



# VACUUM PRESSURE CASTING MACHINE

## K2NEXT 8K



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# 1. INTRODUCTION

---

## 1-1. SAFETY PRECAUTIONS

Three safety precautions are described in this instruction manual to avoid risks on human body during operation. Be sure to read these precautions before using our products.

Each meaning as follows;

**DANGER:** Indicates a high-risk hazard. If this hazard is not avoided, it may result in severe injury or even death.

**WARNING:** Indicates a medium-risk hazard. If this hazard is not avoided, it may result in severe injury or even death.

**CAUTION:** Indicates a low-risk hazard. If this hazard is not avoided, it may result in a minor or moderately severe injury. It also indicates a potentially hazardous situation. If it is not avoided, the product or items in its immediate environment may suffer damage.

## 1-2. SAFETY INFORMATION

This product contains high frequency oscillator and requires high pressure inert gas. Therefore, perform daily maintenance well and operate very carefully and safely.

### DANGER

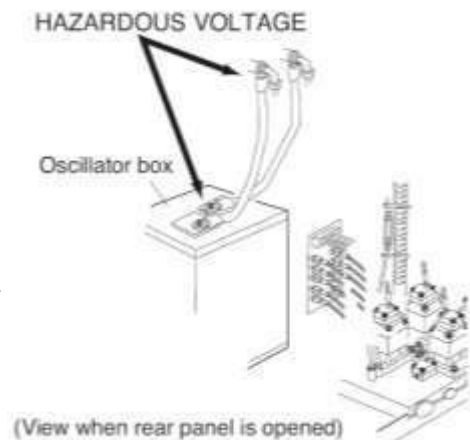
High-voltage electricity is applied inside this product.

Do not open the panel unless instructed in this manual.

If the panel is accidentally opened while power is on, there is a risk of injury or death from electric shock.

If you need to open the panel of main unit, be sure to turn off power and unplug power cable from outlet even if the breaker switch is turned off beforehand.

Otherwise hazardous voltage can cause an electrical shock, burn or death.





## WARNING

1. Do not place fingers, hands, a part of body, or an article between lid and melting chamber or between melting chamber and mold chamber when you press START button, Lid will move downwards and mold chamber will move upwards to close with pressure.

As their pressing force to close is very strong, careless positioning of your fingers, hands, or any other part of body can cause severe injury.

Particular care should be taken so that any other person, standing close to you, should not place fingers, hands, any other part of body, or an article between above-mentioned parts of chambers.

When you need to release lid or chambers, Press RESET button immediately.

If you release START button before lid is completely closed, the lid goes up to its original position.

If you release START button in one second after lid is closed, the lid goes up as well.

The lid or the chamber will not be released by EMERGENCY STOP button.

You need to push RESET button when you need to release them.



2. Do not put anything on lid.

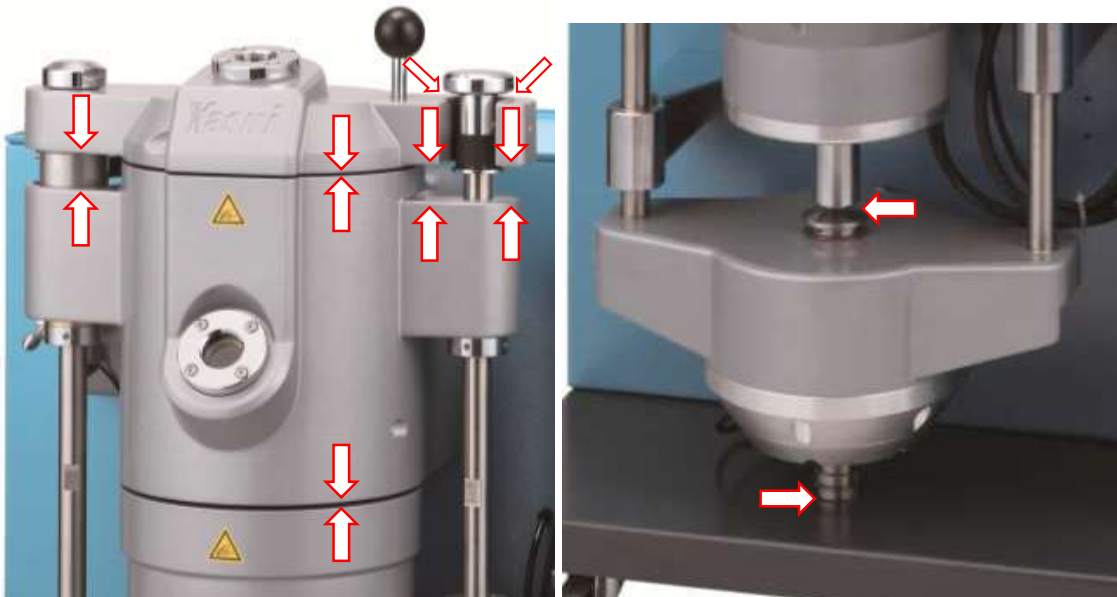
Also do not place part or all of the human body on lid in the same way.

Otherwise lid fixing shaft will be deformed by the excessive weight and no longer operated.

Also, the lid may be hot which can cause burns on human body.



CAUTION!





## CAUTION

1. Do not look into molten metal continuously for a long time. Eyes may suffer eye sight disease. Wear protection glasses.
2. Check that no crack or breakage is observed on crucible, outer crucible, before setting. Do not push crucible body, or metal in crucible, strongly. When crucible has a crack, molten metal may leak through it, resulting damage on this product.
3. Crucibles have their casting lives. Do not use a deteriorated crucible. Check condition of crucible before use.
4. Do not leave this product unattended, while it is turned on.
5. When performing maintenance like replacing, or cleaning crucibles, heating coils, mold chambers, and other parts which can be hot by heating, make sure that they have sufficiently cooled. Otherwise operator may suffer burns.
6. Do not place any material or tool on operation panel or on top cover of this product. When lid is moved, an object may fall off and an unexpected accident may occur to this product and operator. Particularly, never place anything on operation panel because malfunction may be caused on LCD touch panel and push switches.



## WARNING

1. Do not use any antioxidant like typically known 'borax', any additives which behave as same, fluxes, sodium bicarbonate, silicone and others. Careful not to slip them into metal accidentally. Most of them will create glassy contamination which clogs stopper holes or brings leakage of metal. This product will suffer serious problem by this.
2. Do not use any materials which contain too much zinc, nickel and others which create lots of fume when melting. They will attack your breathing apparatus.
3. Electromagnetic waves from this product may adversely influence medical equipment such as a pacemaker or an implantable cardioverter defibrillator (ICD). People wearing it should not be near this product.



## IMPORTANT

- Be sure to read this instruction manual and fully understand the contents before using it.
- The manufacturer shall in no event be liable for any damage resulting from improper use, negligence to follow the warnings and cautions in the instructions manual or the labels on the product, unskillfulness, use of non – original optional /consumable accessories / spare parts, non - authorized modification.
- The manufacturer shall in no event be liable for any consequential or indirect damages including, but not limited to, loss of production or loss of profit or damages due to machine downtime.
- Damages to the instrument and /or human bodies resulting from a crucible breakage or contacting with high temperature parts are not compensated by the manufacturer.
- Damages resulting from delay of reaction at emergency and mistaken operation are not compensated by the manufacturer.
- Damages by electrical noise, over voltage, or wiring error caused from an external vacuum pump are not compensated by the manufacturer.
- Casting results by this product or by this manual are not compensated by the manufacturer.
- No part of this document may be copied or in any way reproduced without the expressed written consent of the manufacturer.



### 1-3. PASSWORD

#### 1-3-1. KIND OF PASSWORD

Three kinds of password are prepared for the machine as follows.

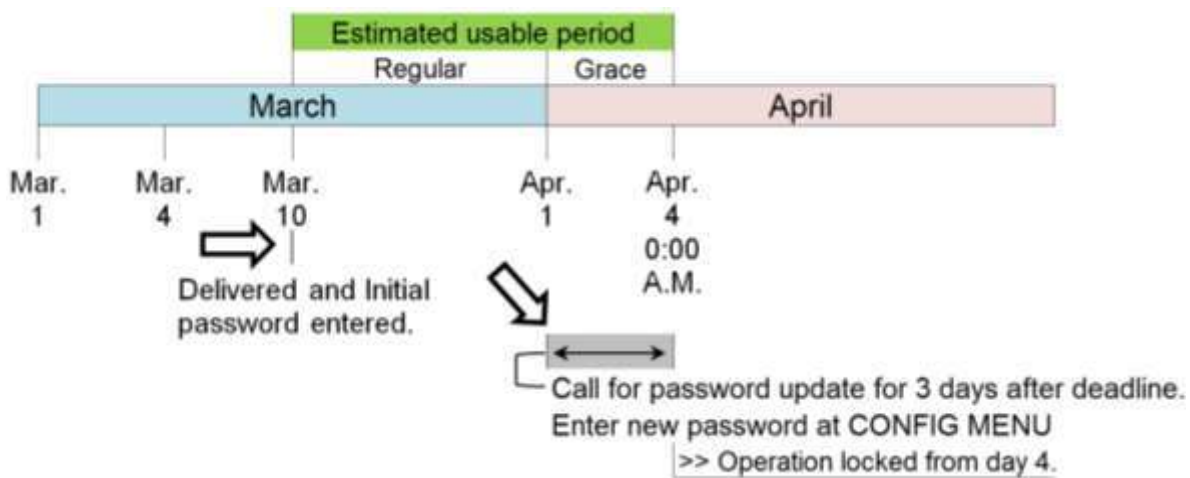
##### 1) Initial installation password

This password is necessary to release operation-lock of the machine at the time of installation.

0:00 a.m. of 4th day of the next month (Japan time) is expiration date of this password.

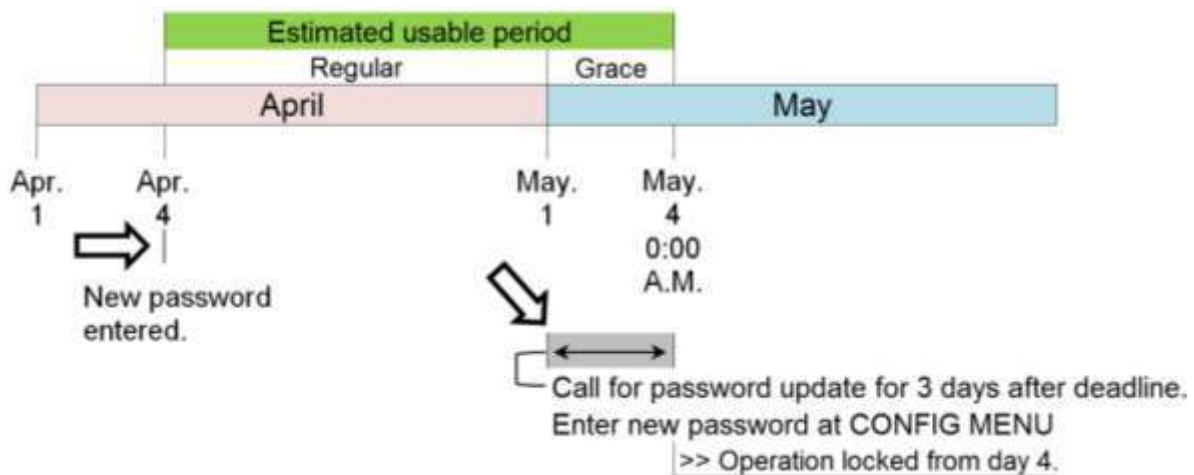
Unless final password is entered, new update password is necessary every month to use the machine on and after this day. Operation will be locked from day 4.

Example of Initial installation password:



##### 2) Monthly update password

In case this product is used by monthly use conditions, this password is necessary on or after the first day of the month to which the next monthly calculation starting time belongs.



\* Some of products and models do not have 'Initial installation password' but 1st password of Monthly update.



## IMPORTANT

If you update before the first day of the month to which next monthly calculation starting time belongs, monthly update subtraction counter is decreased by extra one month. Update should be done on or after the first day of the month to which calculation starting day belongs.

### 3) Final password

When this password is entered and verified by the machine normally, the machine can be operated without time-limit.



## IMPORTANT

Once this final password has been verified by the machine, machine cannot be reset to the monthly update password mode.

## 1-3-2. ISSUE OF PASSWORD

To issue next password in the case of use by monthly update password mode, the following information is necessary.

Model name: K2NEXT 8000

Production Serial No. : xxx

Current monthly update history count: xx

## 1-4. SPECIFICATION LABEL

The principal specifications label of this product is affixed on the back side panel.

NOTE: When ordering spare parts, specify the production serial number that is printed on that label. Apply power specified voltage printed on the label. Should any voltage exceed beyond the specified voltage, the manufacturer is not responsible to guarantee performance of K2NEXT 8000.

## 1-5. PURPOSE

This product is designed for one of lost wax casting process; burnout molds for precious metal and non-precious metal jewelry accessories.

This product has been developed for use in the manufacture of precious metal and base metal alloy

products as accessories, and in the manufacture of some other precious metal base and non-ferrous metal products (eyeglasses, apparel business, Japanese accessories, and general industrial parts). Do not try for other purpose.

The manufacturer will not take any responsibility if not followed the purpose.

## 1-6. WORKING CONDITIONS

- 1) Use this product at temperatures ranging 0-40 degrees Celsius and humidity under 70%.
- 2) Apply power voltage 380 VAC, 50/60 Hz, 3 phase only.
- 3) Do not use this product under atmosphere with too much dust or with harmful gas.

## 1-7. OTHERS

1) Please note that K2NEXT 8000 is controlled by genuine computer which needs longer time for starting up comparing with other electric equipment apparatus.

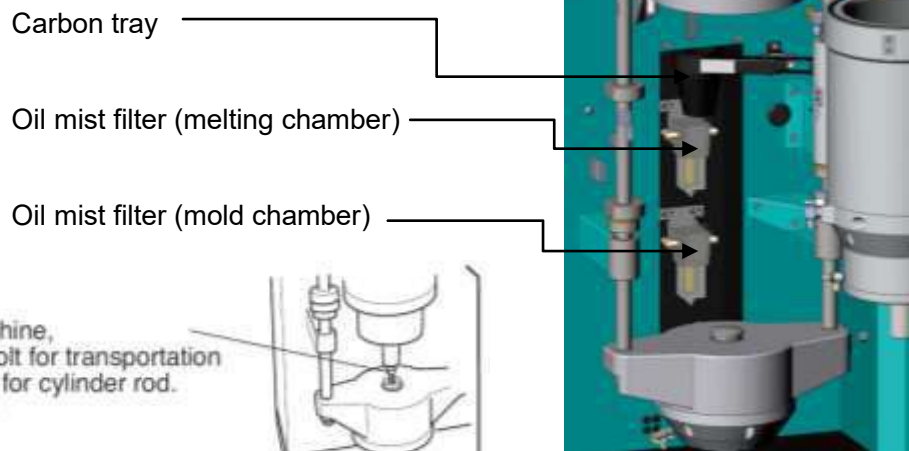
2) Please note that we have "half life period" on back up light for Liquid Crystal Display (LCD). Actual half life period of display is approx. 3 years when you use it with 100% brightness.

K2NEXT 8000 is always shipped out with initial brightness setting 50% to save life time of back up light.

You can also control its life by using suspend function.

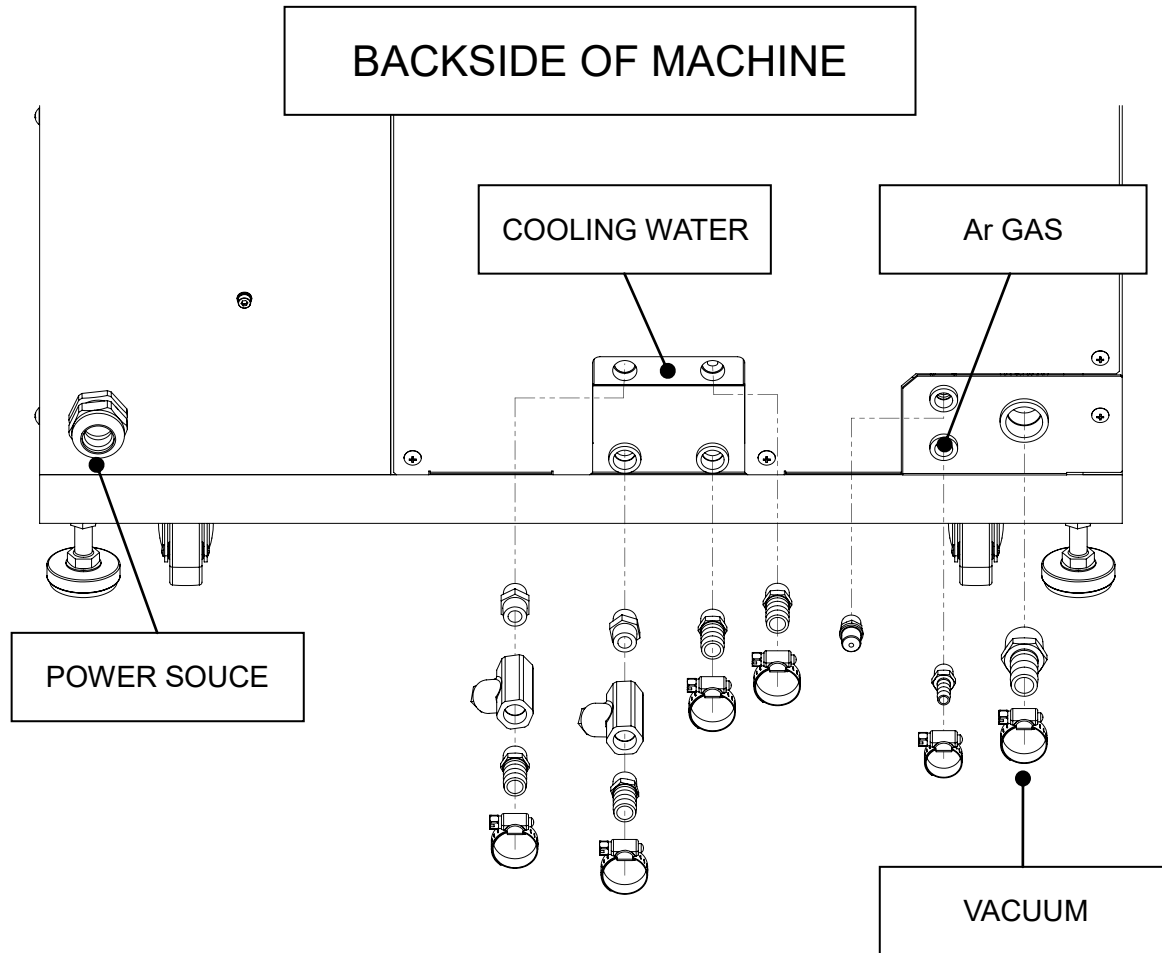
# 2. NOMENCLATURE

## 2-1. MAIN BODY

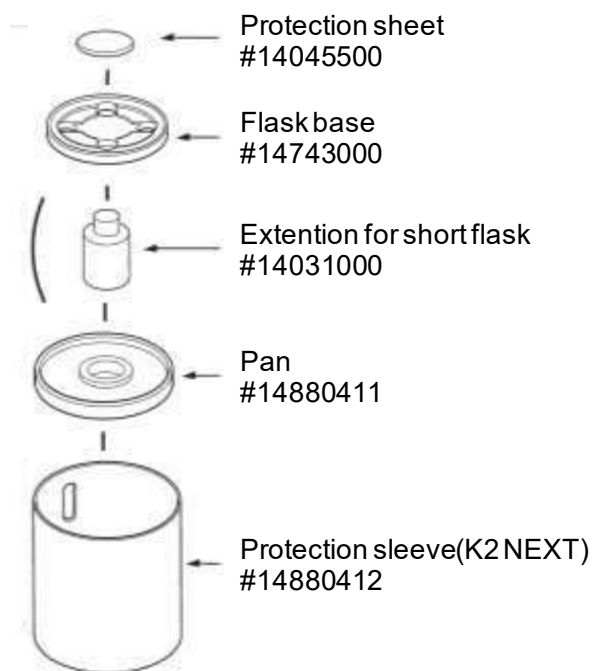


When installing the machine,  
 1) remove the fixation bolt for transportation  
 2) then, place the cover for cylinder rod.  
 See page 82 for details.

