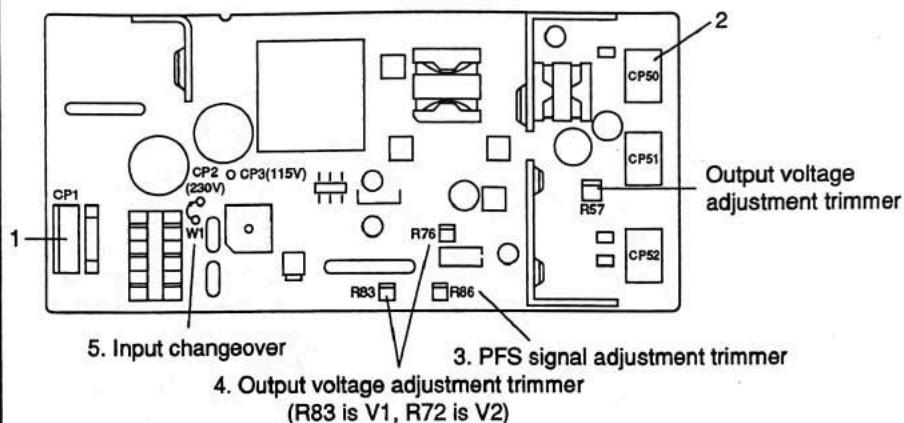


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## MRM-270

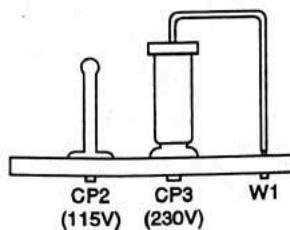
1. Input terminals (CP1)
  - AC terminal (L, N)  
Confirm that this is connected to the 200/230V single-phase line.
  - Frame ground terminal (FG)  
The ground wire is connected. Connect this terminal with the case.
2. Output terminals (CP50 ~ CP52)
  - DC output terminal (V1, V2, V3, V4)  
Connect the load wire.
  - DC output common terminal (0V)  
Connect the load wire.
  - Power failure signal terminal (PFS)  
The DC voltage monitor signal is output. This is not used.
3. PFS signal adjustment trimmer (R86)
 

The power failure signal voltage can be adjusted with trimmer R86. This is not used.
4. Output voltage adjustment trimmers (R83, R76, R57)
 

The V1 (+5V), V2 (+12V) and V3 (-12V) voltages can be adjusted with trimmers R83, R76 and R57. The voltage variable range is approx.  $\pm 5\%$ . V4 is not used.
5. Input voltage changeover jumpers (W1, CP2, CP3)
 

By connecting the jumper wire with connector protruding from W1 to CP2 or CP3, the input voltage can be changed over. (CP3: AC200 to 230V) Confirm that this is connected to the CP3 side.

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**1-2-5 Input/output****(1) Input/output inside machine**

The main input/output signals are listed below.

**1) Input signal**

- |               |                                    |
|---------------|------------------------------------|
| DI(20)        | : Emergency stop (halt) input      |
| DI(21)        | : Temporary stop (interlock) input |
| DI(22)-DI(27) | : Conveyor periphery input         |
| DI(30)-DI(37) | : Heads 1 and 2 periphery input    |
| DI(40)-DI(47) | : Option mounting input            |
| DI(50)-DI(57) | : Option mounting input            |
| DI(60)-DI(67) | : Heads 3 and 4 periphery input    |
| DI(70)-DI(77) | : Option mounting input            |
| DI(80)-DI(87) | : Option mounting input            |
| DI(90)-DI(97) | : Option mounting input            |
| DI(A0)-DI(A7) | : Option mounting input            |
| DI(B0)-DI(B7) | : Option mounting input            |

**2) Output signals**

- |               |                                  |
|---------------|----------------------------------|
| DO(02)        | : CPU-NG output                  |
| DO(05)        | : Output during running (RUN)    |
| DO(06)-DO(11) | : Conveyor periphery output      |
| DO(20)-DO(27) | : Heads 1 and 2 periphery output |
| DO(30)-DO(37) | : Option mounting output         |
| DO(40)-DO(47) | : Heads 3 and 4 periphery output |
| DO(50)-DO(57) | : Option mounting output         |
| DO(60)-DO(67) | : Option mounting output         |
| DO(70)-DO(77) | : Option mounting output         |

Port	Identification	Function	Output format	Remarks
DO00	T00	Sub-stopper (wait position)	Tr	
01		Spare	Tr	
02	T02	Warning lamp red lamp (ALARM)	Relay	
03	T03	Warning lamp yellow lamp (CAUTION)	Relay	
04	T04	PCB request signal (GATE OUT)	Dry contact	Connect to previous process machine
05	T05	Warning lamp green lamp (RUN)	Relay	
06	T06	Main conveyor motor	Relay	
07	T07	Buzzer	Tr	
DO10	T10	Main stopper (work position)	Tr	
11	T11	Locating pin (PCB positioning fix)	Tr	
12	T12	BUSY OUT (SMEMA) from previous process machine	Dry contact	Option, synchronized with D004 GATE OUT
13	T13	BA OUT (SMEMA) to next process machine	Dry contact	Option
14		Spare	Tr	Not used
15		Spare	Tr	Not used
16		Spare	Tr	Not used
17		Spare	Tr	Not used
DO20	T20	Head 1 lower	Tr	Mounter head specifications
		Dispenser head 1 lower		Dispenser head specifications
21	T21	Head 2 lower	Tr	Mounter head specifications
		Dispenser head 2 lower		Dispenser head specifications
22	T22	Dispenser head 1 rotation	Tr	Dispenser head specifications
23	T23	Dispenser head 2 rotation	Tr	Dispenser head specifications
24	T24	Head 1 pickup	Tr	Mounter head specifications
		Dispenser head 1 blow		Dispenser head specifications
25	T25	Head 2 pickup	Tr	Mounter head specifications
		Dispenser head 2 blow		Dispenser head specifications
26		Spare		Not used
27		Spare		Not used
DO30	T30	Teaching camera lighting		
31	T31	Conveyor transfer direction reversal		
32	T32	PCB push-up		
33	T33	Edge reference clamp		
34	T34	Conveyor speed changeover		
35	T35	Edge reference push-in		
36	T36	LED for permeating beam recognition		
37	T37	PCB quantity counter		
DO40	T40	Head 3 lower		
		Head 3 push lever lower		Dispenser head specifications
		Dispenser head 3 lower		Not used
41		Spare	Tr	Dispenser head specifications
42	T42	Dispenser head 2 rotation	Tr	Not used
43		Spare	Tr	Mounter head specifications
44	T44	Head 3 pickup	Tr	Dispenser head specifications
		Dispenser head 3 blow		
45	T45	Spare	Tr	
46	T46	Head 3 vacuum changeover ON/OFF	Tr	When using mechanical alarm

Port	Identification	Function	Output format	Remarks
DO60	T60	Nozzle station rise(ANC)	Tr	Option
61	T61	Nozzle clamp (ANC)	Tr	Option
62	T62	LED for reflective beam recognition	Tr	Option
63	T63	Spare	Tr	
64	T64	Spare	Tr	
65	T65	Spare	Tr	
66	T66	Spare	Tr	
67	T67	Spare	Tr	
DO70	T70	Z-axis brakes (trayfeeder 31)	Tr	Option
71	T71	Head lower (trayfeeder 31)	Tr	Option
72	T72	Head pickup (trayfeeder 31)	Tr	Option
73	T73	Arm for hook advance/retract (trayfeeder 31)	Tr	Option
74	T74	End chuck for hook open/close (trayfeeder 31)	Tr	Option
75	T75	Traverse station 1 pickup (trayfeeder 31)	Tr	Option
76	T76	Traverse station 2 pickup (trayfeeder 31)	Tr	Option
77	T77	Spare	Tr	

Port	Identification	Function	Condition	CRT	Remarks
DI10	OT	Secondary limit over	Open during dog detection		
11	WORG	W axis origin limit (PCB width)	Open during dog detection	1	Option
12	N12	BUSY OUT (SMEMA) from previous process machine			Option, synchronized with DI22 GATE IN
13	N13	BUSY IN (SMEMA) to next process machine			Option
14	XORG	X axis origin limit	Open during dog detection	1	
15	YORG	Y axis origin limit	Open during dog detection	1	
16	ZORG	Z axis origin limit	Open during dog detection	1	
17	RORG	R axis origin limit	Open during dog detection	1	
DI20	N20	Emergency stop	Open during input	1	Push block switch
21	N21	Temporary stop (interlock)	Open during input	1	Various
22	N22	PCB unload permit (GATE IN)	Closed during input	1	Input from next process machine
23	N23	Main conveyor entrance	Closed during detection	1	
24	N24	Work position	Closed during detection	1	
25	N25	Main conveyor exit	Closed during detection	1	
26	N26	Locating pin fixed side rise	Closed during rise	1	
27	N27	Locating pin movable side rise	Closed during rise	1	
DI30	N30	Head 1 lower limit	Open during lower	0	Mounter head specifications
		Dispenser head 1 lower limit	Open during lower	0	Dispenser head specifications
31	N31	Head 2 lower limit	Open during lower	0	Mounter head specifications
		Dispenser head 2 lower limit	Open during lower	0	Dispenser head specifications
32	N32	Dispenser head 1 90° rotation	Open during lower	0	Dispenser head specifications
33	N33	Dispenser head 2 90° rotation	Open during lower	0	Dispenser head specifications
34	N34	Head 1 pickup sensor judgment low-order bit			Mounter head specifications
35	N35	Head 2 pickup sensor judgment low-order bit			Mounter head specifications
36	N36	Head 1 pickup sensor judgment high-order bit			Mounter head specifications
37	N37	Head 2 pickup sensor judgment high-order bit			Mounter head specifications
DI40	N40	Spare			Not used
41	N41	Sub-stopper (wait position)	Closed during detection	1	
42	N42	PCB push-up rise limit	Closed during rise	1	
43	N43	Spare			Not used
44	N44	Spare			Not used
45	N45	Spare			Not used
DI50	N50	Beam sensor	Closed during detection	1	Option
51	N51	Head 3 push rod lower limit	Open during lower	0	When using Z axis servo head
52	N52	Spare			Not used
53	N53	Spare			Not used
54	N54	Count reset input	Closed during input	1	From unloader
55	N55	Spare			Not used
56	N56	Nozzle clamp rise limit (ATC)	Closed during unclamping	1	Option
57	N57	Nozzle station rise limit (ATC)	Closed during lowering	1	Option
DI60	N60	Head 3 lower limit	Open during lower	0	Mounter head specifications
		Head 3 nozzle lower limit	Open during lower	0	Z axis servo head specifications
		Dispenser head 3 lower limit	Open during lower	0	Dispenser head specifications
61	N61	Spare			Not used
62	N62	Dispenser head 3 90° rotation	Open during rotation	0	Dispenser head specifications
63	N63	Spare			Not used
64	N64	Head 3, pickup sensor judgment low-order bit			Mounter head specifications
65	N65	Spare			Not used
66	N66	Head 3, pickup sensor judgment high-order bit			Mounter head specifications
67	N67	Spare			Not used

## 1) GATE IN (PCB request signal input from next process)

JAE SRCN2A13-3S (3-pin female receptacle: main unit side)

- 1 : N54 (Count reset signal input)
- 2 : N22 (Gate in signal input)
- 3 : VP (Common for 242V:N54, N22)

## [Gate in signal input]

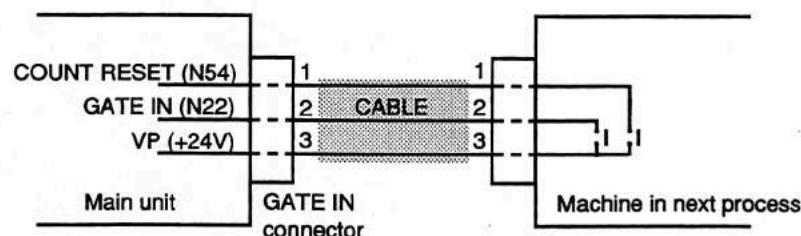
This signal is received from the machine in the next process. If the machine in the next process (unloader, etc.) requires time for setup, etc., (replacement of racks due to max. number of PCBs, etc.), and if the maximum number of PCBs are designated on the main unit side, after the main unit side has unloaded the maximum number of PCBs, it will stop while waiting for the count reset signal from the machine in the next process. When the count reset signal is input from the machine in the next process, the main unit will restart unloading until the maximum number of PCBs is reached again.

The number of PCBs is reset when 1 <-> 3 become conductive (closed). The partner connector is JAE SRCN6113-3P (3-pin male plug) (When the machine is shipped, a connector that makes 2 <-> 3 conductive is attached.)

**CAUTION !**

Use a relay contact (dry contact: no-voltage output) for the output from the machine in the next process.

