Nov, 1999

OPERATION MANUAL
HLM-A60-E

Hitachi Chemical Co., Ltd.

Hitachi AIC Inc. HAGA WORKS

BE SURE TO READ THE FOLLOWING INSTRUCTIONS BEFORE STARTING OPERATION !

Be sure to observe the following items so that you may operate it in high efficiency without causing any trouble for disorder, smoothly.

(1)While operating the equipment, do not put hand, finger or face in any part of it.

(2)Do not operate the equipment with safety switches of the door and cover turned off.

(3)With the door and cover taken off, do not operate the equipment.

(4)Be sure to turn off the power switch when the equipment is maintained or serviced.

(5)While the equipment is energized or after energizing it, the temperature at laminating rolls and its vicinity become high temperature. Therefore, never touch them.

(6)When handling the cutter blade, wear a pair of gloves made of leather or KEPLER. Handle the cutter blade with utmost care so that you may not fall or throw it away.

(7)Be sure to turn off the power switch when change or clean the cutter blade.

(8)Wrap replacement blades or used blades with an oil paper or cloth in such a way that blade edges do not appear at outside. Then, store it a safe place.

(9)If the equipment is handled by a plural number of workers, call out each other and carry out operations upon confirming safety.

(10)If manual operation is carried out, carry out manual operation with both hands.

(11)If manual operation is carried out with both hands, workers must confirm that nobody put his hand or finger in the equipment and operate it.

(12)Full care must be taken that clothing's are not wound into the roller conveyor and drive etc.

(13)If there should arise a trouble, be sure to stop the operation of the equipment and take a countermeasure therefor.

1. IMPORTANT FOR SAFE OPERATION

Read this operation manual with full care so that you may operate this unit safely and in high operational efficiency. At the same time, pay full attention to the following points.

SAFETY FIRST

1. Read this operation manual with full care prior to starting installation and operation.
2. Be sure to observe strictly the instructions shown in the warning label.
3. Disconnecting the safety cover, interlock and safety devices, the unit shall not be operated.
4. The unit starts its operation automatically. Therefore, do not touch rotary or movable parts absolutely.
5. Be sure to turn off the power switch before making inspection, repair, service and maintenance.

If the above instructions are not observed strictly, a serious calamity or accident might be caused or the unit, be damaged seriously.

1-1. Warning labels stuck to the unit

Important information concerning safety is included in the warning labels. These warning labels are stuck to the upper part of the unit.

1-2. Warning labels

(1) Important information concerning safety is shown in a warning label stuck to such part of the unit as easy to be seen. An operator concerned must observe strictly the instructions shown in the warning label. If not observed, a serious accident might develop sometimes.

(2) There are 3 kinds of warning label according to the degree of danger as shown hereunder.

DANGER : If miss-operated or mishandled, there will be a possibility that user is killed in an accident or gets badly injured. At the same time, the degree of urgency at the time of danger is high.

WARNING : If mishandled, there will be a possibility that user is killed or get badly injured.

CAUTION : If mishandled, there will be a possibility that user gets slightly wounded or only property damage is caused.

(3)Keep always the warning labels clean. At the same time, do not move them to other positions of the unit.

(4)Besides the information shown in these warning labels, there are many kinds of information or instructions which an operator must observe strictly.

Accordingly, read the instructions concerning safety with full care.

While installing, operating, inspecting and maintaining the unit, be sure to observe the instructions strictly.

MAIN FEATURES OF HLM-A60-E

FUNCTION

1.Operation panel.

A standard operation panel. (5.7") contains setting of Lamination Temp., Speed and Position by each devices.

Operation control shall be proceeded through 5.7" panel.

On the other hand, larger type of 10.4" LCD touch-panel can be applied as the option so that you can control and manage all functions of the machine through the panel easily.

2.Setting of film

Setting and removal of dry film can be made easily at the front of the machine body.

It is provided with a fine adjustment mechanism for locating of printed circuit board and film.

3.Winding shaft

An special winding shaft has been adopted so that only protective film can be removed.

4.Film cutter

A unique one-ridge cutter has been adopted, enabling it to move synchronously with the transferring speed of film for cutting. Therefore, it is very accurate.

Furthermore, as the contact time of one time of film is short, it is long in life.

5.Feeding of film

Adoption of an unique film separation guiding mechanism has made it possible to laminate very stably without temporal pressing of film to the printed circuit board, resulting in shortening of laminating time per piece.

As the protective film is separated just before lamination, it is free from depositing of dust or foreign matter on the resisting surface.

6.Laminating rolls

(1)Laminating rolls have a diameter of ϕ90 and interchange ability with jacket rolls (electromagnetic induction heating type.)

(2)It has been so designed and constructed as possible to move laminating rollers to the back side of the equipment so that exchanging work of laminating rolls can be conducted easily.

7.With laminating roll speed of 1.0~6.2m/min, it is so designed as possible to carry out laminating operations at a high speed.

8.Manual switch box

Apart from the main operation switch, a manual switch box has been provided so that confirmation and adjustment can be made on operation.

9.Possible to laminate one side of boards

(But, only the resist film at one side must be set in this case.)

10.Layout of operation panel.

Even after delivery and installation, the location of the operation panel can be changed from left to right and vice versa.

This will be very convenient when the layout of the plant is changed.

1.Name

Auto cut laminator (Abbreviation : HLM-A60-E)

2.Outline

Locating printed circuit boards fed one by one from a drying furnace, the Resist film is laminated in a form of frame in the specified part and discharged on the conveyor.

3.Object work

3-1.Printed circuit board

a)Board dimensions and material

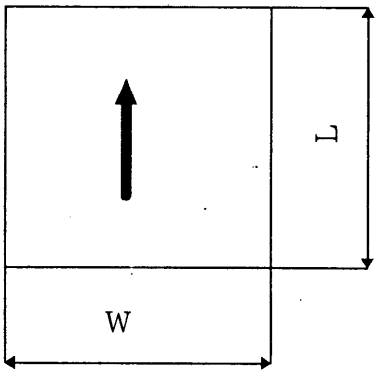
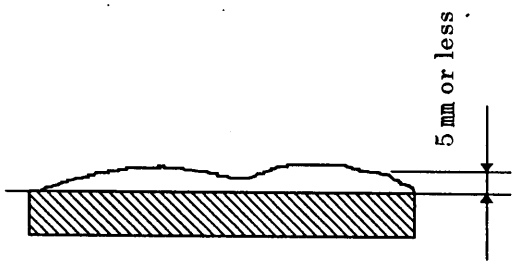


Plate Thickness : T

UNIT : mm

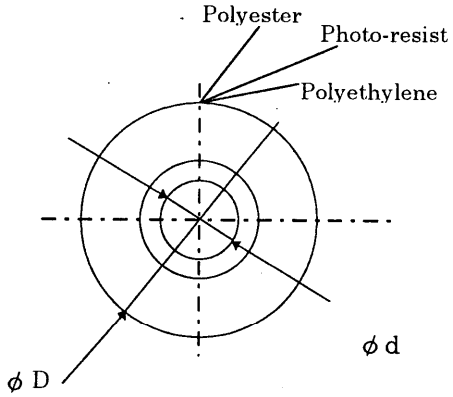
DIMENSION	K I N D
W	250～615
L	250～625
T	0.1～3.2
MATERIAL	Paper epoxide copper plated plate, glass epoxide copper plated plate.

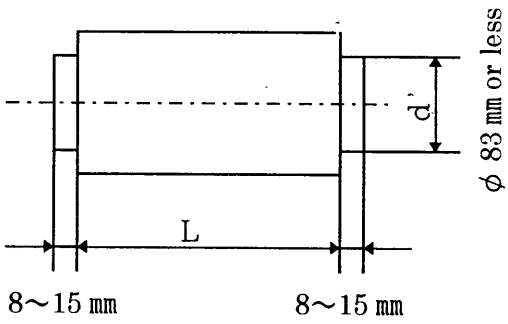
b)Warping and twisting of boards



3-2.Dimensions of resist film

ITEM	STANDARD
WIDTH OF FILM	250～625 ㎜
THICKNESS OF POLYESTER	20 μm
PHOTO-RESIST THICKNESS	25～50 μm
POLYETHYLENE THICKNESS	30 μm
OUTER DIAMETER OF ROLL ϕD	ϕ220 ㎜ MAX.
INSIDE DIAMETER OF BOBIN ϕd	6 in





4.Specifications

4-1.Constitution of equipment

a)Support base

b)Locator for feeding position

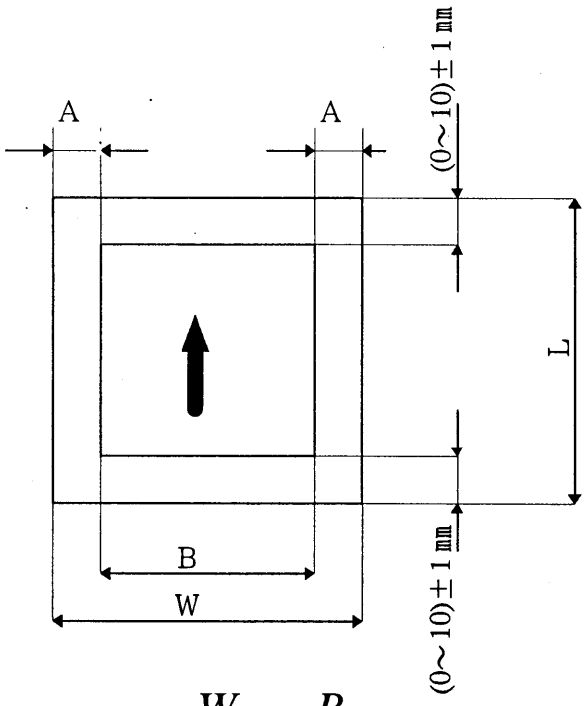
c)Laminating block

d)Board discharging block

e)Control

f)Pre-Heater

4-2.Laminate specifications



$$A = \frac{W - B}{2}$$

Where,

B : Width of resist film

W : Width of board

L : Length of board

4.-3.Processing capacity

$$T = A + 60 \times \frac{L}{V}$$

$$N = 3600 / T$$

A : 4.0 (sec)
L : Length of board (m)
V : Roller speed of laminate (m/min)
T : Required time (sec)
N : No. of pcs. Tod e processed (pcs/h)

An example of calculation

The required time (T) in case the laminate roller speed is V=6.0m/min with a length of board (m) L=600 ㎜, is as follows.

$$T = A + 60 \times \frac{L}{V}$$

$$= 4.0 + \frac{60 \times 0.600}{6.0}$$

$$= 10\,\text{sec}$$

Number of pieces processed $N = 3600/T$

$= 360\,\text{pcs/h}$

TABLE OF NO. OF PCS. TREATED (pcs/h)

SPEED / Length of board	2.0	2.5	3.0	4.0	5.0	6.0
200	360	375				
	300	310				
250	313	360	400			
	266	300	327			
330	258	302	339	402		
	226	258	285	328		
400	225	264	300	360	409	
	200	230	257	300	333	
500	189	225	257	313	360	400
	163	182	200	257	300	327
600	163	195	225	276	321	360
	150	176	200	240	272	300

UPPER STAGE : Plate thickness more than 0.5 mm

LOWER STAGE : Plate thickness less than 0.4 mm

(The above-mentioned changes slightly according to width moving speed)

4-4.Constructions of the related parts

a)Support base for equipment

a-1)Provided with casters.

a-2)The equipment is fixed with jack bolts.

a-3)Pass line is 950±30 ㎜.

(But, when casters and jack bolts are disconnected, the pass line will be min. 880 ㎜)

b)Locator for feeding position

b-1) The transferring rollers for feeding conveyor are made of stainless steel.

b-2) As for locating of board position, detection is made on the tip of board and then, locating operation is carried out by a width moving 2-stage motion mechanism.

b-3) A motor is used for width moving drive.

b-4) The feeding conveyor can be moved for the purpose of setting of a resist film.

b-5) The speed of conveyor is variable in a range of 1.0～6.2m/min. Display is made digitally.

c)Laminating block

c-1) Cutting of resist film is done without interrupting lamination.

c-2) Provided with a slide guide warmer for heating of a resist film.

c-3) Provided with an adsorbing mechanism for resist film. The operation is carried out by a vacuum pump. (The vacuum pump is installed separately.)

c-4) An air cylinder is used for feeding of the tip of film. The upper and lower operations are carried out separately.

c-5) A COLLET-CHUCK system is adopted for supply roll shaft and it is provided with a powder brake and a scale for rough judging of locating. After setting, fine adjustment in a lateral direction shall be able to make in ±5 ㎜.

c-6) Detecting the outer diameter of resist film, the braking force of the supply roll shaft must be able to control by a powder brake.

c-7) A winding motor is provided individually for the upper and lower parts, for the protective film. Control is exercised over the winding force by powder clutch.

c-8) The protective film is wound by a special winder and only the protective film is removed.

c-9) Removal of electric charge of the protective film is made by a electric charge removing bar.

c-10)The speed of laminating rollers must be variable in a range of 1.0～6.2 m/ min. Display shall be made digitally.

c-11)The laminating rollers are hot ones and of Jacket rollers type.

c-12)Pressurizing of laminating rollers is done by an air cylinder. It is provided with a regulator for adjustment on pressure.

c-13)Temperature of laminating rollers

laminating rollers : Normal temperature～150±10℃

(roller surface temperature)

① Each of the above-mentioned heater circuits is provided with a broken wire monitor. If wire is broken, it will be informed to the parties concerned by buzzer and lamp, resulting in cyclic stopping.

② The abnormal temperature of each of the above-mentioned rollers is informed to the parties concerned by sounding of the buzzer.

③ Each of rollers must be able to rise in temperature within 40 minutes.

c-14)For carrying out the exchanging operation of laminating rollers easily, the laminating roller block moves to the back side of equipment.

c-15)Possible to laminate one side of board. (But, one side resist film is set only)

d)Discharging block of boards

d-1) The transferring rollers of the discharging conveyor are made of aluminum material.

d-2) The transferring roller conveyor can be attached or detached. (Attaching or detaching operation must be carried out at the time of exchanging laminating rollers.)

d-3) The speed of conveyor is variable in a range of 1.0～6.2m/min. Display is made digitally.

e)Control

e-1) The control cabinet must be provided with another exclusive use box.

e-2) A power reception terminal is provided in one place. Class 3 earthling is required. (You will please carry out the operation of CLASS 3 EARTHLING.)

e-3) An emergency stop switch must be provided in 7 places. (including two Pre-Heater)

e-4) A leak current breaker must be provided in each of main control circuit and heater circuit.

e-5) Sequential control is exercised by a universal Sequencer.

e-6) Giving a large variety of error messages on the liquid crystal screen, manual operation can be carried out with hand.

e-7) Possible to set the sticking position of film and board in a unit of mm in a lengthwise direction.

e-8)The standard unit is provided with a power key switch.
(It is unable by OFF and enable by ON)

e-9)A countermeasure is taken for noise.

f)Pre-Heaters

f-1) For preheating of boards, a 4-pair hot roller system combining aluminum roller and rubber roller has been adopted. (Cartridge heater built-in type)

f-2) Temperature of rollers

Aluminum roller : Normal temp～190℃±15℃

Rubber roller : Normal temp～150℃±15℃

① Providing the above-mentioned heater circuits with a broken wire monitor, information will be given to the parties concerned if wire broken.

② The abnormality in temperature of the above-mentioned heat rollers is informed to the parties concerned by sounding of buzzer.

③ The respective rollers must be able to rise in temperature within 40 minutes.

f-3) As for removal of electric charge of printed circuit boards, an electric charge removing bar must be provided at the outlet of hot rollers.

f-4) Providing an adhesive roller, dust must be removed from boards.

f-5) The speed of conveyor is variable in a range of 1.0～6.2m/min.
Display is made digitally.

g)A countermeasure for prevention of generation of dust

g-1) Air pressure

① A non-lubrication type has been adopted for air pressure operating machines.

② A mist filter is provided at the line of air pressure machines.

5.Operation method

5-1.Names of devices on the operation panel of the body and their function

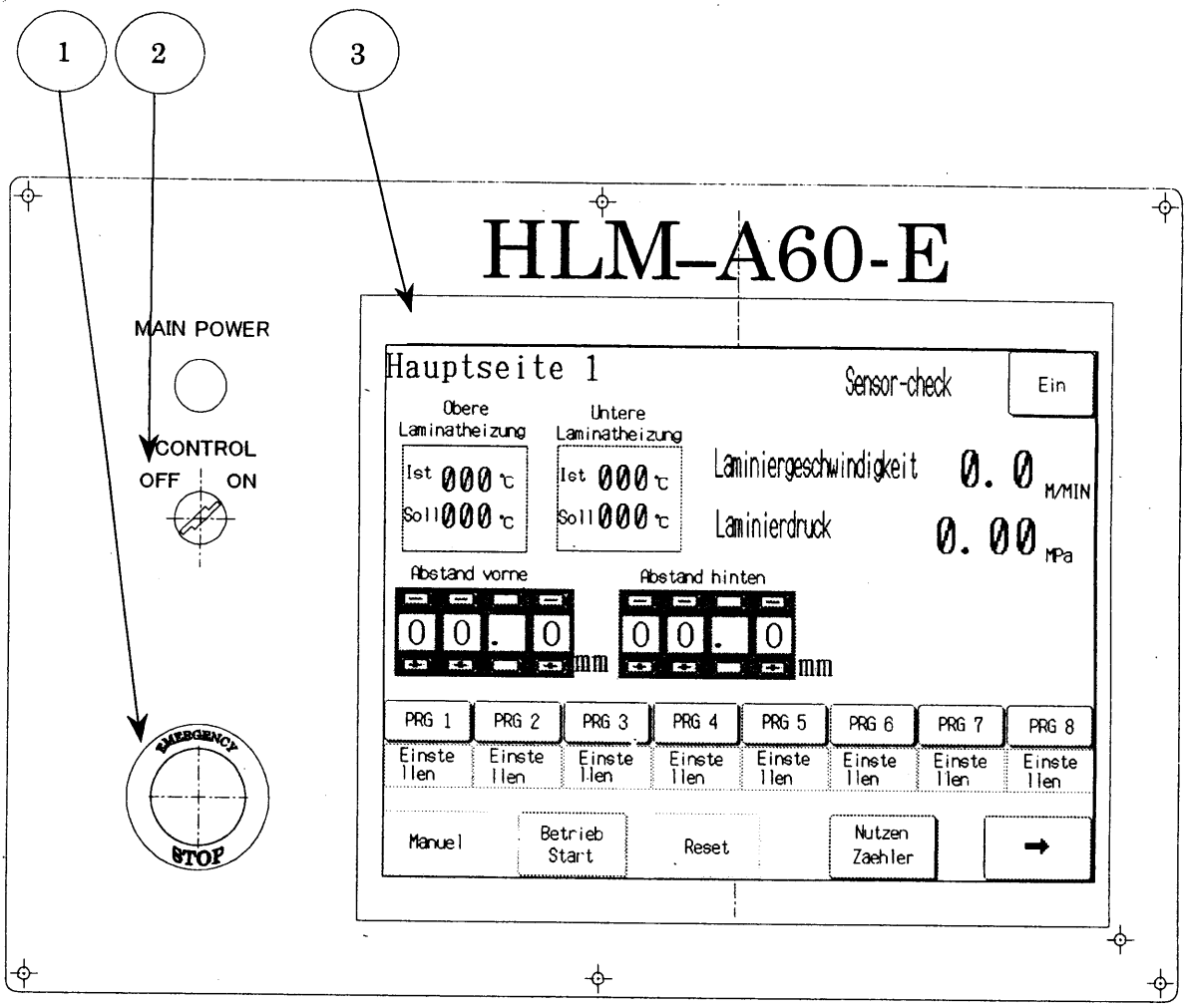


Fig.5-1. OPERATION PANEL

No	N A M E	F U N C T I O N
1	EMERGENCY STOP	When pushed, the equipment will be stopped.
2	KEY SWITCH	Putting a key therein, when it is turned on, power source can be turned on. If not used for a long time or maintenance is made, not requiring electric power because of danger, it must be turned off. Then, pull out the key and stored in a specified place.
3	MONITOR DISPLAY	This indicates various operations and information. (DETAILS5-2)