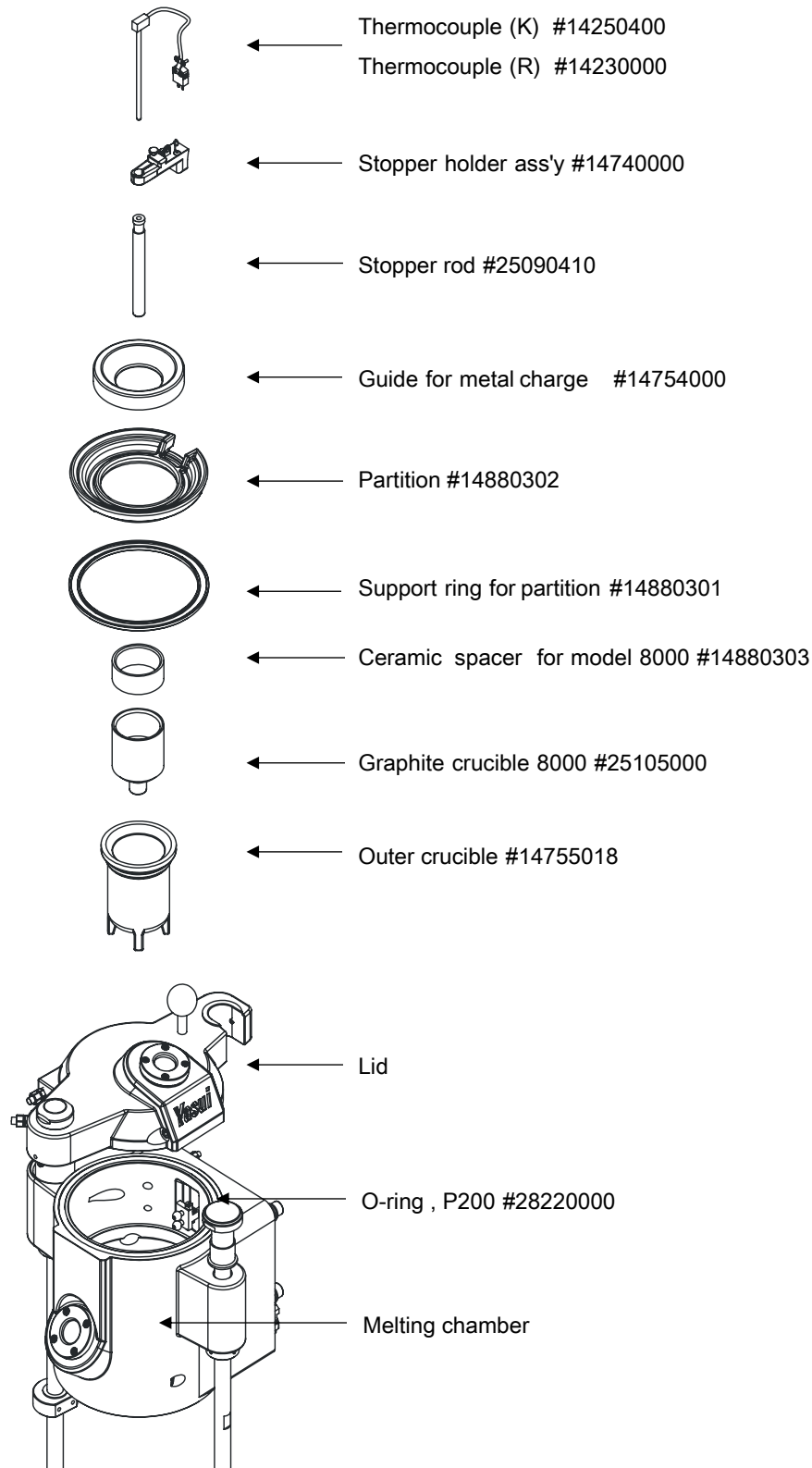
### 2-2. REAR PANEL



### 2-3. FLASK CHAMBER



## 2-4. MELTING CHAMBER



## 3. PREPARATION BEFORE CASTING



### CAUTION

When supplying power and others to this product for the first time after installation, be sure to fully understand and confirm the details about installation described in the separate section.

If installed incorrectly, problems on heating, overheating on wiring, control system, gas leakage, and insufficient vacuum may not only affect the casting results, but also may cause serious damage to the product and human body.

### 3-1. CHECKING POINTS BEFORE POWER ON

Check below points prior to power ON.

- 1) Connection of vacuum pump and its direction of rotation
- 2) Pressure of supply inert gas and electricity
- 3) Connection of hose to WATER IN
- 4) Connection of hose to WATER OUT



### CAUTION

Make sure before starting heating that tap water is turned on and cooling water is running inside machine. It won't be operated by error message when water supply is not enough.

### 3-2. SETTING CRUCIBLE AND OTHER PARTS

Set up below items.

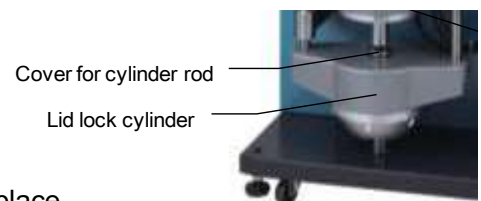
- |                       |                                       |                            |
|-----------------------|---------------------------------------|----------------------------|
| Meting chamber >>     | 1) Outer crucible, inner crucible     | 3) Stopper holder, stopper |
|                       | 2) Partition, Guide for metal charge  | 4) Thermocouple            |
| Mold chamber >>       | Protection sleeve, pan and flask base |                            |
| Below mold chamber >> | Cover for cylinder rod (#14721000)    |                            |



### IMPORTANT

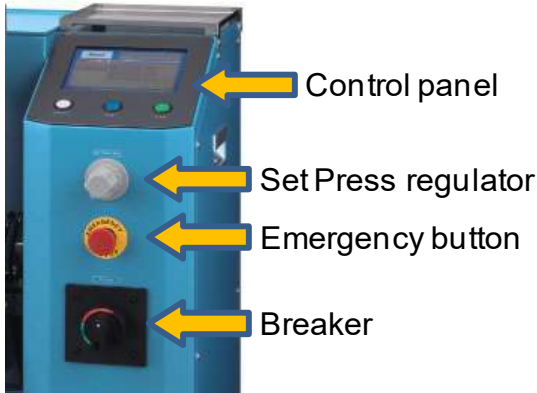
If cylinder rod head cover is forgotten, the lid lock action cannot be performed properly.

At the time of installing the product, be sure to check it is set in place.



# 4. OPERATION

## 4-1. OPERATION PANEL AND OTHERS



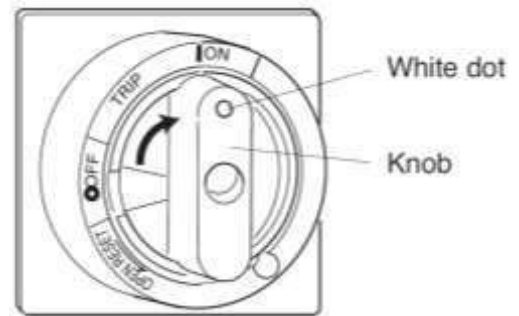
Major operation will be done around this area.

## 4-2. POWER ON

Turn knob of BREAKER switch until its white dot is set to ON position.

Power is supplied to all necessary parts.

initial display will be shown after pushing 'MASTER BUTTON' as instructed on LCD.



### IMPORTANT

Turn knob securely until it clicks into place.

When white dot on the knob moved to TRIPPED position during use of this product, over current has flown inside (TRIPPED condition by over current). In this case, check the cause and take necessary action. Then, turn knob to OPEN RESET position. Next, turn knob to ON.



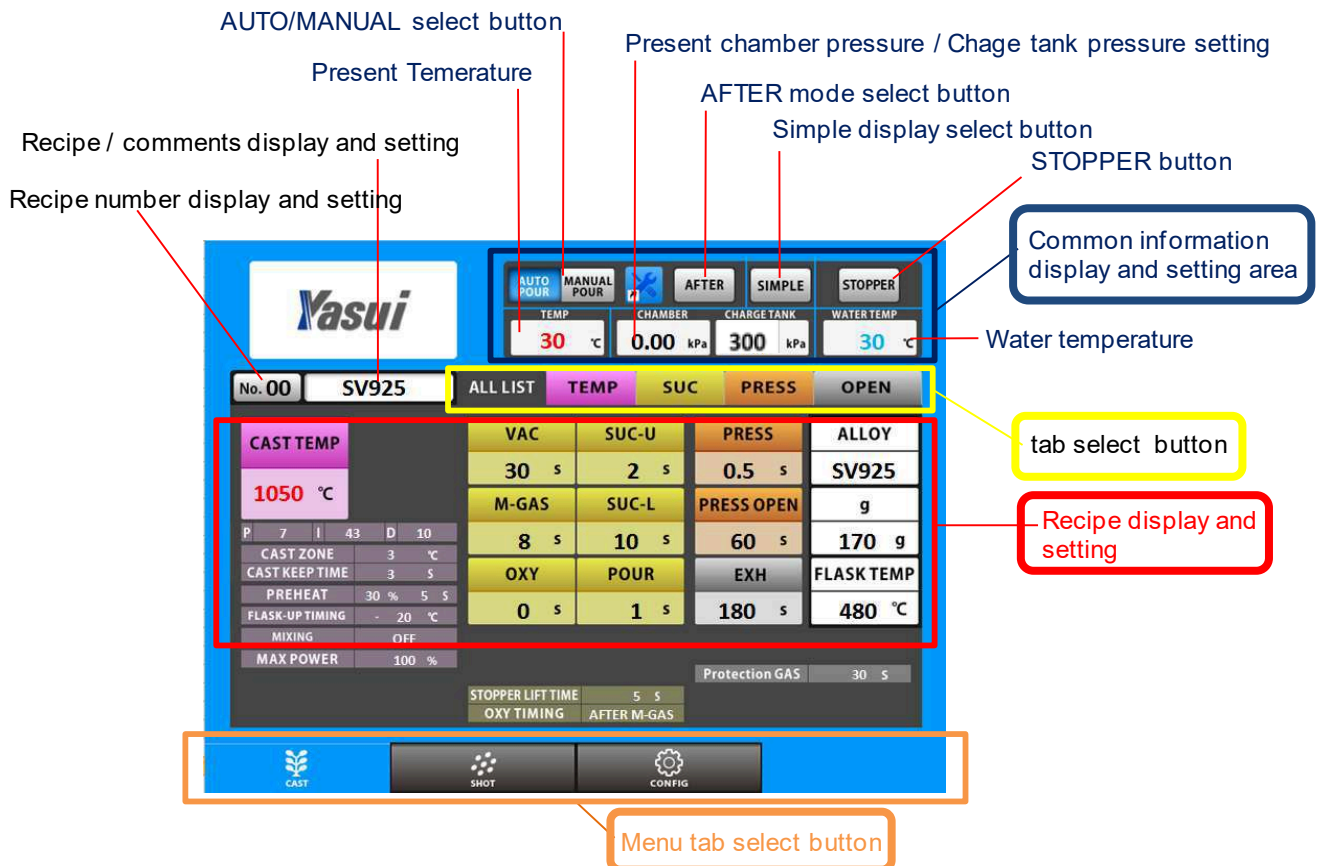
### 4-3. OPERATION

#### AUTOMATIC OPERATION

- 1) Turn main breaker ON.
- 2) Push MASTER button.
- 3) Select memory at main display.
- 4) Put metal into crucible and close lid.
- 5) Put mold into chamber and close.
- 6) Push START button for more than 2 seconds.
- 7) Take mold out from chamber when casting process completed.



Details on main display;



## 4-4. SET PRESS Regulator

Turn SET PRESS regulator knob to set the final pressurization value of internal charge tank. Set value is indicated on operation panel.

Maximum pressure value of this product is 300 kPa.

When you finish turning knob, push knob in to lock.

## 4-5. EMERGENCY STOP button

In case of emergency, press EMERGENCY STOP button to stop all of the functions.

To recover, turn it clockwise and press RESET button.

## 4-6. WINDOW AFTER START BUTTON

After pushing START button for actual casting, the window changes to GAUGE window.

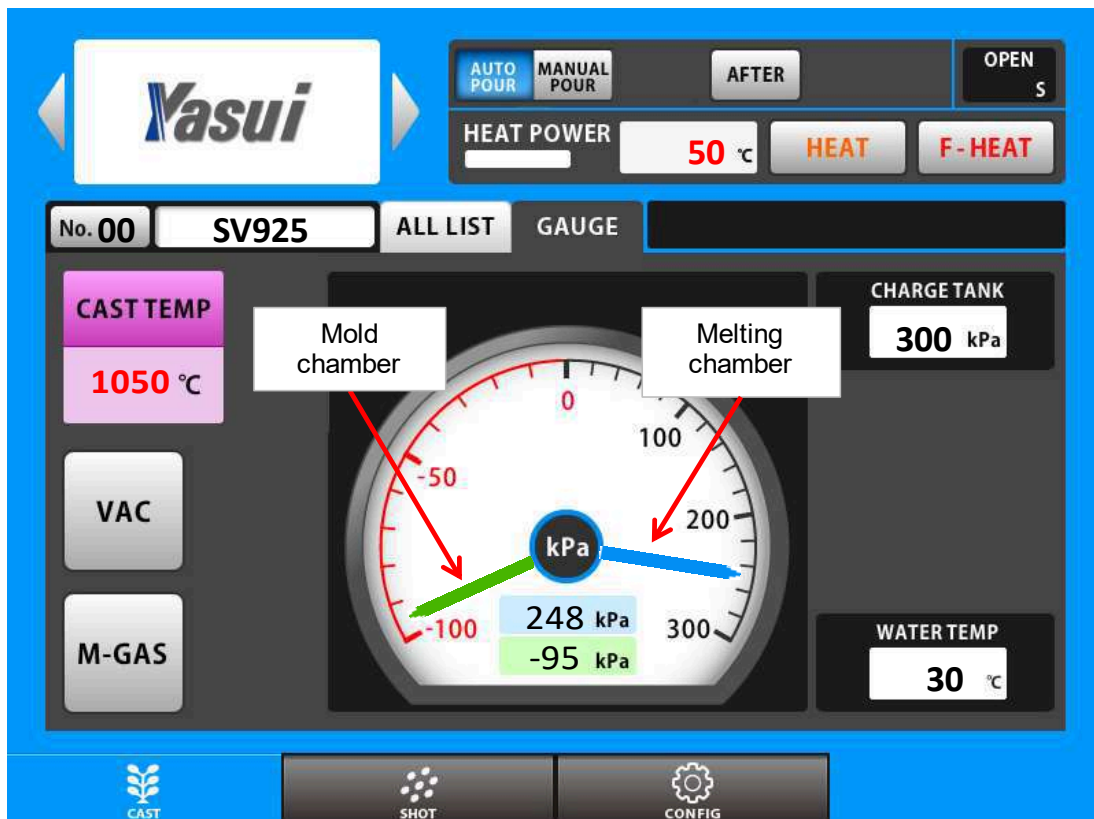
Big bourdon tube style manometer enables you to feel pressure instinctively by needles.

While digital display in the gauge is very useful for reviewing casting result.

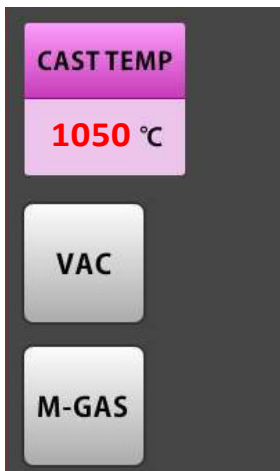
K2NEXT 8000 shows not only pressure in melting chamber but also mold chamber pressure.

You will know the condition of sealing disk, investment quality, difference by control suction value and others to improve casting result.

Other tabs except for ALL LIST tab are not shown while casting operation.



### 4-6-1. LEFT SIDE OF WINDOW



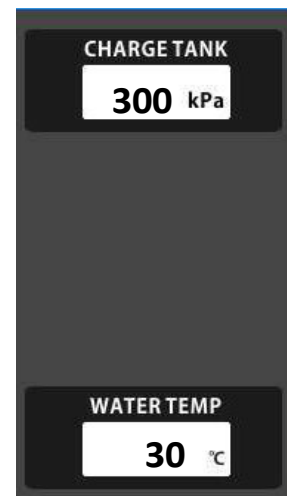
There is 'CAST temperature setting' box on top of this window. You can change setting during heating by tapping this box to call keyboard.

VAC button in the middle. You can adjust vacuum level by this button.

M-GAS button at bottom. You can adjust pressure level by this button.

### 4-6-2. RIGHT SIDE OF WINDOW

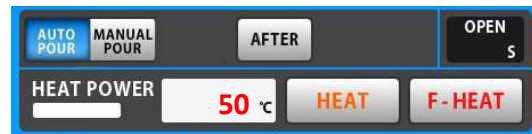
Charge tank pressure indicator on top. You can adjust it by regulator in front of machine. You can check cooling water temperature at drain exit. Please be careful you will have warning when it increased over 40 degrees Celsius.