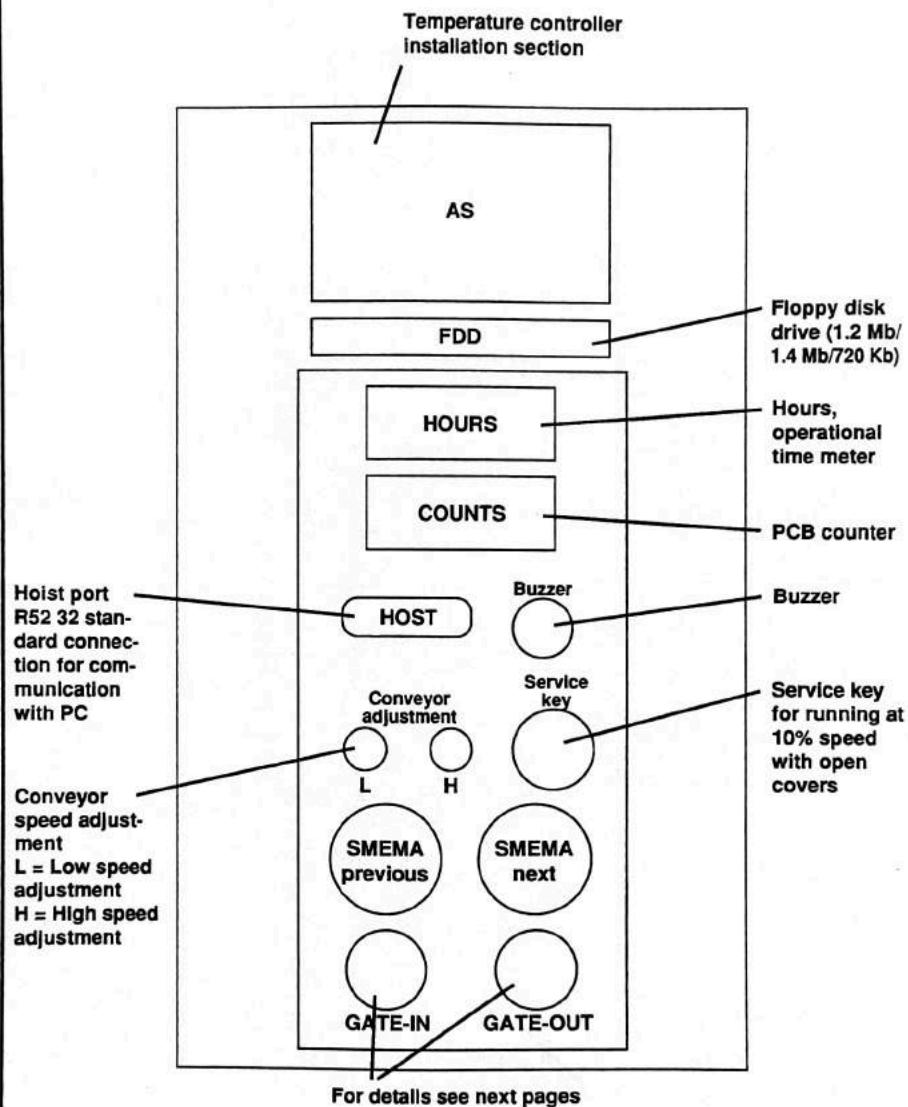
Fig. 1-23  
GATE IN



## (2) Device connections

The details of the connectors and switches connected in the front door of this unit are described below.

Fig. 1-22  
Device connec-  
tions



11199033-00

Port	Identification	Function	Condition	CRT	Remarks
DI70	N70	Nozzle 1 identification valid(ATC)	Open during detection	0	Option
71	N71	Nozzle 2 identification valid(ATC)	Open during detection	0	Option
72	N72	Nozzle 3 identification valid(ATC)	Open during detection	0	Option
74	N74	Spare			Not used
75	N75	Spare			Not used
76	N76	Spare			Not used
77	N77	Spare			Not used
DI80	N80	Nozzle station lower limit(ANC)	Closed during detection	1	Option
81	N81	Nozzle station rise limit(ANC)	Closed during detection	1	Option
82	N82	Nozzle clamp(ANC)	Closed during clamping	1	Option
83	N83	Nozzle unclamp(ANC)	Closed during unclamping	1	Option
84	N84	Nozzle 1 identification(ANC)	Open during detection	0	Option
85	N85	Nozzle 2 identification(ANC)	Open during detection	0	Option
86	N86	Nozzle 3 identification(ANC)	Open during detection	0	Option
87	N87	Nozzle 4 identification(ANC)	Open during detection	0	Option
DI90	N90	Nozzle 5 identification(ANC)	Open during detection	0	Option
91	N91	Nozzle 6 identification(ANC)	Open during detection	0	Option
92	N92	Spare			Not used
93	N93	Spare			Not used
94	N94	Spare			Not used
95	N95	Spare			Not used
96	N96	Spare			Not used
97	N97	Spare			Not used
DIa0	Na0	Head lower limit (trayfeeder 31)	Open during lowering	0	Option
a1	Na1	Head pickup sensor (trayfeeder 31)	Closed during pickup	1	Option
a2	Na2	Hook advance limit (trayfeeder 31)	Closed during advance limit	1	Option
a3	Na3	Hook retract limit (trayfeeder 31)	Closed during retract limit	1	Option
a4	Na4	Hook wait position (trayfeeder 31)	Closed during waiting	1	Option
a5	Na5	End chuck for hook open (trayfeeder 31)	Closed when chuck is open	0	Option
a6	Na6	End chuck for hook closed (trayfeeder 31)	Closed when chuck is closed	0	Option
a7	Na7	Pallet storage confirmation (trayfeeder 31)	Closed during storage	1	Option
DIb0	Nb0	Pallet set position (trayfeeder 31)	Closed during storage	1	Option
b1	Nb1	Traverse station 1 vacuum sensor (trayfeeder 31)	Closed during pickup	1	Option
b2	Nb2	Traverse station 2 vacuum sensor (trayfeeder 31)	Closed during pickup	1	Option
b6	Nb2	Spare			Not used
B7	NB7				Option

Table 1-7  
Communication parameters

#### (4) Transmission methods and communication parameters

The transmission methods and set communication parameters are shown below.

Transmission method	Full duplex
Synchronization method	Start-stop synchronization
Baud rate	2400, 4800, 9600, 19200 [bps] (selective)
Character length	Fixed to 8 bits
Stop bit length	1, 2 bit (selective)
Parity	None, odd, even (selective)
Busy signal with control line	Provided (DTR is used during reception, CTS and DSR check are used during transmission)
XON/XOFF control	Yes, no (selective) (XON = 11H, XOFF = 13H)
Reception buffer	255 bytes
Transmission buffer	127 bytes

#### (5) Setting of communication parameters

The setting screen is displayed with the communication parameters (DATA IN, SYSTEM, PARAMETER and HOST). Refer to the operator manual.

#### CAUTION !

Always set the same communication specifications for the mounter and external device communication parameters. The communication port will be initialized when the communication parameters are changed. During initialization, the communication related errors and the reception buffer will be cleared, and the machine will be set into the reception enabled state.

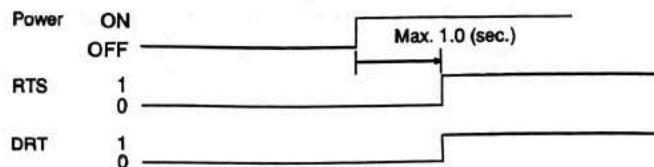
##### [Explanation 1] CR/CRLF

CR/CRLF sets how the LF code (=0AH) is to be handled.  
CR adds only the CR code (=0DH) at the end of the line when the mounter is transmitting. The data up to the CR code is handled as one line when the mounter is receiving.  
CRFL always adds an LF code after the CR code when the mounter is transmitting. The data up to the CR code is handled as one line when the mounter is receiving, and the LF code is ignored.

##### [Explanation 2] XON/XOFF

The timing chart for XON/XOFF is shown below.  
RTS and DRT are activated within 1.0 [sec.] after the power is turned ON, and the RST holds that state until the power is turned OFF. The communication port enters the data reception enabled state simultaneously with the activation of DTR.

Fig. 1-28  
Timing chart when power is turned ON



## 1-2-6 RS-232-C

## (1) Outline

The communication function between the mounter and external devices is described in this section. The communication device mentioned here refers to all devices having an RS-232-C interface. The mounter and external device are connected with an RS-232-C serial line (described later). When the "COMMUNICATIONS" item in the machine configuration data is set to "ONLINE", commands (online commands) can be transmitted from an external device to the mounter.

## (2) Connector

The cable used for RS-232-C communication is connected to the "HOST" connector on the right front of the main unit. The connection pin wiring is shown below.

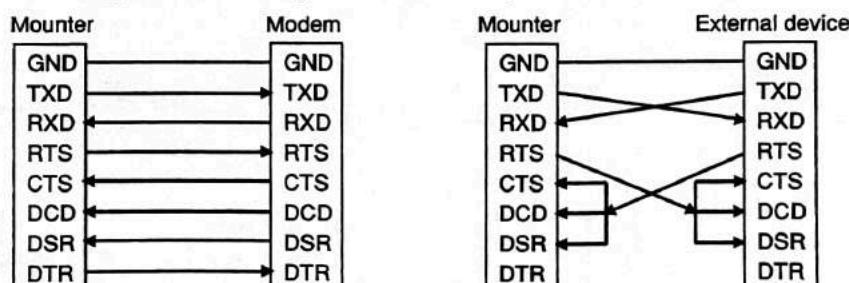
Table 1-6 Connector pin wiring

Pin No.	Name	Meaning	Input/output
2	TXD	Transmit data	Output from mounter
3	RXD	Receive data	Input to mounter
4	RTS	Request to send	Output from mounter
5	CTS	Clear to send	Input to mounter
6	DSR	Data set ready	Input to mounter
7	GND	Signal ground	
8	DCD	Data carrier detected	Input to mounter
20	DTR	Data transmission ready	Output from mounter

## (3) Connection examples

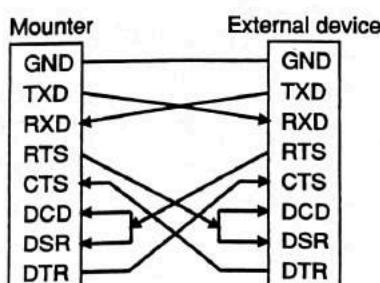
When connecting the mounter and an external device using RS-232-C, the pin connection will differ according to the device specifications. Refer to the following connection examples when connecting the devices.

Fig. 1-27  
Connection examples

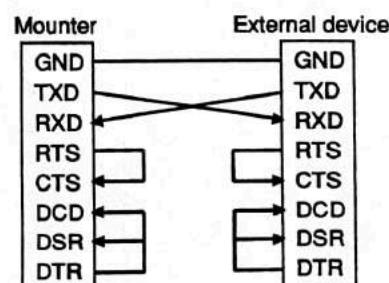


1) Connection with modem

2) To use RTS to check if communication is open



3) To use DTR for busy control



4) When no control wire is used

CAUTION !

DCD input is not used with the mounter.

## 2) GATE OUT (PCB request signal output to previous process)

JAE SRCN2A13-3P (3-pin male receptacle: main unit side)

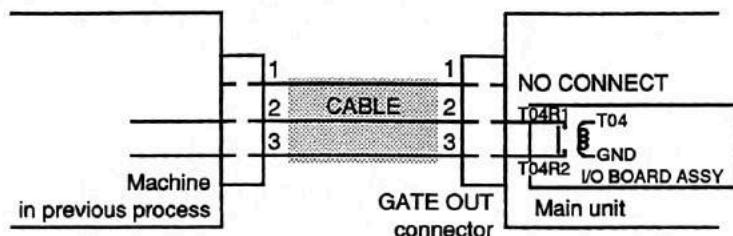
- 1 : (Blank)
- 2 : T04R1 (Relay contact output) → Dry contact : no-voltage output
- 3 : T04R2

## Gate out signal output

This signal is transmitted to the machine in the previous process. When the preparations for the next work are completed in the main unit, 2 <--> 3 become conductive (closed) as the PCB reset signal.

The partner connector is JAE SRCN6113-3S (3-pin female plug)  
(A connector is attached when shipped.)

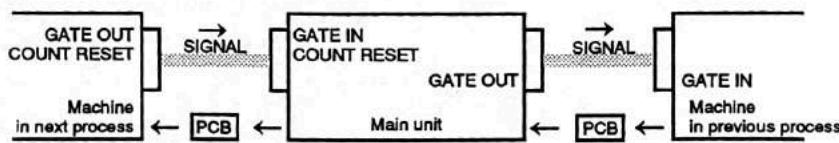
Fig. 1-24  
GATE OUT



## 3) Connections between devices

Refer to sections 2) and 3), and make the connections.

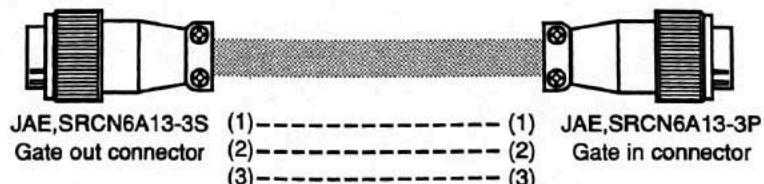
Fig. 1-25  
Connections  
between devices



## 4) Cable (For gate signals: option)

A cable having a gate in connector on one end and a gate out connector on the other end is provided for connecting the devices. 5m and 10m cables are available.

Fig. 1-26  
Cable



## (7) Online commands

Online commands allow similar key operations or command execution from an external device. The online command starts with a start code @ and ends with c/r (=0DH) at the end of the line transmitted to the mounter. These commands can be executed only when the "COMMUNICATION" parameter in the machine configuration data is set to "ONLINE".

## [Online command format]

@ [ _ ] < Online command > [< Command option >] c/r
---

@ Start code 40H

[ \_ ] Blank (can be omitted)

<Online command> Refer to the online command table

[< Command option >] Refer to the online command table  
(Can be omitted depending on the command>

## [General classes of online commands]

- 1) Key operations
- 2) Data handling
- 3) Utilities
- 4) Special codes

## [Online command table]

Class	Online command	Option	Meaning	Execution condition
Key operations	MAIN	ON OFF	Display main menu	2
	PCBRUN		Display PCB work conditions selection screen	2
	ORIGIN		Origin return	0
	RESET		Execute reset	1
	RUN		Start operation execution	1
	STOP		Stop	4
	REMOTE		HHK-SC key input disabled	3
	REMOTE		HHK-SC key input enabled	3
Data handling	?	PXY	Monitor current head position	4
	?	MOD	Monitor current mode	4
	?	MSG	Monitor error messages	4
	?	VER	Monitor system version	4
	READ	Read file	Read data file	3
	WRITE	Write file	Write data file	3
	INIT	PRD	Reset production control information	0
Utilities	INIT	TRP	Reset production control trip	0

## Execution conditions

- 0 : Can be executed only in the main menu screen
- 1 : Can be executed only in the PCB work conditions selection screen
- 2 : Can be executed only when not operating
- 3 : Can be executed by interrupting operation
- 4 : Can be executed at any time

## [Special codes]

The special codes are listed below.

