

Turbo-molecular-pump Pumping system

INSTRUCTION MANUAL

MODEL Desktop YTP YTP70A-D



Read this manual carefully and use the machine correctly.
Keep this manual with care so that you can refer at any time.

ULVAC INC, Components Division

www.ulvac.co.jp

Before Using the Machine

We thank you for purchasing a turbo-molecular-pump pumping system: Desktop YTP (hereinafter referred to as "machine") of Ulvac, Inc.(hereinafter referred to as "We")

Upon receipt of the machine, please confirm the contents included are the same as you ordered and check the machine for any damage attributed to transportation etc. just in case.

This operation manual (hereinafter referred to as "manual") describes appropriate operation and maintenance methods in order to use the machine safely and effectively. Read this manual beforehand and use the machine correctly.

Install and operate this machine according to the local and national safety laws and regulations (such as fire laws and electric wiring code). Accordingly, you are required to take classes for general safety that are valid in the country and the local area at the site. No one who hasn't take the classes can handle the machine. The operator is required to have taken such trainings. In addition, the operator has expertise, skills, qualifications in electrics, mechanics, cargo handling, vacuum, etc.

This machine is designed to follow the current regulations as of the preparation of this manual. If the criteria of the regulations are changed in the future, the compliance is not guaranteed.

If the device with this machine built-in doesn't follow the same regulations, or if any changes are made to the machine itself, it may not be guaranteed to have its performance and safety. We don't guarantee (have no responsibility for) such performance and safety. Any machine modifications you have done are not covered by our warranty and we are not responsible for them.

Before installing/removing this machine, keep the machine from all the energy sources (such as electricity, cooling water etc.)

All the parts of this machine are not intended for permanent use with the performance at the delivery. Even under the conditions of use expected in light of common sense, the performance inevitably deteriorates with time, which tends to cause trouble on the machine. We would like to ask you to grasp your conditions of use and cooperate to provide preventive maintenance to avoid any trouble.

If you cooperate to make preventive maintenance measures, the likelihood of the trouble on this machine attributed to malfunctions caused by worn parts will decrease and that of the risk, such as downtime, fire, and influence on other processes, attributed to the trouble on this machine will also decrease.

In addition, from the viewpoint of preventive maintenance, you are asked to prepare a maintenance and inspection plan and conduct parts replacement and overhaul accordingly.




If you have any unclear points, please contact the closest sales office, agency, or our Components Division.

About Safety Notation









In this manual and warning signs on the machine, signal words and symbol marks are displayed in order for you to understand the matters to adhere. The meanings are shown below:

► Meaning of signal words:

The terms that signify the warning level for safety are referred to as "signal words."

 DANGER	This indicates an imminently hazardous situation which, if the machine is misused, will result in operator's death or serious injury.
 WARNING	This indicates a potentially hazardous situation which, if the machine is misused, could result in operator's death or serious injury.
 CAUTION	Signifies the possibility of suffering moderate degree of injury if the user failed in handling.
NOTES	Signifies important information about injury on human body.



► Meaning of symbol marks:

	Signifies potential danger for injury on human body.
	Signifies potential danger of electric shock.
	Signifies potential danger of high temperature.
	Signifies the matters "prohibited" or must not to do.
	Signifies the matters "compulsory" or must to do.
	Signifies that a protective gloves must be worn.
	Signifies that a protective glasses must be worn.
	Signifies that the instruction manual must be referred to.

Types and display position on warning labels

A warning label is attached onto a warning location on the machine. Never fail to check these labels before operating the machine.

► Types and explanation on warning labels

	<p>Do not operate the machine while attaching a device that may interfere in the passage of gasses on the exhaust port side such as covering the port. This may raise the pump inner pressure which may end up in blowout of casing or level gauge, oil leakage, or overload on the motor.</p> <p>Explosive/Combustible/Flammable gas may ignite in the pump, increasing the pump inner pressure. Do not exhaust any gas with these properties.</p>
	<p>Before using the machine, carefully read through the instruction manual until understanding the details sufficiently.</p>

Warning Label display position

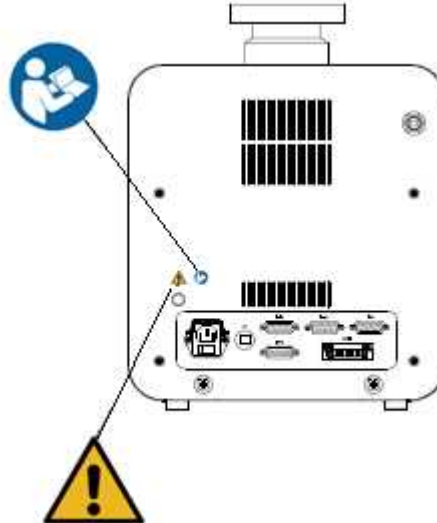


Figure 1 Warning label pasting position

Warranty Clause

This product is shipped after strict internal inspection. If you find any manufacturing defects, accidents during the transportation, or other defects attributed to our responsibility, please contact our Components Division at headquarters or the nearest sales office or agency. The repair/replacement is free of charge.

▶ Warranty Product

- (a) Turbo-molecular-pump pumping system Desktop YTP (YTP70 A-D)

▶ Warranty Period

- (a) Domestic: 1 year from the date of delivery.
- (b) Direct export: 1 year from the date of B/L.

▶ Warranty Coverage

- (a) Domestic:

For a product at the time of delivery with a damage because of trouble during transportation.

For a product not satisfying the basic specification in spite of using the product within the service condition (temperature range, power supply, etc).

- (b) Direct export:

For a product at the time of delivery with a damage because of trouble during transportation.

However, for an international direct trade, it shall conform to the warranty coverage of international merchandise trade condition (INCOTERMS etc) defined at the time of each trade.

For a product not satisfying the basic specification in spite of using the product within the service condition (temperature range, power supply, etc).

▶ How to Respond

- (a) Domestic:

An alternative is delivered or the product is sent back to us or the nearest our ULVAC TECHNO, Ltd. for repair.

If it is necessary to respond on site, contact our Components Division, or the nearest sales office or agency for assistance.

- (b) Direct export:

Return the product to our office or nearby service station. In response, we deliver a replacement or repair the product.

The return expense shall be borne by the customer.

▶ Disclaimer

- (a) A product with expired warranty period
- (b) Failures and defects caused by natural disasters including fire, wind and flood, earthquake and thunderbolt, and unavoidable disasters including war.
- (c) Failures and defects caused by careless handling or misuse.
- (d) Products modified/disassembled/repared without our permission.
- (e) Failures and defects under an abnormal environment (strong electromagnetic field, radiation environment, high temperature, high humidity, inflammable gas atmosphere, corrosive gas atmosphere, dust).
- (f) Failures and defects due to noise.
- (g) Product failure or indirect damage to your company in the event of a claim by a third party to us on violation of patents.
- (h) When our engineers judge that the failures or defects are caused under the conditions of use inappropriate to this product.
- (i) Consumable articles
- (j) A case in which a security seal is peeled off or a trace of peel-off is found.

▶ Others (Warranty Clause)

- (a) If there are individual contracts and memorandum related to specifications in addition to this document, the contents in those documents prevail.
- (b) Please let us know if you export this machine from Japan and take necessary procedures according to the provisions of export-related laws and regulations, such as foreign exchange laws and foreign trade laws.
- (c) For any questions and consultation on this machine, check the model/serial number and then contact the nearest sales office or agency.
https://www.ulvac.co.jp/support_info/
- (d) Note that the contents in this document is subject to change without prior notice.

About this manual

- In order for you to use this machine as long as possible, before working on the installment, operation, inspection or maintenance, read this manual carefully to fully understand the safety considerations, specifications, and operation of the machine.
- Acknowledge in advance that, for improvement reason, the specification or price described herein may be subject to change without notice. When a change is made in this manual, the manual will be issued as a revised edition with the document number on the upper right of the cover page updated.
- Never fail to hand over this manual to the end user who actually uses the product.
- Without our permission, any part in this manual cannot be duplicated for a third-party.
- This manual is designed for a Japanese speaking user. When allowing a non-Japanese speaking user to work on the machine, provide a thorough safety education and handling instruction under the responsibility of the customer.

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1. For safe use

Signifies, by each work, the method for avoiding danger and the actions prohibited to do for dangerousness reasons.

▶ 1.1 Handling the machine

For an overhaul, repair, or problem on the machine, contact a neighboring service center.

 DANGER 	<p>Inert gasses (air, nitrogen, and argon) can be discharged with this machine. Other gasses (toxic, combustion, combustion-supporting, corrosive, and explosive gases) cannot be used since they may be leaked from the pump main unit, or ignition or explosion may be occurred inside the pump when discharged.</p>
 DANGER 	<p>Install the machine in a ventilated indoor room. If nitrogen or argon is leaked, you may be suffocated because of deficiency in oxygen.</p>
 DANGER 	<p>Before working on the installment or removal, keep the machine away from all of the energy sources (power supply, cooling water, etc)</p>
 DANGER 	<p>If this machine sucks in a toxic gas, not only the pump main unit but also the lubricating oil may become poisonous. Be careful to this at the time of maintenance work.</p>
NOTES 	<p>Install an appropriate filter separator trap so as not let the machine sucks in liquid and solid particulates.</p>

- This machine is designed so as to conform to the rules and regulations at the time of preparing this manual. The conformity to the rules and regulations shall not be necessarily guaranteed if the standard of rules and regulations are changed in future.
- If a device embedded in this machine does not conform to the same rules and regulations or if the machine itself is modified, the performance and the safety of the machine may not be guaranteed. In such a case, we can neither guarantee the performance and the safety nor take the responsibility.
- For those who never took general safety education which is regarded to be effective publicly in the country intended to use, by any means, do not use the machine. An operator shall receive such trainings.
- Install and operate the machine according to the rules, regulations, and ordinances (Fire Service Laws and electric wire regulations) on safety of the country intended to use






- If the details of dangerous substances to be used is not disclosed, or the substances difficult to undergo a detoxication processing are discharged, we may reject the maintenance and other related handlings.
If you entrust us of an overhaul, maintenance, or repair etc, enter the necessary information in the "Pollution Certificate" attached to the end of this manual and submit it to a service center.
- If you export this machine to the outside Japan, you are required to pass through several examinations based on the foreign exchange and foreign trade laws, and the related government and ministerial ordinances and notifications etc. Contact a nearby sales office or agent.