### 4-6-3. TOP OF WINDOW

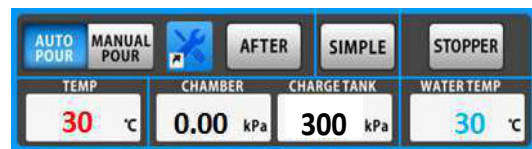
You can switch 'AUTO' or 'MANUAL' pour by these buttons. You can switch automatic mode casting or 'AFTER' mode casting. 'OPEN' box for EXH counting down window. At lower level, 'HEAT POWER' indicator and present temperature indicator for your reference. 'HEAT' button, you can heat on or off while heating. 'F-HEAT' button for 100% heating anytime.

#### After START button



You will find the window as you see on the right at standing by (details will be described later)

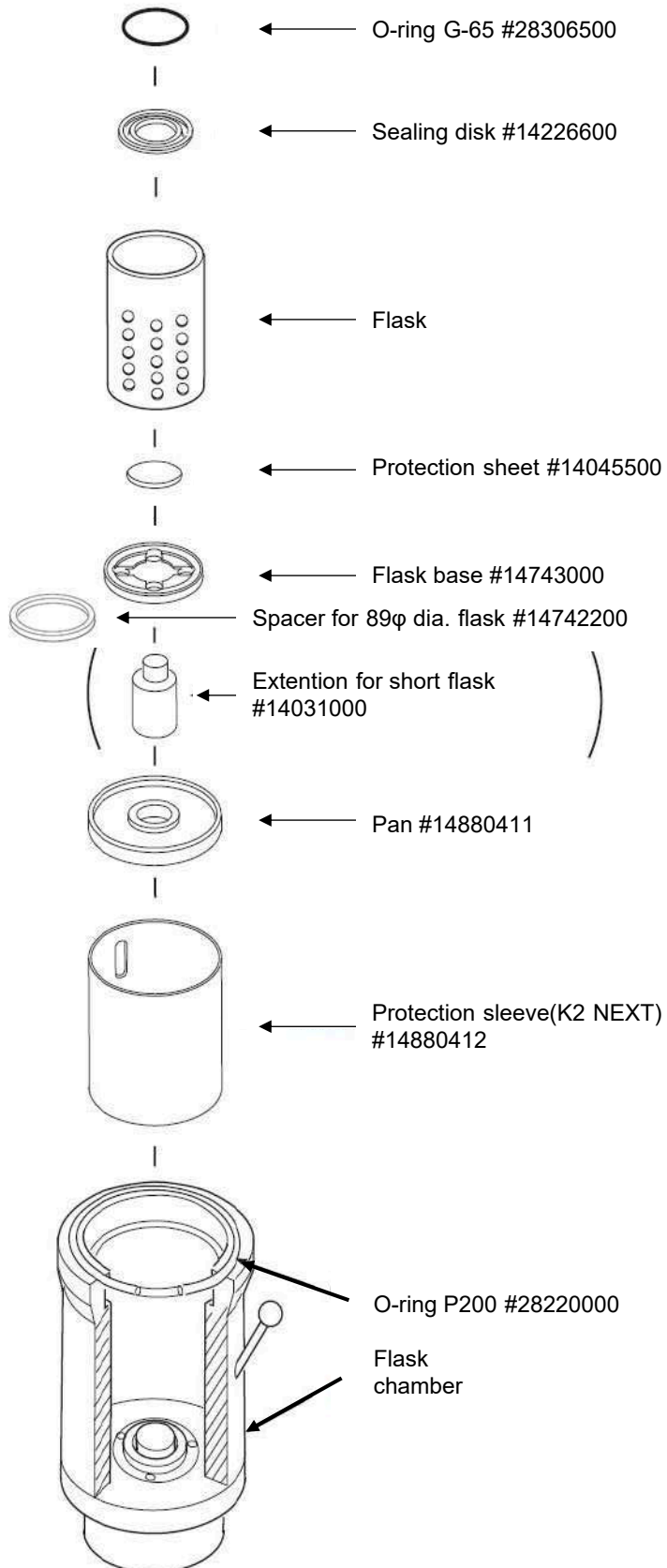
#### Before casting

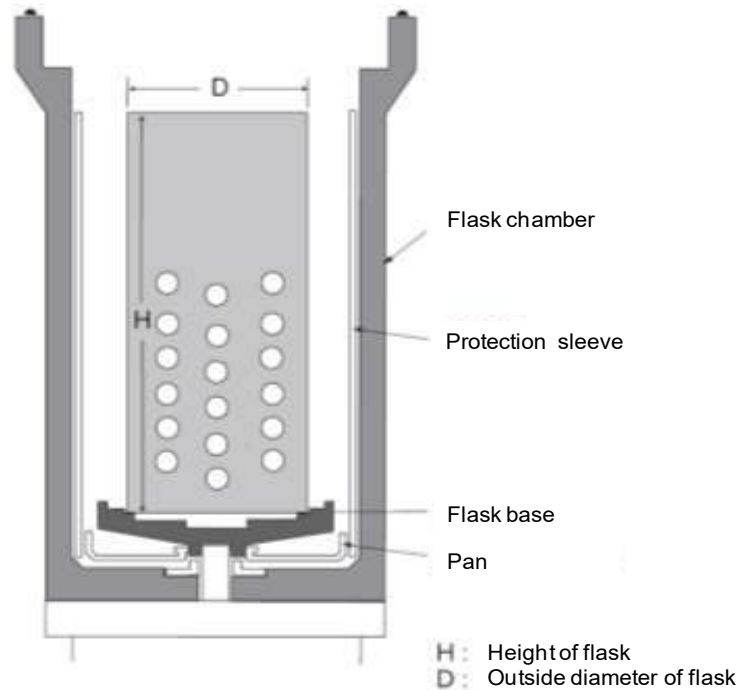


# 5. FLASK




## 5-1. FLASK COMBINATION


Use of a perforated flask is recommended.  
 Position the flask and other accessories in order as the below figure.





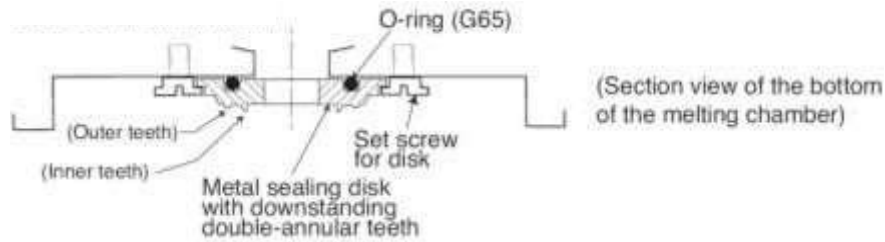
The below flasks can be used.

Flask base	Size of flask to be used	
	Height (H)	Outside diameter (D)
	190 mm to 230 mm (7 1/2" to 9")	89 mm (3 1/2") to 125 mm (5") (when flask is not deformed)
 to be used together with the adapter for short flask (H=40 mm) 	150 mm to 190 mm (6" to 7 1/2")	

( The positioning ring #14742200 is necessary for 89 mm flask )  


### 5-2. METAL SEALING DISK

Top of the flask is pressed against the bottom of the melting chamber. Then, pressurization and suction are actuated. Gas passes from the upper surface of the flask mold through inside the mold, then is disperses through side walls and bottom of the mold to outside. Use the metal sealing disk with down standing double-annular teeth to seal the upper surface of the flask mold.



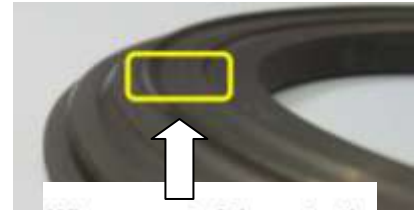
## IMPORTANT

Wrong fixation of the metal sealing disk with down standing double-annular teeth may greatly affect casting results.

Check the below 1 to 4.

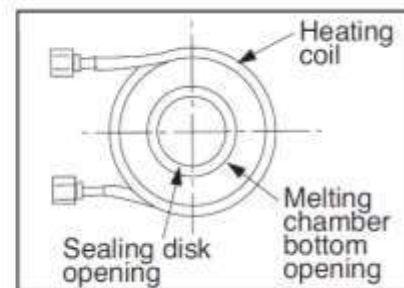
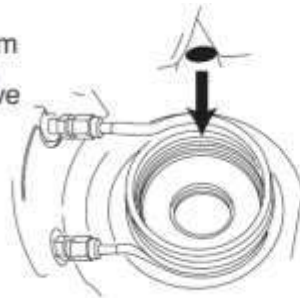
1. Check periodically the conditions of the metal sealing disk and the O-ring. The O-ring used for this sealing is consumable. So, replace into a new one before sealing effect is weakened.

2. Adjust the horizontal location so that the disk is exactly centered, and then tighten the three screws evenly. If the disk is not set properly, results of casting will be greatly affected.



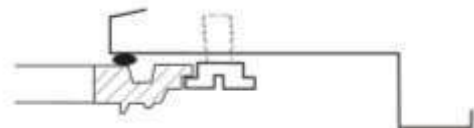
When a part of these teeth is broken, a good casting result may not be expected. Check them periodically.

Look into the bottom opening of melting chamber from above



3. Take care that the O-ring will not go off the groove of the disk and will not be flattened.

O-ring location not good



4. Wrong positioning of the set screw and the disk will disturb tightening of the screw to its end.

Disk location not good



Good



## 5-3. O-RING CONDITIONS

As the O-ring is used for times, its sealing capability may be weakened which affects casting result. When deterioration of the O-ring is found, replace into a new one. (item #28306500 O-ring, G-65)

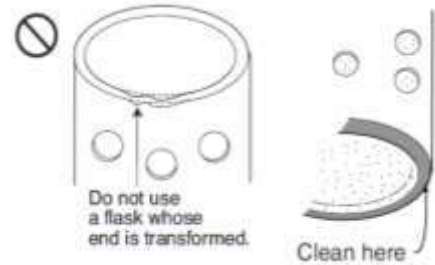
The O-ring has their lives. It is recommended to keep its spares in stock.

NOTE : In one of the below cases, it is possible that the investment may be cracked.

- 1) Pressure of melting chamber indicates rapid decrease suddenly.
- 2) Pressure increase is slower than usual at the time of pressurization.
- 3) Suction speed (after cast start) is slower than usual.

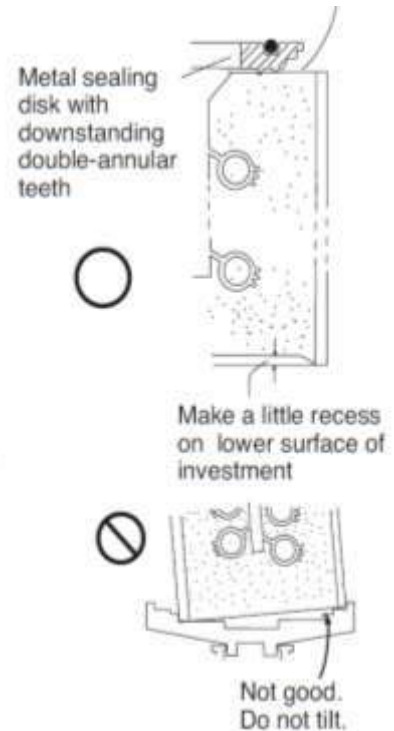
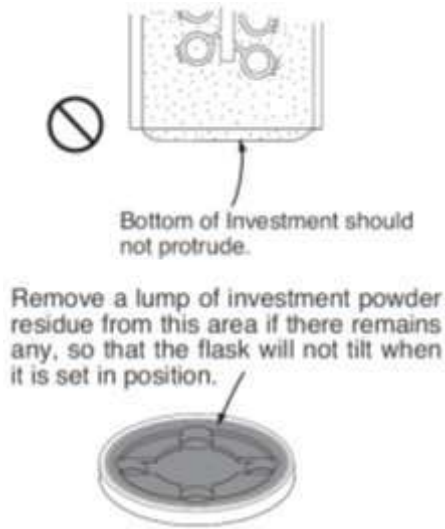
### 5-4. CORRECT PLACEMENT OF FLASK

1) Buildup of investment powder on either top edge or bottom edge of the flask may result in failure of casting. Before placing the flask into the burnout furnace, scrape spilled investment on both edges of the flask completely.



2) Check to see that investment surface is not protruding over the upper side edge or the lower side edge of the flask, so that sealing will be secured. (Check rubber base also) Make space as required referring to the below figure.

When you use the metal sealing disk with downstanding double-annular teeth, the upper surface of investment must be flat.

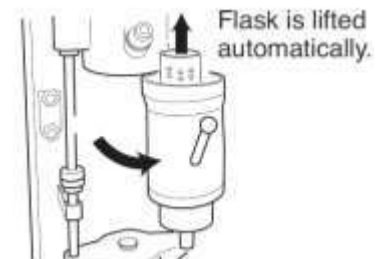
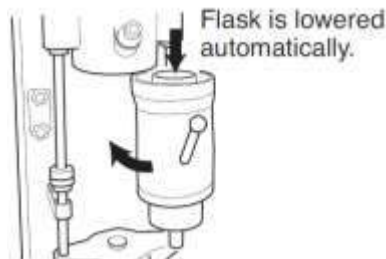


3) Slide the mold chamber in and out for trial to check that the flask automatically goes up and down.



#### IMPORTANT

Do not slide the mold chamber toward the machine body too fast.



## 6. MAINTENANCE



### DANGER

Be sure to turn BREAKER switch OFF before starting maintenance. Be careful with electric current in some part of this product even when switch turned OFF, unless power supply cable is unplugged from outlet.

Otherwise hazardous voltage can cause an electrical shock, burn or death.

### 6-1. CLEANING OBSERVATION WINDOW

- 1) When observation window for melting became dirty, rotate lid to the left and clean surface of lens glass beneath.
- 2) When observation window for casting is to be cleaned, Remove 4 screws and clean internal glass.



### IMPORTANT

1. Tighten casing of lens securely after cleaning. When tightening is insufficient, vacuum leakage may be caused.
2. However, it might be better not to remove the lens from casing except for replacement of lens.

### 6-2. GAS CYLINDER

Replace a gas cylinder early when remaining amount in the cylinder became small. Take enough care during replacement of gas cylinder, so that any dust will not enter the inside of gas tube.

### 6-3. CRUCIBLE AND STOPPER

After casting, slag sticks on the surface of crucible and stopper. Always clean it with a hard brass-wire brush or the like before next casting.



### CAUTION

1. When they are not cleaned, Molten metal can be leaked, resulting inferior casting. Further, a trouble which disturbs normal operation of this product may be caused, so take deliberate care about leakage of molten metal.
2. You need to check the contact between stopper and crucible every time before casting as they are gradually exhausted which can bring leakage of molten metal.



## 6-4. FILTERS FOR CHAMBERS

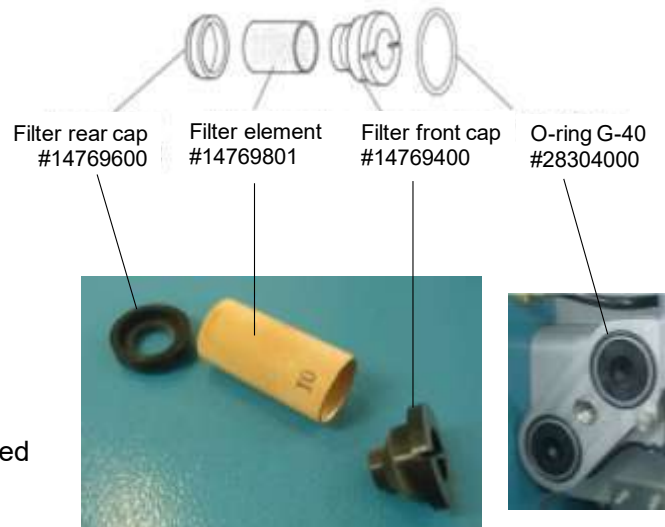
### 6-4-1. CLEANING

Condition of filter is likely to affect casting results. Check filters after every daily work and clean them as follows.

- Cleaning of filter for melting chamber (upper side) depends on amount of zinc contained in molten metal you use, however, it is better to clean filter frequently.

- Clean filter for mold chamber (lower side) after every daily work.

When clogging of filter element cannot be improved after cleaning, replace element with a new one (filter element 10 micron --- #14769801).



### 6-4-2. DISASSEMBLING FILTER UNIT

- 1) Rotate knob for filter counterclockwise.
- 2) Remove knob with plate.  
 \* Note: parts inside can easily drop when open.
- 3) Withdraw filter parts.

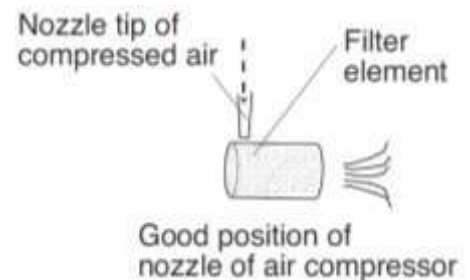


### 6-4-3. CLEANING FILTER

Press tip of air compressor nozzle on outer surface of filter.

If you place tip of nozzle of a vacuum cleaner (available in the market) inside the filter, cleaning will be more effective.

When it is difficult to remove clogged dusts, use an ultrasonic cleaner.



#### 6-4-4. REASSEMBLING

- 1) Take care at the time of reassembling filter element that dust or investment particles shall not enter inside.
- 2) Clean front and rear caps beforehand. Check that O-ring is put back in place at the time of reassembling. Apply a light coating of grease to surface of O-ring for better sealing.

**If no grease applied, O-rings here easily can fall down and you can't get enough vacuum level.**



#### IMPORTANT

1. Use only grease made for exclusive use for vacuum sealing. Do not use grease which is available for general mechanical use etc.
2. If direction of filter element is reverse at reassembling, it will not be possible to lock the cover.

#### 6-4-5. HIGH-DENSITY FILTER ELEMENT 5 micron (option)

Filter element 10 micron (#14769801) for mold and melting are equipped at shipment.

Use of high-density filter element 5 micron (#14769802, optional accessory) may be more effective to prevent intrusion of investment particles inside the pipe system. Size of high-density filter element 5 micron is same to filter element 10 micron, so it can be set to this product just in the same manner as filter element 10 micron.



