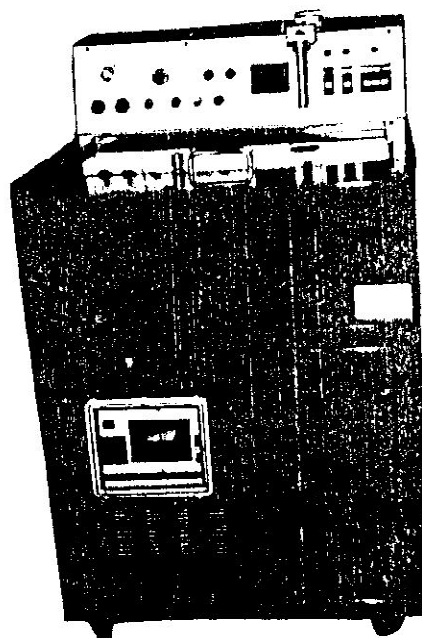


# Instruction Manual

PLATINUM CASTING MACHINE

<TCP-3250>

<TCP-3300>



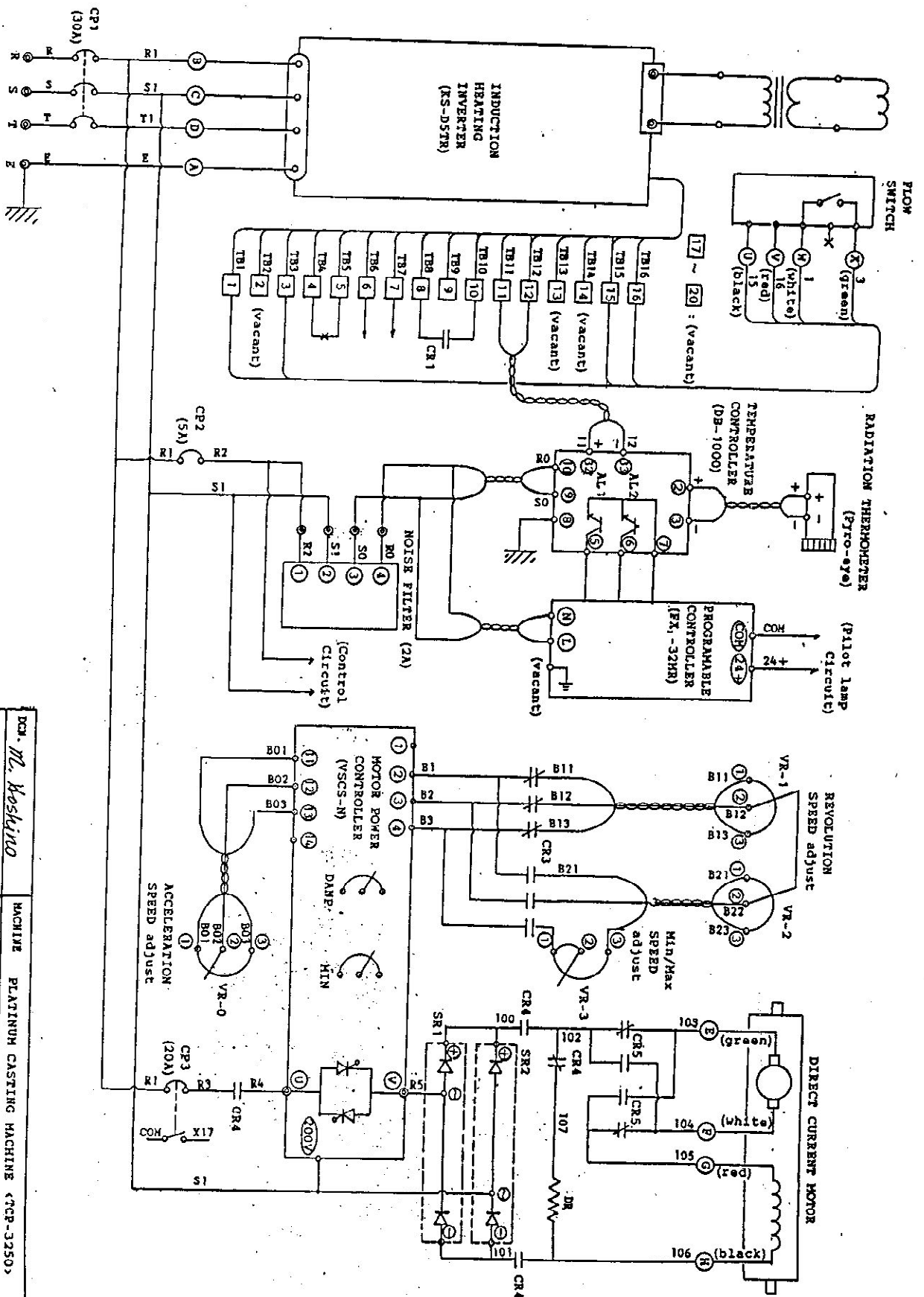
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DCR. M. Koshino	MACHINE	PLATINUM CASTING MACHINE (COP-3250)
DIC. 14. Miyajima	DWG. NAME	ELECTRIC CIRCUIT (1)
TANABE KENDEN CO., LTD.	DWG. NO.	