【Sales offices list】




https://www.ulvac.co.jp/support_info/sales_office/

▶ 1.2 Acceptance /transport / storage


1.2.1 Acceptance

 <p>DANGER</p> 	<p><u>Do not enter the underside of the machine.</u></p> <p>If the machine is operated recklessly, or the maintenance is insufficient, the machine may be fell off or toppled down. Do not enter the underside of the machine.</p>
 <p>WARNING</p> 	<p><u>Only a qualified person shall perform a cargo-work and operate a cargo-handling machine.</u></p> <p>An unqualified person shall neither perform a cargo-work nor operate a cargo-handling machine.</p>
<p>NOTES</p> 	<p><u>Upon unpacking, check that there are no missing or damaged components.</u></p> <p>After unpacking, check that there are no missing, damaged, or abnormal components. If there is a problem by any chance, do not work on the installation work.</p>





1.2.2 Transportation



 WARNING 	<p><u>For a long-distance transportation, the machine shall be carried by a cargo-handling device or by a pallet truck.</u></p> <p>If the machine is transferred for a long distance for such reasons as changing the room to install etc, you may suffer a backache or get injured. For long distance transportation, fix the machine on a cart or a pallet, and use a pallet truck.</p>
NOTES 	<p><u>Attach a transportation jig for transportation.</u></p> <p>Never fail to attach a transportation jig when transferring the machine. Without attaching the transportation jig, the machine may possibly be damaged during the transportation.</p>

1.2.3 Storage



NOTES 	<p><u>Keeping the environmental conditions</u></p> <p>This machine includes precise clearances. Check that the storage place satisfies "3.1.2 Environmental condition for storage."</p>
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▶ 1.3 Installation and operation

 WARNING 	<p><u>Do not detach the face panel</u></p> <p>Do not detach the face panel. There is a possibility of getting burned or electric shock.</p>
NOTES 	<p><u>Do not have the machine impacted, tilted, toppled sideways, stood upright, or made upside-down.</u></p> <p>Do not have the machine impacted, tilted, toppled sideways, stood upright, or made upside-down. The operation of the machine may be obstructed. Horizontally install the machine.</p>
NOTES 	<p><u>Do not start operation of the machine until the main unit of the machine reaches the operational temperature range.</u></p> <p>If the machine is stored at a place outside the operational temperature range, do not start operation of the machine until the main unit temperature reaches the operational temperature range.</p>



NOTES	<u>Horizontally install the main unit of the machine</u>
	If you have the machine tilted, toppled sideways or made upside-down, the machine may be damaged. Horizontally install the machine with the intake port facing upward.
NOTES	<u>Keeping the environmental conditions</u>
	This machine includes precise clearances. Check that the installation place satisfies "3.1.3 Environmental condition for installation and operation"

► 1.4 Disposal

 WARNING	<u>Especially after the exhaust of hazardous gas on a human body, please ask a professional company to dispose of the pump.</u>
	For the disposal of machine that discharged gasses harmful to humans, entrust a specialized processor.

Dispose the machine following to the national laws and local government ordinances. Especially, if harmful gasses are discharged, entrust a specialized processor to do the disposing and processing works.
The cost for the disposal shall be borne by the customer.



► 1.5 Protective equipment







 WARNING	<u>Never fail to attach an earth leakage breaker.</u>
	Without an earth leakage breaker attached, the machine may be burned, or a fire or electric shock may be break out.

The machine is not equipped with a mechanism for interrupting the motive power and a function for detecting an electric leakage.
For choosing an electric leakage breaker, refer to the "electric wiring."



► 1.6 Dangerousness inherent to the machine and safety measures

1.6.1 Intake and exhaust of dangerous gasses and substances










 DANGER	<u>Do not discharge toxic gasses, combustion gasses, combustion-supporting gasses, corrosive gasses, and explosive gasses.</u>
	Discharging toxic gasses, combustion gases, combustion-supporting gases, corrosive gases, and explosive gasses is extremely danger. Moreover, it would be extremely danger if such gasses are sucked in the machine, because, not only during the operation but also after stopping, the residue gasses or generated substances may cause fire or explosion.

 DANGER 	<p><u>Wearing protective gears</u> When doing an inspection or other works, wear a protective gear suitable for the poisonous substance to use.</p>
 WARNING 	<p><u>Entrusting a waste disposer for disposal.</u> Entrust a waste disposer authorized by the administration for disposal works.</p>
 WARNING 	<p><u>Entrust a specialized processor for detoxication processing.</u> For an overhaul or disposal, entrust a processor specialized in waste disposal to do the detoxication processing.</p>




1.6.2 Long-distance transportation

 WARNING 	<p><u>An unqualified person shall neither perform a cargo-work nor operate a cargo-handling machine.</u> An unqualified person shall neither perform a cargo-work nor operate a cargo-handling machine. Ignorance to this may cause an accident or injury.</p>
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1.6.3 Electric shock

 DANGER  	<p><u>Before working on an electric wire connection, turn off the primary power supply.</u> Before working on an electric wire connection, never fail to turn off the primary power supply.</p>
 DANGER  	<p><u>For an inspection or relocation, turn off the primary side power supply.</u> For an inspection or relocation, never fail to turn off the primary side power supply.</p>
 WARNING  	<p><u>Never fail to connect an earth terminal to the ground.</u> An electric work specialist qualification is required for such engineering works as burying an earth and connecting earth wires. Imperfectly connected earth wires may cause an electric shock.</p>

1.6.4 High temperature

 WARNING  	<p><u>Do not detach the face panel</u> Do not detach the face panel. The machine holds extremely high temperature during the operation which persists for a while even after stopping. You may get burned by touching the machine.</p>
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1.6.5 Burst



WARNING



Do not set 0.03 MPaG or more for the exhaust side pressure of the machine.

Measure the pressure on the pump exhaust side and if it is 0.03 MPaG (0.3 kg/cm²G) (gauge pressure) or more, remove the obstacle that blocks the passage of the gas on the exhaust side.

If the pump internal pressure raises to 0.03 MPaG or more, the pump may be burst.

2. Product Summary

Desktop YTP is a desktop type high vacuum pumping system equipped with a ceramic ball-bearing type turbo-molecular pump. In consideration of desktop operating environment, the noise and vibration during the operation have been reduced. Moreover, a newly employed touch panel with intelligible display icons enables simple operation.

▶ 2.1 Features

■ Designed for desktop operating environment

- The noises and vibrations on operation are reduced.

■ Low noises

- Low noise with 43dB (A) or less during operation.
(Operation without load. ICF flange type. Measured by us)

■ Compact and light-weight design

■ Excellent operability

- Simple operation with a touch panel.

■ A dedicated display for vacuum gauge is not necessary

- Vacuum gauge signals can be imported to display on the operation screen.
- Maximum two units of vacuum gauge can be connected (a vacuum gauge is an option).

▶ 2.2 Use



WARNING



Do not use the machine for the purpose other than described herein.

Using the machine for the purpose other than described herein may cause an unexpected accident or breakdown.

- High-vacuum system for various experiments and researches.
- High-vacuum system from atmospheric pressure.
- Whole other high-vacuum exhaust purposes.

▶ 2.3 Names and works on each section

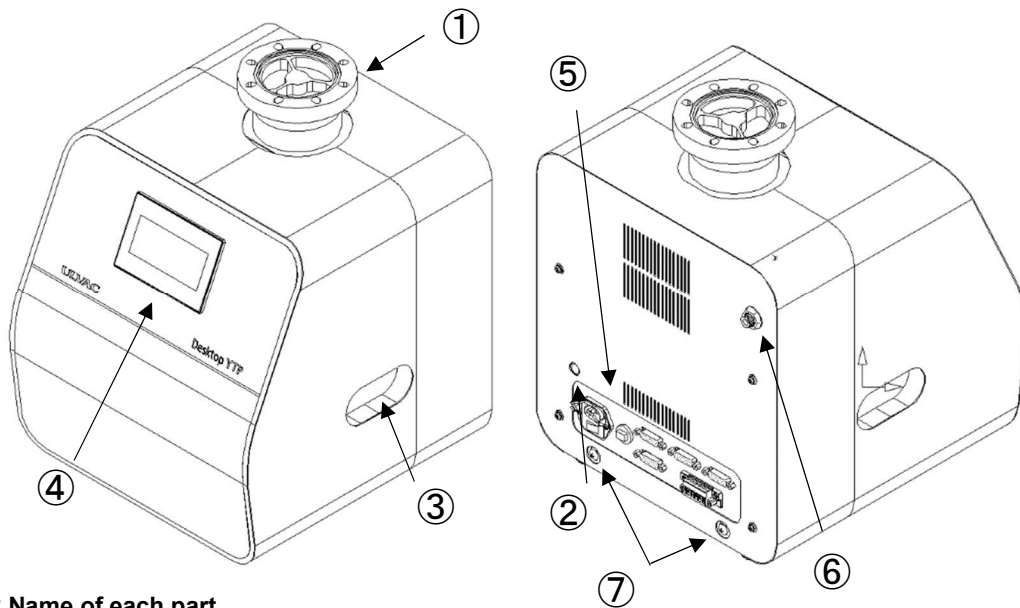


Figure 2 Name of each part

Table 1 Name of each part

Name	Description
1 Intake port	Containers or piping for vacuum exhaust are connected.
2 Exhaust port	The piping for discharging the exhausted gasses is connected.
3 Handle	It is a handle for placing your hand to lift up the product.
4 Touch panel	Status of operation, stopping, or alarm is indicated.
5 Connector panel	It is used for power supply connection, switch operation, and external device connection.
6 Gas purge unit interface	It is an interface with the gas purge unit (option),
7 Transportation jig	It is a jig (bolt) for fixing the FP to protect the device during transportation.