Code	Meaning
^Y (=19H)	Cancel command input
^C (=03H)	Execution stop ("STOP") key

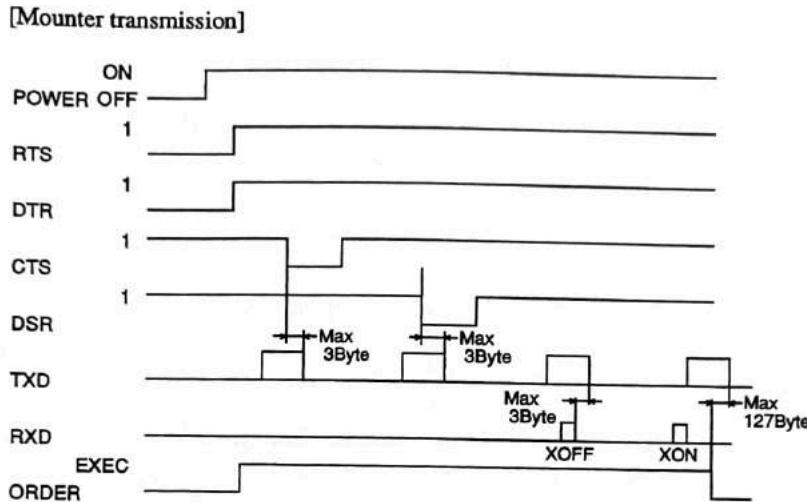
Table 1-8  
Online command table

Table 1-9  
Special codes

## (6) Other precautions

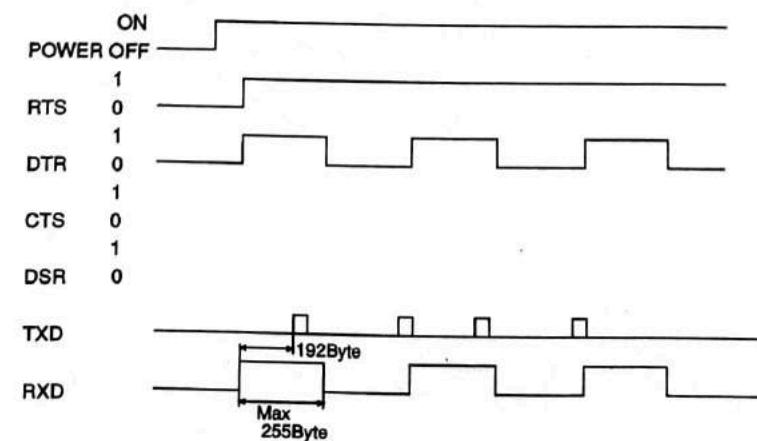
- 1) As long as there is an allowance in the reception buffer, the mounter will constantly be in the reception enabled status. However, the reception buffer will be initialized in the following cases.
  - A. When the power is turned ON.
  - B. When the RESET key is input on the RUNNING SETUP screen.
  - C. When the "COMMUNICATION" parameter in the machine configuration data is changed.
  - D. When the communication parameter settings are changed.
- 2) When the mounter power is turned ON first and then unstable data is transmitted when the external device power is turned ON, the mounter will lead in the incorrect data into the reception buffer and can cause a communication error. In this case, initialize the reception buffer with method A or B given in 1) above.  
This type of trouble can be avoided by turning on mounter after turning on the external device.
- 3) The mounter transmission is completed when all data has been written into the transmission buffer. However, if an external device is not connected, or if the reception ready state is not entered, the data will accumulate in the transmission buffer. If a transmission wait state continues for five or more seconds, the message "126: COMMUNICATION OFF" will display. In this case, enable the external device for reception and transmit the data, or initialize the transmission buffer. The transmission buffer is reset in the following cases.
  - A. When the power is turned ON.
  - B. When the RESET key is input on the WORK CONDITIONS SELECT screen.
- 4) If busy control or XON/XOFF control is not provided for the external devices, the process may not be completed during communication causing a communication error. In this case, the communication speed must be dropped by changing the baud rate.

Fig. 1-29  
Mounter transmission timing chart



- 1) The data is transmitted when CTS and DTR are "1". The mounter will stop transmission within 3 bytes after CTR or DSR changes to "0".
- 2) When using XON/XOFF control, the mounter will stop transmission within 3 bytes after XOFF (=13H) is received. The mounter will resume transmission when XON (=11H) is received.
- 3) When the transmission command is completed, the data in the 127 bytes of the transmission buffer will be transmitted.

Fig. 1-30  
Mounter reception timing chart



- 1) The mounter can receive data when both RTS and DTR are set to "1". When the reception buffer (255 bytes) is filled up to three-quarters (192 bytes), DTR will be set to "0", so the external device will stop transmission. When the mounter processes the data in the reception buffer, and the data drops to one-quarter (64 bytes) of the reception buffer, DTR will be set to "1" again and the reception will be enabled.
- 2) When using XON/XOFF control, the mounter will transmit XOFF and XON in synchronization with DTR being set to "0" and "1".

### 3) Utilities

#### [INIT]

The production control information data is initialized.

Example : @INIT PRDc/r (The production control information data is reset.)

@INIT TRPc/r (The production control information trip is reset.)

Response example : OKc/r (normal completion)

141: CANNOT EXECUTE. ROBOT IS RUNNING

c/r (When the changes cannot be accepted.)

Stop the operation and then execute the command.

### 4) Special codes

#### [^Y]

The mounter reception buffer is initialized. This code is transmitted to the mounter when online commands that have been input midway are to be canceled.

#### [^C]

The online commands being executed are aborted. If the mounter is running, this code will stop the operation. The following response will be given when the online command is aborted.

Response example : \*\*\* ABORTEDc/r (normal completion)

## 2) Data handling

[?]

- Example : @?PXYc/r (The current position of the head is monitored.)  
Response example : X = 0.00 Y = 0.00 R = 0.00c/r  
Example : @?MODc/r (The currently displayed screen is monitored.)  
Response example : MAIN MENUc/r (Main menu screen is displayed.)  
RUNNING MODEc/r (The program is in the running items.)  
During operation, “---RUNNING” will be added.  
MANUAL MODEc/r (Manual mode is entered.)  
DATA IN MODEc/r (Data input)  
M.I.S. MODE c/r (Production control information)  
Example : @?MSGc/r (The operation or error messages are monitored.)  
Response example : OKc/r (Response when there is no message.)  
Example : @?VERc/r (The mounter specifications and version are monitored.)

[READ]

The data in the mounter is read out.

- Example : @READ MCHc/r (System data is read out.)  
@READ BRDc/r (PCB data is read out.)  
@READ FDRc/r (Component data is read out.)

[WRITE]

The above data is written into the mounter.

- Example : @WRITE MCHc/r (System data is written in.)  
@WRITE BRDc/r (PCB data is written in.)  
@WRITE FDRc/r (Component data is written in.)  
Response example : \*\*\* PLEASE ENTERc/r (Data reception state)  
OKc/r (Response when data is correctly input.)

## (8) Details of online commands

## 1) Key operations

## [MAIN]

The screen changes to the main menu screen.

This command corresponds to the "MAIN MENU" key on the operation panel and HHK-SC.

Example : @MAINc/r

Response example : OKc/r (normal completion)

141: CANNOT EXECUTE. ROBOT IS RUNNING  
c/r (When the changes cannot be accepted.)

## [PCBRUN]

The screen changes to the work conditions selection screen for the selected PCB.

Example : @PCBRUNc/r

Response example : OKc/r (normal completion)

141: CANNOT EXECUTE. ROBOT IS RUNNING  
c/r (When the changes cannot be accepted.)

## [ORIGIN]

The axis is returned to the origin. This command can be executed on the main menu screen when the axis has not been returned to the origin.

Example : @ORIGINc/r

Response example : 50% 46% 52%c/r (XYR axis machine reference amount)

10: CANNOT EXECUTE c/r (When origin return cannot be executed.)

## [RESET]

The status is reset to the initial status. This command corresponds to the "RESET" key on the operation panel and HHK-SC.

Example : @RESETc/r

Response example : OKc/r (normal completion)

141: CANNOT EXECUTE. ROBOT IS RUNNING  
c/r (When the changes cannot be accepted.)

## [RUN]

Operation is started. This command corresponds to the "RUN" key on the operation panel and HHK-SC.

Example : @RUNc/r

Response example : OKc/r (normal completion)

141: CANNOT EXECUTE. ROBOT IS RUNNING  
c/r (When the changes cannot be accepted.)

## [STOP]

Operation is stopped. This command corresponds to the "STOP" key on the operation panel and HHK-SC.

Example : @STOPc/r

Response example : OKc/r (normal completion)

## [REMOTE]

The YPU-SC keys are invalidated or validated.

Example : @REMOTE ONc/r (HHK-SC keys are invalidated)

@REMOTE OFFc/r (HHK-SC keys are validated)

Response example : OKc/r

The HHK-SC keys are always valid when the power is turned ON.

## CAUTION !

**MCX2 CONTROLLER**

CPU BOARD : PCB LAYOUT	P 2-49
MOTHER BOARD : PCB LAYOUT	P 2-50
SERVO BOARD : PCB LAYOUT	P 2-51
SERVO BOARD : CONNECTOR INTERFACE DIAGRAM	P 2-52
DRIVER BOARD : PCB LAYOUT	P 2-53
DRIVER BOARD : CONNECTOR INTERFACE DIAGRAM	P 2-54
VICS 2000 BOARD : BLOCK DIAGRAM	P 2-55
VICS 2000 BOARD : PCB LAYOUT	P 2-56
VACUUM BOARD : PCB LAYOUT	P 2-57
I/O BOARD : PCB LAYOUT	P 2-58
I/O BOARD : CONNECTOR INTERFACE DIAGRAM	P 2-59
282 V DRIVER POWER BOARD : PCB LAYOUT	P 2-60
282 V DRIVER POWER BOARD : ELECTRICAL DIAGRAM	P 2-61
5/12 V POWER SUPPLY BOARD : PCB LAYOUT	P 2-62
24 V POWER SUPPLY BOARD : PCB LAYOUT	P 2-63

## CHAPTER 2 ELECTRICAL DIAGRAMS

**CSM 66 III**

OVERALL INTERCONNECT DIAGRAM	P 2-2
CONVEYOR SOLENOID, VALVES & SENSORS	P 2-3
HEAD SOLENOID, VALVES & SENSORS	P 2-4
EMERGENCY CIRCUIT DIAGRAM	P 2-5
POWER CIRCUIT DIAGRAM	P 2-6
ITEM LIST	P 2-7

**CSM 84 III**

OVERALL INTERCONNECT DIAGRAM	P 2-12
CONVEYOR SOLENOID, VALVES & SENSORS	P 2-13
HEAD SOLENOID, VALVES & SENSORS	P 2-14
EMERGENCY CIRCUIT DIAGRAM	P 2-15
POWER CIRCUIT DIAGRAM	P 2-16
ITEM LIST	P 2-17

**CSM 84V III**

OVERALL INTERCONNECT DIAGRAM	P 2-22
CONVEYOR SOLENOID, VALVES & SENSORS	P 2-23
HEAD SOLENOID, VALVES & SENSORS	P 2-24
EMERGENCY CIRCUIT DIAGRAM	P 2-25
POWER CIRCUIT DIAGRAM	P 2-26
ITEM LIST	P 2-27

**CSM TRAYFEEDER 31**

INTERCONNECTION DIAGRAM	P 2-32
EMERGENCY CIRCUIT DIAGRAM	P 2-33
POWER CIRCUIT DIAGRAM	P 2-34
ITEM LIST	P 2-35

**PHILIPS MONITOR LDH2162 & LDH2163**

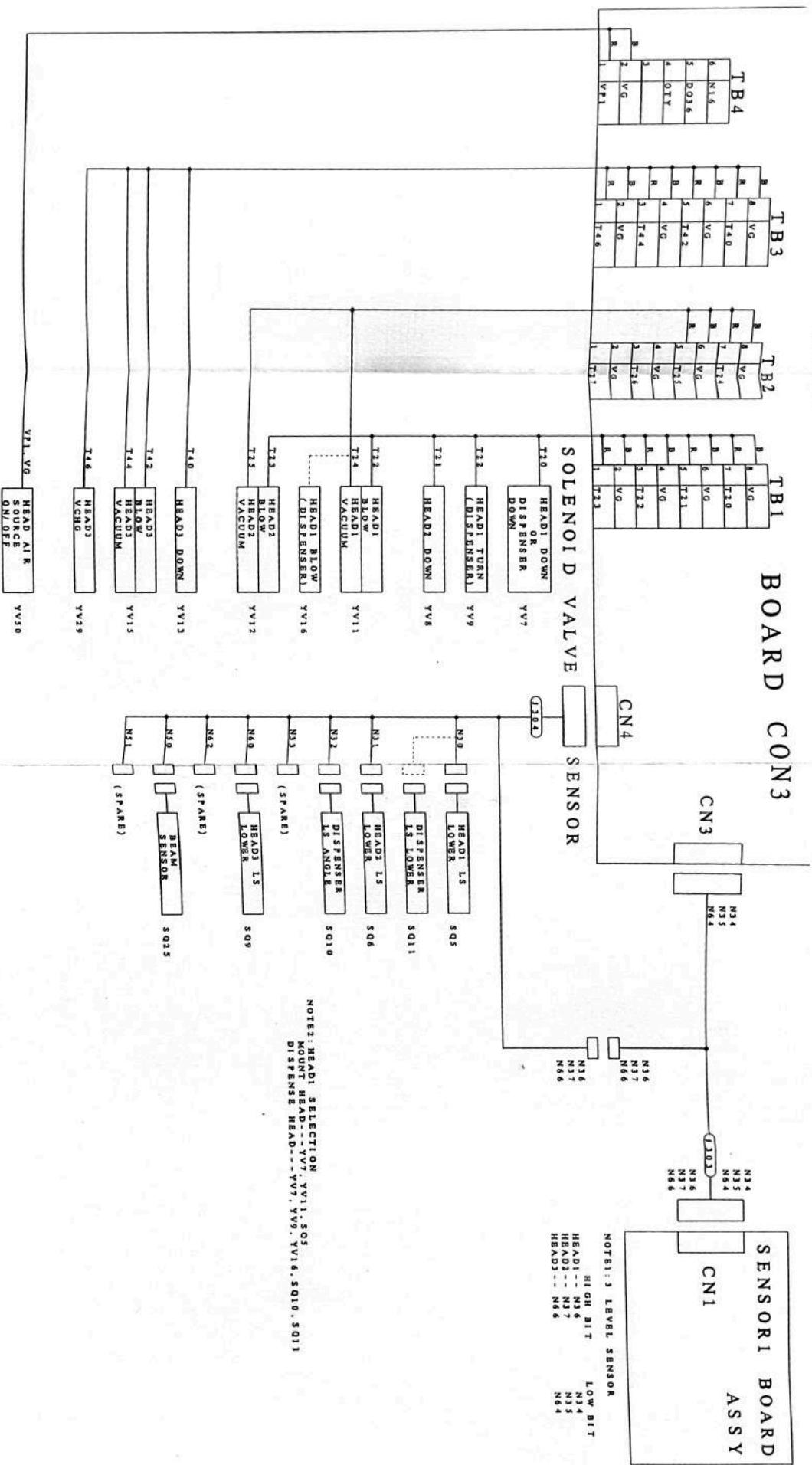
BLOCK DIAGRAM	P 2-37
MAIN BOARD : POWER SUPPLY DIAGRAM	P 2-38
MAIN BOARD : VIDEO INPUT & CONTROLS	P 2-39
MAIN BOARD : LINE STAGE DIAGRAM	P 2-40
MAIN BOARD : FRAME STAGE DIAGRAM	P 2-41
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CRT BOARD DIAGRAM	P 2-43