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## SAFETY INSTRUCTIONS

Before using TANABE KENDEN Platinum Casting Machine, please read all these safety instructions. They are for your protection and should always be followed to reduce the risk of personal injury or damage to the machine.

Always wear proper eye and hand protection. Safety sunglasses and heat resistant gloves should be worn whenever you operate TANABE KENDEN Platinum Casting Machine to prevent serious eye or hand injuries.

Wear protective clothing or face shields as required by local and national safety regulations.

In order to protect operator from electric shock or serious injuries:

Never operate the machine without proper grounding procedures.

Never touch metal in the crucible with any other goods excluding the ceramic bar provided by the manufacturer.

Do Not remove side panels of the machine while the main switch is in ON position.

The output terminals, feeder, output transformer, and heating coil are high voltage and huge current while in electrical supply, Do not touch or approach with metal.

Never put anything into the cast chamber while in operation.

The following person's machine operation or approach to a machine in operation are forbidden:

- (1) A person who holds metal in operation;
- (2) A person who dresses heavily up with metals;
- (3) A person who is using a pacemaker.

All electrical/induction heating device precautions must be taken.

## 2 INSTALLATION

### 2.1 Installation Conditions

The machine must be installed with proper ventilated working spaces for safety in operation and maintenance.

The working spaces must be clean, no corrosive gas, and no or less vibration. The space environmental temperature and moisture must meet requirements specified on the specifications.

Keep minimum clearance of 2 feet around the machine and ensure that no obstacles around the cooling fan exhaust port of the machine.

Having decided the spaces of the machine, fix the caster with Caster Stoppers(Accessories--4EA) and ensure that the machine is balanced in horizontal position.

### 2.2 Electrical Supply

#### Warning

Ensure that the electrical installation of Induction Heating Inverter unit confirms with your local and national safety requirements. It must be connected to a suitably fused and protected electrical supply and a suitable permanent grounding point by a competent, certified electrician.

Ensure that the electrical supply capacity, voltage, and phases corresponds with those specified on the specifications.

Remove the terminal cover from the machine Power Source terminals.

Connect supply cable to the Power Source terminals of the machine.

#### Caution

Transformer is needed if maximal voltage is over 220V.

### Warning

The supply cable and ground wire must confirm in size and color coding with your local and national installation regulations.

The machine must be grounded while in using for operator safety, machine protection, and electrical noise shielding.

Check that the cable connections are correct, then replace terminal cover to the terminals.

## 2.3 Water Supply

Ensure that water quality, flow, and pressure meet the requirements specified on the specifications.

Insert Couplers(Accessories--2EA) into the Water Inlet and Outlet. Connect Water Inlet and Outlet of the machine with proper water hoses, then tie the hoses with hose band.

Check that outlet and inlet hoses are connected correctly.

Water cooling effects is directly related to the water used. Dirt which condense in the water can be carried to the machine, and metallic dirt can result in damage to the flexible tube and/or the Induction Coil. To prevent this we recommend that you check water quality regularly and mount filter at water supply tap if necessary.

### Caution

Frozen water will damage machine. Circulating the water or drain water out of the machine if the water temperature is inadequate.

DO NOT connect water intake hose to the outlet. The machine does not work if water enters into the machine through the water outlet.

### 3.1 Revolving Arm Balance

The revolving arm must be balanced before operation. The revolving action is noisy or the machine will be vibrating if the revolving arm balance is inadequate.

Follow the steps listed below to balance the revolving arm (Figure 1):

- (1) Unscrew the locknut (b) .
- (2) Set an empty crucible (d) and a mold (e) in working position.
- (3) Put a dummy weight (Notes 1) (f) on the mold.
- (4) Adjust the balance weight (a) and balance the arm in horizontal position.
- (5) Screw the locknut back into place.

Notes: 1) Dummy weight is the weight of alloy used in cast.  
2) The revolving arm must be re-balanced if the weight of alloy and/or the weight of the mold changed.