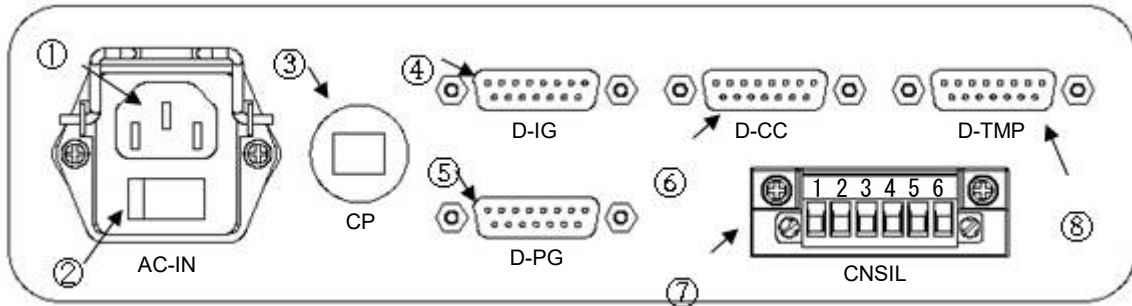


Figure 3 Name of the connector panel

Table 2 Name of the connector panel

Name	Description
1 AC INPUT connector	It is the primary side power supply input section of the main unit of the machine.
2 MAIN POWER switch	It is the main power supply switch.
3 Circuit protector	Shuts down the power supply when the main power supply is overloaded.
4 D-IG connector	It is an ionization vacuum-gauge import connector. Supports following G-TRAN models. ST2-1、SH2-1、SC1
5 D-PG connector	It is a low-vacuum area vacuum-gauge import connector. Supports following G-TRAN models. SW1-1、SP1
6 D-CC	It is a capacitance manometer import connector. Supports following G-TRAN models. CCMT-D
7 CNSIL	It is a device operation signal input connector. Following operations are performed. Input of START interlock signal. Input of ionization vacuum gauge filament FIL1/FIL/2 switchover. ◆Arrange a non-voltage contact for the input signals.
8 D-TMP	Histories etc can be checked by connecting to TMP via RS485 communication using the I/F cable and communication cable for UTM70B. For more details, refer to TMP instruction manual.

▶ 2.4 Explanation on touch panel operation screen

2.4.1 Initial screen

Turning on the power supply switch displays the initial screen.
After passing a few seconds, the operation main screen is switched to appear automatically.



Figure 4 Initial screen

Table 3 Explanation of initial screen

Name	Description
1	Display of version information The software version is indicated.

2.4.2 Main screen

It is an operation screen for devices.
The devices can be started up or stopped by operating the switches.

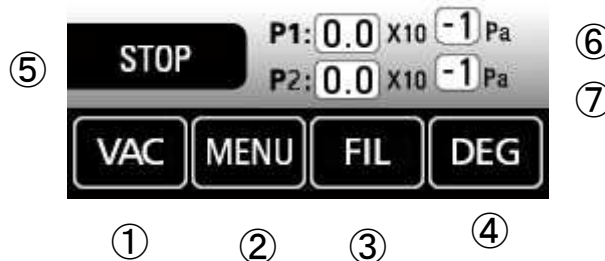


Figure 5 Main screen

Table 4 Explanation of main screen switch

Name	Description	Turning on light	Blinking	Turning off light	
1	VAC switch	Operation for starting up and stopping of the machine	A high-vacuum Pumping is running	Starting-up/ Stopping	Completion of stopping
2	MENU switch	Setting for each device	—	—	—
3	FIL switch ^{※1}	Filament operation at the time of using the ionization vacuum gauge	Turning ON the filament	—	Turning OFF the filament
4	DEG switch ^{※1}	Degassing operation at the time of using the ionization vacuum gauge	Turning ON the degassing	—	Turning OFF the degassing

※1 : Displayed only when setting P1.

Table 5 Explanation of main screen display

Name		Description
5	Indication of operation status	Indicates the status of the machine Rough VAC/Low-vacuum Pumping by FP is running (flickering VAC switch by 0.5 sec) TMP:ACC / TMP is accelerating (flickering VAC switch by 0.5 sec) TMP:NOR / TMP rated operation is running (turning on the VAC switch light) Waitto STOP / Stop operation is running(flickering VAC switch by 0.5 sec) STOP / Completion of stopping (turning off the VAC switch light)
6	Indication of P1 pressure	Output operation value of the device is indicated when the P1 is specified (for high -vacuum) P1: Nothing is indicated when "NO USE" is specified
7	Indication of P2 pressure	Output operation value of the device is indicated when the P2 is specified (for low -vacuum) P2: Nothing is indicated when "NO USE" is specified

2.4.3 VAC screen

It is a screen to be displayed by pressing the VAC switch, used for the startup and stopping operations of the device.



Figure 6 VAC screen

Table 6 Explanation of VAC screen switch

Name		Description
1	START	FP starts up simultaneously with the START operation and the TMP starts up if the time specified with the delay timer elapses.
2	STOP	FP stops and the TMP decelerates. It indicates stopping status after four minutes.
3	Return switch	Returns to the Main screen.

2.4.4 Menu screen

It is a screen, to be displayed by pressing the Menu switch, for setting various devices.



Figure 7 Menu screen

Table 7 Explanation of Menu screen switch

Name		Description	Turning on light	Tuning off light
1	P1 switch	It is used for setting the devices to be displayed in the P1 display section (for high-vacuum)	—	—
2	P2 switch	It is used for setting the devices to be displayed in the P2 display section (for low-vacuum)	—	—
3	Operation sound switch	It is used for changing over the presence/absence of the sound for operating the switches.	With operation sound	Without operation sound
4	Delay timer switch	It is used for setting the Rough VAC time. Based on the delay timer setting, during the Rough VAC, the time spent for discharging by FP only can be specified without starting up the TMP. Change the value according to the volume of the work.	—	—
5	Return switch	Returns to the Main screen.	—	—

2.4.5 Delay timer setting screen

It is a screen, to be displayed by pressing the delay timer switch, for setting the delay timer.



Figure 8 Delay timer screen

Table 8 Explanation of delay timer screen switch

Name		Description
1	Timer numerical value entry frame	Enter the numeric value of the delay time (in sec) until starting up the TMP. A ten-key is displayed by pressing the entry frame. Before the factory shipment: 0 sec
2	Return switch	Returns to the Main screen.

2.4.6 P1 setting screen

NOTES	<p><u>If a wrong connector is chosen, the connected device may possibly be damaged.</u></p> <p>Since there is a terminal that outputs DC24V, and if a wrong connector is chosen, the connected device may possibly be damaged, therefore, carefully check the connection destination.</p>
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It is used for setting a device of which output operation value is indicated on the P1 display section. The item currently selected turns on the light.



Figure 9 P1 setting screen

Table 9 Explanation of P1 setting screen

Name	Description
1 ST2/SH2 only switch	The output operation value for ULVAC vacuum gauge G-TRAN is indicated (for high-vacuum). <Target devices> ST2/SH2 only: For using in ST2, SH2 single unit mode. ST2/SH2 combi: For using in ST2, SH2 combination mode SC1
2 ST2/SH2 combi switch	
3 SC1 switch	
4 NO USE switch	When the P1 display section is not used.
5 etc.1、etc.2	When the operation result of the function is indicated in the P1 display section.
6 Return switch	Returns to the Main screen.

2.4.7 P2 setting screen

NOTE	<p><u>If a wrong connector is chosen, the connected device may possibly be damaged.</u></p> <p>Since there is a terminal that outputs DC24V, and if a wrong connector is chosen, the connected device may possibly be damaged, therefore, carefully check the connection destination.</p>
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It is used for setting a device of which output operation value is indicated on the P2 display section. The item currently selected turns on the light.



Figure 10 P2 setting screen

Table 10 Explanation of P2 setting screen

Name		Description
1	CCMT-D switch	The output operation value for ULVAC vacuum gauge G-TRAN is indicated (for low-vacuum). <Target devices> CCMT-1D,CCMT-10D,CCMT-100D,CCMT-1000D SP1 SW1
2	SP1 switch	
3	SW1 switch	
4	NO USE switch	When the P2 display section is not used.
5	etc.1、etc.2	When the operation result of the function is indicated in the P2 display section.
6	Return switch	Returns to the Main screen.

2.4.8 etc.1/ etc.2 screen

NOTES	<p><u>If a wrong connector is chosen, the connected device may possibly be damaged.</u></p> <p>Since there is a terminal that outputs DC24V, and if a wrong connector is chosen, the connected device may possibly be damaged, therefore, carefully check the connection destination.</p>
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By selecting the etc.1/etc.2 on the P1 and P2 setting screen, the value operated with the function prepared preliminarily by this machine can be displayed along with the display of analog voltage output for other than the G-TRAN.