**HAND HELD KEYBOARD**

KEYBOARD LAYOUT	P 2-44
KEYBOARD SHEET CODING	P 2-45
PCB LAYOUT	P 2-46
STATUS LED SIGNALS	P 2-47
ELECTRICAL DIAGRAM	P 2-48



NOTES: VP---124V DC WITH THE CONTACT OF MC1



# I / O BOARD ASSY

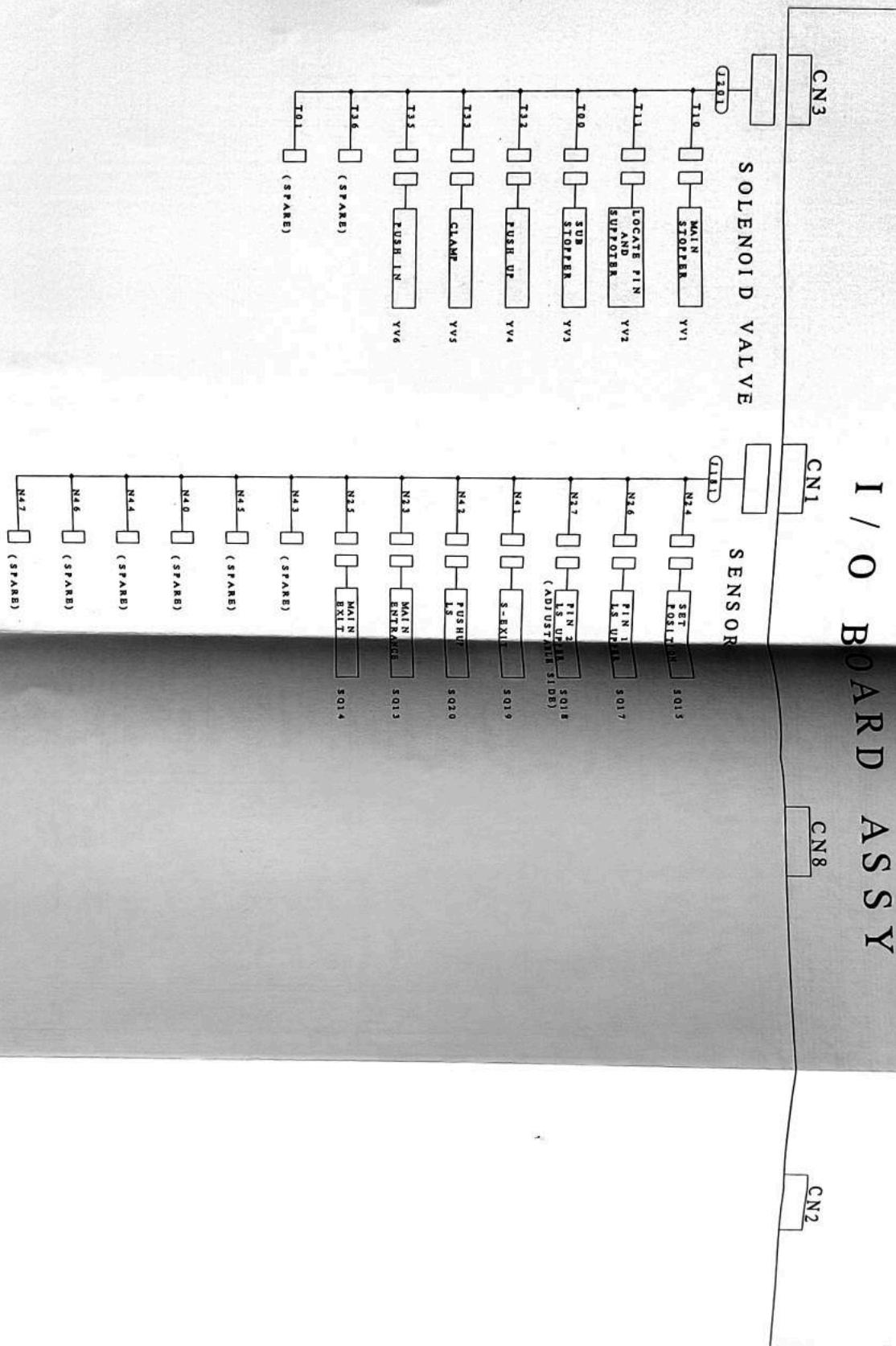
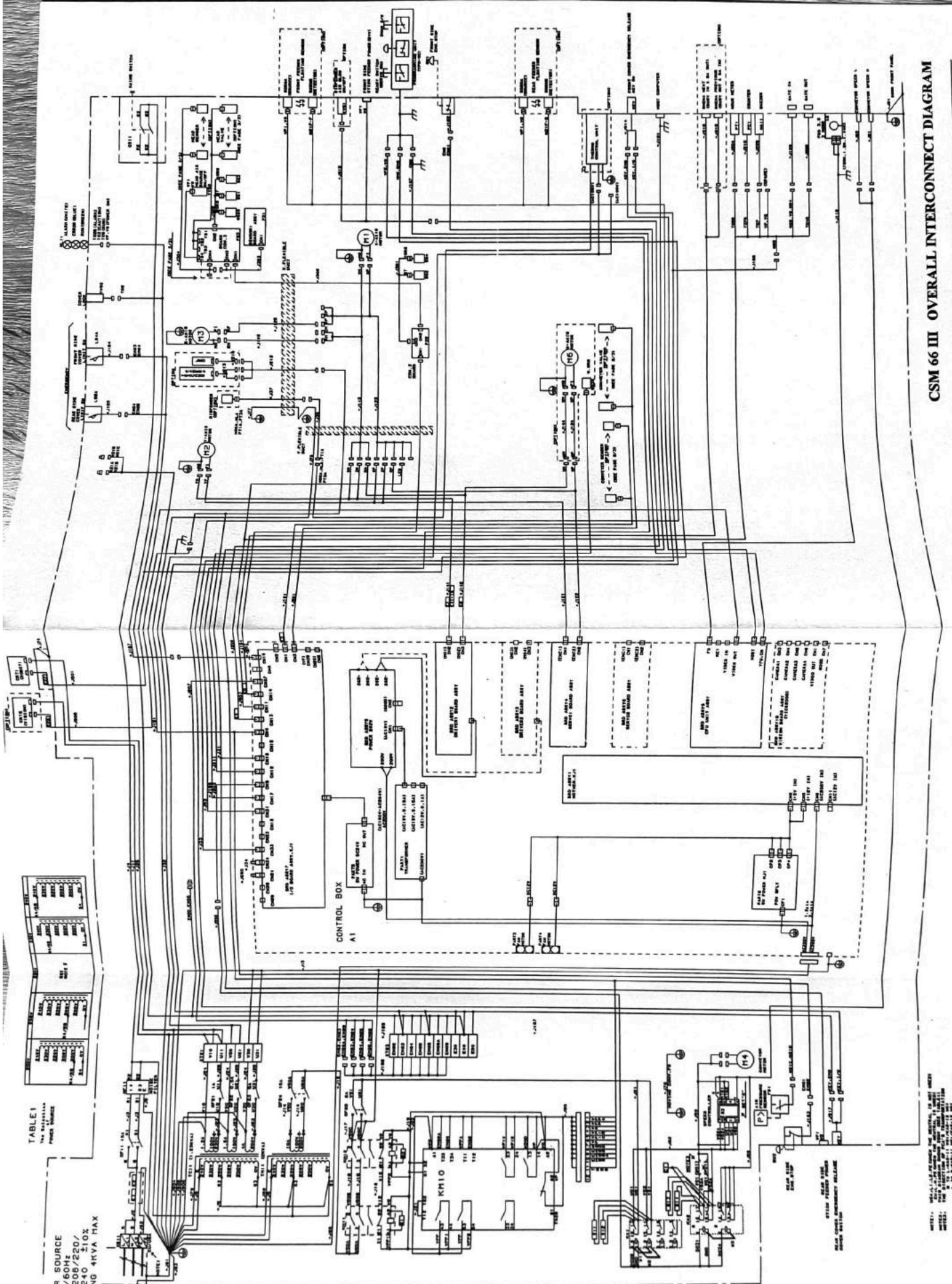


TABLE I

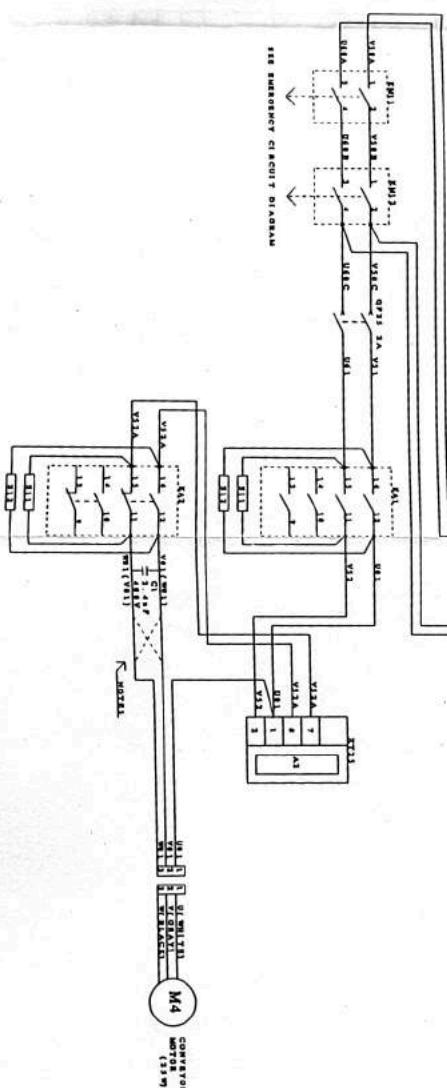
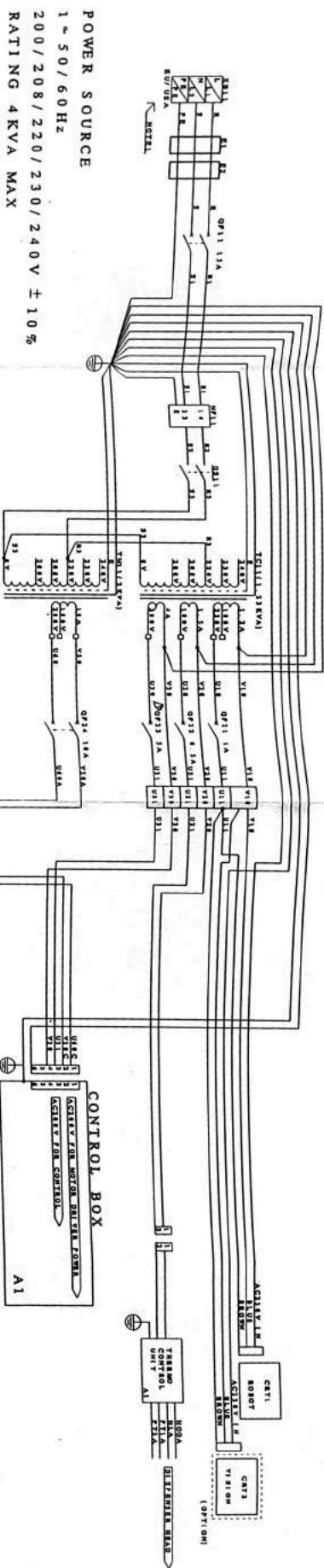
POWER SOURCE  
1~ 50/60Hz  
200/208/220/  
230/240 ±10%  
RATING 4kVA MAX