Fig5-2-P001
HLM-A60-E

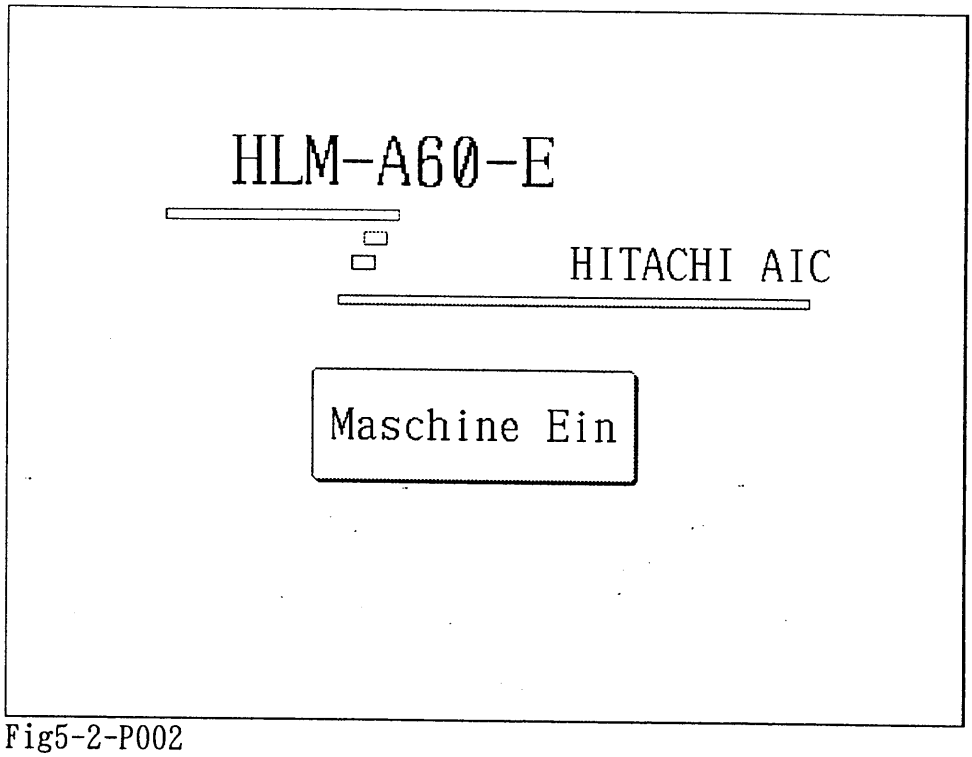


Fig5-2-P002
SENSOR CHECK

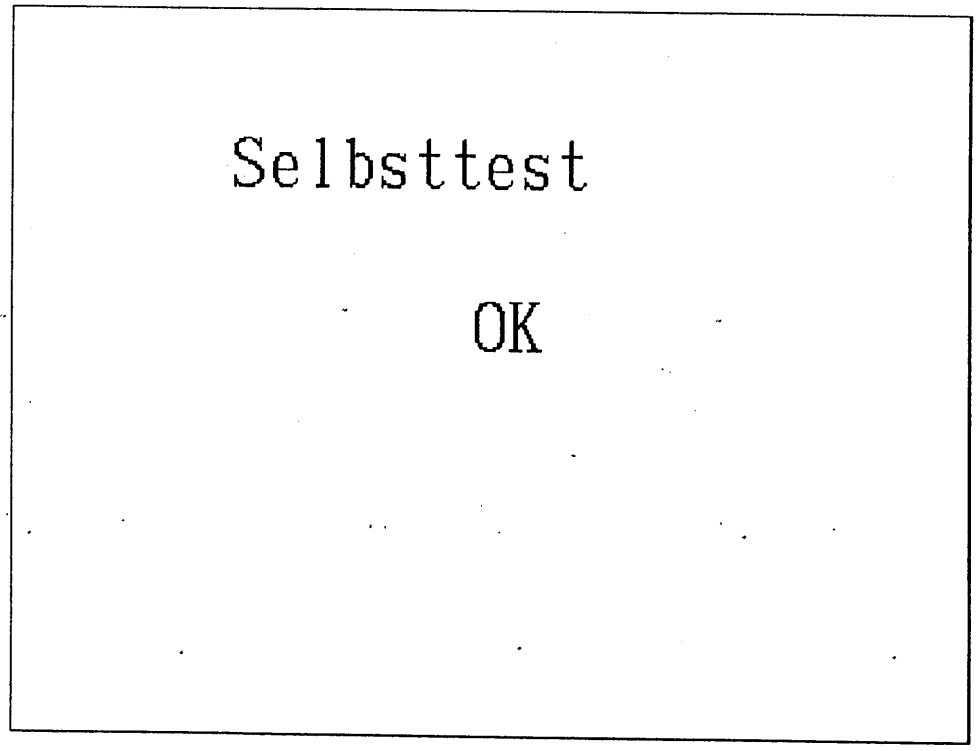


Fig5-2-P003
MAIN PANEL1

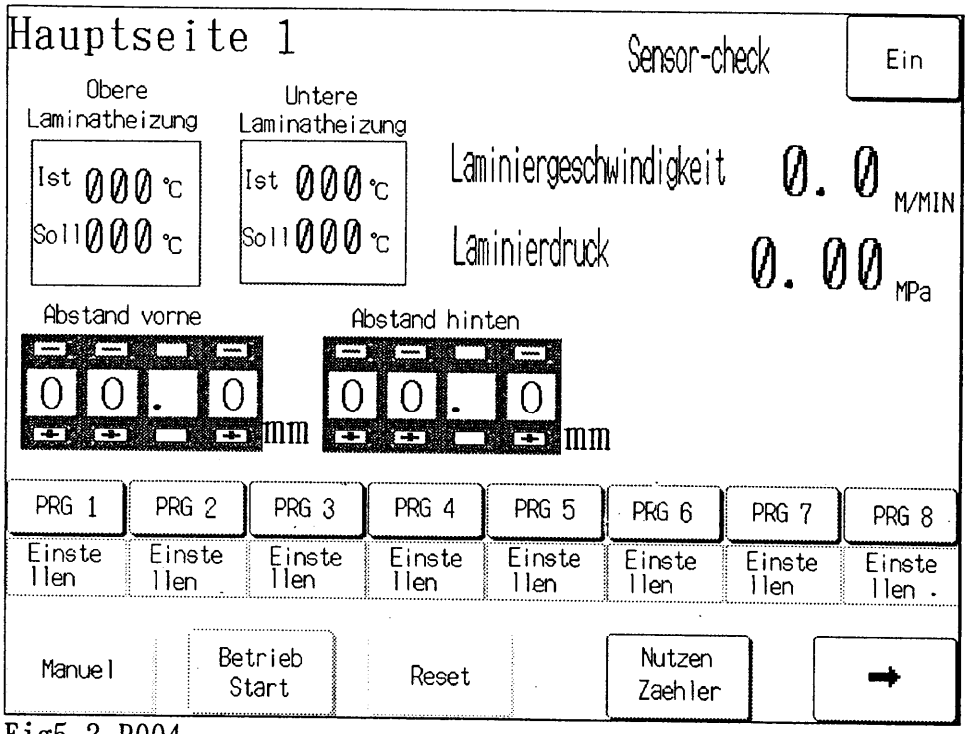


Fig5-2-P004
MAIN PANEL2

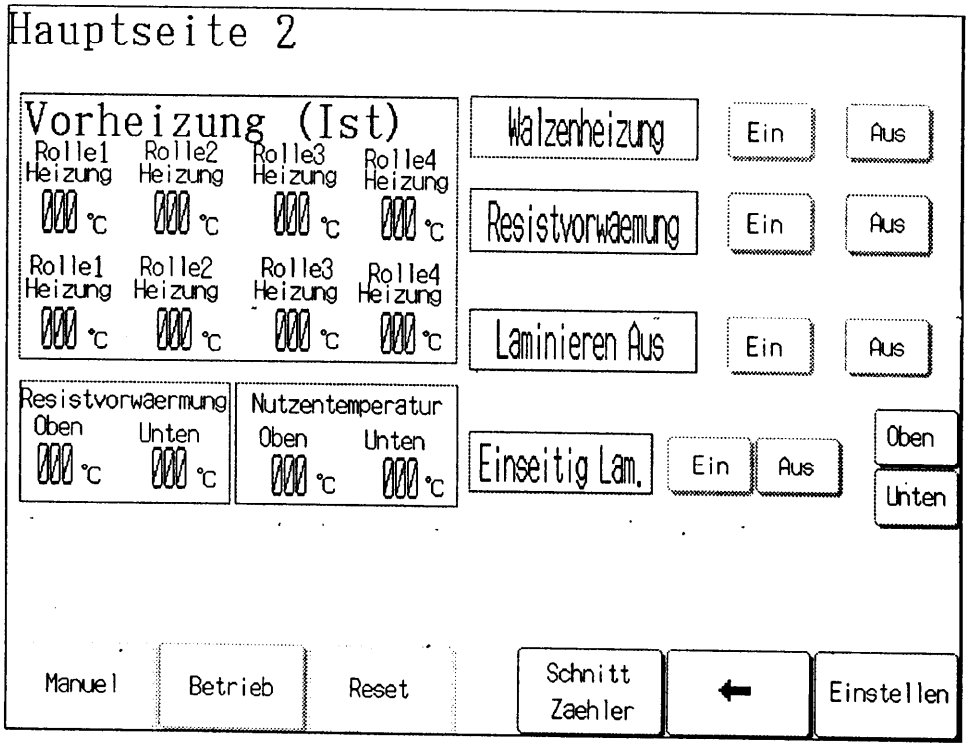


Fig5-2-P005
MANUAL PANEL1

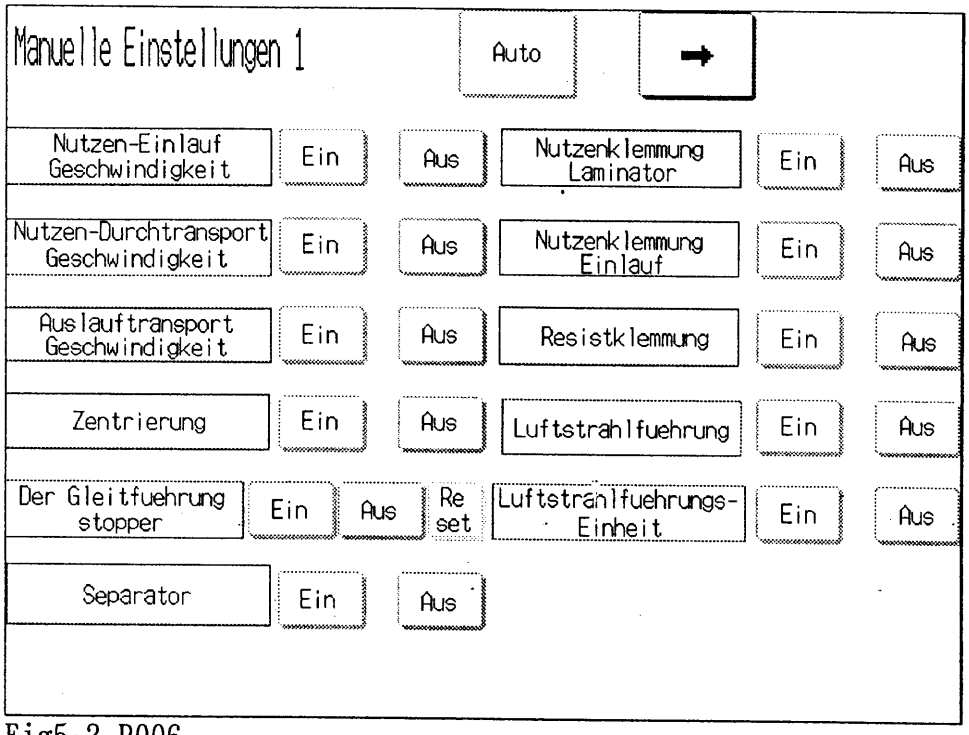


Fig5-2-P006
MANUAL PANEL2

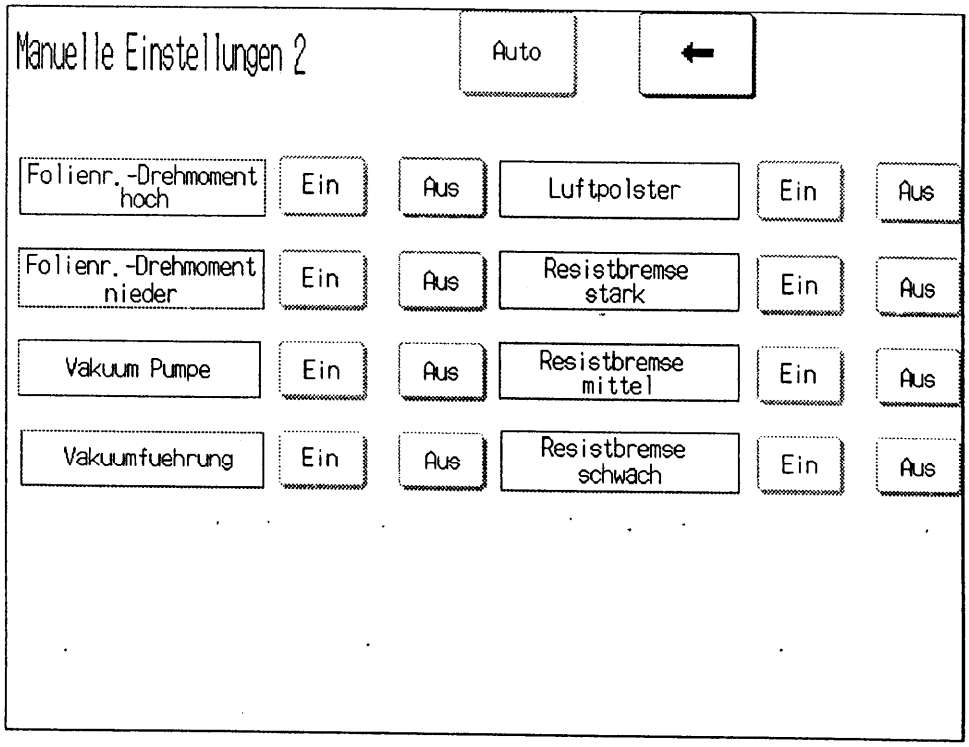


Fig5-2-P007
OPELATION

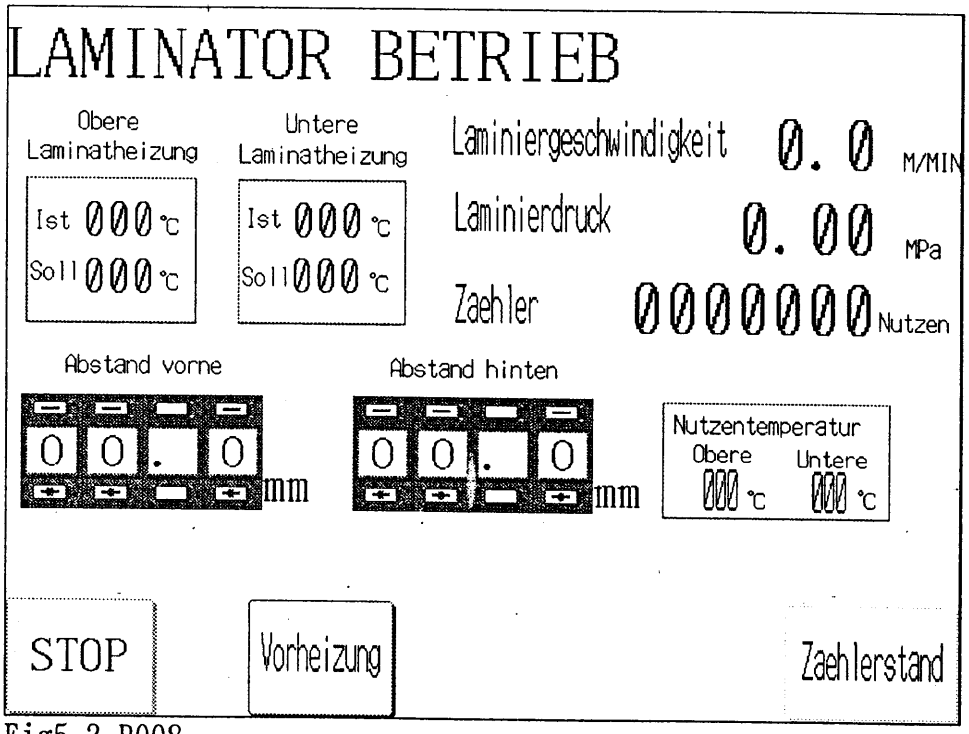


Fig5-2-P008
FILM RESET

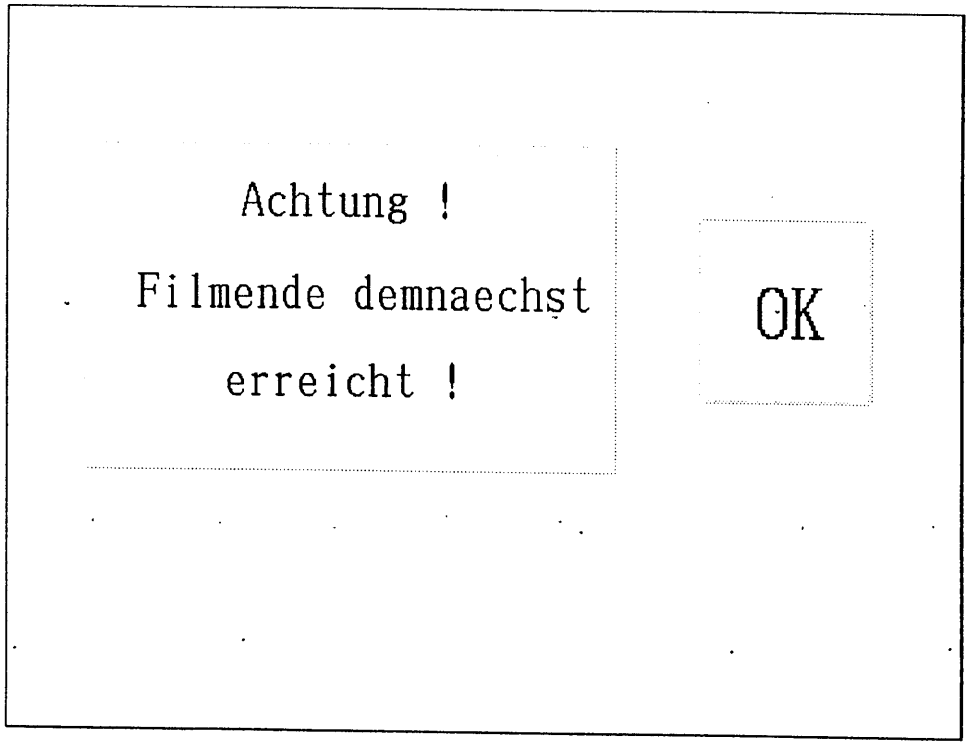


Fig5-2-P009
HEATER ALARM

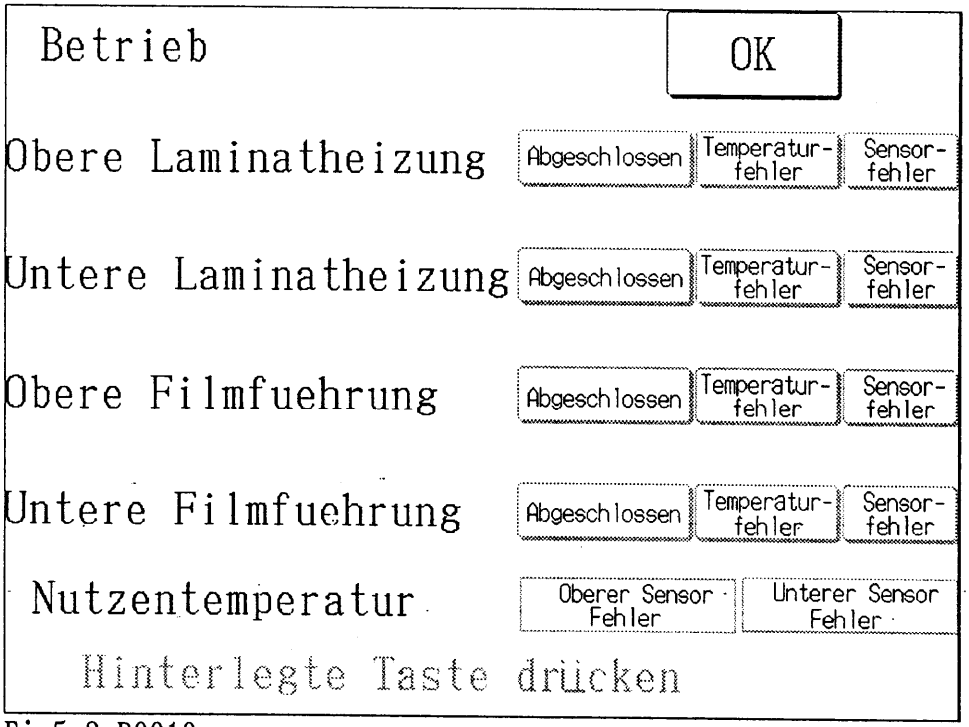


Fig5-2-P0010
ERROR PANEL

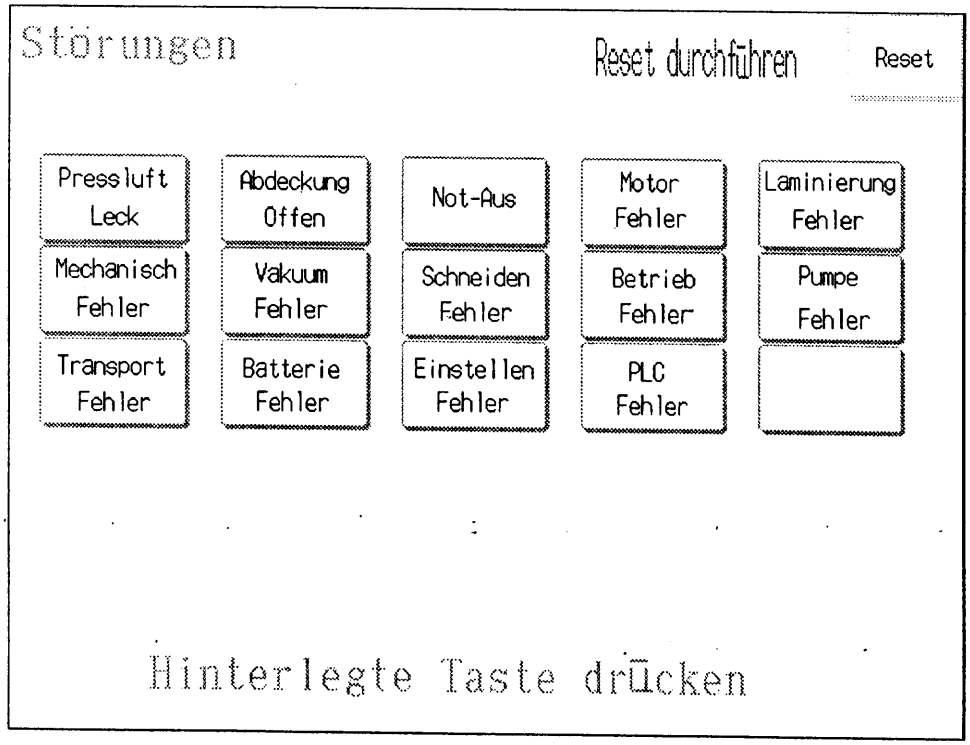


Fig5-2-P0011
TEMPERATURE SETTING

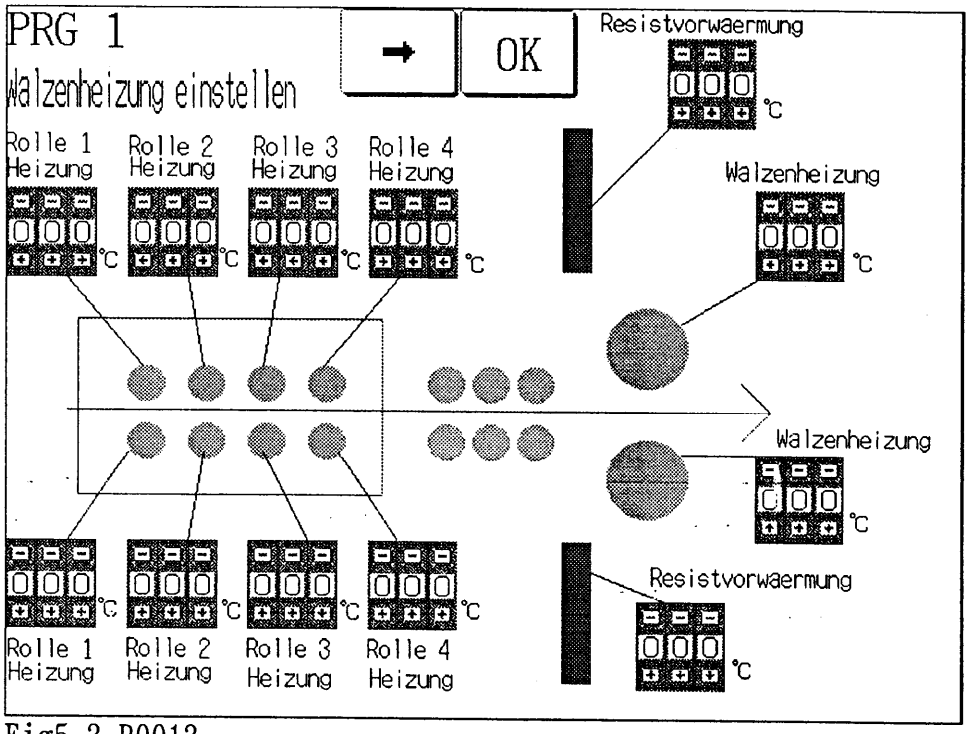


Fig5-2-P0012
SPEED SETTING

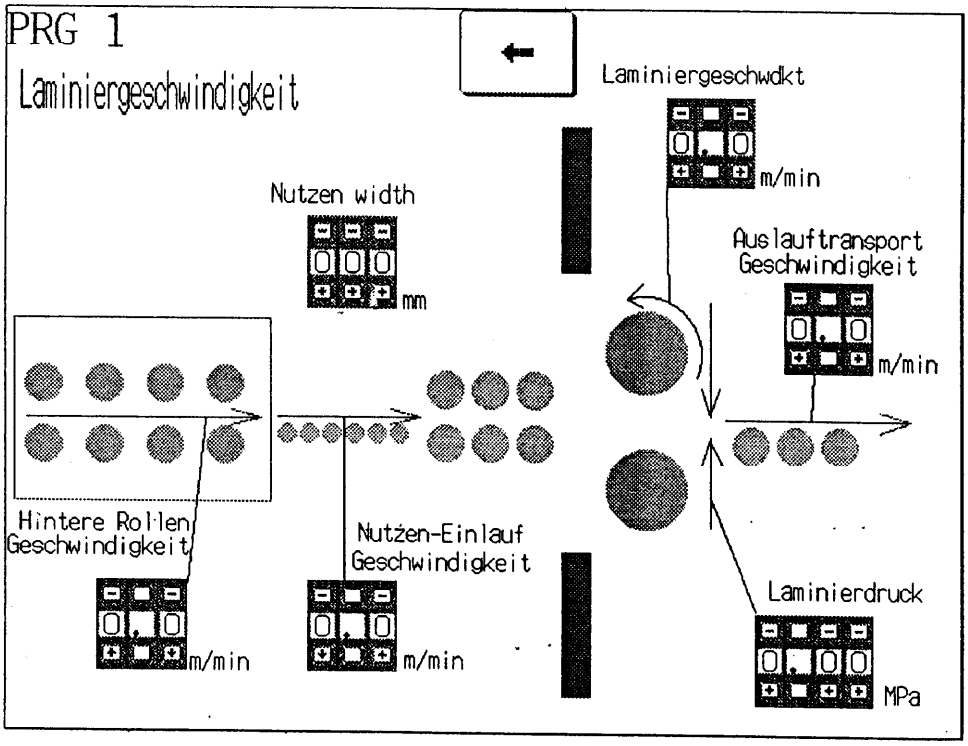


Fig5-2-P0013
TEMPERATURE

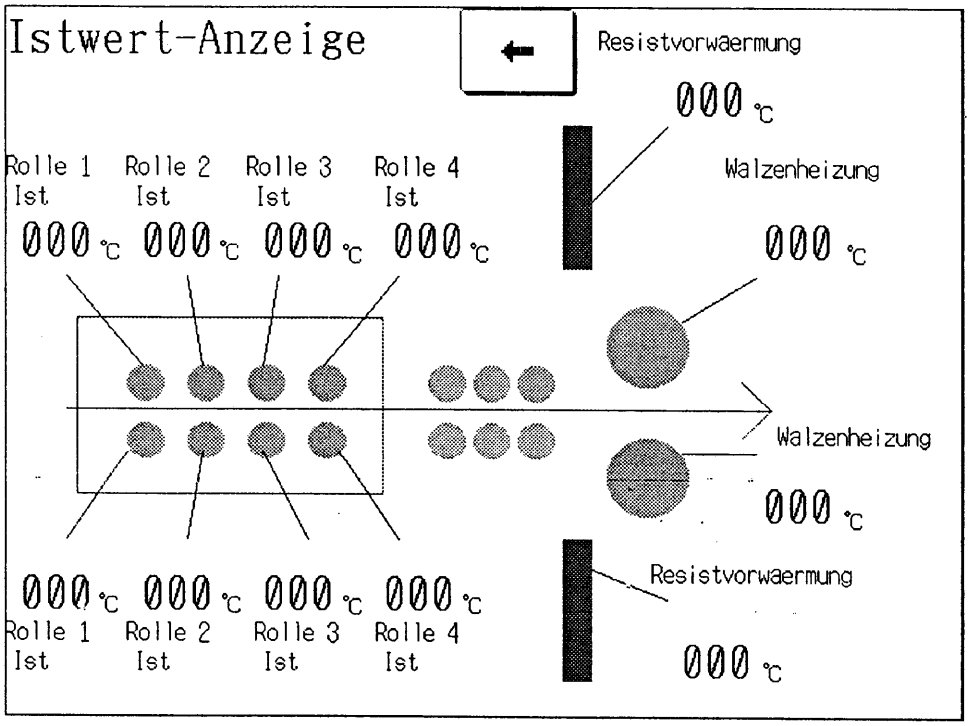


Fig.5-2-P001

No	N A M E	F U N C T I O N
1	POWER ON 【Maschine Ein】	This button turns on the power source.

Fig.5-2-P002

No	N A M E	F U N C T I O N
1	SENSOR CHECK PANEL 【Sensor check】	

Fig.5-2-P003

No	N A M E	F U N C T I O N
1	TEMPERATURE REGULATOR FOR LAMINATING ROLLS 【Laminatheizung】	This is used for setting of temperature of laminating rolls.
2	COMPENSATION OF TIP 【Abstand vorne】	This is used for setting of the sticking position of tip.
3	COMPENSATION OF END 【Abstand hinten】	This is used for setting of the sticking position of end.
4	SENSOR CHECK SW 【Sensor check】	This checks whether or not the cylinder switch or photoelectric switch is at an initial condition. (Fig5-2-P002)
5	SPEED OF LAMINATING ROLLS 【Laminiergeschwindigkeit】	This indicates the speed of laminating rolls.
6	PRESSURE OF LAMINATING ROLLS【Laminirdruck】	This indicates the pressure of Laminating rolls.
7	PRG1~8	This is used for setting of program NO.
8	SETTING 【Einstellen】	This is used for setting of temperature & speed.(Fig5-2-P011& Fig5-2-P012)
9	MANUAL【Manuel】	At the main panel, push it when exchanging to MANUAL MODE from AUTO MODE.
10	OPERATION 【Betrieb start】	Operation starts.
11	STEP RESET 【Reset】	This resets the equipment to its home position.

12	COUNTER 【Nutzen zaehler】	This indicates a numeral figure the product counter. It also sets it.
13	NEXT PAGE	Next page is shown. (Fig.5-2-P004)

Fig.5-2-P004

No	N A M E	F U N C T I O N
1	PRE-HEATER TEMPERATURE 【Vorheizung Heizung】	This indicates the temperature of pre-heater.
2	SLIDE GUIDE TEMPERATURE REGULATOR (UPPER) 【Resistvorwaermung】	This indicates the temperature of the slide guide temperature regulator. (upper)
3	SLIDE GUIDE TEMPERATURE REGULATOR (LOWER) 【Resistvorwaermung】	This indicates the temperature of the slide guide temperature regulator. (lower)
4	BOARD TEMPERATURE 【Nutzentemperatur】	This indicates the temperature of Board.
5	LAMINATING HEATER SW 【Walzenheizung】	This is used when turning on or off the heater. ON when power switch is turned on.
6	SLIDE GUIDE HEATER SW 【Resistvorwaermung】	This is used when turning on or off the heater. It varies according to type of film.
7	IDLE OPERATION SW 【Laminieren Aus】	This is to be turned on when not laminating the film to board.
8	LAST PAGE	The last page is shown. (Fig.5-2-P003)
9	CUTTER COUNTER 【Schnitt Zaehler】	This is a cutter counter and the number of times of use at upper and lower parts is used. Use this for exchange of cutters and for maintenance operations.
10	COMPENSATION 【Laminitig Lam】	This is a switch for adjustment on the sticking method of tip and back end.

Fig.5-2-P005

No	N A M E	F U N C T I O N
1	AUTO【Auto】	This sets the mode to AUTO. (Fig.5-2-P003)
2	NEXT PAGE	For manual operation, pages are changed. (Fig.5-2-P006)
3	LOAD MOTOR TRANSFER SPEED【Nutzen-Einlauf Geschwindigkeit】	This is a SW for turning on and off the loader motor. Confirmation can be made on transfer speed.
4	UNLOADER MOTOR TRANSFER【Nutzen-Durchtran Spoot Geschwindigkeit】	This is a SW for turning on and off of un-loader motor. Transfer speed can be confirmed.
5	UNLOADER MOTOR THE CONVEYANCE 【Auslauftranspoot Geschwindigkeit】	The conveyance speed can be confirmed in SW which ON / OFF un-loader.
6	CENTERING 【Zentrierung】	This is a SW for turning on and off the centering unit.
7	SLIDE GUIDE STOPPER 【Der Gleitfuehrung stopper】	This is a SW for turning on and off the slide guide stopper.
8	SEPARATOR GUIDE 【Separator】	This is a SW for turning on and off the separator guide.
9	BOARD CLAMP 【Nutzenklemmunglaminator】	This is a SW for turning on and off the board clamp.
10	CLAMP ROLLER 【Nutzenklemmung Einlauf】	This is a SW for turning on and off the clamp roller.
11	FILM CLAMP 【Resistklemmung】	This is a SW for turning on and off the film clamp.
12	AIR-JET【Luftstrahlfuehrung】	This is a SW for turning on and off the air-jet.
13	AIR-JET SLIDE 【Luftstrahlfuehrungs-Einheit】	This is a SW for turning on and off the air-jet slide.

Fig.5-2-P006

No	N A M E	F U N C T I O N
1	AUTO【Auto】	This sets the mode to AUTO. (Fig.5-2-P003)
2	LAST PAGE	The last page is shown. (Fig.5-2-P005)
3	FILM-WINDING 1ST-STAGF 【Folienr.-Drehmomenthoch】	This is a SW for turning on and off the film-winding 1st-stagf.

4	FILM-WINDING 2ND-STAGF 【Folienr.-Drehmomentnieder】	This is a SW for turning on and off the film-winding 1st-stagf.
5	VACUUM PUMP FILM ABSORPTION 【Vakuum Pumpe】 【Vakuumfuehrung】	This is a SW for turning on and off the vacuum pump film absorption.
6	AIR BLOW 【Luftpolster】	This is a SW for turning on and off the air blow.
7	BASED FILM BRAKE 【LARGE】 【Resistbremse stark】	This is a SW for turning on and off the based film brake. (Large)
8	BASED FILM BRAKE 【MIDOLE】 【Resistbremse mittel】	This is a SW for turning on and off the based film brake. (Middle)
9	BASED FILM BRAKE 【SMALL】 【Resistbremse schwach】	This is a SW for turning on and OFF the based film brake. (Small)

Fig.5-2-P007

No	N A M E	F U N C T I O N
1	TEMPERATURE REGULATOR FOR LAMINATING ROLLS 【Laminatheizung】	This is used for setting of temperature of laminating rolls.
2	COMPENSATION OF TIP 【Abstand vorne】	This is used for setting of the sticking position of tip.
3	COMPENSATION OF END 【Abstand hinten】	This is used for setting of the sticking position of end.
4	SPEED OF LAMINATING ROLLS 【Laminirgeschwindigkeit】	This indicates the speed of laminating rolls.
5	PRESSURE OF LAMINATING ROLLS 【Laminierdruck】	This indicates the pressure of Laminating rolls.
6	COUNTER 【Zaehler】	This indicates a numeral figure the product counter. It also sets it.
7	BOARD TEMPERATURE 【Nutzentemperatur】	This indicates the temperature of Board.
8	STOP	Operation stop.
9	TEMPERATURE PAGE 【Vorheizung】	Fig5-2-P013

10	COUNTER 【Zaehlerstand】	This indicates a numeral figure the product counter. It also sets it.

Fig.5-2-P008

No	N A M E	F U N C T I O N
1	FILM RESET	Film passes away shortly.

Fig.5-2-P009

No	N A M E	F U N C T I O N
1	UPPER LAMINATE HEATER 【Obere Laminatheizung】	(Broken wire, over heating & sensor error)
2	LOWER LAMINATE HEATER 【Untere Laminatheizung】	(Broken wire, over heating & sensor error)
3	UPPER SLIDE GUIDE HEATER 【Obere Filmfuehrung】	(Broken wire, over heating & sensor error)
4	LOWER SLIDE GUIDE HEATER 【Untere Filmfuehrung】	(Broken wire, over heating & sensor error)

Fig.5-2-P010

No	N A M E	F U N C T I O N
1	SHORTAGE OF AIR 【Pressluft Leck】	Air is insufficient or manual valve is turned off.
2	OPENING OF COVER 【Abdeckung offen】	As the cover is open ,close those which are open.
3	EMERGENCY STOP 【Not-Aus】	Emergency stop.Upon confirming the safety turn off the power source to decrease.
4	ABNORMAL MOTOR 【Motor Fehler】	This is an abnormality of AC servo motor. Turn the power source to decrease.
5	WRONG STICKING 【Laminirung Fehler】	This is a wrong sticking.Check whether or not the feeding quantity of film is correct.
6	ABNORMAL MECHANISM 【Mechanisch Fehler】	This is a positional abnormality the locating conveyor and slide guide.
7	ABNORMAL VACUUM 【Vakuum Fehler】	The thermal relay and vacuum SW of the vacuum pump was operated.
8	WRONG CUTTING 【Schneiden Fehler】	No cutter was operated and it did not return. Check and confirm the cylinder sensor.

9	WRONG ACTION 【Betrieb Fehler】	This will be lighted when the action of the equipment is not normal.
10	WRONG PUMP 【Pumpe Fehler】	This pilot lamp will be lighted when the temperature in the pump is high.
11	TRANSFER IS WRONG 【Transport Fehler】	Please board insert in the machine at regular intervals.
12	BATTERY ERROR 【Batterie Fehler】	Please PLC and Display battery change
13	SETTING ERROR 【Einstellen Fehler】	The program NO is not established.
14	PLC ERROR 【PLC Fehler】	Check the PLC.Read a manual.

5-3.NAMES OF MANUAL OPERATION BOX AND FUNCTION

No	N A M E	F U N C T I O N
1	MANUAL DISPLAY PILOT LAMP	The pilot lamp will be lighted while ② manual button is pushed.
2	MANUAL BUTTON	While pushing this button at the condition where the body operation panel is changed over to MANUAL, the related push button switches in the manual box will become effective.
3	LAMINATING ROLLER CLOSE BUTTON	Only the laminating rolls can be closed. It can be used when measurement is made on parallel degree and distribution of pressure.
4	NORMAL REVOLUTION BUTTON OF LAMINATING ROLLERS	Laminating rolls can be turned in normal revolution. This is used for cleaning of rolls and removal of clogging trouble of boards.
5	REVERSE REVOLUTION BUTTON OF LAMINATING ROLLERS	Laminating rolls can be reversed in revolution. The clogging trouble of boards which can not be removed in normal revolution can be removed.

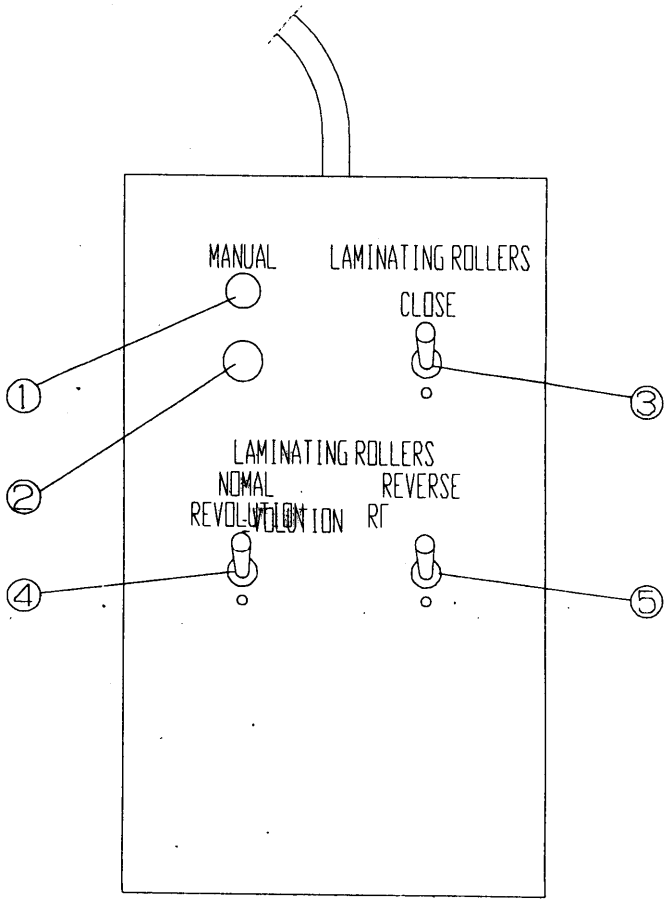


Fig.5-3 MANUAL OPERATION BOX

5-4. NAME AND FUNCTION OF THE TENSION SETTING PANEL (DO NOT OPERATE NORMALLY)

No	N A M E	F U N C T I O N
1	WINDING UP CLUTCH (UPPER)	This is used for setting of the winding force of the upper protective film.
2	WINDING UP CLUTCH (LOWER)	This is used for setting of the winding force of the lower protective film.
3	WINDING UP CLUTCH(1)	This is used for setting of winding force at the time of standing by or laminating.
4	WINDING CLUTCH (2)	This is used for setting of the winding up force at the time of operation of the separating guide.
5	MAIN WINDING BRAKE (UPPER)	This is used for setting of a braking force of the main winding film at upper side.
6	MAIN WINDING BRAKE (LOWER)	This is used for setting of a braking force of the main winding film at lower side.
7	MAIN WINDING BRAKE (LARGE)	This is used for setting of a braking force when the outer diameter of the main winding film is more than approx. 135 ㎜.
8	MAIN WINDING BRAKE (MEDIUM)	This is used for setting of a braking force when the outer diameter of main winding film is approx. 104～135 ㎜.
9	MAIN WINDING BRAKE (SMALL)	This is used for setting of a braking force when the outer diameter of main winding film is less than approx. 104 ㎜.
10	THE METER ADJUSTMENT	It is for the meter adjustment. Don't touch.
11	The film brake (Later)	It is for the adjustment of the film brake. Generally, don't touch.
12	The film brake (The bottom)	It is for the adjustment of the film brake. Generally, don't touch.

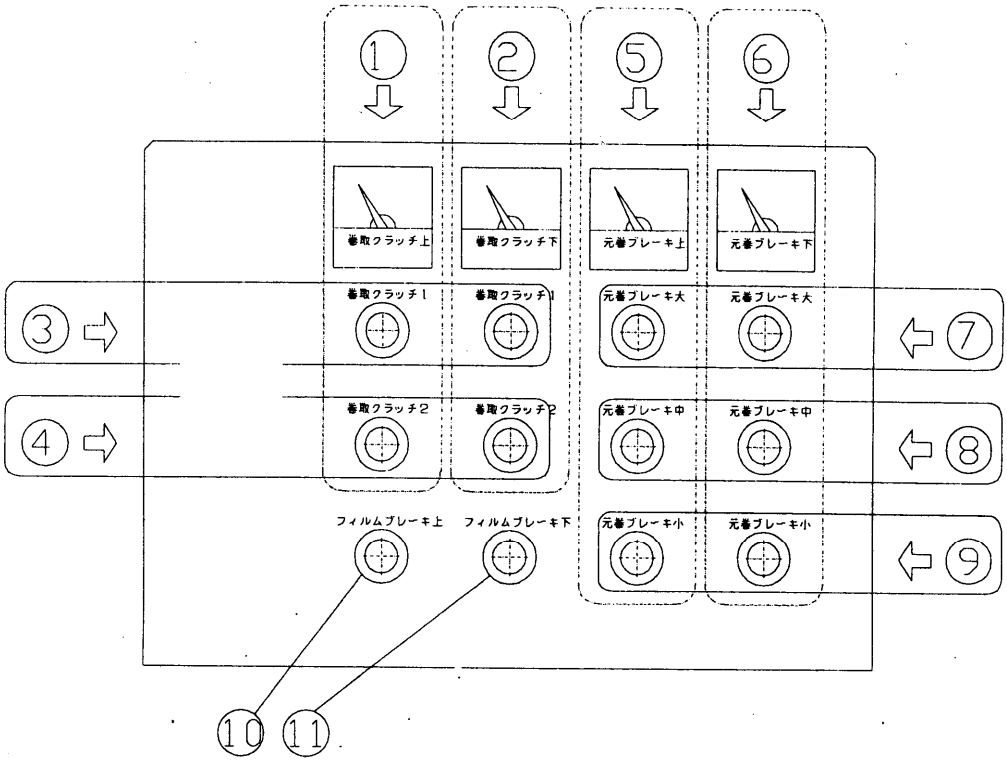


Fig.5-4. TENSION PANEL

5-5. OPERATING METHOD

(1) Turning on the circuit breaker, confirm that the power OFF lamp is lighted.

(2) Turning on the key switch, push on the power switch.

(3) The main panel is displayed. Specifying an item with the NEXT PAGE and LAST PAGE, turn on the operation switch.
(There are 4 items such as LAMINATING HEATER, SLIDE GUIDE HEATER, IDLE OPERATION, AND ONE SIDE STICKING .Therefore, select them.)

(4) When completing operation, push the stop or operation switch and push the power OFF switch.

(5) Turning off the key switch, pull out the key and turn off the breaker.
(When the time switch is used, keep the key SW and breaker ON.)

5-6. CAUTIONS

(1) With the cutter cover, cover and door taken off, do not operate it. If operated, it will be very dangerous.

(2) Do not put hand or thing in the equipment under operation. If put in, it will be dangerous.

(3) As for the cleaning of cutter blade or exchange of the said, do so after turning off the power switch of the equipment.
Full care must be taken not to injure your hand while handling.
(We recommend you to wear a pair of gloves etc.)

(4) When operating with hand, give a voice and confirm the action. Do so without hand or thing put in the equipment.

(5) At the time of maintenance or other operations, do so after turning off the power switch.

(6) Carry out the laminating operation in board width film width.
(If not, wrinkles or roll stains will be caused.)

(7) The laminating roll speed is different from the line speed.

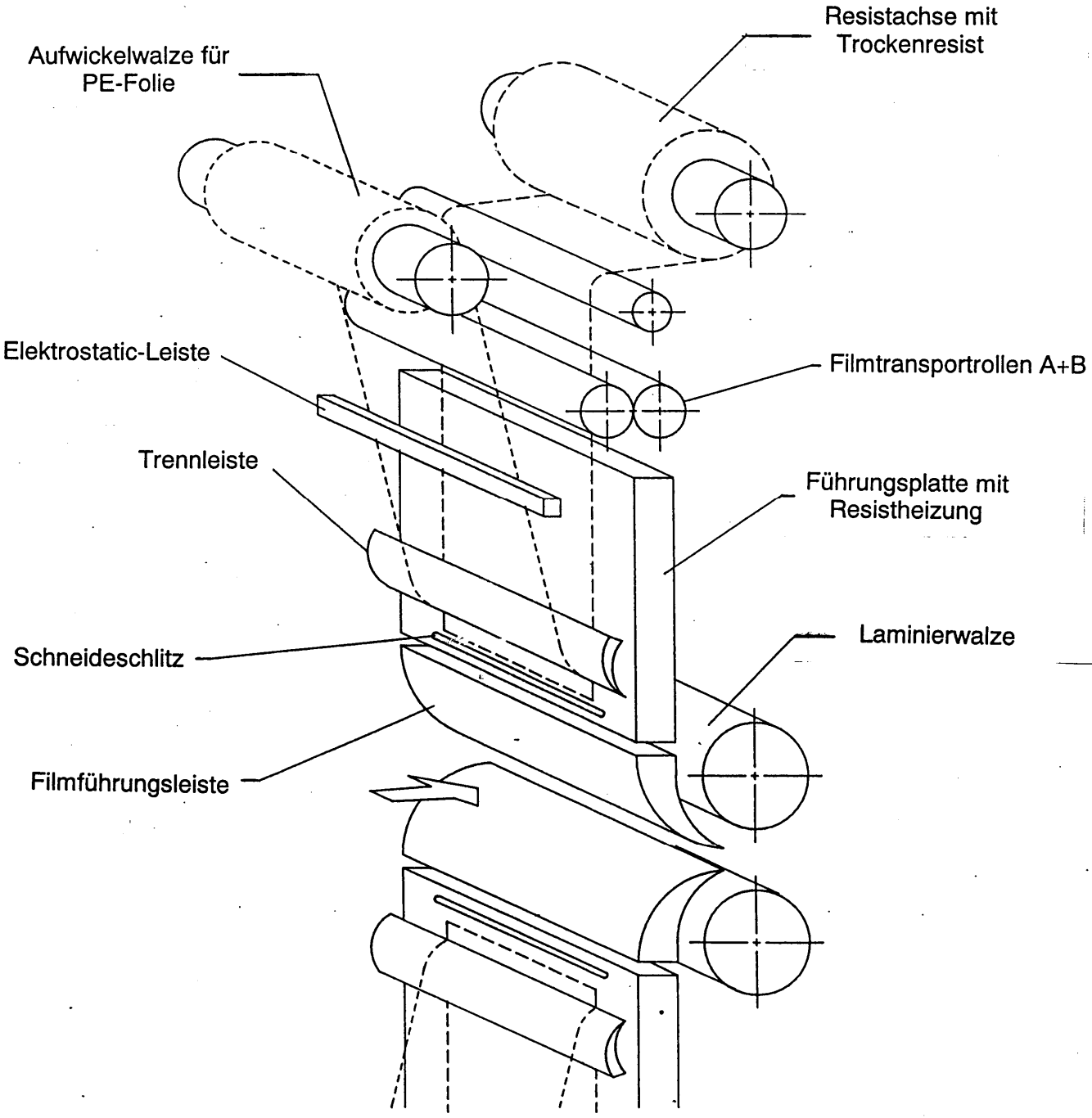
(8) The speed of laminating rolls might be limited by the length of board sometimes.
(LENGTH 400 ㎜ or less in L : The speed of laminating rolls is less than 4m/min.)

(9) The lifetime of the cutter can not be guaranteed.
Because, varies slightly depending on kind of film. As for the regrinding product, the life become shorter.

(10) As for new parts, regrinding parts or rewinding parts of cutter blade and laminating rolls, we do not take any responsibility for the trouble or disorder which should be caused by using other products than Hitachi AIC.

Einbau von Trockenresistrollen

1. Die Trennleisten (siehe Skizze) können durch Lockern der seitlichen Rändelschrauben geöffnet werden.
2. Der Trockenresist muß zwischen den Filmtransportrollen A und B durchgeführt werden.
3. Nachdem der Resist um die Trennleiste geführt wurde, ist die PE-Folie vom Resist abzuziehen und diese auf die Aufwickelvorrichtung zu bringen. Zur Fixierung der PE-Folie sind 3~4 Umdrehungen der Aufwickelwalze manuell durchzuführen.
4. Der Resist ist in der Nähe der Trennleiste mit einem Tapeziermesser manuell abzuschneiden.
5. Die Unterseite ist symmetrisch aufgebaut und kann somit auf die gleiche Weise gerüstet werden.
6. Vor Beendigung des Rüstvorgang vergewissern, ob die 4 Rändelschrauben der Trennleisten wieder angezogen sind, und der Resistmengenzähler zurückgesetzt ist.



5-7.APPLICATION OF FILM

The separating guide can be opened or closed by loosening the knobs at right and left sides. Passing between the film feeding rollers and separating guide, wind only the protective film around the winding side 3~4 times. It has a symmetrical construction. Set the lower side in the same way. After setting, reset the film counter for remaining quantity. Check whether or not the knob at the separating guide block.

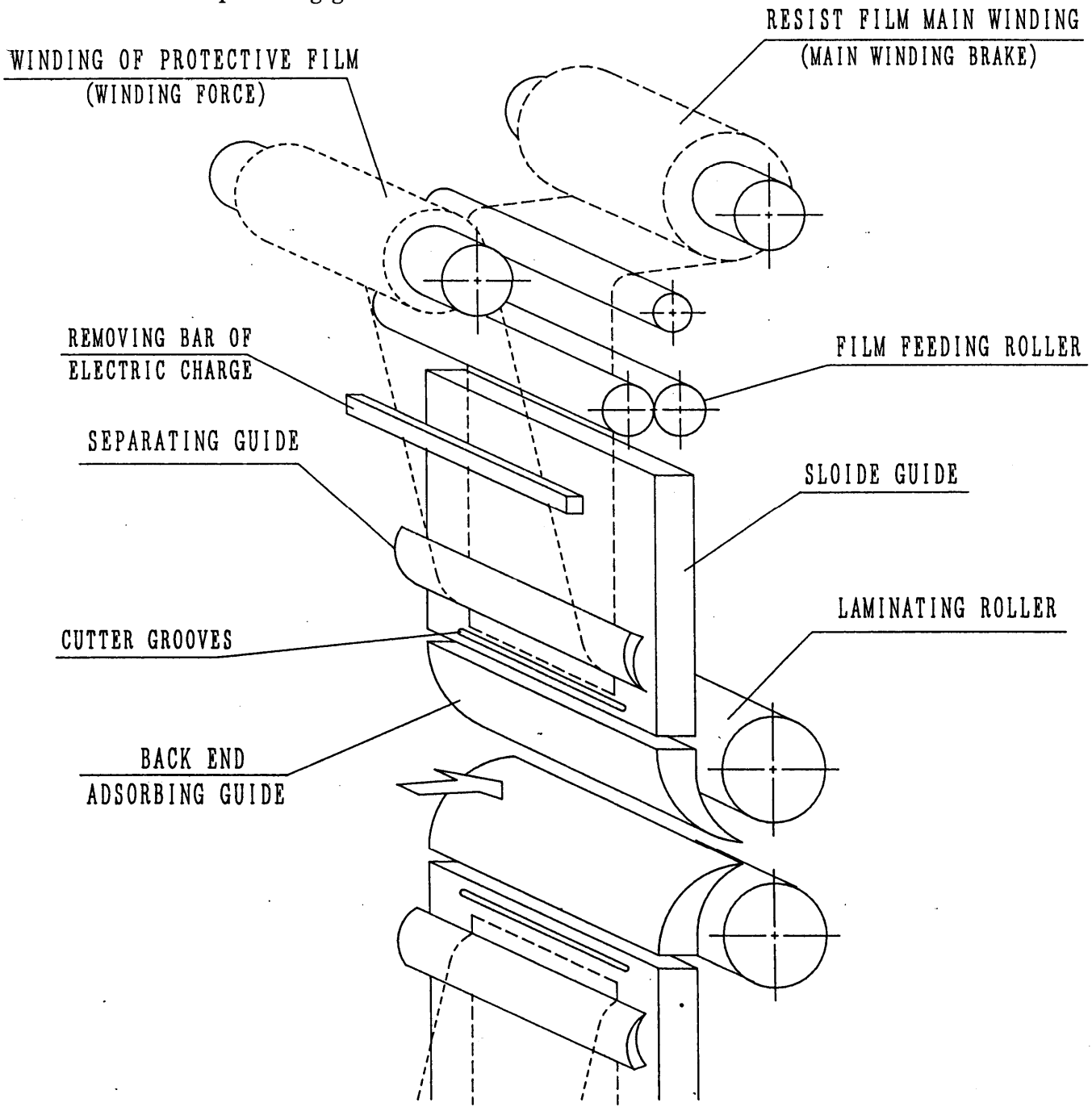


Fig.5-7 APPLICATION OF FILM

6. GENERAL

6-1.Power source

Power source : 3ϕ 200V 40A

Air pressure : 6 kg/cm^2 0.4Nm^3/min.