#### IMPORTANT

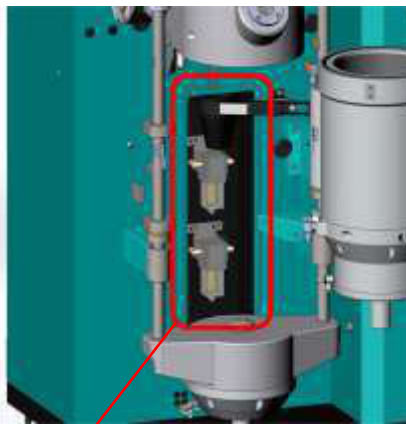
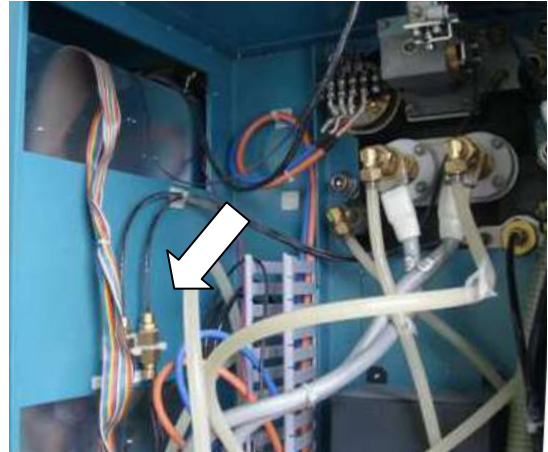
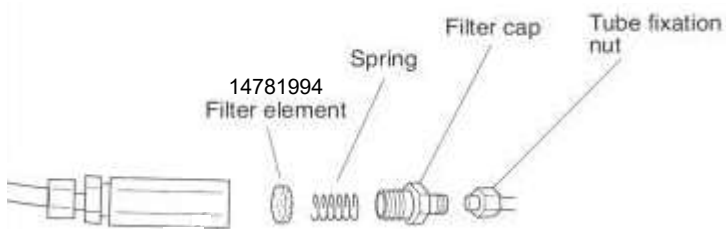
1. If filter element 5 micron is installed, vacuum load is increased, and as a result vacuum speed becomes slower and it takes longer time to finish evacuation. If vacuum speed equivalent to filter element 10 micron is required, you need to replace the external vacuum pump with a stronger one.
2. Clogging degree of filter element depends on mold condition after burnout and suction timing. Further, filter element can't catch all particles perfectly (Some of particles pass through the filter)

\*\* We strongly recommend checking oil mist trap element (#17561501) on vacuum pump as well as filters in casting machine.  
Many casters don't care about this and have vacuum problem.



## 6-5. FILTERS FOR SENSORS

There are two metal mesh filters inside of machine body for protection of pressure sensors on control board.  
(Pressure in melting chamber and flask chamber)  
Clean them on a regular basis.



Two oil mist filters are added in the same room of carbon tray cabinet to avoid clogging up of sensor filters.

Much easier to check and clean filter elements.

- 1) Twist filter bowl 45 degrees to remove.
- 2) Unscrew filter element to remove.
- 3) Clean element by air blow as mentioned already.
- 4) Restore them.

(#14880921 Filter element M1000)

Upper SENSOR FILTER (Melting chamber), Lower SENSOR FILTER (Flask chamber)

## 6-6. SCRAPER

There is a piston for jack up under flask base.

It often happens gold and silver left around there.

Please try to clean the area everyday removing flask base and pan.

This part which goes up and down always receives heat from hot flasks every casting.

So sealing material becomes brittle and gas leakage happens in certain period.

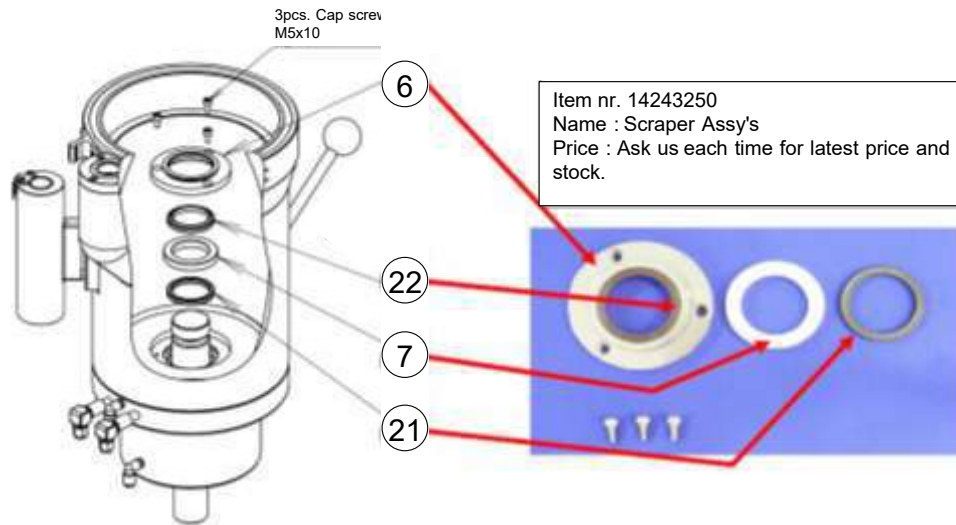
Sometimes hot metal gives damage directly on them.

You will not be able to jack up or vacuum level will become lower which causes non filling on casting if leakage on this part.

Try to replace them before getting those problems.

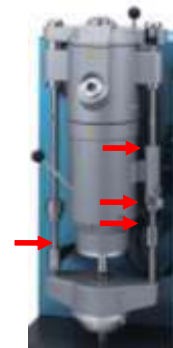
We strongly recommend replacing as Assembly of 4 parts.

Especially it is not very easy to get good condition on assembling part #6 and #22 without special assembling tool.



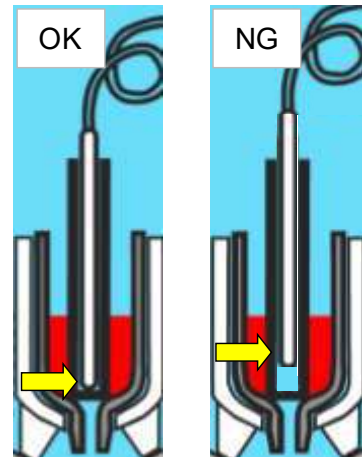
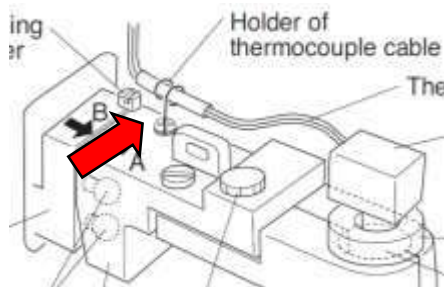
### 6-7. LUBRICATION

Lubrication must be done on movable part at fixed intervals.  
e.g. Just a little amount of machine oil every day.



### 6-8. THERMOCOUPLE

Thermocouple wire must be connected to correct socket through 'cable holder'.  
It can be lifted up by wire tension which causes lower temperature showing while metal can be boiling. This makes a lot of defects on casting results as well as thermocouple defective in short period.



# 7. ADVANCED OPERATION

## 7-1. WINDOWS

There are 5 tabs on main window for CAST; ALL LIST, TEMP, SUC, PRESS, OPEN as you see on the right.

The initial tab after turning power ON is ALL LIST tab.

Each tab description as follows;



### 7-1-1. ALL LIST tab

Principal casting parameter can be seen and edited here at this window.

Detailed settings which are registered at other tabs can be monitored at lower part of this window with smaller letters in white color.

- CASTTEMP :  You can check and edit casting temperature here in this box.



Tap this button to activate keyboard at lower part on the window to edit.

Range: 0.0-1200(K), 0.0-1300(R)

- VAC(To set vacuum keep time)

Timer for evacuation of melting chamber and mold chamber after pressing START button is set.

When the timer of this key is in action, timer display is counted down.

Range: 0.0-999

- M-GAS(To set inert gas charging time)

Timer for gas charge into melting and mold chambers after VAC.

When inside pressure of the chamber reached 100 kPa, M-GAS is automatically stopped for safety.

Range: 0.0-20.0

VAC	SUC-U
30 s	2 s
M-GAS	SUC-L
8 s	10 s
OXY	POUR
0 s	1 s

- OXY(To set air introduction time)

Timer for opening exhaust valve to introduce air into melting and mold chambers.

You have 2 choices when introduce OXY at SUC tab.

Range: 0.0-10.0

- SUC-U (To set time of communication between two chambers)

Suction of melting chamber is carried out during this time.

Timer for action of communication valve between suction line of melting chamber and suction line of mold chamber.

When process temperature reaches Set Value and CAST START is activated, action set by this key starts, and after elapse of setting time it is turned off.

Range: 0.0-10.0

- SUC-L (To set time of communication between two chambers)

Suction of melting chamber is carried out during this time.

Timer for action of communication valve between suction line of melting chamber and suction line of mold chamber.

When process temperature reaches Set Value and CAST START is activated, action set by this key starts, and after elapse of setting time it is turned off.

Range: 0.0-100.0

- POUR (To set waiting time for start of pouring by lifting of stopper)

Timer from expiration of time preset by "SUC-U" to lifting of stopper rod.

When the timer is in action, it is counted down.

Range: 0.0-100.0

- PRESS (To set waiting time for starting pressurization)

Waiting time from start of POUR to action start of PRESS.

Range: 0.0-100.0

- PRESSOPEN (Pressure valve open time)

This is for time to open pressure valve between melting chamber and charge tank.

Range: 0.0-999.0

PRESS	ALLOY
0.5 g	SV925
PRESSOPEN	9
60 s	170 g
EXH	FLASK TEMP
180 s	480 °C

- EXH (To set time to exhaust finish)

Timer from pouring start to finishing exhaust of gas in the chamber is set.

To avoid wearing of crucible by oxidation, it is recommended to set a longer time.

During action, this setting time is displayed in the parameter display by countdown.

Range: 0-999

- ALLOY : You can take note alloy used as your reference for better quality.
- g : You can take note amount alloy used.
- FLASKTEMP : You can take note flask temperature.

### 7-1-2. TEMP tab

This window is for setting parameters to control casting temperature.



- **FLASK-UP TIMING** : Temperature to determine when jack up flask.  
Range: 3-100

- **CASTZONE** : Casting is started at this area.  
Range: 0.0-100

- **CASTKEEP TIME** : Holding time at CAST temperature ZONE  
CAST starts automatically by combination of TIME and ZONE. (Details described later).  
Range: 0.0-100.0

- **POWER** : Heating power after POUR.  
Range: 0-100

- **KEEPTIME** : Time of heating after POUR.

\* Heating after POUR is to maintain metal temperature when it takes long to go out of crucible. This function can be used when you cast with big amount of metal.  
Range: 0.0-100.0

- **PID** : Setting for each value of PID control. (P: Proportional, I: Integral, D: Differential)  
PID control is a kind of feedback control system using 3 parameters.  
PI control is for reaching CAST temperature very promptly with big heating power but tries not to overshoot setting value controlling power before target  
After reaching target D controls heating power to maintain the temperature until CAST starts.  
Range: 0-1000

- **%CONTROL** : In addition of PID control, you can control maximum heating power at 3 ranges up to target for more sensitive heating.  
Range: 0-1200 (1-4), 0-100 (5-7)

% CONTROL	
TEMP RANGE	MAX POWER
4 800 ~	7 80 %
2 300 ~ 3 800	6 100 %
~ 1 300	5 70 %

• MAXPOWER : Maximum heating power can be controlled in whole range to target.  
 You can combine this function with PID control for much sensitive heating.  
 Range: 0-100



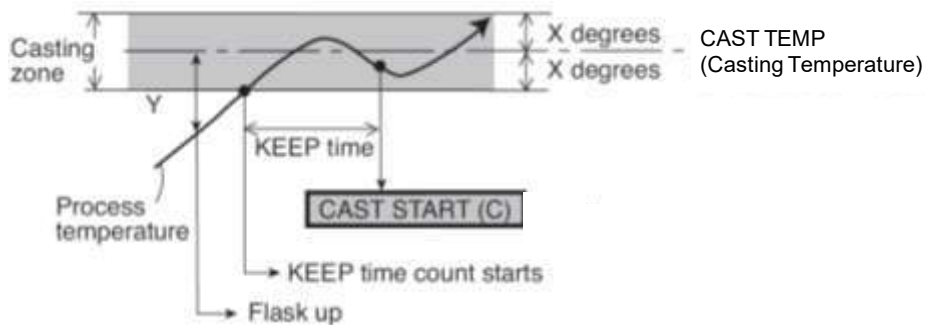
• MIXING : Choose MIXING function

\* Additional information about CAST ZONE and TIME

When temperature enters into Casting Zone by heating, casting is started on specified conditions.

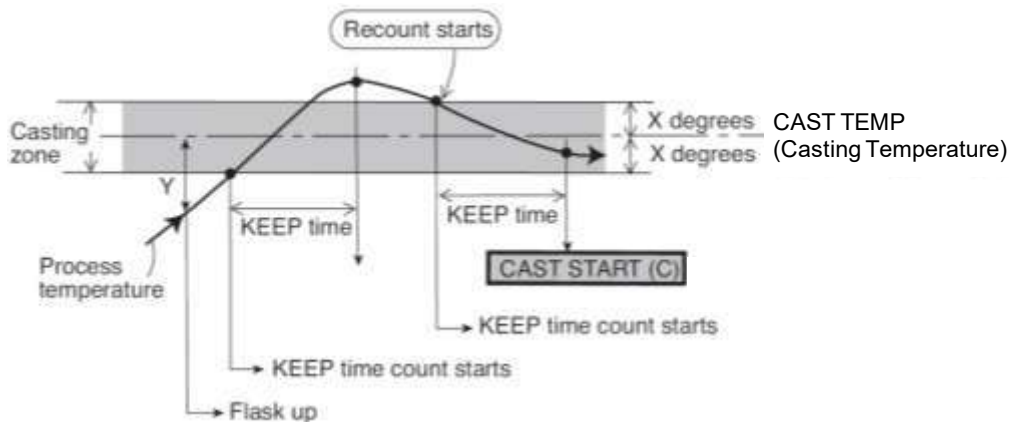
"Casting Zone" = Temperature SV of TEMP. CONTROLLER +/- X degrees Celsius (Default setting of X: 3 degrees Celsius)

Range: 0.0-100



- Y degrees Celsius for activating flask up is set with key (Default setting: set temperature (SV) -20 degrees Celsius).

Range: 3-100



When measured present temperature goes out of Casting Zone during KEEP time, counting of time starts again when temperature came back to CAST ZONE.



### 7-1-3. SUC tab

This window is mostly for setting VAC level control

- VAC, M-GAS, SUC-U, SUC-L, OXY, POUR are already described.

- OXY : You have 2 choices when introduce OXY here in this window.

AFTER M-GAS is to introduce OXY after M-GAS finished.

AFTER FLASK UP is when flask jack up finished.

- LIFTTIME : This is for time lifting stopper rod up.  
Range: 3-999.0



### 7-1-4. PRESS tab

This window is for setting pressure control

- PRESS and PRESS OPEN are already described;

PRESS for waiting time of pressurization.

Range: 0.0-100

PRESS OPEN is for opening valve for pressure.

Range: 0.0-999.0

- De-Gas : Activate De-Gas function by this button.

\* The window changes when you choose De-Gas.

This is a new function for K2NEXT 8000.

" DeGas " mode: The machine waits for exhaust of gas that has been generated at the time of metal charge into the mold.

After then, pressurization will be started.

(Patent pending)

Two parameters are added when De-Gas activated.

Each function on this mode;



- PRESS : Press timing as already mentioned.

Range: 0.0-100.0

- PRESSOPEN : Press open time as already mentioned.

Range: 0.0-999.0

- PREPRESS : Time for supplying lower pressure for De-gas.

Range: 0.0-999.0

- DELAYTIME : Time to keep PRE PRESS.

PRESS will be done after this timer.

Range: 0.0-999.0



### 7-1-5. OPEN tab

- EXH : Time to maintain pressure as already mentioned.

Range: 0-999

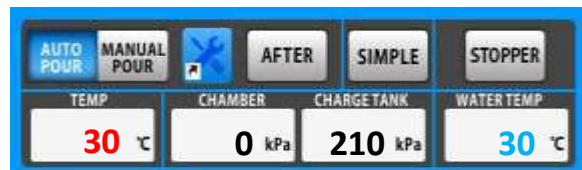
- Protection Gas : Time for Protection gas when casting with AFTER MODE chosen.

Range: 0.0-999.0



### 7-1-6. UPPER PART on CAST window

Some selections here in this area.



- AUTO/MANU POUR : Choice of Auto pour or Manual pour. Manual pour is called Semi Auto in previous model. The button turns its color blue when chosen.



-  : Short cut button to MAINTENANCE window. No need to go through CONFIG window.

- AFTER : Choice of AFTER mode. Button will turn blue when chosen.
- SIMPLE : You can erase detailed setting information which is shown lower part of CAST window in white color except for principal casting parameters. Button will turn blue when chosen.
- STOPPER : Manual stopper lifting up and down for cleaning or checking contact to crucible.
- TEMP : Present temperature measured by thermocouple is indicated here.
- CHAMBER : Present pressure inside of melting chamber is indicated here.
- CHARGE TANK : Present pressure of charge tank is indicated here.
- WATER TEMP : Present temperature of drain water is indicated here.

## AFTER MODE

1) It is possible to melt metal temporarily before loading flask.

This is effective to protect flasks from metal leaking during melting caused by bad contact of stopper and crucible. It is very effective at stone set casting as well as normal casting which requires stable flask temperature to prevent cooling down by this for better filling up.

Previous model also has this function but metal is oxidized by air when lid and flask chamber lock released.

K2NEXT 8000 has protection gas system when loading flask.

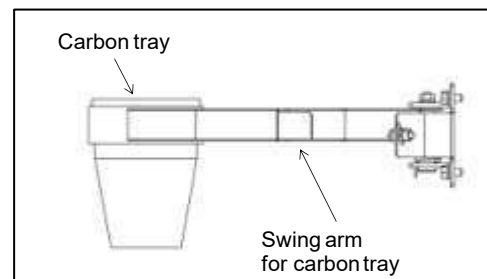
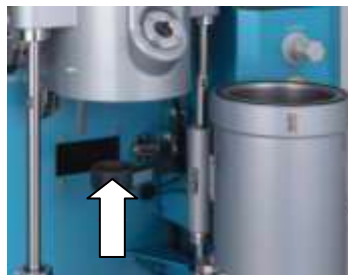
2) Flask chamber is released when temperature reaches target. You can open it to load flask.

3) LID lock is not released to maintain inert gas and furthermore protection gas is provided to melting chamber to minimize atmosphere comes up.

\* Timer for Protection gas should be set in advance at OPEN tab.

4) Close flask chamber slowly, gently and push START button to continue AUTO casting.

5) K2NEXT 8000 has a carbon tray (#14880711) which receives metal fall down by leakage which can be happened by shock chamber open and closing. (Can be stored inside of body by magnet if not used)



6) Optional 'Fail safe leak metal saver'

We've developed another safety solution for leaked metal during melting before putting flask.

A dummy flask made of graphite pot with base receives leaked metal.

You can pour all of metal by manual even if leaking stopped on the way and still some metal remains in crucible.



