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USERGUIDE
June 1995

KG-200 Controller Series

HIM Series Robot
HE Series Robot

MNL-00047

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

CONTENTS

1. FEATURES

The KG controller controls the HIM/HE series robot with its sequence control system which is applicable for complicated special robot motion. It is available to control the robot operation just besides the robot by using a handy console.

MODE SELECTION	Selection of [ROBOT OFF], [AUTO MODE] and [PGM·MAN] by a key switch.
EMERGENCY STOP	Cut off the all output by pressing EMERGENCY STOP switch.
MANUAL OPERATION	Individual manual operation of Main arm, Strip, traverse and wrist flip motion are available.
RETURN TO HOME.....	Possible to return to home position by [HOME] button.
SETTING	MODE setting and TIMER setting are done with digital display.

The following display is available on the LCD (Liquid crystal display with back light) which has 16 letters and 4 lines.

PROGRAM NUMBER	Max. 20 programs can be stored
MODE setting	Setting of operation mode
TIMER setting	Digital display and setting of timer value (units of 0.01SEC)
X AXIS POSITION	Digital display and setting of X axis stop position
PALLETIZING ..... (Multi-row placing)	Setting of stop pitch and number of stops
INPUT/OUTPUT display ...	Monitoring of I/O status (Robot I/O and interface with press)

POSITION ON X AXIS ..... Display of the present position on the traverse beam

ALARM indication ..... Diagnosis of handling problem

ERROR message ..... Error messages of robot problem

COUNTER ..... Cycle counter of robot operation and take out cycle

2. CAUTION ON HANDLING KG-200 CONTROLLER

Make sure the followings before operate the robot with KG controller.

1) Press the keys on control panel by finger. Do not press the keys by sharp shaped tool such as screw driver in order to protect keys from being damaged.

2) Make sure that the circuit breaker is OFF when connect and disconnect the cables of KG controller.

3) Check if the wiring (interface between the press and robot) is correct after installation of robot. The miss wiring might cause the miss operation or damage the controller or robot.

4) Keep the controller in the proper position. Especially, high temperature and/or vibration will cause the problem.

3. STANDARD SPECIFICATION

a) Conditions

	Specification
Power supply	AC 200V 50/60 Hz Three phase
Allowable voltage	AC 180V ~ AC 253V
Allowable frequency range	± 5%
Power consumption	650 Watt (Max) (KG-201/204) 1130 Watt (Max) (KG-203)
Temperature range	0° C ~ + 50° C
Humidity range	35% ~ 85% RH, No dew
Circumstance	No corrosion gas and dust

b) Control

	Specification
Control system	Stored program system
Programming system	ROM fixed sequence program
Program capacity	8000 Steps
Scan speed	0.74μs
Program protection	Pass word
Battery life time	3 years(+5° ~+35°) Lithium bat.
Temperature range	0° C ~ + 55° C
Humidity range	35% ~ 85% RH, No dew
Voltage resistance	AC 1500V / 1 min.
Insulation resistance	Over 5MΩ at DC 500V
Circumstance	No corrosion gas and dust

c) Input/Output

	Specification
Input	DC 24V 7 A (Open collector)
Transistor output(Max)	DC 24V 200 mA (Open collector)
Relay output	AC 250V, DC 30V 5A
Insulation	Photo-coupller

d) Power supply for control circuit

	Specification
Power supply	AC 200V 50/60 Hz Single phase
Allowable voltage	AC 170V ~ AC 264V
Voltage resistance	AC 2KV / 1 min. (Cut off 20mA)
Temperature range	0° C ~ + 50° C
Humidity range	30% ~ 90% RH, No dew
Preservation temp.	-20° C ~ + 85° C(20% ~ 95%)
Over load protection	Over 105% of rated consumption
Safety standard	UL1012, CSA EB1402

e) Inverter

	Specification
Power supply	AC200V ~ AC230V 50/60HZ 3phase
Allowable voltage range	AC 180V ~ AC 253V(50/60 HZ)
Allowable frequency range	± 5%
Power capacity	1.5KVA (0.4kw)(KG-201/204) 4.5KVA (1.5kw)(KG-203)
Rated output	1.2KVA (0.4kw)(KG-201/204) 3.2KVA (1.5kw)(KG-203)
Temperature range	- 10° C ~ + 50° C
Humidity range	90% RH, No dew
Preservation temp.	-20° C ~ + 65° C
Protection	Over current, Over load, External thermal protection
Power consumption	Less 4.3A (1.4Kw) Less 7.2A (0.75Kw)

4. CONTROL BOX

1 SWITCH PANEL ON THE BOX

(1) [KEY SWITCH]

a) ROBOT OFF .. For the operation of only the press (without the robot).

b) AUTO MODE .. For the auto operation of the robot.

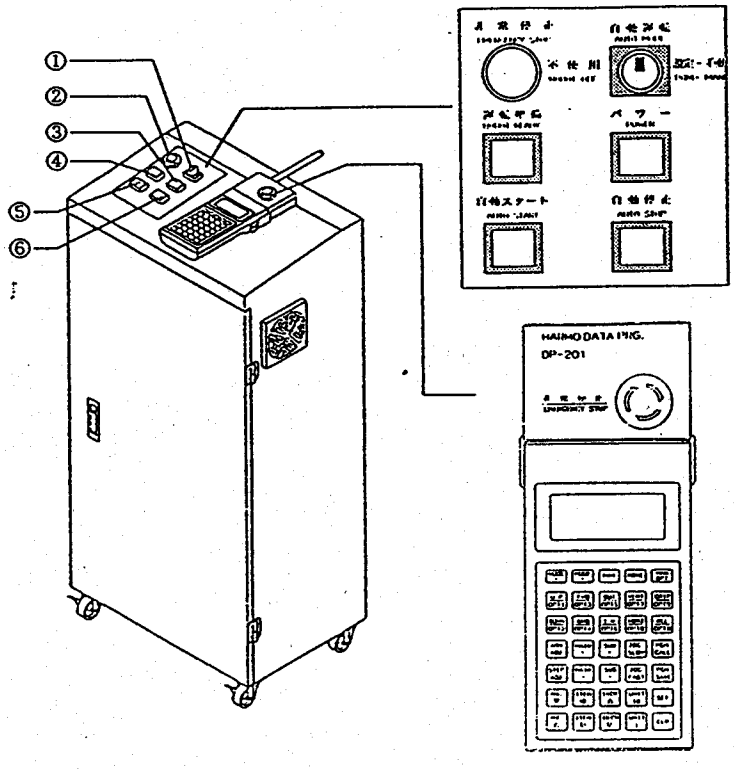
c) PGM·MAN (Program and manual)
.. For the setting of the MODE, TIMER, and STOP POSITION, and for MANUAL OPERATION.

(2) [EMERGENCY STOP]

The robot stops immediately when this switch is pressed.

(3) [POWER]

The switch enable the drive circuit live.



(4) [ROBOT READY]

Perform the initialization of motor drive circuit. After robot ready is performed, each actuator can be actuated.

(5) [AUTO START]

The robot starts auto operation.

(6) [AUTO STOP]

The robot stops at its cycle end position.

5. TURN THE POWER ON

1) After checking the correct interface with press, turn the circuit breaker in the controller ON.

2) After turning the power ON, the controller will have an Initial check (self diagnosis) and display the message as below.

```
ROBOT CONTROLLER
HANDY CONSOLE
(C) COPYRIGHT
VER 12 --HARMO
```

Note) VER 12 indicates the ROM version

3) Operation mode indication is shown after initial check (2 seconds later) on the LCD display.

6. OPERATION MODE

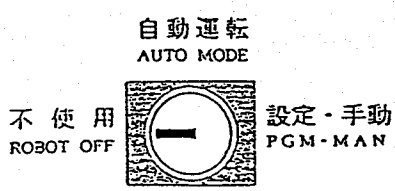
The selection of following three modes is available by the key switch. High reliability and safety are obtained by not only the program stored in ROM IC but also external hardware circuit.

1) ROBOT OFF mode

When the key switch is set to [ROBOT OFF], the following message is shown on the LCD. Under this mode, the interlock signals for the press are released and press operation is available without robot.

```
*ROBOT OFF MODE*

    INTERLOCK
    RELEASED
```



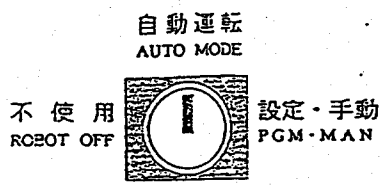
Note) If the robot is not at home position the interlock for the press is effective.

2) AUTO mode

When the key switch is set to [AUTO MODE], the following message will appear on the LCD and the robot AUTO operation is available.

```
*ROBOT AUTO MODE*

PRESS AUTO START
```

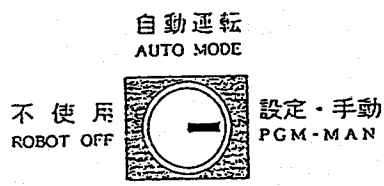


See for (10) auto operation.

3) PGM·MAN (Program and manual) mode

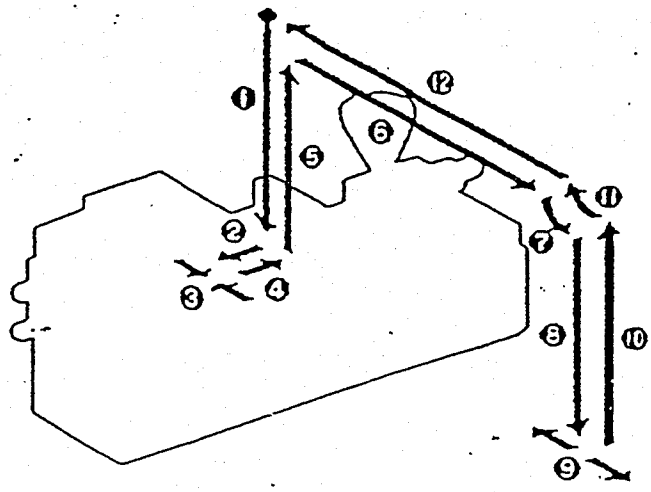
When the key switch is set to [PGM MAN], the following message will appear on the LCD.
The each setting (Program #, Modes, Timer value, Positions on the beam etc.) and manual operation by pressing MANUAL key are available.

```
*INITIALIZE*
 HOME, RETURN
 UNDER MANUAL
 MODE
```



See for (9) manual operation.

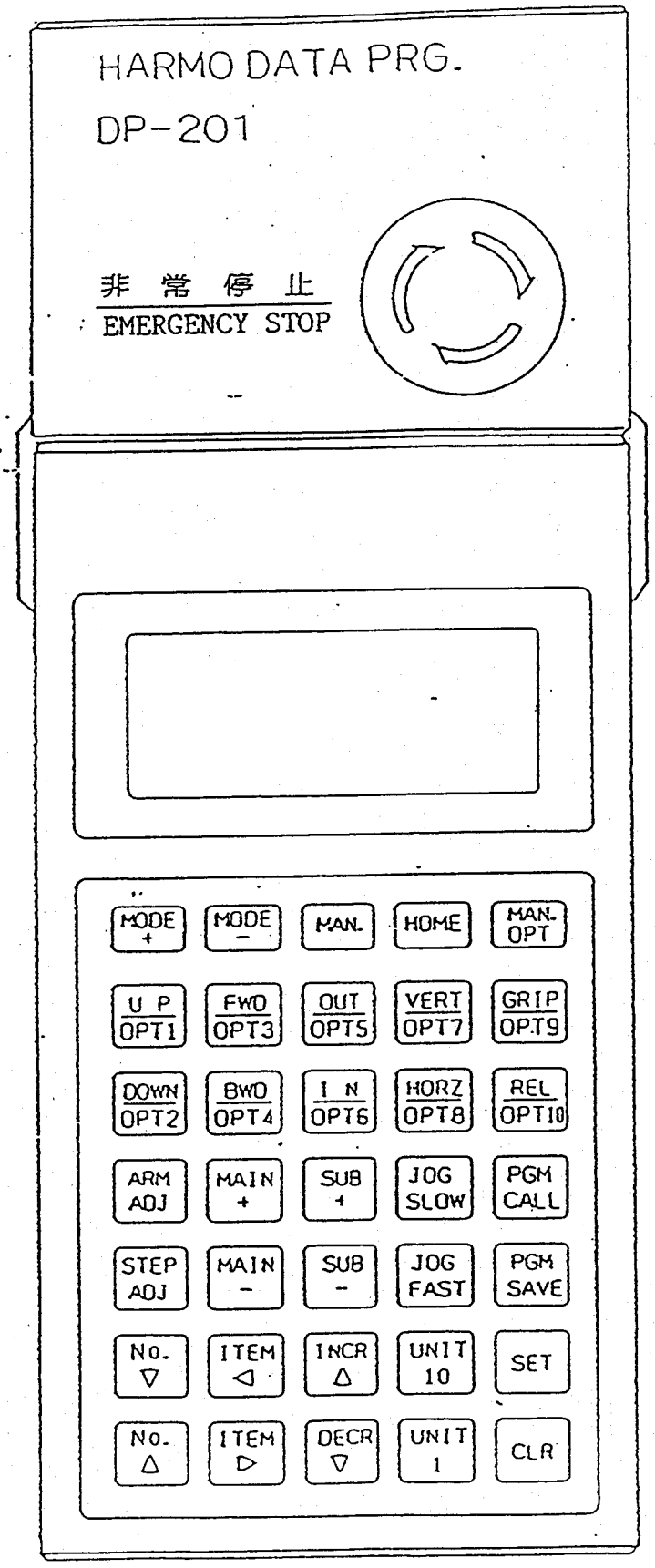
7. BASIC MOTION SEQUENCE



1. Arm first descent
2. Strip forward
3. Grip
4. Strip backward
5. Arm first ascent
6. Traverse outward
7. Wrist flip horizontal
8. Arm second descent
9. Release
10. Arm second ascent
11. Wrist return vertical
12. Traverse inward

The above motion sequence is obtained by the following mode setting.

M1:	Pick up arm select	MAIN
M2:	Part grip select	WITH SWITCH
M4:	Part release position	2ND.DESC MID MOLD
M5:	Main sprue grip select ...	OFF
M9:	Wrist motion	OUT TRAVERSE


HARMO DATA PRG.
DP-201
非 常 停 止
EMERGENCY STOP
MODE +
MODE −
MAN.
HOME
MAN. OPT
U P OPT1
FWD OPT3
OUT OPT5
VERT OPT7
GRIP OPT9
DOWN OPT2
BWD OPT4
I N OPT6
HORZ OPT8
REL OPT10
ARM ADJ
MAIN +
SUB +
JOG SLOW
PGM CALL
STEP ADJ
MAIN −
SUB −
JOG FAST
PGM SAVE
No. ▽
ITEM ◁
INCR △
UNIT 10
SET
No. △
ITEM ▷
DECR ▽
UNIT 1
CLR

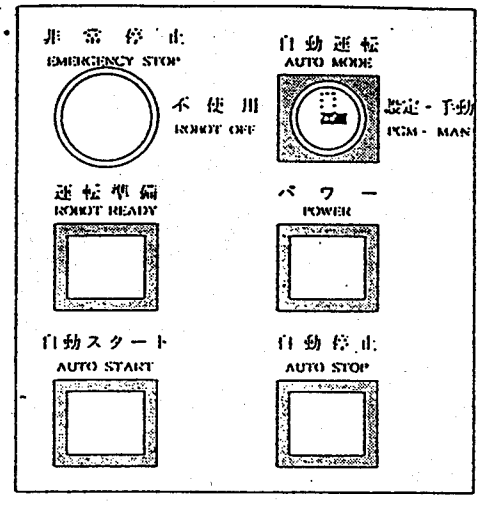
8. INITIAL SETTING

Initial setting of positions on traverse beam is needed when installed and change the program number.

1 MECHANICAL HOME POSITION

Set mechanical home position first.

1) Turn the key switch to [PGM·MAN].
2) Press [POWER] and confirm the white lamp lights.




```
*INITILIZE*
 PRESS
   [POWER]
```

3) Press [ROBOT READT], then yellow lamp blinks and start to run.

```
*INITILIZE*
 PRESS
   [ROBOT READY]
```

4) Robot go out to the traverse outward end and return to the main second descent safety off position, then stop when it becomes off.
   The indication is shown as below.

```
*INITILIZE*
 SET  THE
 POSITION  [PO]
 BY TEACHING
```

5) Press [MODE +] / [MODE -] to call the LCD message as shown below.

```
*TEACHING DATA*
 HOME POSITION
PO=±****PS=- 000
SPEED=.......LOW
```

6) Press [IN] continuously. the robot return to home position at that time.

NOTE) "HIGH" or "LOW" is indicated in the right lower part on the LCD.
press [JOG FAST] ....robot return to fast
press [JOG LOW] ....robot return to slow

7) Pressing the button until robot return to the return limit actuator proximity switch position(L-X1) and release the switch.

NOTE) please do not press the switch continously after that cause of over run.

8) Press [SET] .
The indication is shown as below.

```
*TEACHING DATA*
 HOME POSITION
PO=    0  PS=   0
SPEED=    1
```

Home position above the mold is completed.

NOTE) Press [INCR Δ]/[DECR ∇] the speed at the button of LCD change to 1. 2. 3. 4. 5.

```
*TEACHING DATA*
 HOME POSITION
PO=    0  PS=   0
SPEED=    1
```

>>>>>>>>>

```
*TEACHING DATA*
 HOME POSITION
PO=    0  PS=   0
SPEED=    2
```

9) Press [NO ▽]/[NO △] the LCD display change to as shown below.

```
*TEACHING DATA*
 HOME POSITION
PO=±****PS=±****
SPEED=.......
```

```
*TEACHING DATA*
 WAITING NIPPER
P3=±****PS=±****
SPEED=.......
```

```
*TEACHING DATA*
 PART RELEASE
P1=±****PS=±****
SPEED=.......
```

```
*TEACHING DATA*
 OP1 POSITION
P4=±****PS=±****
SPEED=.......
```

```
*TEACHING DATA*
 SPRUE RELEASE
P2=±****PS=±****
SPEED=.......
```

```
*TEACHING DATA*
 OP2 POSITION
P5=±****PS=±****
SPEED=.......
```

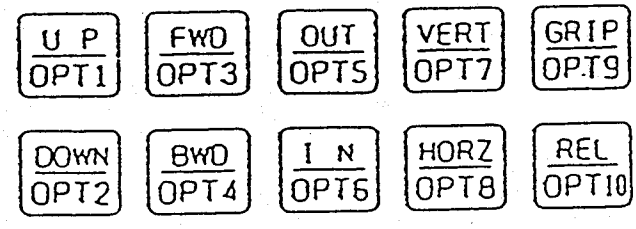
9. MANUAL OPERATION

MANUAL operation and HOME RETURN operation can be done under MANUAL OPERATION MODE. The manual operation outside the mold area is available even if the mold open complete signal is OFF.

MANUAL OPERATION

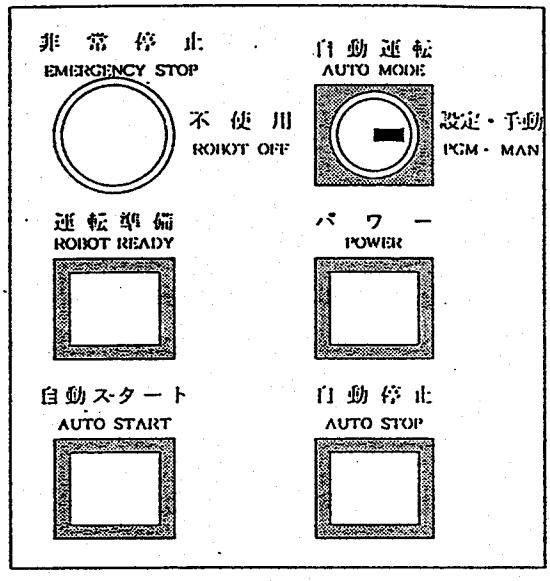
1) Turn the key switch to [PGM·MAN].
2) Press [MAN] . [AUTO START] switch is blinks with green light press each manual button and operate manually_refer to item (3)
   if press [MAN] again, the green lamp goes out and the manual operation becomes not effective.
3) RETURN TO HOME POSITION
   While the green lamp lights under auto mode, the robot returns to home position automatically by pressing [HOME] .
4) The functions of each manual button are as follows.

[UP].....Arm ascent
[DOWN].....Arm descent
[FWD].....Arm strip forward
[BWD].....Arm strip backward
[OUT].....Traverse outward
[IN].....Traverse inward
[VERT].....Wrist return vertical
[HORZ].....Wrist flip horizontal
[GRIP].....Grip on and Nipper on(nipper position)
[REL].....Grip off



10. AUTO OPERATION

1) Turn the key switch to [PGM.MAN]



2) Press [POWER], then white lamp lights.

3) Press [ROBOT READY], then yellow lamp blinks and mechanical home position initial setting is performed.

4) When [ROBOT READY] sequence is finished, the indication is shown as below.

```
*MANUAL MODE*
 RETURNED TO
 HOME POSITION
```

5) Return the robot to home position by pressing [HOME] or [IN].

6) Turn the key switch to [AUTO MODE]

7) Check the following message is shown on the LCD. and press [AUTO START]. the robot starts auto operation.

```
*ROBOT AUTO MODE

PRESS AUTO START
```

8) If the part verification is ON after take out motion, the controller issue the safety interlock release and mold closing start signal to the press. The robot starts to traverse out.

9) If the part verification is OFF, alam sounds and green lamp blinks.

10) Press [AUTO START] button after make sure that nothing is remained in the mold area.
The robot and press continue to next sequence.

11) After returned to home position, the robot waits for the next mold open complete signal.

12) To stop the AUTO OPERATION, press [AUTO STOP], then the [AUTO START] lamp blinks.
When returned to home position, the AUTO OPERATION stops.

Note) To start AUTO OPERATION is available only when the robot is at home position.

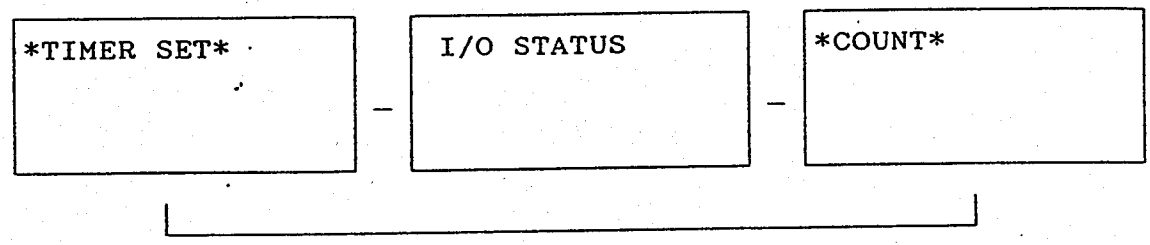
13) If needed to stop the robot immediately, then the key switch to [ROBOT OFF] or [PGM-MAN], when the AUTO OPERATION stop. and press EMERGENCY STOP switch.

14) Mode setting during AUTO operation is not available, but timer setting can be done. Refer to the instruction "TIMER SETTING".

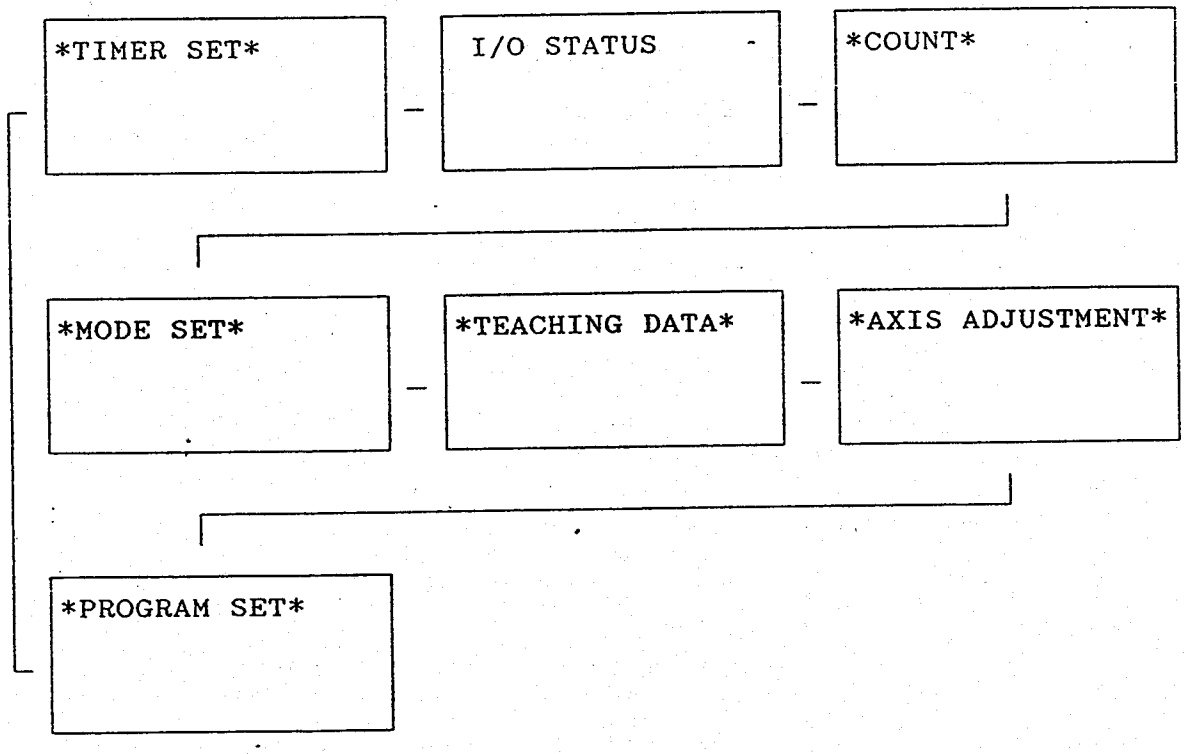
11. MODE SELECTION

Press [MODE +]/[MODE -] button to select the each mode.