6-2.Weight

Approx. 1000 kg

6-3.External dimensions

Refer to the attached drawing.

6-4.Painting

Colors

Body : T25-90C

Operation panel : (MUNSELL'S index code No.6Y3.3/0.2) frosted

6-5.Special tools

1set attached

6-6.Spare parts

(1)Cutter 2pcs.

(2)Temperature sensor 2pcs.

6-7.Equipment operation panel direction (Refer to the attached drawing)

	SEEN FROM BOARD FEEDING DIRECTION		PRESENT SUPPLY MODEL
	OPERATION PANEL	MOVEMENT OF LOCATING CONVEYOR	
RIGHT TYPE	Right side	Left side	
LEFT TYPE	Left side	Right side	○

6-8.Options (separate price)

(1)Special STOCKER for Resist film (portion of 2 rolls of film)

(2)Program console of Sequencer

(3)Laminating rollers

7.PREHEATERS

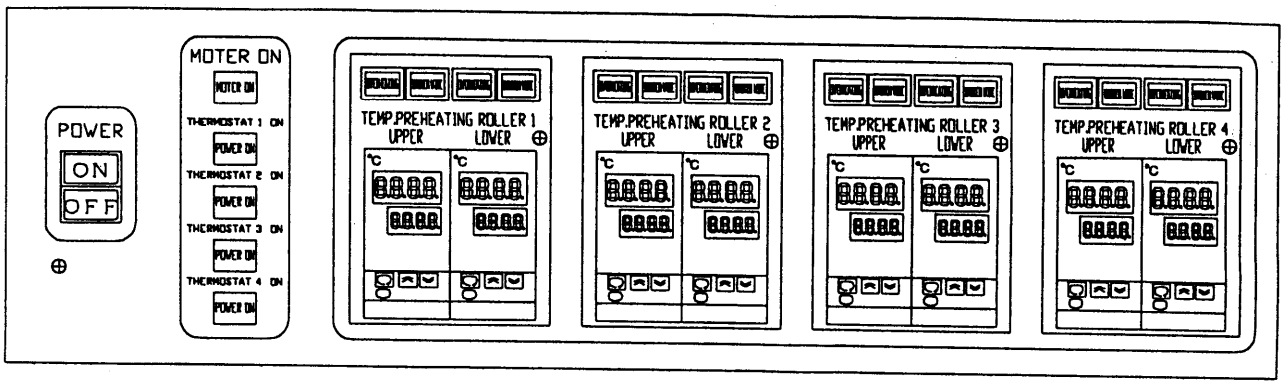


Fig.7-1 PREHEATER PANEL

7-2.OPERATING METHOD

(1) Turning on the breaker, turn on the power switch.

(2) Setting the temperature regulator, by laminator panel wait for the building up of the temperature.
(If the automatic temperature increasing device in the equipment body is operated, the Pre-Heater will be operated for increasing of temperature too.)

(3) Referring to the temperature graph of Pre-Heaters (Fig.7-4), set the speed at it. At the sometime, check and confirm the setting of temperature.

(4) If the body is operated, the Pre-Heater will start operation.

(5) When the power switch is turned off, push the power OFF button switch in order to turn off the circuit breaker. (When the time switch rises, keep the breaker turned on.)

7-3.CAUTIONS AT THE TIME OF OPERATION

(1) Referring to the speed graph, determine the conveyor speed.
(There is some error between indication and the said.)

(2) The temperature of the upper surface of the cover of the Pre-Heaters is high, resulting in requiring full attention to be paid.

(3) If the temperature is higher than 30℃ as against the set temperature, the temperature over-rising pilot lamp will be lighted. Therefore, check and confirm the setting of the temperature sensor and temperature regulator.

(4) If an warning of broken wire is given, it will be attributable to the break of wire, resulting in requiring exchange.

(5) When the emergency stop button switch of the Pre-Heaters is pushed, the machine body can be stopped. Then, turn off the power switch and build it up once again.

(6) Wash the adhesive rollers with water. Wipe off other rubber and metallic rollers with a piece of cloth immersed in alcohol.
(7) While the equipment is under operation, do not put hand or thing in the inside. If done so, it will be very dangerous.
(8) If 2 pcs. of board are overlapped and put therein, trouble will be caused, resulting in requiring full attention to be paid.
(9) Do not place anything on the upper surface of the preheaters.

METER READING	1.1	2.1	3.1	4.0	4.8	5.6
ACTUALLY MEASURED	1.0	2.0	3.0	4.0	5.0	6.0

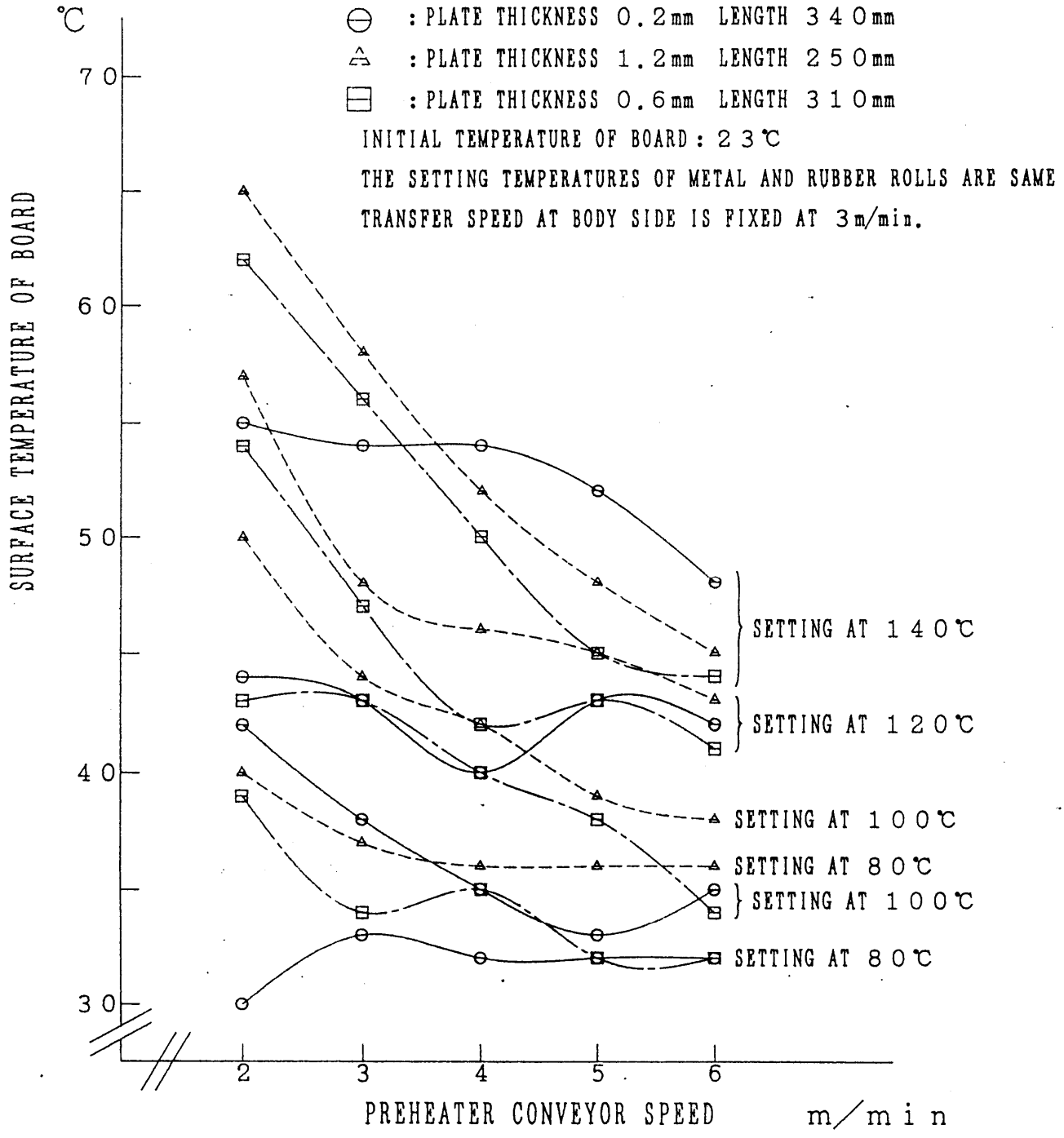


Fig.7-4. SURFACE TEMPERATURE OF BOARD
(IMMEDIATELY BEFORE LAMINATING)

7-5.OVERALL

(1)Power source

Power source : Single phase 200V 30A

(2)Weight

Approx. 300 kg

(3)External dimensions

Refer to the attached drawing

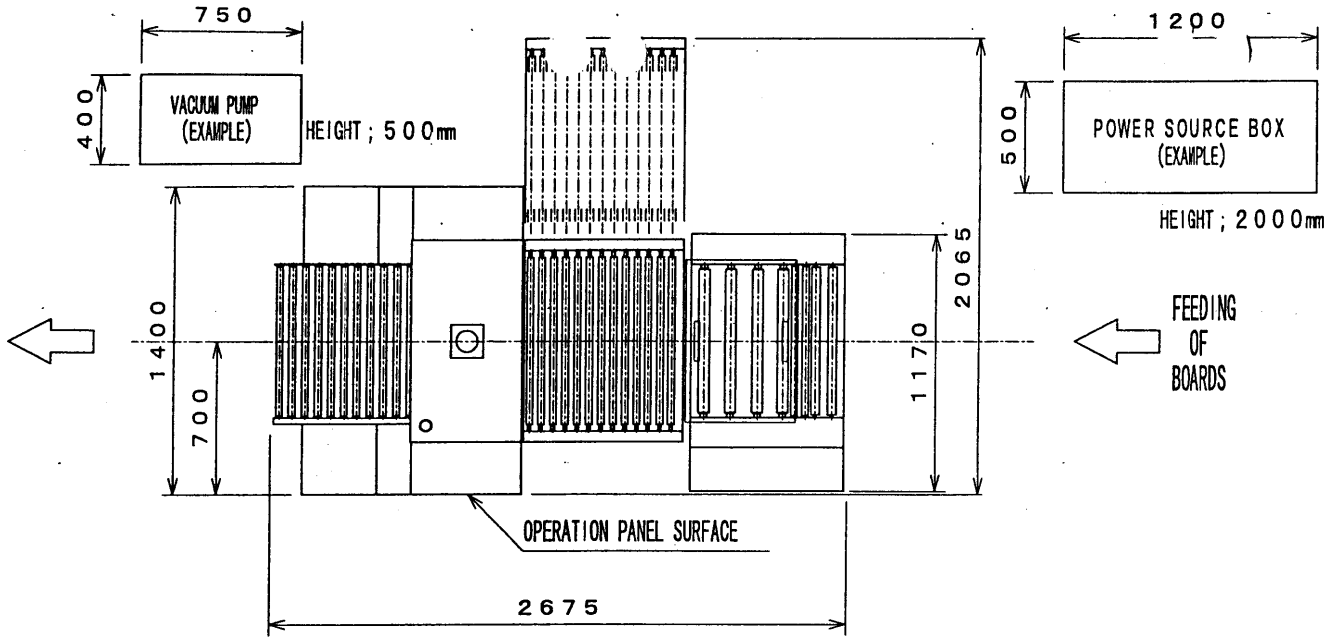
(4)Coating

Colors

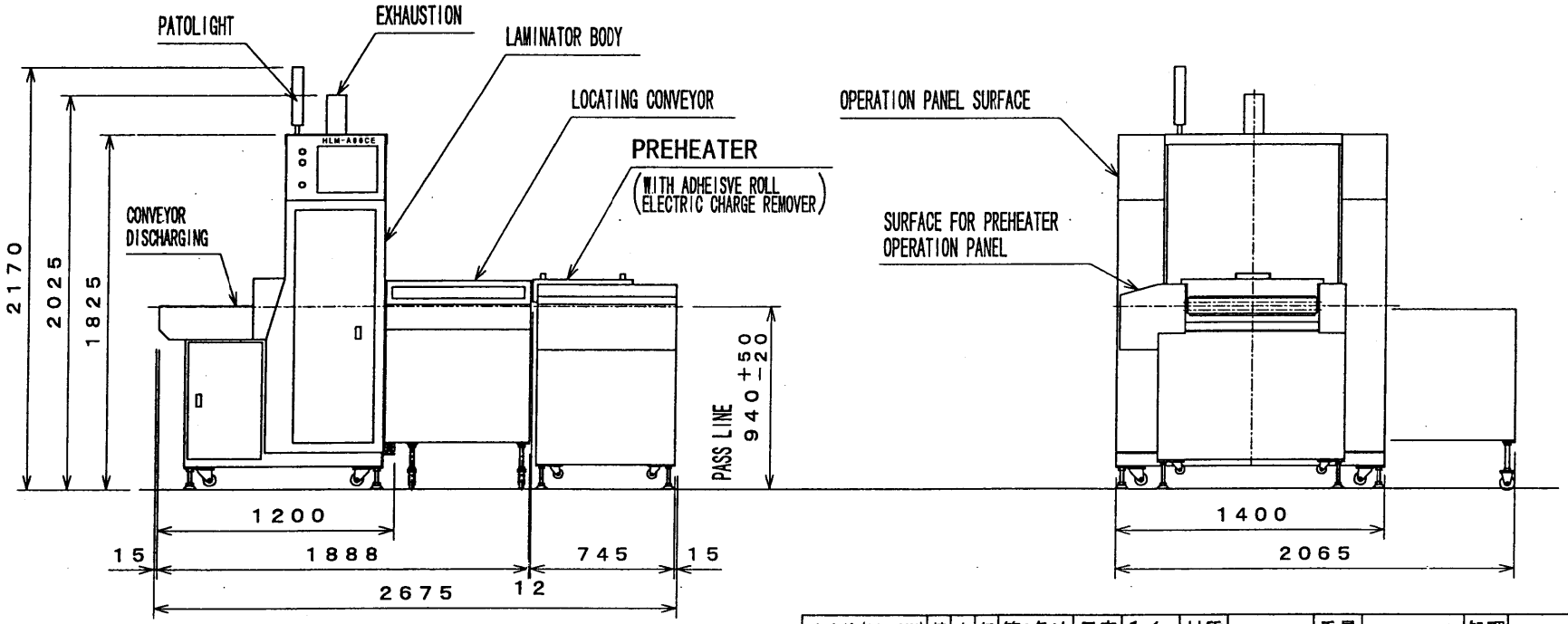
※Body : T25-90C

※Operation panel : (Munsell's index code No. 6Y3.3/0,2) frosted

型名	HLM-A60CE		
記号	訂正事項	年月日	担当



THE FIG. SHOWS THE LEFT TYPE EQUIPMENT.
OPERATION PANEL AT LEFT SIDE
LOCATING CONVEYOR RIGHT MOVEMENT



寸法差(JIS B 0405)	精	中	粗	第3角法	尺度	1/25	材質		重量	kg	処理		個数	
設計	小河原	99.09.13	区分	オートカットラミネータ	品名	概観図	図番	HLM-A60CE (LEFT TYPE)						
製図	小河原	99.09.13												
検図	桐野	99.09.13												
承認	桐野	99.09.13												

日立エーアイシー株式会社

HLM-A60-E (AUTO CUT LAMINATOR)SPARE PATRS

No	PARTS	TYPE	Pc.
1	CUTTER	FCT06-44	2
2	TEMPERATURE SENSOR (LAMINATE ROLL)	SE-4275	2
3	MAINTENANCE TOOL		1SET
	WRENCH	EM-150	1
		EM-300	1
	SPANNER	5.5×7	1
		8×10	1
		10×13	1
		12×14	1
		13×17	1
	DRIVER	+ 1×75.	1
		+ 2×100	1
		+ 3×150	1
		− 6×100	1
	DRIVER SET	No.1300 6PC.SET	1SET
	HEXAGON WRENCH	BHS-9	1SET
	NT CUTTER		1
	HOOK SPANNER	ϕ60	1
	TOOL BOX	Y-350	1

HLM-A60-E (PREHEATER) SPARE PARTS

No	PARTS	TYPE	Pc.
1	HEATER (RUBBER・METAL ROLL)	PLH14-300A	1
2	TEMPERATURE SENSOR (RUBBER ROLL)	SE-4275	1
3	TEMPERATURE SENSOR (METAL ROLL)	PLH14-67A	1

Date Sep. 30, '99

INSPECTION SHEETS of INDUCTION HEATED JACKET ROLL

（誘導発熱ジャケットロール試験成績書）

Messrs. 株式会社 日立エーアイシー 殿

Serial No. (製番) H-08815 Test No. (指番) 908R-T005 Dwg. No. (図番) RH-16333H Room Temp. (室温) 26 ℃

Specifications
（仕様）

Type (型式)	J F — DW	Source (入力電源)	1 φ 50 Hz 200 V ±5%
Roll Demensions (ロール寸法)	φ 90 mm × 780 L	Capacity (容量)	2 kVA 以下 at 20 ℃ 0.9 kW −10%以上 at 180 ℃
Roll Surface (ロール表面)	☐ HCr ☐ Ceramic ■ RUB ☐ GRBF ☐ TF		
	シリコンゴム 3t 硬度 70° 赤色	Operating Temp. (使用温度)	100～150 ℃ (Max. 180 ℃)
Revolving Speed (周速)	■ m/min. Max. 5 ☐ r.p.m.	Accuracy of Temp. (温度分布精度)	(目標 ±2.0 deg.) ±2.5 deg. at 100～130 ℃
Roundness (真円度)	Less than (以下) 0.05 mm	Thermal Medium (熱媒体)	■ Water ☐ sk-170 ☐ 240 ☐ $C_{10}H_8$ ☐ Therms-300
Cylindricity (円筒度)	Less than (以下) 0.07 mm	Weight (重量)	Approx. (約) 30 kg
Run out (振れ)	Less than (以下) 0.10 mm at 20 ℃ Less than (以下) — mm at — ℃ to — ℃		

Test 1. Temperature Rising Characteristics Test [at 5 ■ m/min.]
（昇温特性試験） ☐ r.p.m.

＊Test Frequency : 60 Hz
（試験周波数）

＊Measuring Equipment : YOKOGAWA AC. POWER METER
（測定器具）

Serface Temp. (表面温度) [℃]	Coil Temp. (コイル温度) [℃]	Voltage (電圧) [V]	Current (電流) [A]	Powerfactor (力率) [%]	Capacity (容量) [W]	Time (時間) [min.]
26	—	214	8.40	74.6	1340	0
100	—	213	7.14	73.6	1120	11' 19"
150	—	213	6.50	71.5	990	36' 39"
180	226	213	6.27	70.8	930	1° 20' 12"
定格電圧換算値 (60 Hz)		200	5.89	—	820	—

Inspector : 古田 Chief of Inspection Section : 辛古

TOKUDEN CO., LTD. トクデン株式会社

Serial No. (製番) H-08815 Test No. (指番) 908R-T005 Date (試験日) Sep.30,'99 Room Temp. (室温) 26 ℃

Test 3. Insulation Resistance Measurement
(絶縁抵抗試験)

* Measuring Equipment (測定器具) : YOKOGAWA INSULATION TESTER (at D.C.1000V) (D.C.1000Vメガー)
* Standard value (基準値) : More than 10 MΩ at Room Temp. (室温にて10 MΩ以上)
* Measurement value (測定値) : Winding−Earth (巻線ーアース間) 2000 MΩ

Test 4. Dielectric Test of Induction Coil
(耐電圧試験)

* Measuring Equipment (測定器具) : TOKUDEN A.C. 60 Hz 0 to 2.2 KV
* Standard value (基準値) : Confirm its normal condition (異常がないこと) ■ 1.5KV □ 1.8KV
* Measurement value (測定値) : Winding−Earth (巻線ーアース間) ■ 1.5KV/min. □ 1.8KV/min. good (良)

Test 5. Withstand Air Pressure Test for Jacket Chamber
(耐空圧試験)

* Standard value (基準値) : Confirm its normal condition (異常がないこと) 10 Kg/cm²
* Measurement value (測定値) : good (良)

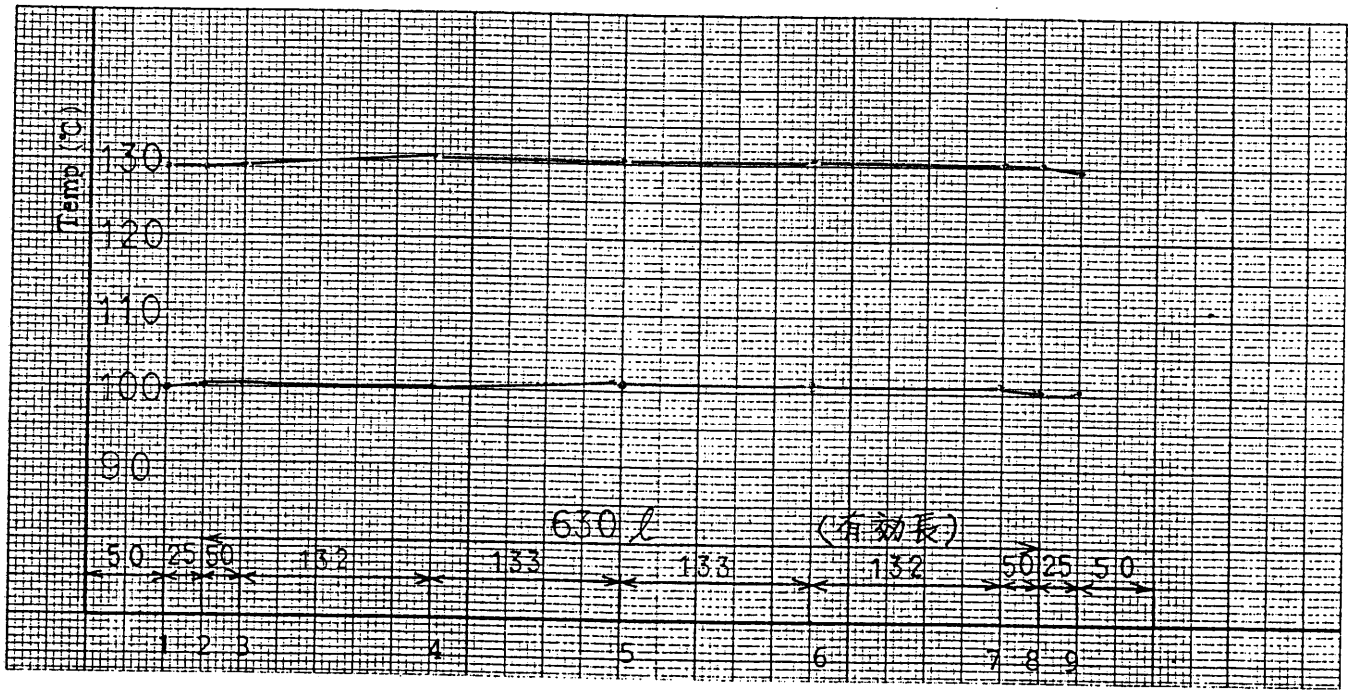
Inspector: 古田 Chief Inspection Section: 古

TOKUDEN CO.,LTD.

Serial No. (製番) H-08815 Test No. (指番) 908R-T005 Date (試験日) Sep.30,'99 Room Temp. (室温) 26 ℃

Test 2. Surface Temperature Profile Measurement
(表面温度分布試験)

* Temp. control (温度制御) : P I D
* Sensing of temp. (温度検出) : ☐ J ☒ K ☐ T ☐ Pt50Ω ☐ Pt100Ω
* Measuring Equipment (測定器具) : ANRITSU METER ☐ AM-8201(TYPE E) ☐ AP-210(TYPE E)
* 30 min. after setting at 5 m/min. ~~r.p.m.~~
* Setting of temp. (温度設定) : 100 ℃, 130 ℃, — ℃
* Standard value (基準値) : ± 2.5 deg. at 100 ℃ to 130 ℃



Lead Wire Side →

Positions (位置)	1	2	3	4	5	6	7	8	9	10	11	difference
Temp.[℃] (温度)	100.0	100.3	100.7	100.8	101.0	101.2	101.2	100.8	100.6			0.9
Temp.[℃] (温度)	129.0	129.0	129.7	130.5	130.5	130.7	130.4	130.3	129.7			1.7
Temp.[℃] (温度)												

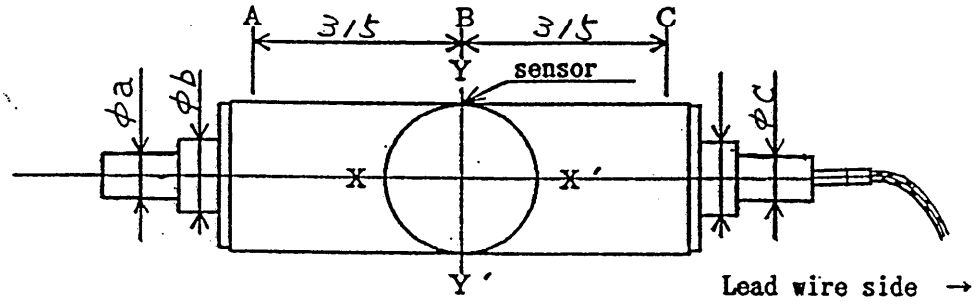
Inspector: 古田 Chief Inspection Section: 辛古

TOKUDEN CO.,LTD.

Serial No. (製番) H-08815 Test No. (指番) 908R-T005 Date (試験日) Sep. 29, '99 Room Temp. (室温) 26 ℃

Test 6. Measurement of Outer Diameter
(外径寸法測定)

* Measuring Equipment (測定器具) : Mitutoyo Outside Micrometer (外側マイクロメータ) and Dial Gauge (ダイアルゲージ)



[mm]

	Outer Diameter (外径)			Roundness (真円度)	Cylindricity (円筒度)	Run out (振れ)
Standard value (基準値)	φ 90 +0 −0.2			0.05	0.07	0.10
Measurement value (測定値)		X−X'	Y−Y'	X-Y= or Y-X=	max.-min.=	
	A	+0.04	+0.04	0		0.050
	B	+0.03	+0.03	0	0.020	0.020
	C	+0.05	+0.05	0		0.040

[mm]

Position (位置)	φa	φb	φc	φd	φe	φf
Standard value (基準値)	φ20 −0.020 −0.041	φ50 0 −0.025	φ20 −0.020 −0.041			
Measurement value (測定値)	−0.020	0	−0.020			

[mm]

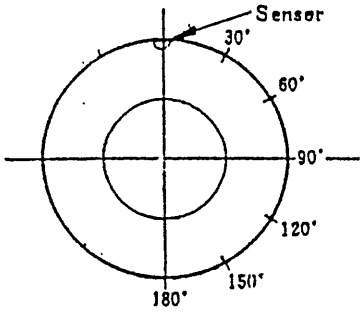
Position (位置)	φg	φh	φi	φj		
Standard value (基準値)						
Measurement value (測定値)						

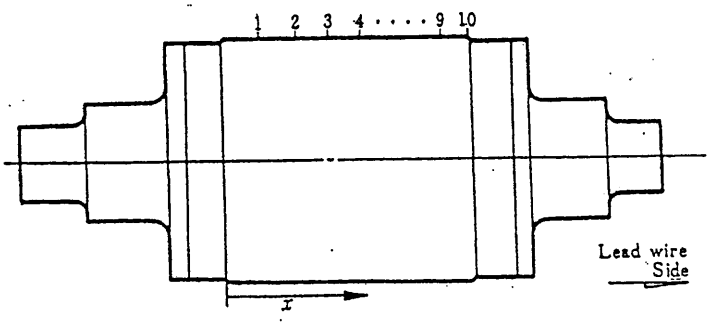
Inspector: 古田 Chief of Inspection Section: 吉古

TOKUDEN CO.,LTD.

Test No. (指番) 908R-T005 Serial No. (製番) H-08815 Date (試験日) Sep. 30, '99

Surface Inspection
(表面検査)





Serial No. (製番)	H-08815	Inspector	古田
Roll Dimension (ロール寸法)	φ 90×780 l	Chief of Inspection Section	寺古

Judgment (判定) 良

Inspection Record (検査記録)	Positions (位置)									
Angle (角度)	1	2	3	4	5	6	7	8	9	10
30°										
60°										
90°										
120°										
150°										
180°										
210°										
240°										
270°										
300°										
330°										
360°										

Date Oct. 1, '99

INSPECTION SHEETS of INDUCTION HEATED JACKET ROLL

(誘導発熱ジャケットロール試験成績書)

Messrs. 株式会社 日立エーアイシー 殿

Serial No. (製番) H-08816 Test No. (指番) 908R-T005 Dwg. No. (図番) RH-16333H Room Temp. (室温) 27 ℃

Specifications (仕様)

Type (型式)	J F — DW	Source (入力電源)	1 φ 50 Hz 200 V ±5%
Roll Demensions (ロール寸法)	φ 90 mm × 780 L	Capacity (容量)	2 kVA 以下 at 20 ℃ 0.9 kW -10%以上 at 180 ℃
Roll Surface (ロール表面)	☐ HCr ☐ Ceramic ■ RUB ☐ GRBF ☐ TF		
	シリコンゴム 3t 硬度 70° 赤色	Operating Temp. (使用温度)	100～150 ℃ (Max. 180 ℃)
Revolving Speed (周速)	■ m/min. Max. 5 ☐ r.p.m.	Accuracy of Temp. (温度分布精度)	(目標 ±2.0 deg.) ±2.5 deg. at 100～130 ℃
Roundness (真円度)	Less than (以下) 0.05 mm	Thermal Medium (熱媒体)	■ Water ☐ sk-170 ☐ 240 ☐ $C_{10}H_8$ ☐ Therms-300
Cylindricity (円筒度)	Less than (以下) 0.07 mm	Weight (重量)	Approx. (約) 30 kg
Run out (振れ)	Less than (以下) 0.10 mm at 20 ℃ Less than (以下) — mm at — ℃ to — ℃		

Test 1. Temperature Rising Characteristics Test [at 5 ■ m/min. ☐ r.p.m.]
(昇温特性試験)

* Test Frequency : 60 Hz
(試験周波数)

* Measuring Equipment : YOKOGAWA AC. POWER METER
(測定器具)

Serface Temp. (表面温度) [℃]	Coil Temp. (コイル温度) [℃]	Voltage (電圧) [V]	Current (電流) [A]	Powerfactor (力率) [%]	Capacity (容量) [W]	Time (時間) [min.]
定格電圧換算値 (50-Hz)				—		—

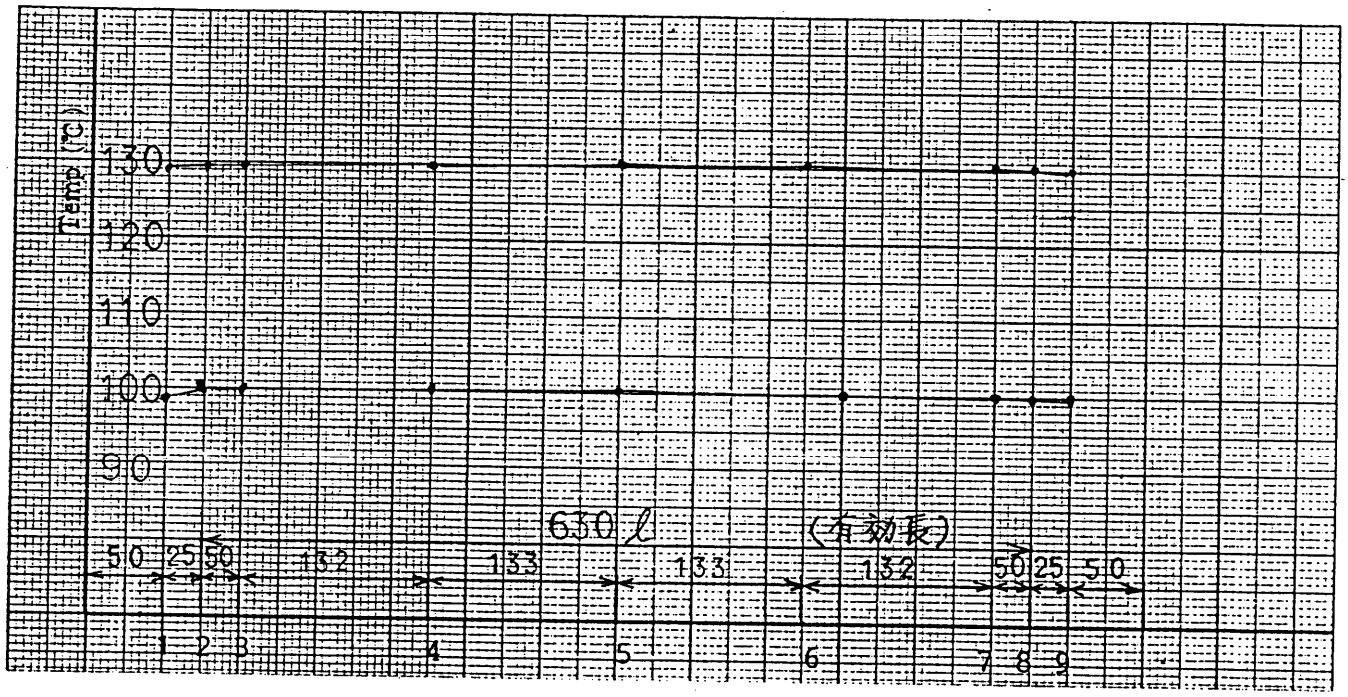
Inspector : 古田 Chief of Inspection Section : 辛古

TOKUDEN CO., LTD. トクデン株式会社

Serial No. (製番) H-08816 Test No. (指番) 908R-T005 Date (試験日) Oct. 1, '99 Room Temp. (室温) 27 ℃

Test 2. Surface Temperature Profile Measurement
(表面温度分布試験)

* Temp. control (温度制御) : PID
* Sensing of temp. (温度検出) : ☐ J ■ K ☐ T ☐ Pt50Ω ☐ Pt100Ω
* Measuring Equipment (測定器具) : ANRITSU METER ☐ AM-8201(TYPE E) ■ AP-210(TYPE E)
* min. after setting at 5 m/min. ~~r.p.m.~~
* Setting of temp. (温度設定) : 100 ℃, 130 ℃, — ℃
* Standard value (基準値) : ±2.5 deg. at 100 ℃ to 130 ℃



Lead Wire Side →

Positions (位置)	1	2	3	4	5	6	7	8	9	10	11	difference
Temp.[℃] (温度)	98.7	99.7	100.1	100.1	100.3	100.2	100.0	99.9	99.9			0.6
Temp.[℃] (温度)	129.2	129.6	129.8	130.0	130.4	130.4	130.4	130.4	130.2			0.8
Temp.[℃] (温度)												

Inspector: 古田 Chief Inspection Section: 寺古

TOKUDEN CO.,LTD.

Serial No. (製番) H-08816 Test No. (指番) 908R-T005 Date (試験日) Oct. 1, '99 Room Temp. (室温) 27 ℃

Test 3. Insulation Resistance Measurement
(絶縁抵抗試験)

* Measuring Equipment : YOKOGAWA INSULATION TESTER (at D.C.1000V)
(測定器具) (D.C.1000Vメガー)

* Standard value : More than 10 MΩ at Room Temp.
(基準値) (室温にて10 MΩ以上)

* Measurement value : Winding—Earth 2000 MΩ
(測定値) (巻線ーアース間)

Test 4. Dielectric Test of Induction Coil
(耐電圧試験)

* Measuring Equipment : TOKUDEN A.C. 60 Hz 0 to 2.2 KV
(測定器具)

* Standard value : Confirm its normal condition ■ 1.5KV □ 1.8KV
(基準値) (異常がないこと)

* Measurement value : Winding—Earth ■ 1.5KV/min. □ 1.8KV/min. good
(測定値) (巻線ーアース間) (良)

Test 5. Withstand Air Pressure Test for Jacket Chamber
(耐空圧試験)

* Standard value : Confirm its normal condition 10 Kg/cm²
(基準値) (異常がないこと)

* Measurement value : good
(測定値) (良)

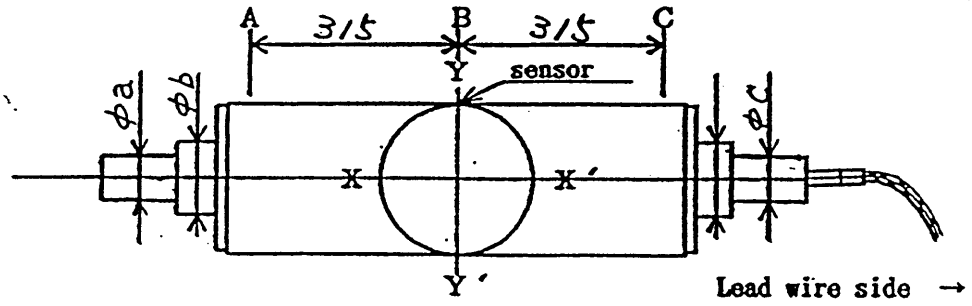
Inspector: 古田 Chief Inspection Section: 寺古

TOKUDEN CO.,LTD.

Serial No. (製番) H-08816 Test No. (指番) 908R-T005 Date (試験日) Oct. 1, '99 Room Temp. (室温) 27 ℃

Test 6. Measurement of Outer Diameter
(外径寸法測定)

* Measuring Equipment (測定器具) : Mitutoyo Outside Micrometer (外側マイクロメータ) and Dial Gauge (ダイアルゲージ)



[mm]

		Outer Diameter (外径)		Roundness (真円度)	Cylindricity (円筒度)	Run out (振れ)
Standard value (基準値)	φ	90	+0 0.2	0.05	0.07	0.10
Measurement value (測定値)		X−X'	Y−Y'	X-Y= or Y-X=	max.-min.=	
	A	0	0	0		0.020
	B	+0.01	0	0.010	0.030	0.020
	C	+0.03	+0.03	0		0.050

[mm]

Position (位置)	φa	φb	φc	φd	φe	φf
Standard value (基準値)	φ20 −0.020 −0.041	φ50 0 −0.025	φ20 −0.020 −0.041			
Measurement value (測定値)	−0.020	−0.010	−0.020			

[mm]

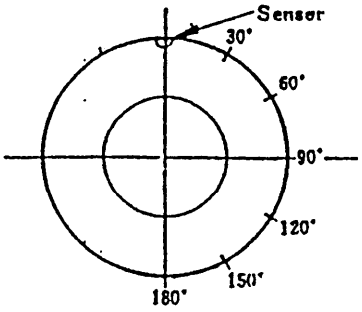
Position (位置)	φg	φh	φi	φj		
Standard value (基準値)						
Measurement value (測定値)						

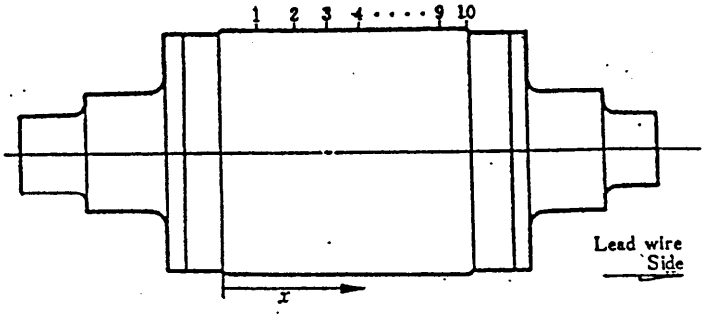
Inspector: 古田 Chief of Inspection Section: 寺古

TOKUDEN CO.,LTD.