#### Caution

The Flask height is being set at 90mm before shipment.  
Adjust it according to the size of your flask.

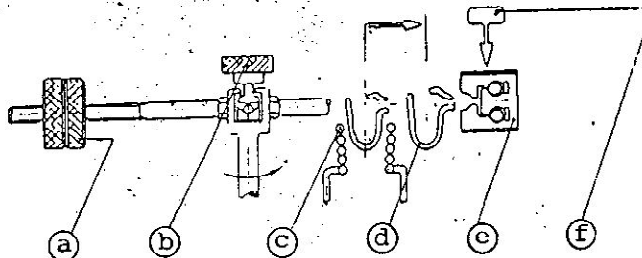


Figure 1 Revolving Arm Balancing

### 3.2 Acceleration Speed & Revolution Speed

Motor Power Controller ensures that the high torque DC motor can be started up very fast in the first second of revolution and can be slowed down after approximately 3 seconds.

The revolving time is being set at 5 seconds before shipment.

Table 1 shows recommended rating Acceleration Speed and rating Revolution Speed.

Table 1 Rating Acceleration & Revolution Speed

USED FOR	ACCELERATION SPEED	REVOLUTION SPEED
Delicate Work	Approx. 10	Approx. 9
General Work	Approx. 8	Approx. 8
Large Work	Approx. 6	Approx. 7

### 3.3 Temperature Controller

Setting Value Indication Diagram(Figure 2) shows how to call up the displays for setting various parameters (Temperature Controller Instructions--Page 4). Refer to the Temperature Controller Instructions and set the parameters required for your application(MODE 4 is not being used).

MODE 0 --- Cast temperature(SV) check and change.

MODE 1 --- Operation Execution Number(grams per melt) selection.

MODE 2 --- Initial cast temperature(SV) setting.

MODE 3 --- Initial PID and alarm setting

MODE 5 --- Initial Indication(measuring input, linear scale, etc.) setting.



4) Press the **ENT** key to store the set value(SV) in memory.

Key

Operation **MODE** → **SEL** → **>** **v** **^** → **ENT**

Note: The initial cast temperature(SV) will be changed and the new values will be stored in memory by the above operations.

### 3.3.2 Change Operation Execution Number(O.E.N.)

The relationship between the Operation Execution Numbers (O.E.N.) and the grams per melt is re-listed as follows:

O.E.N. #1 ---- 40-120 grams per melt

O.E.N. #2 ---- 130-200 grams per melt

O.E.N. #3 ---- 210-280 grams per melt

The machine is set at O.E.N. #1 before shipment. The operation procedure for check and change O.E.N. from the operation screen is as follows(Instructions--Page 5):

- 1) Press the **MODE** and **^** keys to set to the MODE 1.
- 2) Call up the required screen with the **SEL** key.
- 3) Set the desired O.E.N. with the **v** and **^** keys referring to the display.
- 4) Press the **ENT** key and to store the new O.E.N. in the memory.

E.g. Change O.E.N. from #1 to #2.