1) AUTO OPERATION



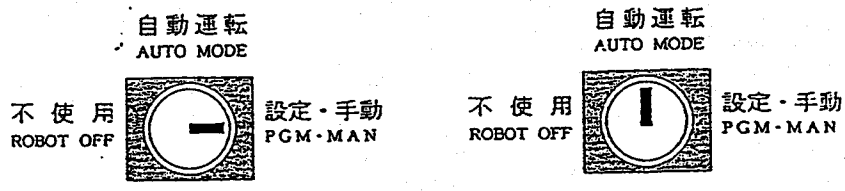
2) MANUAL OPERAITION



12. TIMER SETTING

Set timer value in order to have secure take out motion and minimize the take out time.
Timer setting range is from 0.00sec. to 9.99sec..
Timer setting is available not only under manual mode but also during auto operation.

SETTING



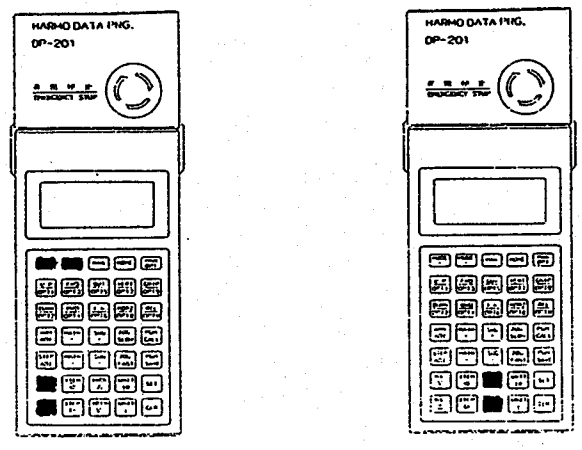
1) Turn the key switch to [PGM·MAN]or [AUTO MODE]

2) Press [MODE+]or[MODE-] to call the LCD message as shown below.

```
*TIMER SET*
FIRST DESC DLY
    T01= .  SEC
```

3) Select timer T01 through T20 by [No△]/[No▽] ,

4) Select time unit by [INCR △]/[DECR ▽] .



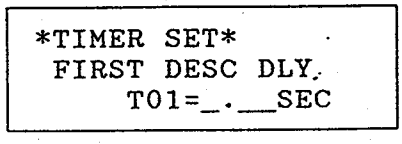
[UNIT 10] ...To increase/decrease value in 0.1 units.

[UNIT 1] ...To increase/decrease value in 0.01 units

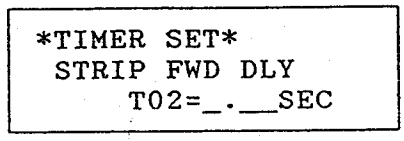
* [UNIT 10]/[UNIT 1] showld be pressed before [INCR△]/[DECR▽] pressed.

TIMER SETTING

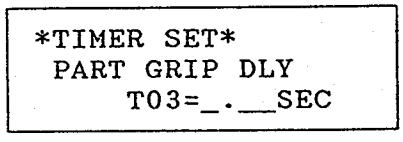
Preset timer value T01 to T08, T09 to T16 and T17 to T24 can be seen on the LCD. And the timer setting is available on the same page.



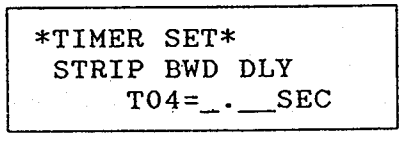
From mold open complete up to arm first descent.



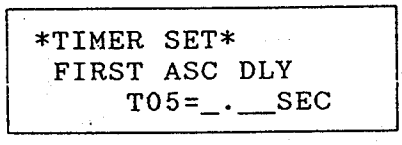
From arm descent up to strip forward.



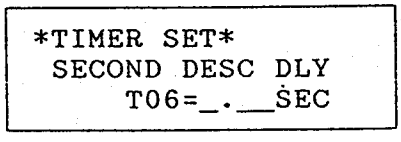
From strip forward up to grip.



From grip up to strip backward.



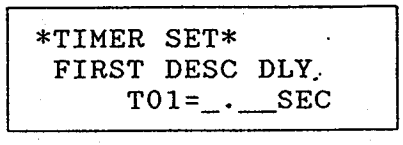
From strip backward up to arm first ascent.



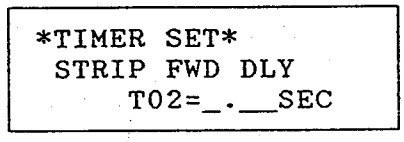
From traverse outward end up to second descent.

TIMER SETTING

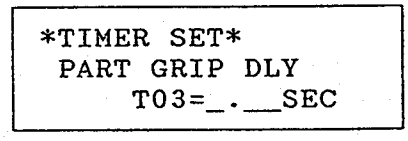
Preset timer value T01 to T08, T09 to T16 and T17 to T24 can be seen on the LCD. And the timer setting is available on the same page.



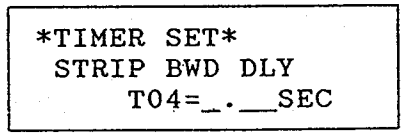
From mold open complete up to arm first descent.



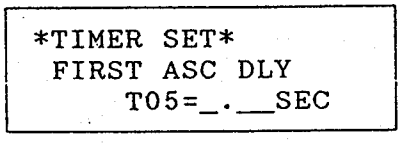
From arm descent up to strip forward.



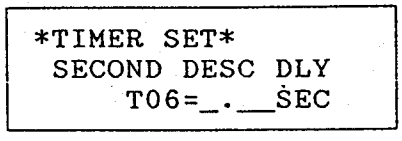
From strip forward up to grip.



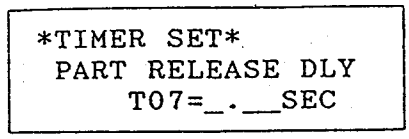
From grip up to strip backward.



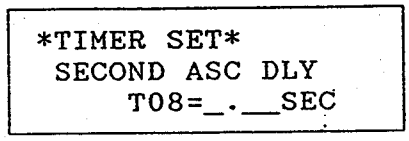
From strip backward up to arm first ascent.



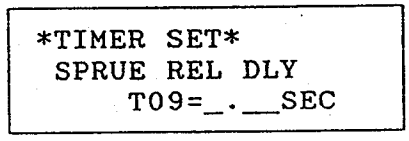
From traverse outward end up to second descent.



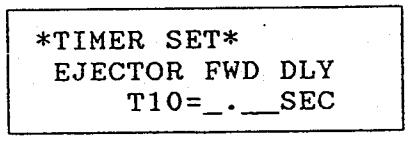
From arm second descent up to part release.



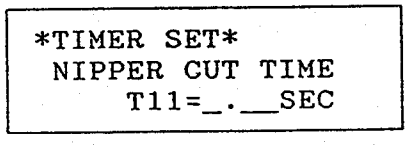
From grip release up to arm second ascent.



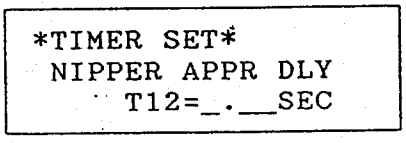
From sprue release position to sprue release.



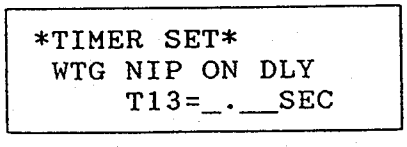
From mold open complete up to ejector forward.



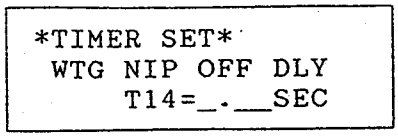
From nipper cut on time.



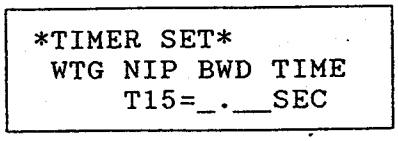
From waiting nipper approach.



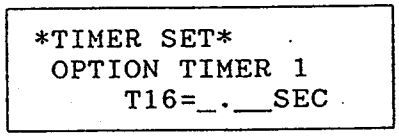
From waiting nipper approach to nipper cut.



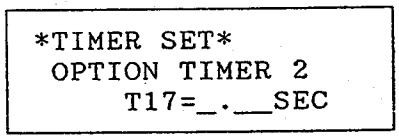
From waiting nipper cut to nipper off.



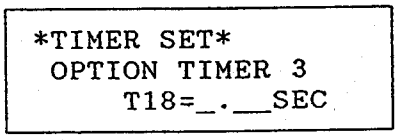
From waiting nipper off to retract.



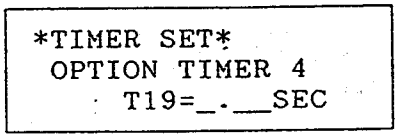
For option.



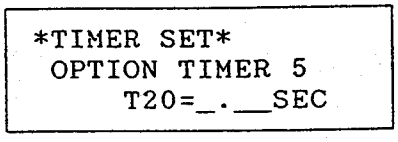
For option.



For option.



For option.



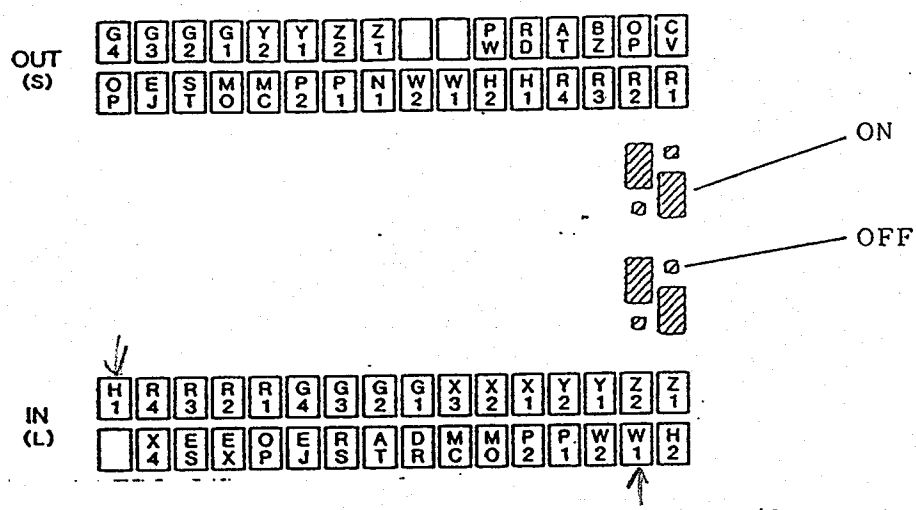
For option.

13. INPUT/OUTPUT STATUS

This controller has a function to check the status of INPUT/OUTPUT of the robot and interfacing with external device (press etc.) on the LCD.

(1) DISPLAY THE I/O STATUS

1. Turn the key switch to [PGM·MAN] or [AUTO MODE].
2. Press [MODE+] or [MODE-], to call the LCD message as shown below.



The followings are the meaning for some I/O status symbols.
See attached INPUT/OUTPUT list for more details.

INPUT

ES	EMERGENCY STOP
EX	EXTERNAL DEVICE
OP	PRESS OPTION
EJ	EJECTOR FWD. END
RS	REJECTED PARTS
AT	PRESS IN AUTO
DR	SAFETY DOOR CLOSED
MC	MOLD CLOSE COMPLETE
MO	MOLD OPEN COMPLETE

OUTPUT

CV	CONVEYOR
OP	OPTION (EXTERNAL DEVICE)
BZ	BUZZER
AT	ROBOT AUTO
RD	ROBOT READY
PW	POWER
MC	MOLD CLOSE SAFETY
MO	MOLD OPEN SAFETY
ST	MOLD CLOSING SAFETY
EJ	EJECT TIMING
OP	PRESS OPTION

14. COUNTER

The total cycle counter of the robot and take out cycle is available.

COUNTER DISPLAY

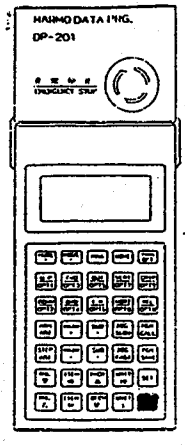
1) Turn the key switch to [PGM·MAN] or [AUTO MODE].

2) Press [MODE+] or [MODE-] . to call the LCD message as shown below.

```
*COUNT*
TAKE OUT T=.....
CYCLE    C=.....
```

Note) The take out cycle counter can be cleared to " 0 " count by [CLR] button, but the robot cycle counter can not be cleared.

The count number of total cycle should be read as " INDICATING NUMBER ON LCD x 10000" (e.g. T=xxx5 should be read 50,000 counts)



15. MODE SETTING

Set modes according to the following procedure.

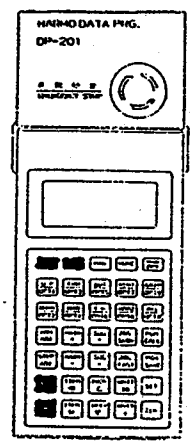
Note) Mode setting is not available under AUTO OPERATION mode.

MODE SETTING

1)Turn the key switch to [PGM·MAN].

2) Press [MODE+] or [MODE-] to call the LCD message as shown below.

```
*MODE SET*
M1 PICK UP ARM
 MAIN SUB M+S
 MAIN+SUB
```

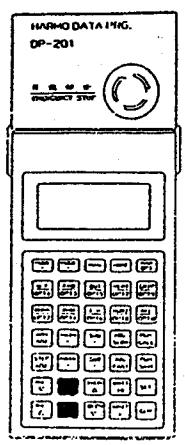


3) Select the page to change the mode by [NO Δ]/ [NO ∇] .

```
*MODE SET*
M2 PART GRIP
 OFF W/SW W/O SW
 WITH SWITCH
```

4) Move the [ITEM ←]/[ITEM →] to change the message.

```
*MODE SET*
M2 PART GRIP
 OFF W/SW W/O SW
 OFF
```



5) Set data is stored in the memory.

6) Set other modes in the same manner.

MODE SELECTION

M1 PICK UP ARM

```
*MODE SET*
M1 PICK UP ARM
 MAIN SUB M + S
 MAIN + SUB
```

1) MAIN. ·Take out molding by main arm.
2) SUB. ·Take out sprue/runner by sub arm
3) M + S (MAIN + SUB)
·Take out molding and sprue/runner from 3 plate molds.

M2 PART GRIP

```
*MODE SET*
M2 PART GRIP
 OFF W/SW  W/O SW
 WITH SWITCH
```

1) OFF ·Grip circuit not in use.
2) W/SW (WITH SWITCH)
·Use grip circuit with part verification switch.
3) W/O SW (W/O SWITCH)
·Use grip circuit without part verification.

M3 VACUUM

```
*MODE SET*
M3 PART VACUUM
 OFF W/SW  W/O SW
 WITH SWITCH
```

1) OFF ·Vacuum circuit not in use.
2) W/SW (WITH SWITCH)
·Use vacuum circuit with vacuum differencial switch.
3) W/O SW (W/O SWITCH)
·Use vacuum circuit without verification.

CAUTION ON GRIP CIRCUIT SELECT

In the following mode setting,the interlock signal for mold open/close cannot be released. please make the mode so to use any grip circuit.

M 1 (ARM) ···· MAIN
M 2 (PART GRIP) ···· OFF
M 3 (VACUUM)··· OFF
M 5 (M. SPRUE GRIP)·· OFF
M 7 (S. GRIP)·· OFF

M4 PART RELEASE POSITION

```
*MODE SET*
M4 PART RELEASE
 2 DESC WAY IN/MO
 2DESC MID MOLD
```

1) 2 DESC (2DESC MID MOLD)
   - Release the molding at arm second descent end.

2) WAY (MID TRAVERSE)
   - Release the molding at traverse end without second descent.

3) IN/MO (IN MOLD)
   - Release the molding in the mold area after strip backward motion.

M5 MAIN SPRUE GRIP

```
*MODE SET*
M5 M. SPRUE GRIP
 OFF W/SW W/O SW
 WITH SWITCH
```

1) OFF
   - Main arm sprue grip circuit not in use.

2) W/SW (WITH SWITCH)
   - Use main sprue grip circuit with sprue verification switch.

3) W/O SW (WITHOUT SWITCH)
   - Use main sprue grip circuit without sprue verification switch.

M6 SPRUE RELEASE TIMING

```
*MODE SET*
M6 SPRUE REL
 OUT IN MOLD
 ON WAY OUT
```

1) OUT (ON WAY OUT)
   - Release sprue on way out of traverse before releasing the molding.

2) IN (ON WAY IN)
   - Release sprue on way in of traverse after releasing the molding.

3) MOLD (INMOLD AREA)
   - Release sprue after strip backward motion in the mold area.

M7 SUB GRIP

```
*MODE SET*
M7 SUB GRIP
 OFF W/SW W/O SW
 WITH SWITCH
```

1) OFF ·Grip circuit not in use.
2) W/SW (WITH SWITCH)
·Use grip circuit with part verification switch.
3) W/O SW (WITHOUT SWITCH)
·Use grip circuit without part verification switch.

M8 EJECTOR INTERLOCK RELEASE

```
*MODE SET*
M8 EJECTOR I/L
 REL TIME SYNCHR
 WITH TIMER
```

1) REL (RELEASED)
·Eject interlock is released when the timer that start counting at the same time of mold open complete signal goes ON.
(No interloking)
2) TIME (WITH TIMER)
·Eject interlock is released when the timer that start counting at the same time of arm descent elapses.
3) SYNCHR (SYNCHRONIZED)
·Eject interlock is released when the arm reaches strip forward end position, and the end of arm tooling grips the molding when the ejector forward end signal goes ON.

M9 WRIST FLIP POSITION

```
*MODE SET*
M9 WRIST MOTION
 OUT ABOVE OFF
 OUT TRAVERSE
```

1) OUT (OUT TRAVERSE)
·Wrist flip motion is done in the area of second descent safty zone.
2) ABOVE (ABOVE MOLD)
·Wrist flip motion is done at above mold.
3) OFF ·Without wrist flip motion.

M10 NIPPER CUT

```
*MODE SET*
M10 NIPPER CUT
OFF EOAT WTG E+W
 ON EOAT
```

1) OFF ·Nipper circuit not in use
2)EOAT (ON EOAT)
·Nipper actuates at molding release position.
3) WTG (WAITING NIPPER)
·For external nipper station equipped in the area of second descent safty zone.
4) E+W (EOAT & WAITING)
·Use above 2)EOAT and 3) WTG together.

M11 REJECT PART RELEASE

```
*MODE SET*
M11 REJECT REL
 OFF MID MOLD
 MID TRAVERSE
```

1) OFF ·Reject part signal from the press is not effective.
2) MID (MID TRAVERSE)
·Release molding at sprue releasing position when the reject signal from the press is ON.
3) MOLD (IN MOLD)
·Release the molding in the mold area when the signal is ON.

M12 ROBOT HOME POSITION (OPTION)

```
*MODE SET*
M12 HOME
 MOLD BEAM
 ABOVE MOLD
```

1) MOLD (ABOVE MOLD)
·Robot waits for mold open at traverse inward end position (Above mold)
2) BEAM (ON BEAM)
·Robot waits at preset position on the beam and start when the mold open complete signal goes ON.

M13 WRIST ROTATION (OPTION)

```
*MODE SET*
M13 WRIST ROTATE
 OFF USE
 IN USE
```

1) USE ·Wrist rotate function in use.

2) OFF ·Wrist rotate function not in use.

M14 OPTION

```
*MODE SET*
M14 OPTION 1
 OFF IN USE
 IN USE
```

1) OFF ·Optional function 1 not in use.

2) IN USE ·Optional function 1 in use.

M15 OPTION

```
*MODE SET*
M15 OPTION 2
 OFF IN USE
 IN USE
```

1) OFF ·Optional function 2 not in use.

2) IN USE ·Optional function 2 in use.

M16 OPTION

```
*MODE SET*
M16 OPTION 3
 OFF IN USE
 IN USE
```

1) OFF ·Optional function 3 not in use.

2) IN USE ·Optional function 3 in use.

M17 OPTION

```
*MODE SET*
M17 OPTION 4
 OFF IN USE
 IN USE
```

1) OFF ·Optional function 4 not in use.

2) IN USE ·Optional function 4 in use.

M18 OPTION

```
*MODE SET*
M18 OPTION 5
 OFF IN USE
 IN USE
```

1) OFF ·Optional function 5 not in use.

2) IN USE ·Optional function 5 in use.

M19 MAIN TAKE OUT MOTION (OPTION)

```
*MODE SET*
M19 M.TAKE OUT
MOVABLE FIXED
 MOVABLE
```

1) MOVABLE (MOVABLE MAIN ARM)
·Pick up from movable mold.

2) FIXED (FIXED MAIN ARM)
·Pick up from fixed mold.

M20 SUB TAKE OUT MOTION (OPTION)

```
*MODE SET*
M20 S. TAKE OUT
FIXED    MOVABLE
 FIXED
```

1) FIXED ·Sub arm pick up from fixed mold.

2) MOVABLE
·Sub arm pick up from movable mold.

16. POSITION SETTING ON TRAVERSE BEAM

When set up the robot or change the stop position such as take out position and part release position,
It is very easy to set or change the positions.

SETTING

1) Turn the key switch to [PGM·MAN].

2) Press [MODE+]/[MODE-] to call the LCD message as shown below.

```
*TEACHING DATA*
 HOME POSITION
PO......PS.....
SPEED.....
```

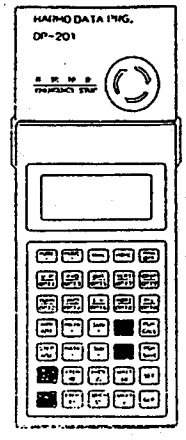
PS = PRESENT POSITION

P0 = SET POSITION

NOTE)
In case PO~P5 showing ****. it means there is no data input

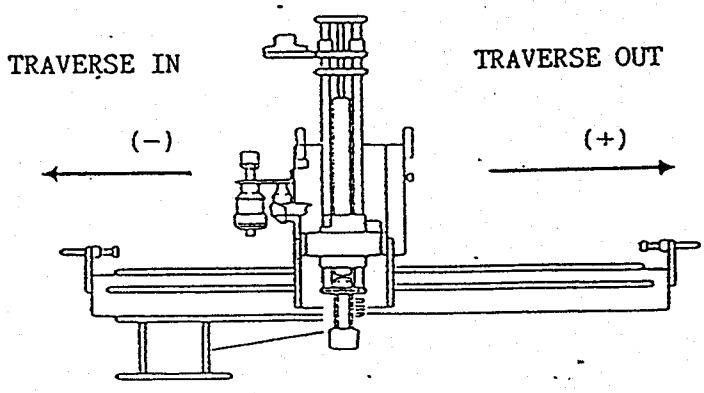
3) Prees [NO△] / [NO▽] , when the PO----P5 selection.

4) Move the traverse stop position by [OPT5] / [OPT6] and then the will be traverse speed setting by [JOG SLOW]/[JOG FAST] .



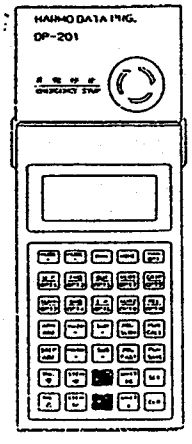
5) After be decided stop position, press [SET] .

NOTE)
[PS] deter into the [PO] LCD indicaters the message.



6) Set traverse speed by [INCR ▽] / [DECR △].
Press [INCR △]/[DECR ▽] the speed at the button of LCD change to 1. 2. 3. 4. 5.

7) Set the other speed in the same manner.



8) EXAMPLE P1 SETTING

A) Press [MODE +] / [MODE -] to call the LCD message as shown below.

```
*TEACHING DATA*
 PART RELEASE
P1=±****PS=±****
SPEED=.......
```

B) Press [OUT] to traverse out the robot to a part release position then the indication is shown as below.

```
*TEACHING DATA*
 PART RELEASE
P1=±****PS=+1500
SPEED=.......
```

C) Press [SET] the set position is memorized.

Then the indication is as below.

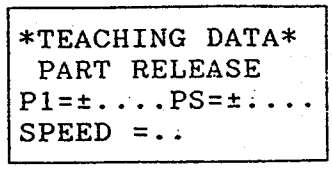
```
*TEACHING DATA*
 PART RELEASE
P1=+1500PS=+1500
SPEED=.......
```

D) Part releast position can be set by the above.

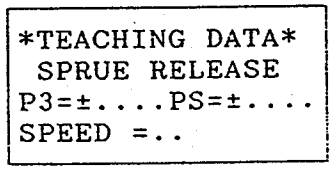
9) Set P1 P2 P3 P4 P5 The same operation.

STOP POSITIONS

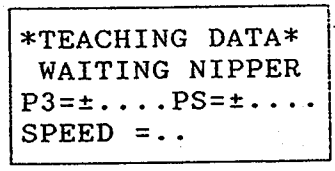
P1 Part release stop position



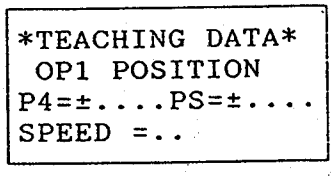
P2 Sprue release stop position



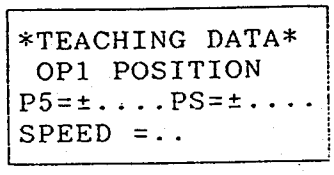
P3 Waiting nipper stop position



P4 Option 1 stop position



P5 Option 2 stop position



17. MULTI-ROW PLACING ON THE TRAVERSE BEAM

In case using conveyor or stocker, and required to place the parts in multiple rows, this function is utilized. The number of stops and pitch in between parts can be set.

SETTING

1) Turn the key switch to [PGM-MAN].

2) Press [MODE +]/[MODE -] to call the LCD message shown below.

```
*TEACHING DATA*
 MULTI ROW PLACE
 P=....    S=....
```

3) Move cursor to which should be set by [ITEM ←]/ [ITEM →] .

```
*TEACHING DATA*
 MULTI ROW PLACE
 P=...     S=....
                □
                └── CURSOR
```

P = PITCH

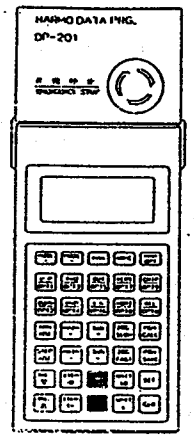
S = NUMBER OF MULTIPLE STOP.....MAX 20

Set proper value by [INCRΔ] / [DECR▽] .