You can continue casting by removing this and putting proper flask when pre-heating finished without any leakage.

We have 3 sizes line up; for standard 200mm length, short length 175mm and long size 300mm.



Fail safe leak metal saver kit

Code:

14880035 - Standard graphite pot + base + fixing bolts

14880034 - Short graphite pot + base + fixing bolts

14880035 - Long graphite pot + base + fixing bolts

9) Factory setting of Protection GAS timer is 100 sec. You need to edit timer at OPEN tab if it takes longer than the setting on loading flask always to get correct protection effect.

On the other hand, protection gas will be cancelled by START button even if flask loaded before set value.

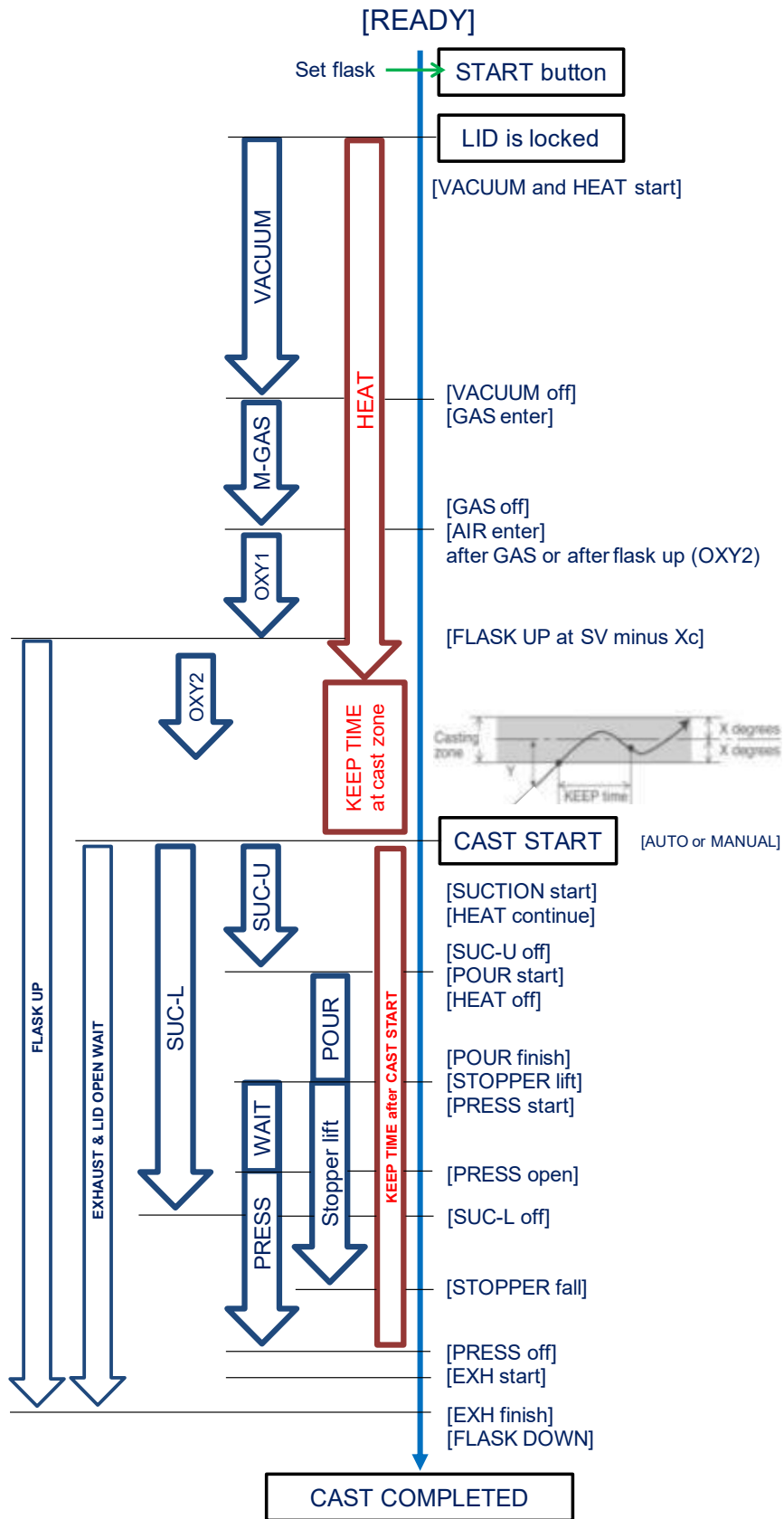


# FLOW CHART OF CASTING

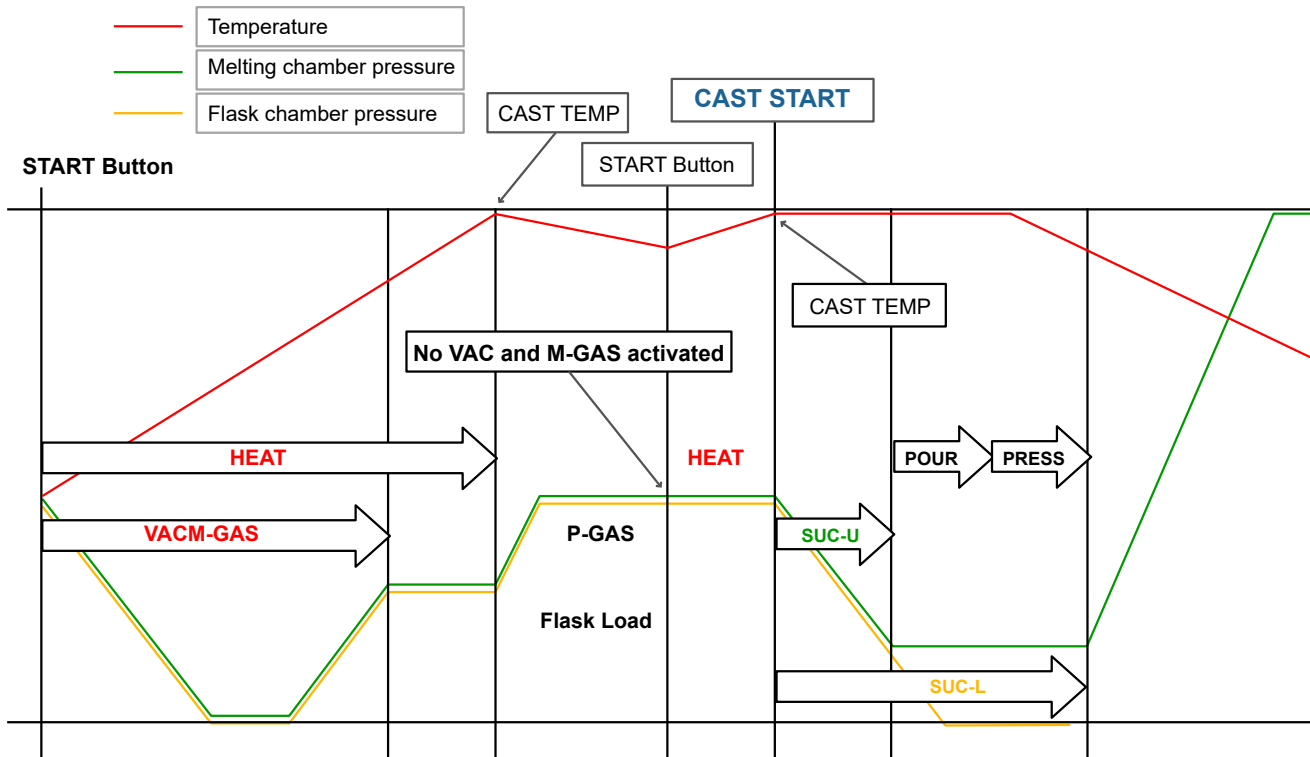
If you press START button in AUTO MODE, casting is automatically started.

Check safety and understand this manual before starting actual process.

<FLOW CHART FOR STANDARD AUTO MODE ("MOLD-IN BEFORE HEATING" MODE)>



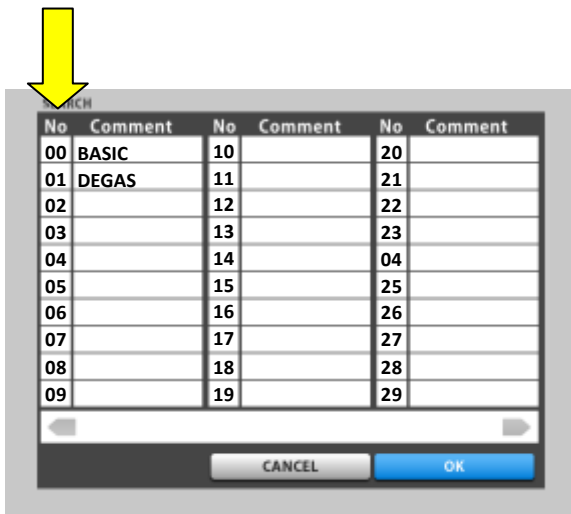
**FLOW CHART OF CASTING AFTER MODE**



**7-1-7. MEMORY REGISTRATION**

You can register your own recipe with number and comment.

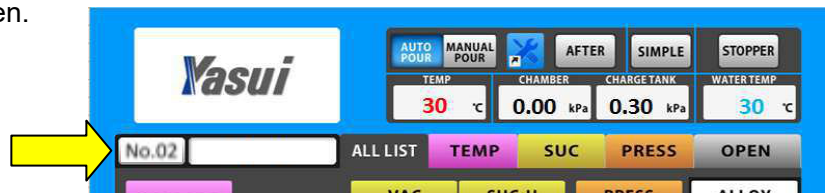
1) As already described, Tap memory number.



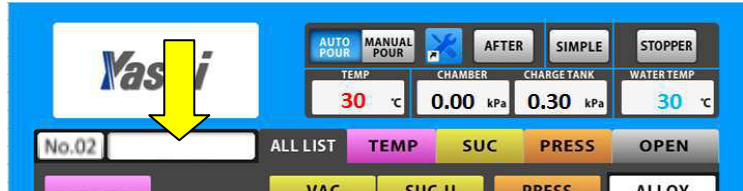
3) Window goes back with number chosen.



2) Choose and tap any number you like

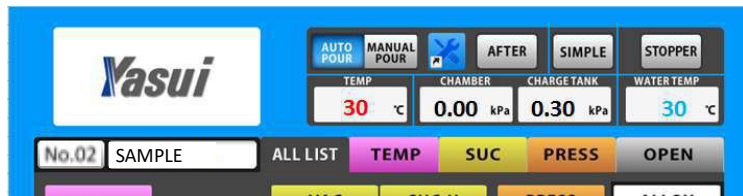


4) Tap blank box to put name or comment.



5) Keyboard opens. Type any name you like.

6) Tap OK button to close.



\* OTHER tabs

There are 5 tabs on CAST window as already described.

Besides CAST window is one of other kinds of tabs on the display.

Other tabs are ; SHOT and CONFIG tabs.



7-2. SHOT tab

This is an operation window for shot making.

Read instruction of SHOT MAKER.

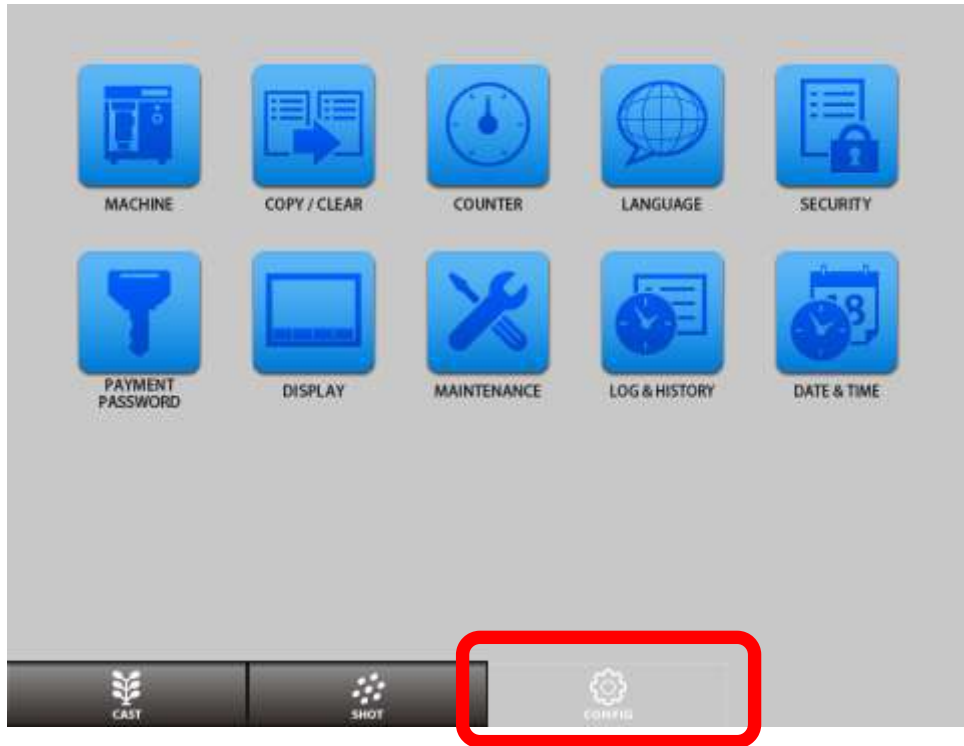


### 7-3. CONFIG tab

You have several configuration and other menus in this window.

< How to open CONFIG menu window >

Tap CONFIG  tab to open the window.



CONFIG tab

< About each icon >



MACHINE

You can check machine information, set advanced parameter here in this window.



COPY/CLEAR

You can copy or delete registered recipes.



COUNTER

You can check how many shots done by AUTO in the past





### LANGUAGE

You can select language here.



### SECURITY

You can edit password and lock recipes.



### PAYMENT PASSWORD

You can enter passwords for Monthly payment here. Only for customers who use this system.



### DISPLAY

You can control suspend timer and brightness.



### MAINTENANCE

You can check status of this product, try single action of each function for maintenance.



### LOG & HISTORY

You can check machine log when problem happened.



### DATE & TIME

You can set calendar and clock at your region.

## 7-3-1. MACHINE

< How to open MACHINE display >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap MACHINE  icon to open MACHINE display.



- 1) VERSION: Serial number, Firmware version and other information are indicated here.
- 2) THERMOCOUPLE: You can choose type of thermocouple R or K here\*\*.
- 3) GAUGE: Indicator selection at GAUGE window.
- 4) CALIBRATION (PRESSURE): This function is used at installation or when location is changed.
- 5) PID Automatic tuning: You can get suitable PID settings automatically when you turn it ON.

\*\* Switching thermocouple type is only allowed to do by skilled authorized technicians.

Ask our distributor when you want to switch.

\*\* PID automatic tuning requires very high level of knowledge and skill on melting gold and silvers.

We don't recommend to use this function.

## 7-3-2. COPY/CLEAR

You can copy and delete registered recipes here in this page.

< How to open COPY/CLEAR window >

1) Tap CONFIG  tab to open CONFIG menu.

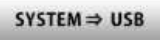
2) Tap COPY/CLEAR  icon to open COPY/CLEAR window.

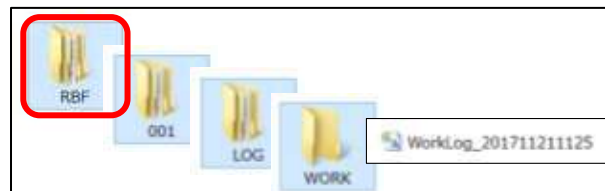


< How to copy and delete >

- 1) Several copy : Copy one recipe to several recipe numbers.
- 2) Single copy : Copy one recipe to another recipe number.
- 3) K2NEXT 8000 to USB : Copy all of recipes in K2NEXT 8000 to USB flash drive.
- 4) USB to K2NEXT 8000: Copy all of recipes in USB flash drive to K2NEXT 8000.
- 5) Delete recipe : Delete recipe chosen from No. XX to No. YY.

\* You need a blank USB flash drive to format when you copy from/to USB as following process.

- 1) Prepare blank USB flash drive SLC type with capacity less than 16 GB.
- 2) Plug it into USB slot on your pc to create new blank folder on root.
- 3) Re-name the folder with the name 'RBF'.
- 4) Plug it off from your pc and put it into USB slot on RBF control box.
- 5) Tap and open MACHINE window to TAP  button.



6) Worklog file has been saved in the USB flash drive.

## Parameters of K2NEXT 8000 Preset at Factory

MEMORY NO.	00	01	Other parameters	
VAC	30 sec.	60 sec.	PID	7 : 43 : 10
M-GAS	8 sec.	8 sec.	CAST TEMP	1000 °C
* (after M-GAS)	(-0) kPa	(-0) kPa	TANK PRESS	200 KPa
OXY	0 sec.	0 sec.	CAST ZONE	±3 °C
SUC-U	2 sec.	2 sec.	KEEP TIME	3 sec
SUC-L	10 sec.	10 sec.	MIX	OFF
POUR	1 sec.	1 sec.	% Control	OFF
FLASK UP	-20 deg.c.	-20 deg.c.	STOPPER LIFT	30% / 5sec.
PRESS	0.5 sec.	0.5 sec.	AT	OFF
PRESS OPEN	10 sec.	- sec.	Language	English only
EXH	180 sec.	180 sec.	Security pass	YASUI_K2NEXT
CAST TEMP	1000 deg.c.	1000 deg.c.	Brightness	50%
PRE PRESS	-	0.5 sec.		
DELAY TIME	-	5.0 sec.		
PRESS OPEN	-	60 sec.		
ALLOY	General casting	DEGAS MODE		

\* (after M-GAS)

The purpose of this timer is to get final pressure just before pouring mentioned as above for each alloy.

You have to adjust the value depending on gas condition like source pressure, flow rate and others.



### IMPORTANT

1. VAC parameter is for use of vacuum pump with capability about 300 liters per minute.
2. Adjust the flowing speed of M-GAS properly.
3. If longer EXH value is set, oxidation of crucible will be smaller, which will result in extended life of crucible.
4. Adjust CAST TEMP parameter depending upon metal.
5. Set pressure of internal pressure tank by adjusting SET PRESS regulator so that pressure inside of melting chamber after metal pouring will be within from 100 to 200 kPa.

