

STP-H600/H1000 Series

Turbomolecular Pump

INSTRUCTION MANUAL

(Third Edition-b)

**Read through the Safety Precautions of this Manual carefully before using the STP pump.
Keep this Manual in a place where you can quickly access it at any time.**

SAFETY PRECAUTIONS

The Safety Precautions in this Manual constitute guidelines to protect operators, the STP pump and its peripheral equipment.

To avoid personal injury and prevent product and/or peripheral equipment damage, observe the Safety Precautions as well as the general safety rules (your country's laws, regulations, safety standards and so on).

SYMBOLS

The following symbols are used in this manual:



Death or Serious Personal Injury

Failure to follow the guidelines marked with this symbol may result in death or serious personal injury.



Minor Personal Injury, Product and/or Peripheral equipment Damage

Failure to follow the guidelines marked with this symbol may result in minor personal injury, product and/or peripheral equipment damage.



Items you must follow during operation and maintenance.

Seiko Seiki cannot perfectly anticipate circumstances of all of hazards or problems. The scope of anticipation is limited to the precautions

included in the  and  specified in this manual.



- ◇ The STP pump is provided with a high-speed rotor. Secure the STP pump according to the specified method. Failure to do so may lead to serious personal injury, product and/or peripheral equipment damage if any abnormality/error occurs in the rotor.
- ◇ The STP pump operates at high temperatures while the baking heater is in operation. NEVER touch the STP pump and its peripheral equipment while the baking heater is in operation. Operators can burn hands.
- ◇ Always exhaust residual gases thoroughly from the STP pump when removing the STP pump from the vacuum equipment. Residual gases in the STP pump may cause an accident which, for certain gases, may involve serious injury or death. Confirm the characteristics of the gas to be used, referring to the Material Safety Data Sheet (MSDS) you obtain from the gas supplier. Wear personal protective equipment if necessary.
- ◇ NEVER throw the battery into fire nor heat it. Failure to do so may result in an explosion, production of fire and/or serious personal injury. Observe the instructions given by the battery maker, the national and/or local government when disposing of the battery.
- ◇ Exhaust residual gas thoroughly when disposing of the STP pump. If the STP pump is used for any toxic or reactive gas, always clean the STP pump and dispose of it as industrial waste in accordance with guidelines given by the national and/or local government. Residual gas in the STP pump may cause an accident which, for certain gases, may involve serious injury or death.
- ◇ Always remove the battery from the STP control unit when disposing of it. Failure to do so may result in fire or other accident.



- ◇ NEVER use any gas that is not specified as usable in this Manual. The use of such gas may corrode the STP pump and damage it.
- ◇ Always check the STP pump has stopped, then turn OFF the primary power (switch the breaker "OFF") before proceeding to any of the following operations. Failure to do so may cause the STP pump to rotate accidentally, which may injure operators seriously or result in electric shock.
 - Connect or disconnect cables;
 - Connect an external battery;
 - Perform maintenance and inspections such as replacement of the internal battery and/or fuses as well as inspections of deposit and/or the air cooling fan (when replacing fuses, always disconnect the internal battery connector);
 - Perform investigations into probable causes and action/measures taken in the event of occurrence of a problem; or
 - Open and close the STP control unit front panel (hereinafter referred to as the front panel) in order to check or reset the "Battery Capacity Low Warning" (BATTERY NG) (hereinafter referred to as "BATTERY NG") lamp.
- ◇ The STP pump and the STP control unit are heavy products. Always use a crane or the like when lifting them. When lifting the STP pump by hands for unavoidable reasons, it must always be lifted by two or more people. Failure to do so may damage their hipbone or injure them due to occurrence of an accident such as fall.
- ◇ Install the STP control unit not only by fitting it with the front panel fitting screws but also by supporting it from the bottom side. Fitting the STP control unit with the screws only cannot sustain its weight, and therefore resulting in product damage.
- ◇ Always use the STP pump, STP control unit and STP connection cables of the same model name, serial number and cable length, which are specified on their own name plate. Failure to do so may result in product damage. If you use units with the same model name but different serial number and cable length; they must be adjusted. If the model names are different, they may not be used even when performing adjustment. In both cases, contact Seiko Seiki.



- ◇ Use the STP connection cable and the motor connection cable that have a label affixed

STP-H600/H1000
Series

The use of different cables may result in product damage.