1) Multi-row placing pitch setting

[INCRΔ] .... To increase value

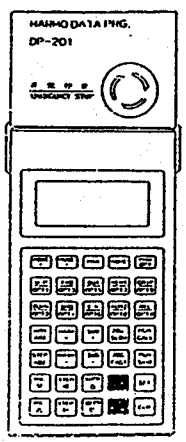
[DECR▽] .... To decrease value



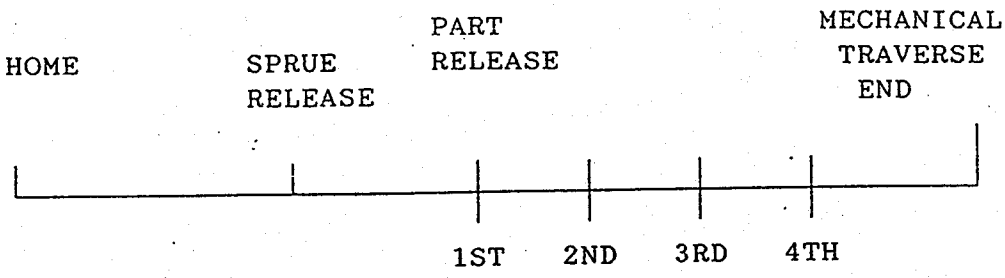
[UNIT 10] ...To increase/decrease value in 10 units

[UNIT 1] ...To increase/decrease value in 1 unit.

* [UNIT 10] / [UNIT 1] button should be pressed before [INCRΔ] / [DECR▽] button pressed.



NOTE)



1)In case the distance of "multi row placing points x pitch" is over the distance between part release point "P1" and mechanical traverse end, [INCR Δ] button becomes not effective.
2)Home position "PO" can not be set without proximity switch L-X1 is ON.
"P1~P5" can not be set without proximity switch L-X2 is ON.

Note) Max. 20 row placing is available, but if the set distance between home position and the end position of multi row placing is over the traverse stroke, the set data is not effective.

18. PROGRAM STORAGE

When set up the robot or operate robot by preset program, this function which has maximum 20 programs storage is very useful to save preparation time.

PROGRAM SAVE

1) Turn the key switch to [PGM MAN].

2) Press [MODE +] / [MODE -] to call the LCD message as shown below.

```
*PROGRAM SET*
PRSNT No SET No
   = 01     = 01
 SET THE PGM No
```

3) Press [INCR Δ]/[DECR ∇] and select the program number.

```
*PROGRAM SET*
PRSNT No SET No
   = 01     = 15
SET THE PGM NO
```

4) Press [PGM SAVE] then the indication is as below.

```
*PROGRAM SET*
PRSNT No SET No
   = 01 ==> = 15
SAVE BY [SET]KEY
```

5) Press [SET] and the message is shown on the LCD.

```
*PROGRAM SET*
PRSNT No SET No
   =  15   : = 15
 SAVE FINISHED
```

6) The set program is memorized.

PROGRAM CALL

1) Turn the key switch to [PGM MAN].

2) Press [MODE +] / [MODE -] to call the LCD message as showu below.

```
*PROGRAM SET*
PRSNT No SET No
   = 01      = 01
SET THE PGM NO
```

3) Press [INCR] / [DECR] button and select the program number.

```
*PROGRAM SET*
PRSNT No SET No
   = 01      = 15
SET THE PGM NO
```

4) Press [PGM CALL] button.

```
*PROGRAM SET*
PRSNT No SET No
   =  01<== = 15
CALL PGM BY[SET]
```

5) Press [SET] to set the program number.

```
*PROGRAM SET*
PRSNT No SET No
   =  15     =15
 CALL FINISHED
```

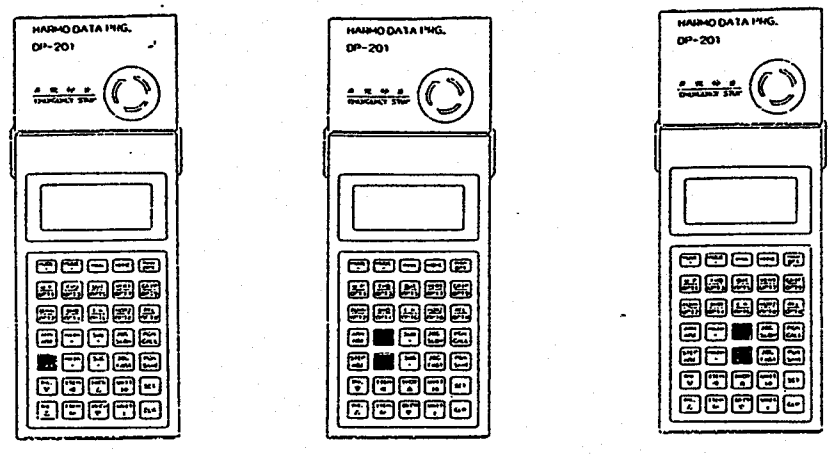
6) The program memorized in SET No.15 is called-up.

19. MECHANICAL MAIN/SUB STRIP STROKE ADJUSTMENT(OPTION)

HE-ICCα TYPE.(standard) HIM TYPE(300.400 standard)

Adjustment of strip forward/backward position can be done on the HANDY console.

SETTING



1) Turn the key switch to [PGM·MAN].

2) Press [MODE+]/[MODE-] button to call the LCD message as shown below.

```
*AXIS ADJUSTMENT

 MAIN [+ -]
 SUB  [+ -]
```

3) Press [STEP ADJ] button, then the following message is shown.

```
*AXIS ADJUSTMENT
 STRIP STROKE
 MAIN [+ -]
 SUB  [+ -]
```

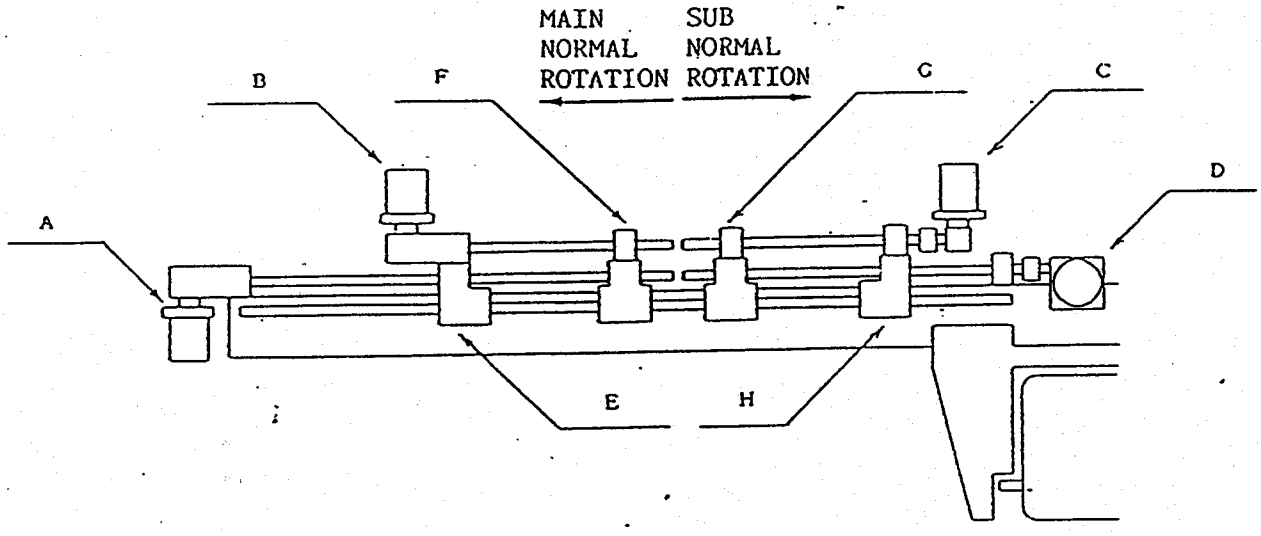
4) MAIN/SUB strip stroke adjustment can be done by pressing [MAIN+ or -] / [SUB+ or -] button.

5) Press [STEP ADJ]. then the following message is shown

```
*AXIS ADJUSTMENT
 STRIP BACK END
 MAIN [+ -]
 SUB  [+ -]
```

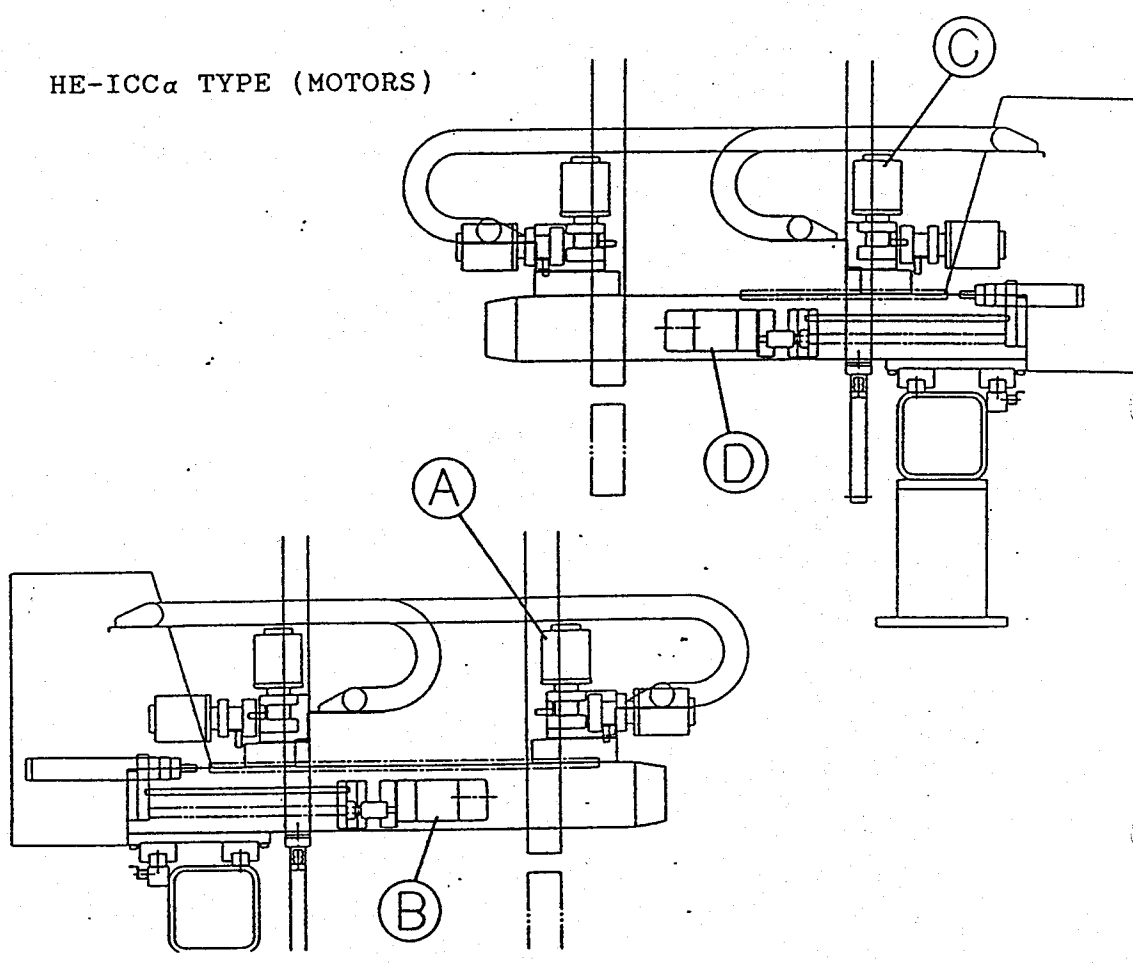
6) MAIN/SUB strip back end position can be adjusted by pressing [MAIN + or -] / [SUB + or -] button.

HIM TYPE (MOTORS)



1. Move E (Main arm fwd. end) by Motor A.
2. Move F (Main arm bwd. end) by Motor B.
3. Move G (Sub arm fwd. end) by Motor C.
4. Move H (Sub arm bwd. end) by Motor D.

HE-ICCα TYPE (MOTORS)



A. Motor for adjustment of strip forward end position of MAIN ARM.
B. Motor for adjustment of strip backward end position of MAIN ARM.
C. Motor for adjustment of strip forward end position of SUB ARM.
D. Motor for adjustment of strip backward end position of SUB ARM.

NOTE)
In case keep pushing [MAIN + , -] or [SUB + , -] button , alarm sounds when end limit switch of adjustment becomes on and adjustment motor can not be operated more then that point.

Get hand off from button to stop alarm.

Both auto operation and manual operation can be available even end limit switch of adjustment is on.

20. MECHANICAL MAIN/SUB VERTICAL STROKE ADJUSTMENTS.

(HE-ICCα TYPE only)

Adjustment of MAIN/SUB arm vertical stroke can be done on the HANDY console.

SETTING

1) Turn the key switch to [PGM MAN].

2) Press [MODE +] or [MODE -] button to call the LCD message as shown below.

```
*AXIS ADJUSTMENT

 MAIN [+ -]
 SUB  [+ -]
```

3) Press [ARM ADJ] button then the following message is shown .

```
*AXIS ADJUSTMENT
 VERTICAL STROKE
 MAIN [+ -]
 SUB  [+ -]
```

4) MAIN / SUB vertical stroke can be adjusted by pressing [MAIN + or -] / [SUB + or -] button.

NOTE)
In case keep pushing [MAIN + , -] or [SUB + , -] button , alarm sounds when end limit switch of adjustment becomes on and adjustment motor can not be operated more then that point.

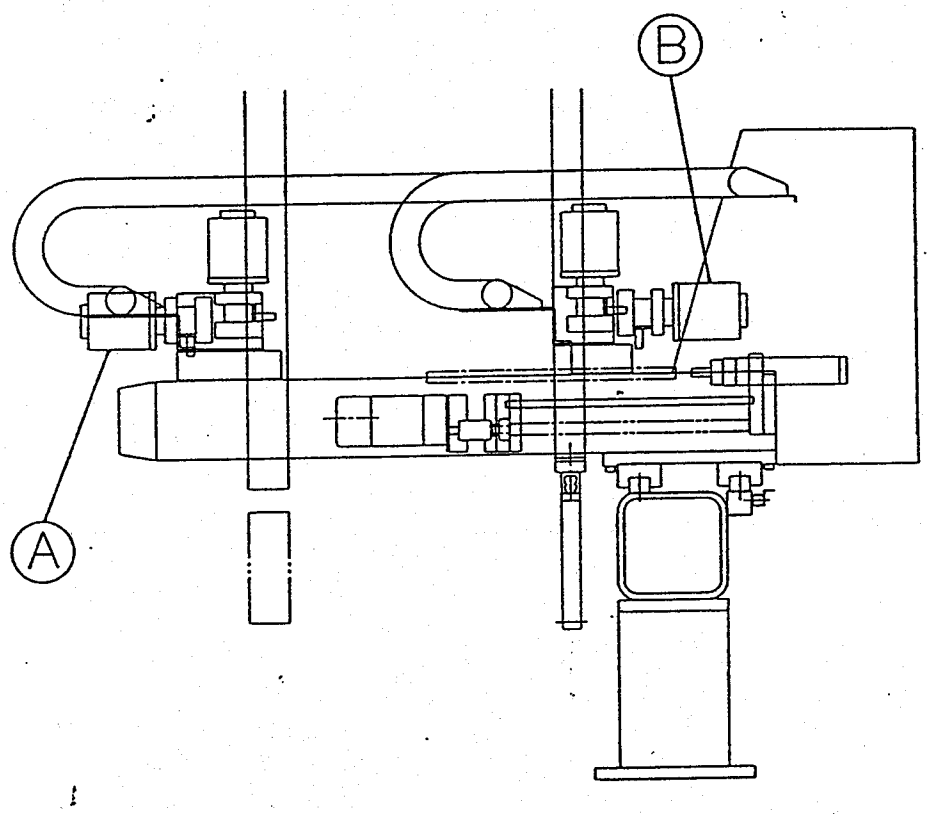
Get hand off from button to stop alarm.

Both auto operation and manual operation can be available even end limit switch of adjustment is on.

HE-ICCα TYPE (MOTORS)

A. Motor for adjustment of vertical stroke of MAIN ARM.

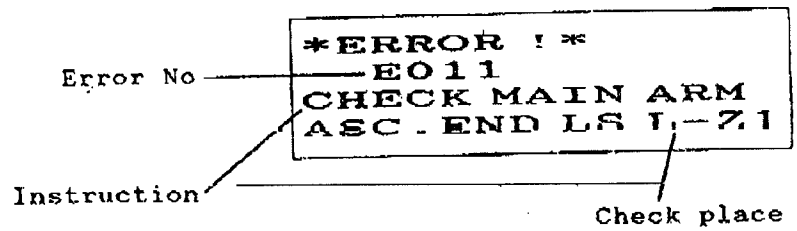
B. Motor for adjustment of vertical stroke of SUB ARM.



21. ERROR DISPLAY

Error message appears and alarm sounds also power goes off when miss operating or malfunction of INPUT/OUTPUT. Error number,error factor and countermeasure are shown on the LED.

Error display



*1 Check the robot according to instruction on LCD.
*2 Refer to attached "Designation of I/O " for checking the robot because ERROR/ALARM message does not cover all ERROR/ALARM cases.

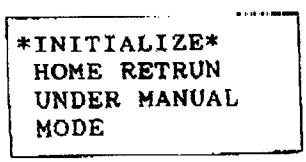
1) Turn the key switch to [PGM·MAN] .

2) Press [CLR] button . alarm stops.

3) Press [POWER] switch then the ERROR/ALARM message disappears.

It is possible to re-display the error message that appeared directly before.

1) Turn the key switch to [PGM·MAN]→.then the indication is shown as below.



2) Press [SET] button for about three seconds, then previous ERROR message appears.

3) Press [CLR] button. error message disappears.

```
*ERROR !*
    E001
PRESS [POWER]
```

Unused

```
*ERROR !*
    E002
PRESS
  [ROBOT READY]
```

Unused

```
*ERROR !*
    E003
PREFORM RETURN
TO HOME
```

Under the Auto operation, the condition of Home position is not enough.
Check that the following proximity switches and its wiring are not broken or loosed, and also these are set correctly.

```
Check point(when the arms are at the Home position)
lot dccoont oafety (L-X1):ON
Main arm ascent end(L-Z1):ON
Sub arm ascent end (L-H1):ON
Main arm strip backward end (L-Y1):ON
Sub arm strip backward end (L-W1):ON
Wrist flip portion) end([illegible]):ON
Part/Sprue etc. verification :OFF
```

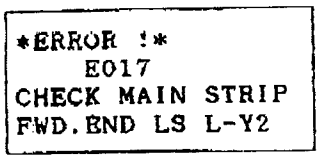
After checking above points, return the Robot to Home position and press [AUTO START].

```
*ERROR !*
    E004
SET KEY SWITCH
TO [AUTO]
```

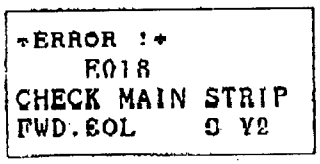
Unused

ERROR ! E006 SET KEY SWITCH [PGM.MAN] MODE	Before finished Initial setting, the Key switch was set to ROBOT OFF or AUTO position. Set it PGM.MAN position.
ERROR ! E006 CHECK MOLD AREA & PRESS [START]	Molded parts/Sprue were not confirmed. After checking the mold area, press [START].
ERROR ! E007 CHECK EMERCENCY STOP SWITCH	The Emergency switch is pressed. Release the Emergency stop button. (Unless it is released, you can not clear the alarm.)
ERROR ! E008	unused
ERROR ! E009	Unused
ERROR ! E010	Unused

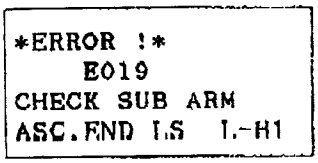
ERROR ! E011 CHECK MAIN ARM ASC.END LS L-Z1	Main arm ascent end switch is abnormal. Check that the Main arm ascent end switch and its wiring are not broken or loosed.
ERROR ! E012 CHECK MAIN ARM ASC.SOL LS S-Z1	The solenoid valve for Main arm ascent is abnormal. Check that the solenoid valve for Main arm ascent and its wiring are not broken or loosed.
ERROR ! E013 CHECK MAIN ARM DESC.END LS L-Z2	Main arm descent end switch is abnormal. Check that the Main arm descent end switch and its wiring are not broken or loosed.
ERROR ! E014 CHECK MAIN ARM DESC.SOL LS S-Z2	The solenoid valve for Main arm descent is abnormal. Check that the solenoid valve for Main arm descent and its wiring are not broken or loosed.
ERROR ! E015 CHECK MAIN STRIP BWD.END LS L-Y1	Main arm backward end switch is abnormal. Check that the Main arm backward end switch and its wiring are not broken or loosed.
ERROR ! E016 CHECK MAIN STRIP BWD.SOL S Y1	The solenoid valve for main arm backward is abnormal. Check that the solenoid valve for Main arm backward and its wiring are not broken or loosed.



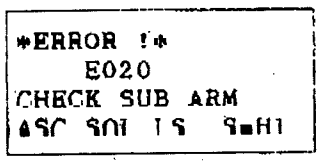
Main arm forward end switch is abnormal.
Check that the Main arm forward end switch and its wiring are not broken or loosed.



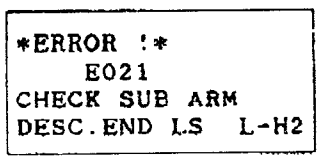
The solenoid valve for Main arm forward is abnormal.
Check that the solenoid valve for Main arm forward end and its wiring are not broken or loosed.



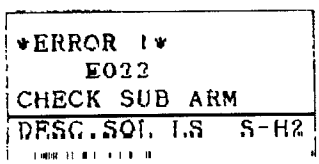
Sub arm ascent end switch is abnormal.
Check that the Sub arm ascent end switch and its wiring are not broken or loosed.



The solenoid valve for Sub arm ascent is abnormal.
Check that the solenoid valve for Sub arm ascent and its wiring are not broken or loosed.

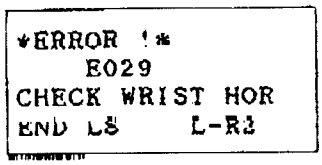


Sub arm descent end switch is abnormal.
Check that the Sub arm descent end switch and its wiring are not broken or loosed.

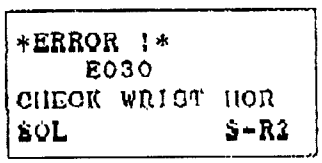


The solenoid valve for Sub arm descent is abnormal.
Check that the solenoid valve for Sub arm descent and its wiring are not broken or loosed.

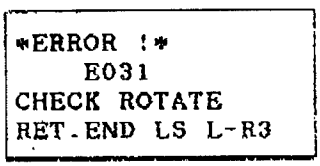
ERROR ! E023 CHECK SUB STRIP BWD.END LS L-W1	Sub arm backward end switch is abnormal. Check that the Sub arm backward end switch and its wiring are not broken or loosed.
ERROR ! E024 CHECK SUB STRIP BWD.SOL S-W1	The solenoid valve for Sub arm backward is abnormal. Check that the solenoid valve for Sub arm backward and its wiring are not broken or loosed.
ERROR ! E025 CHECK SUB STRIP FWD.END LS L-W2	Sub arm forward end switch is abnormal. Check that the Sub arm forward end switch and its wiring are not broken or loosed.
ERROR ! E026 CHECK SUB STRIP FWD.SOL S-W2	The solenoid valve for Sub arm forward is abnormal. Check that the solenoid valve for Sub arm forward and its wiring are not broken or loosed.
ERROR ! E027 CHECK WRIST VER END LS L-R1	Wrist flip vertical end switch is abnormal. Check that the Wrist flip vertical end switch and its wiring are not broken or loosed.
ERROR ! E028 CHECK WRIST VER SOL S-R1	The solenoid valve for wrist flip vertical is abnormal. Check that the solenoid valve for Wrist flip vertical and its wiring are not broken or loosed.



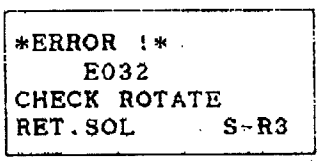
Wrist flip horizontal end switch is abnormal.
Check that the Wrist flip horizontal end switch and its wiring are not broken or loosed.



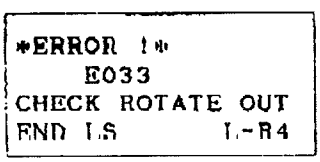
The solenoid valve for Wrist flip horizontral is abnormal.
Check that the solenoid valve for Wrist flip horizontal and its wiring are not broken or loosed.



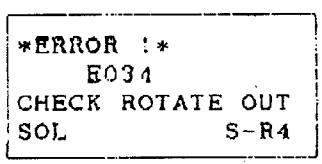
Wrist rotate return end switch is abnormal.
Check that the Wrist rotate return end switch and its wiring are not broken or loosed.



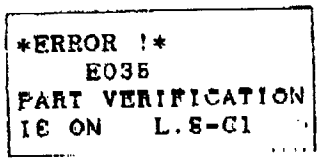
The solenoid valve for Wrist rotate return is abnormal.
Check that the solenoid valve for Wrist rotate return and its wiring are not broken or loosed.



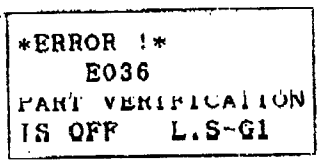
Wrist rotate out end switch is abnormal.
Check that the Wrist rotate out end switch and its wiring are not broken or loosed.



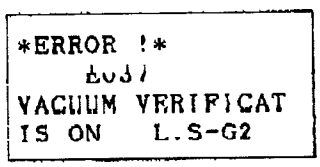
The solenoid valve for Wrist rotate out is abnormal
Check that the solenoid valve for Wrist rotate out and its wiring are not broken or loosed.