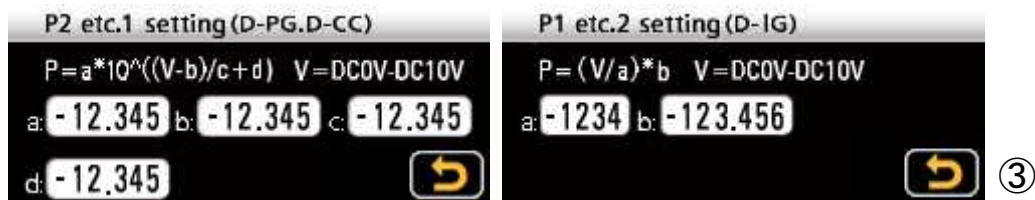


Figure 11 etc.1/etc.2 screen

Table 11 Explanation of etc.1/etc.2 screen switch

Name	Function	Description
1	etc.1	P: Indicated value V: Input voltage DC 0-10V A,b,c, d: Variable *1
2	etc.2	
3	Return switch	Returns to the Main screen.

*1: The ten-key screen can be displayed by pressing the white frame of the variable name, in which numeric values can be entered.

For the pin assignment when connecting a device other than G-TRAN, refer to the following table.

Name	PIN No.	Description
D-PG	1	Input of power supply DC 24V
	2	Input of device abnormal signal. Normal open.
	8	Input of analog signal. DC0-10V
	9	Power supply GND
	10	Signal GND
	15	Signal GND
D-IG	1	Input of power supply DC 24V
	2	Input of device abnormal signal. Normal open.
	5	Output of filament ON signal
	6	Output of signals when CNSIL Close
	8	Input of analog signal. DC0-10V
	9	Power supply GND
	10	Signal GND
	13	Output of signals when DEGAS ON
15	Signal GND	

2.4.9 FIL screen

It is a screen, to be displayed by pressing the FIL switch, for operating the filament of G-TRAN specified in P1.



Figure 12 FIL Screen

Table 12 Explanation of FIL screen switch

Name	Description
1 FIL ON	Turn ON the filament (electric discharge) to start vacuum measurement. It is operational only when the operation status is "TMP NOR."
2 FIL OFF	Turn OFF the filament (electric discharge) to stop vacuum measurement.
3 Return switch	Returns to the Main screen.

2.4.10 DEG screen

It is a screen, to be displayed by pressing the DEG switch, for operating the degassing of G-TRAN probe specified in P1.



Figure 13 DEG screen

Table 13 Explanation of DEG screen switch

Name	Description
1 DEGAS ON	Turn on the degassing to start degassing of the gas accumulated in the probe. It is operational only when P1 is "FIL ON."
2 DEGAS OFF	Turn off the degassing to stop the degassing.
3 Return switch	Returns to the Main screen.

For the details of degassing, refer to the G-TRAN vacuum gauge instruction manual.

2.4.11 Alarm pop-up screen

When an abnormality is occurred with a device, the name of the device is popped up (Example: Abnormality in TMP). Eliminate the cause of the abnormality following to the device instruction manual.



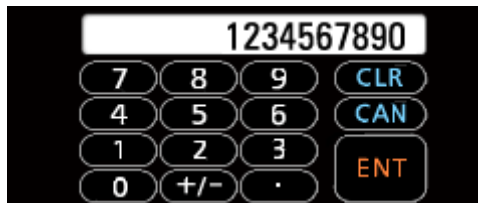
Figure 14 Alarm pop-up screen

Table 14 Explanation of Alarm pop-up screen

Name		Description
1	RESET switch	Reset the alarm. If the abnormality is not eliminated, the alarm generates again.

2.4.12 Numeric key screen

It is a ten-key, to be displayed by pressing the numeric value frame, for entering numeric values.



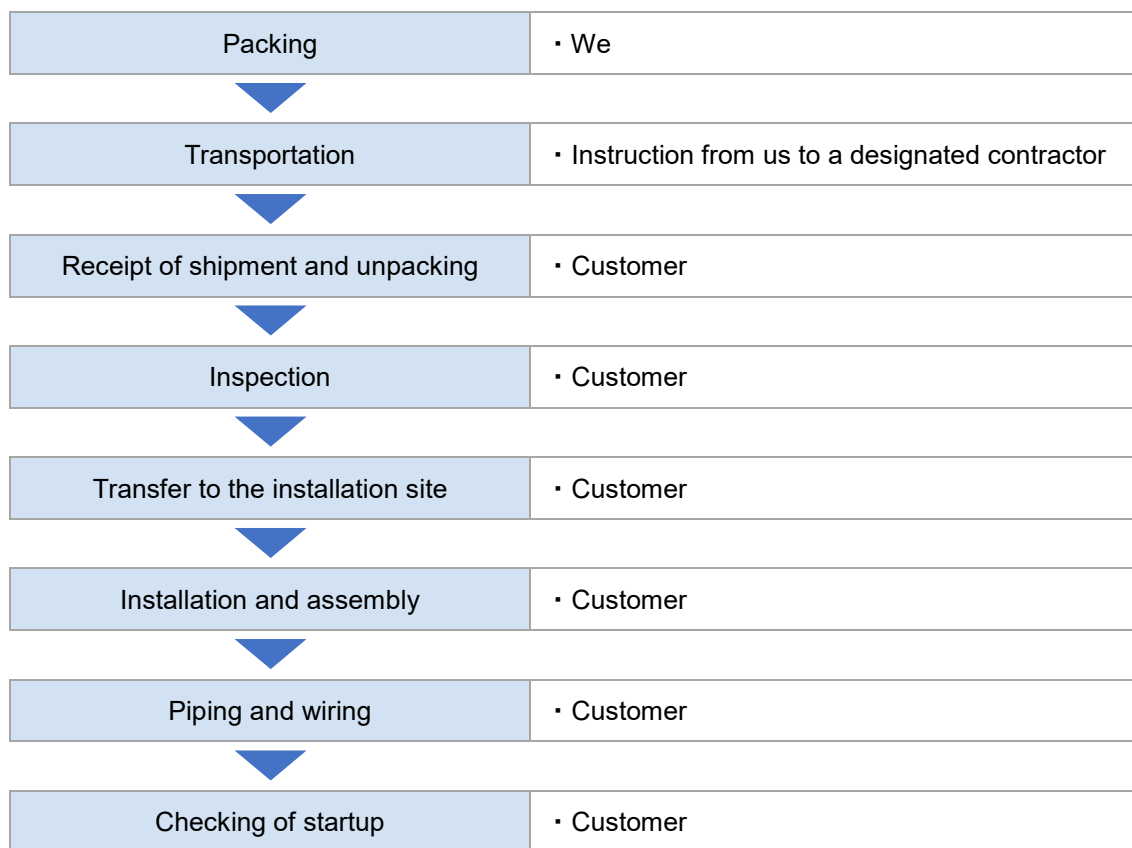
Name		Description
1	0-9 keys	Enter a number between 0 and 9.
2	+/- keys	The sign (+/-) of the numerical values entered can be toggled.
3	. key	A decimal point is entered.
4	CLR	The numerical value entered can be erased.
5	CAN	It is a cancel key. Cancels the entered value and returns to the previous screen.
6	ENT	It is a decision key. Changes into the entered numeric value and returns to the previous screen.

3. Installation

▶ 3.1 Before installation

3.1.1 Works from shipment to startup

The work area shall be assumed in that we take on the work area from packing to the shipment (transportation) while the customer takes on from the receipt of shipment to the startup. However, depending on the contract condition of the machine, the customer may take on whole or part of the transportation, unpacking, and installation.



NOTES

In some cases, above statement regarding the works from shipment to startup may not be necessarily true, check the description in the specification of the machine. Contact us if you have any uncertainties.

3.1.2 Environmental condition for storage

If the machine is stored in a warehouse or an anterior chamber before installation, or the machine is not used for a long time, store the machine following to the conditions listed below.

Ambient temperature	From -20 to 60 °C (no freeze)
Ambient humidity	80% RH or less (no condensation)
Altitude	Altitude of 1,000 m or less
Vibration resistance	0.5 G (114 dB) or less for the vibrational acceleration
Others	No dust shall be found
	It shall be inside of a ventilated room.
	The machines shall not be stacked, toppled sideways, or stood upright.
	The machine shall not be given impact.
	The machine shall not be exposed to the direct sunlight.
	The machine shall be kept away from a heat source.
	The machine shall not be tilted for 10 degrees or more.

3.1.3 Environmental condition for installation and operation

This machine includes precise clearances.

For installation and operation of the machine, make the following matters satisfactory.

Ambient temperature	From 10 to 35°C
Ambient humidity	80% RH or less (no condensation)
Altitude	Altitude of 1,000 m or less
Others	No corrosive or explosive gas shall be found.
	No dust shall be found
	It shall be inside of a ventilated room.
	The machines shall not be stacked, toppled sideways, or stood upright.
	The machine shall not be given impact.
	The machine shall not be exposed to the direct sunlight.
	The machine shall be kept away from a heat source.
	The machine shall be installed horizontally.
	The machine shall be definitely fixed in preparation for an earthquake.
	The machine shall not be tilted for 10 degrees or more.









▶ 3.2 Unpacking

Before being shipped, the machine is protected by stretch film and shock absorbing material etc and packed up with a wooden frame and carton box.

For a wooden frame packing, entrust a specialized contractor for disassembly work.

Give following cautions and instructions to the disassembly work contractor.

3.2.1 Cautions on unpacking

 DANGER 	<p><u>Do not enter the underside of the machine.</u></p> <p>If the machine is operated recklessly, or the maintenance is insufficient, the machine may be fell off or toppled down.</p>
 WARNING 	<p><u>Only a qualified person shall perform a cargo-work and operate a cargo-handling machine.</u></p> <p>An unqualified person shall neither perform a cargo-work nor operate a cargo-handling machine.</p>
 WARNING 	<p><u>Do not tilt the machine for 10 degrees or more.</u></p> <p>Ignorance to this may cause topple down etc which may end up in injury or damage.</p>
 CAUTION 	<p><u>For a wooden frame packing, wear leather gloves and use an appropriate tool for disassembly.</u></p> <p>When doing the works, the nails or wood pieces that fix the wooden frame may wound the worker's hand, therefore, instruct the worker to wear leather gloves and to use an assembly tool such as a bar.</p>

3.2.2 Check following to unpacking

After unpacking, check that the contents are the same as the order and there are no damages due to the transportation etc.