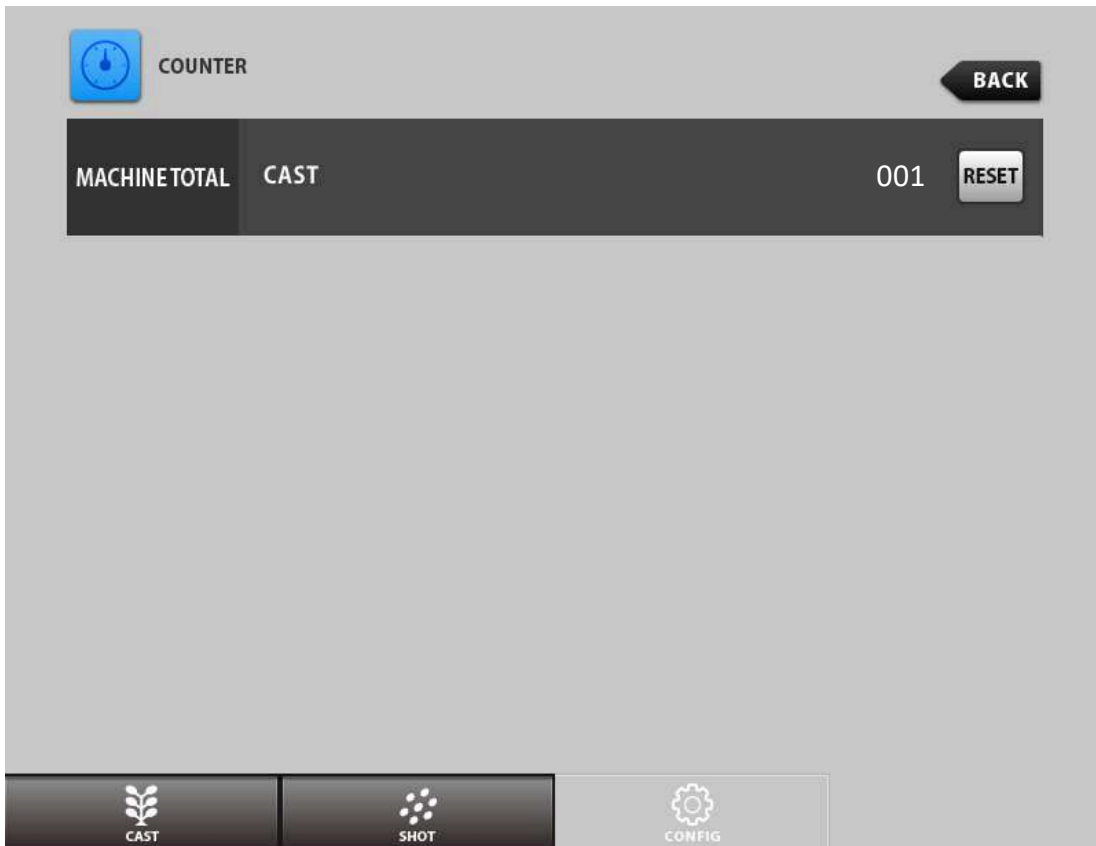
### 7-3-3. COUNTER

\* It is not possible to edit counter.

< How to open COUNTER window >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap COUNTER  icon to open COUNTER window.



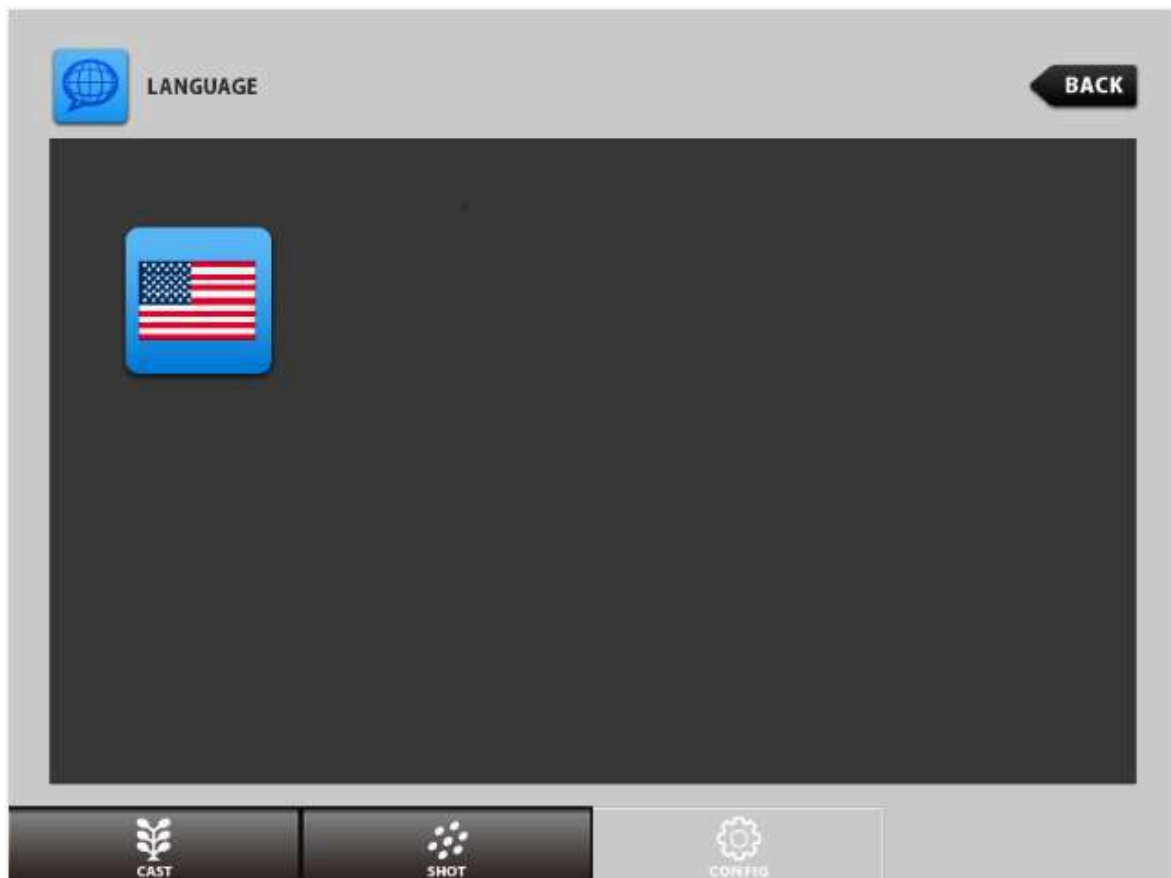
### 7-3-4. LANGUAGE

You can choose language

< LANGUAGE window >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap LANGUAGE  button to open.



<How to switch language>

- 1) Just tap icon you want.
- 2) Reboot system (Log off - Power off - Power on)

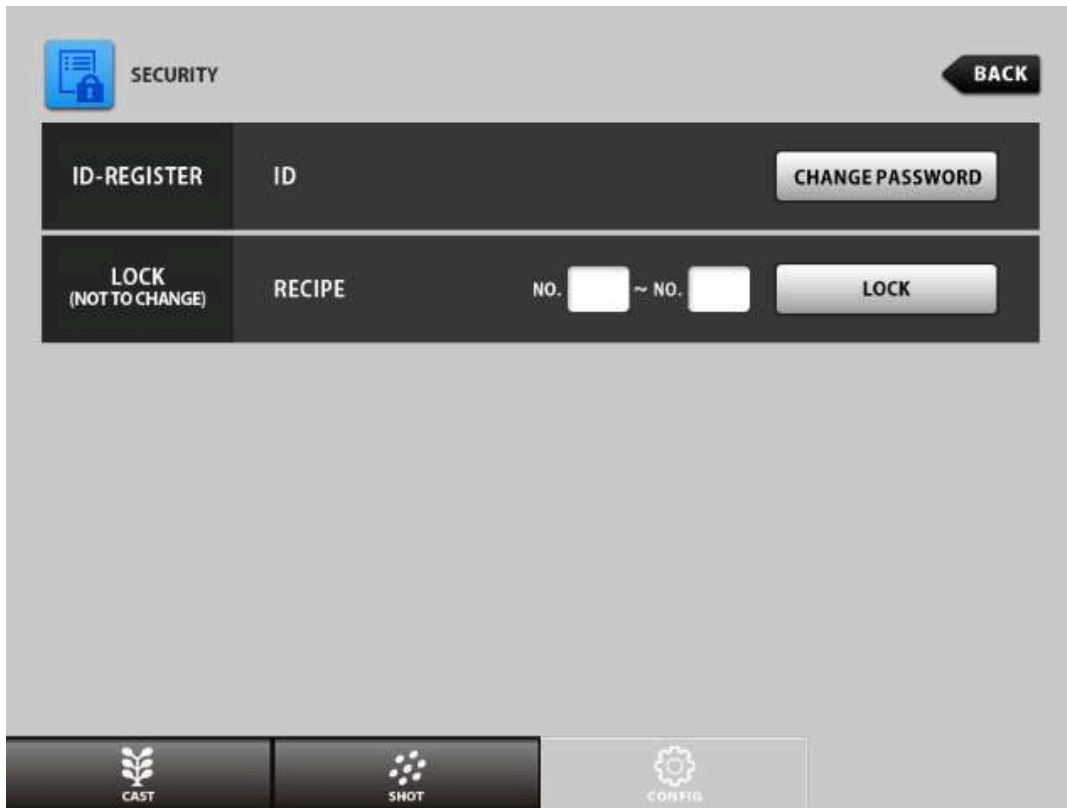
\* At present we supply only English.

### 7-3-5. SECURITY

You can change your ID and protect recipes already registered here in this page.

- 1) Tap CONFIG  tab to open CONFIG menu.

- 2) Tap SECURITY  button to open.



< ID-REGISTER >

1) Tap CHANGE PASSWORD  button.

2) Tap blank cell to open keyboard and enter new password you want to register


3) Tap present password (before change).

Default password is "YASUI\_K2NEXT"



< RECIPE LOCK >



- 1) Enter any number you want to lock.
- 2) Tap LOCK button to open keyboard.
- 3) Enter password.
- 4) Lock button turns blue. 

< Unlock RECIPE >

- 1) Tap LOCK button to open keyboard.
- 2) Enter password.
- 3) Lock button turns white.

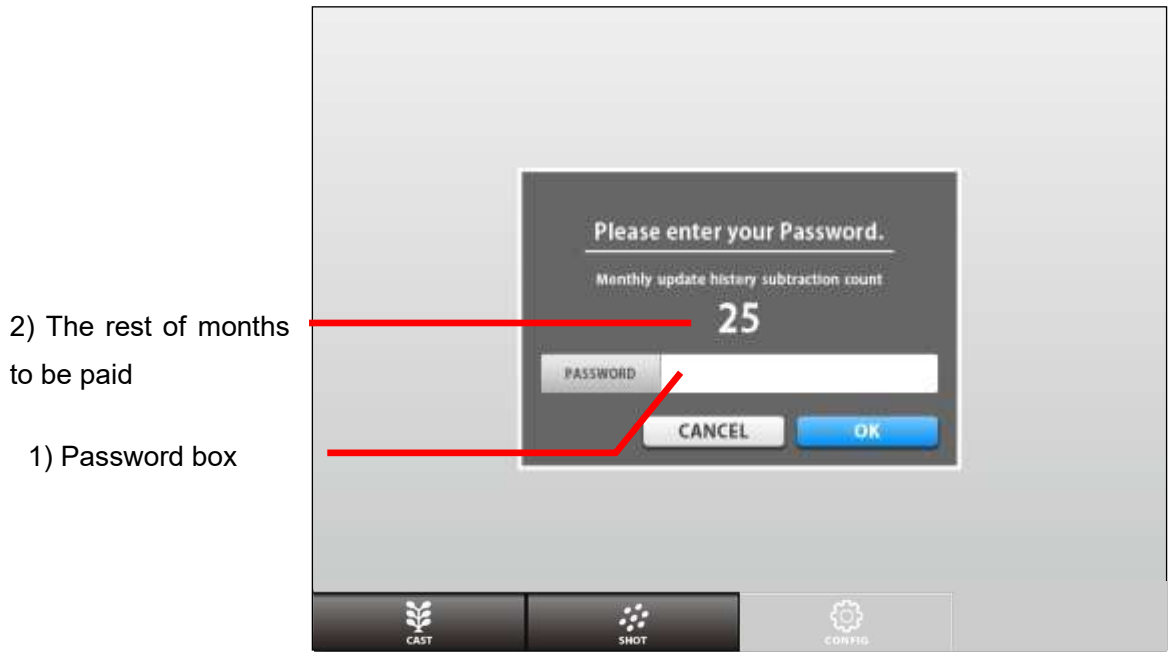
### 7-3-6. PAYMENT PASSWORD

You can enter passwords for Monthly payment here. Only for customers who use this system.

< How to open PAYMENT PASSWORD window >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap PAYMENT PASSWORD  button to open.



2) The rest of months to be paid

1) Password box

1) PASSWORD



You can enter password.

2) Monthly update history subtraction count.

The rest of months of payment.

### 7-3-7. DISPLAY

You can switch suspend ON or OFF, adjust brightness of display.

< How to open DISPLAY window >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap DISPLAY  button to open.





1) SUSPEND



You can activate Automatic power OFF function of the display.  
 Select ON for activate, timer can be set from 1-999 minutes.

2) BRIGHTNESS



You can adjust the brightness of display.  
 Tap ◀ button to decrease, tap ▶ button to increase.  
 You can also long tap for continuous adjusting.  
 You can also enter value directly with keyboard.  
 The range is 0 - 100%

### 7-3-8. DATE & TIME

You can set date and time at your region.

< How to open “DATE & TIME” window >

1) Tap CONFIG  tab to open CONFIG menu.

2) Tap DATE & TIME  icon to open.

- Tap blank to open keyboard to enter date and time.

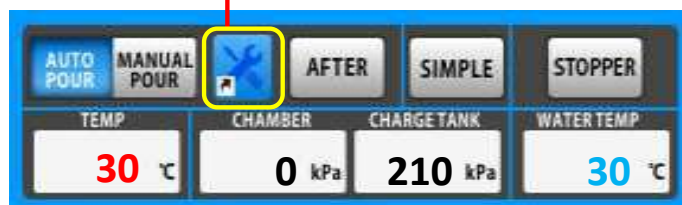
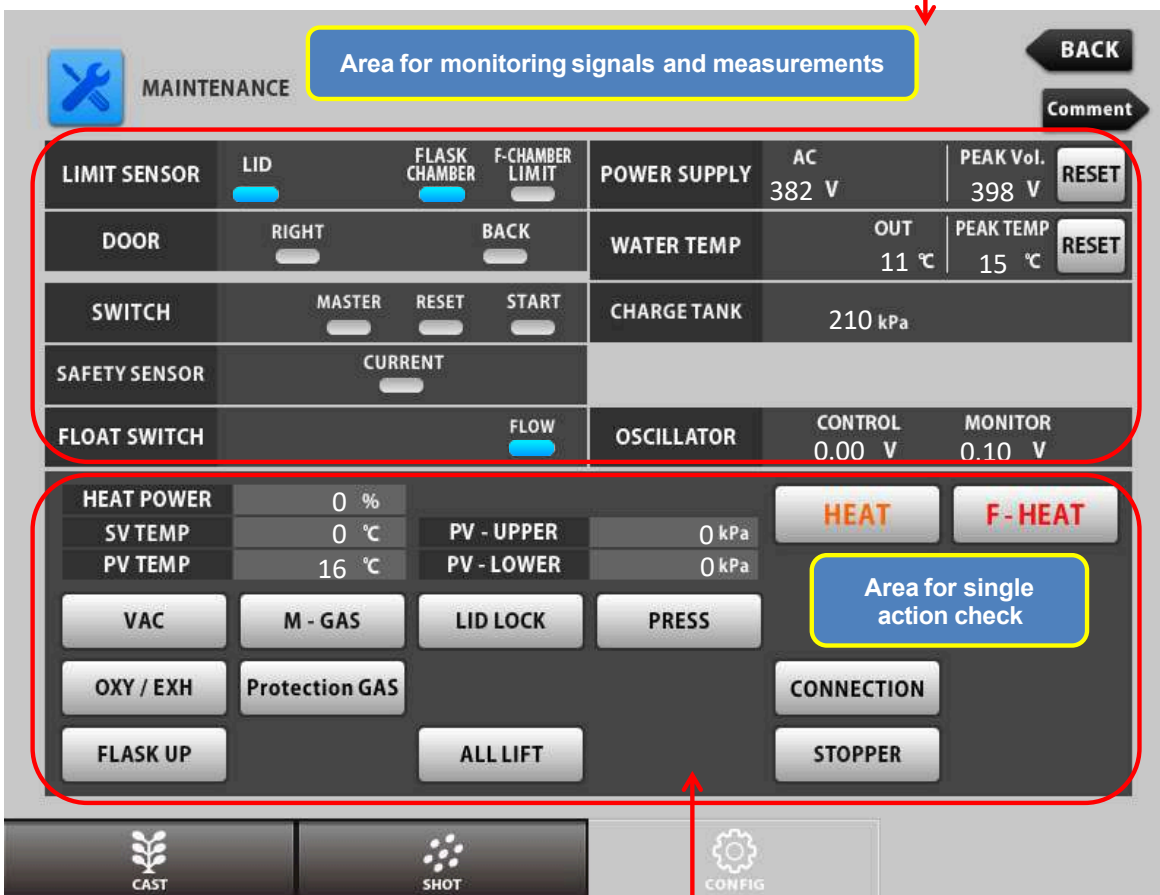
- Tap SET button to finish.



### 7-3-9. MAINTENANCE

You can activate each single action of K2NEXT 8000 for maintenance and other purpose.

- 1) Tap CONFIG tab at CAST window.
- 2) Tap MAINTENANCE button.
- 3) Check each function by tapping buttons. You can also monitor electric power, signals and others.



\* You can also open the page through short cut key on main display.

### 7-3-10. LOG & HISTORY

You can check machine log when problem happened.

It is very difficult to communicate about problems on this product. However you can easily report what is happening on it by taking picture and send us or our distributors this window.

It is very useful tool to diagnose.

**LOG & HISTORY** BACK

2015

DATE	HISTORY	WORK BY
2015 / 05 / 12 19:29	RP Verion : 1.0.06	
2015 / 05 / 12 19:29	CPU[1.1.00] LCD[1.0.	
2015 / 05 / 12 20:08	Error (E0400)	Control Board
2015 / 05 / 13 10:24	Power ON.	
2015 / 05 / 13 10:24	Error (E0400)	Control Board
2015 / 05 / 13 10:25	Model : K2next	
2015 / 05 / 13 10:25	SN:731	
2015 / 05 / 13 10:25	RP Verion : 1.0.06	
2015 / 05 / 13 10:25	CPU[1.1.00] LCD[1.0.	
2015 / 05 / 13 13:39	Error (E0400)	Control Board

CAST SHOT CONFIG

# 8. TROUBLE SHOOTINGS

## 8-1. ERROR MESSAGES

K2NEXT 8000 shows messages when accidents happen.

You cannot operate K2NEXT 8000 while message is displayed.

### Example of error message



1) Error code: Code of error.

2) Error icon: 3 kinds of icons will be shown  Error,  warning,  information.