Key

Operation **MODE** → **^** → **SEL** → **SEL** → **^** → **ENT**

Screen

Display	MODE0	MODE1	AL RESET	NO. SELECT	NO. SELECT	
			NON RESET	1	2	<b>2</b>

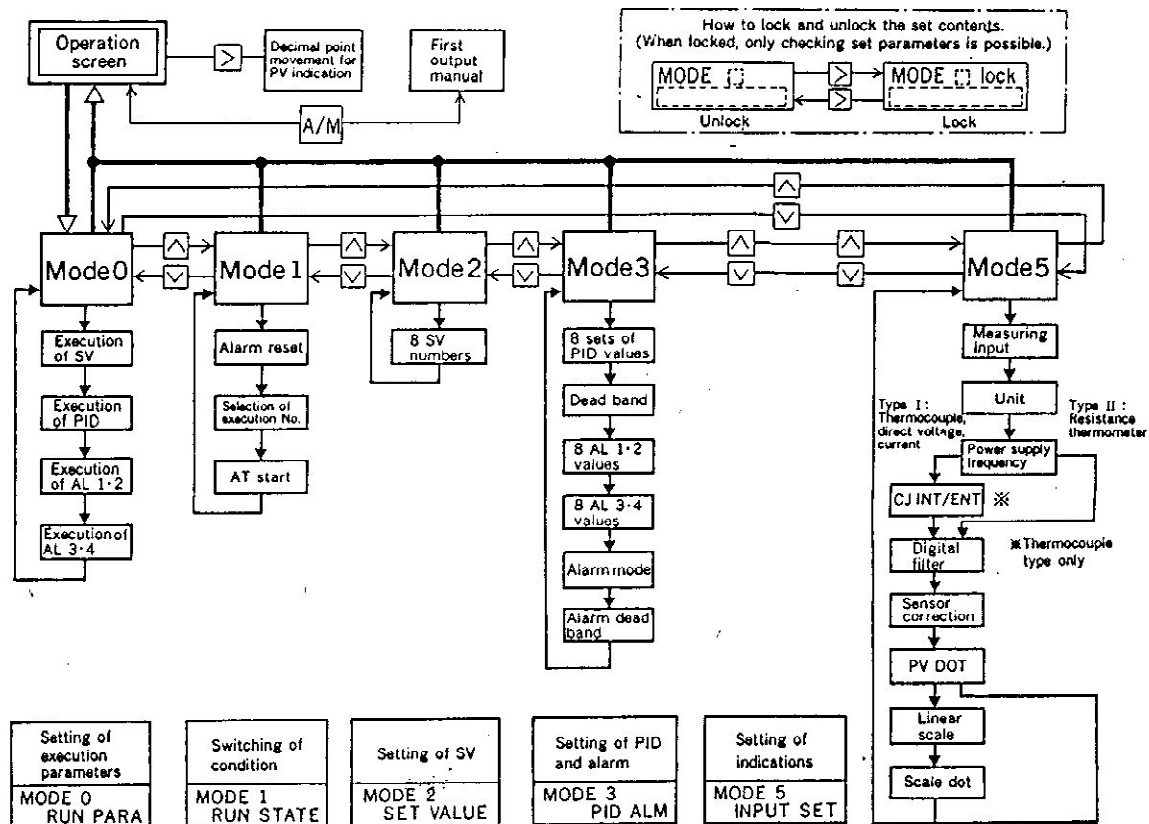


Figure 2 Setting Indication Diagram

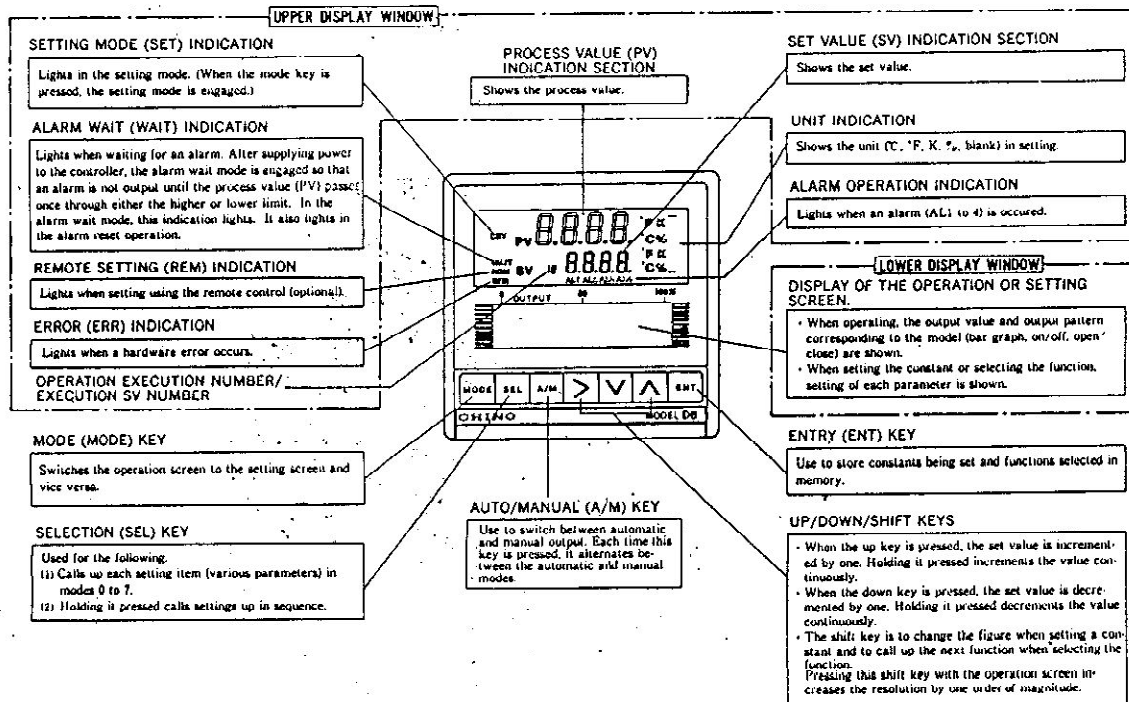


Figure 3 Temperature Controller Display Window

#### 4.1 Pre-operation Check-out

Before you operate the machine, check the following:

- (1) Water flow through the machine and no water leak.
- (2) Switch on the Main Switch of the machine, ensure that the Main Switch Lamp, Motor Breaker Lamp and Circuit Breaker Lamp are all in ON position (No Blinking).
- (3) Press the Coil UP/DOWN button and ensure that compressed air is coming into the machine.
- (4) The Acceleration Speed, Revolution Speed, are in proper places and the Temperature Controller shows the correct start temperature(PV Value) and cast temperature (SV Value).
- (5) Check that the Inverter Power Source switch is in ON position and the change over switch at Work Mode place.

#### 4.2 Operating Instructions

Read all safety instructions in this manual before operating the TANABE KENDEN Platinum Casting Machine. Wear proper eye and hand protection to prevent serious eye or hand injuries.

Normally, the Auto Cast mode is used for melt and cast operation. The Manual Cast mode is used if you wish to hold cast temperature for a while and press Revolving On by hand.

For experience casters who know Temperature Controller well, they can combine the operation Manual Cast Mode and temperature manual mode to adjust output power, cast timing, and etc.

For Platinum cast, pre-melt is strongly recommended.

- (1) Press Coil UP/DOWN button and let the Induction Coil in UP position;
- (2) Set a proper crucible into the Crucible Plate, fix the crucible with the clip and ensure that there are metal in the crucible.

## 5 MAINTENANCE

### 5.1 Maintenance Schedule

TANABE KENDEN Platinum Casting Machine is manufactured to high standards of quality and performance and with proper use and regular maintenance will give you years of trouble-free performance.

Obey the safety instructions given below and take note of appropriate precautions in maintenance:

- A competent electrician must perform all of the electrical work.
- ALWAYS DISCONNECT the electric supply to the machine.
- The capacitors of the power source in the machine could not discharge immediately even the electric supply is OFF. Wait for 1-2 minutes before maintenance.

The Maintenance Schedule (Table 3) in the following page gives the maintenance operations necessary to maintain your machine in normal use. If necessary, adjust the maintenance schedule according to your experience.

### 5.2 Spare Parts List

The TANABE KENDEN products, spares are available from our distributors.

Order spare parts from your supplier or our distributor in your region.

Item No.	Description of Goods	Note
20101	Platinum Investment	
	A-1-Mix	25kg/ctn
20203	Ceramic Crucible	
20205	Induction Coil	
20207	Ceramic Bar	
20401	Flask(Ø76.3mmxH70mm)	
20403	Flask(Ø76.3mmxH90mm)	
20601	Filter Paper	
	300mmx300mm	100/pk.
21001	Crucible Plate	
21002	Flask Plate	

## TROUBLE SHOOTING

A table (Table 4) of possible abnormal condition (including machine protective alarm signals), possible causes and remedies is provided to assist you in basic trouble shooting.

The button or the Pilot Lamp on the Main Operation Panel will be blinking if the machine is not ready for operation or the machine is in an abnormal condition. The LED lamp on the Inverter Operation Panel will be lit if the Inverter is in a fault condition.

Table 4 Trouble Shooting Guide

Lamp/Button	Reasons & Remedies
Main Switch	a) Inverter Power OFF. Switch ON the Inverter Power Source b) No water or water is insufficient. Check water supply
Circuit Breaker	a) Programmable Controller no battery. Change new battery b) Programmable Controller malfunction
Motor Breaker OFF	Excess current or overload
Coil UP/DOWN	a) No Compressed air or low air pressure Check air supply b) Limit Switch failure
Melt ON/OFF	a) Malfunction of Radiation Thermometer b) Inverter failure
Inverter LED #1&#5	Inverter overheat. Inverter fan motor trouble or bad ventilation inside of the Inverter
Inverter LED #5	a) Coil Overheat. Inverter fan motor trouble or bad ventilation inside of the Inverter b) Excess current. Inverter Failure c) Overvoltage of power supply d) Insufficient power capacity or power supply voltage is too low

After found and/or remedied fault condition, press the

## WARRANTY

TANABE KENDEN CO., LTD warrants the TANABE KENDEN Platinum Casting Machine to be free of defects in material or workmanship under normal use and service. This warranty is in lieu and excludes all other expressed or implied warranties or merchantability of fitness for any particular use.

The machine is warranted for one year from date of shipment from TANABE KENDEN CO., LTD in Tokyo, Japan.