CSN 66 III OVERALL INTERCONNECT DIAGRAM

## CSM 66 III ITEM LIST

HARNESS (HNS) ITEMS		
ITEM NR.	ITEM NAME	REMARKS
J2	HNS 15-2	XB11 ↔ → QF11
J3	HNS 1-1	QF11 ↔ → NF11 (1,2)
J4	HNS 1-2	NF11 (3,4) ↔ → QS11
J5	HNS 6-4	R3, S3, PE
J6	HNS 6-5	NF11-FG
J11	HNS 5-1	XT21 ↔ → CRT 2 (CRT POWER)
J13	HNS 5-3	XT21, KM12 ↔ → CONTROL BOX
J14	HNS 5-4	TM11 ↔ → QF24
J15	HNS 5-5	QF24 ↔ → KM11
J16	HNS 5-6	KM11 (2,4) ↔ → KM12 (1,3)
J17	HNS 5-7	KM12 ↔ → QF25
J18	HNS 5-8	KM11 (22) ↔ → KM12 (21)
J19	HNS 5-9	KM10 ↔ → KM11, KM12
J20	HNS 5-10	KM10 ↔ → J207 (EMG)
J21	HNS 5-11	KM10/T12-T22 SHORT
J22	HNS 5-15	KM10 A1 ↔ → 43, 53
J23	HNS 5-12	TC11 ↔ → QF21, QF22, QF23
J24	HNS 5-13	TC11 ↔ → XT21
J25	HNS 5-14	QF21, QF22, QF23 ↔ → XT21
J26	HNS 5-1	XT21 ↔ → CRT 1 (CRT POWER)
J31	HNS 3-11	I/O (CN18) ↔ → STICK FEEDER POWER
J32	HNS 3-7	XT21 ↔ → THERMO CONT POWER
J33	HNS 3-4	I/O (CN33) ↔ → (FEEDER SENSOR)
J34	HNS 3-14	I/O (CN34) SHORT
J36	HNS 2-10	THERMO CONT ↔ → Y-FLEX
J37	HNS 2-11	X-FLEX ↔ → J36
J51	HNS 6-8	QF25 ↔ → KA1
J52	HNS 10-1	KA1 ↔ → SPEED CONTROLLER
J53	HNS 5-16	I/O (CN31) ↔ → HHK POWER
J58	HNS 10-2	KA2 ↔ → CONVEYOR VR
J59	HNS 10-3	KA2 ↔ → CONVEYOR MOTOR
J61	HNS 3-11	CONVEYOR VR, H
J62	HNS 3-12	CONVEYOR VR, L
J76	HNS 4-3	MOVING CONVEYOR, FG
J77	HNS 4-1	X-FLEX, FG
J78	HNS 4-2	Y-FLEX, FG
J79	HNS 4-6	TC11 ↔ → FG (TERMINAL)
J80	HNS 4-6	TM11 ↔ → FG (TERMINAL)
J81	HNS 301	PLATE POWER BOX ↔ → FG
J82	HNS 301	XB11 ↔ → FG (TERMINAL)
J84	HNS 4-5	FRONT DOOR ↔ → FG (TERMINAL)
J85	HNS 301	CONTROLLER ↔ → FG
J101	HNS 16-1	CONTROLLER ↔ → HOST
J107	HNS 16-4	CONTROLLER ↔ → HHK
J110	HNS 4-8	CONTROLLER ↔ → FD
J121	HNS 1-2	P1 (P1 X, Y, Z)
J122	HNS 1-3	P2 (P1 R, W)
J123	HNS 2-4	Y-FLEX (P1)
J124	HNS 2-13	WP



**TABLE I**  
**THE SELECTION**  
**POWER SOURCE**

SELECTION	INPUT	OUTPUT	SELECTION	INPUT	OUTPUT
220.2	220.2	220.2	220.2	220.2	220.2
220.3	220.3	220.3	220.3	220.3	220.3
A.2	A.2	A.2	A.2	A.2	A.2
220.2	220.2	220.2	220.2	220.2	220.2
A.2	A.2	A.2	A.2	A.2	A.2

NOTE 1: USE 11.2A PLUG WHEN THE MATERIAL IS NOT USED  
 NOTE 2: BULB, IF PRESENT THE MATERIAL IS NOT USED  
 NOTE 3: THIS DIAGRAM SHOW SIZE (SEE TABLE)

NOTE: THE DIRECTION OF POWER TRANSMISSION  
 L TO L1 AND N1 WITH EARTH E1  
 \*: SPLITTER OR TWO SEPARATE CABLES  
 \*\*: TWO CONTROLLED BY ONE CORD

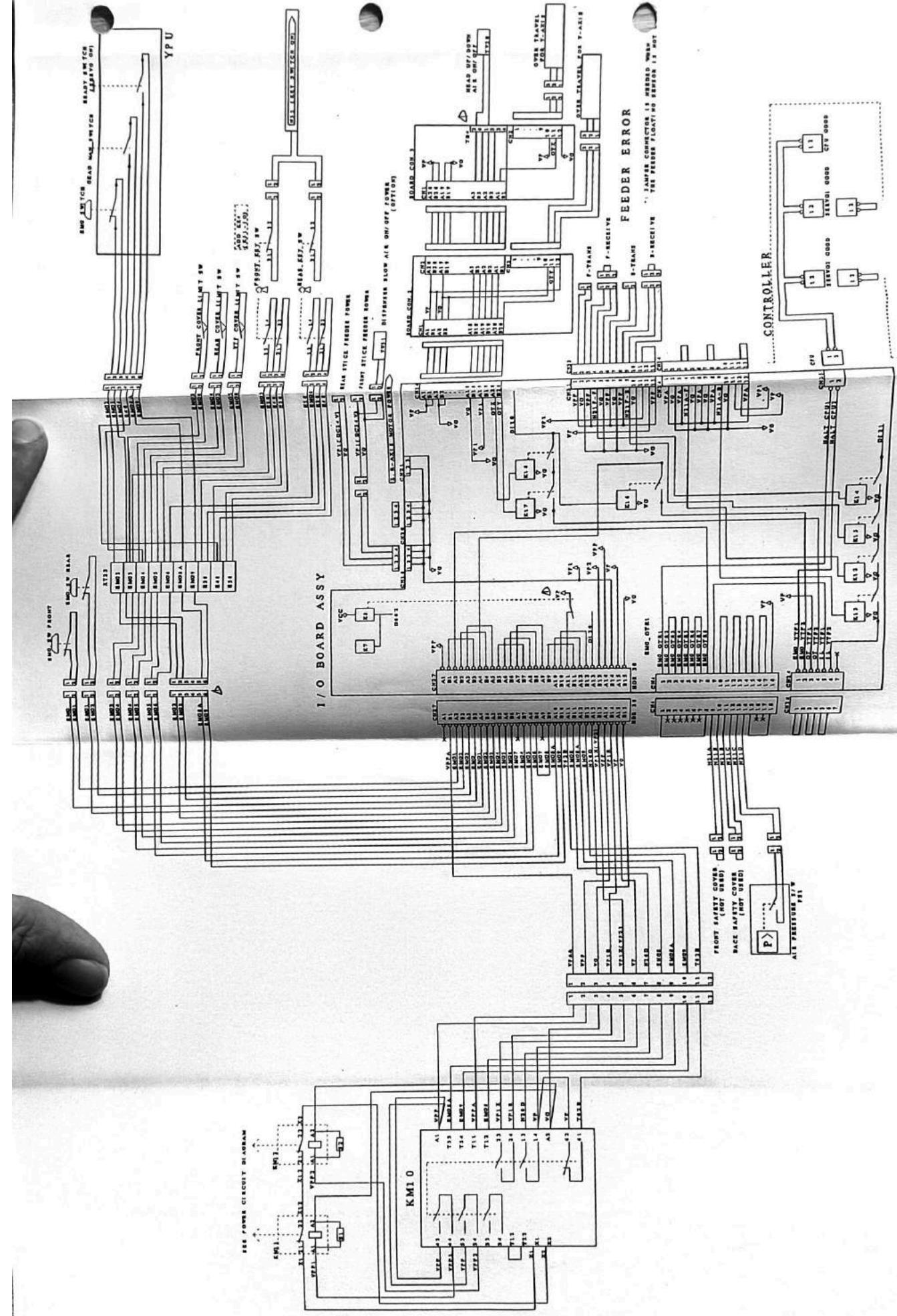
### CSM 66 III POWER CIRCUIT DIAGRAM

## CSM 66 III EMERGENCY CIRCUIT DIAGRAM

5322 871 63603 V96.00

CHAPTER 2 ELECTRICAL DIAGRAMS

2-5



**SEVERAL ITEMS**

ITEM NR	ITEM NAME	REMARKS
QF 11	CIRCUIT PROTECTOR 2	15 AMPS.
QF 21	CIRCUIT PROTECTOR 3	1 AMP.
QF 22	CIRCUIT PROTECTOR 3	0.5 AMPS.
QF 23	CIRCUIT PROTECTOR 3	3 AMPS.
QF 24	CIRCUIT PROTECTOR 5	10 AMPS.
QF 25	CIRCUIT PROTECTOR 5	2 AMPS.
NF 11	NOISE FILTER	→ J3, J4, J6
PT 1	HOUR METER	→ J204
PC 1	COUNTER	→ J210
LS 4A	SWITCH SAFETY	COVER SAFETY SWITCH → J164
LS 5A	SWITCH SAFETY	COVER SAFETY SWITCH → J165
QS 11	MAIN SWITCH	→ J4
HL 11	LIGHT 1 ASSY	→ J187
TM 11	POWER TRAFO	2 KVA MOTOR
TC 11	POWER TRAFO	1.25 KVA CONTROL
SW 1	SWITCH STOP	EMERGENCY STOP SWITCH → J162
SW 2	SWITCH STOP	EMERGENCY STOP SWITCH → J163
CRT 1	CRT 1 ASSY	UFOS USER INTERFACE
CRT 2	CRT 2 ASSY	VISION SCREEN
P21	SENSOR 1 BOARD ASSY	-
P22	CONNECTION 2 BOARD ASSY	-
P23	CONNECTION 3 BOARD ASSY	-
M1	MOTOR ASSY	X-AXIS MOTOR
M2	MOTOR ASSY	Y-AXIS MOTOR
M3	MOTOR ASSY	R-AXIS MOTOR
M4	MOTOR ASSY	CONVEYOR MOTOR 25W/200V
M6	MOTOR ASSY	W-AXIS MOTOR
A1	CONTROL BOX	-
A2	SPEED CONTROLLER	SOFT STOP SPEED CONTROLLER
A3	THERMO CONTROL UNIT	-
A8	DISK DRIVE	FLOPPY DISK DRIVE 3.5 INCH, 3 MODES
KM 10	CONTACTOR 1	GREEN BOX
KM 11	CONTACTOR 1	-
KM 12	CONTACTOR 1	-
KA 1	RELAY 1	4 RELAY'S WITH TERMINAL
KA 2	RELAY 1	-
PS 1	GAUGE	PRESSURE GAUGE
XB 11	TERMINAL ASSY	POWER
S1/S2	SPARK KILLER	-
S11-14	SPARK KILLER	-

**SENSOR ITEMS**

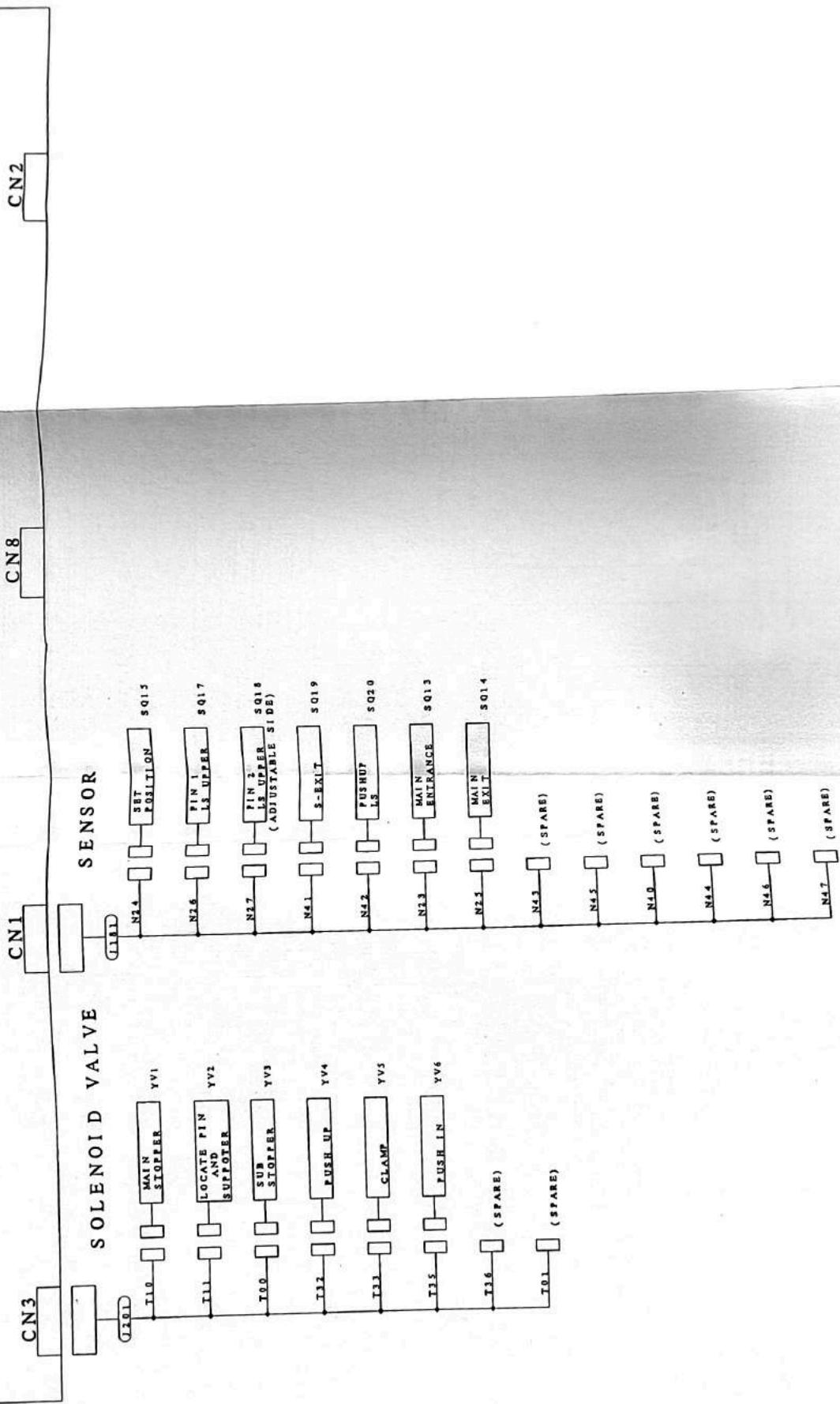
SENSOR NR.	SENSOR NAME	REMARKS
SQ 1	SENSOR 1-1	X-AXIS SECOND LIMIT SENSOR
SQ 2	SENSOR 1-1	Y-AXIS SECOND LIMIT SENSOR
SQ 3	SENSOR 1-2	X-AXIS ORG. SENSOR
SQ 4	SENSOR 1-2	Y-AXIS ORG SENSOR
SQ 5	SENSOR 1-8	HEAD 1 LS LOWER
SQ 6	SENSOR 1-8	HEAD 2 LS LOWER
SQ 9	SENSOR 1-8	HEAD 3 LS LOWER
SQ 10	SENSOR 1-8	DISPENSER ANGLE SENSOR
SQ 11	SENSOR 1-8	DISPENSER LOWER SENSOR
SQ 13	SENSOR 1-2	MAIN ENTRANCE
SQ 14	SENSOR 1-2	MAIN EXIT
SQ 15	SENSOR 1-2	SET POSITION
SQ 17	SENSOR SPARE 2	PIN 1 LS UPPER
SQ 18	SENSOR SPARE 2	PIN 2 LS UPPER (ADJUSTABLE SIDE)
SQ 19	SENSOR 1-2	S-EXIT
SQ 20	SENSOR SPARE 1	PUSH UP LS
SQ 25	SENSOR	BEAM SENSOR
SQ 25	SENSOR 1-2	R-AXIS ORIGIN SENSOR
SQ 32	SENSOR	NOZZLE CLAMP LS (NOZZLE STATION)
SQ 33	SENSOR	STATION UP LS (NOZZLE STATION)
SQ 34	SENSOR 1-1	NOZZLE 1 LS (NOZZLE STATION)
SQ 35	SENSOR 1-1	NOZZLE 2 LS (NOZZLE STATION)
SQ 36	SENSOR 1-1	NOZZLE 3 LS (NOZZLE STATION)
SQ 38	SENSOR 1-2	W-AXIS ORIGIN SENSOR
SQ 50 A	SENSOR S	FRONT FEEDER FLOATING SENSOR (SOURCE)
SQ 50 B	SENSOR R	FRONT FEEDER FLOATING SENSOR (DETECTOR)
SQ 60 A	SENSOR S	REAR FEEDER FLOATING SENSOR (SOURCE)
SQ 60 B	SENSOR R	REAR FEEDER FLOATING SENSOR (DETECTOR)