- ◇ Connect the cables securely. NEVER bend nor place heavy objects on the cable. Doing so may result in electric shock or product damage.
- ◇ Always use the power voltage specified on the name plate for the primary power voltage of the STP control unit. Wire the power cable securely. Incorrect wiring may result in electric shock or product damage.
- ◇ NEVER remove the splinter shield from the STP pump. Doing so may result in product damage.
- ◇ DO NOT put foreign objects into the STP pump. Doing so may result in product damage.
- ◇ NEVER turn OFF the primary power (DO NOT switch the breaker "OFF") while the STP pump is rotating. Doing so may result in product damage.
- ◇ Perform investigations into probable causes and remove them before restarting the STP pump in the event of occurrence of a problem. The use of the abnormal STP pump may result in product damage.
- ◇ Always replace batteries once a year. Failure to do so, the battery backup operation may not run at the power failure.
- ◇ DO NOT connect internal batteries and external batteries simultaneously. Failure to do so may result in product damage.
- ◇ DO NOT move the STP pump and the STP control unit while the STP pump is in operation. Doing so may result in product damage.

INTRODUCTION

Thank you very much for purchasing Seiko Seiki's turbomolecular pump. The turbomolecular pump is designed to be installed in the vacuum equipment in to exhaust gases from it.

This manual covers all items necessary to ensure safe installation, operation and maintenance of the following series of the STP-H600/H1000 turbomolecular pump:

| Model Name | Specification |
|--------------|--|
| • STP-H600 | High-throughput type |
| • STP-H1000 | High-throughput type |
| • STP-H600C | High-throughput type, chemical specific *1 |
| • STP-H1000C | High-throughput type, chemical specific *1 |

For the specifications of other models of the STP-H600/H1000 pump series, contact Seiko Seiki.

*1: Chemical specific: STP pump with anti-corrosive treatment (responding to chlorine, fluorine or other system gases)

In this manual, the above STP pump series is collectively referred to as the "STP pump."

APPLIED STANDARDS

The STP pump conforms to the following directives and standards:

- ◇ Applied Directives
 - EC Machinery Directive
 - EC Electromagnetic Compatibility Directive
 - EC Low Voltage Directive
- ◇ Applied Standards
 - EN292-1
 - EN292-2
 - EN60204-1
 - EN55011 (class A)
 - EN50082-2

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- 2) Seiko Seiki pursues a policy of continuing improvement in design and performance of this product. The right is, therefore, reserved to vary specifications and design without notice. Understand that the product you purchased and its contents including specifications described in this manual may differ.

REQUEST

If you find inaccuracies or errors in this manual, advise your nearest sales representative office of Seiko Seiki or the following sections of them:

Seiko Seiki Co., Ltd. (Sales Headquarters)

1-8 Nakase, Mihama-ku, Chiba 261, Japan

Telephone: + 81-43-211-7972(VIP Service Sec, Direct)
+ 81-43-211-1401(VIP Sales Department, Direct)

Facsimile: + 81-43-211-8075

Seiko Seiki Co., Ltd. (Head office)

4-3-1 Yashiki, Narashino-shi, Chiba 275, Japan

Telephone: + 81-474-72-3173 (Direct)
+ 81-474-75-3111 (Central)
+ 81-474-75-3110 (Gatekeeper Office: Night, Holidays,)

Facsimile: + 81-474-71-1544

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Vacuum Innovative Products Sales Department

1-8 Nakase, Mihama-ku, Chiba 261, Japan

Telephone: + 81-43-211-1401(Direct)

Facsimile: + 81-43-211-8075

LIMITED WARRANTY

This WARRANTY applies to the customer to whom Seiko Seiki has delivered this product.

1. WARRANTY PERIOD:

Seiko Seiki warrants this product against defects for a period of one (1) year from the date of delivery or during the period specified in the agreement made by and between the customer and Seiko Seiki.

2. ITEM WARRANTED:

- 1) This warranty applies only to the product delivered from Seiko Seiki to the customer.
- 2) If any defect is found during this period, Seiko Seiki will, at its option, repair or recondition the product free of charge. The costs for repair or replacement of the product after the warranty period has passed will be at the customer's own charge.

3. DISCLAIMER:

Seiko Seiki makes no warranty with respect to any damage occurred due to any of the following during the warranty period:



- 1) Handling, operation or maintenance other than that specified herein;
- 2) Failure to follow any of the warnings or cautions enumerated under  **WARNING** or  **CAUTION**;
- 3) Installation, operation or maintenance using parts which are not specified by Seiko Seiki;
- 4) Maintenance personnel other than those authorized by Seiko Seiki or its specified plant have disassembled, reconditioned, or tampered the product;
- 5) Damage resulting from the not-specified use of the product.
- 6) When the product is used under special conditions without obtaining the written consent of Seiko Seiki;
- 7) Any problem resulting from deposit;
- 8) Product damage occurred during transport or other factors not attributable to Seiko Seiki;
- 9) Product breakage or damage due to natural disasters, fire or other external factors.
- 10) Deterioration in the basic performance due to the use of the product beyond limits of the use.
- 11) Any direct, incidental or consequential damage resulting from the use of the product.