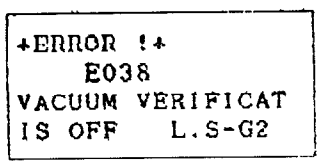
Part verification is ON when the auto operation starts or finished one operating cycle.
Check that the part verification switch is set at correct position and not broken, its wiring is not short circuit.
The solenoid valve for part grip and its wiring should be also checked.



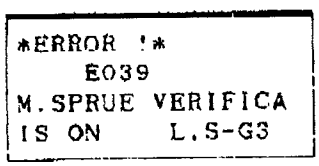
Unused



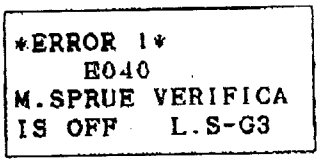
Vacuum verification is ON when the auto operation starts or finished one operating cycle.
Check that the vacuum differential switch is not broken or its wiring is not short circuit.
The solenoid valve for vacuum and its wiring should be also checked.



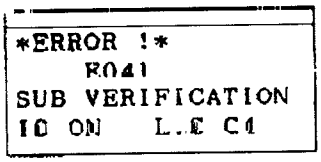
Unused



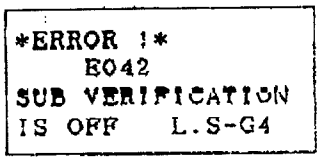
Main sprue grip verification is ON when the auto operation starts or finished one operating cycle.
Check that the Main sprue grip verification switch is set at correct position and not broken, its wiring is not short circuit.
The solenoid valve for main sprue grip and its wiring should be also checked.



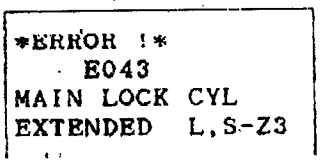
Unused



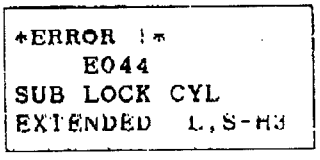
Sub grip verification is ON when the auto operation starts or finished one operating cycle.
Check that the sub grip verification switch is set at correct position and not broken, its wiring is not short circuit.
The colenoid valve for Sub grip and its wiring should be also checked.



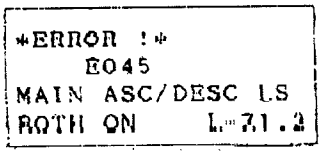
Unused



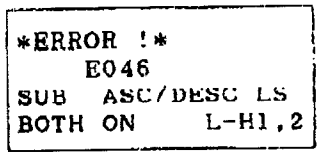
Unused



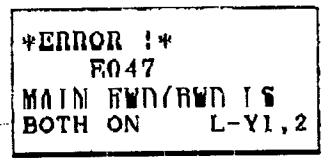
Unused



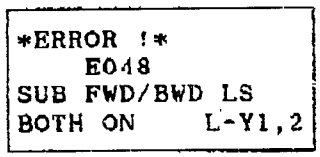
The main ascent end and descent end signals are input simultaneously. Check that these switches are set at correct positions and not broken, these wirings are correct.



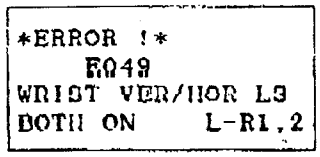
The sub ascent end and descent end signals are input simultaneously. Check that these switches are set at correct positions and not broken, these wirings are correct.



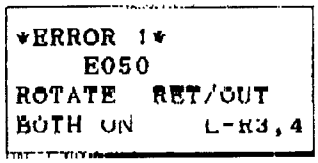
The Main forward end and backward end signals are input simultaneously Check that these switches are set at correct positions and not broken, these wirings are correct.



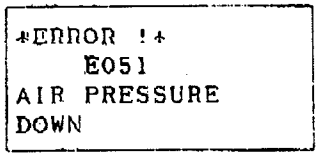
The Sub forward end and backward end signals are input simultaneously Check that these switches are set at correct positions and not broken, these wirings are correct.



The Wrist vertical end and horizontal end signals are input simultaneously. Check that these switches are set at correct positions and not broken, these wirings are correct.



The Wrist rotation turn end and turn out end signals are input simultaneously. Check that these switches are set at correct positions and not broken, these wirings are correct.



Unused

ERROR ! E052 AIR PRESSURE FAILURE

Unused

ERROR ! E053 ROBOT STANDARD MOVEMENT ERROR

The following signals are not input above the mold.

Signals
Main backward end or ascent end and Wrist flip vertical end
Sub ascent end and Wrist flip vertical end

Check that each switch and its wiring are not broken or loosed.

ERROR ! E054 ROBOT OPTIONAL MOVEMENT ERROR

Unused

ERROR ! E055

Unused

ERROR ! E056 TRAVERSE MIDWAY ERROR

2nd descent safety off position data does not accord with its data of the last time.
Check that the 2nd descent safety actuator is not moved.
If it has been moved, turn the breaker off after indicating this error message and execute the initial setting again. then also recheck the teaching data.

ERROR ! E057 CYCLE OVER ERROR	Under the Auto operation, the operating cycle from part verification to return to home position did not finish within 90 seconds.
ERROR ! E058	Unused
ERROR ! E059	Unused
ERROR ! E060	Unused
ERROR ! E061 1ST DESC.SAFETY SIGNAL OFF L-X1	1st descent safety switch is OFF at the Home position. Check that the 1st descent safety actuator is set at the correct position.(Set it to actuate L-X1.)
ERROR ! E062 2ND DESC.SAFETY SIGNAL OFF L-X2	2nd descent safety switch is OFF at the part/cprue release positions. Check that the 2nd descent safety actuator is set at the correct position.(Set it to actuate L-X2.)

ERROR ! E063 TRAVERSE OVERRUN LS ON L-X3

The Robot overruns out.
Move the Robot toward the Home position with the Manual operation or the Teaching mode.

ERROR ! E064 TRAVERSE OVERRUN LS ON L-X4

The Robot overruns out.
Move the Robot toward the Home position with the Manual operation or the Teaching mode.

ERROR ! E065 NC NOT COMPLETE ROM VERSION

The Robot did not stop within the locational accuracy in spite of 10 tries positioning.
Check the backlash between traverse motor gear and rack gear.
Turn slightly the level adjust(VR 1) on POD M100 clockwise to stop within the locational accuracy under the traverse motion.

ERROR ! E066 NC ACCURACY ERR ROM VERSION

Unused

ERROR ! E067 ENCODER SIGNAL ERROR ENCODER

This error is indicated under the initial setting.(After finished initial setting, the controller indicates error No.70)
Check that the encoder and its cable connector are not broken or loosed.

ERROR ! E068 INVERTER ERROR

Unused

```
*ERROR !*
    E069
TRAVERSE MOTION
IMPOSSIBLE
```

The Robot can not traverse in spite of outputing the order of traverse motion.
Check that ascent end and wrist flip vertical end switch is ON. If this error message is indicated at the ascent end position, check that the arms are not bounded.

```
*ERROR !*
    E070
CHECK MOTOR
CIRCUIT
```

Traverse motor is abnormal.
Check following matters.

Inverter, motor, encoder and these wiring are not broken or loosed.

Backlash between motor and rack.

Motor brake is released.

Coupling of encoder is not loosed.

```
*ERROR !*
    E071
CHECK EXTERNAL
DEVICE
```

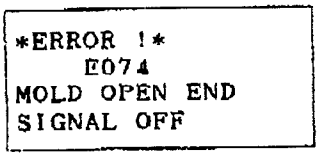
Unused

```
*ERROR !*
    E072
CHECK INTERFACE
WIRING W/I.M.M.
```

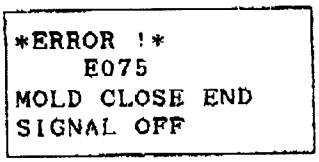
Unused

```
*ERROR !*
    E073
INTERLOCK
NOT RELEASED
```

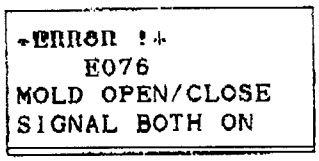
The key switch was turned to ROBOT OFF position under the Robot was not able to release interlock.
Move the Robot to Home position with manual operation and turn the key switch to ROBOT OFF position.



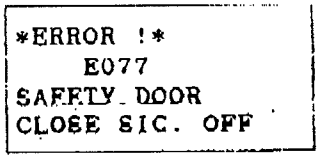
Mold open end signal is OFF under the mold safety interlock signal is issued.
Check wirings for Main/Sub ascent end signals and Mold open end signal.



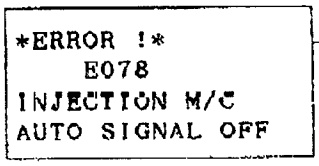
Unused



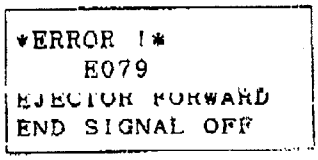
Mold open end signal and Mold close end signal are input simultaneously.
Check wirings for mold open/close end signals.



Safety door close signal is OFF under the Auto operation.
Close Safety doors and check that safety door close signal is input.



Check that injection molding machine operates under AUTO/SEMI operation.



Unused

ERROR ! E080 INJECTION SIGNAL OFF	Unused
ERROR ! E081 PART/RUNNER DROP ON WAY OUT	Unused
ERROR ! E082 REMOVE THE WRIST ROTATION UNIT	Unused
ERROR ! E091 BACK UP BATTERY CHANGE BATTERY	Under-voltage of backup battery. Replace the battery. Unless it is replaced, programed mold data is deleted. however program of Rom chip is not deleted.
ERROR ! E096 OPTION 1 ERROR	Unused
ERROR ! E097 OPTION 2 ERROR	Unused

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

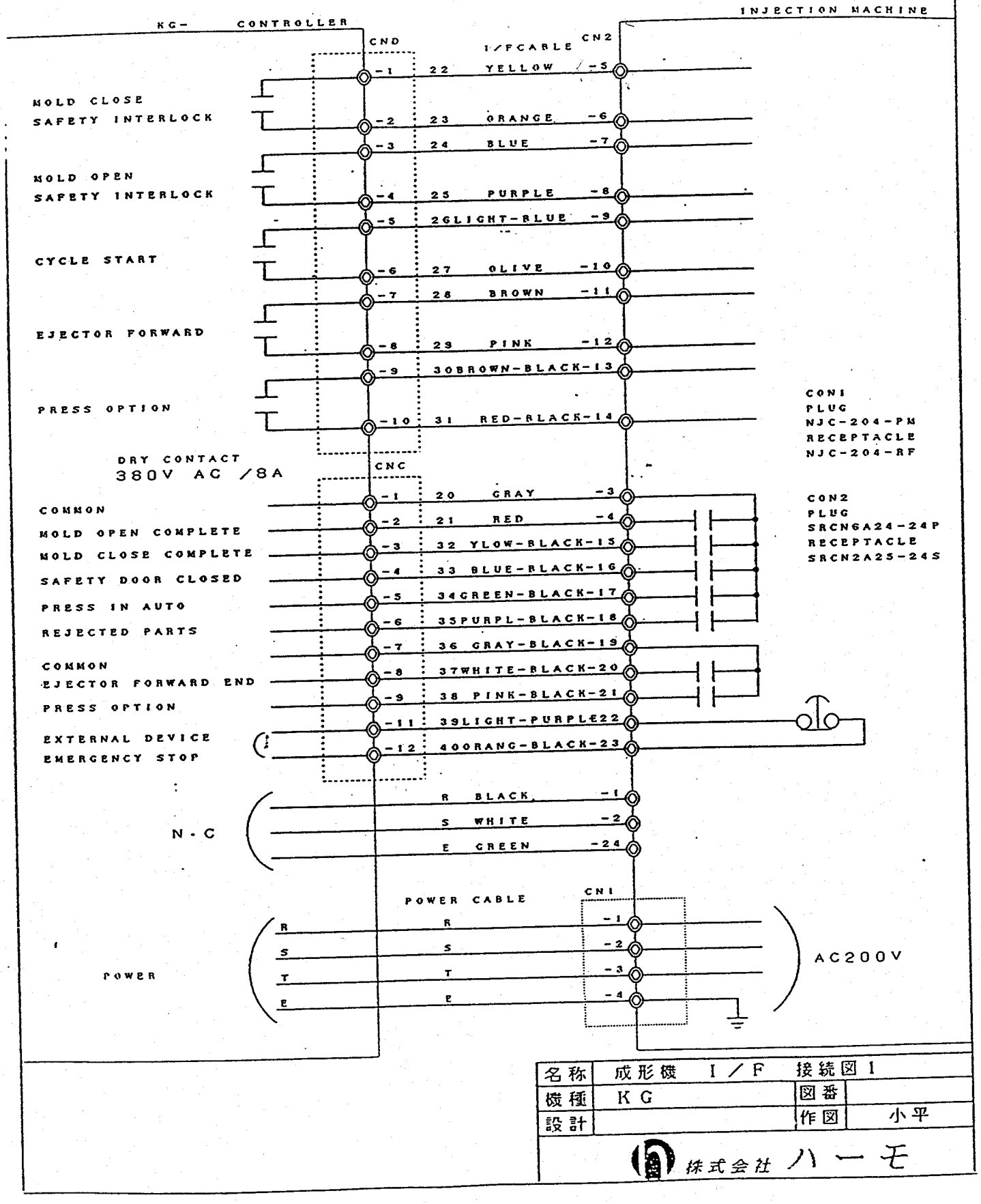
- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