You may be charged if it is reported after the beginning of use.

Although we take utmost care for the shipment, however, check following matters after unpacking just to make sure.

- Are the contents the same as the order?
- Are the accessories (instruction manual and optional components) included?
- Is not there any damaged part during the transportation?
- Is not there any looseness with the screws and nuts during the transportation? Is not there any omitted part?

If there is any problem by any chance, contact our sales department or an agent you deals with.








Table 15 Standard accessory list

Name	Specification	Q'ty	Remarks
Gasket	ICF: Copper gasket VG : O ring ISO: Centering	1	
Dust cap	Inlet port, o port		
Protective net	Only for VG and ICF * The ISO flange is embedded in the gasket.	1	
CNSIL connector		1	
Jumper pin	For Start interlock	1	For CNSIL 3-4pin
Instruction manual	CD-ROM	1	
Cautions for safety		1	



Table 16 Option article list

Name	Specification			
	Country	Allowable voltage	Plug type	Safety standard
AC code	Japan	AC125V	B type	JIS (PSE)
	USA Canada	AC125V	B type	UL,CSA
	Europe	AC250V	CEE7	VDE,FIMCO,CEBEC,SEMKO,NEMCO,NEMA
	China	AC250V	GB type	GB (CCC)
	Korea	AC250V	K type	KS
	Gas purge unit	—		




► 3.3 Transport

 WARNING 	<p><u>Do not tilt the machine for 10 degrees or more.</u></p> <p>Ignorance to this may cause topple down etc which may end up in injury or damage.</p>
 WARNING 	<p><u>For a long-distance transportation, the machine shall be carried by a cargo-handling device or by a pallet truck.</u></p> <p>If the machine is transferred for a long distance for such reasons as changing the room to install etc, you may suffer a backache or get injured. For long distance transportation, fix the machine on a cart or a pallet, and use a pallet truck.</p>
 WARNING 	<p><u>Wear safety shoes for transportation.</u></p> <p>Never fail to wear safety shoes for transporting the machine.</p>
NOTES 	<p><u>Attach a transportation jig for transportation.</u></p> <p>Never fail to attach a transportation jig when transferring the machine. Without attaching the transportation jig, the machine may possibly be damaged during the transportation.</p>



3.3.1 Transportation by pallet truck

 WARNING 	<p><u>For the transportation using a pallet truck, never fail to use a pallet.</u></p> <p>Do not transport the machine by a pallet truck without loading the machine on a pallet. The machine may fall which would cause injury or damage.</p>
---	--

▶ 3.4 Piping and wiring

 WARNING 	<p><u>Shutdown of dangerous energy sources</u></p> <p>Before working on piping or wiring, refer to "1.For safety use" to check that all the dangerous energy sources have been shut down.</p>
NOTE 	<p><u>The structure of piping and wiring shall be designed so that vibration can be absorbed.</u></p> <p>For the vacuum piping, cooling water piping, purge gas piping, and electric wiring, design a structure capable of absorbing the vibration to the predefined level so as to avoid the torn and drop off of the piping.</p>

3.4.1 Intake and exhaust port piping

 WARNING 	<p><u>Do not set 0.03 MPaG or more for the exhaust side pressure of the machine.</u></p> <p>Measure the pressure on the pump exhaust side and if it is 0.03 MPaG (0.3 kg/cm²G) (gauge pressure) or more, remove the obstacle that blocks the passage of the gas on the exhaust side. If the pump internal pressure raises to 0.03 MPaG or more, the pump may be burst.</p>
--	--

- Remove the flange cap for piping connection.
 Before the factory shipment, a flange cap is attached to the intake port flange section. For connecting piping, remove the flange for storage.
 Contact a nearby service center.
- Do not put a foreign object in the intake and exhaust port of the machine.
 For connecting piping, take care not to drop off any foreign object (e.g., bolt) in the intake and exhaust port of the machine. If a foreign object is dropped off, it is necessary to disassemble the machine to remove the object.
- Do not directly apply load on the intake and exhaust port of the machine.
 Do not directly apply load of the connected piping etc on the intake and exhaust port of the machine.
- Take care not to leave a flaw on the sheet surface of the gasket.
 Take care not to leave a flaw on the sheet surface of the gasket (intake and exhaust port). After assembling the piping, conduct a leak test for the entire system.

3.4.1 Gas purge

To this machine, a gas purge unit can be optionally available and installed.
 If gasses are discharged, the pump temperature rises, which may affect the bearing service life.
 If Ar gas of 30 mL/min or more is discharged serially, use the unit. ^(Note 1)

(Note 1) For more details, refer to attached instruction manual on turbo-molecular-pump UTM-70B.
 Introduce N2 gas for the purge gas type with the volumetric flow of 25mL/min.

Start of gas supply	After the startup of the auxiliary pump but before the process gas discharge.
Stop gas supply	After full discharge of the process gas but before the stop of the auxiliary pump.
Gas type	Nitrogen of which purity is 4N (99.99%) or more
Interface (main unit side)	Single touch joint of $\phi 6\text{mm}$

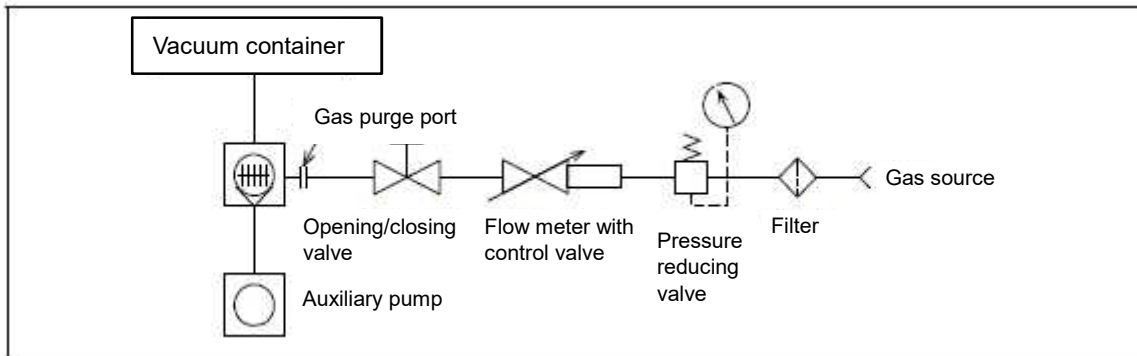


















Figure 15 Gas purge method

▶ 3.5 Electric wiring













3.5.1 Electric wiring

 DANGER  	<p><u>A qualified person shall perform a wiring work.</u></p> <p>A qualified person shall perform electric wiring work.</p>
 DANGER  	<p><u>Before working on a wiring work, turn off the primary side power supply first.</u></p> <p>Before working on a wiring work, turn off the primary side power supply first. Never perform the work while the voltage is applied.</p>
 WARNING  	<p><u>Never fail to connect an earth terminal to the ground.</u></p> <p>Imperfectly connected earth wires may cause an electric shock.</p>
 WARNING  	<p><u>Do not use it other than the rated voltage.</u></p> <p>Do not use it other than the rated voltage. Ignorance to this may prevent the earth leakage breaker from working normally which may end up in burnout or fire breakout.</p>
 WARNING 	<p><u>Follow the rules, regulations, and ordinances.</u></p> <p>Install and operate the machine according to the rules, regulations, and ordinances (Fire Service Laws and electric wire regulations) on safety of the country and region intended to use</p>
 WARNING 	<p><u>Installation of an earth leakage breaker</u></p> <p>Performs a physical and overload protection for devices and wiring at the occurrence of short circuit accident. Also, performs a ground fault protection for preventing electric shock and fire breakout caused by an electric leakage. If an earth leakage breaker is not installed or if the earth leakage breaker installed is not suitable to the motor capacity, it may cause a burnout of the machine, fire breakout, or electric shock.</p>

- Use the AC input cable optionally available with this machine.

4. Operation

▶ 4.1 Cautions on operation

 DANGER 	<p><u>Do not suck in non-inert gasses.</u></p> <p>Do not use non-inert gasses (toxic gas, combustion gas, combustion-supporting gas, corrosive gas, explosive gas) as this machine is supposed to discharge inert gasses (air, nitrogen, argon) and discharging other gasses may cause leakage of these gasses from the pump main unit, or may cause ignition or explosion inside the pump.</p>
 DANGER 	<p><u>Do not suck in toxic gasses.</u></p> <p>If this machine sucks in a toxic gas, not only the pump main unit but also the lubricating oil may become poisonous. Be careful to this at the time of maintenance work.</p>
 WARNING 	<p><u>Do not use the machine at a place where dangerous atmosphere may be generated.</u></p> <p>Do not use the machine at a place where dangerous atmosphere may be generated by explosive gasses. Ignorance to this may cause injury or fire breakout.</p>
 WARNING 	<p><u>Do not cover the exhaust port.</u></p> <p>Do not operate the machine while attaching a device that may interfere in the passage of gasses on the exhaust port side such as covering the port. This may raise the inner pressure of the machine and may end up in blowout of casing or oil leakage, or overload on the motor. The machine structure is not designed to withstand pressures. The resisting pressure guaranteed value of the pump is 0.03 MPaG (0.3 kg/cm²G) (gauge pressure).</p>
 WARNING 	<p><u>In front of the ventilation opening, take a clearance of 0.5m or more</u></p> <p>If there is a wall or an obstacle within 0.5m from the ventilation opening, abnormal overheat may occur which may cause burn or fire breakout.</p>
NOTES 	<p><u>Use the machine with the face panel attached.</u></p> <p>The performance of the machine may be deteriorated if the machine is operated without the face panel attached. Never fail to use the machine with the face panel attached. The discharge performance cannot be fully demonstrated soon after the startup or without the face panel attached.</p>
NOTES 	<p><u>Do not suck in chemicals such as acid</u></p> <p>Suction of chemicals such as acid may disable the operation of the machine.</p>

▶ 4.2 Preparation for operation

4.2.1 Check items before operation

Before starting the operation, check following matters.