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Section 1 Precautions for Safe Operation of the STP Pump

1.1 Usable Gases

Chlorine or fluorine system gases can be used in chemical specific pumps (STP-H600C/H1000C or other models). When you use gases including alkaline metals, but excluding Li, gases including Ga, Hg, In, or Sn, or HBr, contact Seiko Seiki. Confirm the characteristics of the gas to be used, referring to the Material Safety Data Sheet (MSDS) you obtain from the gas supplier.



- ◇ NEVER use corrosive gases (chlorine, fluorine, or other system gases) in the STP-H600/STP-H1000 pump or other models without anti-corrosion treatment.
- ◇ Introduce a dry N₂ gas (purge gas) to protect the inside of the STP pump when using reactive or corrosive gases (see Section 7.1, "Gas Suction").
- ◇ Cool the STP pump to within the operating pressure range to prevent the STP pump from overheating when sucking gases (see Section 7.2, "Cooling the STP Pump" and Table 16.1, "Specifications for the STP Pump" [maximum working pressure/allowable backing pressure]).

1.2 Maintenance Precautions

Perform any maintenance of the STP pump and the STP control unit (battery replacement, fuse replacement), following Section 12, "Maintenance and Inspection".



- ◇ Always turn OFF the primary power (switch the breaker "OFF") before performing any maintenance.
- ◇ Disconnect internal battery connector before performing maintenance of the STP control unit.
- ◇ NEVER touch any portions other than those designated when performing maintenance.
Careless touch may cause electric shock and/or a short-circuiting of the internal circuit, resulting in product damage or a problem.

1.3 Inspection Precautions

Perform inspections of the STP pump and the STP control unit (check of the air cooling fan and reset of the "BATTERY NG" lamp), following Section 12. "Maintenance and Inspection"

When performing inspections (check of the air cooling fan and reset of the "BATTERY NG" lamp), always turn OFF the primary power (switch the breaker "OFF") before opening the front panel, then turn ON the primary power again (switch the breaker "ON").



- ◇ NEVER touch any portions other than those designated when performing inspections.
Careless touch may cause electric shock and/or a short-circuiting of the internal circuit, resulting in product damage or a problem.

1.4 Labels

The following labels are affixed to the STP pump and STP control unit. Read the contents of the labels before operation. For the positions of the labels, see Figures 16.3 to 16.5.

1) STP Pump Caution Label

This label describes precautions for operating the STP pump. Follow these precautions.

| ▲ 注意 | ▲ CAUTION |
|---|--|
| ◇必ず指定の型式のケーブルを使用してください。 ◇最初にアース線を接続してください。 | ◇Use only designated type of cables. ◇Connect ground cable first. |


2) STP Control Unit Caution Label

This label describes precautions for operating the STP control unit. Follow these precautions.

| ▲注意 | ▲CAUTION |
|--|---|
| ◇ポンプとコントロールユニットおよび接続ケーブルは同一No.の組合せで使用してください。 | ◇Use pump, control unit and connection cable with same serial number. |
| ◇必ず指定の型式のケーブルを使用してください。 | ◇Use only designated type of cables. |
| ◇最初にアース線を接続してください。 | ◇Connect ground cable first. |

3) Heavy Product Caution Label

This label is affixed to the product with a weight of 20 kg or more. Follow the precautions of Section 2, "Unpacking" so as not to cause any accident during handling.

| ▲注意 |  | ▲CAUTION |
|-----------------------------------|--|---|
| <u>重量物</u> k g 取扱注意 | | <u>Heavy product</u> k g Handle with caution. |

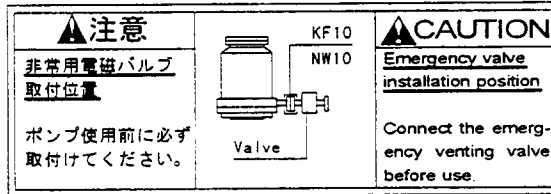
4) STP Pump Installation Warning Label

This label describes installation of the STP pump. Install the STP pump according to the precautions of Section 3, "Installation of the STP Pump."

| ▲警告 | ▲WARNING |
|-----------------------------|--|
| ポンプは取扱説明書の指示に従い確実に固定してください。 | Install pump securely according to instruction manual. |

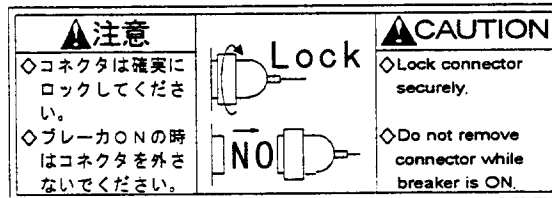
5) Emergency Vent. Valve Caution Label

This label describes the emergency vent. valve installation position.
Connect the emergency vent. valve before use.



6) Connector Caution Label

- i. This label describes lock of the connector.
- ii. This label instructs operators to prevent the connectors from being disconnected while the STP pump is in operation.



7) STP Control Unit Safety Instruction Label

This label describes instructions before operating the STP control unit.