Test No. (指番) 908R-T005 Serial No. (製番) H-08816 Date (試験日) Oct. 1, '99

Surface Inspection
(表面検査)

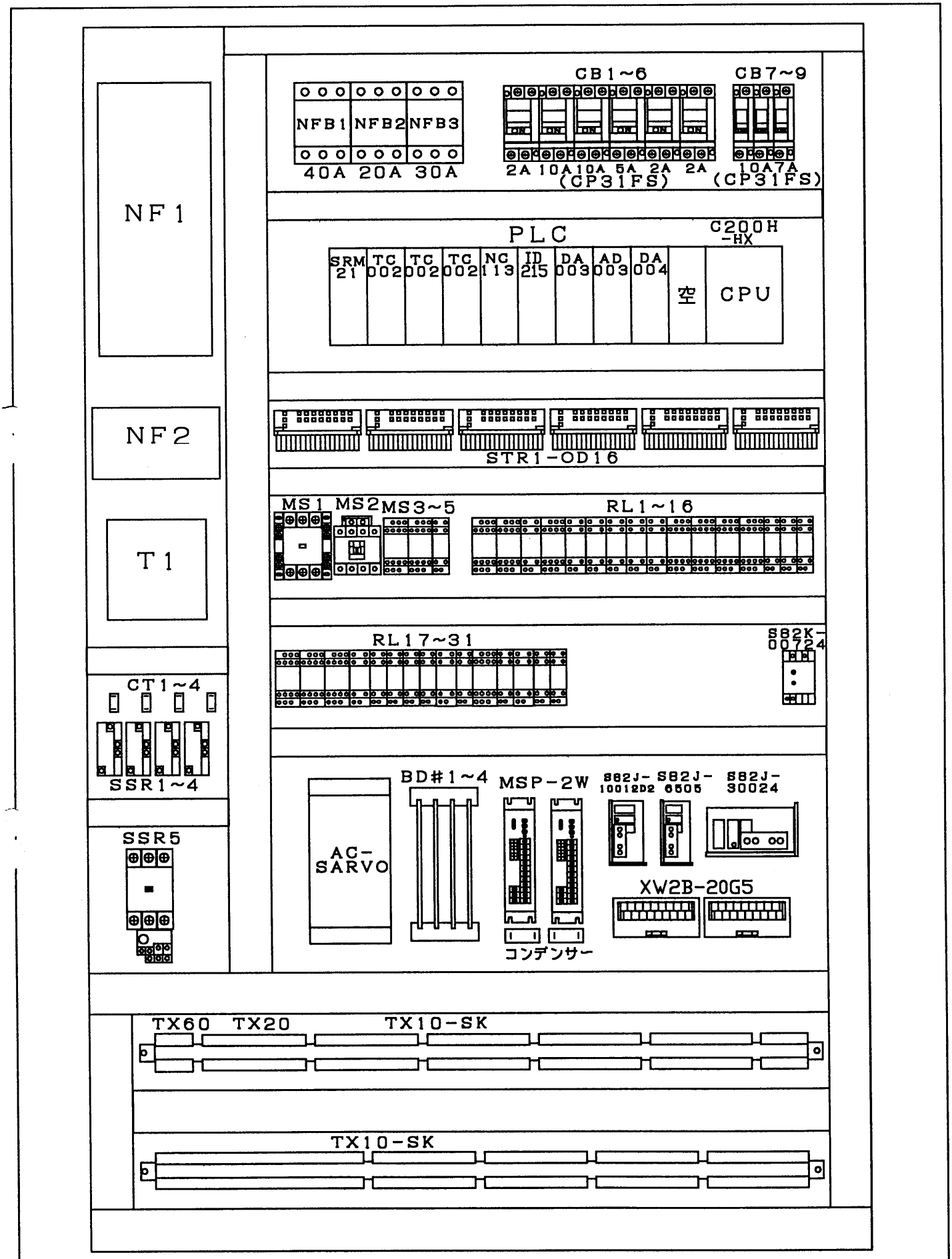




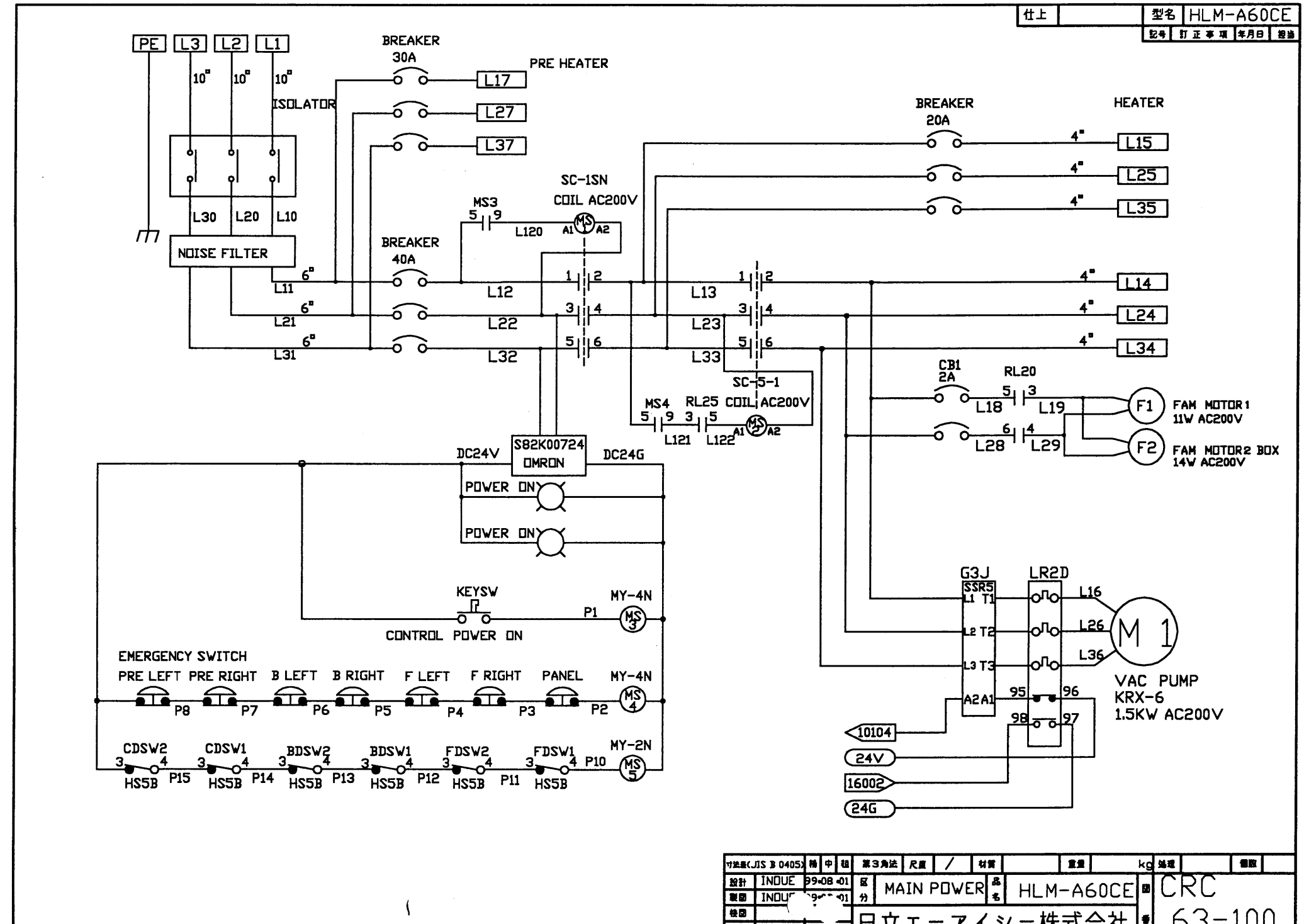
Serial No. (製番)	H-08816	Inspector	古田
Roll Dimension (ロール寸法)	φ 90×780 1	Chief of Inspection Section	孝古

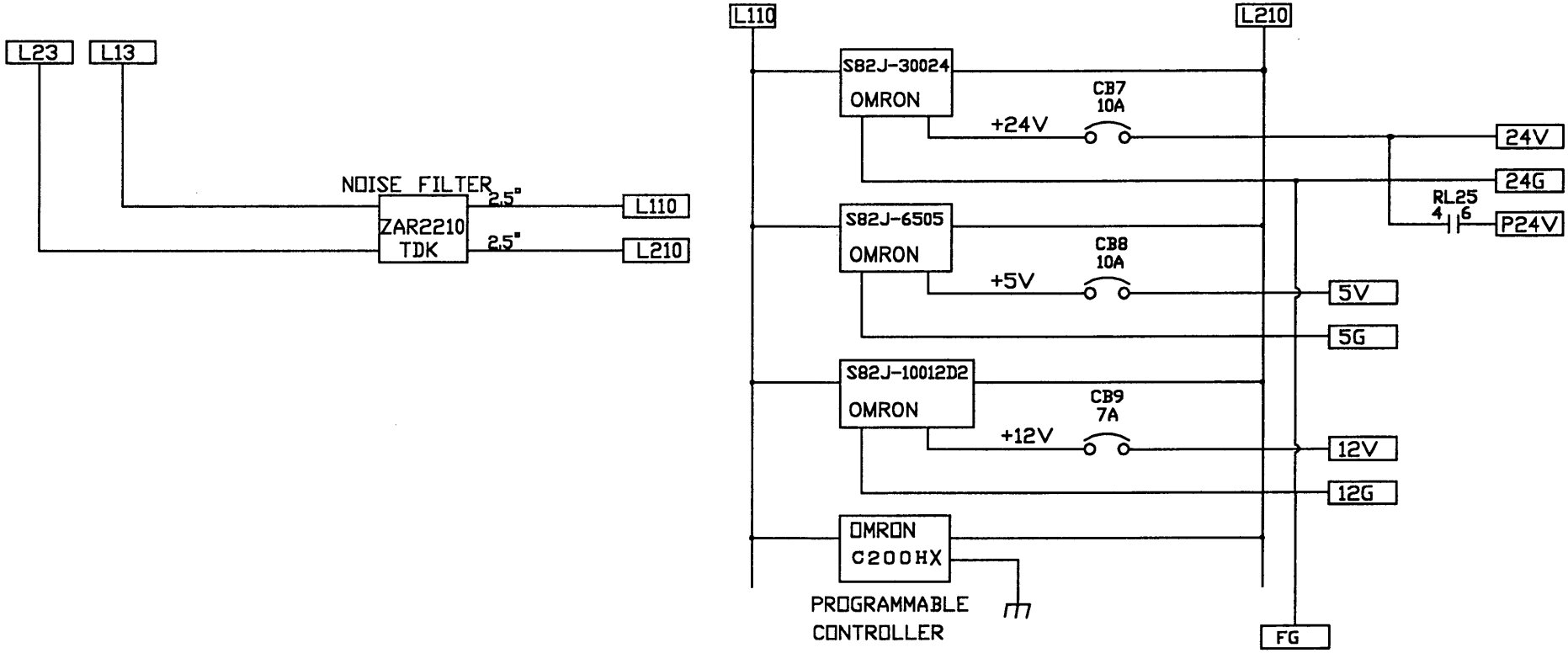
Judgment (判定) 良

Inspection Record (検査記録)	Positions (位置)									
Angle (角度)	1	2	3	4	5	6	7	8	9	10
30°										
60°										
90°										
120°										
150°										
180°										
210°										
240°										
270°										
300°										
330°										
360°										

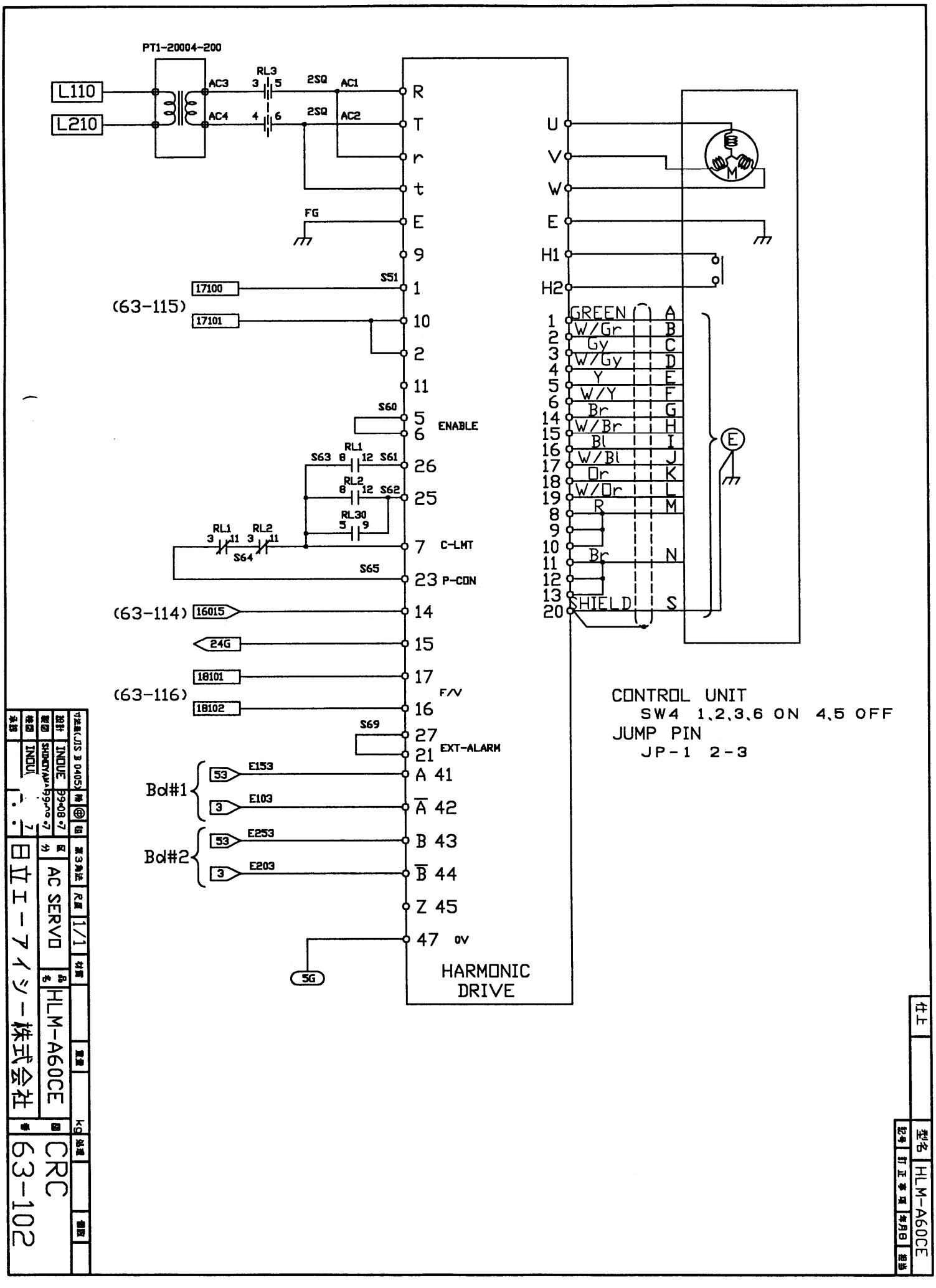


Machine	HLM-A60CE	＊ 制御盤部品配置図 ＊	Date	99, 9,25	File	No. 1	Page
Name	日立エーアイシー株式会社 芳賀工場	Making No.	Designer	K.O	Wiring	RÉGULO	
Line		Drawing No.	Draftman	M.S	KEM-TEC JAPANCO., LTD		

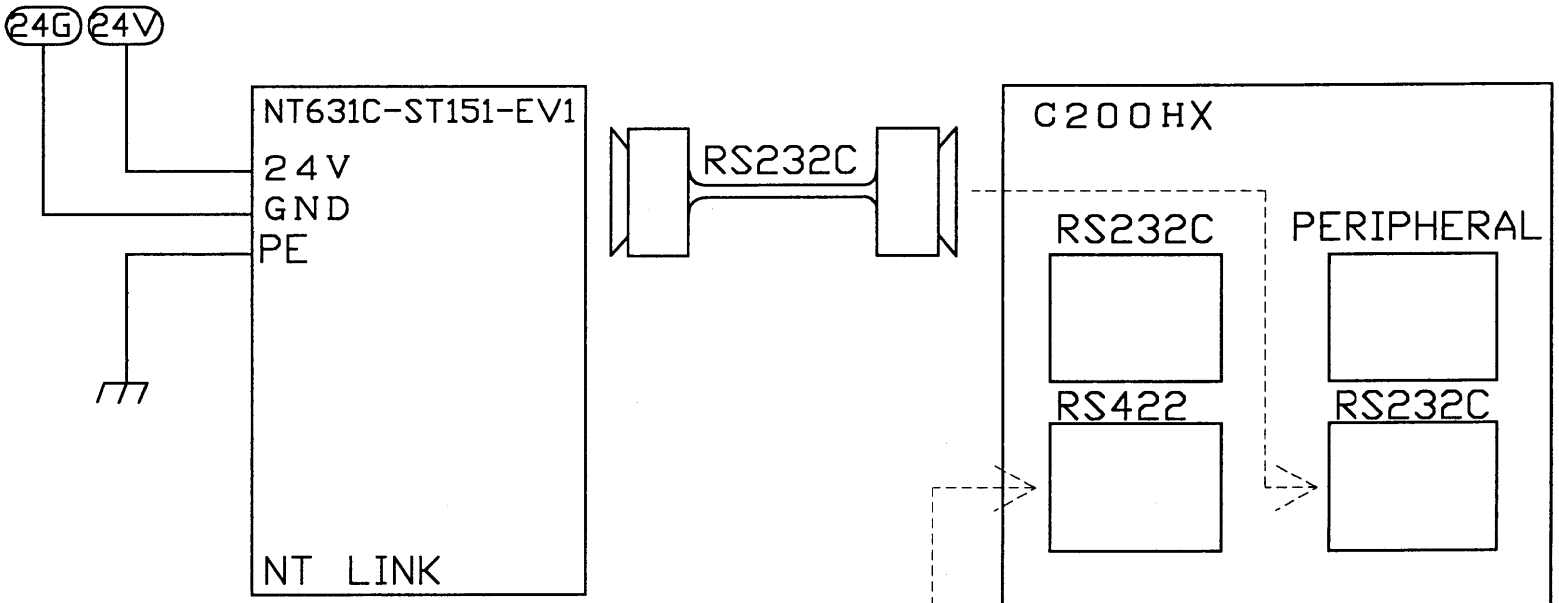

仕上
型名 HLM-A60CE
記号 訂正事項 年月日 担当
PE L3 L2 L1
10□ 10□ 10□
ISOLATOR
L30 L20 L10
NOISE FILTER
BREAKER 30A
PRE HEATER
L17
L27
L37
BREAKER 40A
MS3
5 9
L120
A1 A2
SC-1SN
COIL AC200V
6□ L11
6□ L21
6□ L31
L12
L22
L32
1 2
3 4
5 6
BREAKER 20A
HEATER
4□ L15
4□ L25
4□ L35
L13
L23
L33
4□ L14
4□ L24
4□ L34
SC-5-1
MS4 RL25 COIL AC200V
5 9 3 5
L121 L122
CB1 2A
RL20
5 3 L18 L19
6 4 L28 L29
F1 FAM MOTOR1 11W AC200V
F2 FAM MOTOR2 BOX 14W AC200V
S82K00724 OMRON
DC24V
DC24G
POWER ON
POWER ON
KEYSW
MY-4N
P1
CONTROL POWER ON
G3J SSR5
L1 T1
L2 T2
L3 T3
A2 A1
LR2D
95 96
98 97
L16
L26
L36
M 1
VAC PUMP KRX-6 1.5KW AC200V
10104
24V
16002
24G
EMERGENCY SWITCH
PRE LEFT PRE RIGHT B LEFT B RIGHT F LEFT F RIGHT PANEL MY-4N
P8 P7 P6 P5 P4 P3 P2
CDSW2 CDSW1 BDSW2 BDSW1 FDSW2 FDSW1 MY-2N
3 4
HS5B P15 HS5B P14 HS5B P13 HS5B P12 HS5B P11 HS5B P10
設計 INOUE 99-08-01
製図 INOUE
検図
承認
区分 MAIN POWER
品名 HLM-A60CE
日立エーアイシー株式会社
CRC 63-100



寸法基(JIS B 0405)	特	中	組	第3角法	尺度	/	材質		重量	kg	処理		個数
設計	INOUE	99-08-01		区分	MAIN POWER	品名	HLM-A60CE		図番	CRC 63-101			
製図	INOUE	99-08-01											
検図													
承認					日立エーアイシー株式会社								

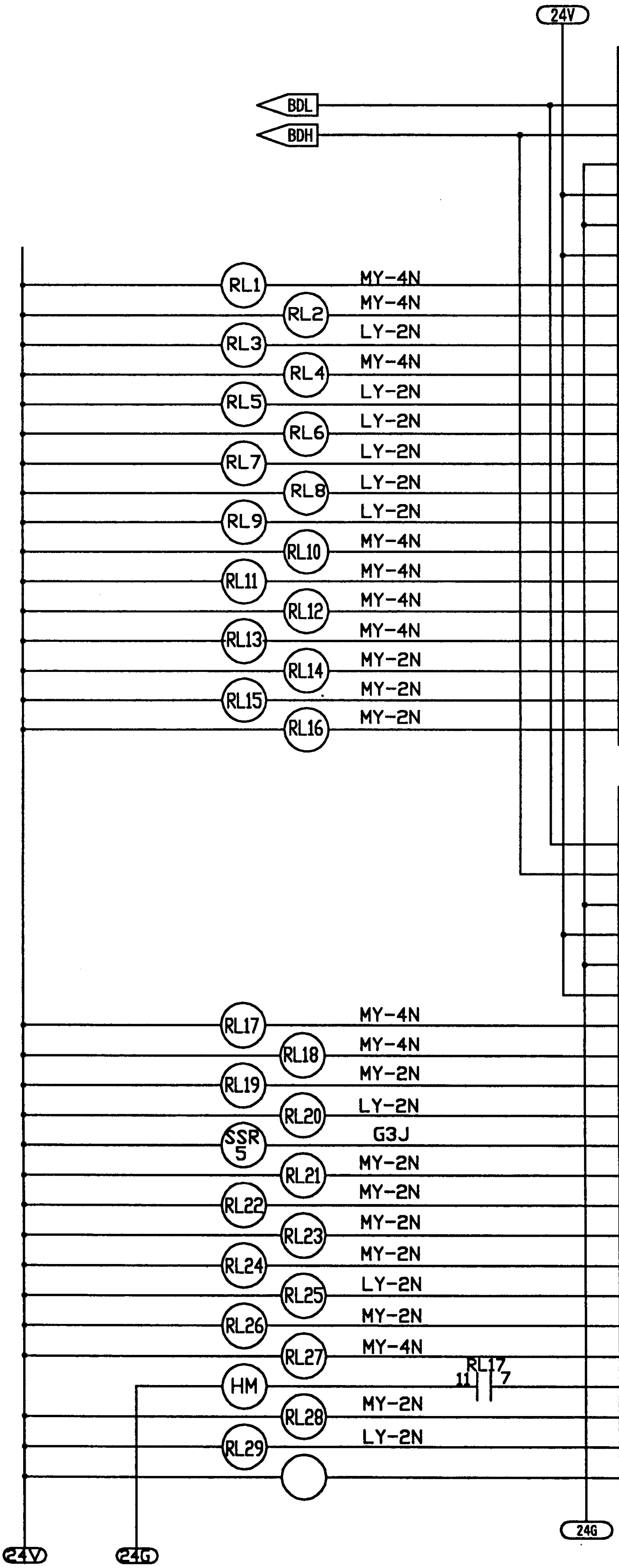


設計	INOUE
製図	INOUE
承認	
日立エーアイシー株式会社	
AC SERVO	
HLM-A60CE	
CRC 63-102	
仕上	
型名	HLM-A60CE



寸法差(JIS B 0405)	精	中	粗	第3角法	R面	/	材質		重量	kg	処理		備考
設計	INOUE	99-08-12		区分	PROGRAMMABLE TERMINAL		品名	HLM-A60CE		図番	CRC 63-103		
製図	INOUE	99-08-12											
検図													
承認													

日立エーアイシー株式会社



100CH OUT SRT1-OD16

BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10000	ROLLER FORWARD
1	10001	ROLLER REVERSE
2	10002	SERVO ON
3	10003	WINDING MOTOR
4	10004	ELIMINATOR ON
5	10005	WINDING TORQUE 1
6	10006	WINDING TORQUE 2
7	10007	FILM BRAKE
8	10008	SLIDE CLUTCH
9	10009	FILM BRAKE UP 1
10	10010	FILM BRAKE UP 2
11	10011	FILM BRAKE LOW 1
12	10012	FILM BRAKE LOW 2
13	10013	SIGNAL GREEN
14	10014	SIGNAL YELLOW
15	10015	SIGNAL RED

101CH OUT SRT1-OD16

BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10100	OPERATING
1	10101	EMERGENCY STOP
2	10102	PRE HEATER ON
3	10103	FAN MOTOR OFF
4	10104	VAC PUMP ON
5	10105	MACHINE POWER ON
6	10106	MACHINE READY
7	10107	MACHINE TROUBLE
8	10108	FILM NOTHING
9	10109	POWER OFF
10	10110	FREE
11	10111	FREE
12	10112	HOUR METER
13	10113	FREE
14	10114	FREE
15	10115	FREE

仕上

型名 HLM-A60CE

記号 訂正事項 年月日 担当

設計 INOUE 99・08・12
製図 INOUE
検図 INOUE
承認

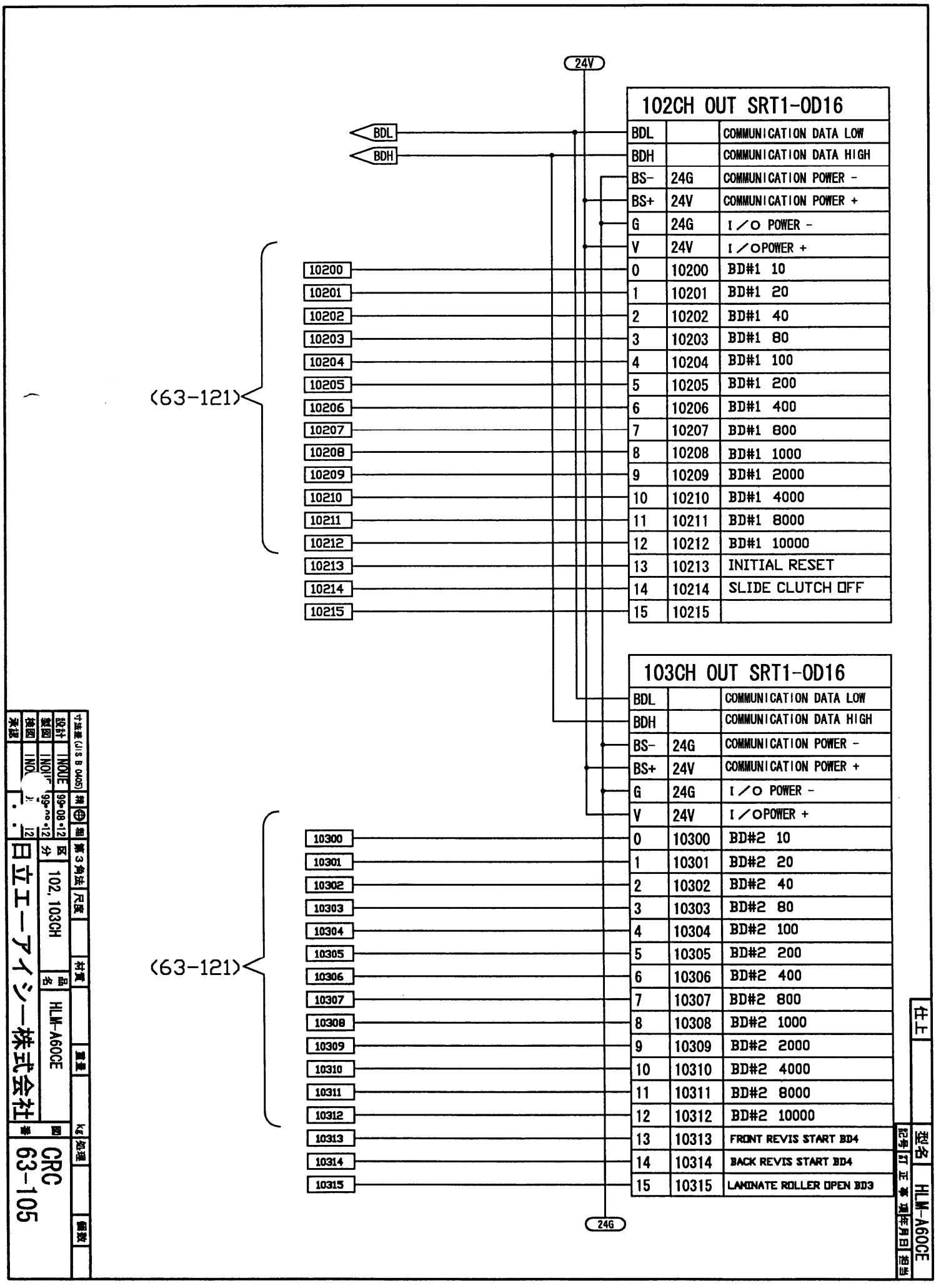
第3角法

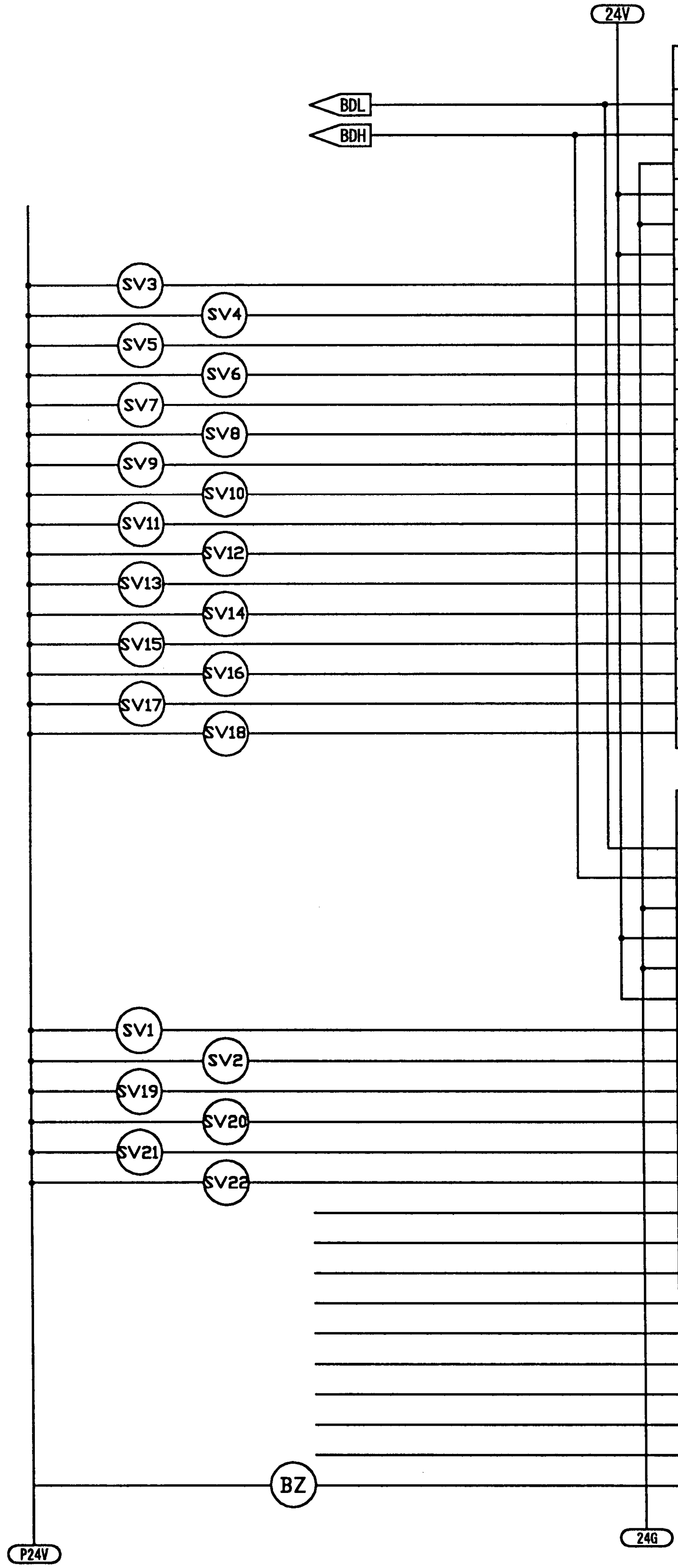
図名 100, 101CH

品名 HLM-A60CE

日立エーアイシー株式会社

図番 CRC 63-104

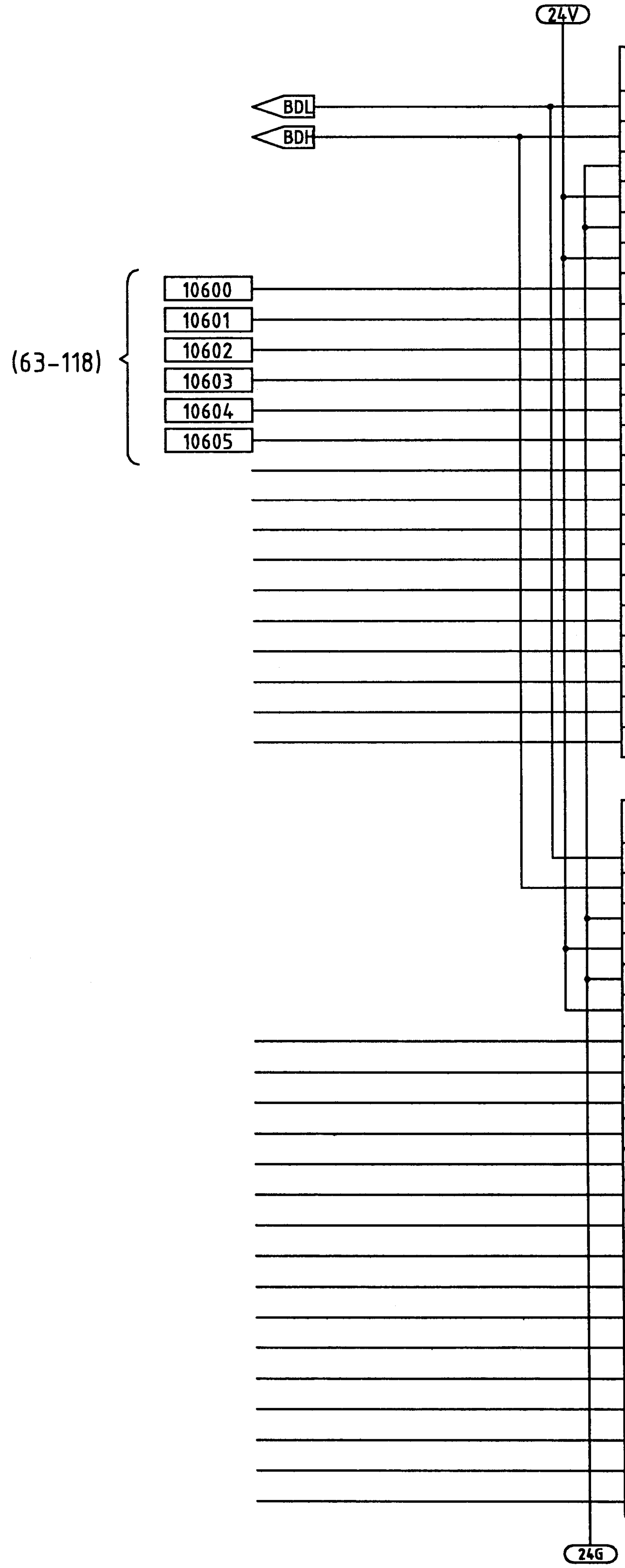

24V
BDL
BDH
102CH OUT SRT1-OD16
BDL COMMUNICATION DATA LOW
BDH COMMUNICATION DATA HIGH
BS- 24G COMMUNICATION POWER -
BS+ 24V COMMUNICATION POWER +
G 24G I／O POWER -
V 24V I／OPOWER +
0 10200 BD#1 10
1 10201 BD#1 20
2 10202 BD#1 40
3 10203 BD#1 80
4 10204 BD#1 100
5 10205 BD#1 200
6 10206 BD#1 400
7 10207 BD#1 800
8 10208 BD#1 1000
9 10209 BD#1 2000
10 10210 BD#1 4000
11 10211 BD#1 8000
12 10212 BD#1 10000
13 10213 INITIAL RESET
14 10214 SLIDE CLUTCH OFF
15 10215
10200
10201
10202
10203
10204
10205
10206
10207
10208
10209
10210
10211
10212
10213
10214
10215
(63-121)
103CH OUT SRT1-OD16
BDL COMMUNICATION DATA LOW
BDH COMMUNICATION DATA HIGH
BS- 24G COMMUNICATION POWER -
BS+ 24V COMMUNICATION POWER +
G 24G I／O POWER -
V 24V I／OPOWER +
0 10300 BD#2 10
1 10301 BD#2 20
2 10302 BD#2 40
3 10303 BD#2 80
4 10304 BD#2 100
5 10305 BD#2 200
6 10306 BD#2 400
7 10307 BD#2 800
8 10308 BD#2 1000
9 10309 BD#2 2000
10 10310 BD#2 4000
11 10311 BD#2 8000
12 10312 BD#2 10000
13 10313 FRONT REVIS START BD4
14 10314 BACK REVIS START BD4
15 10315 LAMINATE ROLLER OPEN BD3
10300
10301
10302
10303
10304
10305
10306
10307
10308
10309
10310
10311
10312
10313
10314
10315
(63-121)
24G
寸法差(JIS B 0405)
設計 INOUE
製図 INOUE 99-08-12
検図 INO
承認
日立エーアイシー株式会社
区分 102, 103CH
品名 HLM-A60CE
CRC 63-105
仕上
型名 HLM-A60CE
記号 訂正事項 年月日 担当