1. For the protection of the machine, the FP is fixed with transportation jigs before the shipment. Remove the transportation jigs before starting up the operation. Keep the transportation jigs with care so as not to lose them.

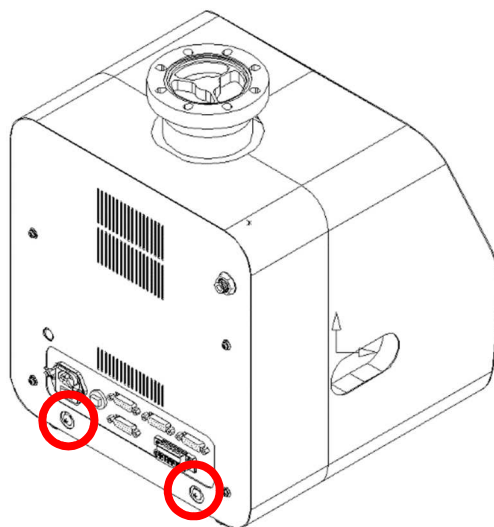


Figure 16: Removal of transportation jigs

2. Check that connection of power supply connectors and signal connector is completed.
3. For flowing a purge gas, connect purge gas piping and supply a purge gas. Check that the purge gas is not leaked.
4. Supply primary side power supply.

▶ 4.3 Startup and stop operation method

4.3.1 Startup and stop

NOTES



FP may not start up when the machine is started with vacuum inside.

When the inside of this machine is started in a vacuum state, the FP diaphragm may stick and may not start. In such a case, please restart after restoring the unit to atmospheric pressure.

■ How to startup

- Press VAC switch on the Main screen.
- Press the START switch to begin startup operation and blink the VAC switch.
- If the delay time is specified, a rough pumping operation is carried out until elapsing the specified time.
"Rough VAC" is indicated on the operational status display.
*Before the factory shipment, the delay timer is set to "0" sec.
- TMP starts up when the time specified in the delay timer elapses.
"TMP:ACC" is indicated on the operational status display.
- When the startup operation of the TMP completes, the VAC switch turns into lighting from blinking.
"TMP:NOR" is indicated on the operational status display.
- When "TMP:NOR" is indicated on the operational status panel, the startup operation of this machine is completed.

■ How to stop

- Press VAC switch on the Main screen.
- Press the STOP switch to begin stop operation and blink the VAC switch.
"Wait to STOP" is indicated on the operational status display.
- During the period from stopping the FP until adequately reducing the TMP rotation, the timer counts four minutes.
*In spite of device operation status, "Wait to STOP" operation status always transits into "STOP" operation status after the timer counts four minutes.
- When "STOP" is indicated on the operational status display, the stop operation of this machine is finished.

4.3.2 External interlock

As an external interlock for emergency shutdown, this machine contains an interface capable of forcibly shutting down the operation by inputting signals into CNSIL connector 1-2 pin and 3-4 pin

Table 17 External interlock pin assignment

Connector	PIN No.	Operation
CNSIL	1-2	Operation permitted when "Open"
	3-4	Operation permitted when "Close"(Jumper pin attached before shipment)

▶ 4.4 Connecting G-TRAN

NOTES



If a wrong connector is chosen, the connected device may possibly be damaged.

Since there is a terminal that outputs DC24V, and if a wrong connector is chosen, the connected device may possibly be damaged, therefore, carefully check the connection destination.

It is possible to simply display G-TRAN output operation value by connecting Ulvac transducer type vacuum gauge G-TRAN series to this machine.

4.4.1 Setting of G-TRAN

1. Check that the operation status is "STOP."
Setting for G-TRAN cannot be allowed except for "STOP" condition.
2. Connect a corresponding G-TRAN to any of D-PG, D-IG, or D-CC of the connector panel.

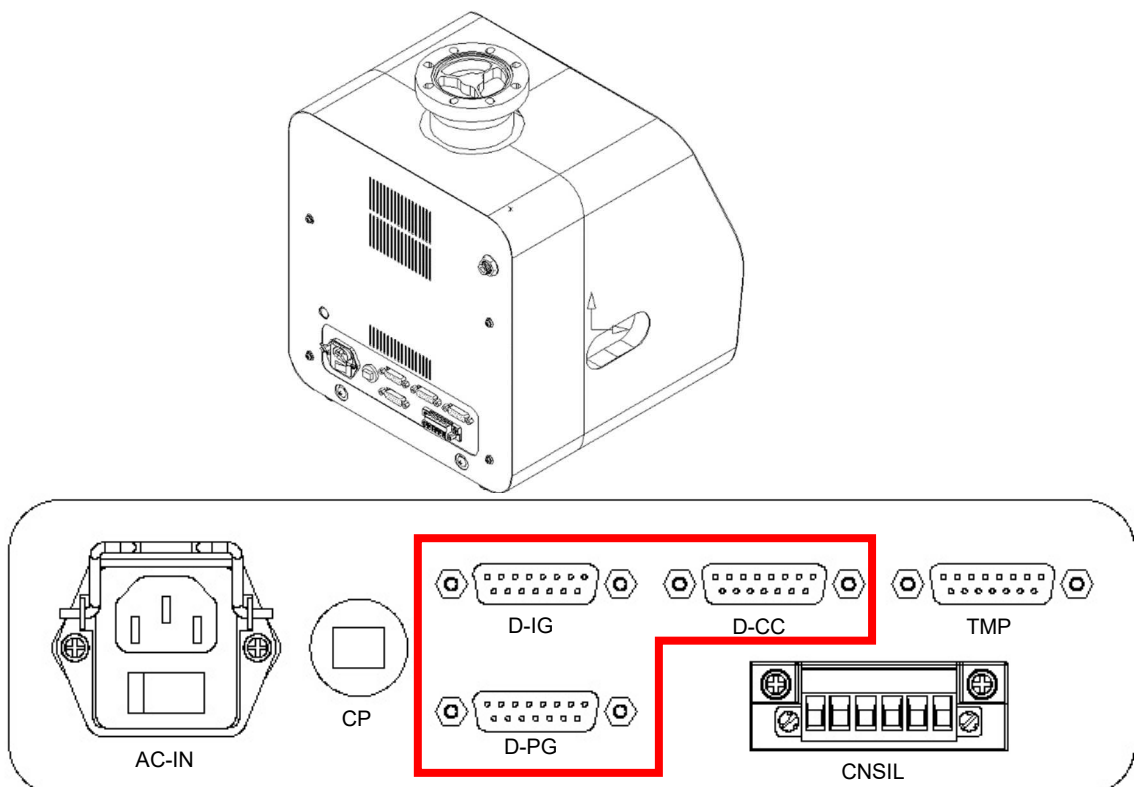


Figure 17 Connector panel G-TRAN connector

Table 18 List of connector panel and corresponding G-TRAN models.

Connector	Corresponding G-TRAN models	Remarks
D-PG	SW-1-1, SP1, CCMT-D	For vacuum gauges not requiring filament or turning ON/OFF operation for electric discharge
D-IG	SH2-1, ST2-1, SC1	For vacuum gauges requiring filament or turning ON/OFF operation for electric discharge
D-CC	CCMT—D*1	For connecting CCMT-D using the cable GDC-xxx for display.

*1: Connect it to D-PG when using the display cable dedicated to CCMT-D

- Press Menu on the Main screen to display the Menu screen.
- Select a G-TRAN model to be connected by P1 and P2 on the Menu screen.

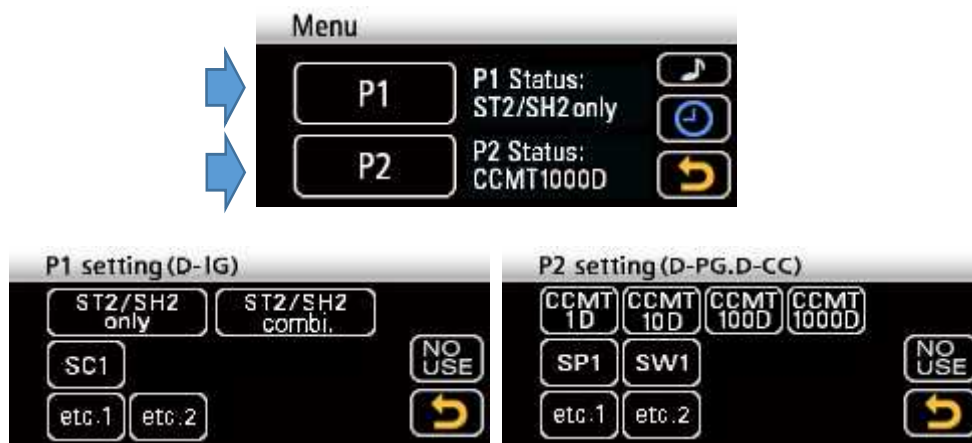


Figure18 Menu screen and G-TRAN models on the P1 and P2 screen.

Switch	Corresponding G-TRAN models	Description
P1	SH2-1, ST2-1, SC1	The output operation value for selected G-TRAN is indicated on the P1 and P2 pressure display section on the Main screen.
P2	SW-1-1, SP1, CCMT-D	
NO USE	—	When the P1 and P2 pressure display is not used.
etc.1, etc.2	—	For displaying the operation result of the function

SH2 and ST2 are shipped in combination mode with the Pirani gauge SPU.

When using in other combinations or as a single unit, the SH2 / ST2 device must be set.