3) Error detail: Detail of error.

4) Remedy: Countermeasures.

5) OK: Tap OK  button to go back to previous page.

## 8-2. ERROR CODE

Error code	Level	Description	Cause	Remedy	
E00	00	Error	EMERGENCY STOP button is ON	Solve problem and release button	
E01	00	Error	(TF) Temp anomaly inside of oscillator	Temp exceeds over 55c	Check cooling water supply temp
	01	Error	(AC) Over current input oscillator	<ul style="list-style-type: none"> <li>Shortcircuit on heating coil</li> <li>Defective on oscillator</li> </ul>	Replace defective part
	02	Error	(NQ) Resonance circuit anomaly	<ul style="list-style-type: none"> <li>Rapid fuse open</li> <li>Shortcircuit on heating coil</li> <li>Opencircuit between heating coil and matching coil</li> <li>Defective on oscillation elements</li> </ul>	Replace defective part
	03	Error	(HF) Over current output	<ul style="list-style-type: none"> <li>Shortcircuit on heating coil</li> <li>Defective on matching coil, others</li> </ul>	Replace defective part
	04	Error	(VL) Input voltage anomaly	Low voltage	Ensure required power
E04	00	Error	Cooling water failure	Cooling water flow and pressure not enough (flow 3L/min, Pressure 1.5kg/cm <sup>2</sup> required) <ul style="list-style-type: none"> <li>Check water tap</li> <li>Check water pressure, amount</li> <li>Check strainer filter</li> </ul>	
E05	00	Error	Over heat on heating coil cooling water supply	Cooling water supply temperature exceeds 35c	Reduce temp
	01	Error	Over heat on heating coil cooling water drain	<ul style="list-style-type: none"> <li>Drain water temp too high</li> <li>Water supply not enough</li> </ul>	<ul style="list-style-type: none"> <li>Check water temp</li> <li>Check water flow</li> </ul>
	03	Warning	Over heat on heating coil cooling water drain	<ul style="list-style-type: none"> <li>Drain water temp too high</li> <li>Water supply not enough</li> </ul>	<ul style="list-style-type: none"> <li>Check water temp</li> <li>Check water flow</li> </ul>
E06	00	Error	No response	No response of temperature controller	<ul style="list-style-type: none"> <li>Check cable</li> </ul>
	07	Error	Hardware error		Replace temp controller
E07	00	Error	Temp anomaly	Present temp too low	<ul style="list-style-type: none"> <li>Check thermocouple type and K2 setting</li> </ul>
	01	Error	Over heat on melting chamber		<ul style="list-style-type: none"> <li>Check thermocouple</li> </ul>
	02	Error	Thermocouple and oscillator defective	Temperature does not go up after heating start	Replace defective part
E08	00	Error	Right side panel open		<ul style="list-style-type: none"> <li>Close panel</li> <li>Check sensor and cable</li> </ul>
	02	Error	Back side panel open		<ul style="list-style-type: none"> <li>Close panel</li> <li>Check sensor and cable</li> </ul>
E12	00	Warning	Cycle time over	Process time exceeds 20 min.	Check leakage

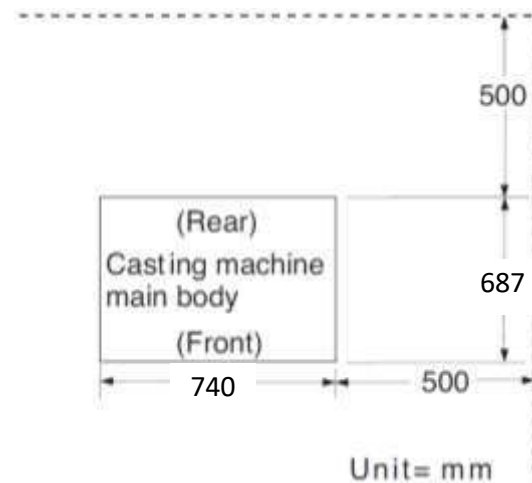
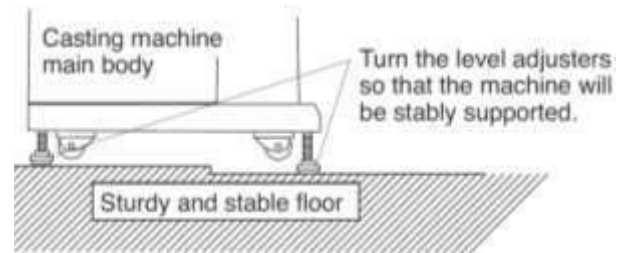
E13	00	Error	Exhaust failure	Exhaust not completed	Clean exhaust valve and pipes
E14	00	Warning	Voltage warning	Power out of range 335V-425V	Ensure required power
E15	00	Error	Voltage anomaly	Power out of range 315V-445V operation suspended	Ensure required power Check parts inside
E17	00	Error	Melting chamber pressure sensor anomaly	Pressure sensor detected pressure out of range	· Clean pipes · Check pressure sensor
	01	Error	Flask chamber pressure sensor anomaly	Pressure sensor detected pressure out of range	· Clean pipes · Check pressure sensor
	02	Error	Source pressure sensor anomaly	Pressure sensor output exceeds capacity range	· Clean pipes · Check pressure sensor
	03	Error	Surge tank pressure sensor anomaly	Sensor output exceeds capacity range	· Clean pipes · Check pressure sensor
E18	01	Error	Vacuum error	Pressure does not go down over certain value in certain time after vacuum starting up	Check vacuum valve and pressure sensor
E19	00	Warning	Recipe injustice	Recipe exceeds capacity range when start casting	Correct recipe
E20	00	Error	Operation panel switches contacts failure	Contacts are closed when turning power ON	Replace defective part
E24	00	Error	Over current for ground	Too much current for ground	Remove short circuit between heating coil and melting chamber
E26	00	Warning	Lid open	Lid is open when operation starts	· Close lid · Check lid sensor
E27	00	Warning	Flask chamber open	Flask chamber is open when operation starts	· Close flask chamber · Check flask sensor
E28	00	Warning	Slow heating speed		Check crucible, thermocouple and PID setting
E29	00	Error	Slow pressure speed	No arrival target	Check solenoid valve and pipes

\*\* Call distributor about errors not mentioned above or not solved by this.

## 9. INSTALLATION

### 9-1. PLACE

- 1) Floor must be sturdy and stable. The machine must be free from vibrations.
- 2) The machine must be leveled. (When floor is not flat, adjust level adjuster, so that the machine should be leveled.)
- 3) Do not install machine at place where material such as gas, that may affect casting and operation of machine, is produced.
- 4) Machine must be installed at a dustless place.
- 5) Electrical noise should not be produced nearby.
- 6) Proper power supply is necessary.
- 7) Save enough space around machine for daily maintenance.



### CAUTION

\* The following problems expected when the product is installed and used in a location that does not meet the requirements of 9-1.

- Incorrect location of lid and mold chamber.  
Operation cannot be started if they do not stay in the specified places.
- Molten metal leaks
- Corrosion inside and outside the device due to moisture accumulated in harmful gas or dust, short circuit of electrical contacts and failure due to overload.
- Possibility of malfunction due to electric noise. Rewriting or corruption of program data.
- Warning message shown by unstable power supply, interruption by error message at worse condition.

### 9-2. POWER SOURCE

Use power source of AC380 V +/- 10%, 3 phase, 6.6kVA, 50/60 Hz, exclusive for this product.



## WARNING

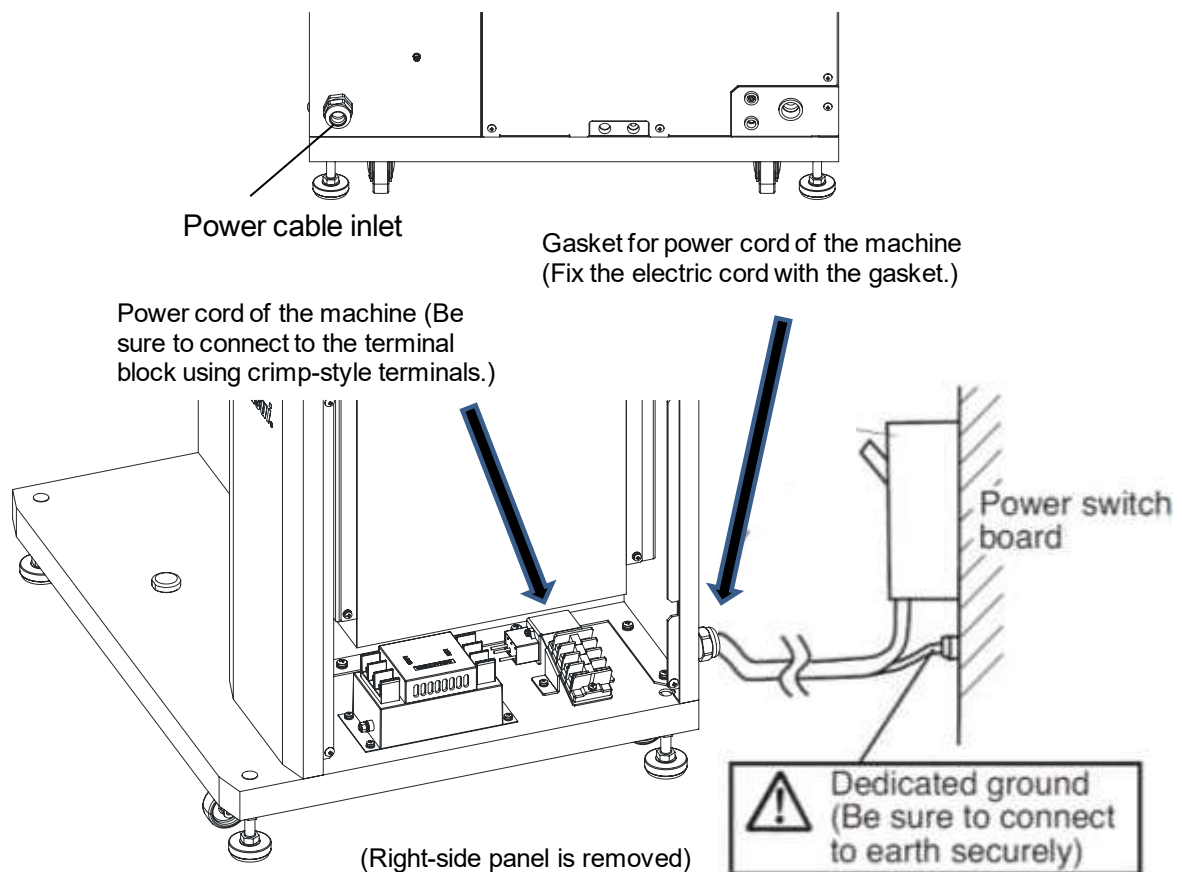
1. Be sure to connect ground cable to prevent electric shock.
2. This product is not equipped with a ground-fault circuit interrupter. Connect to ground-fault circuit interrupter on power switch board in your factory. If grounding wire is not earthed correctly, ground-fault circuit interrupter may not work as expected. Connect grounding wire correctly.
3. Wiring must be made by a qualified electrician only. If not, hazardous voltage can cause an electrical shock, burn or death.
4. Do not connect vacuum pump cable to K2NEXT 8000 machine body. Use another exclusive power supply line for vacuum pump.

- 1) Open right-side cover.
  - 2) The terminal block for power source is located at bottom.
- Connect power cable to terminal block.



## IMPORTANT

Three-phase current is used for power supply in this product.  
Therefore, correct connection of power cable is important.





### 9-3. CONNECTING WATER HOSE

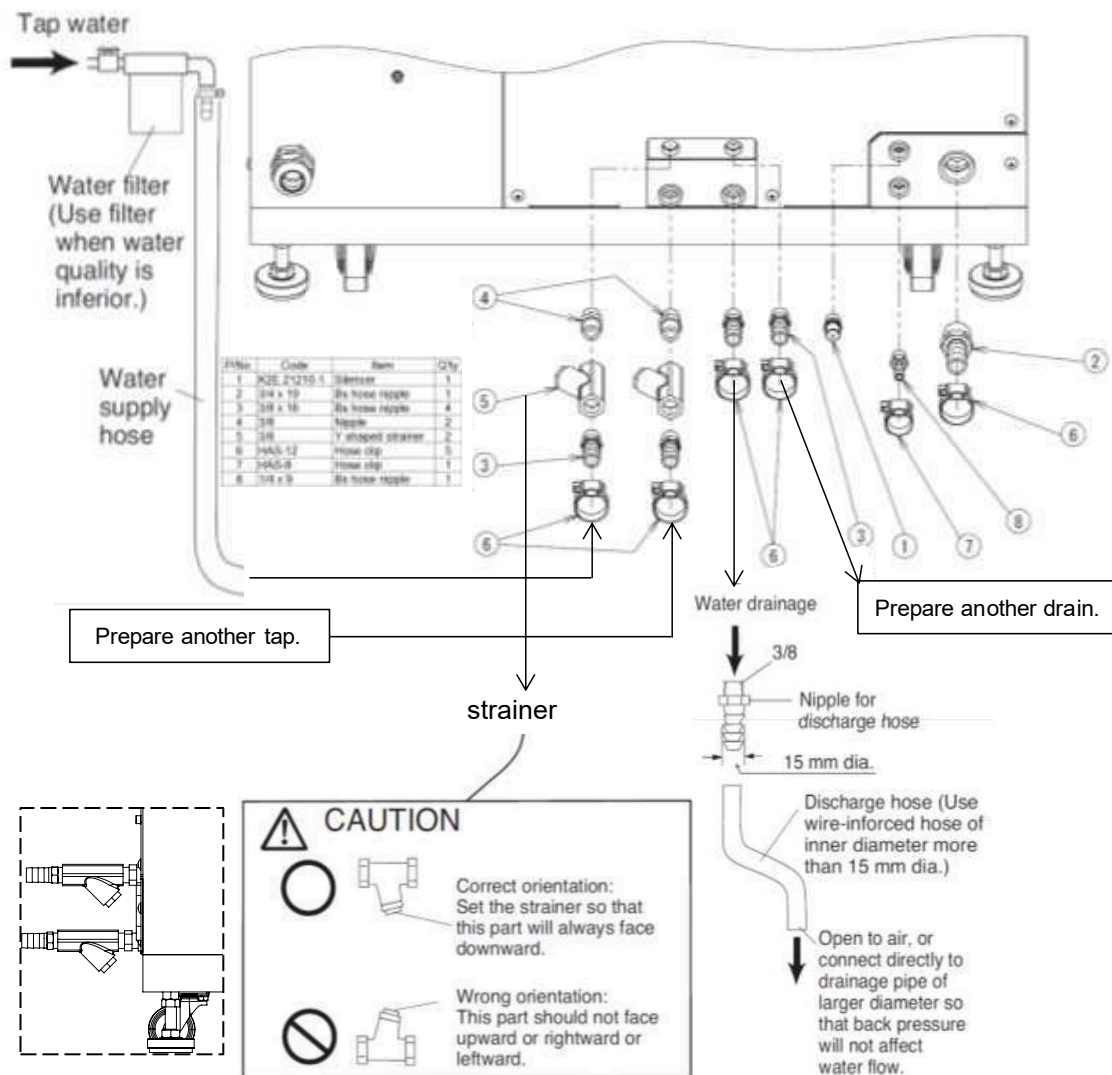
This product needs internal circulation of tap water for cooling. Connect to water supply of sufficient water pressure (water supply pressure: over 0.15 MPa in average, and water supply flow rate: more than 3 liters per minute).



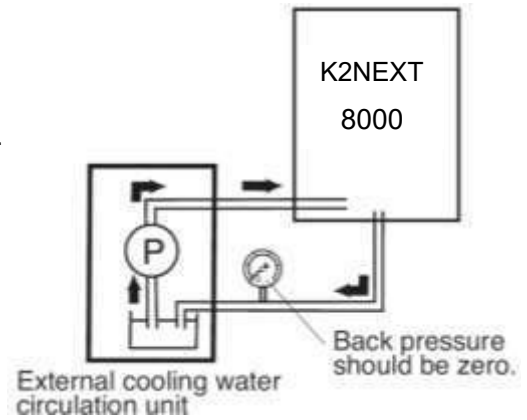
#### CAUTION

1. In case water from tap is not clean, water should be supplied through water filter available in the market. (Water filter and hose are not provided with K2NEXT 8000.) Select water filter of adequate size so that water flow should not be decreased.
2. Be sure to complete water supply correctly before start heating.

Connect a water supply hose and a water discharge hose as below figure.



When using external cooling water circulation unit available in the market, arrange it so that back pressure should be 0 (zero). (External cooling water circulation unit is not provided with K2NEXT 8000.)



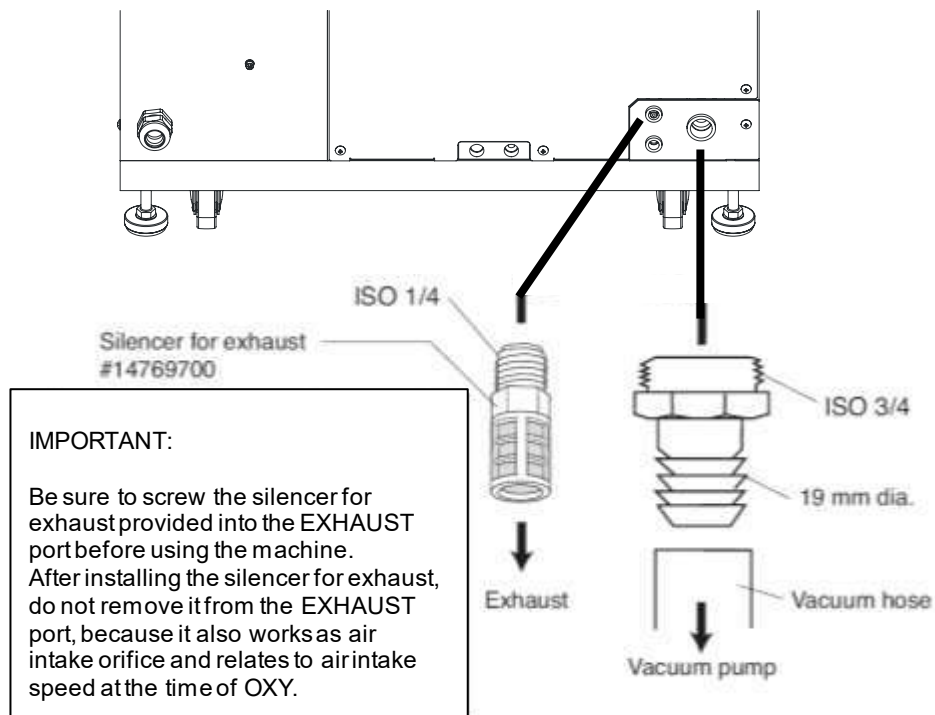
**! IMPORTANT**

1. Boost pressure of its pump should be high enough.
2. Consult with a qualified technician for arrangement of circulation unit.