104CH OUT SRT1-OD16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10400	SLIDE JET (F TYPE)
1	10401	AIR JET SLIDE
2	10402	FILM CLAMP
3	10403	SLIDE GUIDE STOPPER UP
4	10404	SLIDE GUIDE STOPPER LOW
5	10405	SLIDE GUIDE UP
6	10406	SLIDE GUIDE LOW
7	10407	FILM CUTTER UP
8	10408	FILM CUTTER LOW
9	10409	CLAMP ROLLER
10	10410	BOARD CLAMP
11	10411	FREE
12	10412	AIR JET
13	10413	SLIDE GUIDE BLOW
14	10414	PEELING GUIDE UP
15	10415	PEERING GUIDE LOW

105CH OUT SRT1-OD16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10500	LAMINATE ROLLER L
1	10501	LAMINATE ROLLER R
2	10502	VACUUM UP OUTSIDE
3	10503	VACUUM UP INSIDE
4	10504	VACUUM LOW OUTSIDE
5	10505	VACUUM LOW INSIDE
6	10506	FREE
7	10507	FREE
8	10508	FREE
9	10509	FREE
10	10510	FREE
11	10511	FREE
12	10512	FREE
13	10513	FREE
14	10514	FREE
15	10515	BUZZER

設計 INOUE 99-08-12
製図 INOUE
検図 INOU 12
承認
図分 104, 105CH
品名 HLM-A60CE
日立エーアイシー株式会社
図番 CRC 63-106
型名 HLM-A60CE
仕上



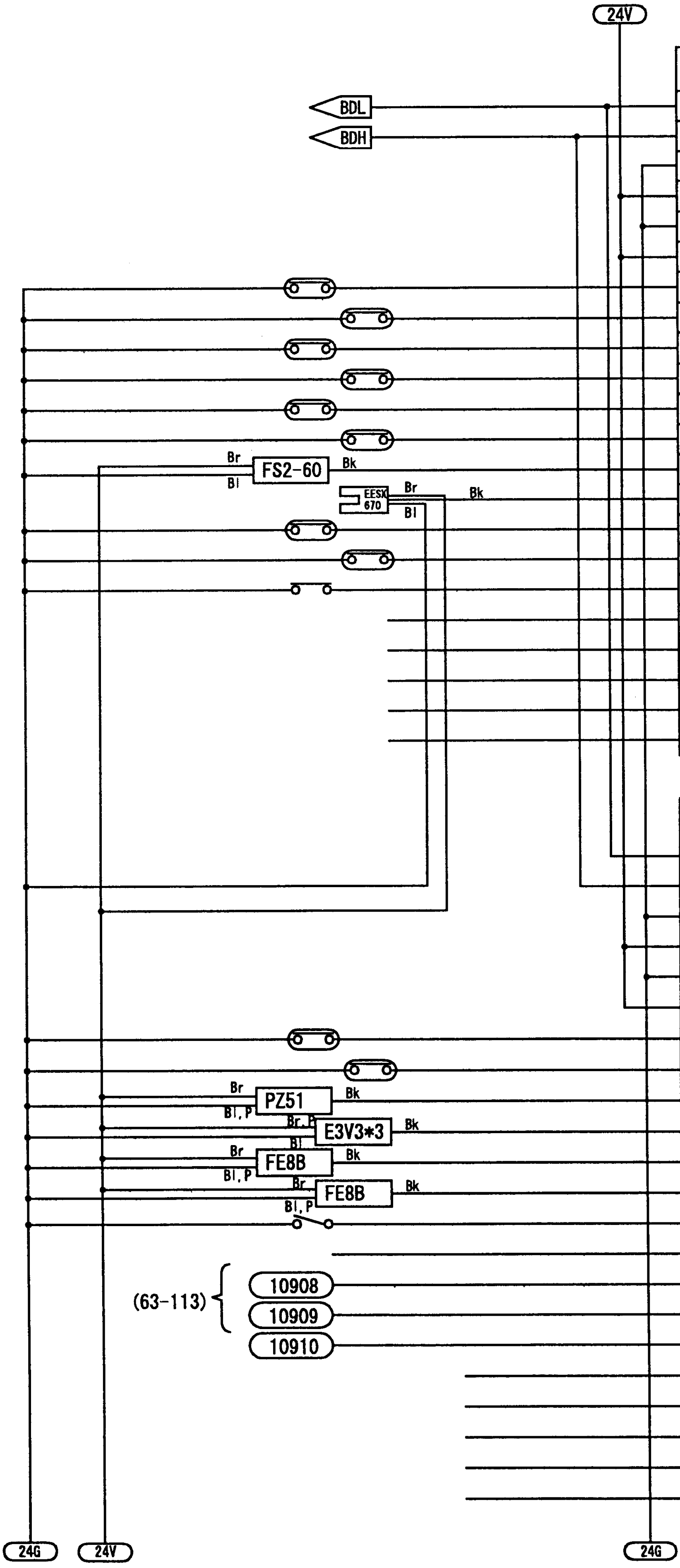
106CH OUT SRT1-OD16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I/O POWER -
V	24V	I/OPOWER +
0	10600	LOADER MOTOR CW
1	10601	LOADER MOTOR FREE
2	10602	LOADER SPEED SET
3	10603	UNLOADER MOTOR CW
4	10604	UNLOADER MOTOR FREE
5	10605	UNLOADER SPEED SET
6	10606	FREE
7	10607	FREE
8	10608	FREE
9	10609	FREE
10	10610	FREE
11	10611	FREE
12	10612	FREE
13	10613	FREE
14	10614	FREE
15	10615	FREE

107CH OUT SRT1-OD16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I/O POWER -
V	24V	I/OPOWER +
0	10700	FREE
1	10701	FREE
2	10702	FREE
3	10703	FREE
4	10704	FREE
5	10705	FREE
6	10706	FREE
7	10707	FREE
8	10708	FREE
9	10709	FREE
10	10710	FREE
11	10711	FREE
12	10712	FREE
13	10713	FREE
14	10714	FREE
15	10715	FREE

仕上

型名 HLM-A60CE

設計 INOUE 99-08-12
製図 INOUE 99-08-12
106,107CH
HLM-A60CE
日立エーアイシー株式会社
CRC 63-107

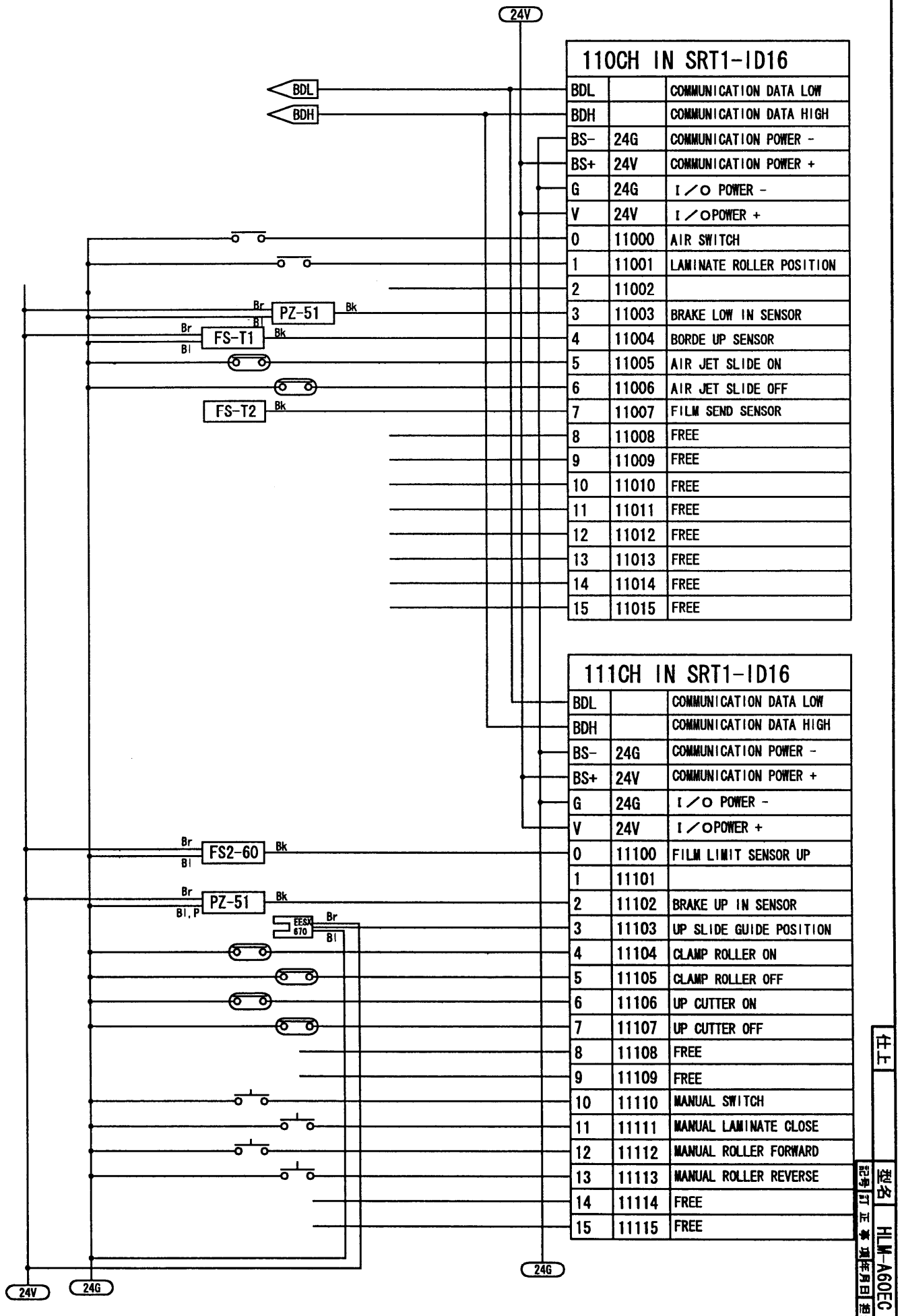


108CH IN SRT1-ID16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10800	LOW PEELING GUIDE ON
1	10801	LOW PEELING GUIDE OFF
2	10802	LOW CUTTER ON
3	10803	LOW CUTTER OFF
4	10804	RIGHT LAMINATEROLLER ON
5	10805	RIGHT LAMINATEROLLER OFF
6	10806	FILM LIMIT SENSOR LOW
7	10807	LOW SLIDE GUIDE POSITION
8	10808	LEFT LAMINATEROLLER ON
9	10809	LEFT LAMINATEROLLER OFF
10	10810	ELIMINATOR ON
11	10811	FREE
12	10812	FREE
13	10813	FREE
14	10814	FREE
15	10815	FREE

109CH IN SRT1-ID16		
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	10900	UP PEELING GUIDE ON
1	10901	UP PEELING GUIDE OFF
2	10902	BRAKE LOW OUT SENSOR
3	10903	BORDE ON SENSOR
4	10904	SIDE RIGHT SENSOR
5	10905	SIDE LEFT SENSOR
6	10906	CONVEYOR SWITCH
7	10907	
8	10908	PULSE MOTOR TIM
9	10909	PULSE MOTOR O.HEAT
10	10910	FREE
11	10911	FREE
12	10912	FREE
13	10913	FREE
14	10914	FREE
15	10915	FREE

寸法許容差(JIS B 0405) 設計 INOUE 99-08-02 製図 INOUE 99-08-02 検図 承認
第3角法 尺度 材質 重量 kg 処理 個数
図名 108,109CH 品名 HLM-A60CE
日立エーアイシー株式会社
図番 CRC 63-108

仕上
型名 HLM-A60CE
記号 訂正事項 年月日 担当



110CH IN SRT1-ID16

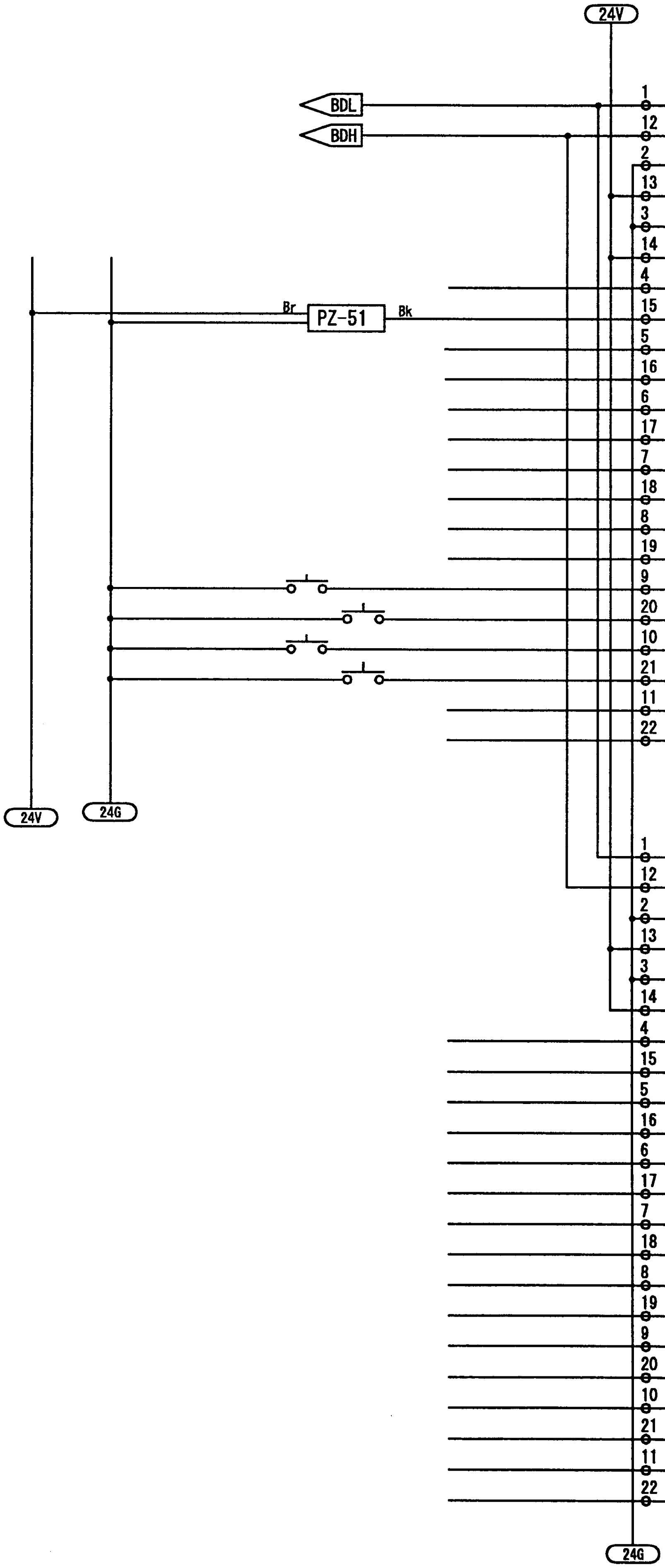
BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	11000	AIR SWITCH
1	11001	LAMINATE ROLLER POSITION
2	11002	
3	11003	BRAKE LOW IN SENSOR
4	11004	BORDE UP SENSOR
5	11005	AIR JET SLIDE ON
6	11006	AIR JET SLIDE OFF
7	11007	FILM SEND SENSOR
8	11008	FREE
9	11009	FREE
10	11010	FREE
11	11011	FREE
12	11012	FREE
13	11013	FREE
14	11014	FREE
15	11015	FREE

111CH IN SRT1-ID16

BDL		COMMUNICATION DATA LOW
BDH		COMMUNICATION DATA HIGH
BS-	24G	COMMUNICATION POWER -
BS+	24V	COMMUNICATION POWER +
G	24G	I／O POWER -
V	24V	I／OPOWER +
0	11100	FILM LIMIT SENSOR UP
1	11101	
2	11102	BRAKE UP IN SENSOR
3	11103	UP SLIDE GUIDE POSITION
4	11104	CLAMP ROLLER ON
5	11105	CLAMP ROLLER OFF
6	11106	UP CUTTER ON
7	11107	UP CUTTER OFF
8	11108	FREE
9	11109	FREE
10	11110	MANUAL SWITCH
11	11111	MANUAL LAMINATE CLOSE
12	11112	MANUAL ROLLER FORWARD
13	11113	MANUAL ROLLER REVERSE
14	11114	FREE
15	11115	FREE

寸法基準(JIS B 0405)	
設計	INOUE
製図	INOUE
検図	INO
承認	
日付	99-08-02
区分	
第3角法	
尺度	
材質	
重量	kg
処理	
個数	
品名	HLM-A60CE
図番	CRC 63-109
会社名	日立エーアイシー株式会社

仕上	
型名	HLM-A60EC
記号 訂正事項 年月日 担当	



112CH IN

Pin	Terminal	Address	Description
1	BDL		COMMUNICATION DATA LOW
12	BDH		COMMUNICATION DATA HIGH
2	BS-	24G	COMMUNICATION POWER -
13	BS+	24V	COMMUNICATION POWER +
3	G	24G	I／O POWER -
14	V	24V	I／OPOWER +
4	0	11200	FILM SENSOR UP
15	1	11201	BRAKE UP OUT SENSOR
5	2	11202	
16	3	11203	UP SLIDE GUIDE POSITION
6	4	11204	CLAMP ROLLER ON
17	5	11205	CLAMP ROLLER OFF
7	6	11206	UP CUTTER ON
18	7	11207	UP CUTTER OFF
8	8	11208	FREE
19	9	11209	FREE
9	10	11210	MANUAL SWITCH
20	11	11211	MANUAL LAMINATE CLOSE
10	12	11212	MANUAL ROLLER FORWARD
21	13	11213	MANUAL ROLLER REVERSE
11	14	11214	FREE
22	15	11215	FREE

113CH IN

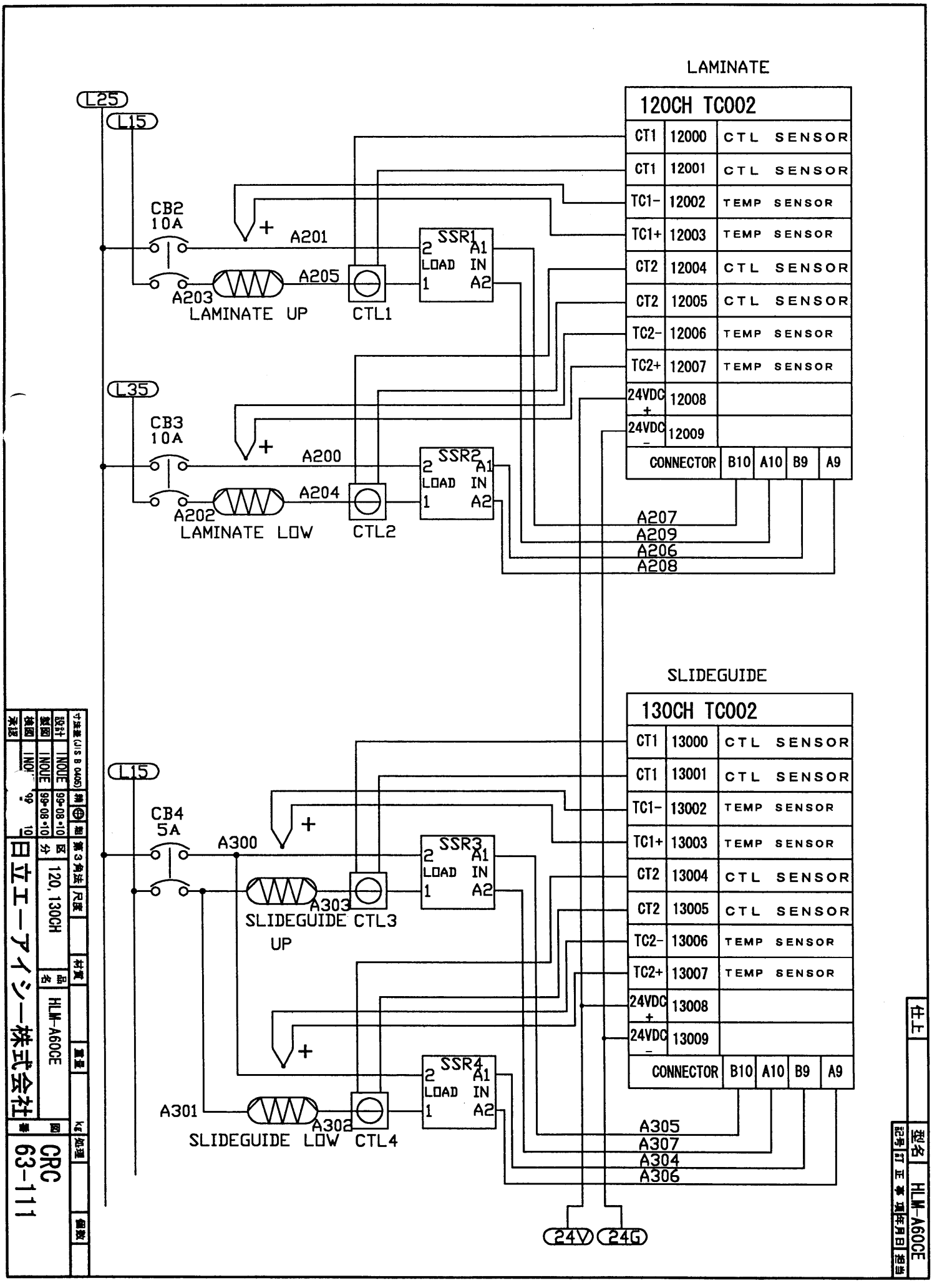
Pin	Terminal	Address	Description
1	BDL		COMMUNICATION DATA LOW
12	BDH		COMMUNICATION DATA HIGH
2	BS-	24G	COMMUNICATION POWER -
13	BS+	24V	COMMUNICATION POWER +
3	G	24G	I／O POWER -
14	V	24V	I／OPOWER +
4	0	11300	FREE
15	1	11301	FREE
5	2	11302	FREE
16	3	11303	FREE
6	4	11304	FREE
17	5	11305	FREE
7	6	11306	FREE
18	7	11307	FREE
8	8	11308	FREE
19	9	11309	FREE
9	10	11310	FREE
20	11	11311	FREE
10	12	11312	FREE
21	13	11313	FREE
11	14	11314	FREE
22	15	11315	FREE

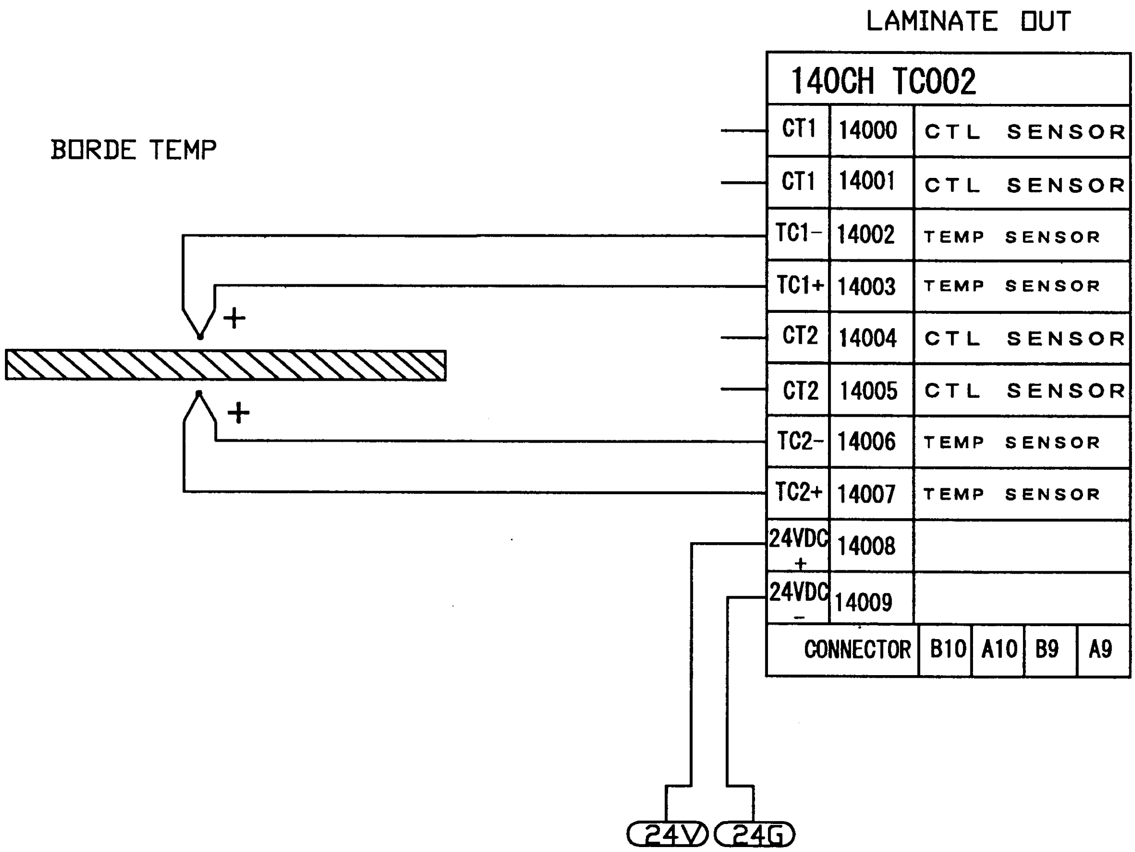
24G

設計	INOUE 99-08-10
製図	INOUE 99-08-10
検図	INO… '99-10
承認	
図名	112, 113CH
品名	HLM-A60CE
図番	CRC 63-110

日立エーアイシー株式会社

型名 HLM-A60CE


LAMINATE
120CH TC002
CT1 12000 CTL SENSOR
CT1 12001 CTL SENSOR
TC1- 12002 TEMP SENSOR
TC1+ 12003 TEMP SENSOR
CT2 12004 CTL SENSOR
CT2 12005 CTL SENSOR
TC2- 12006 TEMP SENSOR
TC2+ 12007 TEMP SENSOR
24VDC + 12008
24VDC - 12009
CONNECTOR B10 A10 B9 A9
L25
L15
CB2 10A
A201
A205
A203
LAMINATE UP
CTL1
SSR1
2 A1
LOAD IN
1 A2
L35
CB3 10A
A200
A204
A202
LAMINATE LOW
CTL2
SSR2
A207
A209
A206
A208
SLIDEGUIDE
130CH TC002
CT1 13000 CTL SENSOR
CT1 13001 CTL SENSOR
TC1- 13002 TEMP SENSOR
TC1+ 13003 TEMP SENSOR
CT2 13004 CTL SENSOR
CT2 13005 CTL SENSOR
TC2- 13006 TEMP SENSOR
TC2+ 13007 TEMP SENSOR
24VDC + 13008
24VDC - 13009
CONNECTOR B10 A10 B9 A9
L15
CB4 5A
A300
A303
SLIDEGUIDE UP
CTL3
SSR3
A301
A302
SLIDEGUIDE LOW
CTL4
SSR4
A305
A307
A304
A306
24V
24G
日立エーアイシー株式会社
CRC 63-111
HLM-A60CE
120, 130CH
INOUE
99-08-10
仕上
型名
HLM-A60CE



設計	INOUE	99-08-10
製図	INOUE	99-08-10
検図	INO	99 10
承認		

寸法差(JIS B 0405) 精 第3角法 尺度 材質 重量 kg 処理 個数

図分 140CH

品名 HLM-A60CE

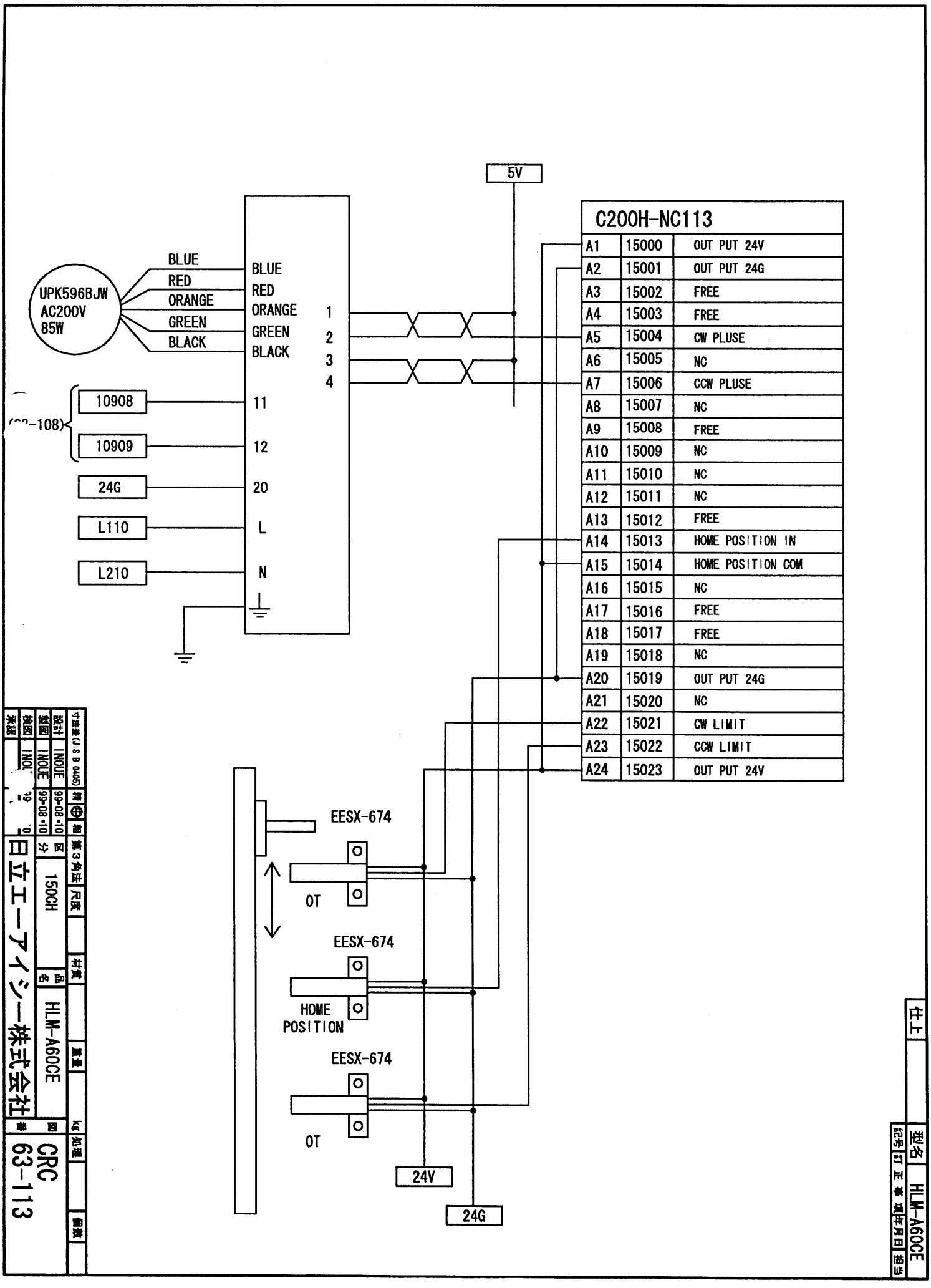
日立エーアイシー株式会社

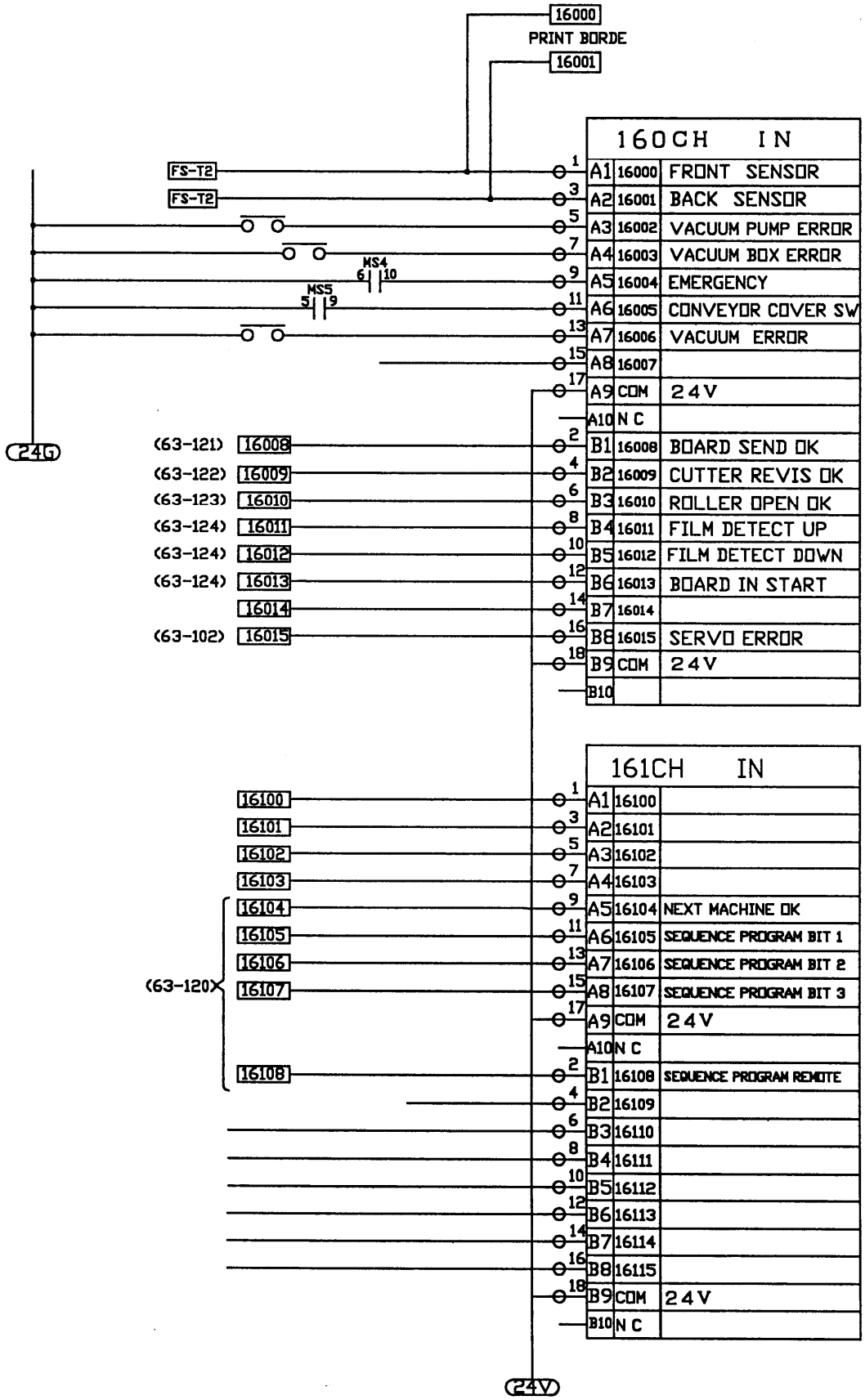
図番 CRC 63-112

仕上

型名 HLM-A60CE

記号 訂正事項 年月日 担当


5V
C200H-NC113
A1 15000 OUT PUT 24V
A2 15001 OUT PUT 24G
A3 15002 FREE
A4 15003 FREE
A5 15004 CW PLUSE
A6 15005 NC
A7 15006 CCW PLUSE
A8 15007 NC
A9 15008 FREE
A10 15009 NC
A11 15010 NC
A12 15011 NC
A13 15012 FREE
A14 15013 HOME POSITION IN
A15 15014 HOME POSITION COM
A16 15015 NC
A17 15016 FREE
A18 15017 FREE
A19 15018 NC
A20 15019 OUT PUT 24G
A21 15020 NC
A22 15021 CW LIMIT
A23 15022 CCW LIMIT
A24 15023 OUT PUT 24V
UPK596BJW
AC200V
85W
BLUE
RED
ORANGE
GREEN
BLACK
1
2
3
4
10908
10909
11
12
24G
20
L110
L
L210
N
EESX-674
OT
EESX-674
HOME
POSITION
EESX-674
OT
24V
24G
日立エーアイシー株式会社
150CH
HLM-A60CE
CRC
63-113
仕上
型名
HLM-A60CE



設計	INOUE 98-12-01
製図	INOUE 99-08-01
承認	
区分	(160,161CH)
品名	HLM-A60CE
番号	63-114

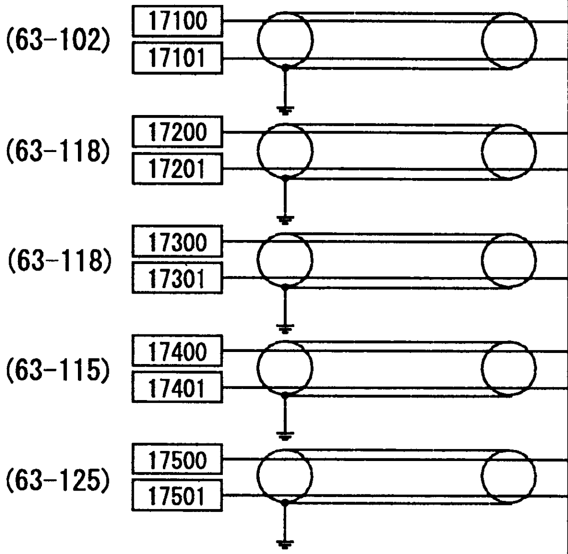
日立エーアイシー株式会社

CRC

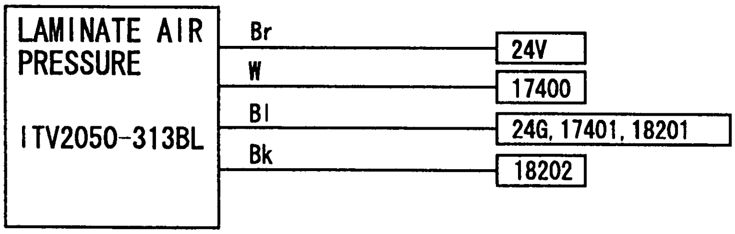
仕上

型名 HLM-A60CE

OUT PUT SIGNAL VOLTAGE

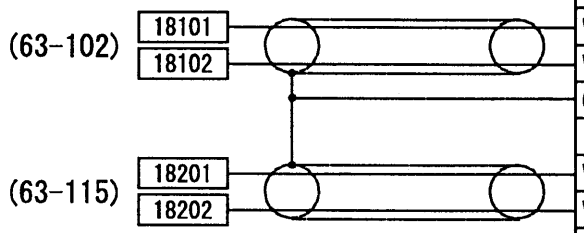


170CH DA003		
V1+	17100	LAMINATE SPEED +
V1-	17101	LAMINATE SPEED -
NC		
V2+	17200	LOADER MOTOR SPEED +
V2-	17201	LOADER MOTOR SPEED -
NC		
V3+	17300	UNLOADER MOTOR SPEED +
V3-	17301	UNLOADER MOTOR SPEED -
NC		
V4+	17400	LAMINATE SET PRESSURE +
V4-	17401	LAMINATE SET PRESSURE -
NC		
V5+	17500	PRE HEATER SPEED +
V5-	17501	PRE HEATER SPEED -
NC		
V6+	17600	
V6-	17601	
NC		
V7+	17700	
V7-	17701	
NC		
V8+	17800	
V8-	17801	
NC		
NC		
NC		
NC		
NC		