No.	Mode	Comments
0	SH2 independent mode	B-A gauge only
1	SPU combination mode	Pirani vacuum gauge and B-A gauge ISG1 S/N: 04050 and higher.
2	SAU combination mode	Pressure measuring, Pirani vacuum gauge, and B-A gauge ISG1 S/N: 04050 and higher.
3	SPU combination mode	Pirani vacuum gauge and B-A gauge ISG1 S/N: 00001~04049
4	SAU combination mode	Pressure measuring, Pirani vacuum gauge, and B-A gauge ISG1 S/N: 00001~04049

5. Press Return switch to return to the Main screen.
The G-TRAN output operation value specified in P1 and P2 is indicated in the Main screen.
*The output operation value of G-TRAN specified in P1 is indicated only while the filament (electric discharge) is turned ON. It indicates "0.0 x 100" while the filament is turned OFF.



Figure19 Display of P1 and P2 output operation value on the Main screen

6. Turning ON/OFF of P1 filament (electric discharge)
 - d. By pressing FIL switch on the Main screen, and pressing FIL ON switch on the Filament ON/OFF screen, a pressure measurement by G-TRAN connected to P1 is started. By pressing FIL OFF switch, the filament is turned OFF and the pressure measurement is stoppe
7. Changeover of P1 filament
If G-TRAN SH2-1 is used, the filament used for the contact signal between CNSI 5-6 pin can be changed over.

Connector	Contact signal	Description
CNSIL 5-6PIN	Open	Using filament FIL1
	Close	Using filament FIL2

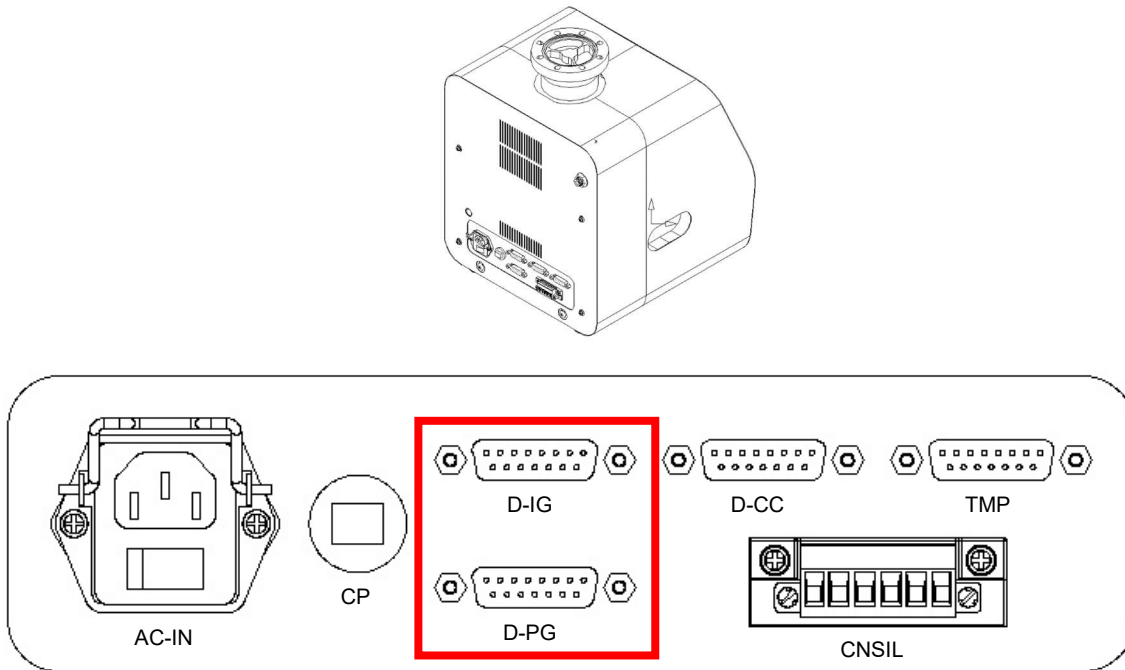
▶ 4.5 Connecting other than G-TRAN

NOTES	<p><u>If a wrong connector is chosen, the connected device may possibly be damaged.</u></p> <p>Since there is a terminal that outputs DC24V, and if a wrong connector is chosen, the connected device may possibly be damaged, therefore, carefully check the connection destination.</p>
--------------	---

4.5.1 Connection method for devices other than G-TRAN

The value calculated by the function prepared in advance with the setting of the connected device can be displayed, and analog voltage output other than G-TRAN can also be displayed easily.

1. Check that the operation status is "STOP."
Setting for devices cannot be allowed except for "STOP" condition.
2. Connect a corresponding device to any of D-PG, D-IG, or D-CC of the connector panel.



The corresponding connector and display section are as follows.

Display	Connector	Device
P1	D-IG	Equipment with ON / OFF operation such as filament and discharge such as ionization vacuum gauge
P2	D-PG	Equipment that always outputs when power is supplied, such as a Pirani gauge

3. Press Menu on the Main screen to display the Menu screen

- Select the function corresponding to the output of the connected device from etc.1 and etc.2 in P1 and P2 of the Menu screen. Check the instruction manual of the connected device and prepare the wiring suitable for the input / output of this unit. Refer to section 2.4.8 for details.

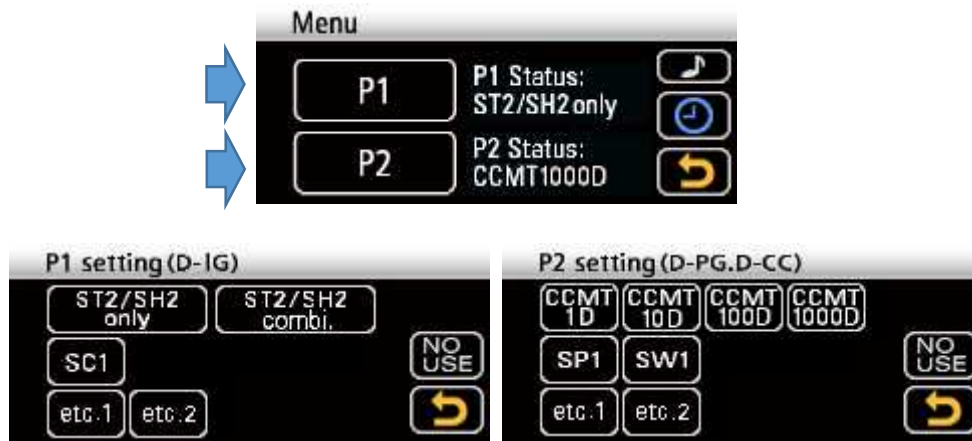


Figure20 Menu screen and G-TRAN models on the P1 and P2 screen.

etc.1 / etc.2 functions

Switch	Function	Work
etc.1	$P = a \times 10^{((V - b) / c + d)}$	P : Display Value V : Input Voltage DC0-10V A,b,c,d : variable
etc.2	$P = (V / a) \times b$	

- Press Return switch to return to the Main screen. The G-TRAN output operation value specified in P1 and P2 is indicated in the Main screen. *The output operation value of G-TRAN specified in P1 is indicated only while the filament (electric discharge) is turned ON. It indicates "0.0 x 100" while the filament is turned OFF.

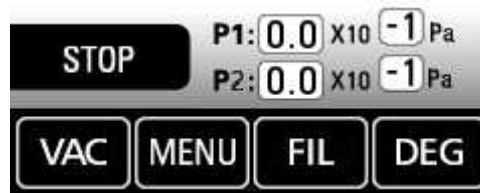


Figure21 Display of P1 and P2 output operation value on the Main screen

6. Turning ON/OFF of P1 filament (electric discharge)
 - d. By pressing FIL switch on the Main screen, and pressing FIL ON switch on the Filament ON/OFF screen, a pressure measurement by G-TRAN connected to P1 is started. By pressing FIL OFF switch, the filament is turned OFF and the pressure measurement is stoppe
7. Changeover of P1 filament

If G-TRAN SH2-1 is used, the filament used for the contact signal between CNSI 5-6 pin can be changed over.

Connector	Contact signal	Description
CNSIL 5-6PIN	Open	Using filament FIL1
	Close	Using filament FIL2

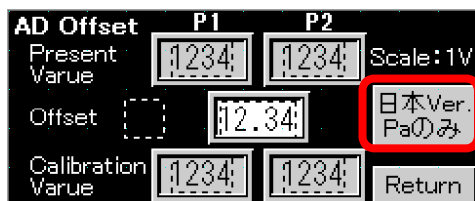
Changing the display unit

The display unit can be changed from Pa to Torr or mbar by the following operations.

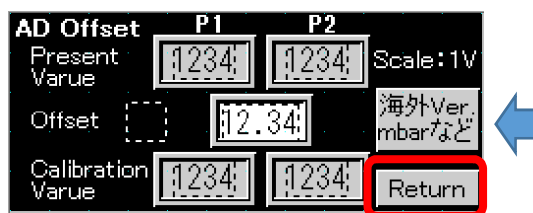
1. Press and hold the ULVAC logo when the power is on.



2. Press the following switch



3. When the switch display changes, press Return.



5. Maintenance and Inspection

In order to use the machine safely with keeping the inherent performance, daily and periodical inspection and maintenance are necessary.

► 5.1 Daily inspection

Check following items in order to prevent the machine from breaking down for extending the service life.

Item	Checking details	Actions taken against abnormalities
Purge gas (when using a purge gas)	The flow rate of the purge gas shall conform to the predefined value.	Check the supplied pressure and piping.
Abnormal sound and abnormal vibration	No abnormal sound or vibration shall be heard.	Check the fixation of the machine and piping.
Are not there any abnormalities in the exhaust.	No overload shall be applied on the pump.	Check the intake side pressure. Check that the exhaust side is not covered.

► 5.2 Inspection after prolonged storage

If the machine is unoperated and kept stored for a long time (six months), the operation of the machine may be interfered because of moisture absorption or lubrication defect etc.