The machine must be installed, used and maintained in accordance with our instructions, including reasonable and necessary maintenance by the user. Users are responsible for the suitability for the machine to their application. There is no warranty damage resulting from improper installation, abuse, power failure, fire, flood, lightening, improper water, misuse, improper specification, misapplication or other operating conditions beyond our control or parts that are normally expendable in usual course of operation.

TANABE KENDEN CO., LTD is not liable for labor costs incurred in removal, reinstallation, or unauthorized repair of the product, or for damages of any type whatsoever, including incidental and/or consequential damages.

Claims for repair or replacement under this Warranty must be made by contacting with our distributor in your region.

## SPECIFICATIONS

Electrical	Power Supply	200V $\pm$ 10%, 3 $\phi$ , 50/60Hz, 8KVA
	Output Power	0-5KW, Variable
	Output Frequency	60KHz $\pm$ 5KHz
Work	Melt Item	Platinum and its alloy
	Melt Method	Direct Induction Heating
	Melt Environment	In Atmosphere
	Melt Capacity	10-250 grams
Temperature Controller	Measure Type	Radiation Thermometer
	Measure Accuracy	$\pm(T_{\max}^{0.1\%}\pm 1)$
	Measure Range	2190-3630°F 3000-4440°F for Platinum
	Control Programs	8 Settings Available
DC Motor	Control Type	Motor Power Controller
	Power	0.75KW
	R.P.M.	1,200(100V), Variable
Cooling Water	Water Pressure	30-45 PSI(2-3kg/cm <sup>2</sup> )
	Flow Rate	80 liters/hr.
	Water Temp.	40--105°F(5-40°C)
	Water Quality	Resistivity---4K $\Omega$ Hardness-----Below 17
Environmental	Temperature.	40-105°F(5-40°C)
	Moisture	Below 85%
General	Machine Type	TCP-3300
	Control Method	Programmable Controller
	Flask Size(Max)	3"Dx4"H
	Air Pressure	75-100 PSI(5-7kg/cm <sup>2</sup> )
	Dimensions	W780xD900xH1200mm
	Weight	Approx. 550Lbs(250kgs)

Alarm Reset button of the Inverter and try again.

If you fail to remedy a fault using this guide, call your supplier or our distributor for help.



Table 3 Maintenance Schedule

Check Place	Maintenance Operation	Frequency
Air Exhaust Port	Wind comes out of the port and no obstacles around it	Every Day
Induction Coil	No metal around/on the coil. No noise sound. No leak	Every Day
	Change the coil	As required
Compressed Air Filter	Check and drain the water condensed in it	Every Month
Inverter Air Filter	Clean the air filter	Every Month
Cooling Water Filter	Clean the water filter	Every Month
Machine Inside	Remove all the panels and clean by compressed air	3-6 Months
Water Tube & Fittings	Clean by compressed air. Clean and/or change if scaled or leak	
Connecting Places	No loose contact. No damage or discoloration	
Gauge & Detector	Working and Indicating correctly	

- (3) Press Melt ON/OFF button and pre-melt;
- (4) Re-press Melt ON/OFF button after the metal is melted(confirm by eye);
- (5) Set a mold into the Flask Adapter;
- (6) Shut the chamber door and press Mold Check button;
- (7) Press the Auto Cast Start button and finish(refer to the Operating Flow Diagram Figure 6).

Note: 1) DO NOT press Coil UP/DOWN button after pre-melt.  
 2) At Auto Cast mode, the Inverter will be OFF automatically if melting time is over 3 minutes.

#### Caution

Put a mold onto the Flask Adapter BEFORE press Mold Check button. the arm will be revolving at Auto/Manual Mode even NO MOLD on the Flask Adapter!!

#### Caution

Cooling water should be circulated for approximately 10 minutes at end of operation.