設計 INOUE 99-08-10
製図 INOUE 99-08-10
区分 170CH
品名 HLM-A60CE
日立エーアイシー株式会社
図番 CRC 63-115
型名 HLM-A60CE

INPUT SIGNAL VOLTAG



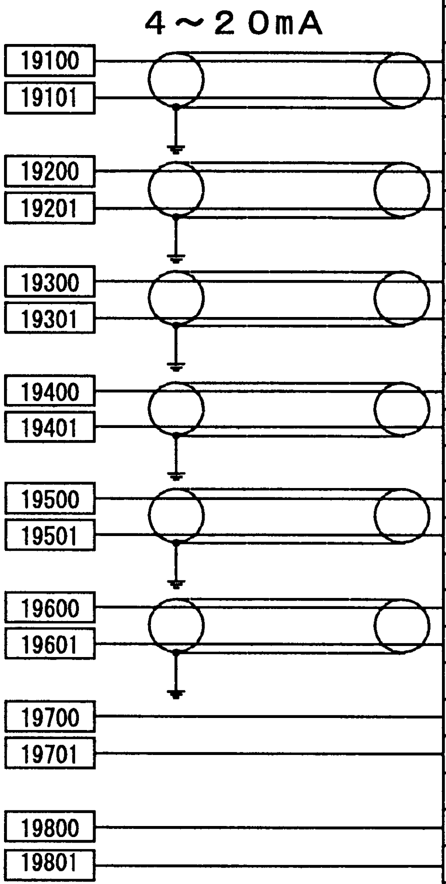
180CH AD003		
I1+	18100	
V1+	18101	LAMINATE SPEED +
V1-	18102	LAMINATE SPEED -
COM		
I2+	18200	
V2+	18201	LAMINATE ACTUAL PRESSURE +
V2-	18202	LAMINATE ACTUAL PRESSURE -
I3+	18300	
V3+	18301	
V3-	18302	
I4+	18400	
V4+	18401	
V4-	18402	
COM		
I5+	18500	
V5+	18501	
V5-	18502	
COM		
I6+	18600	
V6+	18601	
V6-	18602	
I7+	18700	
V7+	18701	
V7-	18702	
I8+	18800	
V8+	18801	
V8-	18802	
COM		

仕上		型名	HLM-A60CE
記号	訂正事項	年月日	担当

寸法基(JIS B 0405)	輪	図	第3角法	尺度		材質		重量		kg	処理		個数
設計	INOUE	99-08-10	区分	140CH		品名	HLM-A60CE			図番	CRC 63-116		
製図	INOUE	99-08-10											
検図	INOUE	99-08-10											
承認													

日立エーアイシー株式会社

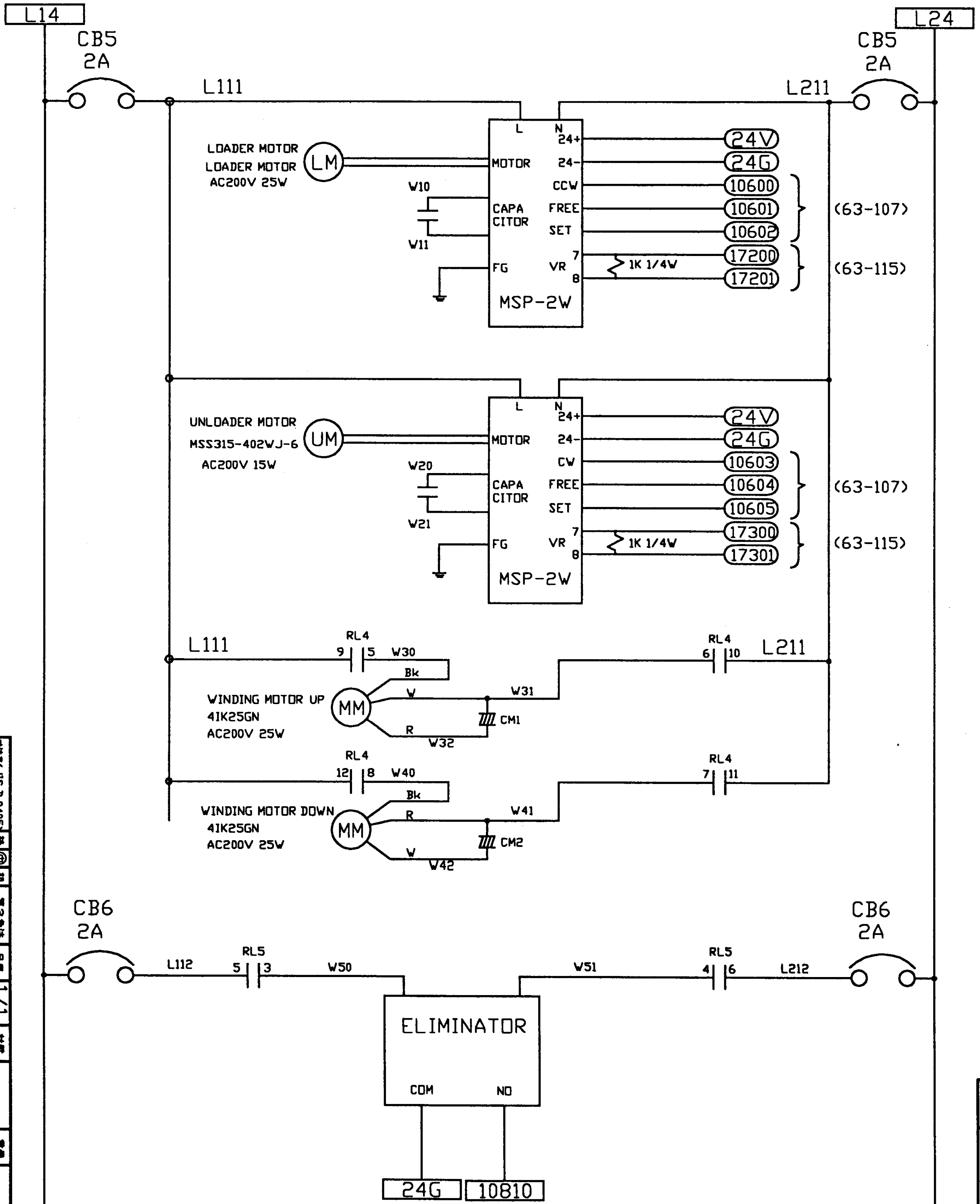
OUT PUT SIGNAL CURRENT



190CH DA004		
NC		
I1-	19100	LAMINATE SPEED -
I1+	19101	LAMINATE SPEED +
NC		
I2-	19200	LAMINATE TEMP TOP -
I2+	19201	LAMINATE TEMP TOP +
NC		
I3-	19300	LAMINATE TEMP BOTTOM -
I3+	19301	LAMINATE TEMP BOTTOM +
NC		
I4-	19400	PCB TEMP TOP -
I4+	19401	PCB TEMP TOP +
NC		
I5-	19500	PCB TEMP BOTTOM -
I5+	19501	PCB TEMP BOTTOM +
NC		
I6-	19600	LAMINATE PRESSURE -
I6+	19601	LAMINATE PRESSURE +
NC		
I7-	19700	
I7+	19701	
NC		
I8-	19800	
I8+	19801	
NC		
NC		
NC		
NC		

設計 INOUE 99-08-10
製図 INOUE 99-08-10
検図
承認
第3角法
図分 190CH
品名 HLM-A60CE
日立エーアイシー株式会社
図番 CRC 63-117

型名 HLM-A60CE
仕上
記号 訂正事項 年月日 担当



日立エーアイシー株式会社

MOTOR

HLM-A60CE

CRC 63-118

1/1

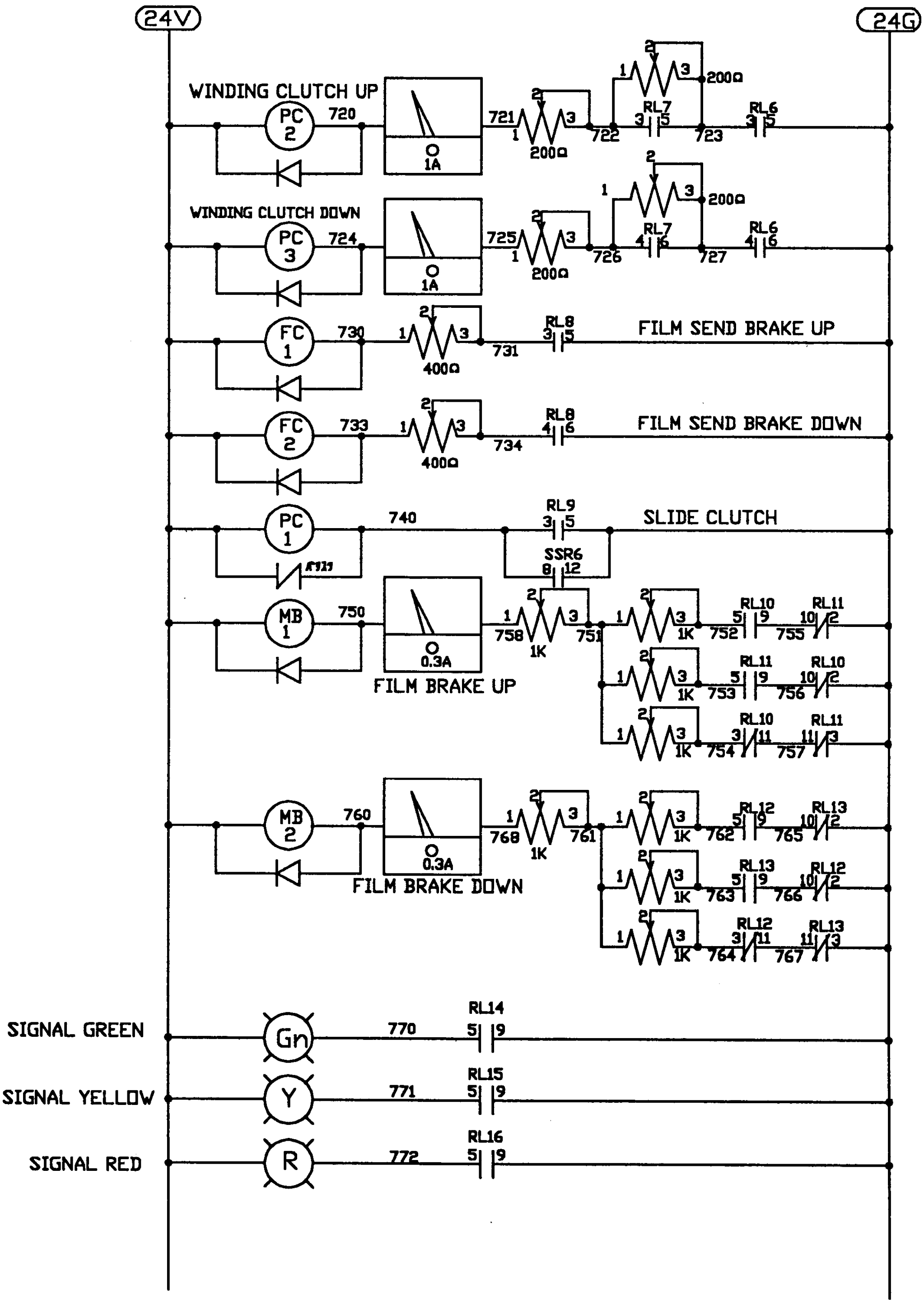
INOUE 99-8

INOUE 99-8

寸法公差(JIS B 0405)

型名 HLM-A60CE

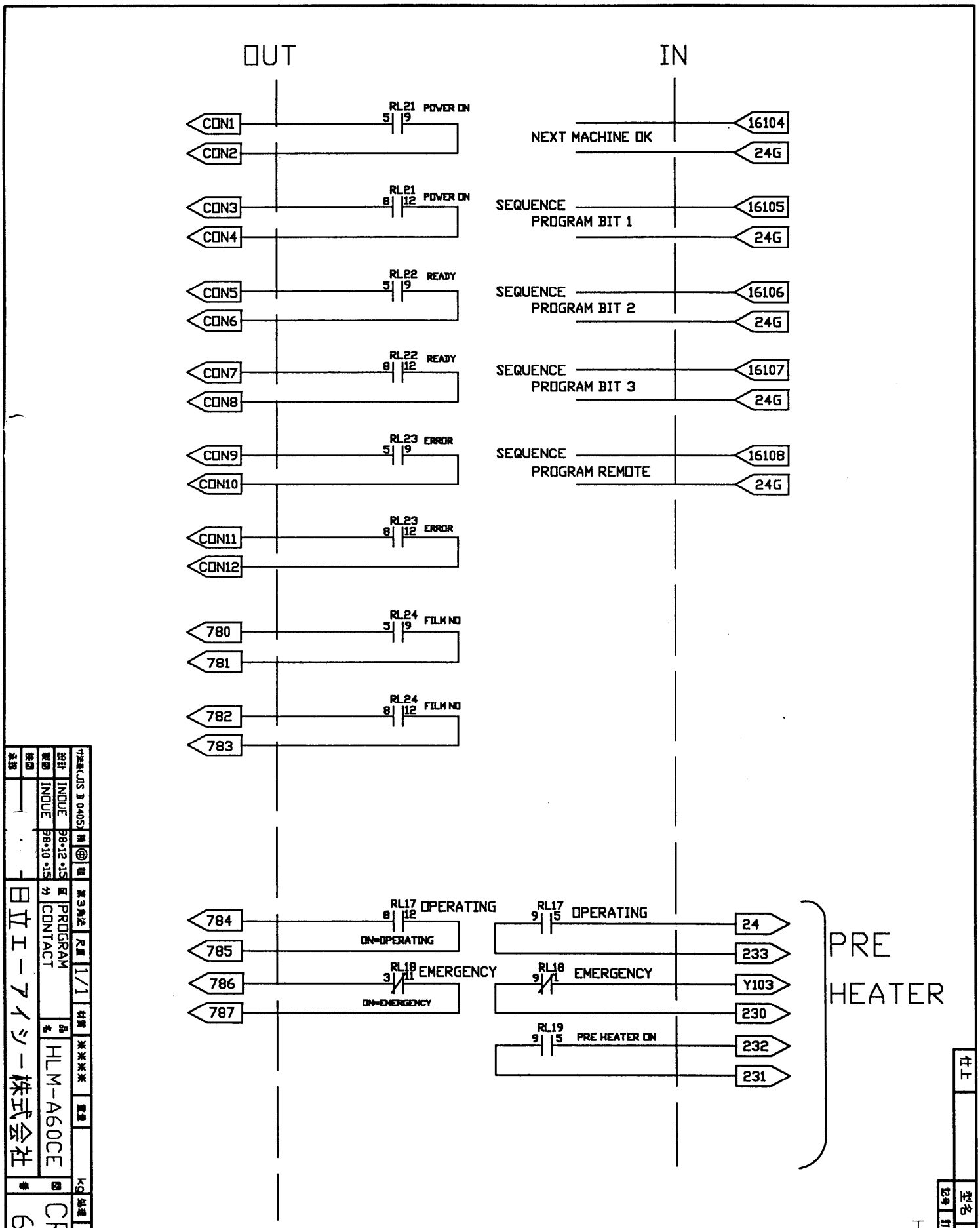
仕上



設計 INDUE
製図 INDUE
図名 CLUTCH BRAKE
品名 HLM-A60CE
図番 CRC 63-119
尺度 1/1
日立エーアイシー株式会社

型名 HLM-A60CE

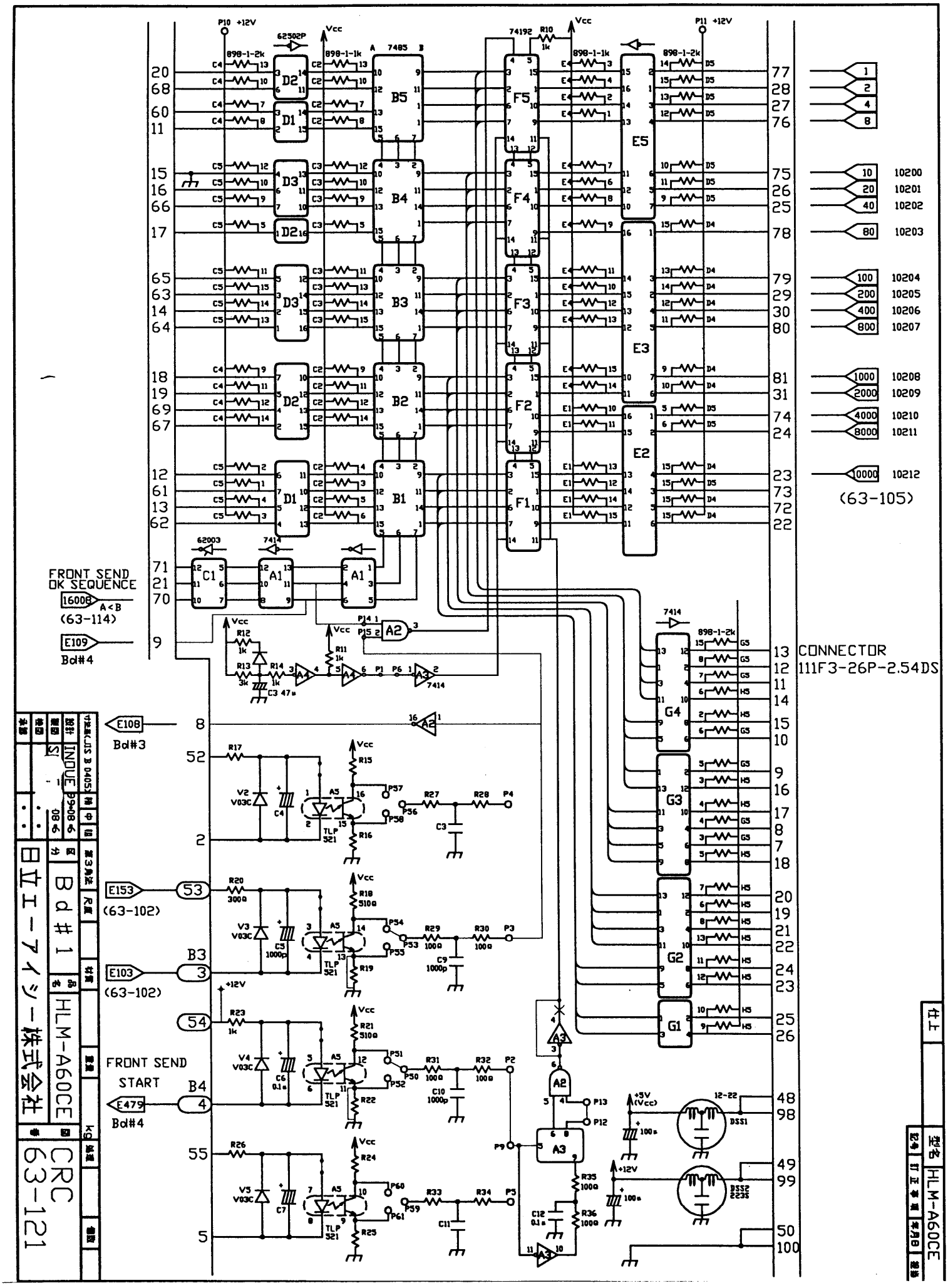
H.P.-ISO-A3

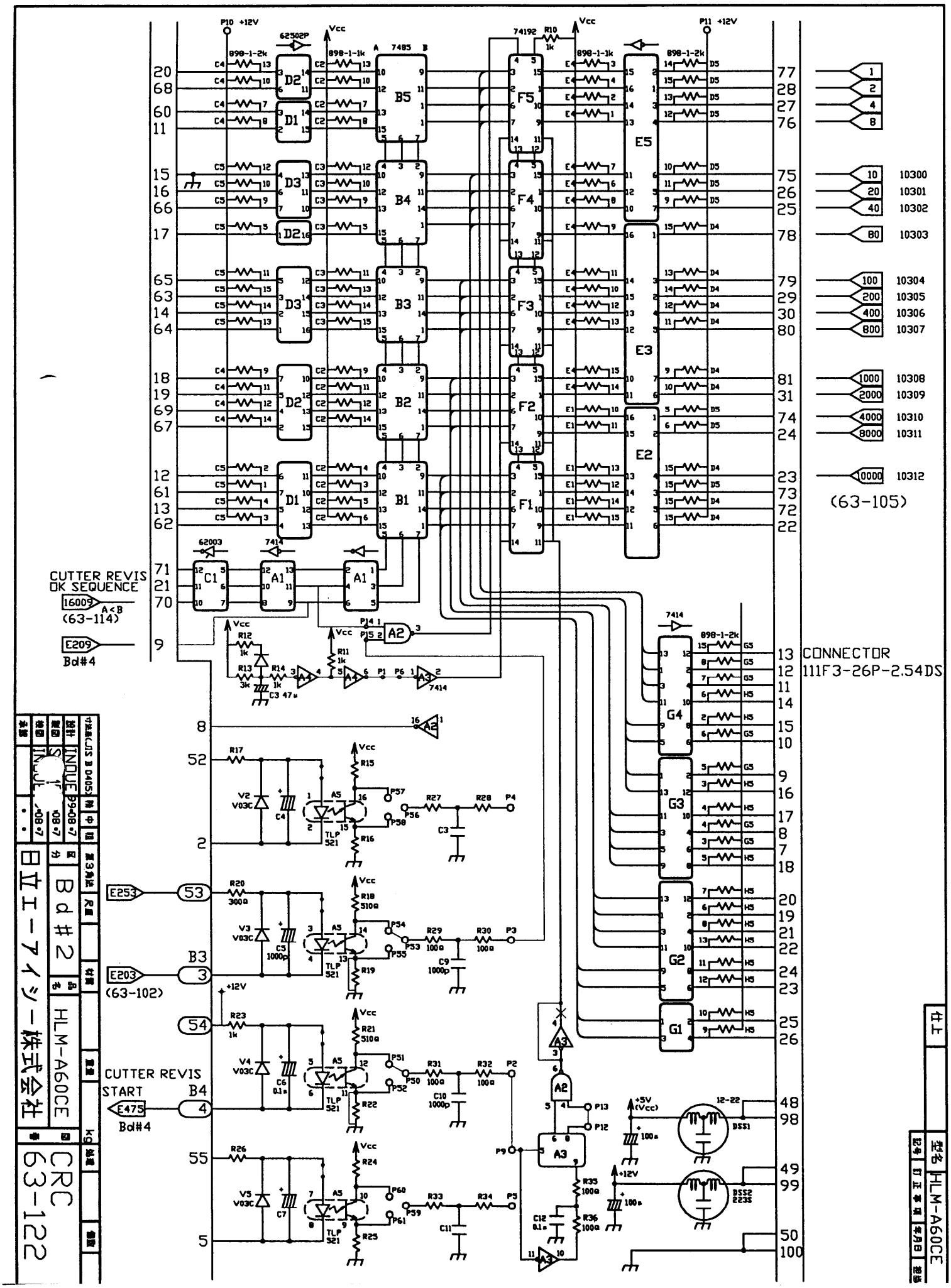


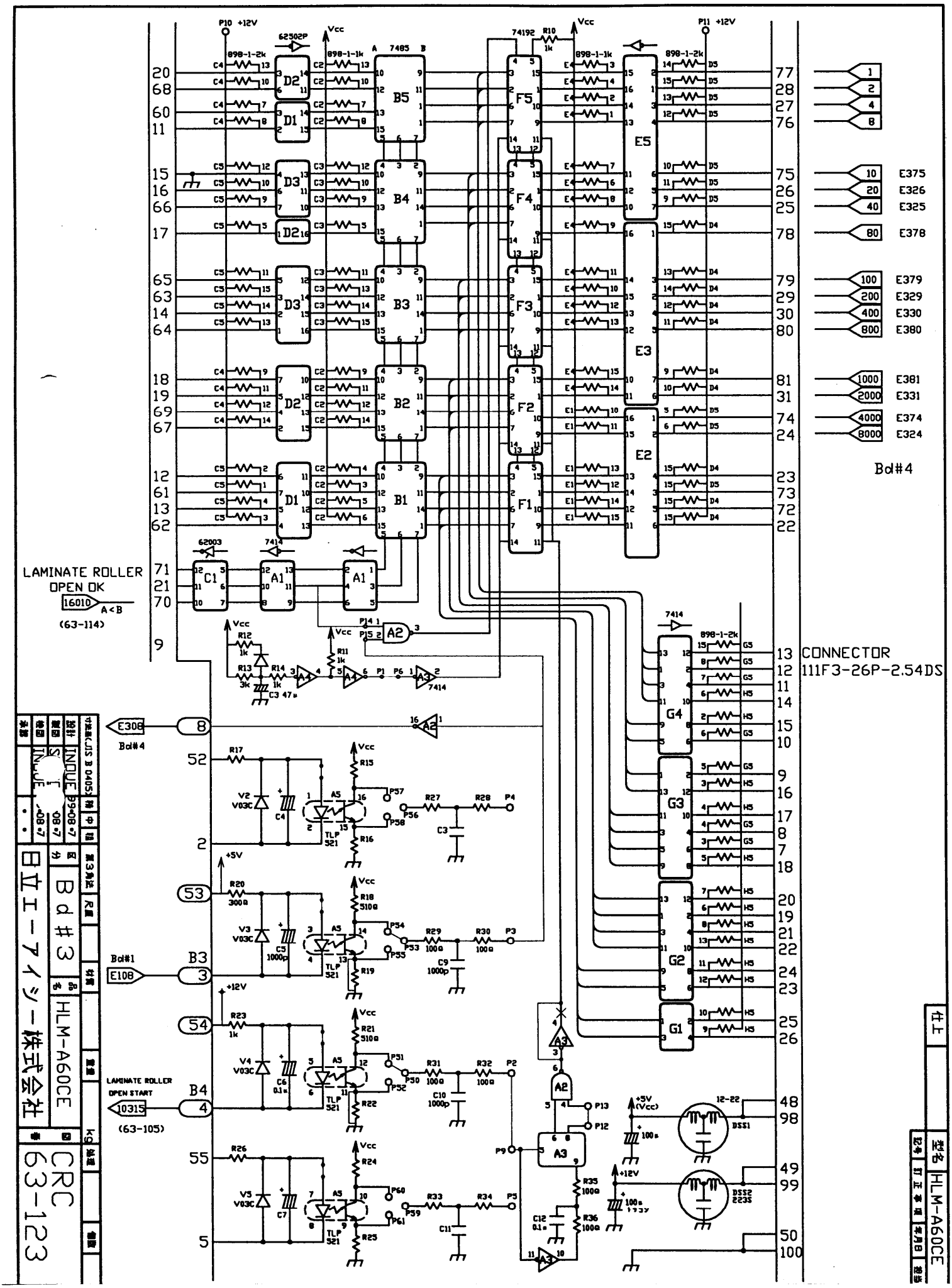
寸法表(JIS B 0405)	第3角法	尺度	1/1	材質	****
設計 INOUE 98・12・15	製図 INOUE 98・10・15	承認		名称	PROGRAM CONTACT
日立エーアイシー株式会社				図番	HLM-A60CE
				重量	kg
				処理	**
				個数	*
				番号	CRC 63-120

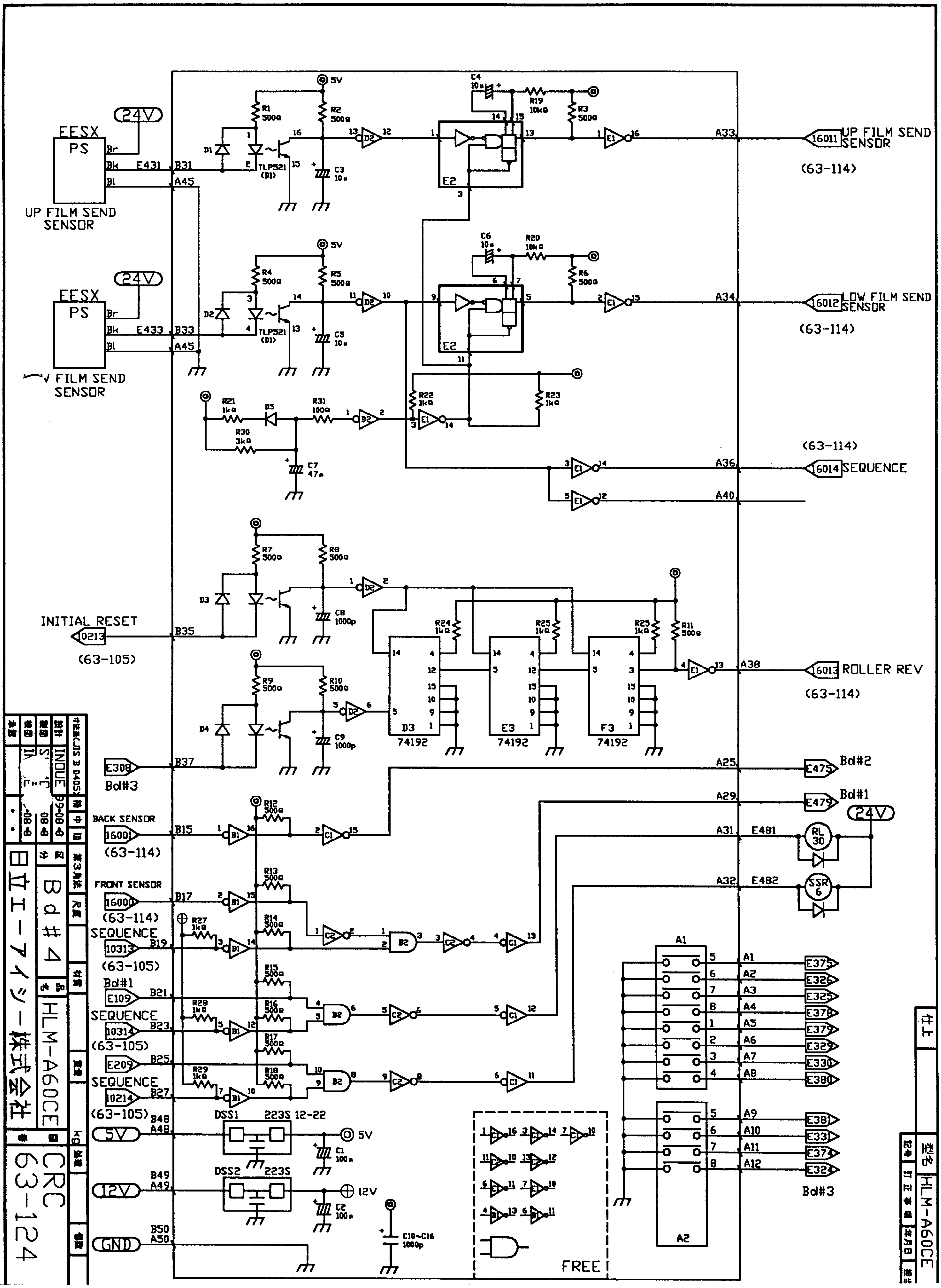
仕上		型名	HLM-A60CE
		記号	
		訂正事項	
		承認日	
		担当	

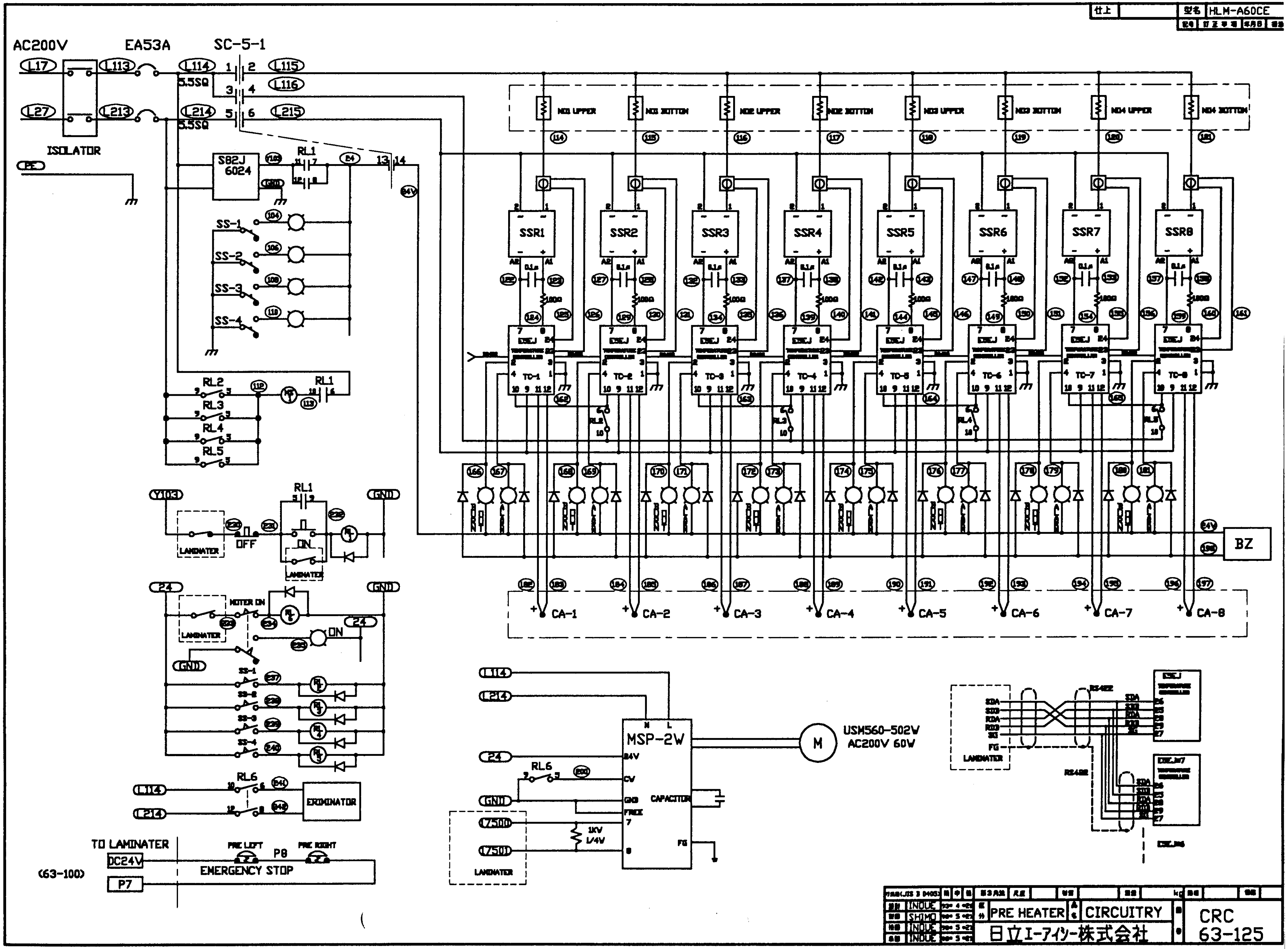
H.P.-ISO-A3


FRONT SEND OK SEQUENCE
(63-114)
(63-105)
CONNECTOR 111F3-26P-2.54DS
FRONT SEND START
(63-102)
(63-102)
日立エーアイシー株式会社
HLM-A60CE
CRC 63-121
Bd #1
INDUE
HLM-A60CE

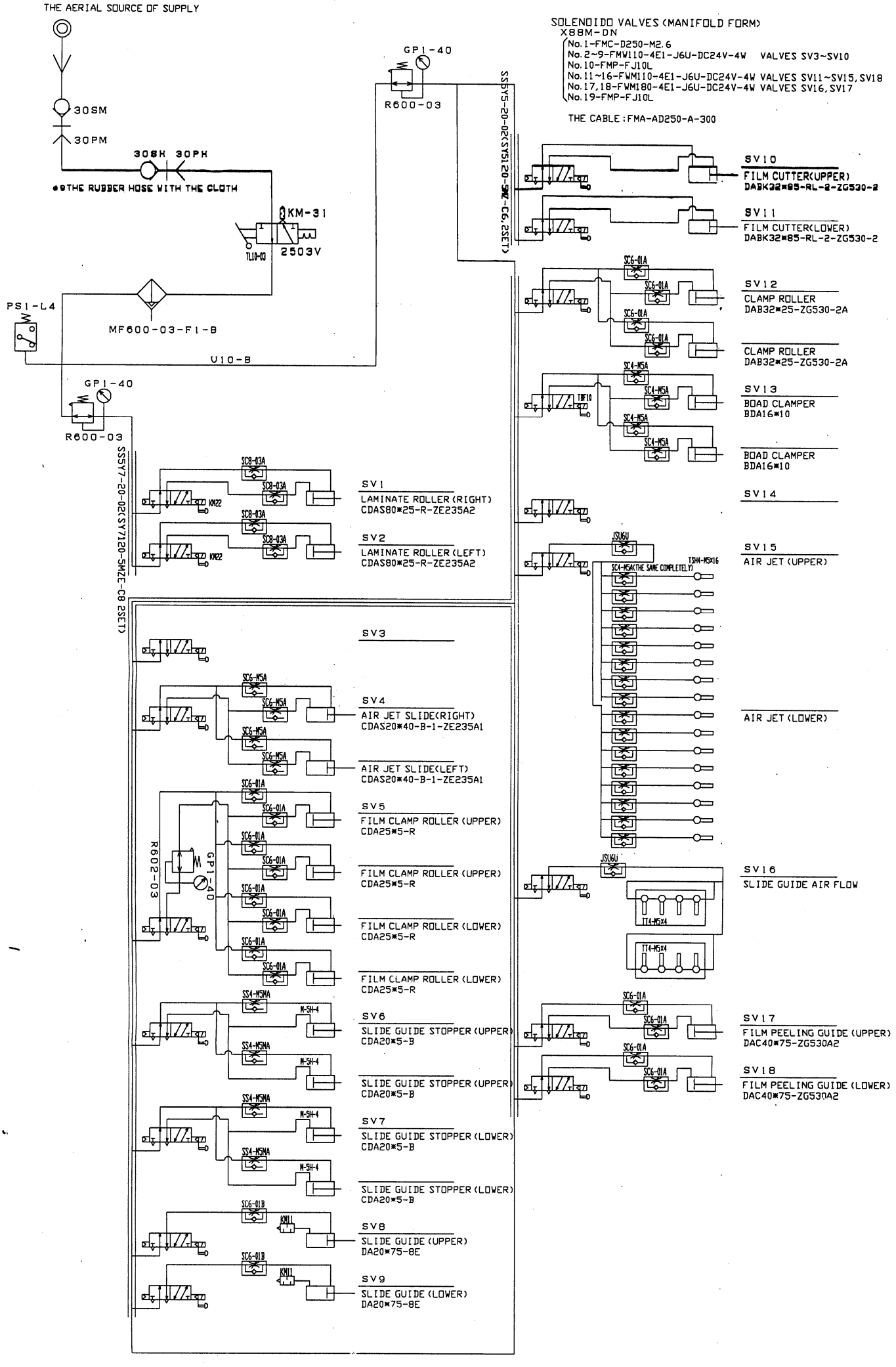

CUTTER REVIS OK SEQUENCE
16009 A<B (63-114)
E209 Bd#4
CUTTER REVIS START
E475 Bd#4
E253
E203 (63-102)
(63-105)
CONNECTOR 111F3-26P-2.54DS
日立エーアイシー株式会社
HLM-A60CE
CRC 63-122
Bd #2