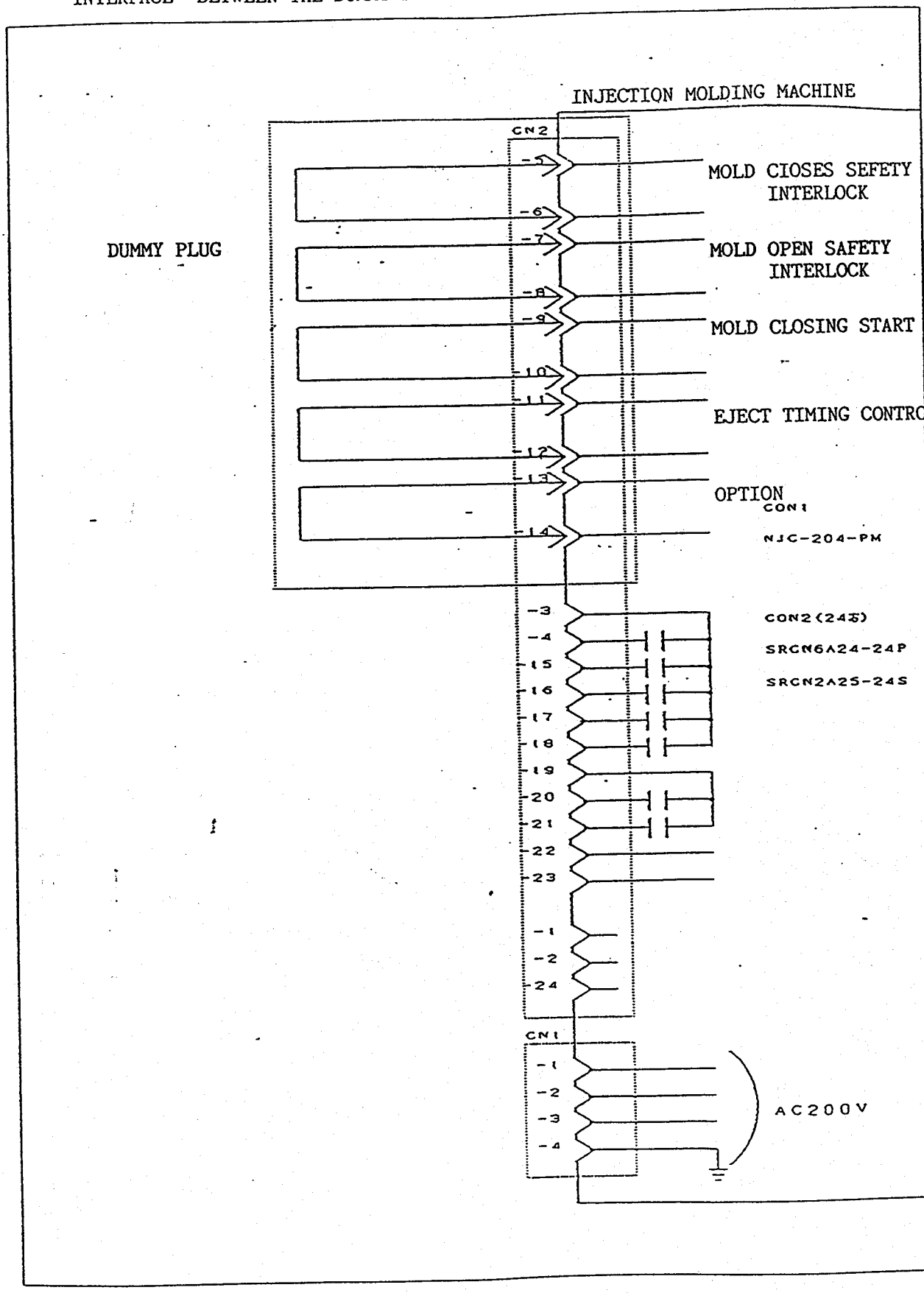
INTERFACE BETWEEN THE ROBOT AND PRESS



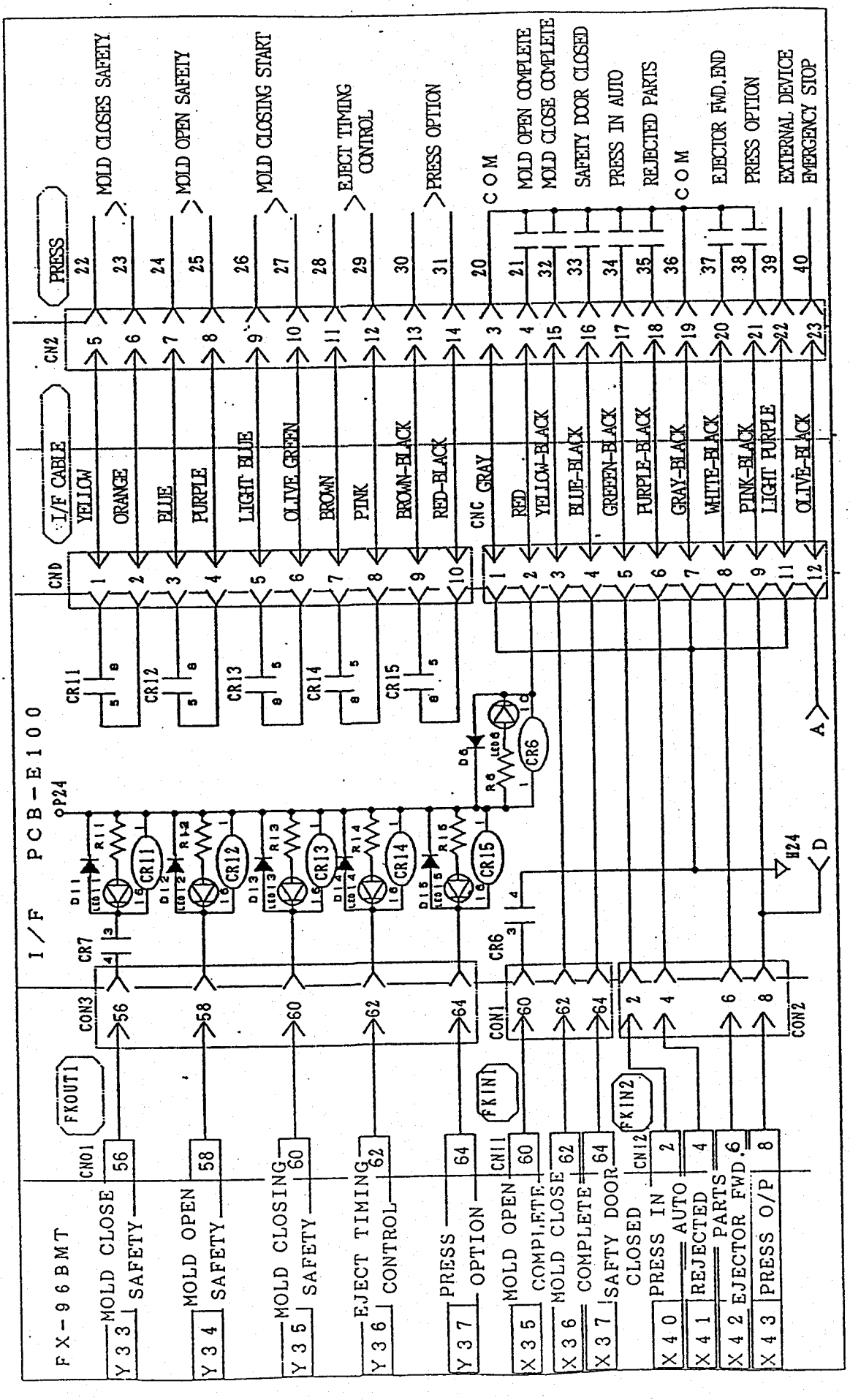
名称	成形機 I／F 接続図1		
機種	KG	図番	
設計		作図	小平

株式会社 ハーモ

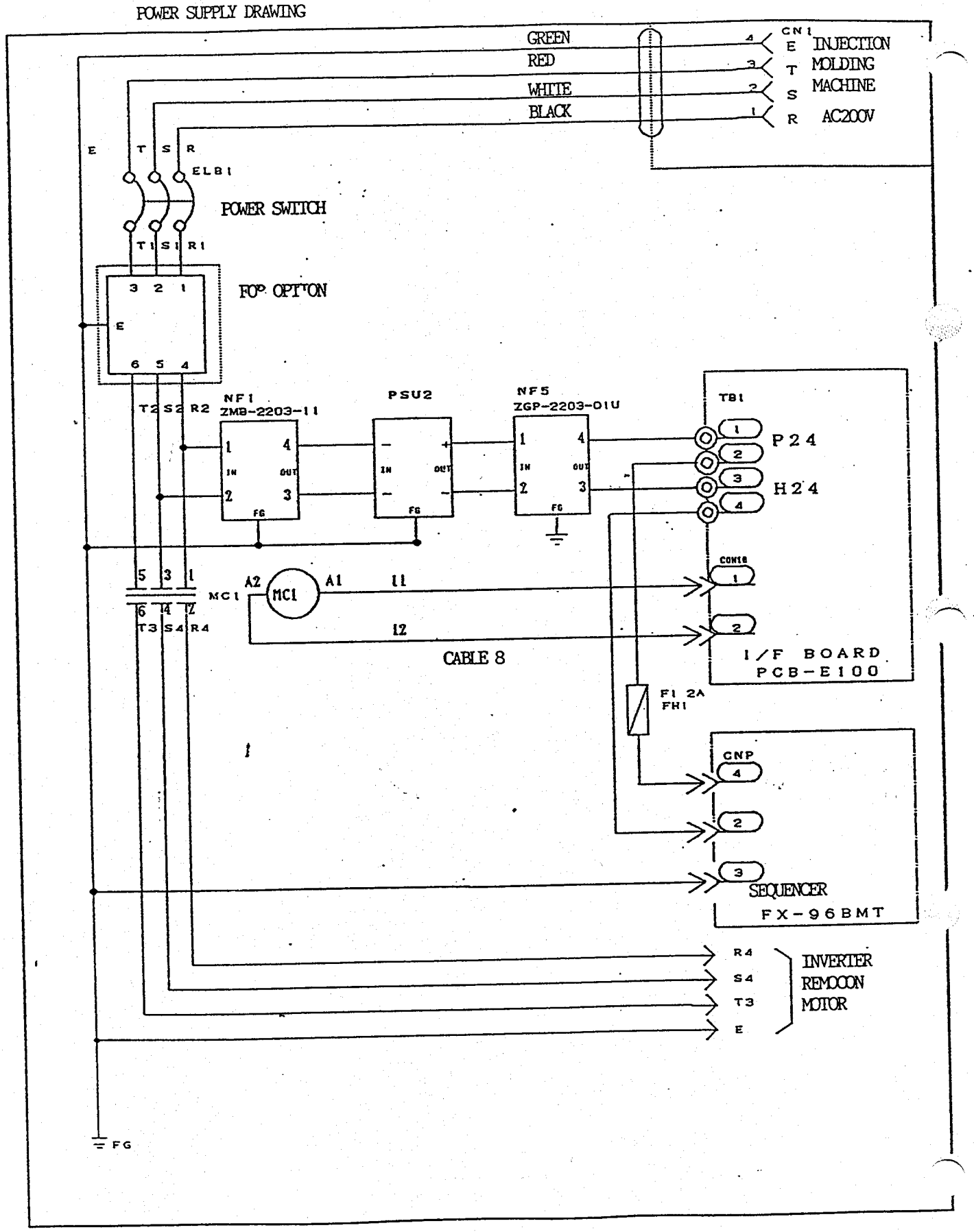
INTERFACE BETWEEN THE DUMMY PLUG AND PRESS



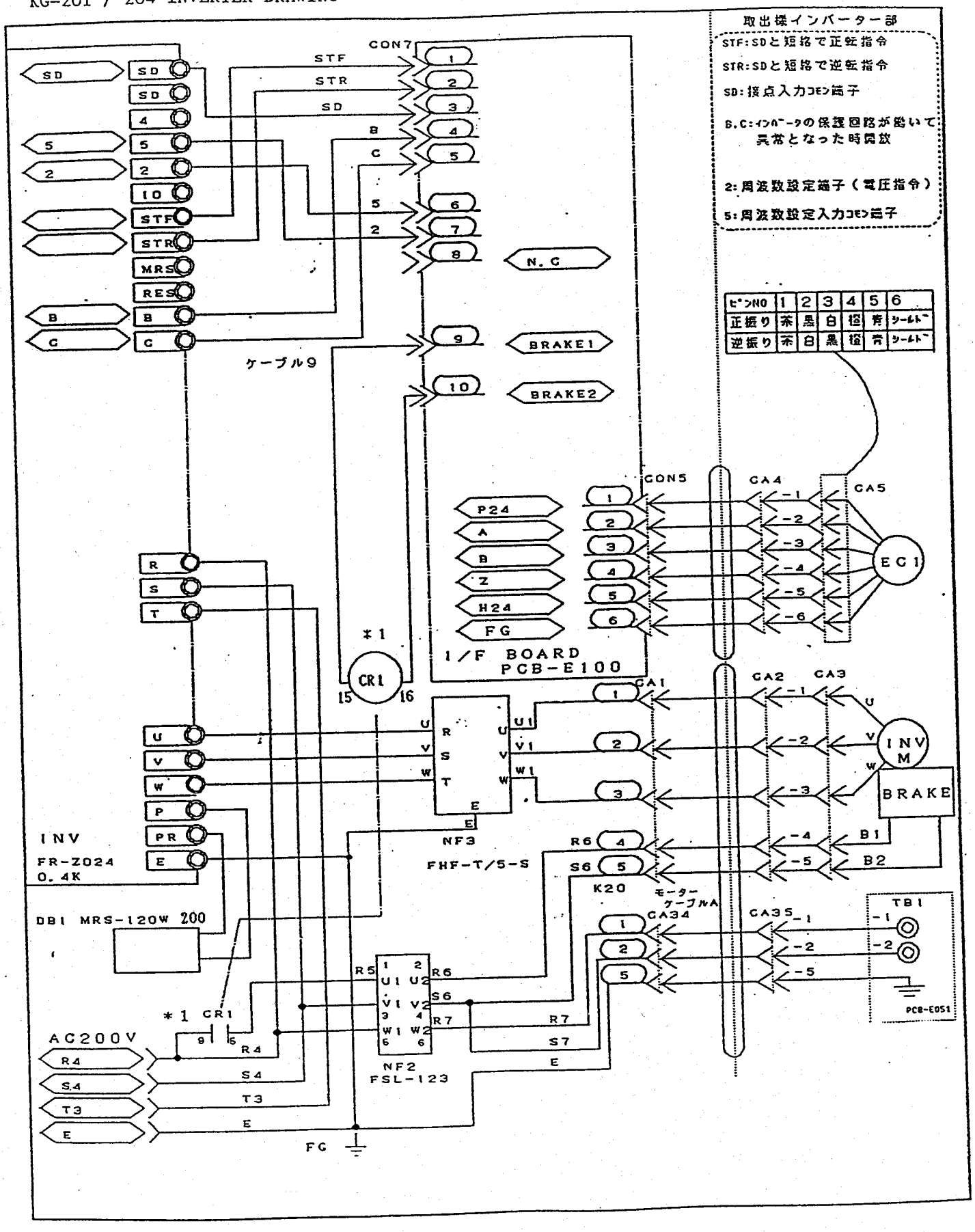
INTERFACE BETWEEN THE CONTROLLER AND PRESS



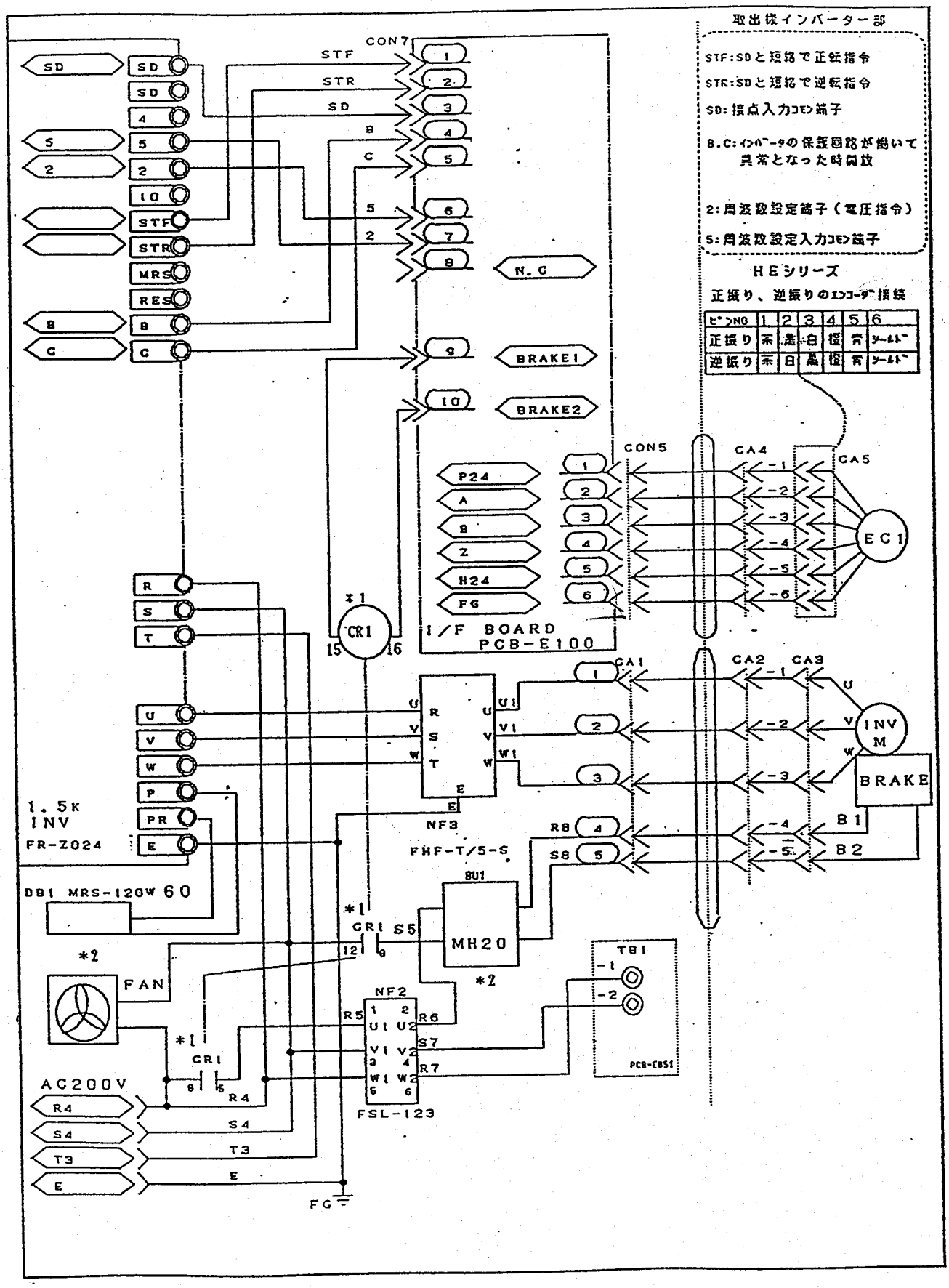
POWER SUPPLY DRAWING



KG-201 / 204 INVERTER DRAWING



KG-203 INVERTER DRAWING



INPUT

NO.					
X 0		A	X41	RS	REJECTED PARTS
X 1		→ SHOULD BE OFF ←	X42	EJ	EJECTOR FWD. END
X 2		B X PULSE FOR HOME	X43	OP	PRESS O/P
X 3		Z	X44	EX	EXTERNAL DEVICE
X 4	L-RM5	MAIN DESC.+END (OP)	X45	ES	EMERGENCY STOP
X 5	L-RM6	MAIN DESC.-END (OP)	X46	L-X4	TRAVERSE OVERRUN -END
X 6	L-RM7	SUB DESC. +END (OP)	X47		KEY SWITCH 1
X 7	L-RM8	SUB DESC. -END (OP)	X50		KEY SWITCH 2
X10	L-Z1	MAIN ASC. END	X51		AUTO START SWITCH
X11	L-Z2	MAIN DESC. END	X52		AUTO STOP SWITCH
X12	L-Y1	MAIN STRIP BWD. END	X53		ROBOT READY SWITCH
X13	L-Y2	MAIN STRIP FWD. END	X54		POWER SWITCH
X14	L-X1	1ST DESC. SAFETY	X55	L-RM1	MAIN STRIP FWD. +END
X15	L-X2	2ND DESC. SAFETY	X56	L-RM2	MAIN STRIP BWD. -END
X16	L-X3	TRAVERSE OVERRUN +END	X57	L-RM3	SUB STRIP FWD. +END
X17	L-G1	PART VERIFICATION	X60	L-RM9	M.STRIP S/T END (OP)
X20	L-G2	VACUUM VERIFICATION	X61	L-RM10	M. STRIP S/T END (OP)
X21	L-G3	M. SPURE VERIFICATION	X62	L-RM11	S.STRIP S/T END (OP)
X22	L-G4	S. SPURE VERIFICATION	X63	L-RM12	S.STRIP S/T END (OP)
X23	L-R1	WRIST VERTICAL END	X64		
X24	L-R2	WRIST HORIZONTAL END	X65		
X25	L-R3	ROTATE RETURN END(O/P)	X66		
X26	L-R4	ROTATE OUT END (O/P)	X67		
X27	L-H1	SUB ASC. END	X70		
X30	L-H2	SUB DESC. END	X71		
X31	L-W1	SUB STRIP BWD. END	X72		
X32	L-W2	SUB STRIP FWD. END	X73		
X33	L-P1	INPUT O/P 1	X74		
X34	L-P2	INPUT O/P 2	X75		
X35	MO	MOLD OPEN COMPLETE	X76		
X36	MC	MOLD CLOSE COMPLETE	X77		
X37	DR	SAFTY DOOR CLOSED			
X40	AT	PRESS IN AUTO			

OUTPUT

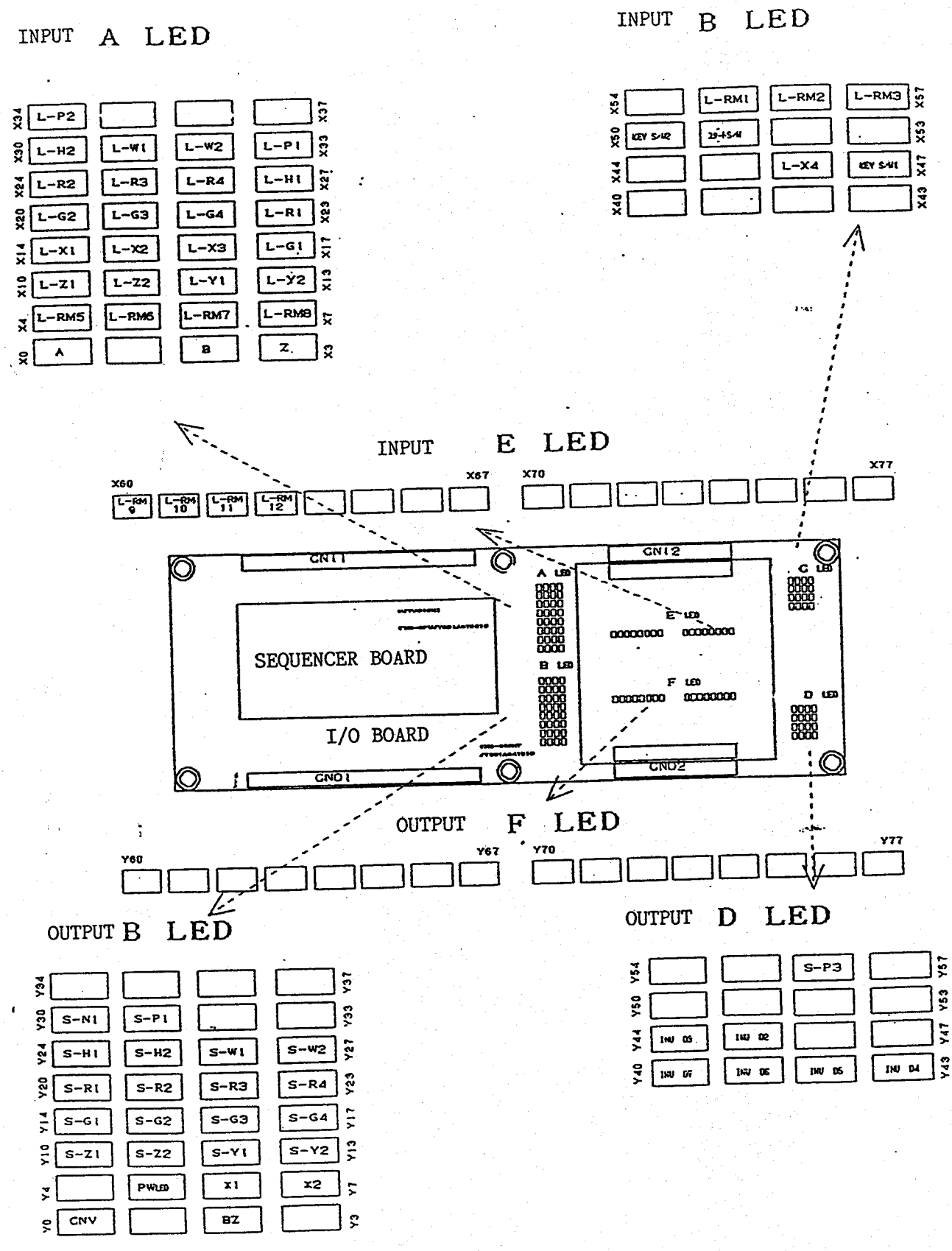
KG-201

NO.					
Y 0	CV	CONVEYOR	Y41		INVERTER DATA (D6)
Y 1	OP	OPTION	Y42		INVERTER DATA (D5)
Y 2	BZ	BUZZER	Y43		INVERTER DATA (D4)
Y 3	AT	ROBOT AUTO LED	Y44		INVERTER DATA (D3)
Y 4	RD	ROBOT READY LED	Y45		INVERTER DATA (D2)
Y 5	PW	POWER END	Y46		INVERTER ROTATION
Y 6		M1 ROTATION NOMAL			NORMAL/REVERSING
Y 7		M1 ROTATION REVERSE	Y47		INVERTER BREAK RELEASE
Y10	S-Z1	MAIN ASC. SOL	Y50		M2 ROTATION NOMAL
Y11	S-Z2	MAIN DESC. SOL	Y51		M2 ROTATION REVERSE
Y12	S-Y1	MAIN STRIP BWD. SOL	Y52		M3 ROTATION NOMAL
Y13	S-Y2	MAIN STRIP FWD. SOL	Y53		M3 ROTATION REVERSE
Y14	S-G1	GRIP SOL	Y54		M4 ROTATION NOMAL
Y15	S-G2	VACUUM SOL	Y55		M4 ROTATION REVERSE
Y16	S-G3	MAIN SPURE SOL	Y56	S-P3	OUTPUT OPTION 3
Y17	S-G4	SUB SPURE SOL	Y57		INVERTER MOTOR ON
Y20	S-R1	WRIST VERTICAL SOL	Y60		
Y21	S-R2	WRIST HORIZONTAL SOL	Y61		
Y22	S-R3	ROTATE RETURN SOL O/P	Y62		
Y23	S-R4	ROTATE OUT SOL O/P	Y63		
Y24	S-H1	SUB ASC. SOL	Y64		
Y25	S-H2	SUB DESC. SOL	Y65		
Y26	S-W1	SUB STRIP BWD. SOL	Y66		
Y27	S-W2	SUB STRIP FWD. SOL	Y67		
Y30	S-N1	NIPPER CUT SOL	Y70		
Y31	S-P1	CHUCK NIPPER SOL O/P	Y71		
Y32	S-P2	OPTION SOL	Y72		
Y33	MC	MOLD CLOSE SAFETY	Y73		
Y34	MO	MOLD OPEN SAFETY	Y74		
Y35	ST	MOLD CLOSING SAFETY	Y75		
Y36	EJ	EJECT TIMING CONTROL	Y76		
Y37	OP	PRESS OPTION	Y77		
Y40		INVERTER DATA (D7)			

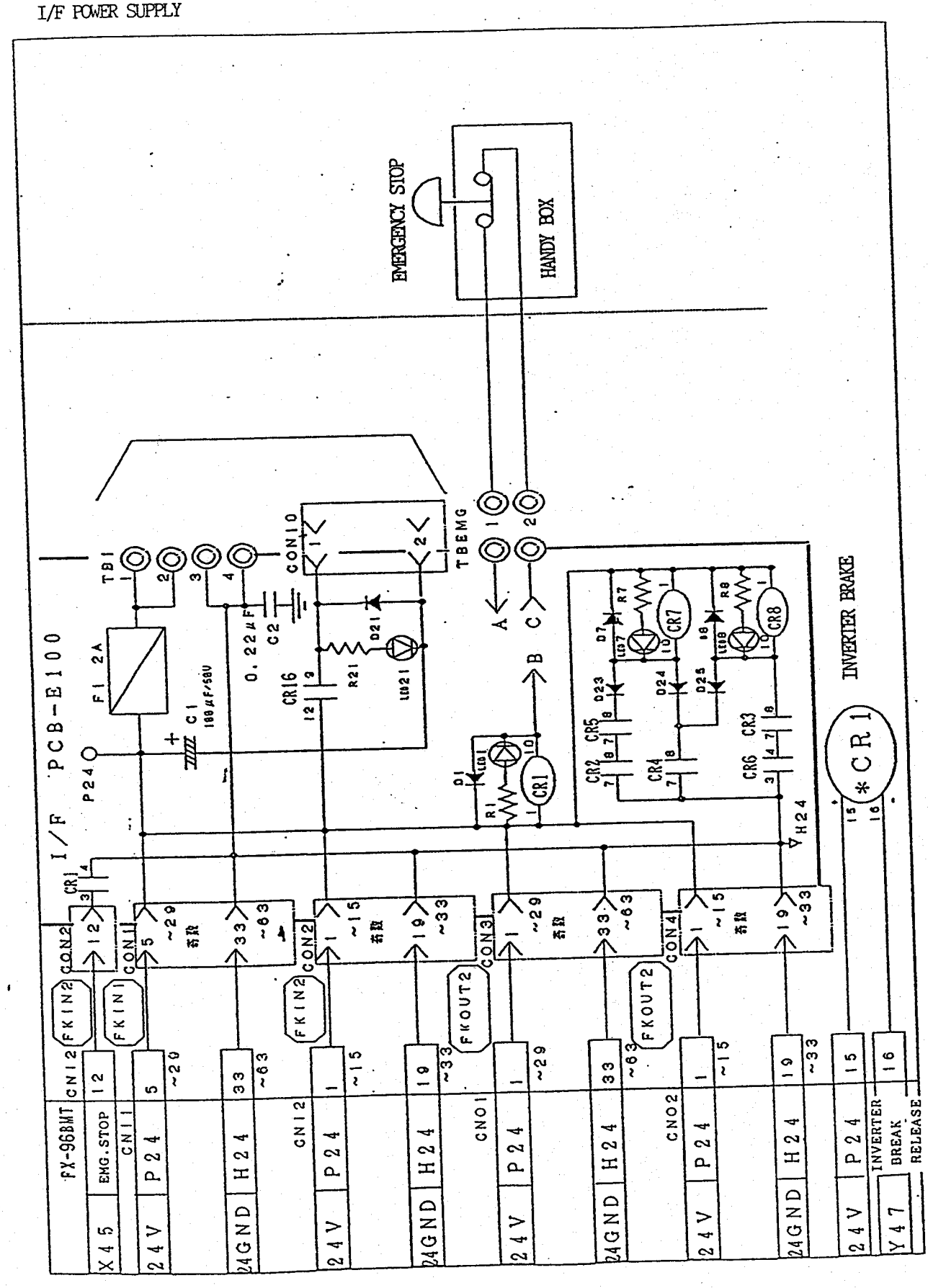
OUTPUT

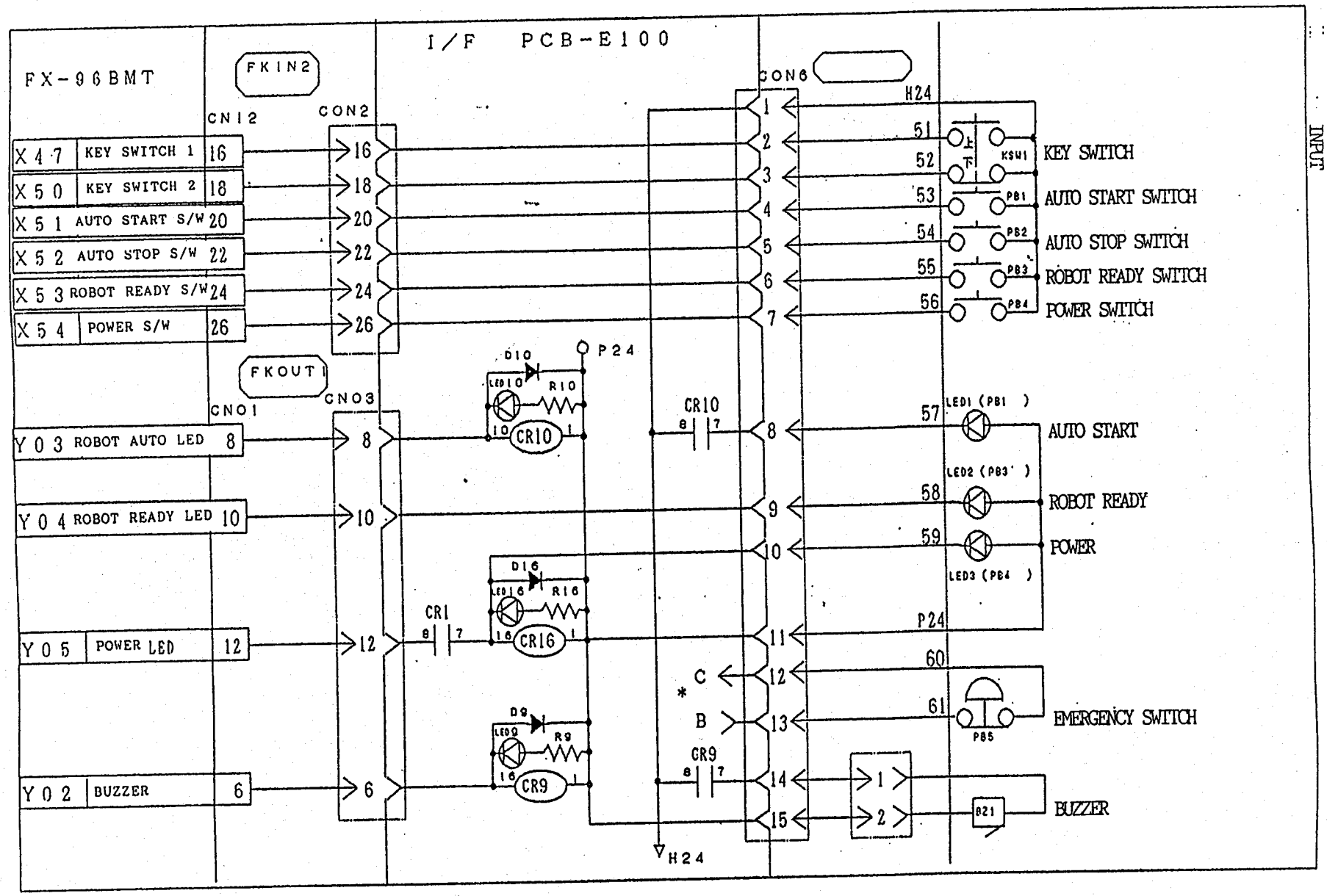
KG-203/204

NO.					
Y 0	CV	CONVEYOR	Y41		INVERTER DATA (D6)
Y 1	OP	OPTION	Y42		INVERTER DATA (D5)
Y 2	BZ	BUZZER	Y43		INVERTER DATA (D4)
Y 3	AT	ROBOT AUTO LED	Y44		INVERTER DATA (D3)
Y 4	RD	ROBOT READY LED	Y45		INVERTER DATA (D2)
Y 5	PW	POWER END	Y46		INVERTER ROTATION
Y 6		M2 DRIVING MI(203)			NORMAL/REVERSING
Y 7		M1 DRIVING M2(203)	Y47		INVERTER BREAK RELEASE
Y10	S-Z1	MAIN ASC. SOL	Y50		M4 DRIVING M3(203)
Y11	S-Z2	MAIN DESC. SOL	Y51		M3 DRIVING M4(203)
Y12	S-Y1	MAIN STRIP BWD. SOL	Y52		M5 DRIVING M5(203)
Y13	S-Y2	MAIN STRIP FWD. SOL	Y53		M6 DRIVING M6(203)
Y14	S-G1	GRIP SOL	Y54		REMOCON MOTOR
Y15	S-G2	VACUUM SOL	Y55		REMOCON MOTOR REVERSE
Y16	S-G3	MAIN SPURE SOL	Y56	S-P3	OUTPUT OPTION
Y17	S-G4	SUB SPURE SOL	Y57		INVERTER MOTOR ON
Y20	S-R1	WRIST VERTICAL SOL	Y60		
Y21	S-R2	WRIST HORIZONTAL SOL	Y62		
Y22	S-R3	ROTATE RETURN SOL O/P	Y63		
Y23	S-R4	ROTATE OUT SOL O/P	Y64		
Y24	S-H1	SUB ASC. SOL	Y65		
Y25	S-H2	SUB DESC. SOL	Y66		
Y26	S-W1	SUB STRIP BWD. SOL	Y67		
Y27	S-W2	SUB STRIP FWD. SOL	Y70		
Y30	S-N1	NIPPER CUT SOL	Y71		
Y31	S-P1	CHUCK NIPPER SOL O/P	Y72		
Y32	S-P2	OPTION SOL	Y73		
Y33	MC	MOLD CLOSE SAFETY	Y74		
Y34	MO	MOLD OPEN SAFETY	Y75		
Y35	ST	MOLD CLOSING SAFETY	Y76		
Y36	EJ	EJECT TIMING CONTROL	Y77		
Y37	OP	PRESS OPTION			
Y40		INVERTER DATA (D7)			