If the machine is kept unoperated for a long time, entrust a nearby service center to conduct an inspection work before re-use.

► 5.3 Overhaul

Conducting an overhaul regularly is recommended. Overhauling is required not only for maintaining the performance level (including safety) but also for continuing scheduled operation.



CAUTION



Do overhaul once a year

Do overhaul once a year.

In addition, if the pump is extremely polluted or the performance extremely deteriorates under the conditions of use, do an overhaul even within one year.

For overhaul, contact the nearest service center. Note that when you make a request for an overhaul, fill out the pollution notice at the end of this document and submit it.

If the details on the hazardous substances you have used are not disclosed, or if substances that are hard to detoxify are exhausted, we may refuse maintenance and other operations at our service center.

6. Troubleshooting

▶ 6.1 Problem in basic motion

Table 19 Problem in basic motion

Problems	Cause	Responding method	Reference
The power supply cannot be turned on.	No electric power is supplied.	Supply electric power.	4.2.1
	Electric leakage occurred inside the machine	Contact a service center.	End
	CP is shut off	Please restore breaker	2.3
Nothing appears on the touch panel display.	No electric power is supplied.	Supply electric power.	4.2.1
	Breakdown of instruments	Contact a service center.	End
The machine cannot be started up even pressing the VAC switch.	External interlock is wired.	Release the CNSIL 1-2 PIN.	4.3.2
	External interlock is wired.	Short-circuit the CNSIL 3-4 PIN	4.3.2
	Breakdown of instruments	Contact a service center.	End
	Breakdown of FP	Contact a service center.	End
Abnormal sound can be heard from the machine.	The machine is operated with the transportation jig kept attached.	Remove the transportation jig.	End
	Breakdown of FP	Contact a service center.	End
	Breakdown of TMP	Contact a service center.	End
	The exhaust side is covered.	Check around the exhaust port.	3.4.1
	Leakage of intake side piping	Inspect the intake side piping and stop the leakage.	3.4.1
The pressure cannot be turned down/ The startup operation cannot be completed ("TMP:NOR" is not indicated but "TCC;APP" is remained)	Clogging in the intake side mesh	Inspect the intake side piping.	3.4.1
	The capacity of exhaust receiving system is large.	Use the delay timer to delay the TMP startup time and operate the machine.	2.4.5
	Exhaust side piping is clogged.	Inspect the exhaust side piping.	3.4.1
	FP does not start up	Restore the unit to atmospheric pressure and restart it	4.3.1
	Breakdown of TMP	Contact a service center.	End
The display of "0.0 x 100" is remained even setting P1 and P2.	Connection section is wrong.	Connect it to the corresponding connection section	4.4.1
	The filament is not turned on (only for P1)	Turn on the filament.	4.4.1
The indicated values of P1 and P2 are obviously different.	The model specified is different.	Select the model of G-TRAN connected.	4.4.1

▶ 6.2 Alarm state and the responding action

Display	Alarm name	State
	P1 ALARM	Abnormality of the device specified in P1



Cause	Responding method	Reference
An abnormal signal is received from the device specified in P1.	Handle the matter according to the instruction manual of the device.	

Display	Alarm name	State
	P2 ALARM	Abnormality of the device specified in P1



Display	Alarm name	State
	TMP ALARM	TMP detects an abnormality.



Cause	Responding method	Reference
Overload on TMP	Use the delay timer to delay the TMP startup time and operate the machine.	2.4.5 6.1
Disconnection of TMP cable	Contact a service center.	End
Breakdown of TMP	Contact a service center.	End

*It is possible to check the details of TMP abnormalities through RS-485 communication.

▶ 6.3 Re-start after alarm generation

■ Alarm reset

If an alarm is indicated, re-start the machine after eliminating the cause of the alarm.

Before re-starting, reset the alarm by any of following methods.

Handling after alarm generation	Method for resetting alarm
After eliminating the cause of alarm, reset the alarm and re-start the machine.	In a condition when the characters representing the alarm details are indicated, press the RESET key of the controller.
Turn on the power supply again.	Once turn off the primary side power supply, and turn it on again when the display of controller disappears.

7. Specification

► 7.1 Performance specification

Model		YTP70A-D	
Inlet port		ICF114,VG65,ISO63-K	
Ultimate pressure (*1)	Pa	10 ⁻⁶	
Pumping speed (*2)	N2	L/s	70
	He	L/s	60
	H2	L/s	49
Backing pump	L/min	20	
Weight	kg	17.5	
Noise (*3)	dB(A)	43	
Input power source		Single-phase AC100~240V (50/60Hz)	
Power capacity	W	300	
dimension	Width	mm	318
	Length		329
	Height		ICF:405,VG/ISO : 387

※1: A digit number is expressed.

※2: Without a protective net.

※3: At ultimate pressure. Measured by ULVAC standard for ICF flange type.

► 7.2 External dimensional drawing

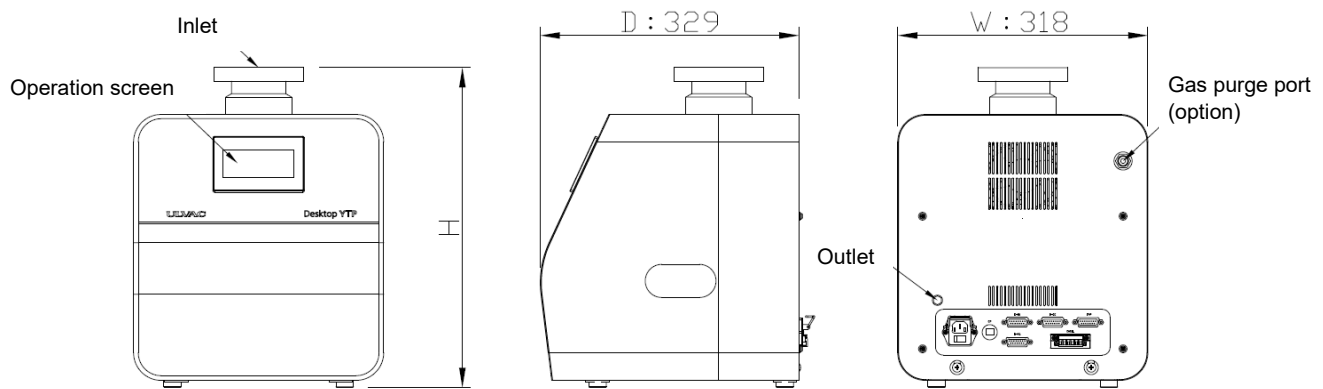


Figure 20 External dimensional drawing

Inlet flange	H	D	W
ICF114	405	329	318
VG65	387		
ISO63-K			

Appendix

Main replacement parts

The components to be replaced in an overhaul are listed below. The replacement period differs according to the component. The recommended replacement cycle in the following table is presented for reference purpose only. It may be varied according to the use condition and environment of the customer.

Table 20 Main replacement parts

Types	Component name	Recommended replacing period
Recommended replacement component for FP	Diaphragm	6,000hr
	Valve	6,000hr
	Bearing	15,000hr
Recommended replacement component for TMP	Bearing	No-load: 5 years With gas load: Two years
	Touchdown bearing	5 years
	Rotor wing	7 years
	Motor	7 years
	Electrolytic capacitor	5 years
	Button cell	5 years
Recommended replacement component for the touch panel	Touch panel	5 years
Recommended replacement component for the power supply.	Power supply	5 years

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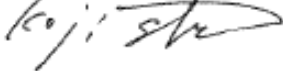
CE EU DECLARATION OF CONFORMITY CE

The object of the declaration is in conformity with the relevant Union harmonization legislation.
This declaration is issued under the sole responsibility of the manufacturer.

Product	TMP Pumping System	
Model	YTP70A series	
Manufacturer	ULVAC, Inc. 2500 HAGISONO, CHIGASAKI-SHI, KANAGAWA-KEN, 253-8543 JAPAN	
Test standard	Low Voltage Directive	2014/35/EU EN61010-1:2010(Third Edition)
	Restriction of the use of Certain hazardous substances (RoHS)	2011/65/EU EN 50581:2012
Test lab.	ULVAC, Inc.	

Note: This declaration becomes invalid if technical or operational modifications are introduced without the manufacture's consent.

European contact address : ULVAC GmbH Head Office
Parking11, 85748, Garching, Germany

Signature : 

Date : *May. 17. 2019.*

Name : KOUJI SHIBAYAMA

Title : Senior Manager of Components Division
Pumps Engineering Department

ULVAC Component Contamination Certificate

This form is used as the Contamination Certificate to make requests for repair/inspection of the ULVAC's components.

Before sending your equipment to us such as for repair, fill out this form and submit to the contact request or the representative sales office.

In addition, for the products used for toxic gas or with reaction products adhering, contact the contact request or the representative sales office in advance

Product Name :
Model :
S/N :
Purpose of Use :
Detail on Request

(Reason for return,
usage situation,
special notes etc.)

Pollutant (Check all the boxes (□) apply)

- It is ensured that the product above is not polluted by hazardous materials.
 The product above is polluted by the following hazardous materials.

	Pollutant Name (Formula)	Characteristics
1		
2		
3		
4		
5		

To ULVAC, Inc.

Your representative: _____

YYYY, MM, DD

Your name / Company
name _____

Department _____

Representative: _____

(signature)

TEL _____

FAX _____

E-mail _____

* The customer is responsible for any accidents attributed to pollutants caused during the transportation to your company.

Please take due care. In addition, we are able to refuse repair etc. depending on the pollutants and the polluted conditions. In such a case, we will send back to you.

Field for ULVAC, Inc. SDS Request: Yes/No	Receipt stamp	
Order No.		

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<http://www.ulvac.co.jp/>

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http://www.ulvac.co.jp/support_info/service/

販売拠点一覧
http://www.ulvac.co.jp/support_info/sales_office/



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