P10 +12V
P11 +12V
Vcc
62502P
74192
7485
898-1-2k
898-1-1k
LAMINATE ROLLER OPEN OK
16010
A<B
(63-114)
62003
7414
CONNECTOR
111F3-26P-2.54DS
Bd#4
E308
Bd#1
E108
LAMINATE ROLLER OPEN START
10315
(63-105)
TLP 521
V03C
+5V
+12V
日立エーアイシー株式会社
HLM-A60CE
CRC 63-123
INOUE
Bd #3


EESX PS
UP FILM SEND SENSOR
24V
E431
E433
B31
A45
B33
TLP521 (D1)
5V
E2
UP FILM SEND SENSOR
(63-114)
LOW FILM SEND SENSOR
(63-114)
(63-114)
SEQUENCE
A33
A34
A36
A40
INITIAL RESET
B35
(63-105)
74192
ROLLER REV
(63-114)
A38
E308
Bd#3
B37
A25
A29
Bd#2
Bd#1
BACK SENSOR
B15
(63-114)
FRONT SENSOR
B17
(63-114)
SEQUENCE
B19
(63-105)
Bd#1
E109
B21
SEQUENCE
B23
(63-105)
E209
B25
SEQUENCE
B27
(63-105)
A31
E481
A32
E482
RL 30
SSR 6
A1
A2
B48 A48
DSS1
223S 12-22
DSS2
223S
B49 A49
B50 A50
5V
12V
GND
C10~C16 1000p
FREE
Bd#3
INOUE
Bd#4
HLM-A60CE
日立エーアイシー株式会社
CRC 63-124
仕上
HLM-A60CE



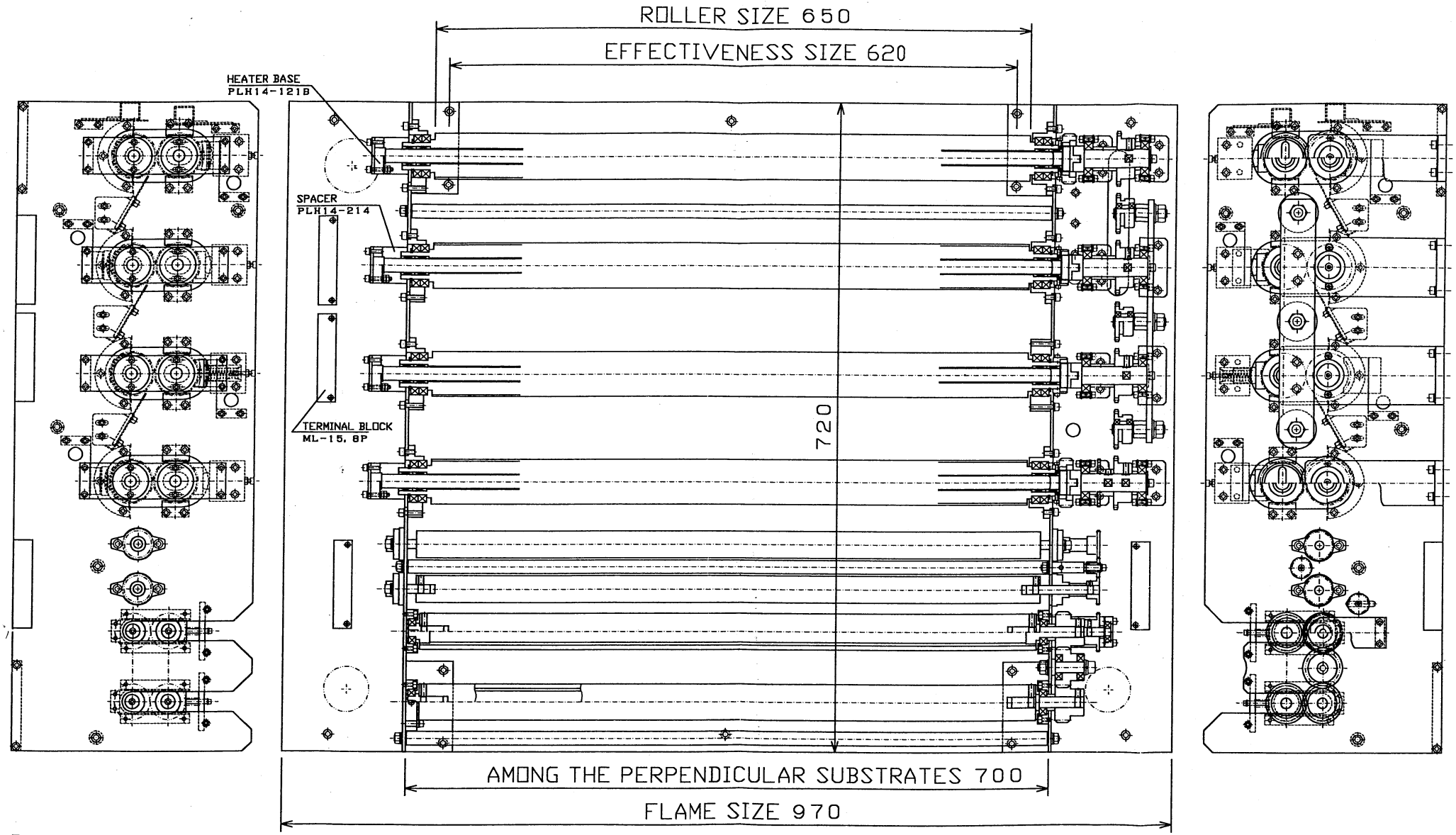
AC200V
EA53A
SC-5-1
ISOLATOR
5.5SQ
S82J 6024
RL1
RL2
RL3
RL4
RL5
RL6
SS-1
SS-2
SS-3
SS-4
SSR1
SSR2
SSR3
SSR4
SSR5
SSR6
SSR7
SSR8
CA-1
CA-2
CA-3
CA-4
CA-5
CA-6
CA-7
CA-8
BZ
OFF
ON
MOTER ON
LAMINATER
ERIMINATOR
TO LAMINATER
DC24V
P7
P8
EMERGENCY STOP
(63-100)
MSP-2W
CAPACITOR
USM560-502W
AC200V 60W
M
1KV 1/4V
RS422
RS485
HLM-A60CE
INOUE
SHIMO
PRE HEATER
CIRCUITRY
日立エーアイシー株式会社
CRC
63-125



配管系統図

日立エーアンドシー株式会社

HLM-A60-E



THE TEMPERRATURE SENSOR COMPOSITION

THE SIDE OF METALLIC ROLLER TEMPERATURE SENSOR BASE(14-63B),THERMOCOUPLE BASE(14-64A),REED LINE FLKATION(14-66A),TENPERATURE SENSOR(14-67A)

THE SIDE OF GOM ROLLER TENPERATURE SENSOR BASE(14-63A),TEMPERATURE SENSOR(SE-4275)

Fig.17 PREHEATING MACHINE MECHANISM FIGURE
(THE PLAN,THE LEFT SIDE VIEW,THE RIGHT SIDE VIEW)