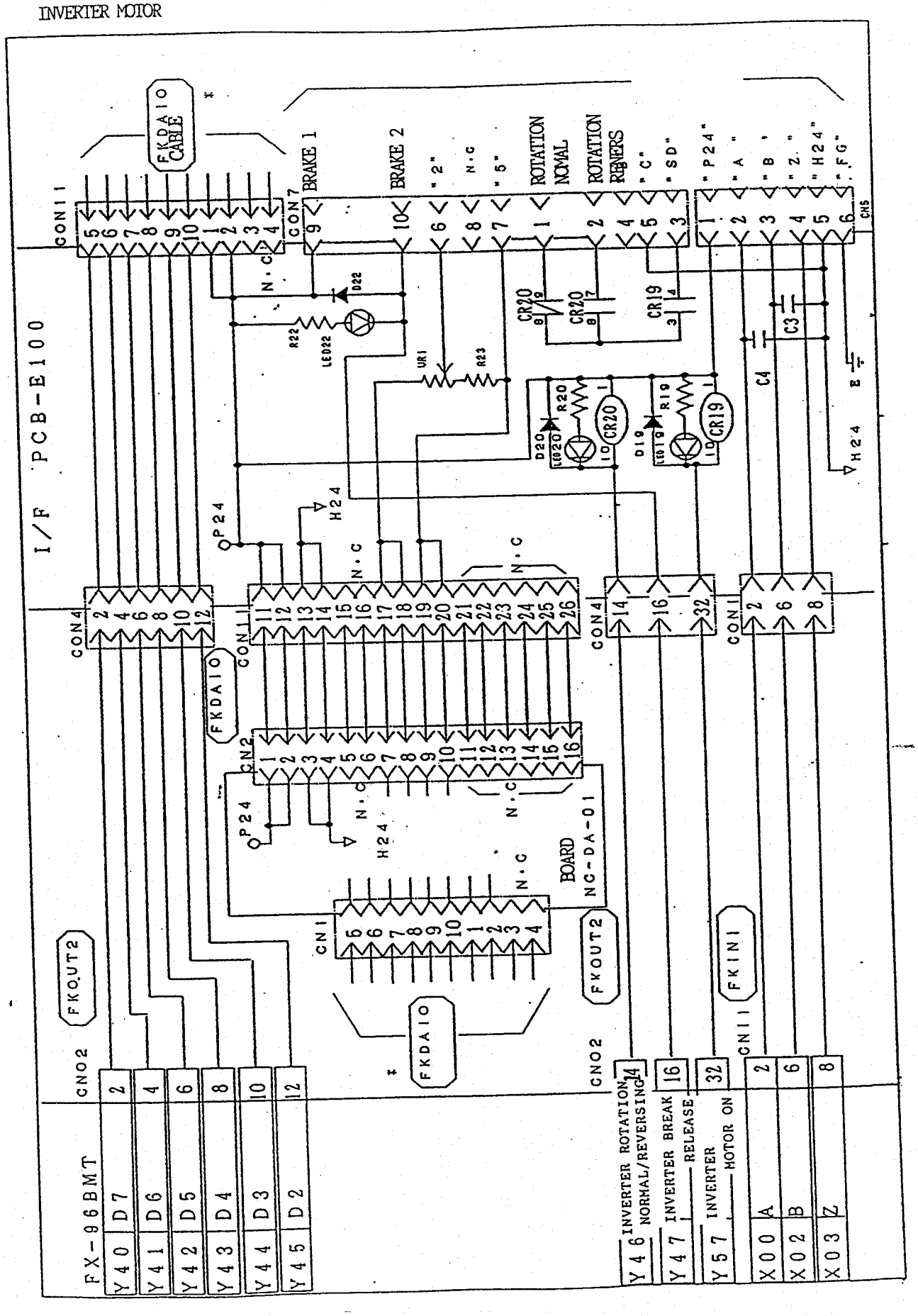

INPUT A LED
L-P2
L-H2
L-W1
L-W2
L-P1
L-R2
L-R3
L-R4
L-H1
L-G2
L-G3
L-G4
L-R1
L-X1
L-X2
L-X3
L-G1
L-Z1
L-Z2
L-Y1
L-Y2
L-RM5
L-RM6
L-RM7
L-RM8
A
B
Z
INPUT B LED
L-RM1
L-RM2
L-RM3
L-X4
INPUT E LED
L-RM 9
L-RM 10
L-RM 11
L-RM 12
CN11
CN12
SEQUENCER BOARD
I/O BOARD
CN01
CN02
A LED
B LED
C LED
D LED
E LED
F LED
OUTPUT F LED
OUTPUT B LED
S-N1
S-P1
S-H1
S-H2
S-W1
S-W2
S-R1
S-R2
S-R3
S-R4
S-G1
S-G2
S-G3
S-G4
S-Z1
S-Z2
S-Y1
S-Y2
PWRLED
X1
X2
CNV
BZ
OUTPUT D LED
S-P3

I/F POWER SUPPLY

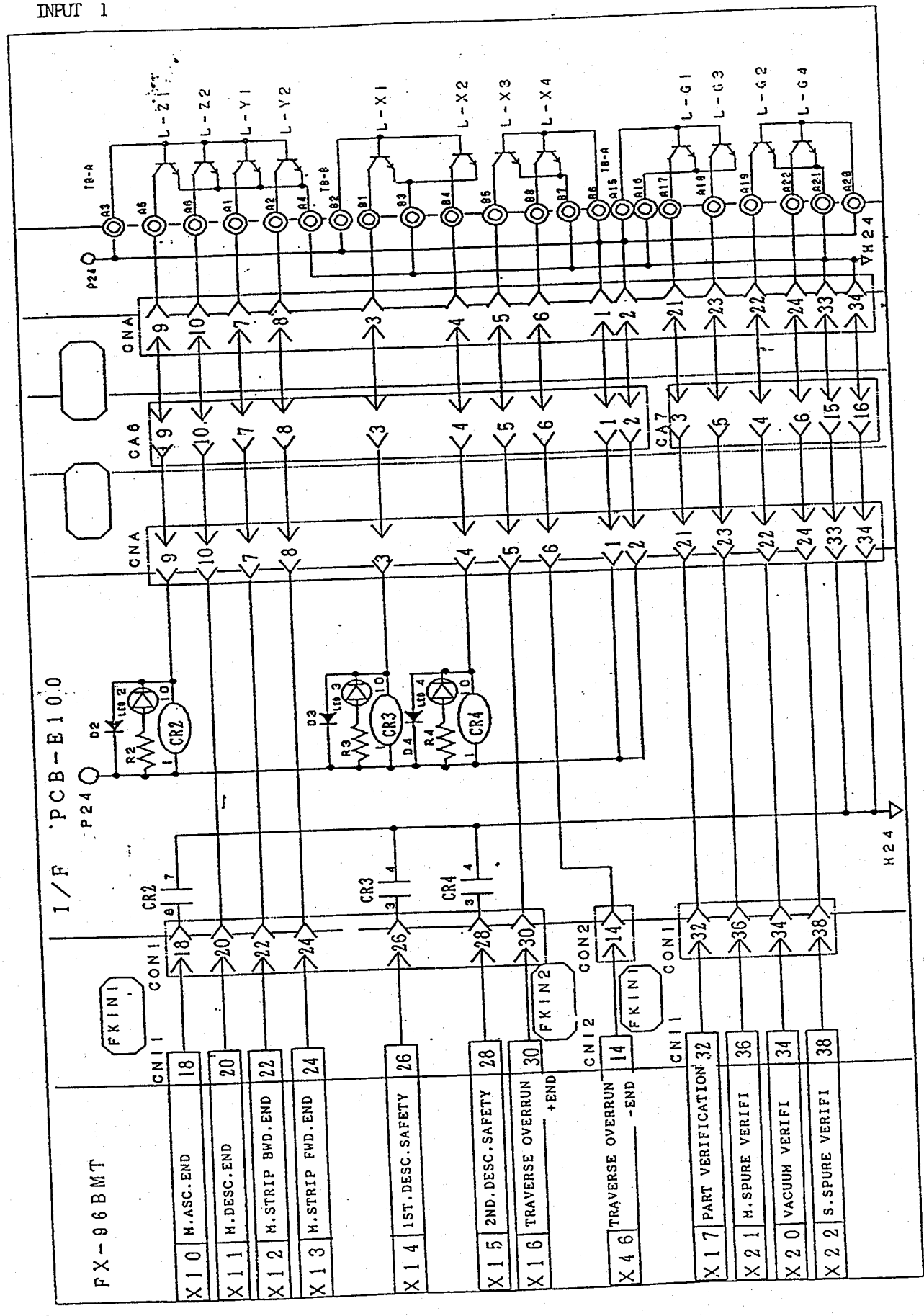



I/F PCB-E100
FX-96BMT
FKIN2
CN12
CON2
CON6
X47 KEY SWITCH 1 16
X50 KEY SWITCH 2 18
X51 AUTO START S/W 20
X52 AUTO STOP S/W 22
X53 ROBOT READY S/W 24
X54 POWER S/W 26
FKOUT1
CNO1
CNO3
Y03 ROBOT AUTO LED 8
Y04 ROBOT READY LED 10
Y05 POWER LED 12
Y02 BUZZER 6
D10
R10
CR10
P24
D16
R16
CR16
CR1
D9
R9
CR9
H24
KSW1
PB1
PB2
PB3
PB4
PB5
KEY SWITCH
AUTO START SWITCH
AUTO STOP SWITCH
ROBOT READY SWITCH
POWER SWITCH
LED1 (PB1)
AUTO START
LED2 (PB3)
ROBOT READY
POWER
LED3 (PB4)
EMERGENCY SWITCH
BZ1
BUZZER
INPUT

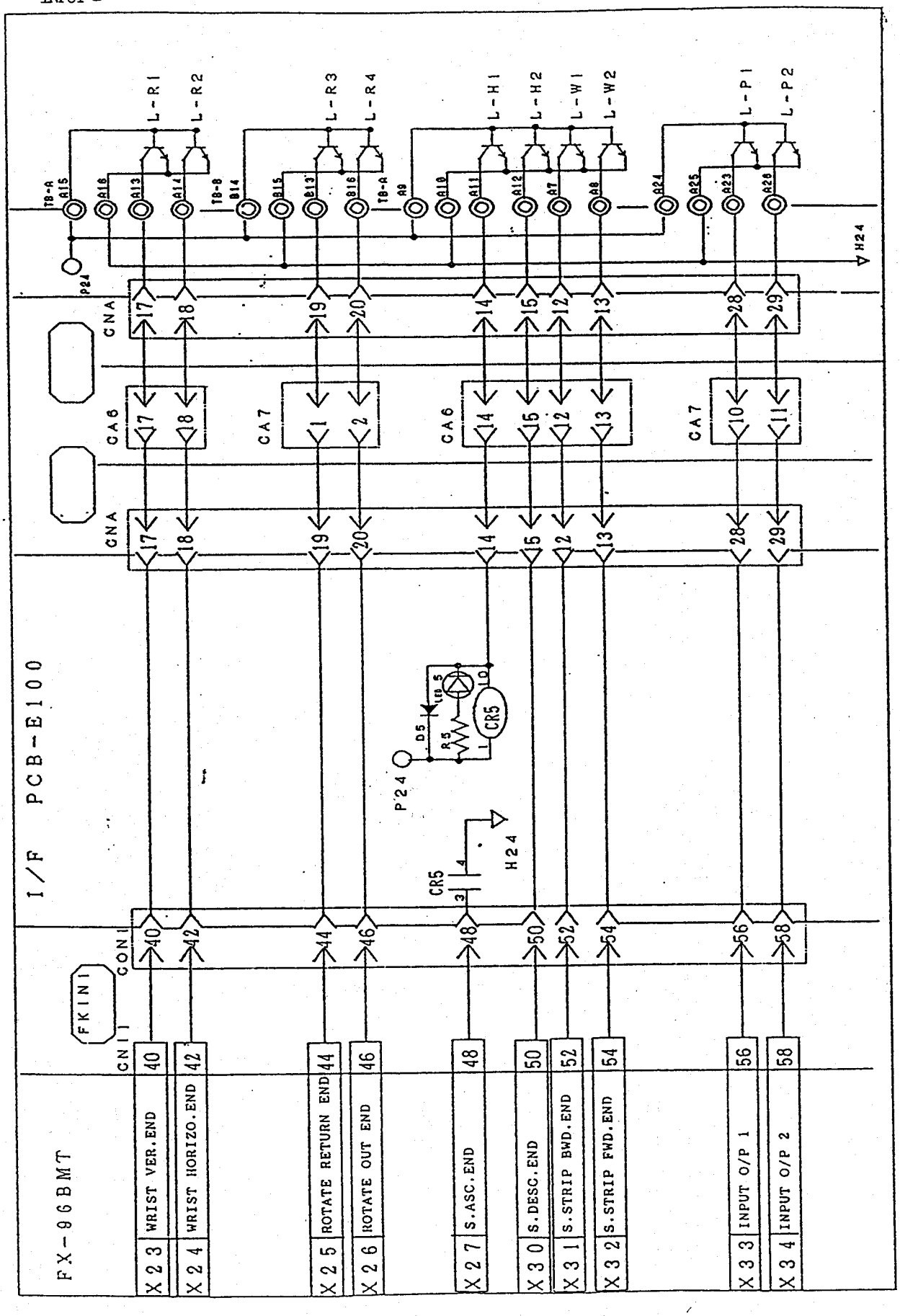
INVERTER MOTOR



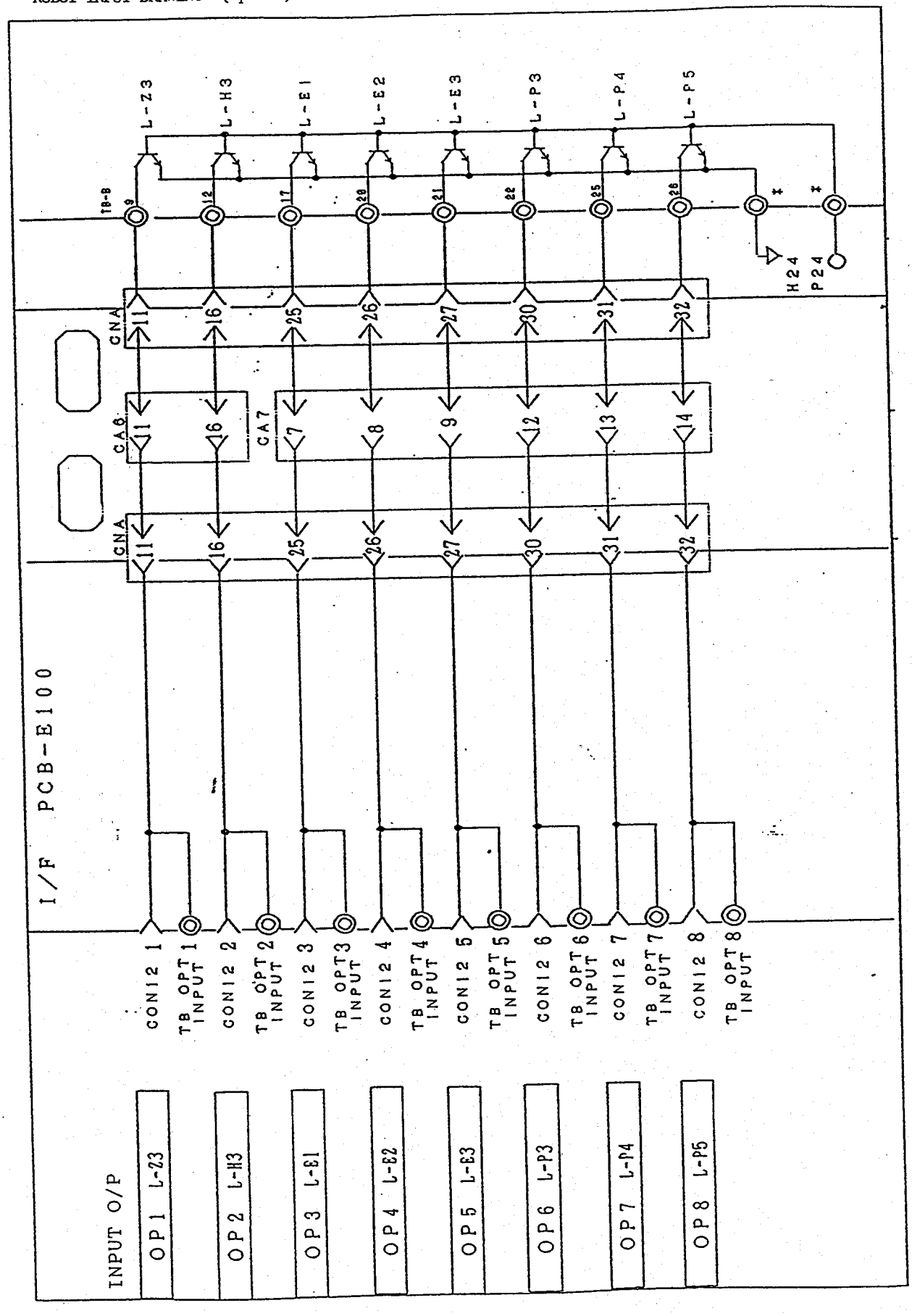
INPUT 1


FX-96BMT
I/F PCB-E100
P24
H24
FKIN1
FKIN2
CON1
CON2
CR2
CR3
CR4
D2
D3
D4
R2
R3
R4
CNA
CA6
CA7
L-Z1
L-Z2
L-Y1
L-Y2
L-X1
L-X2
L-X3
L-X4
L-G1
L-G3
L-G2
L-G4
X10 M.ASC.END
X11 M.DESC.END
X12 M.STRIP BWD.END
X13 M.STRIP FWD.END
X14 1ST.DESC.SAFETY
X15 2ND.DESC.SAFETY
X16 TRAVERSE OVERRUN +END
X46 TRAVERSE OVERRUN -END
X17 PART VERIFICATION
X21 M.SPURE VERIFI
X20 VACUUM VERIFI
X22 S.SPURE VERIFI

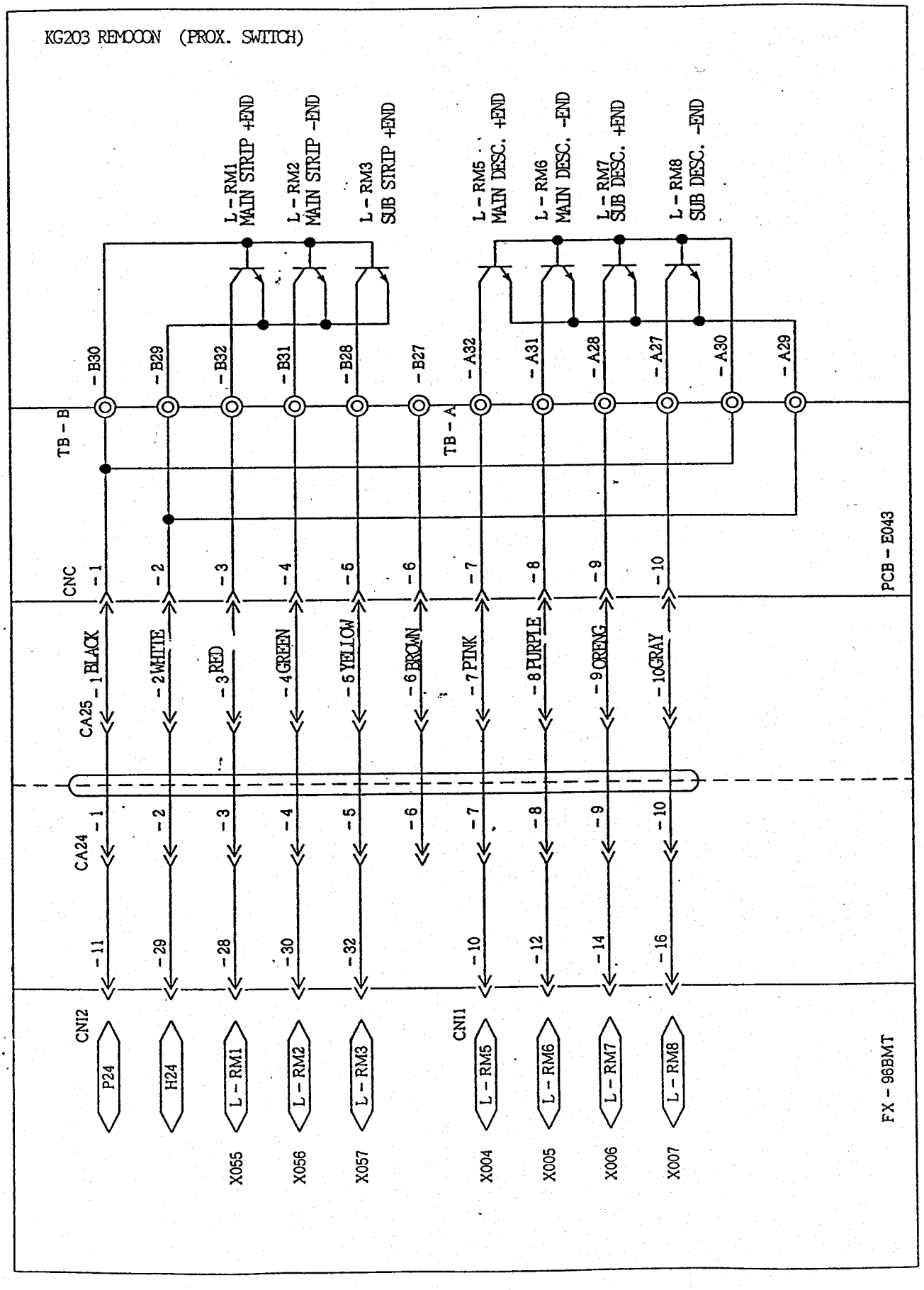
INPUT 2

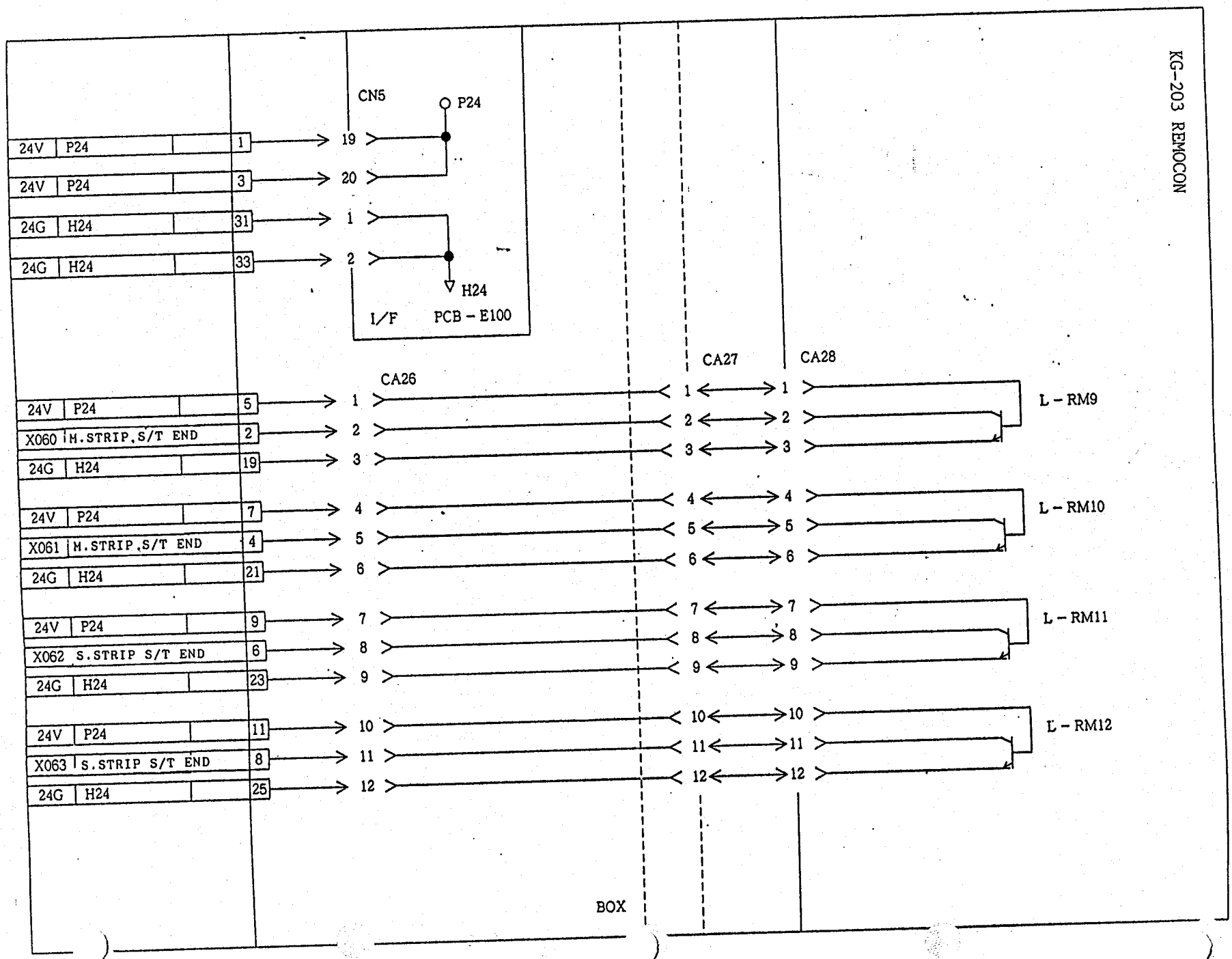

FX-96BMT
I/F PCB-E100
CN11
FKIN1
CON1
X23 WRIST VER.END 40
X24 WRIST HORIZO.END 42
X25 ROTATE RETURN END 44
X26 ROTATE OUT END 46
X27 S.ASC.END 48
X30 S.DESC.END 50
X31 S.STRIP BWD.END 52
X32 S.STRIP FWD.END 54
X33 INPUT O/P 1 56
X34 INPUT O/P 2 58
CNA
CA6
CA7
L-R1
L-R2
L-R3
L-R4
L-H1
L-H2
L-W1
L-W2
L-P1
L-P2
P24
H24
D5
R5
CR5
LD

ROBOT INPUT DRAWING (option)