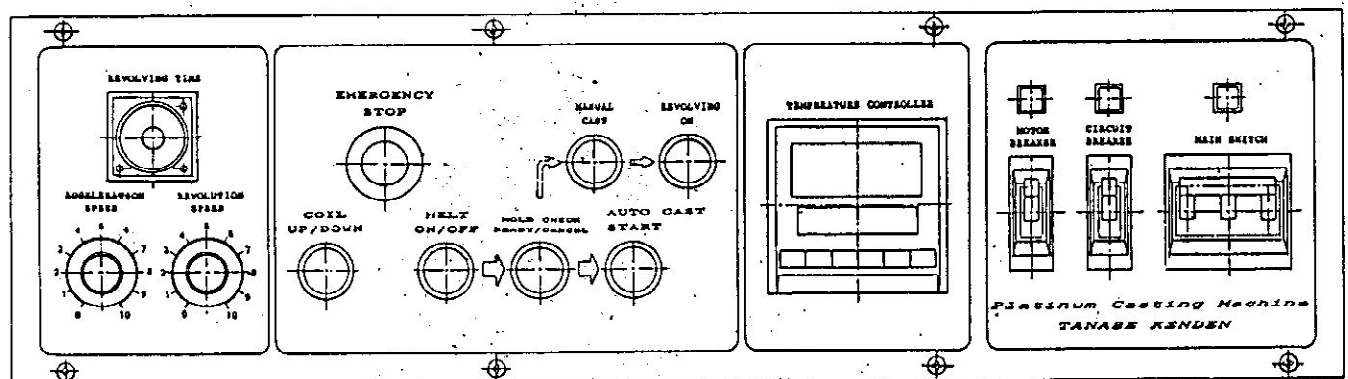


Figure 5 Main Operation Panel

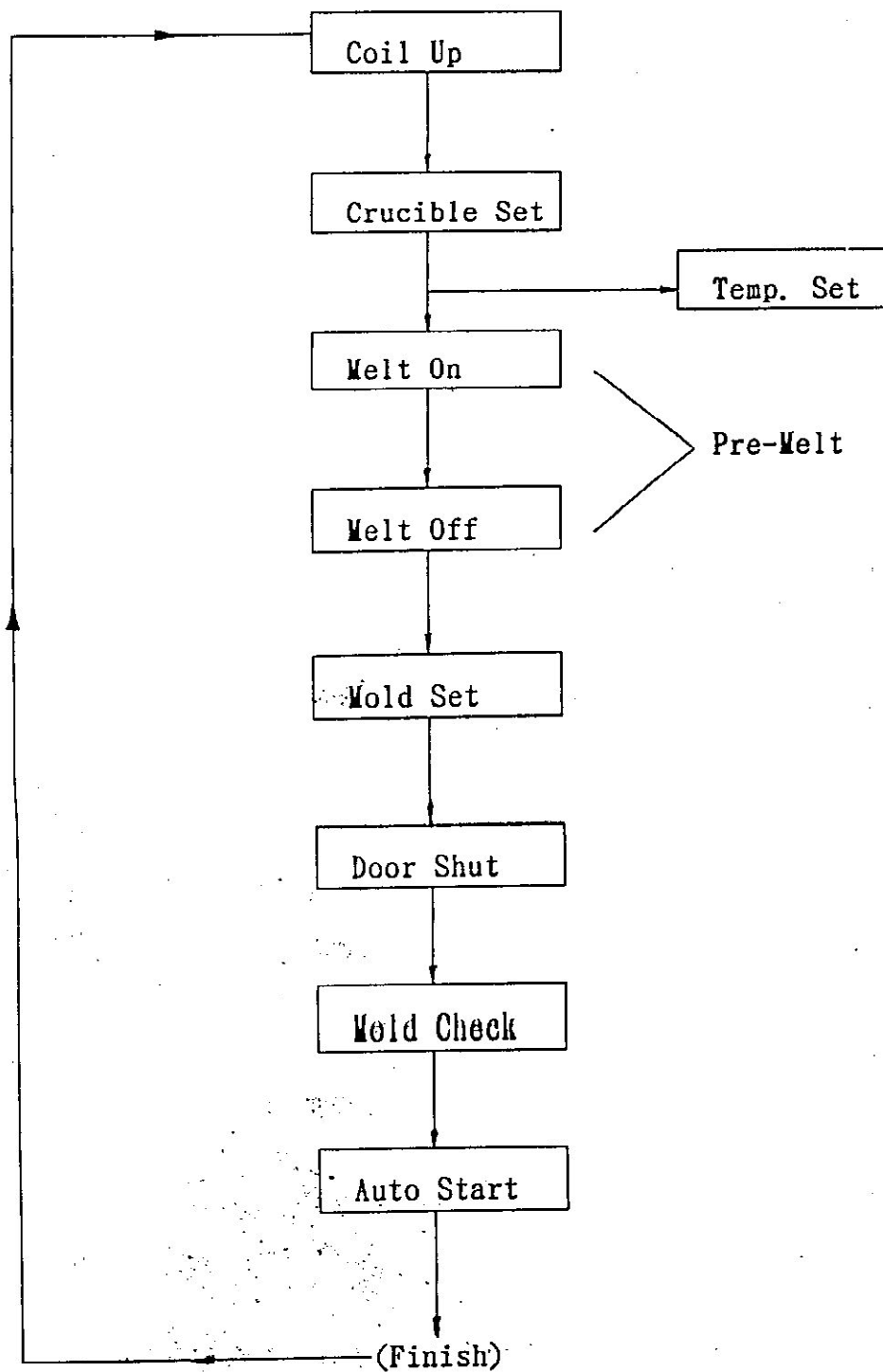
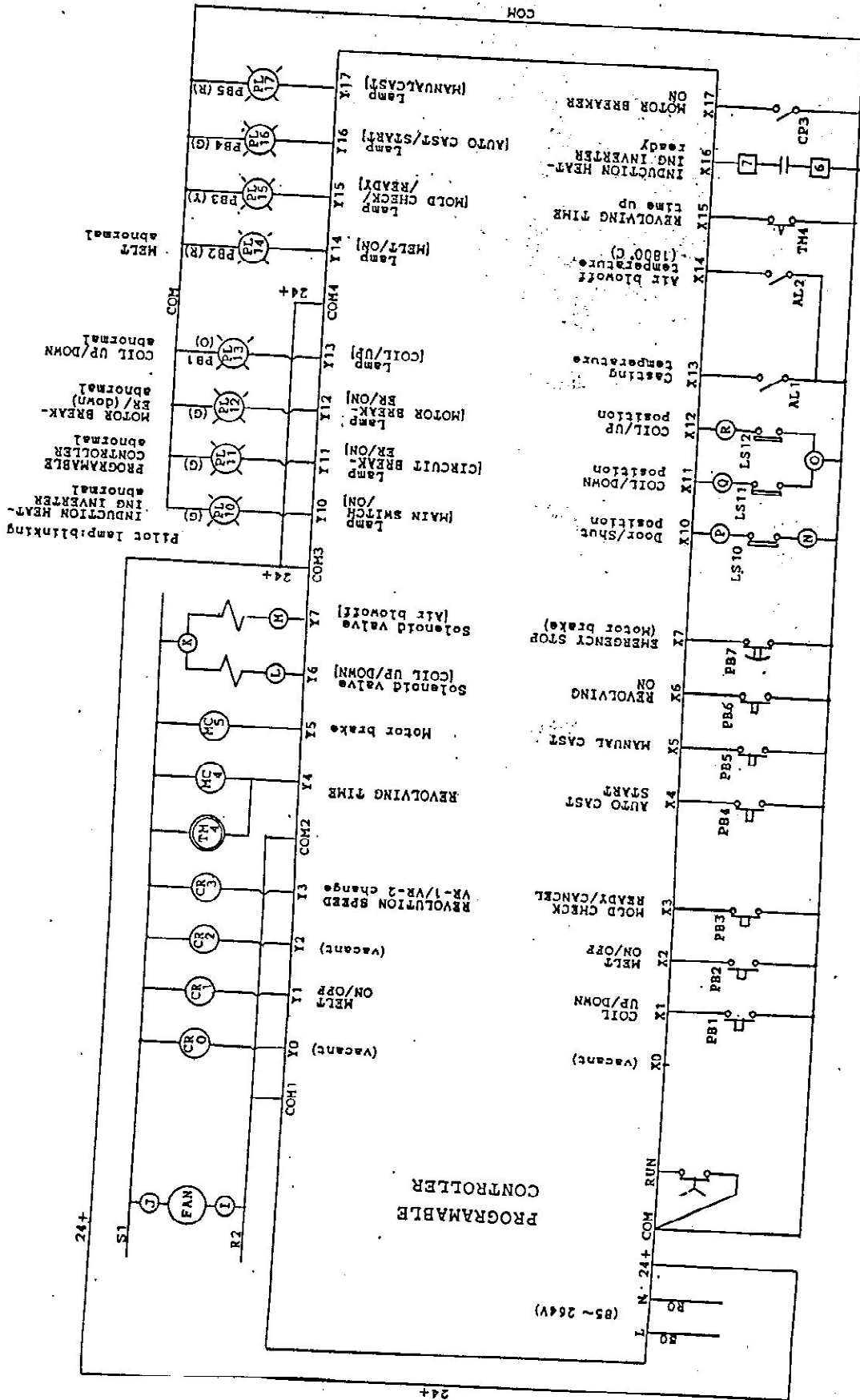


Figure 6 Operating Flow Diagram



DR. M. Hoshino	MACHINE	PLATINUM CASTING MACHINE (TCP-3250)
DR. H. Miyagaki	DR. NAME	ELECTRIC CIRCUIT (2)
TANABE KENDEN CO., LTD.	DR. NO.	