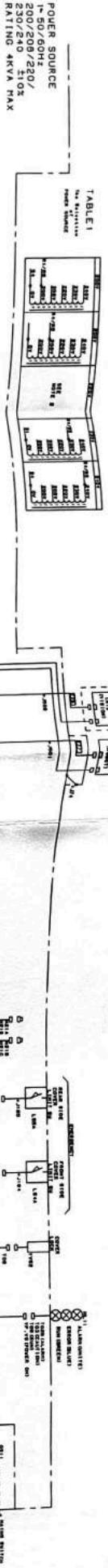
**PNEUMATICAL ITEMS**

ITEM NR.	ITEM NAME	REMARKS
YV 1	VALVE	MAIN STOPPER
YV 2	VALVE	LOCATE PIN AND SUPPORTER
YV 3	VALVE	SUB STOPPER
YV 4	VALVE	PUSH UP
YV 5	VALVE	CLAMP
YV 6	VALVE	PUSH IN
YV 7	VALVE	HEAD 1 DOWN
YV 8	VALVE	HEAD 2 DOWN
YV 9	VALVE	HEAD 1 TURN
YV 11	VACUUM PUMP	HEAD 1 VACUUM
YV 12	VACUUM PUMP	HEAD 2 VACUUM
YV 13	VALVE	HEAD 3 DOWN
YV 15	VACUUM PUMP	HEAD 3 VACUUM
YV 16	VALVE	HEAD 1 BLOW
YV 20	VALVE	NOZZLE CLAMP (NOZZLE STATION)
YV 21	VALVE	STATION UP (NOZZLE STATION)
YV 29	VALVE	HEAD 3 VACUUM CHANGE
YV 50	VALVE	HEAD AIR SOURCE ON/OFF
YV 51	VALVE	DISPENSER AIR BLOW ON/OFF
YV 52	VALVE	COVER LOCK

ITEM NR.	ITEM NAME	REMARKS
J125	HNS 2-19	X-FLEX (RP)
J141	HNS 1-7	MO1 (MO X,Y,Z)
J142	HNS 1-4	MO2 (MO R,W)
J143	HNS 2-5	Y-FLEX (MO)
J144	HNS 2-12	WM
J145	HNS 2-8	X-FLEX (RM)
J161	HNS 3-2	I/O (CN4) ↔ PS1
J162	HNS 7-2	FRONT EMG STOP
J163	HNS 7-2	REAR EMG STOP
J164	HNS 7-1	FRONT COVER LIMIT SWITCH
J165	HNS 7-1	REAR COVER LIMIT SWITCH
J166	HNS 7-4	J207 ↔ XT23
J167	HNS 7-5	XT23 ↔ SERVICE KEY
J168	HNS 7-6	J208 ↔ SERVICE KEY
J169	HNS 7-7	XT23 ↔ EMG
J181	HNS 3-4	I/O (CN1) ↔ CONVEYOR SENSOR
J184	HNS 3-10	I/O (CN14) ↔ BOARD, CON2 (CN1)
J186	HNS 3-1	I/O (CN17) ↔ W ORG
J187	HNS 3-12	J205 ↔ HL11,
J189	HNS 8-7	GATE IN
J201	HNS 3-6	I/O (CN3) ↔ CONVEYOR VALVE
J202	HNS 3-8	I/O (CN9) ↔ J206 (SPEED CONTROL)
J203	HNS 3-11	I/O (CN19) ↔ HL11
J204	HNS 16-5	HOUR METER
J205	HNS 9-5	GATE OUT
J206	HNS 9-6	J202 ↔ KA1, KA2
J207	HNS 7-3	I/O (CN27) ↔ EMG
J208	HNS 3-3	I/O (CN13) ↔ FRONT PANEL
J209	HNS 16-7	BUZZER
J210	HNS 16-6	COUNTER
J211	HNS 13-5	I/O (CN12) ↔ TEACHING CAMERA
J212	HNS 13-1	Y-FLEX (TEACHING CAMERA)
J213	HNS 13-2	TEACHING CAMERA
J214	HNS 13-4	LED
J301	HNS 5-1	BOARD CON2 (CN3) ↔ SQ2, SQ4
J302	TERMINAL 1	BOARD CON2 (CN2) ↔ BOARD CON3 (CN1)
J303	HNS 5-3	BOARD CON3 (CN3) ↔ SENSOR 1 BOARD
J304	HNS 3-15	BOARD CON3 (CN4) ↔ HEAD SENSOR
J305	HNS 5-2	BOARD CON3 (CN2) ↔ SQ1, SQ3, SQ26
J501	HNS 1-8	VIDEO OUT ↔ CRT 1
J506	HNS 1-8	CRT 2 ↔ J211
J510	HNS 1-8	CPU (VIDEO IN) ↔ J211
J690	HNS 9-1	I/O (CN24) SHORT
J903	HNS 3-9	I/O (CN11) ↔ SMEMA
J904	HNS 17-1	FG ↔ TC11, V10
J905	HNS 17-1	FG ↔ TC11, V20
J906	HNS 17-1	FG ↔ TC11, V30
J912	HNS 8-7	STICKFEEDER ↔ J31
J914	HNS 8-3	KEY SWITCH
J915	HNS 16-8	SMEMA PREVIOUS
J916	HNS 16-9	SMEMA NEXT
J917	HNS 8-3	KEY SWITCH

# I / O BOARD ASSY





### CSM 84 III OVERALL INTERCONNECT DIAGRAM

ITEM NR	ITEM NAME	REMARKS
W 1-3	PARTS 3-7	PARTS FOR SHORT.
E 1	FERRITE CORE	-
E 2	FERRITE CORE	-
E 3	FERRITE CORE	-
E 4	FERRITE CORE	-
E 5	FERRITE CORE	-
E 7	FERRITE CORE	-
E 8	FERRITE CORE	-
E 11	FERRITE CORE	MX U
E 12	FERRITE CORE	MX V
E 13	FERRITE CORE	MX W
E 14	FERRITE CORE	MY U
E 15	FERRITE CORE	MY V
E 16	FERRITE CORE	MY W
E 27	FERRITE CORE	-
E 28	FERRITE CORE	-