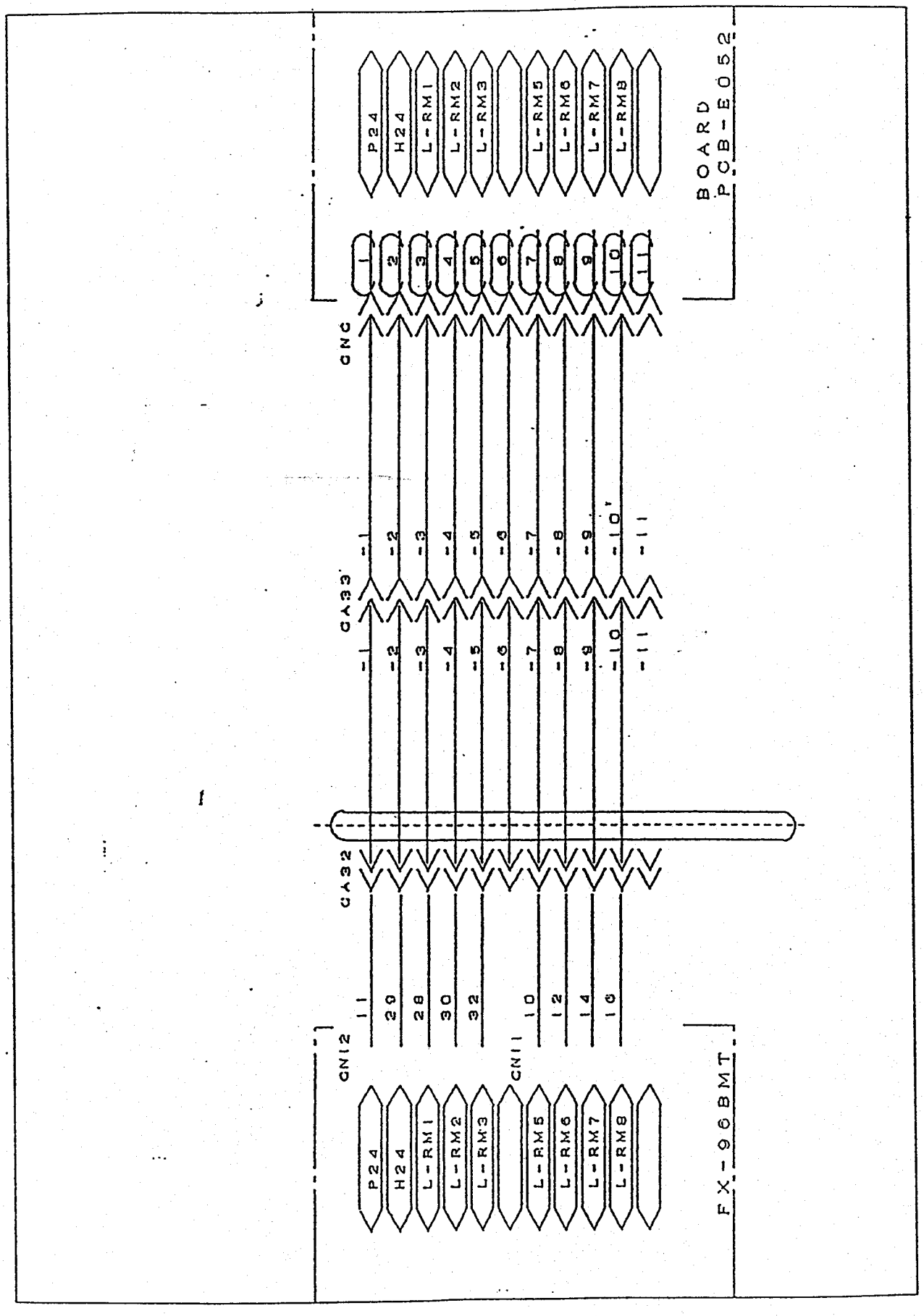


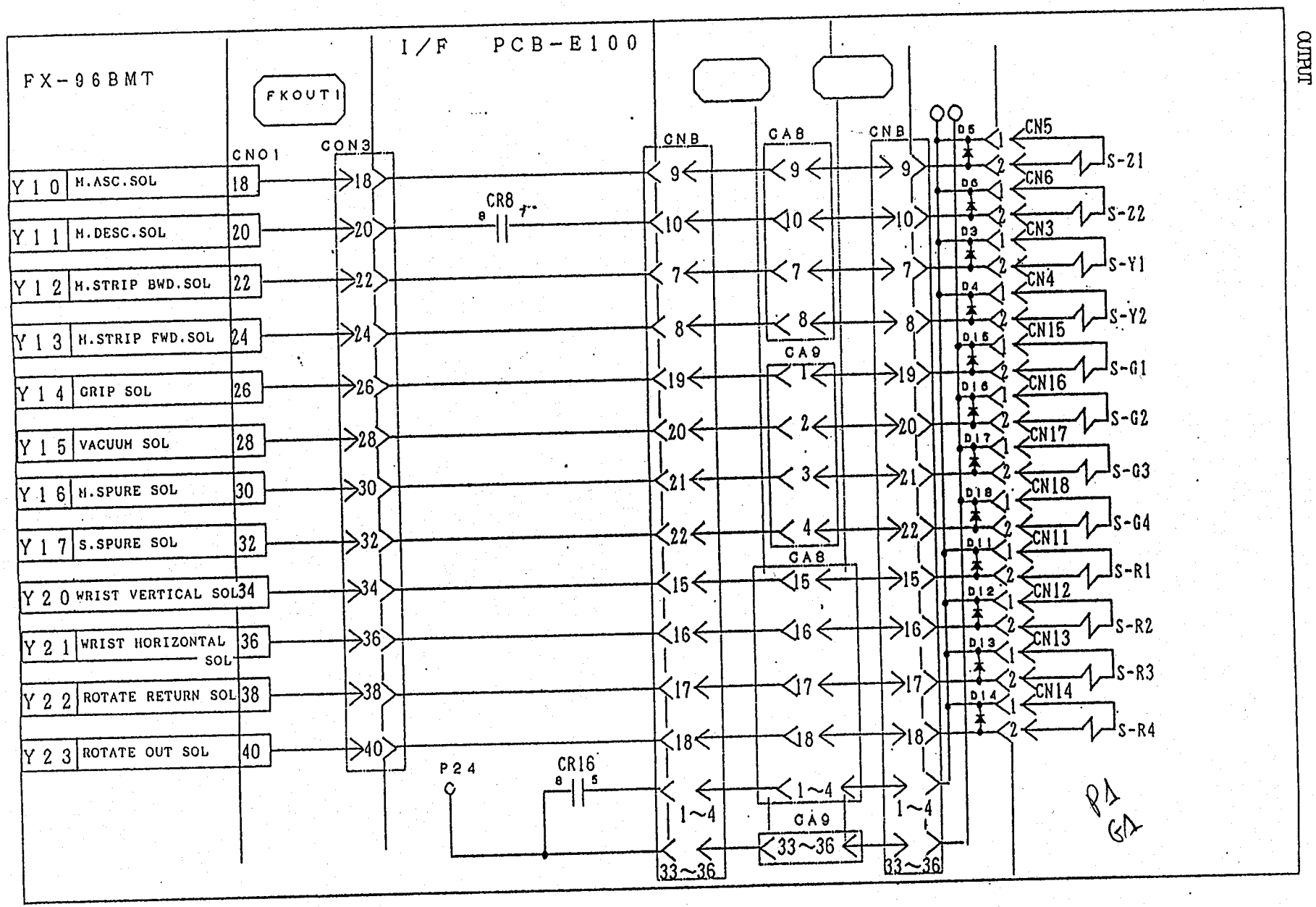
ROBOT INPUT DRAWING

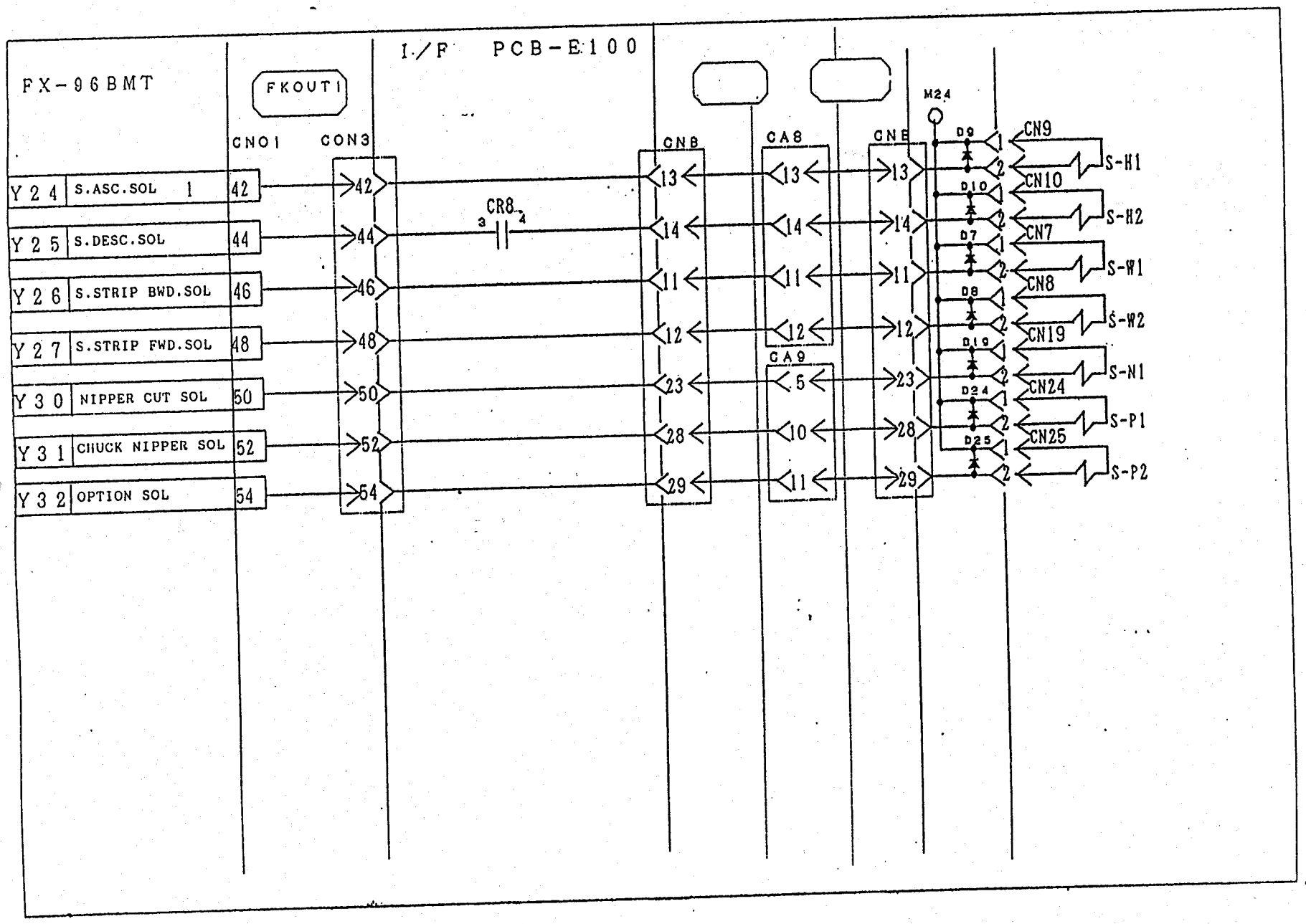



KG-203 REMOCON
CN5
P24
24V P24 1
24V P24 3
24G H24 31
24G H24 33
19
20
1
2
H24
I/F PCB - E100
CA26
CA27
CA28
24V P24 5
X060 M.STRIP,S/T END 2
24G H24 19
1 2 3
1 2 3
L - RM9
24V P24 7
X061 M.STRIP,S/T END 4
24G H24 21
4 5 6
4 5 6
L - RM10
24V P24 9
X062 S.STRIP S/T END 6
24G H24 23
7 8 9
7 8 9
L - RM11
24V P24 11
X063 S.STRIP S/T END 8
24G H24 25
10 11 12
10 11 12
L - RM12
BOX

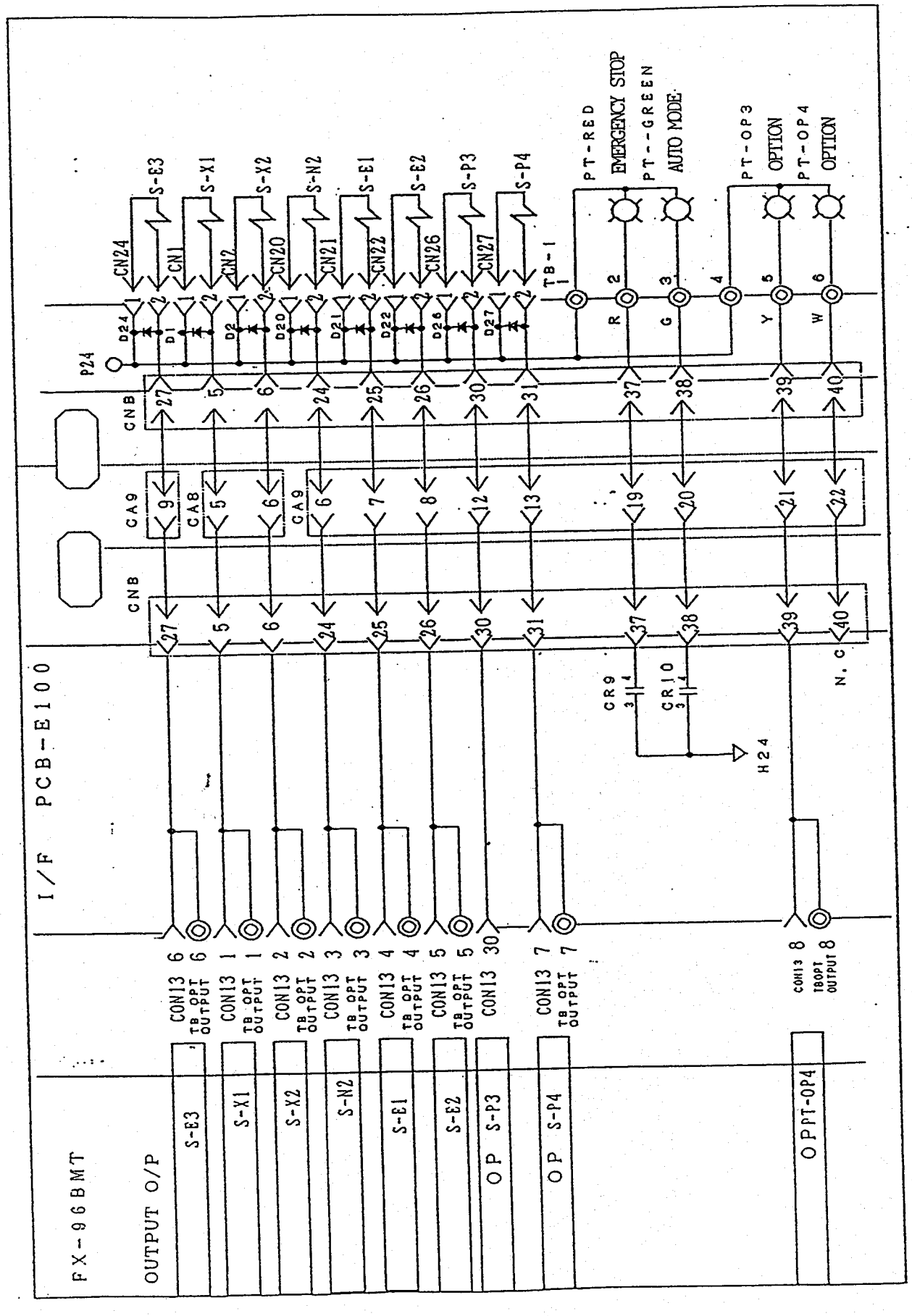
KG-204 REMOCON

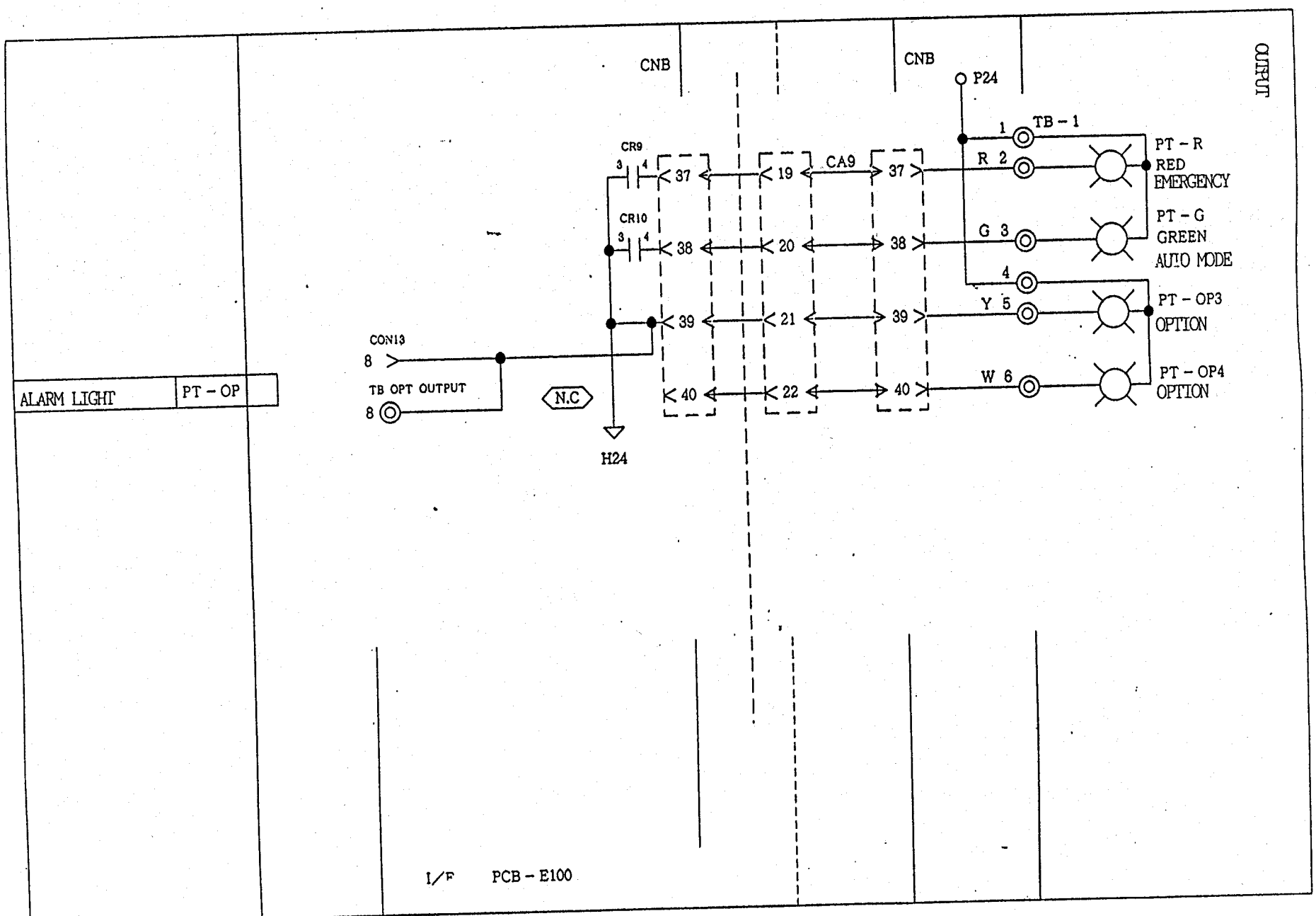


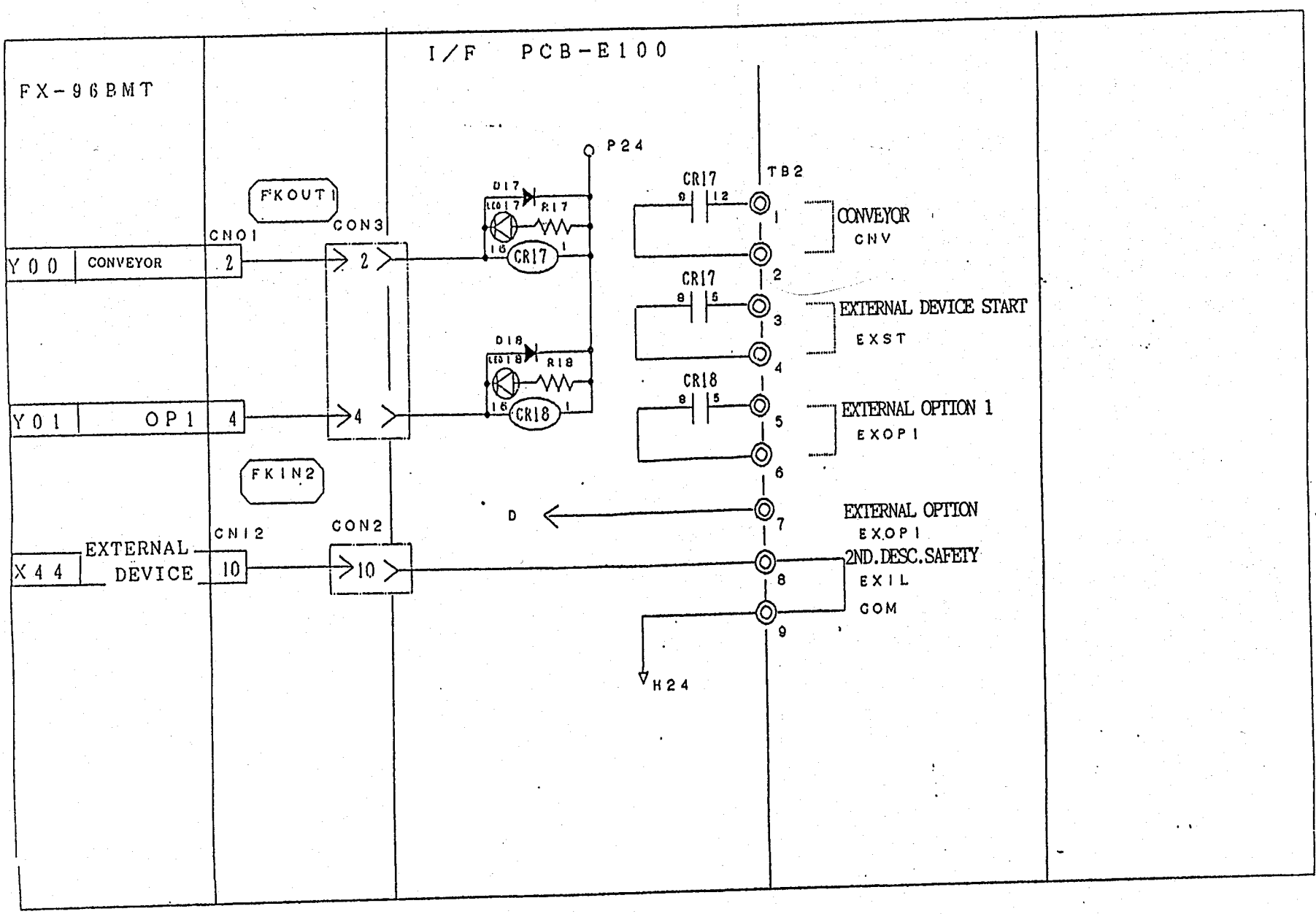

FX-96BMT
I/F PCB-E100
FKOUT1
CNO1
CON3
Y10 M.ASC.SOL 18
Y11 M.DESC.SOL 20
Y12 M.STRIP BWD.SOL 22
Y13 M.STRIP FWD.SOL 24
Y14 GRIP SOL 26
Y15 VACUUM SOL 28
Y16 M.SPURE SOL 30
Y17 S.SPURE SOL 32
Y20 WRIST VERTICAL SOL 34
Y21 WRIST HORIZONTAL SOL 36
Y22 ROTATE RETURN SOL 38
Y23 ROTATE OUT SOL 40
CR8
P24
CR16
CNB
CA8
CA9
1~4
33~36
D5 CN5 S-Z1
D6 CN6 S-Z2
D3 CN3 S-Y1
D4 CN4 S-Y2
D15 CN15 S-G1
D16 CN16 S-G2
D17 CN17 S-G3
D18 CN18 S-G4
D11 CN11 S-R1
D12 CN12 S-R2
D13 CN13 S-R3
D14 CN14 S-R4
OUTPUT


FX-96BMT
FKOUT1
I/F PCB-E100
CN01
CON3
CN8
CA8
CA9
CN6
M24
Y24 S.ASC.SOL 1
Y25 S.DESC.SOL
Y26 S.STRIP BWD.SOL
Y27 S.STRIP FWD.SOL
Y30 NIPPER CUT SOL
Y31 CHUCK NIPPER SOL
Y32 OPTION SOL
42
44
46
48
50
52
54
CR8
D9
D10
D7
D8
D19
D24
D25
CN9
CN10
CN7
CN8
CN19
CN24
CN25
S-H1
S-H2
S-W1
S-W2
S-N1
S-P1
S-P2