The manufacturer shall in no event be liable for any damage resulting from use of external cooling water circulation unit.

### 9-4. CONNECTING VACUUM PUMP

Connect vacuum pump specified by manufacturer to this product as follows. (Vacuum pump is not included in K2NEXT 8000.)





## CAUTION

1. Use a pump w/ pumping speed more than 300 liters per minute to get the best performance of this product.

2. Do not forget to pour vacuum oil in pump cylinder to avoid damages inside of pump.

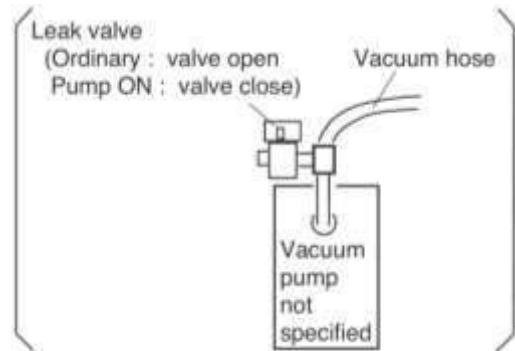
3. Connect power cable of vacuum pump to wall power outlet separately from casting machine, so that the pump will operate alone independently to avoid possibility of damage on this product when vacuum pump defective.

4. Be sure to set up a 'leak valve' to vacuum pump so that the inside of the hose will become exhaust condition at the moment when pump is turned OFF. That leak valve should synchronize with power ON-OFF in such a manner that when pump is ON, the leak valve should be OFF and when pump is OFF, the leak valve should be ON.

5. After checking of cable connection, check also that rotating direction of motor of vacuum pump is correct.

If not vacuum oil will back flow immediately after turning power ON, piping inside of this product will be full of oil which is very hard to remove and clean.

Particular care should be taken at cable connection to avoid reverse rotation by phase difference.



## 9-5. SUPPLY OF INERT GAS

### WARNING

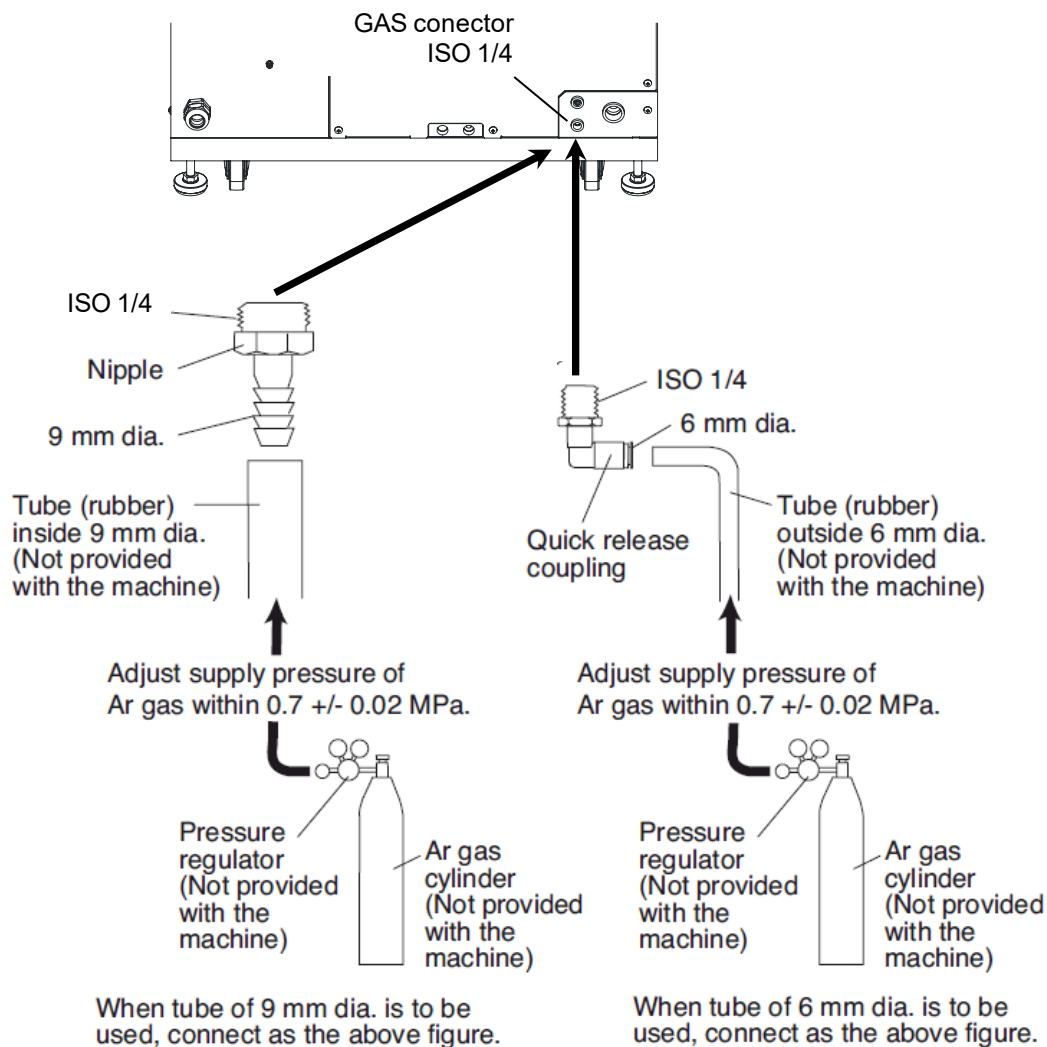
1. Never use inflammable gas (such as hydrogen gas, etc.). They may catch fire and explode, causing a risk of serious injury, including death.
2. Never replace gas cylinder while this product is in operation.  
Especially when it's pressing after pouring metal, locking of chambers will be cancelled.  
As a result, it is dangerous that the pressure is released at once, causing a small explosion, which may harmful to human body.
3. Observe below mentioned requirement of gas supply. In case gas supply flow rate is extremely small, this product may not work properly.

Argon is standard supply gas of this product.

Both below-mentioned 1) and 2) requirements should be satisfied.

1) Gas supply pressure: 0.7 MPa

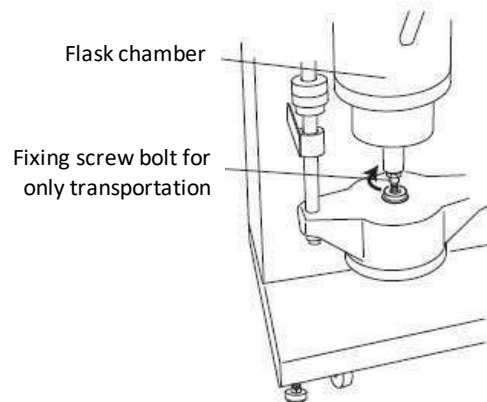
2) Gas supply flow rate: more than 120 liters per minute



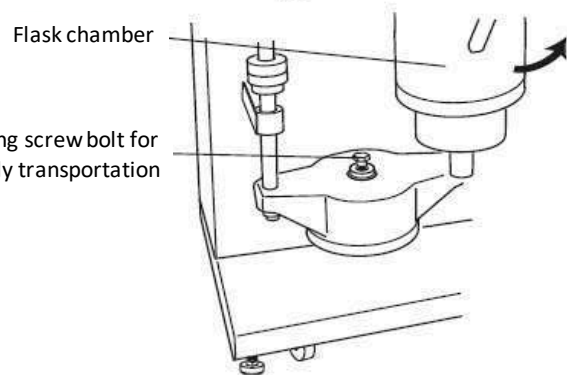
## 9-6. FLASK CHAMBER

### 9-6-1. REMOVING FIXATION BOLT FOR TRANSPORTATION

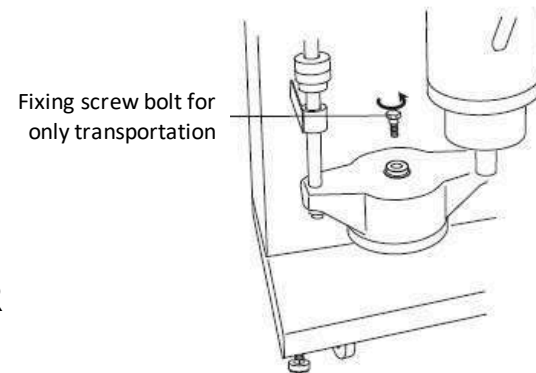
1) Turn fixation bolt for transportation (Hexagonal head bolt, Size: ISO M12 L=45mm) clockwise, so that mold chamber can be moved back and forth freely.



2) Slide mold chamber to front side.

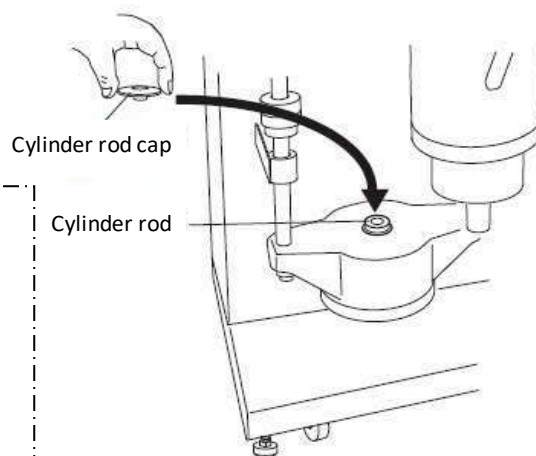


3) Remove fixation bolt for mold chamber turning it counterclockwise.



### 9-6-2. CYLINDER ROD HEAD COVER

Place cover for cylinder rod on top of cylinder rod for protection. (#14721000)



#### IMPORTANT

If cylinder rod head cover is forgotten, lid lock action cannot be performed properly.

At the time of installing this product, be sure to check it is set in place.

## 9-7. THERMOCOUPLE



### CAUTION

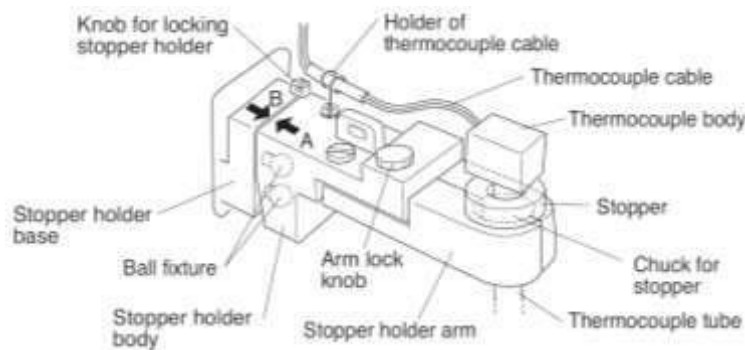
In case of K-type machine, if "R-type thermocouple" is connected to "K-type socket" by mistake, display temperature will be lower, and actual temperature of metal will become too high. Such mistake at type selection may cause hazardous results, so always check that type of thermocouple is correct.

In case of R-type machine, if "K-type thermocouple" is connected to "R-type socket" by mistake, display temperature will be abnormally higher than actual metal temperature.



### IMPORTANT

It is possible that a large amount of moisture is contained in protection tube of a new thermocouple. Carry out preheating up to around 200 degrees Celsius before actual casting.



- 1) Set stopper holder in place, making alignment with ball fixture.
- 2) Turn knob for locking stopper holder, so that a part of knob will be positioned over upper rear edge of stopper holder body. This position of knob can lock stopper holder.



### IMPORTANT

Check that the level of stopper holder (A) and that of stopper holder base (B) will be the same as shown in the figure.

- 3) Lift arm lock knob, so that stopper holder arm will be released. Then, slide and open left arm to left side.
- 4) Lifting stopper holder, set stopper to chuck and close left arm. Lower arm lock knob.
- 5) Put tube of thermocouple body into the hole of stopper.

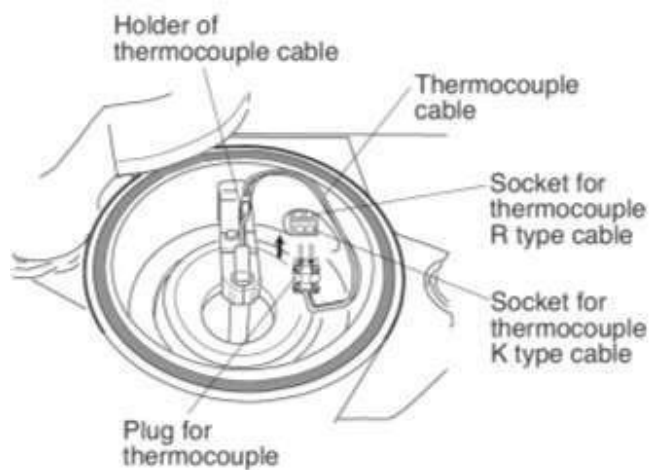
**CAUTION**

Insert thermocouple so that the lower end touches the bottom of carbon stopper hole.  
 When it doesn't touch there with some space, showing temperature will be lower than true temperature.  
 This can lead overheat on metal inside of crucible, which is dangerous that reading temperature is low and metal is boiling.  
 Thermocouple and crucible can be broken by the heat, molten metal can scattered in chambers, and sometimes piping can be damaged by it.

6) Route thermocouple cable through the holder of thermocouple cable on stopper holder body.

**CAUTION**

1. Carefully route thermocouple cable so that the cable should not be caught by other parts.
2. Do not kink thermocouple cable.



7) Plug thermocouple into socket of this product. (It is not possible to connect plug in reverse direction.)

### 9-8. CALIBRATION (Zero adjustment of pressure sensor)

You have to calibrate pressure sensor after installation and transportation.

- 1) Turn main breaker switch ON.
- 2) Push Master Button when requested.
- 3) Tap CONFIG button to open another page.

\* Maintain chambers released.  
 Charge tank pressure must be set 0 by regulator.

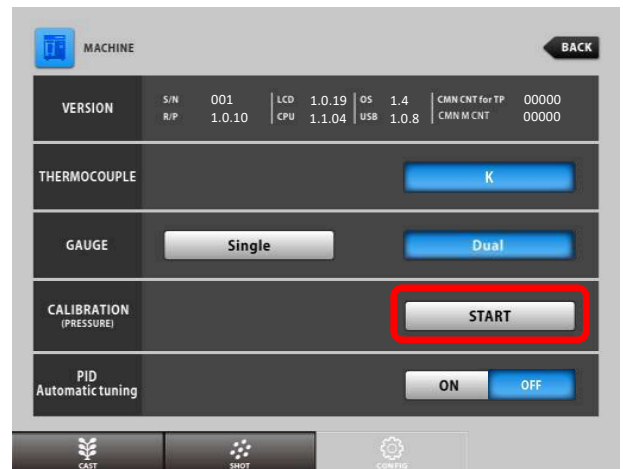




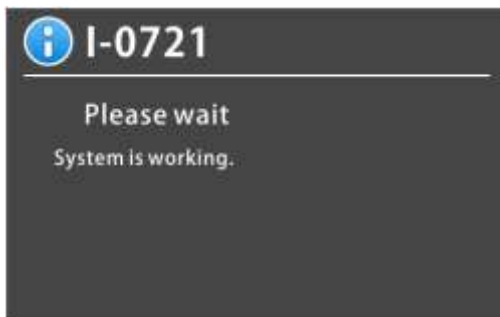
4) Tap MACHINE button



5) Tap START button



6) Calibration starts automatically  
Pop up message will be shown for a while.



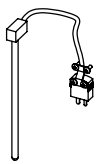



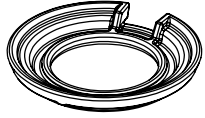
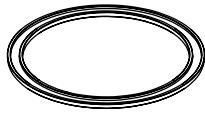

End of process when display returned to MACHINE window.

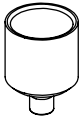
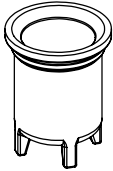






## 10. SPECIFICATIONS




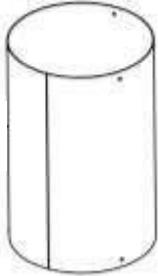
Power source	380VAC +/-10%, 50/60Hz 3phase, 6.3kVA
Oscillation	4.8kW
Net Weight	Approx.250kg
Dimension	746 (W) x 685 (D) x 1,191 (H)mm
Max. flask size	125mm dia.×230mm(H) standard
	125mm dia.×300m m(H) option
Crucible volume	158cc
Max. casting amount	100cc
Max. temperature	K type 1200 degrees Celsius
	R type 1300 degrees Celsius
Max. charge tank pressure	0.3MPa
Program memory	100
Casting system	Vacuum Pressure Casting system
Alarm	Digital indication by self diagnosis
Vacuum pump	Option over 300 liters/min.
Working condition	0-40 degrees Celsius: Room temperature
	Less than 70%: Humidity
Cooling Water	Tap water direct cooling system. more than 3L/min, more than 0.15MPa, Less than 30 degree Celsius
Replacing gas	Argon gas 0.7MPa / over 120 liters per min.

# 11. PARTS & CONSUMABLES

	#14250400	Thermocouple (K)
	#14230000	Thermocouple (R)
No image	#14230700	Thermocouple socket (K)
	#14230500	Thermocouple socket (R)
	#14740000	Stopper holder ass'y
	#25090410	Stopper rod
	#14754000	Guide for metal charge
	#14880302	Partition
	#14880301	Support ring for partition
	#14880303	Ceramic spacer 70φ

	#25105000	Graphite crucible 4.5kW/4.8kW/5kW
	#14755018	Outer crucible
No image	#28220000	O-ring P200 / Melting chamber O-ring P200 / Flask chamber
No image	#14726004	Heating coil

	#28306500	O-ring G-65
	#14226600	Sealing disk (Outer dia. 89φ, Inner dia. 49φ) (For flask dia. 89-125mm)
No image	#14226400	Sealing disk fixing screw bolt
	#14045500	Protection sheet
	#14743000	Flask base

	<p>#14742200</p>	<p>Spacer for 89φ dia. flask</p>
	<p>#14031000</p>	<p>Extension for short flask</p>
	<p>#14880411</p>	<p>Pan</p>
	<p>#14880412</p>	<p>Protection sleeve</p>
<p>No image</p>	<p>#14040000</p>	<p>Sight glass disk (lid) Sight glass disk (flask)</p>
<p>No image</p>	<p>#28203200</p>	<p>2pcs O-ring P32 for sight glass disk (lid)</p>
<p>No image</p>	<p>#28203400</p>	<p>2pcs O-ring P34 for sight glass disk (flask)</p>
<p>No image</p>	<p>#14082011</p>	<p>Element for Strainer</p>

End of document