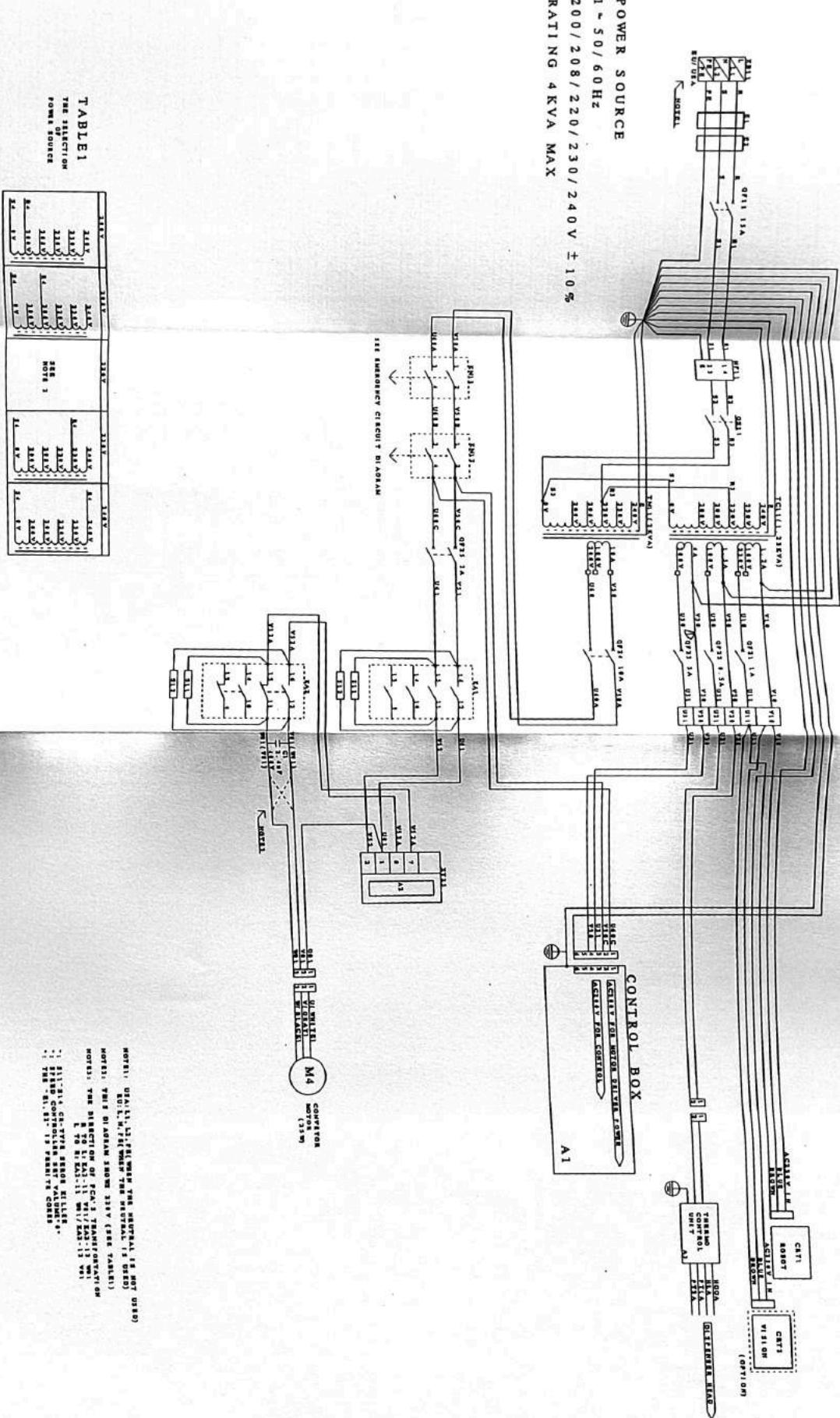


TABLE I  
THE SELECTION OF  
POWER SOURCE

**NOTE:** USE ALL UPPERCASE WHEN THE NEUTRAL IS NOT USED  
E.G.: W.P.C. (WHEN THE NEUTRAL IS USED)

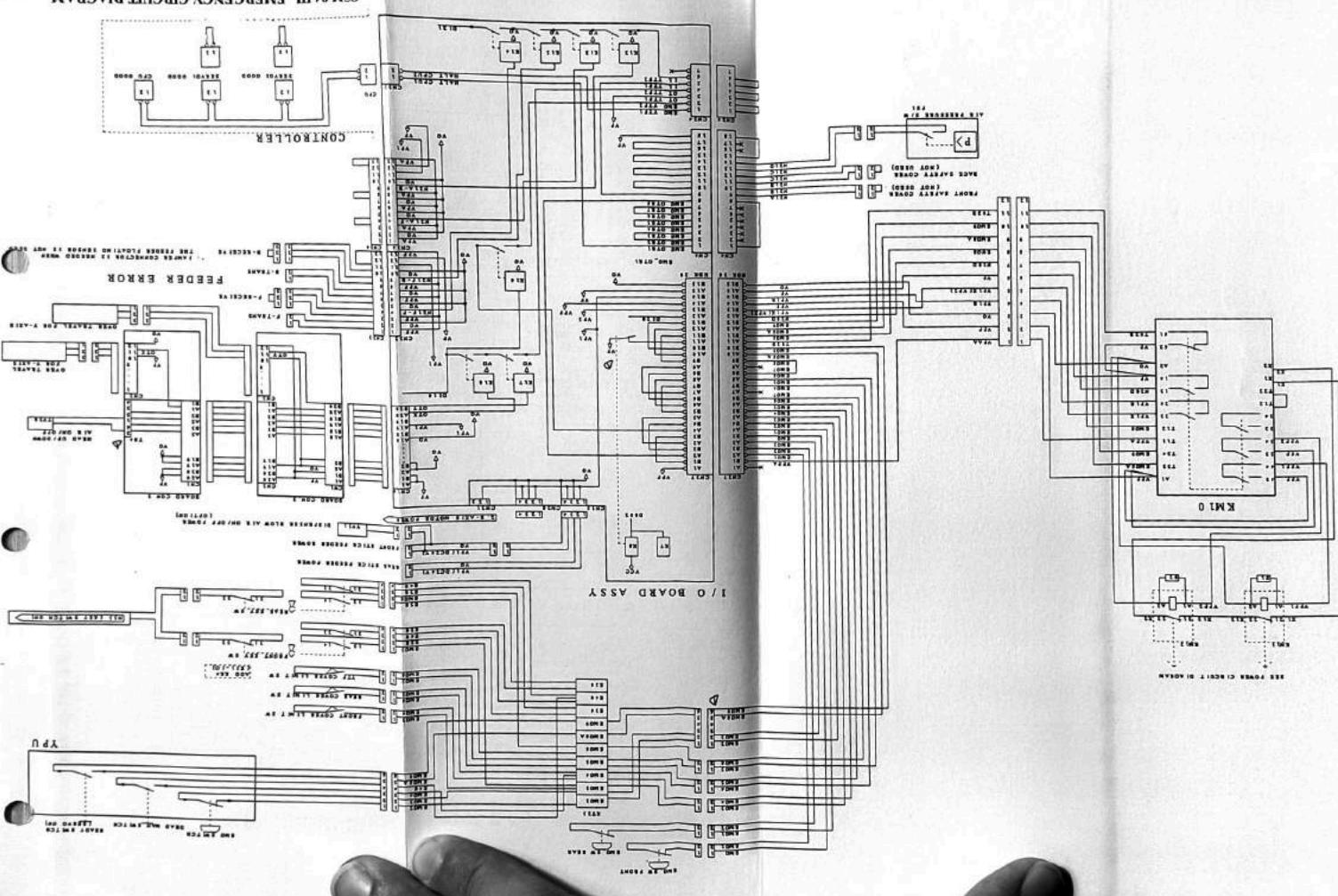
**NOTE:** THIS DOCUMENT SHOWS THE DIRECTION OF PCA'S TRANSPORTATION  
**NOTES:** THE DIRECTION OF PCA'S TRANSPORTATION  
NOTES: THE DIRECTION OF PCA'S TRANSPORTATION  
NOTES: THE DIRECTION OF PCA'S TRANSPORTATION

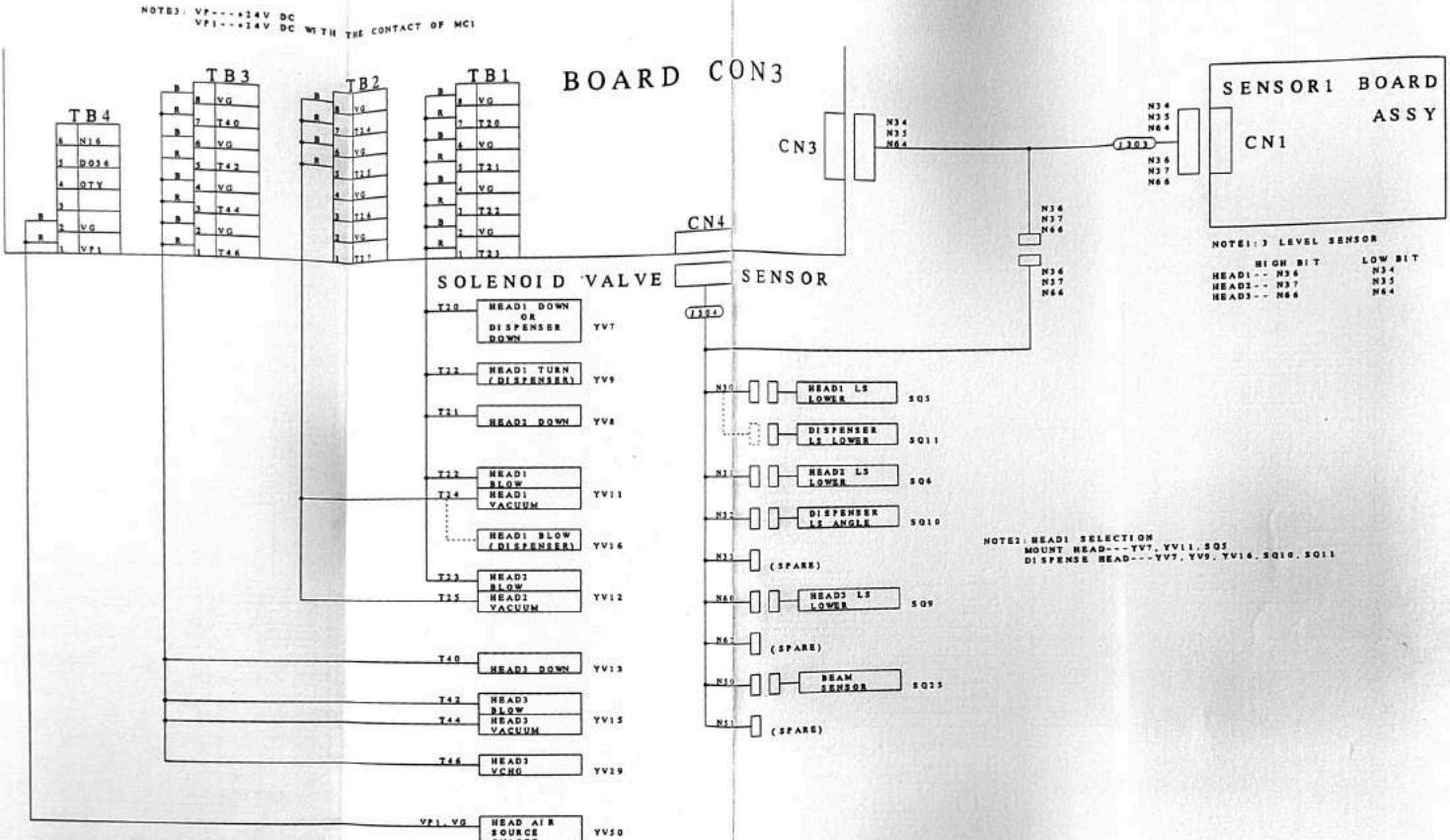
L TO R: LAD-11 901-1 LAS-11 VMI

THE "BL. BL." IS PROBABLY CORRECT

CSM 84 III POWER CIRCUIT DIAGRAM

CSM 84 III ENERGY CIRCUIT-BLACKGRAM





**SENSOR ITEMS**

SENSOR NR.	SENSOR NAME	REMARKS
SQ 1	SENSOR 1-1	X-AXIS SECOND LIMIT SENSOR
SQ 2	SENSOR 1-1	Y-AXIS SECOND LIMIT SENSOR
SQ 3	SENSOR 1-2	X-AXIS ORG. SENSOR
SQ 4	SENSOR 1-2	Y-AXIS ORG SENSOR
SQ 5	SENSOR 1-8	HEAD 1 LS LOWER
SQ 6	SENSOR 1-8	HEAD 2 LS LOWER
SQ 9	SENSOR 1-8	HEAD 3 LS LOWER
SQ 10	SENSOR 1-8	DISPENSER ANGLE SENSOR
SQ 11	SENSOR 1-8	DISPENSER LOWER SENSOR
SQ 13	SENSOR 1-2	MAIN ENTRANCE
SQ 14	SENSOR 1-2	MAIN EXIT
SQ 15	SENSOR 1-2	SET POSITION
SQ 17	SENSOR SPARE 2	PIN 1 LS UPPER
SQ 18	SENSOR SPARE 2	PIN 2 LS UPPER (ADJUSTABLE SIDE)
SQ 19	SENSOR 1-2	S-EXIT
SQ 20	SENSOR SPARE 1	PUSH UP LS
SQ 25	SENSOR	BEAM SENSOR
SQ 26	SENSOR 1-2	R-AXIS ORIGIN SENSOR
SQ 32	SENSOR	NOZZLE CLAMP LS (NOZZLE STATION)
SQ 33	SENSOR	STATION UP LS (NOZZLE STATION)
SQ 34	SENSOR 1-1	NOZZLE 1 LS (NOZZLE STATION)
SQ 35	SENSOR 1-1	NOZZLE 2 LS (NOZZLE STATION)
SQ 36	SENSOR 1-1	NOZZLE 3 LS (NOZZLE STATION)
SQ 38	SENSOR 1-2	W-AXIS ORIGIN SENSOR
SQ 50 A	SENSOR S	FRONT FEEDER FLOATING SENSOR (SOURCE)
SQ 50 B	SENSOR R	FRONT FEEDER FLOATING SENSOR (DETECTOR)
SQ 60 A	SENSOR S	REAR FEEDER FLOATING SENSOR (SOURCE)
SQ 60 B	SENSOR R	REAR FEEDER FLOATING SENSOR (DETECTOR)

**PNEUMATICAL ITEMS**

ITEM NR.	ITEM NAME	REMARKS
YV 1	VALVE	MAIN STOPPER
YV 2	VALVE	LOCATE PIN AND SUPPORTER
YV 3	VALVE	SUB STOPPER
YV 4	VALVE	PUSH UP
YV 5	VALVE	CLAMP
YV 6	VALVE	PUSH IN
YV 7	VALVE	HEAD 1 DOWN
YV 8	VALVE	HEAD 2 DOWN
YV 9	VALVE	HEAD 1 TURN
YV 11	VACUUM PUMP	HEAD 1 VACUUM
YV 12	VACUUM PUMP	HEAD 2 VACUUM
YV 13	VALVE	HEAD 3 DOWN
YV 15	VACUUM PUMP	HEAD 3 VACUUM
YV 16	VALVE	HEAD 1 BLOW
YV 20	VALVE	NOZZLE CLAMP (NOZZLE STATION)
YV 21	VALVE	STATION UP (NOZZLE STATION)
YV 29	VALVE	HEAD 3 VACUUM CHANGE
YV 50	VALVE	HEAD AIR SOURCE ON/OFF
YV 51	VALVE	DISPENSOR AIR BLOW ON/OFF
YV 52	VALVE	COVER LOCK

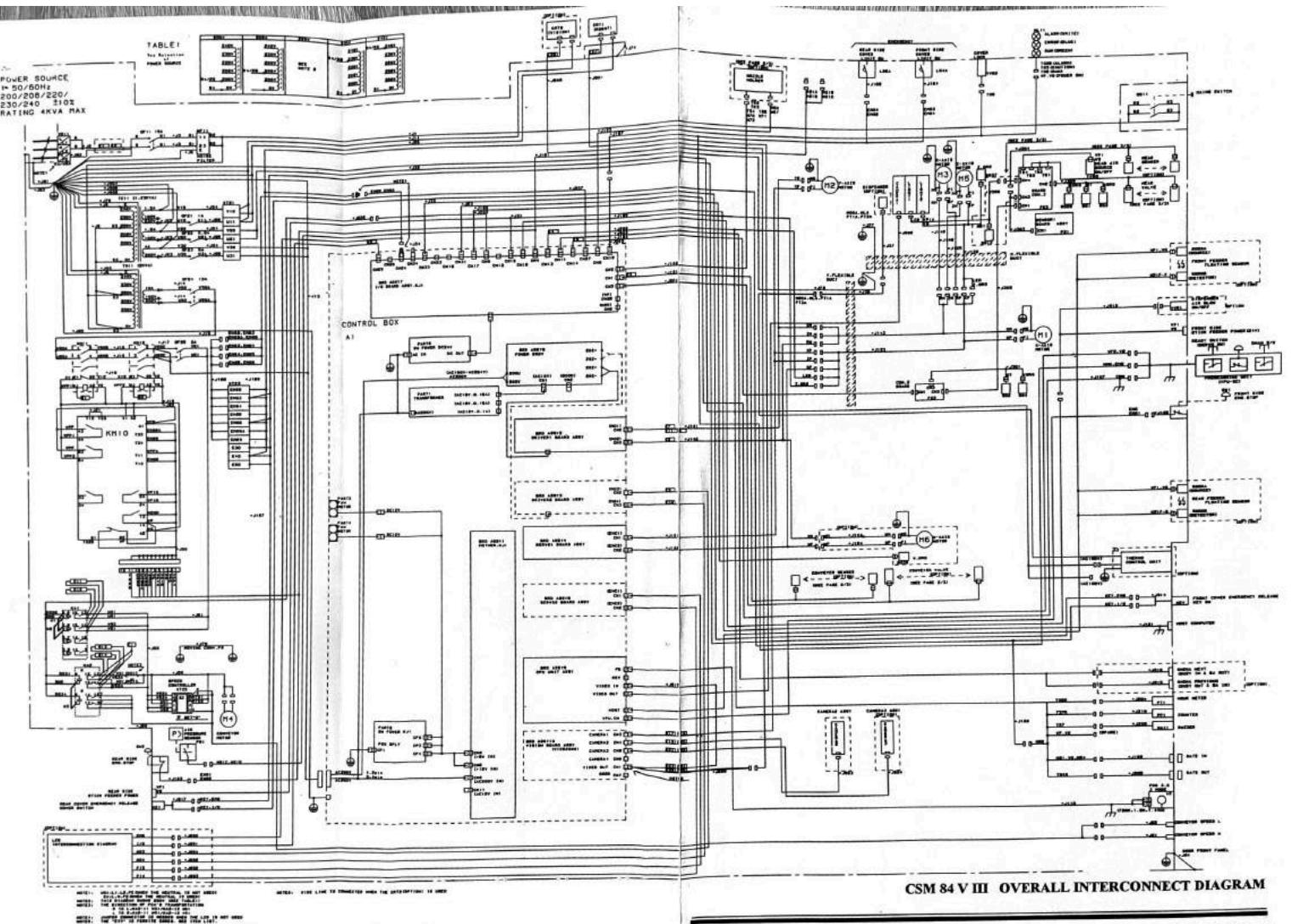
ITEM NR.	ITEM NAME	REMARKS
J125	HNS 2-19	X-FLEX (RP)
J141	HNS 1-7	MO1 (MO X,Y,Z)
J142	HNS 1-4	MO2 (MO R,W)
J143	HNS 2-5	Y-FLEX (MO)
J144	HNS 2-12	WM
J145	HNS 2-8	X-FLEX (RM)
J161	HNS 3-2	I/O (CN4) ↔ PS1
J162	HNS 7-2	FRONT EMG STOP
J163	HNS 7-2	REAR EMG STOP
J164	HNS 7-1	FRONT COVER LIMIT SWITCH
J165	HNS 7-1	REAR COVER LIMIT SWITCH
J166	HNS 7-4	J207 ↔ XT23
J167	HNS 7-5	XT23 ↔ SERVICE KEY
J168	HNS 7-6	J208 ↔ SERVICE KEY
J169	HNS 7-7	XT23 ↔ EMG
J181	HNS 3-4	I/O (CN1) ↔ CONVEYOR SENSOR
J184	HNS 3-10	I/O (CN14) ↔ BOARD, CON2 (CN1)
J186	HNS 3-1	I/O (CN17) ↔ W ORG
J187	HNS 3-12	J205 ↔ HL11,
J189	HNS 8-7	GATE IN
J201	HNS 3-6	I/O (CN3) ↔ CONVEYOR VALVE
J202	HNS 3-8	I/O (CN9) ↔ J206 (SPEED CONTROL)
J203	HNS 3-11	I/O (CN19) ↔ HL11
J204	HNS 16-5	HOUR METER
J205	HNS 9-5	GATE OUT
J206	HNS 9-6	J202 ↔ KA1, KA2
J207	HNS 7-3	I/O (CN27) ↔ EMG
J208	HNS 3-3	I/O (CN13) ↔ FRONT PANEL
J209	HNS 16-7	BUZZER
J210	HNS 16-6	COUNTER
J211	HNS 13-5	I/O (CN12) ↔ TEACHING CAMERA
J212	HNS 13-1	Y-FLEX (TEACHING CAMERA)
J213	HNS 13-2	TEACHING CAMERA
J214	HNS 13-4	LED
J301	HNS 5-1	BOARD CON2 (CN3) ↔ SQ2, SQ4
J302	TERMINAL 1	BOARD CON2 (CN2) ↔ BOARD CON3 (CN1)
J303	HNS 5-3	BOARD CON3 (CN3) ↔ SENSOR 1 BOARD
J304	HNS 3-15	BOARD CON3 (CN4) ↔ HEAD SENSOR
J305	HNS 5-2	BOARD CON3 (CN2) ↔ SQ1, SQ3, SQ26
J501	HNS 1-8	VIDEO OUT ↔ CRT 1
J506	HNS 1-8	CRT 2 ↔ J211
J510	HNS 1-8	CPU (VIDEO IN) ↔ J211
J690	HNS 9-1	I/O (CN24) SHORT
J903	HNS 3-9	I/O (CN11) ↔ SMEMA
J904	HNS 17-1	FG ↔ TC11, V10
J905	HNS 17-1	FG ↔ TC11, V20
J906	HNS 17-1	FG ↔ TC11, V30
J912	HNS 8-7	STICKFEEDER ↔ J31
J914	HNS 8-3	KEY SWITCH
J915	HNS 16-8	SMEMA PREVIOUS
J916	HNS 16-9	SMEMA NEXT
J917	HNS 8-3	KEY SWITCH