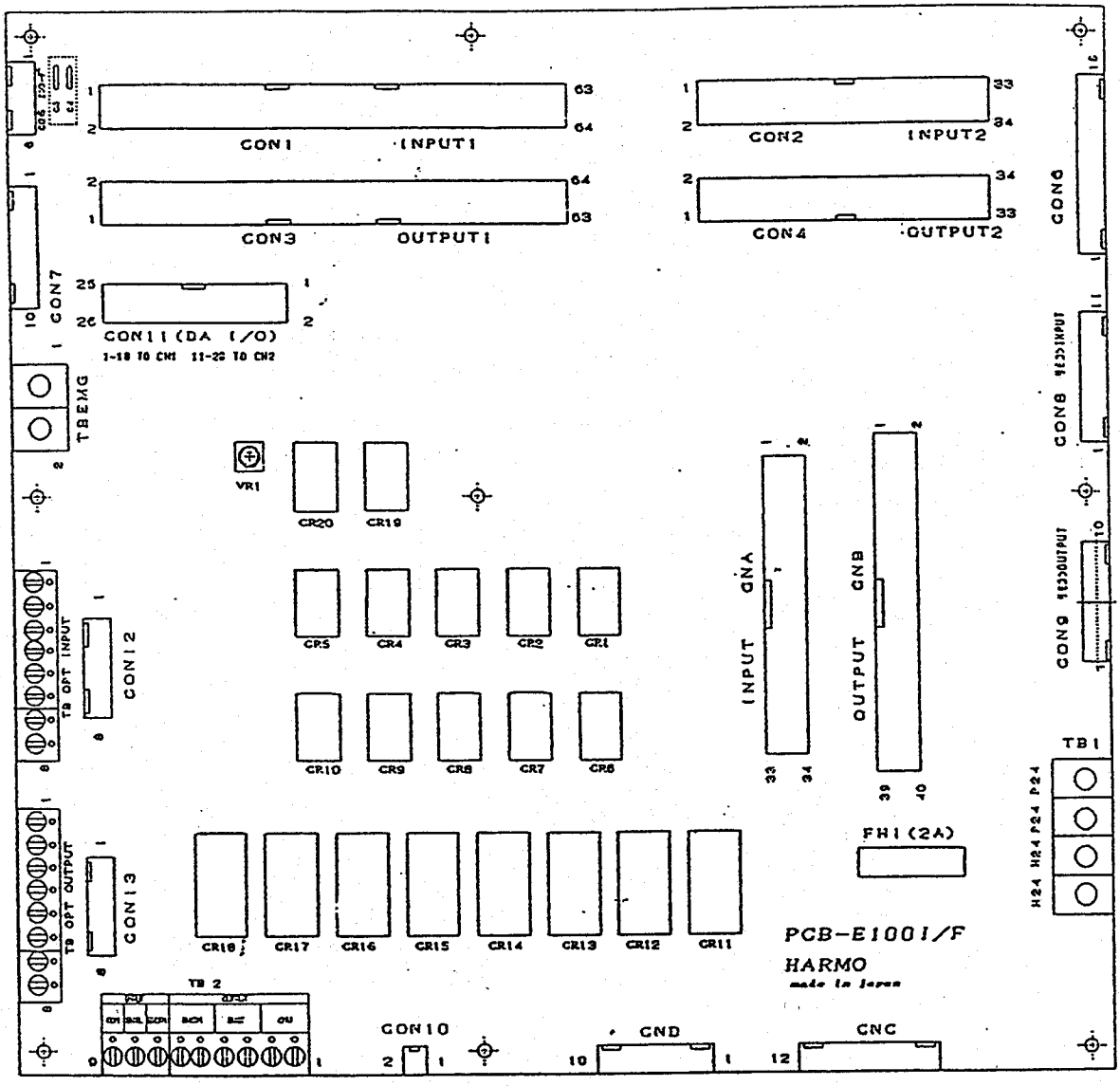
OUTPUT (option)




CNB
CNB
OUTPUT
P24
TB - 1
1
R 2
G 3
4
Y 5
W 6
PT - R
RED
EMERGENCY
PT - G
GREEN
AUTO MODE
PT - OP3
OPTION
PT - OP4
OPTION
CR9
CR10
CA9
37
19
37
38
20
38
39
21
39
40
22
40
CON13
8
TB OPT OUTPUT
8
N.C
H24
ALARM LIGHT
PT - OP
I/F PCB - E100


I/F PCB-E100
FX-96BMT
FKOUT1
CON3
CN01
Y00 CONVEYOR 2
Y01 OP1 4
FKIN2
CN12
CON2
X44 EXTERNAL DEVICE 10
P24
D17
R17
CR17
D18
R18
CR18
TB2
CR17
CONVEYOR
CNV
CR17
EXTERNAL DEVICE START
EXST
CR18
EXTERNAL OPTION 1
EXOP1
D
EXTERNAL OPTION
EXOP1
2ND.DESC.SAFETY
EXIL
COM
H24
OUTPUT (EXTERNAL DEVICE)

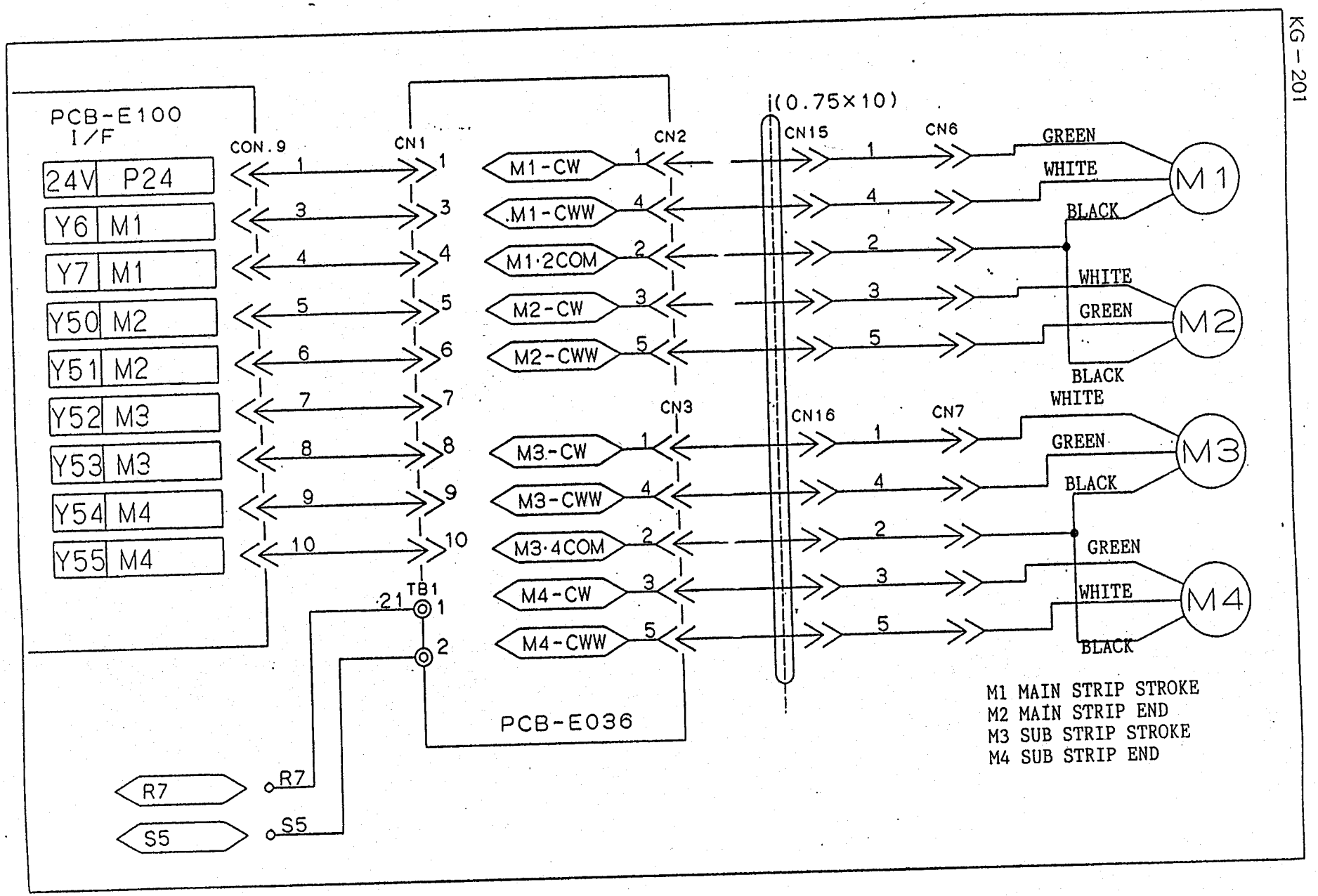
INTERFACE BOARD (PCB – E1001/F)



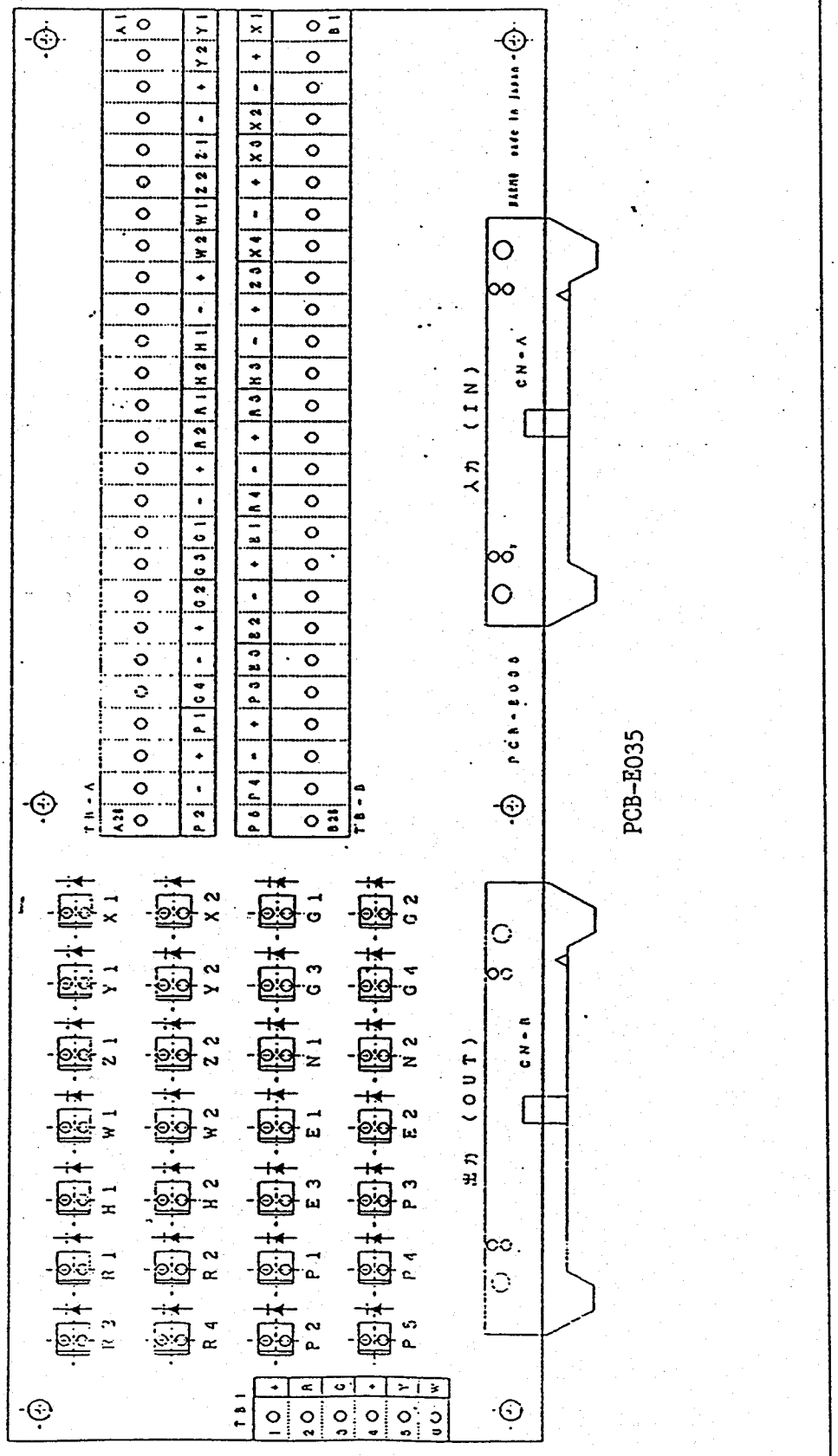
CR1-10, 19, 20 : ATQ204 TQ2-24V

CR11-18 : AGP2024 DSP2a-DC24V

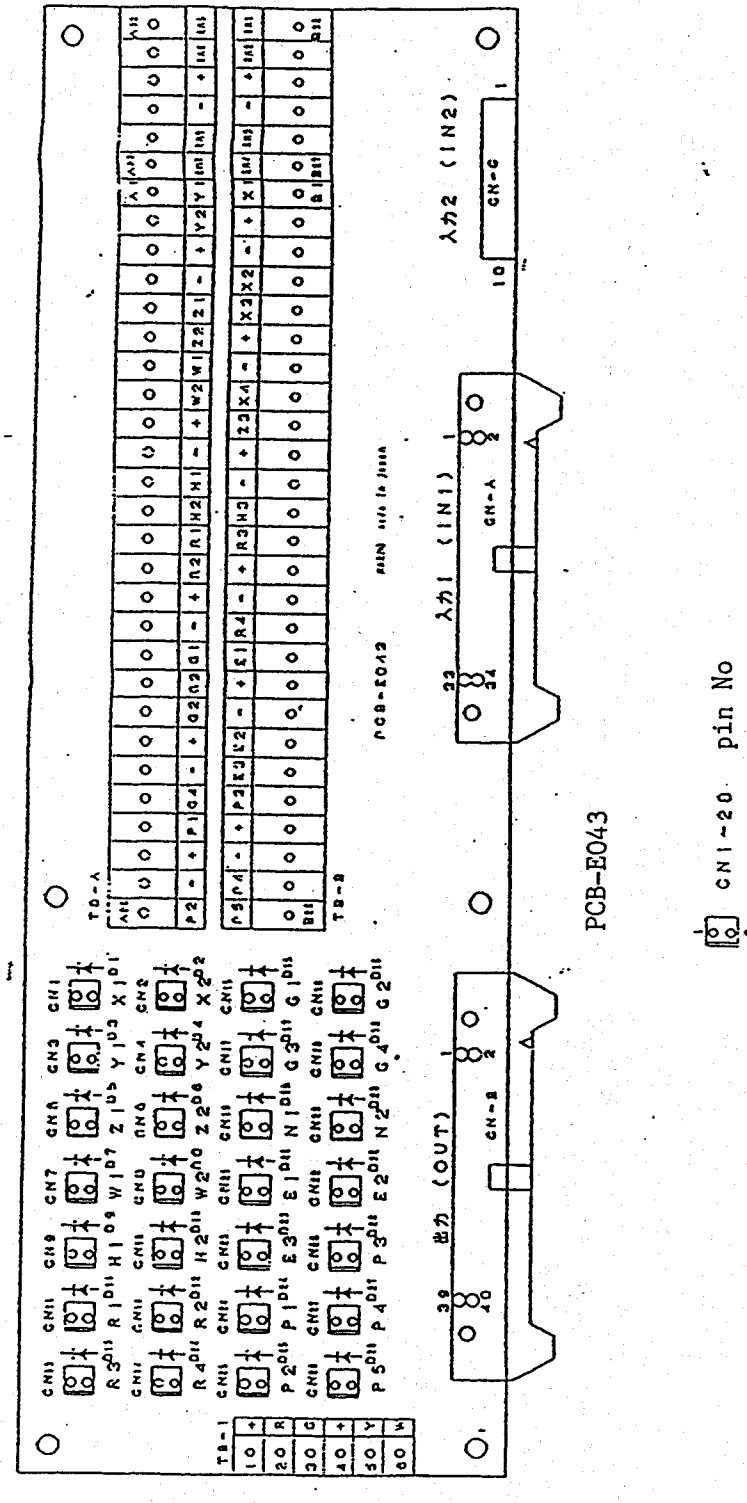
CR1 EMAERGENCY STOP
CR2 MAIN ASCENT END
CR3 1ST.DESCENT SAFETY
CR4 2ND.DESCENT SAFETY
CR5 SUB ASCENT END
CR6 MOLD OPEN COMPLETE
CR7 TRAVERSE RUN INTERLOCK
CR8 MAIN/SUB DESCENT SAFETY
CR9 BUZZER
CR10 ROBOT AUTO LED.
CR11 MOLD CLOSES SAFETY
CR12 MOLD OPEN SAFETY
CR13 MOLD CLOSING SAFETY
CR14 EJECT TIMING CONTROL
CR15 PRESS OPTION
CR16 POWER LED.
CR17 CONVEYOR
CR18 EXTERNAL OPTON 1
CR19 MOTOR ON
CR20 ROTATION NORMAL/REVERSING(motor)


PCB-E100
I/F
CON.9
CN1
CN2
(0.75×10)
CN15
CN6
24V P24
Y6 M1
Y7 M1
Y50 M2
Y51 M2
Y52 M3
Y53 M3
Y54 M4
Y55 M4
M1-CW
M1-CWW
M1·2COM
M2-CW
M2-CWW
GREEN
WHITE
BLACK
M1
M2
CN3
CN16
CN7
M3-CW
M3-CWW
M3·4COM
M4-CW
M4-CWW
M3
M4
TB1
21
PCB-E036
R7
S5
M1 MAIN STRIP STROKE
M2 MAIN STRIP END
M3 SUB STRIP STROKE
M4 SUB STRIP END

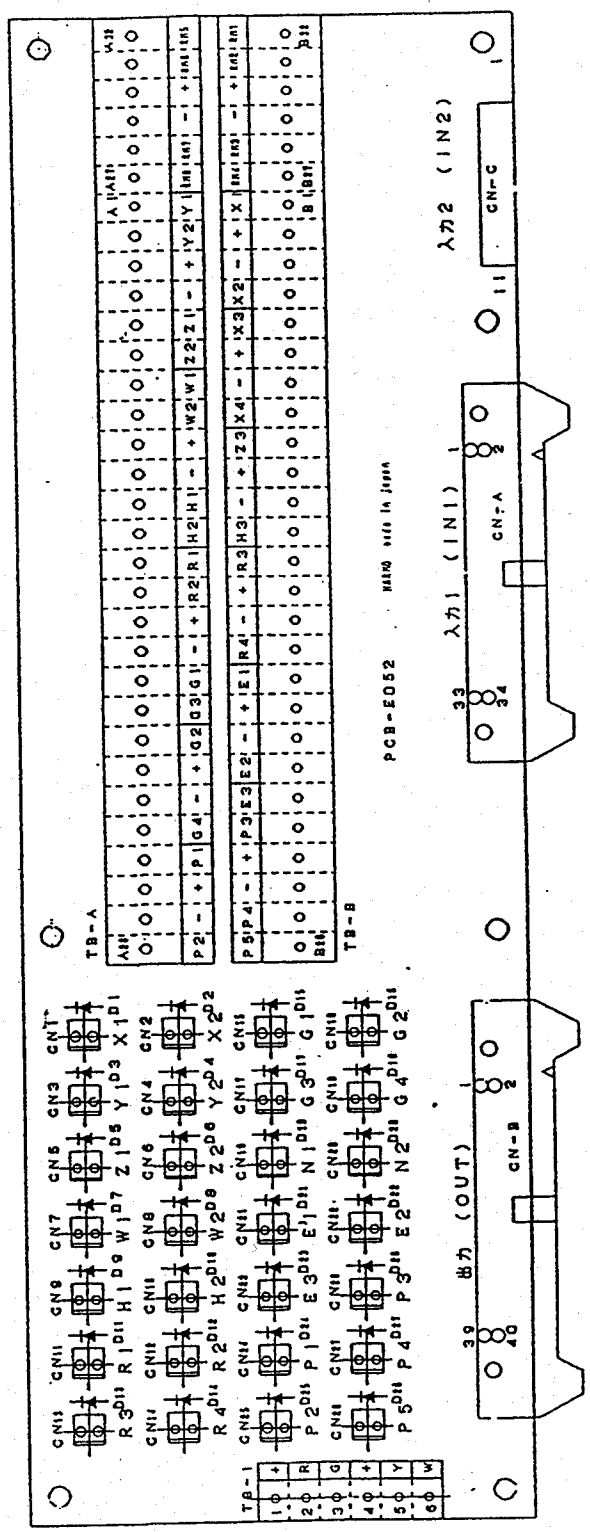
INPUT OUTPUT TERMINAL BOARD KG-201



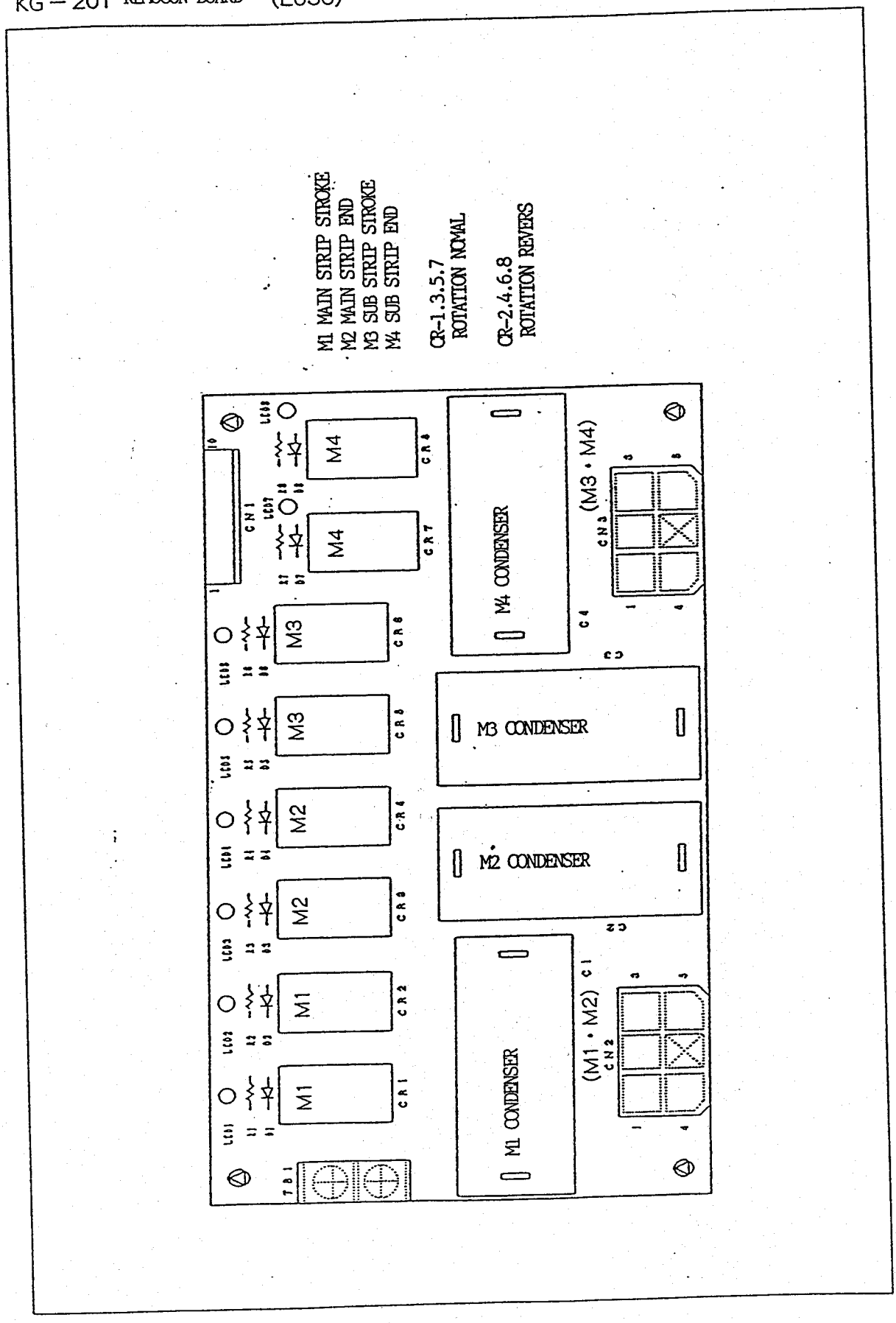
INPUT OUTPUT TERMINAL BOARD KG-203

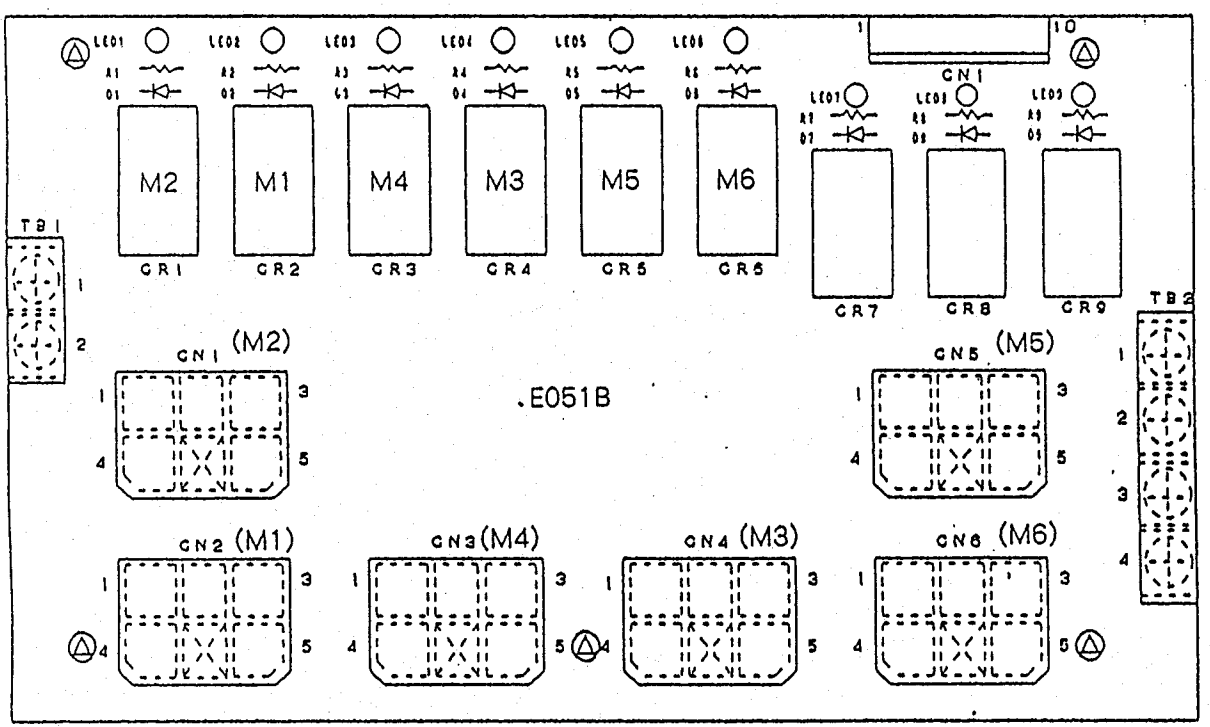


INPUT OUTPUT TERMINAL BOARD KG-204



KG – 201 REMOCON BOARD (E036)





M1 MAIN STRIP STROKE
M2 MAIN STRIP END
M3 SUB STRIP STROKE
M4 SUB STRIP END
M5 MAIN VERTICAL STROKE
M6 SUB VERTICAL STROKE

CR7 ROTATION NOMAL
CR8 ROTATION REVERSE
CR9 BRAKE RELEASE