge of gas via the outlet, gas may also leak from other parts of the pump, and it should therefore not be used with toxic gases. If toxic gas is discharged for any reason it is important to note that the interior of the pump will be contaminated by the gas, requiring appropriate caution during maintenance.

#### Maintenance and Repair

- (3) When requesting the manufacturer's service division to dismantle and repair the pump, always note the gas which the pump has been used with on the Usage Check Sheet. Note that if it has been used to discharge toxic gas for any reason it will be contaminated. **Please be aware that use with some gases will preclude dismantling and repair.**

### **Warning**

#### Installation

- (1) Do not use the pump in an explosive atmosphere. Such use may result in injury and fire.
- (2) Ensure that there are no inflammable materials such as solvents in the vicinity when using the pump.
- (3) Ensure that the motor is freely ventilated to prevent overheating which may result in fire or burns.

#### Power Supply

- (4) Always remove the power cord from the wall socket before checking or repairing the pump. Failure to do so may result in electric shock, or the pump suddenly starting and causing injury.
- (5) Ensure that the relevant wiring is in accordance with technical standards for electrical equipment and wiring regulations. Incorrect wiring may result in fire.
- (6) Remove the power cord from the wall socket before connecting any wiring. Connecting wiring with the power on may result in electric shock.
- (7) Always ensure that the pump is correctly earthed. A dedicated earth leakage breaker is recommended. Failure to earth the pump correctly may result in electric shock if a fault or earth leakage occurs.
- (8) Use the pump only at the rated voltage. Use at other than the rated voltage will interfere with operation of the overload protection device, and this may result in the motor burning out, or fire.
- (9) Do not damage, modify, pull the power cord, or place objects on it. Damage to the cord may result in electric shock or fire.
- (10) Always fully insert the power cord into the socket. Partial insertion may result in electric shock.
- (11) Remove the cord from the socket while holding the plug. Failure to do so may result in electric shock.
- (12) Touching the power cord with wet hands may result in electric shock.
- (13) Touching electrical wiring etc while inserting the power plug may result in electric shock.

## Warning

### Operation

- (14) This pump is not designed to be explosion-proof. When using the pump, ensure that there are no inflammable materials such as solvents, or explosive gases, in the vicinity. Use under such conditions may result in injury or fire.
- (15) Inserting fingers or objects into the motor inlet may result in electric shock, injury, or fire.
- (16) Operating the pump with the discharge outlet blocked, or with a device which prevents passage of gas to the discharge outlet, may result in rupture of the pump. The internal pressure of the pump rises and the pump body may rupture and the motor become overloaded.  
This pump is not designed to be pressure-resistant. The internal pressure of the pump is limited to 0.03 MPa (gauge pressure).

### Maintenance and Repair

- (17) The pump should be dismantled or repaired only by a repair technician trained by the manufacturer.
- (18) To prevent ingestion of microscopic particles resulting from wear of components, **use a dust mask and gloves during repair work.**

## Caution

### Installation

- (1) The fine clearances used in this pump require that the following conditions be satisfied during storage, installation, and operation.
  - 1. Ambient temperature of 0~40°C and maximum relative humidity of 85% during operation.
  - 2. Other conditions for storage and operation.
    - a) Level floor of sufficient strength.
    - b) No condensation
    - c) Dust-free environment
    - d) Well ventilated
    - e) Environment free of corrosive or explosive gas.
    - f) Not subject to direct sunlight.
    - g) No danger of fire.
    - h) Maximum ambient temperature of 40°C during assembly of pump.
- (2) To prevent back injury, **always use both hands to lift pumps.**
- (3) Microscopic particles resulting from wear of components are discharged from the outlet and contaminate the room. If necessary, connect a pipe from the discharge outlet to the outside of the building.

### Operation

- (4) **Do not use in applications involving organ transplants, or contact with body fluids or living tissue.**
- (5) Touching rotating components (eg motor, main shaft, axial joints, cooling fan) while the pump is in operation may result in injury.
- (6) The overload protector operates when the pump becomes excessively hot. Touching it in this condition may result in burns.
- (7) Touching the motor while the pump is in operation or while it is still hot immediately after having been switched off may result in burns.
- (8) Do not insert fingers or objects into, or peer into, the inlet or outlet during operation.



## Caution

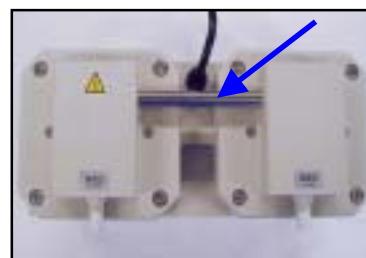
### Maintenance and Repair

- (9) Dispose in accordance with legislation for disposal and cleaning of waste products, handle as industrial waste, and do not incinerate. Toxic fluorine gas is generated by incineration of fluorine-based plastics.
- (10) If the pump ceases operation, turn power OFF (set switch to O) immediately to prevent accidents, remove the power cord from the wall outlet, and contact your dealer or the manufacturer for inspection and repair.
- (11) Leave the pump for at least 30 minutes until it has cooled, and begin operation again. Touching the pump immediately after it has stopped may result in burns.

## Note

### Installation

- (1) The pump may malfunction if it is subjected to shocks or tipped over on its side.
- (2) Do not hold or push the tube at the top of the pump (see below). Damage to the tube may affect performance of the pump.



### Applications

- (3) This pump is not designed to be corrosion-proof. Use it only with clean air at normal temperature, or with gases of equivalent characteristics.
- (4) This pump is designed for general corrosion resistance, however it is not resistant to molten alkali metals such as molten sodium, to fluorine at high temperatures, and to some oxides of fluorine.
- (5) Ingestion of liquids or compressed and gases into the pump will result in damage and prevent proper operation.
- (6) Ingestion of rubbish and dust in the air entering the pump will interfere with its proper function. If the air is likely to contain rubbish or dust, a filter should be fitted to the inlet to protect the pump.
- (7) Ducting should always be fitted to the pump outlet if toxic corrosive gases, or steam, enters the pump.



## Note

### Operation

- (8) Use the pump within an ambient temperature range of 40°C. Use at high ambient temperatures will dramatically reduce the life of the pump.
- (9) Back pressure at the outlet while the pump is starting may overload the motor.
- (10) The thermal protection relay operates when the pump reaches a very high temperature. Touching the pump in this condition may result in burns.
- (11) To maintain the performance of the pump, always ensure that it is cleaned internally after use. Clean by ingesting clean air for 3~5 minutes under no-load conditions.

### Maintenance and Repair

- (12) The fine clearances used in this pump require skill in its assembly. If a repair technician is unavailable, replacement of all consumables should be left to the manufacturer's service division.