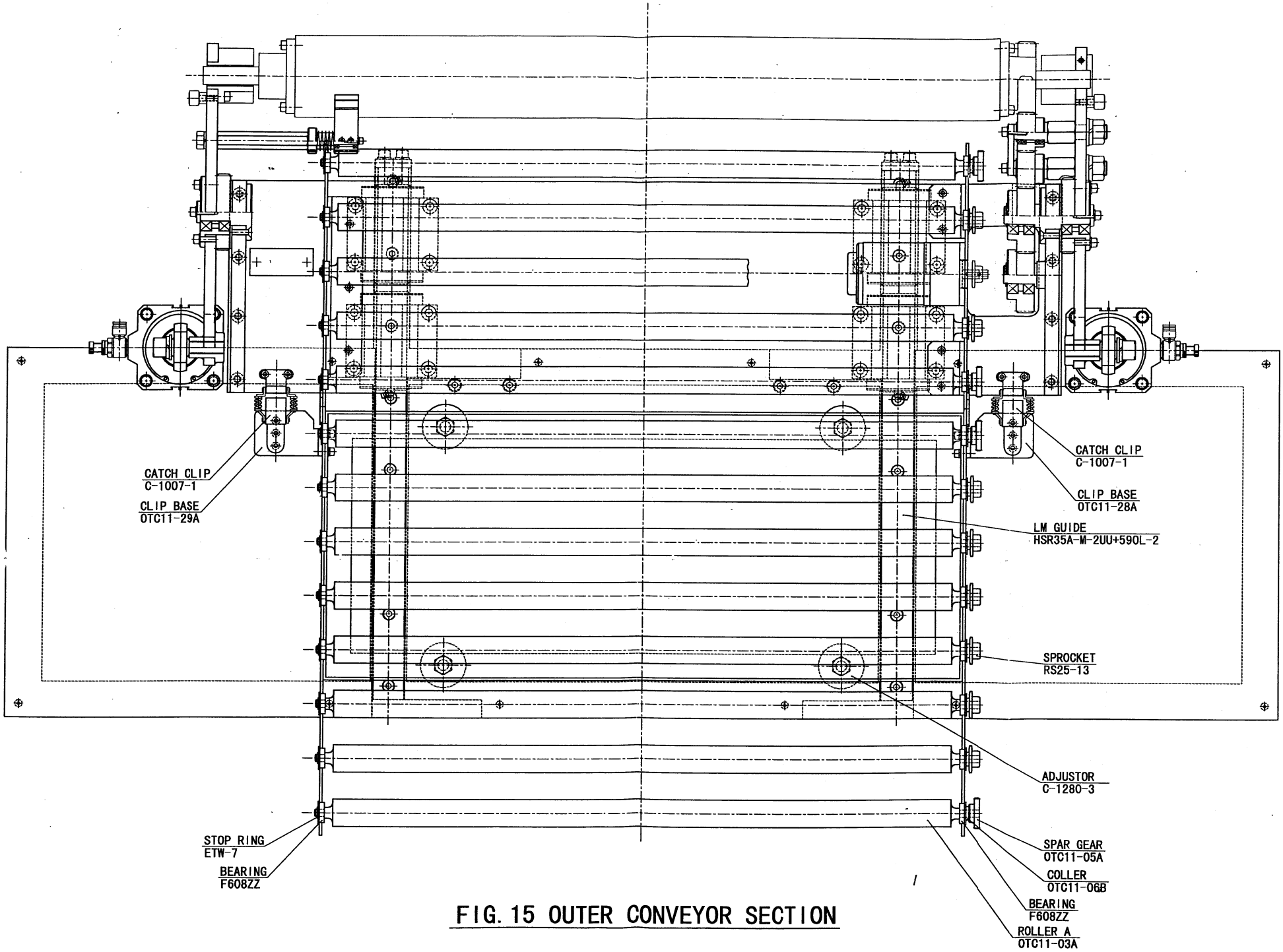


FIG. 15 OUTER CONVEYOR SECTION

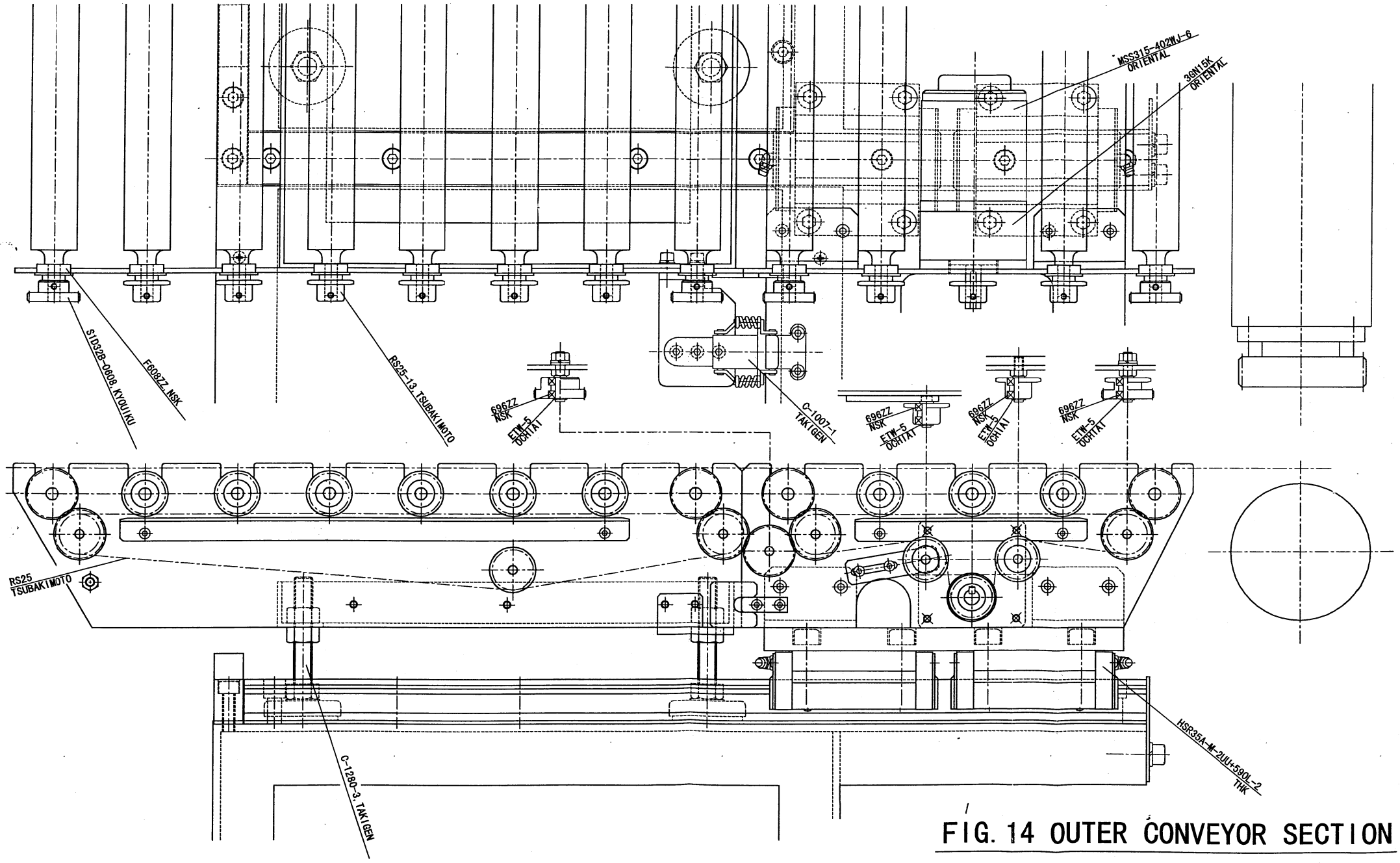


FIG. 14 OUTER CONVEYOR SECTION

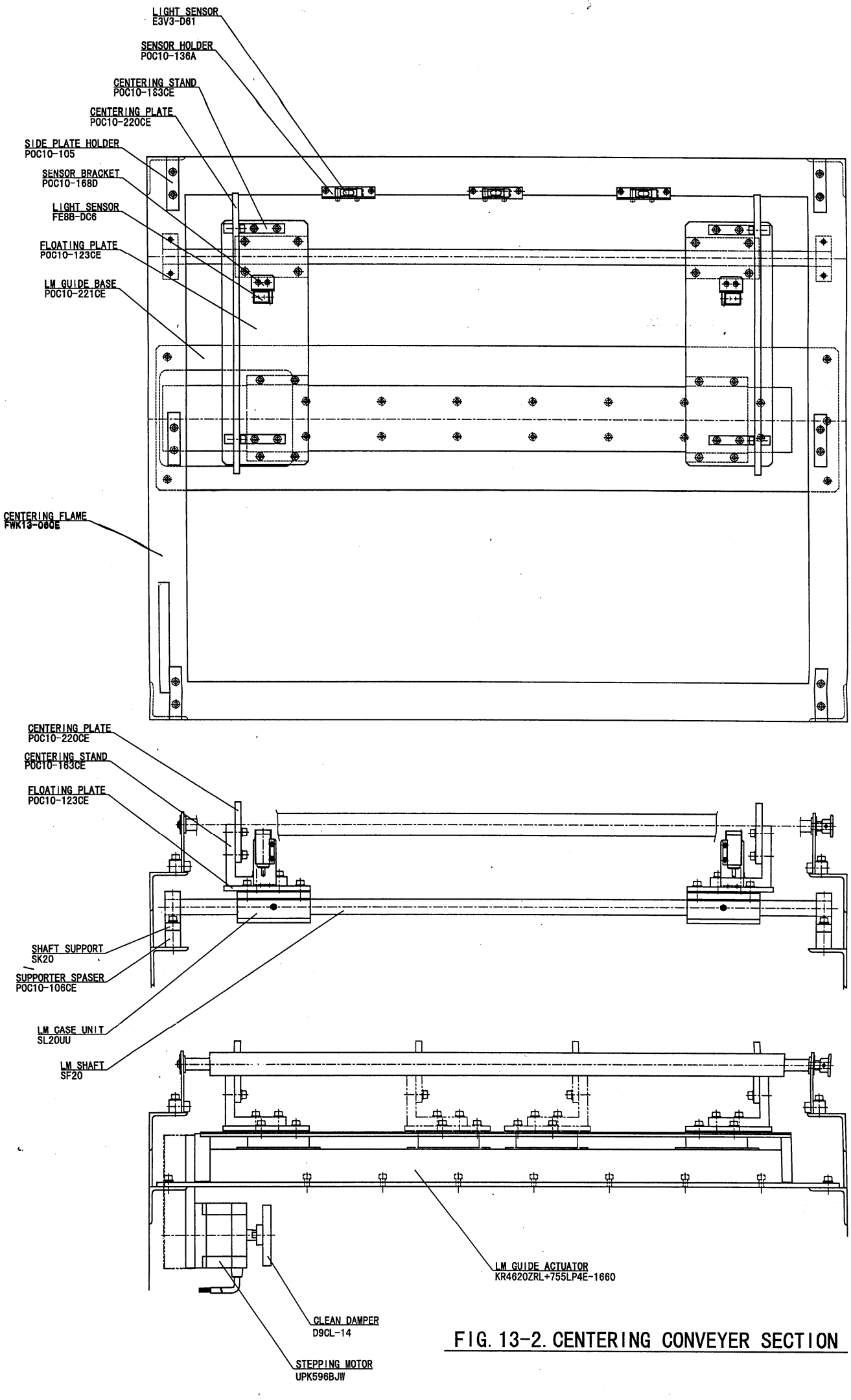


FIG. 13-2. CENTERING CONVEYER SECTION

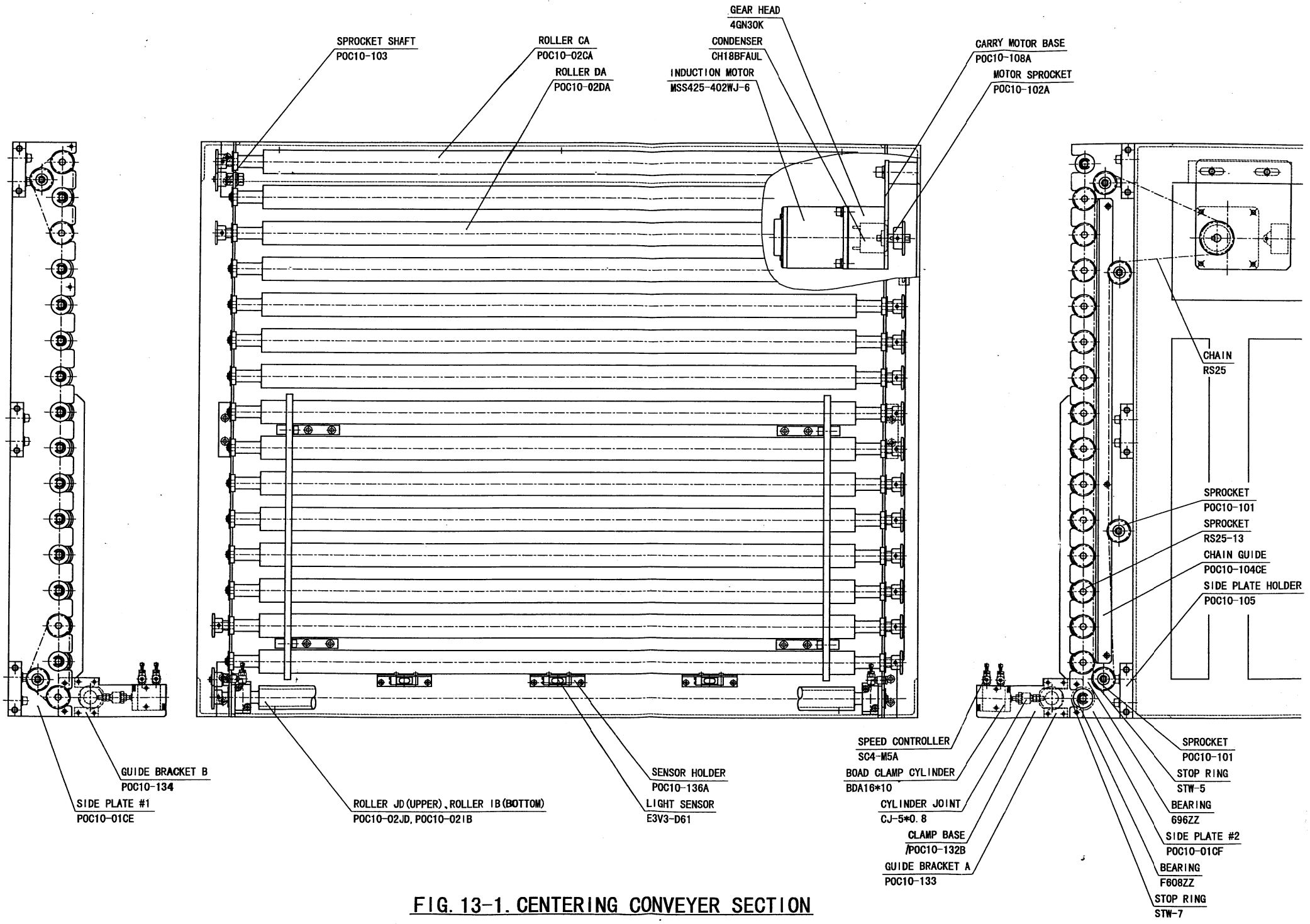


FIG. 13-1. CENTERING CONVEYER SECTION

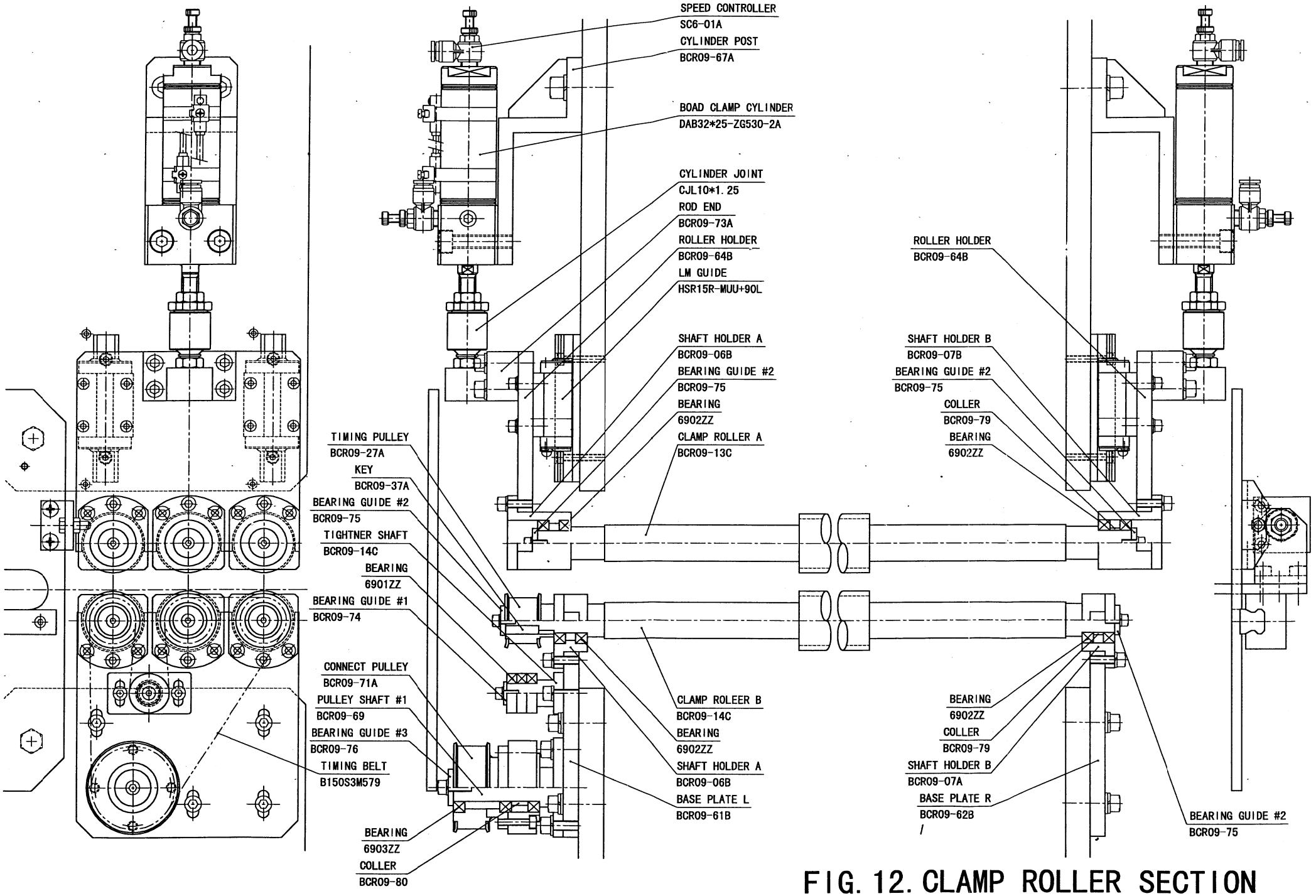


FIG. 12. CLAMP ROLLER SECTION

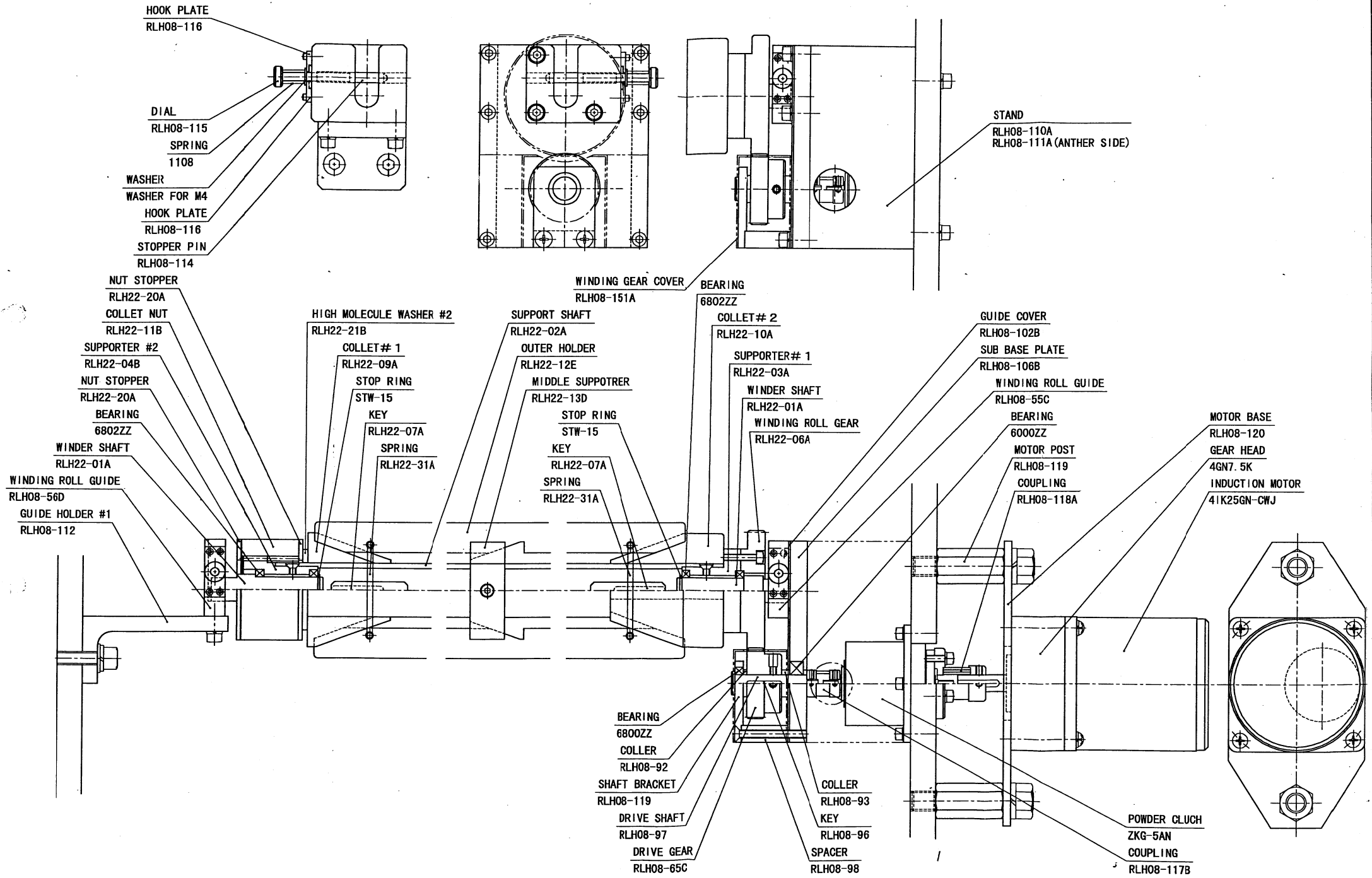


FIG. 11. WINDING ROLL HOLDER SECTION

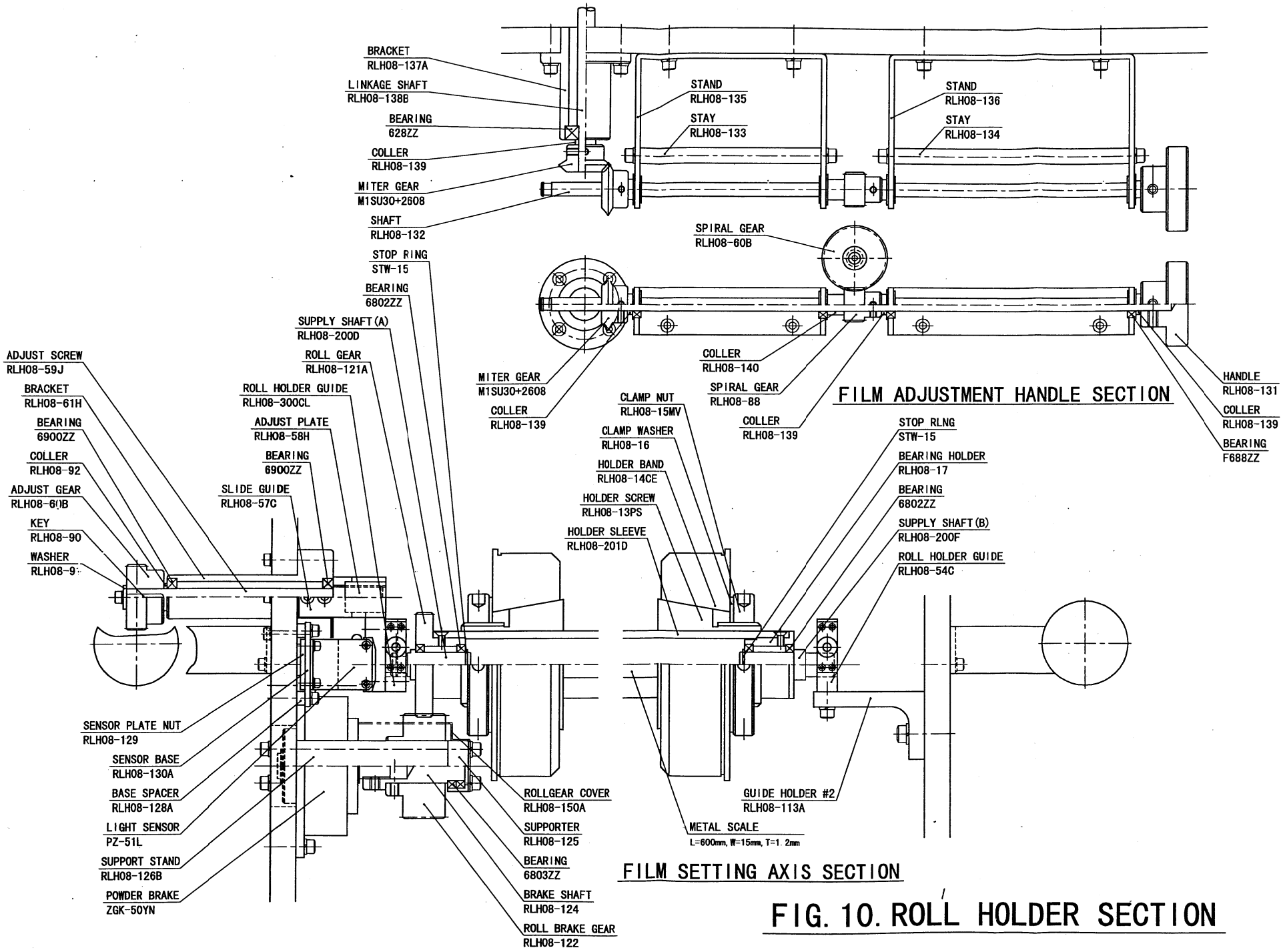


FIG. 10. ROLL HOLDER SECTION

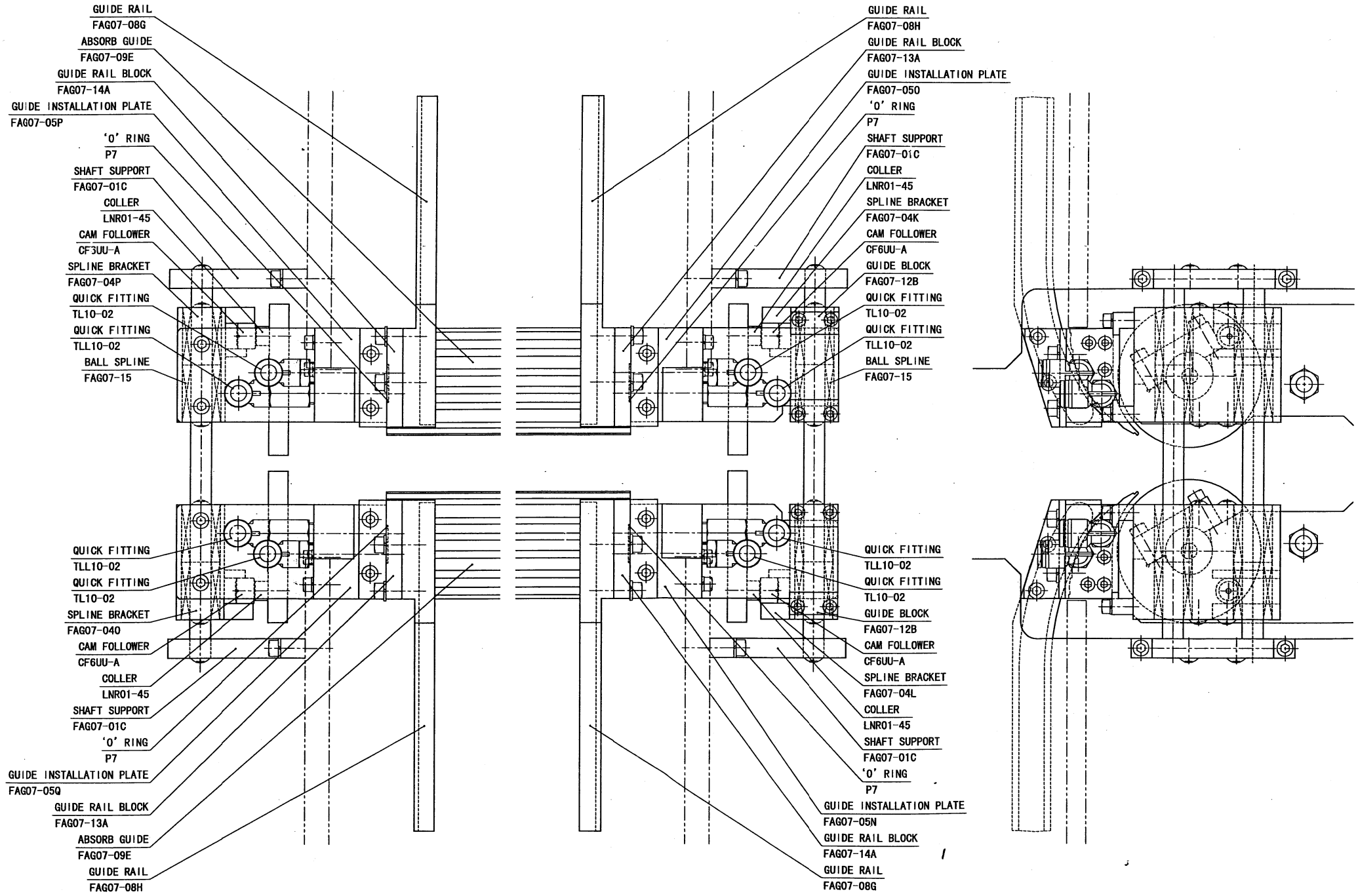


FIG. 9. FILM ABSORB GUIDE SECTION

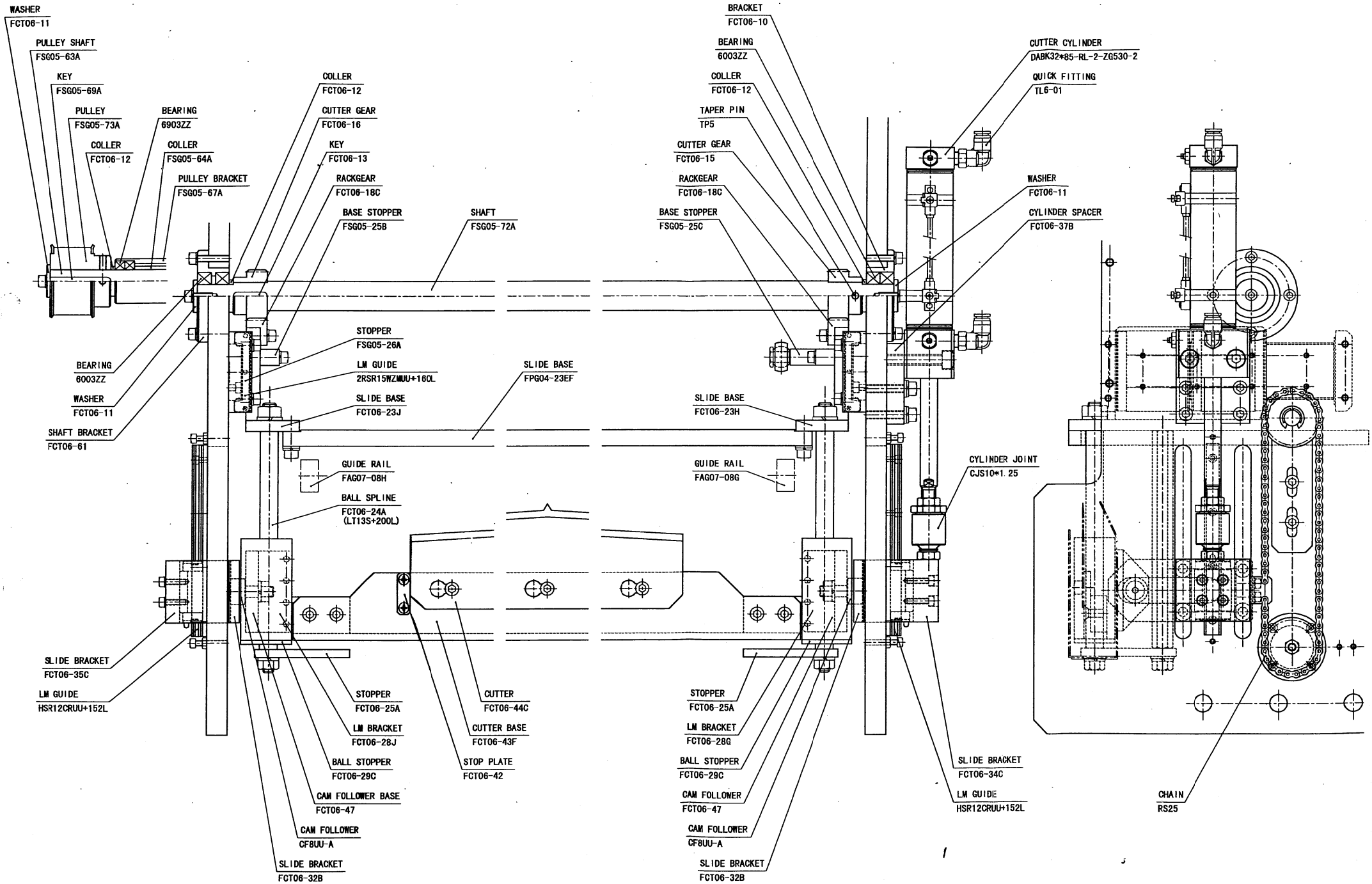


FIG. 8. FILM CUTTER SECTION, BOTTOM SIDE

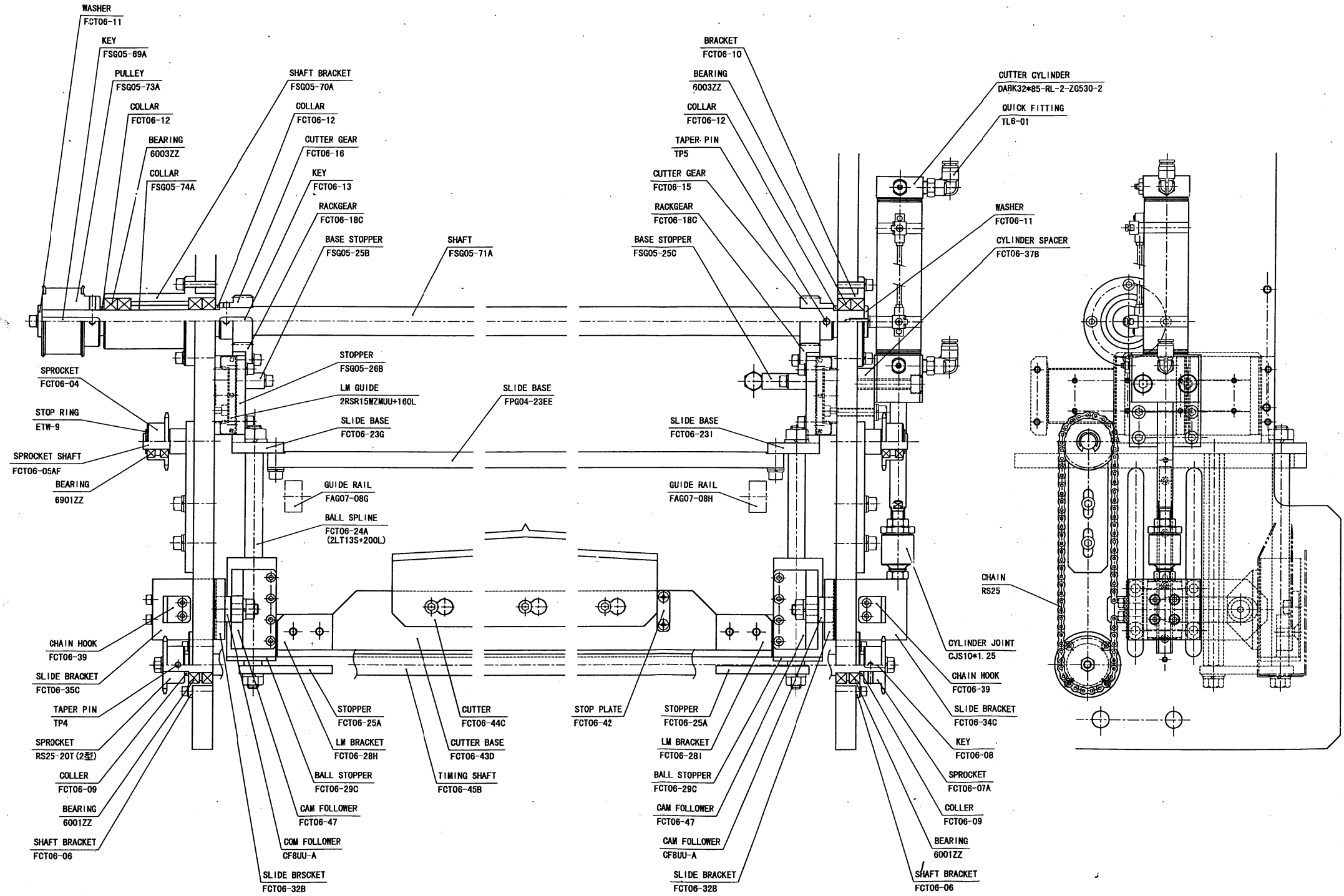


FIG. 7. FILM CUTTER SECTION, UPPER SIDE

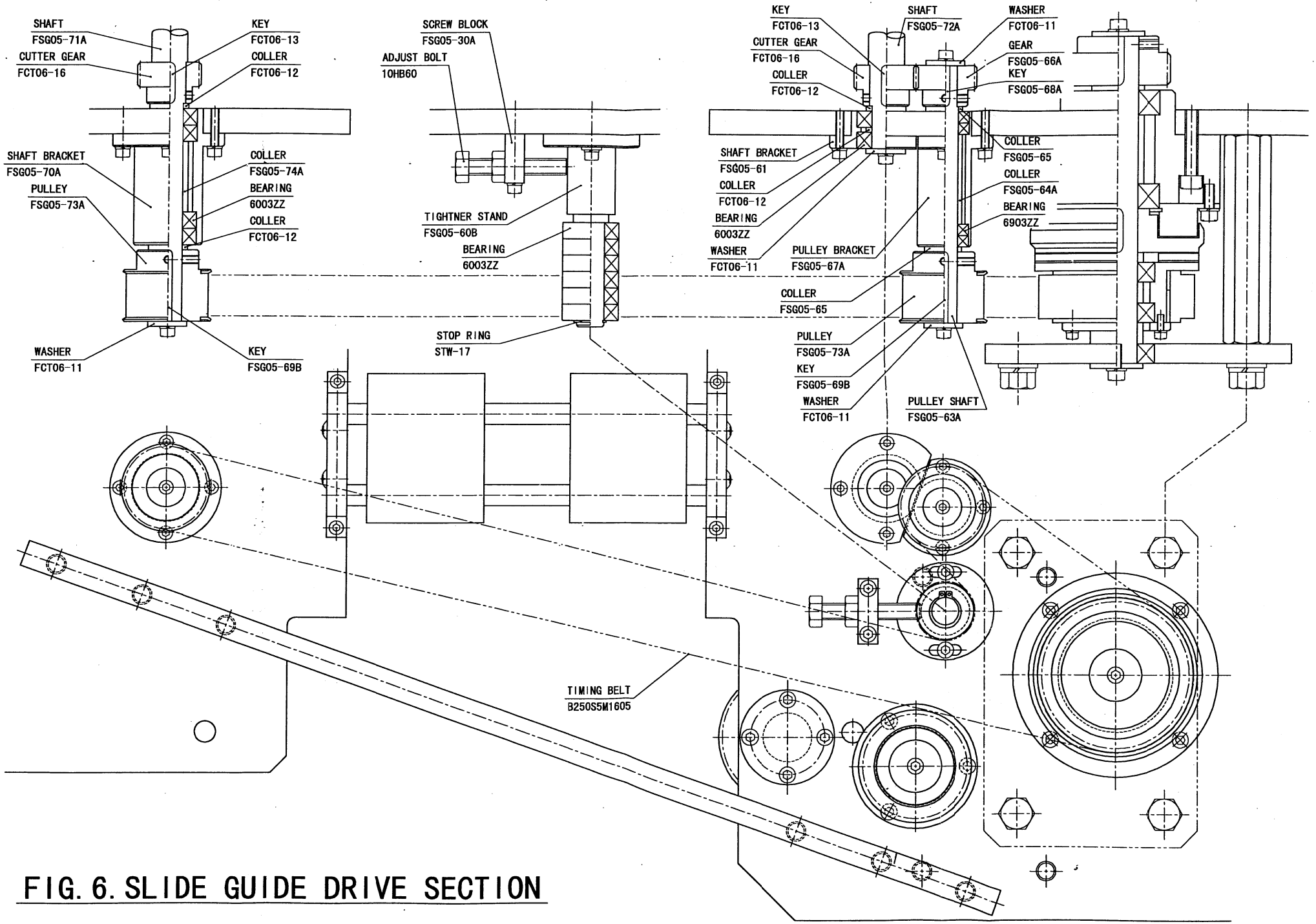


FIG. 6. SLIDE GUIDE DRIVE SECTION

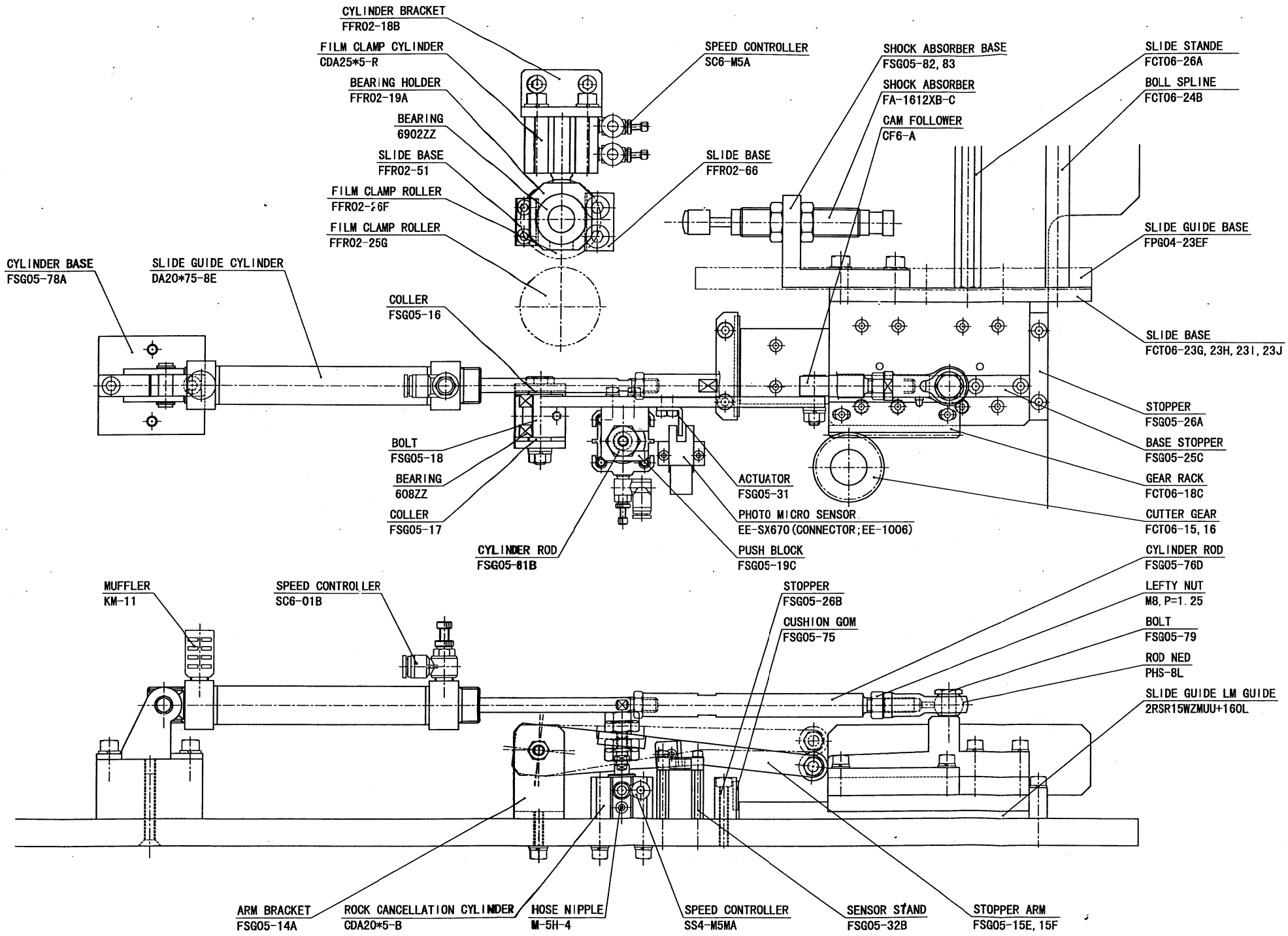


FIG. 5. FILM SLIDE GUIDE SECTION

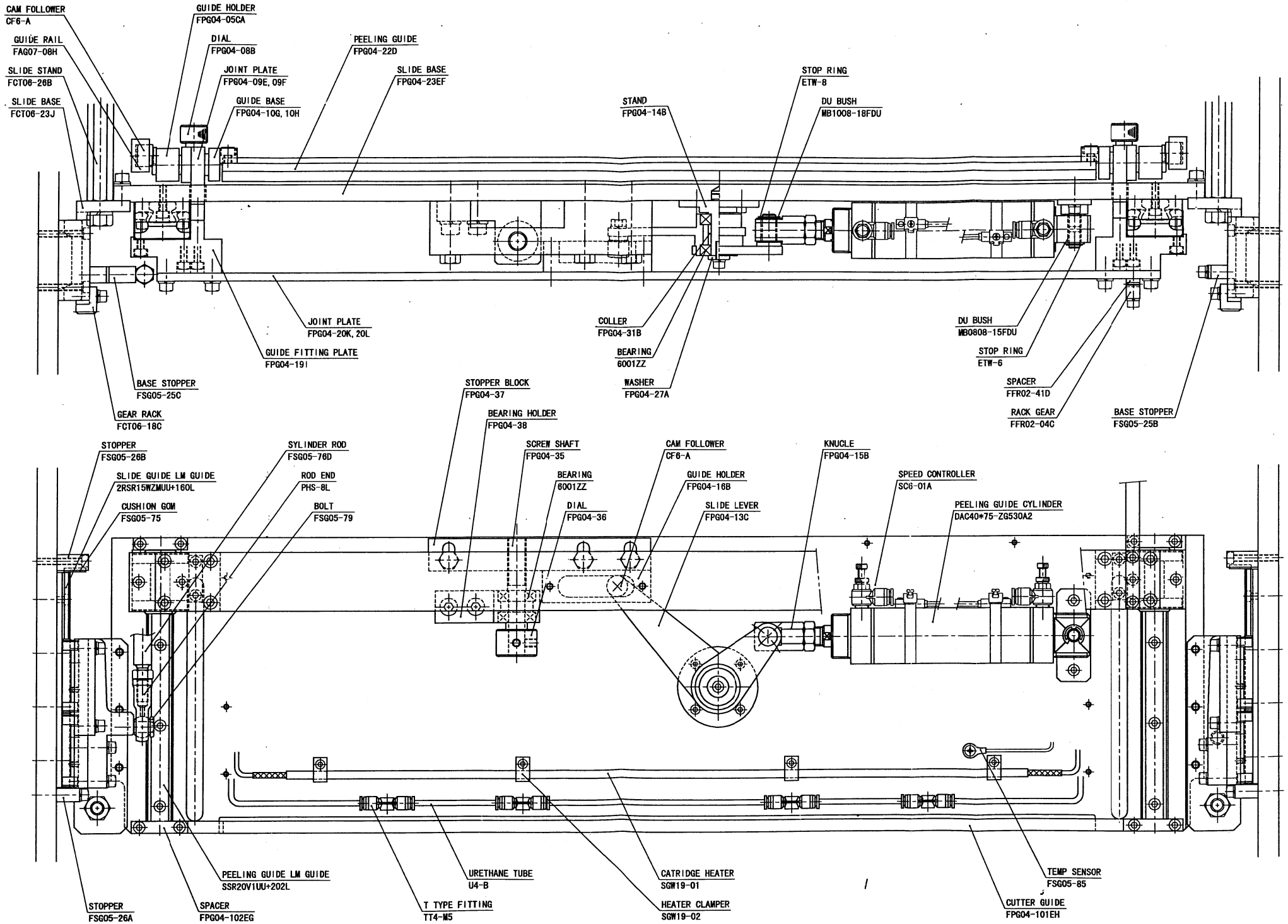


FIG. 4. FILM PEELING GUIDE SECTION

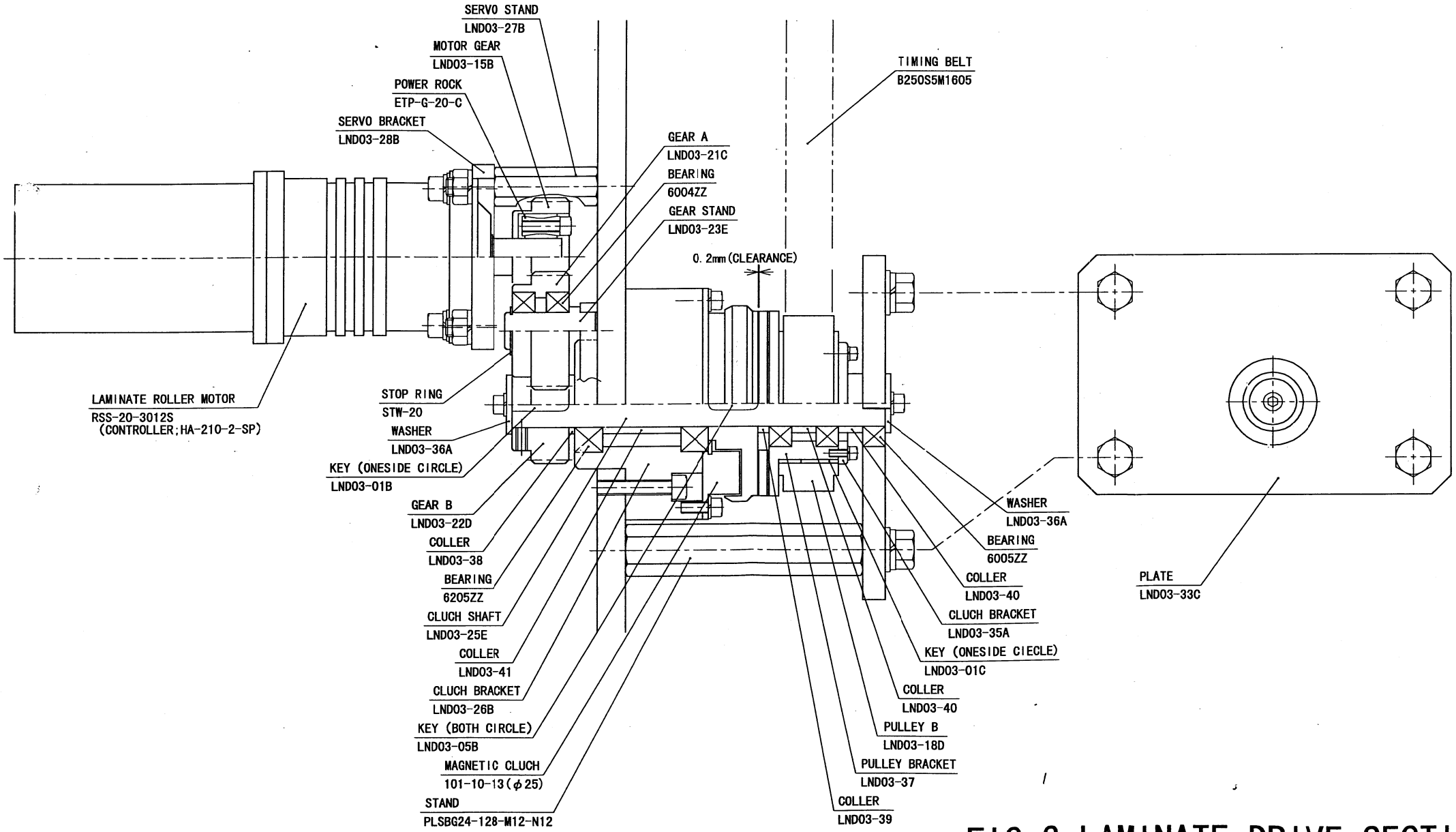


FIG. 3. LAMINATE DRIVE SECTION

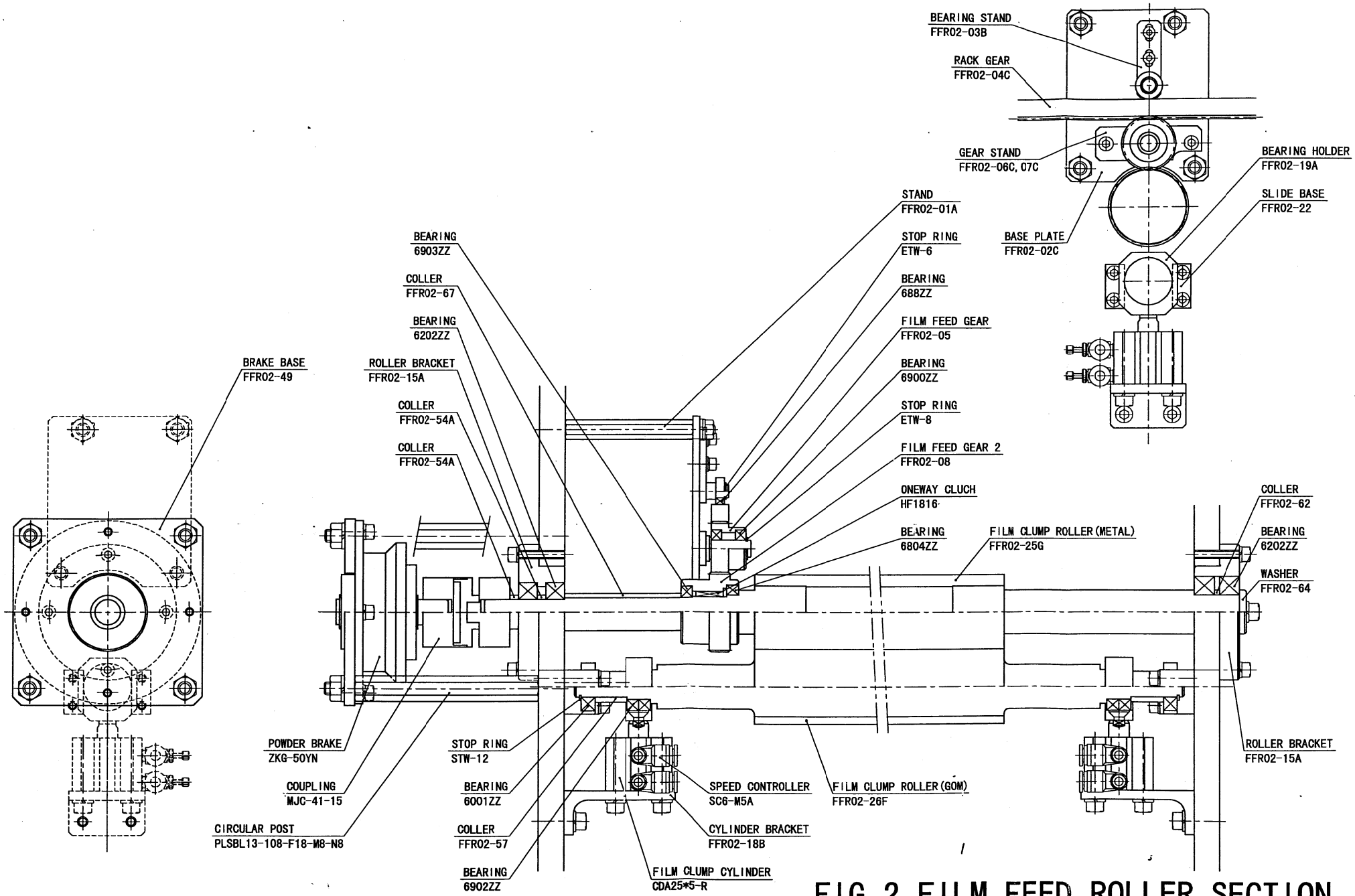


FIG. 2. FILM FEED ROLLER SECTION

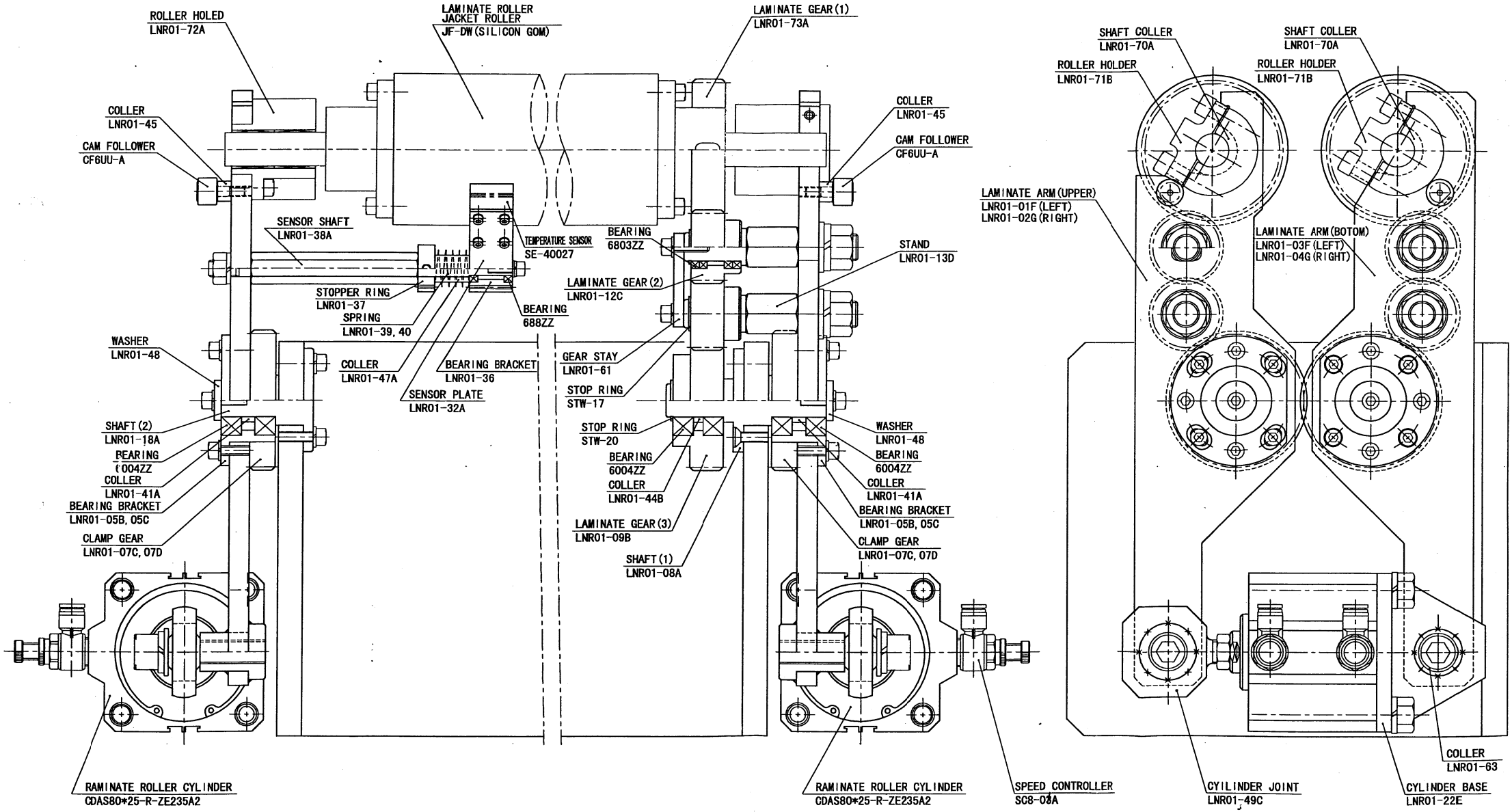


FIG. 1. LAMINATE ROLLER SECTION

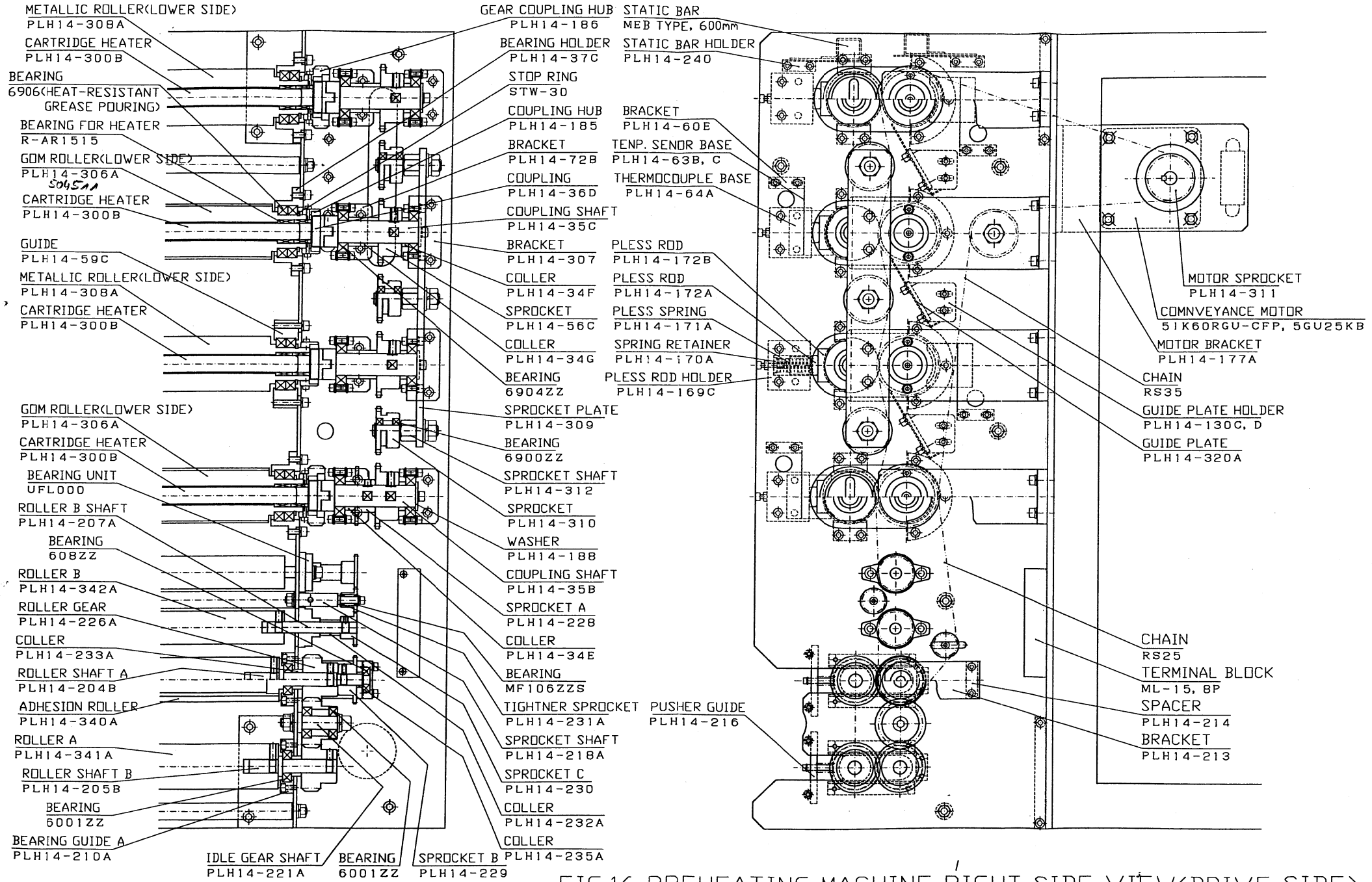
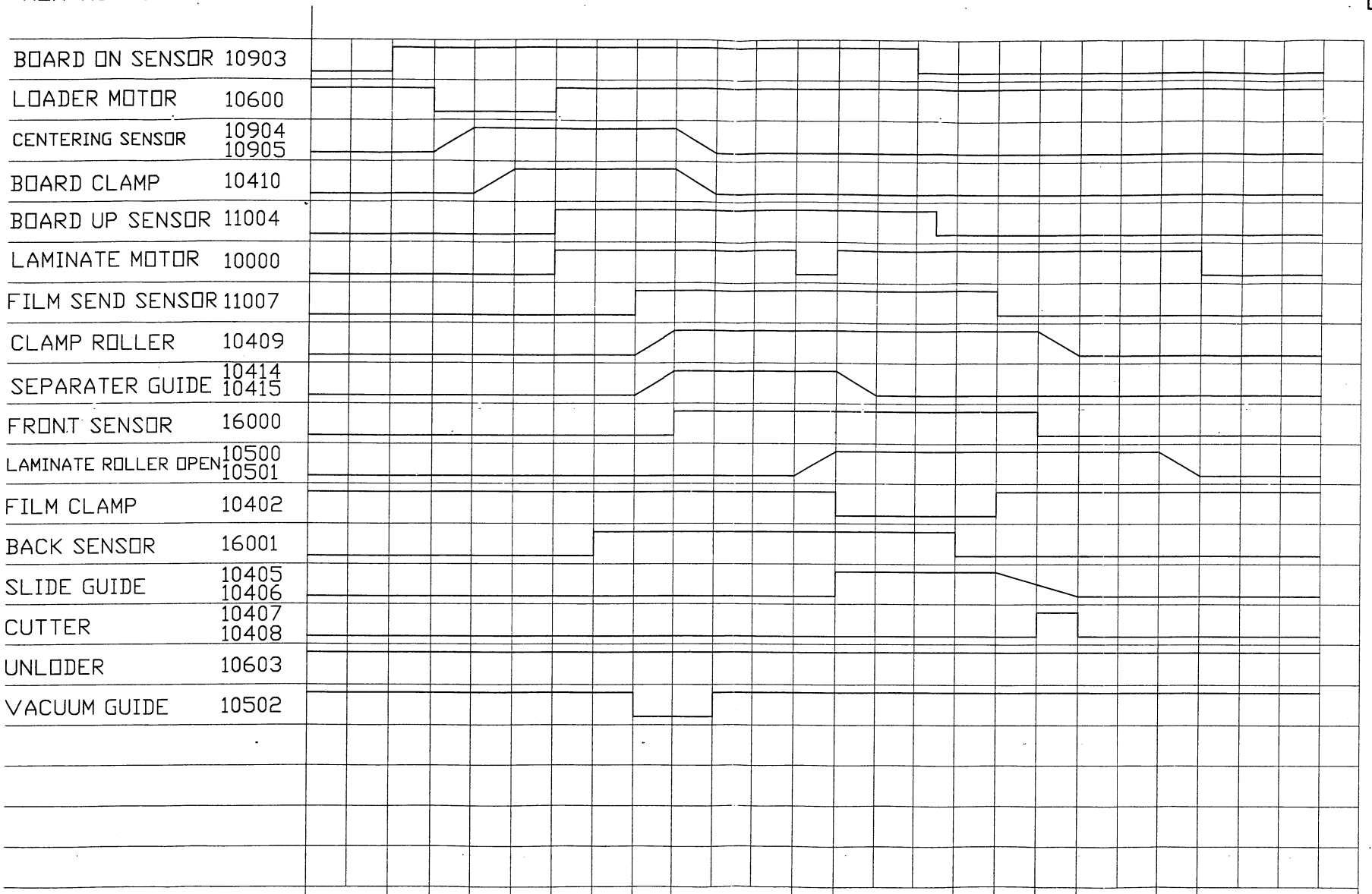


FIG.16 PREHEATING MACHINE RIGHT SIDE VIEW(DRIVE SIDE)

HLM-A60-E

仕上		型名	HLM-A60-E

記号	訂正事項	年月日	担当



寸法差(JIS B 0405)	精	中	粗	第3角法	尺度	/	材質		重量	kg	処理		個数	
設計	井上	99・07・17		区分	HLM-A60		品名	TIMMING CHART		図番	CRC 60-200			
製図	井上	99・07・17												
検図		・ ・												
承認		・ ・												

日立エーアイシー株式会社