## CSM 84 III ITEM LIST

HARNESS (HNS) ITEMS		ITEM NAME	REMARKS
J2	HNS 15-2	XB11 ↔ QF11	
J3	HNS 1-1	QF11 ↔ NF11 (1,2)	
J4	HNS 1-2	NF11 (3,4) ↔ QS11	
J5	HNS 6-4	R3, S3, PE	
J6	HNS 6-5	NF11:FG	
J11	HNS 5-1	XT21 ↔ CRT 2 (CRT POWER)	
J13	HNS 5-3	XT21, KM12 ↔ CONTROL BOX	
J14	HNS 5-4	TM11 ↔ QF24	
J15	HNS 5-5	QF24 ↔ KM11	
J16	HNS 5-6	KM11 (2,4) ↔ KM12 (1,3)	
J17	HNS 5-7	KM12 ↔ QF25	
J18	HNS 5-8	KM11 (22) ↔ KM12 (21)	
J19	HNS 5-9	KM10 ↔ KM11, KM12	
J20	HNS 5-10	KM10 ↔ I207 (EMG)	
J21	HNS 5-11	KM10 T12-T22 SHORT	
J22	HNS 5-15	KM10 A1 ↔ 43, 53	
J23	HNS 5-12	TC11 ↔ QF21, QF22, QF23	
J24	HNS 5-13	TC11 ↔ XT21	
J25	HNS 5-14	QF21, QF22, QF23 ↔ XT21	
J26	HNS 5-1	XT21 ↔ CRT 1 (CRT POWER)	
J31	HNS 3-1	I/O(CN18) ↔ STICK FEEDER POWER	
J32	HNS 3-7	XT21 ↔ THERMO CONT POWER	
J33	HNS 3-4	I/O(CN33) ↔ (FEEDER SENSOR)	
J34	HNS 3-14	I/O(CN34) SHORT	
J36	HNS 2-10	THERMO CONT ↔ Y-FLEX	
J37	HNS 2-11	X-FLEX ↔ J36	
J51	HNS 6-8	QF25 ↔ KA1	
J52	HNS 10-1	KA1 ↔ SPEED CONTROLLER	
J53	HNS 5-16	I/O(CN31) ↔ HK POWER	
J58	HNS 10-2	KA2 ↔ CONVEYOR VR	
J59	HNS 10-3	KA2 ↔ CONVEYOR MOTOR	
J61	HNS 3-11	CONVEYOR VR, H	
J62	HNS 3-12	CONVEYOR VR, L	
J76	HNS 4-3	Moving CONVEYOR, FG	
J77	HNS 4-1	Y-FLEX, FG	
J78	HNS 4-2	Y-FLEX, FG	
J79	HNS 4-6	TC11 ↔ FG (TERMINAL)	
J80	HNS 4-6	TM11 ↔ FG (TERMINAL)	
J81	HNS 301	PLATE POWER BOX, FG	
J82	HNS 301	XB11 ↔ FG (TERMINAL)	
J84	HNS 4-5	FRONT DOOR, FG (TERMINAL)	
J85	HNS 301	CONTROLLER ↔ FG	
J101	HNS 16-1	CONTROLLER ↔ HOST	
J107	HNS 16-4	CONTROLLER ↔ HK	
J110	HNS 4-8	CONTROLLER ↔ FD	
J121	HNS 1-2	P1 (P, X, Y, Z)	
J122	HNS 1-3	P12 (P, R, W)	
J123	HNS 2-4	Y-FLEX (P)	
J124	HNS 2-13	WP	

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DIAGRAMS

CHAPTER 2 ELECTRICAL

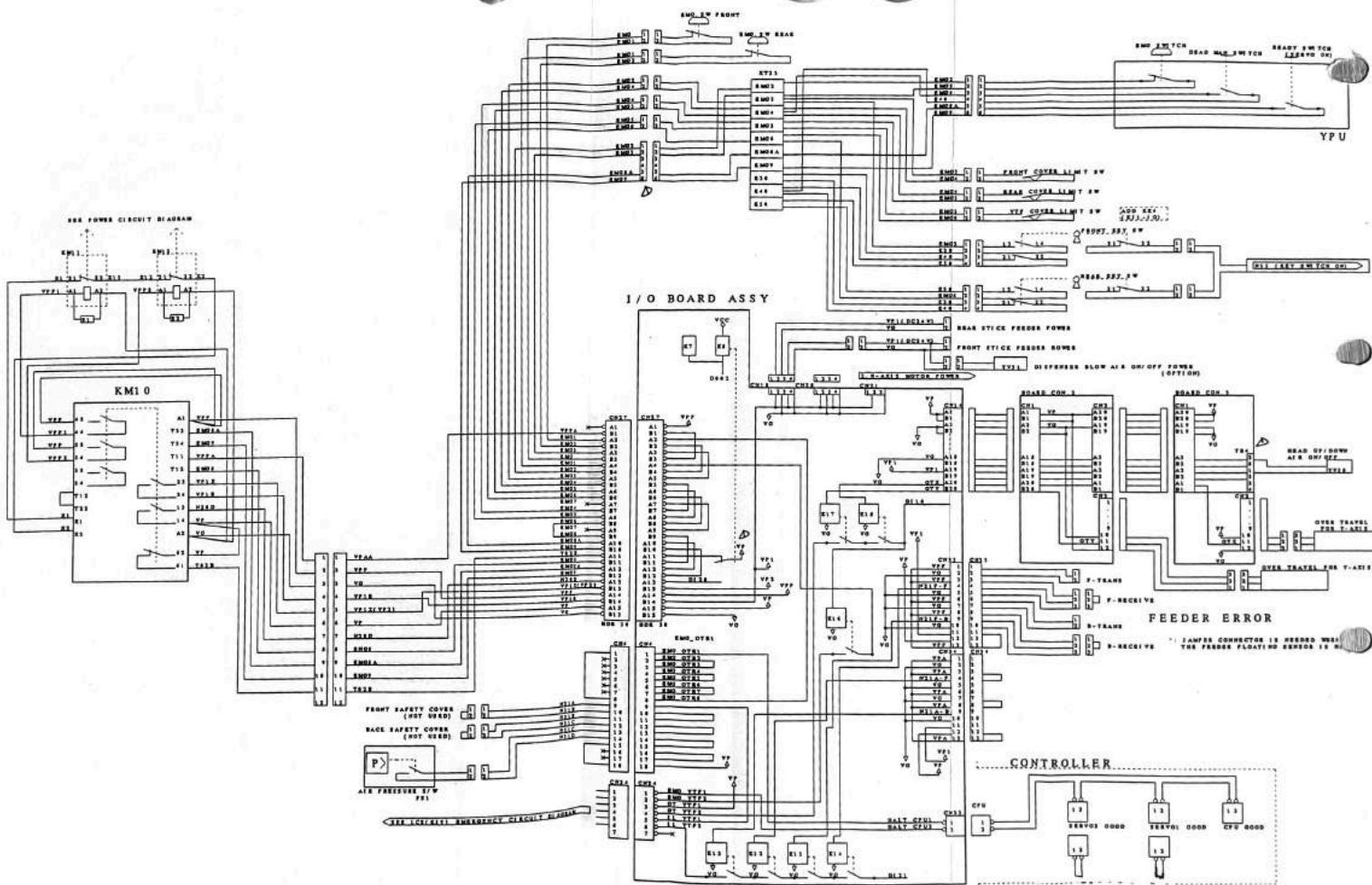


CSM 84 V III OVERALL INTERCONNECT DIAGRAM

ITEM NR	ITEM NAME	REMARKS
W 1-3	PARTS 3-7	PARTS FOR SHORT.
E 1	FERRITE CORE	-
E 2	FERRITE CORE	-
E 3	FERRITE CORE	-
E 4	FERRITE CORE	-
E 5	FERRITE CORE	-
E 7	FERRITE CORE	-
E 8	FERRITE CORE	-
E 11	FERRITE CORE	MX U
E 12	FERRITE CORE	MX V
E 13	FERRITE CORE	MX W
E 14	FERRITE CORE	MY U
E 15	FERRITE CORE	MY V
E 16	FERRITE CORE	MY W
E 27	FERRITE CORE	-
E 28	FERRITE CORE	-

**SEVERAL ITEMS**

ITEM NR	ITEM NAME	REMARKS
QF 11	CIRCUIT PROTECTOR 2	15 AMPS.
QF 21	CIRCUIT PROTECTOR 3	1 AMP.
QF 22	CIRCUIT PROTECTOR 3	0.5 AMPS.
QF 23	CIRCUIT PROTECTOR 3	3 AMPS.
QF 24	CIRCUIT PROTECTOR 5	10 AMPS.
QF 25	CIRCUIT PROTECTOR 5	2 AMPS.
NF 11	NOISE FILTER	→ J3, J4, J6
PT 1	HOUR METER	→ J204
PC 1	COUNTER	→ J210
LS 4A	SWITCH SAFETY	COVER SAFETY SWITCH → J164
LS 5A	SWITCH SAFETY	COVER SAFETY SWITCH → J165
QS 11	MAIN SWITCH	→ J4
HL 11	LIGHT 1 ASSY	→ J187
TM 11	POWER TRAFO	2 KVA MOTOR
TC 11	POWER TRAFO	1.25 KVA CONTROL
SW 1	SWITCH STOP	EMERGENCY STOP SWITCH → J162
SW 2	SWITCH STOP	EMERGENCY STOP SWITCH → J163
CRT 1	CRT 1 ASSY	UFOS USER INTERFACE
CRT 2	CRT 2 ASSY	VISION SCREEN
P21	SENSOR 1 BOARD ASSY	-
P22	CONNECTION 2 BOARD ASSY	-
P23	CONNECTION 3 BOARD ASSY	-
M1	MOTOR ASSY	X-AXIS MOTOR
M2	MOTOR ASSY	Y-AXIS MOTOR
M3	MOTOR ASSY	R-AXIS MOTOR
M4	MOTOR ASSY	CONVEYOR MOTOR 25W/200V
M6	MOTOR ASSY	W-AXIS MOTOR
A1	CONTROL BOX	-
A2	SPEED CONTROLLER	SOFT STOP SPEED CONTROLLER
A3	THERMO CONTROL UNIT	-
A8	DISK DRIVE	FLOPPY DISK DRIVE 3.5 INCH, 3 MODES
KM 10	CONTACTOR 1	GREEN BOX
KM 11	CONTACTOR 1	-
KM 12	CONTACTOR 1	-
KA 1	RELAY 1	4 RELAY'S WITH TERMINAL
KA 2	RELAY 1	-
PS 1	GAUGE	PRESSURE GAUGE
XB 11	TERMINAL ASSY	POWER
S1/S2	SPARK KILLER	-
S11-14	SPARK KILLER	-



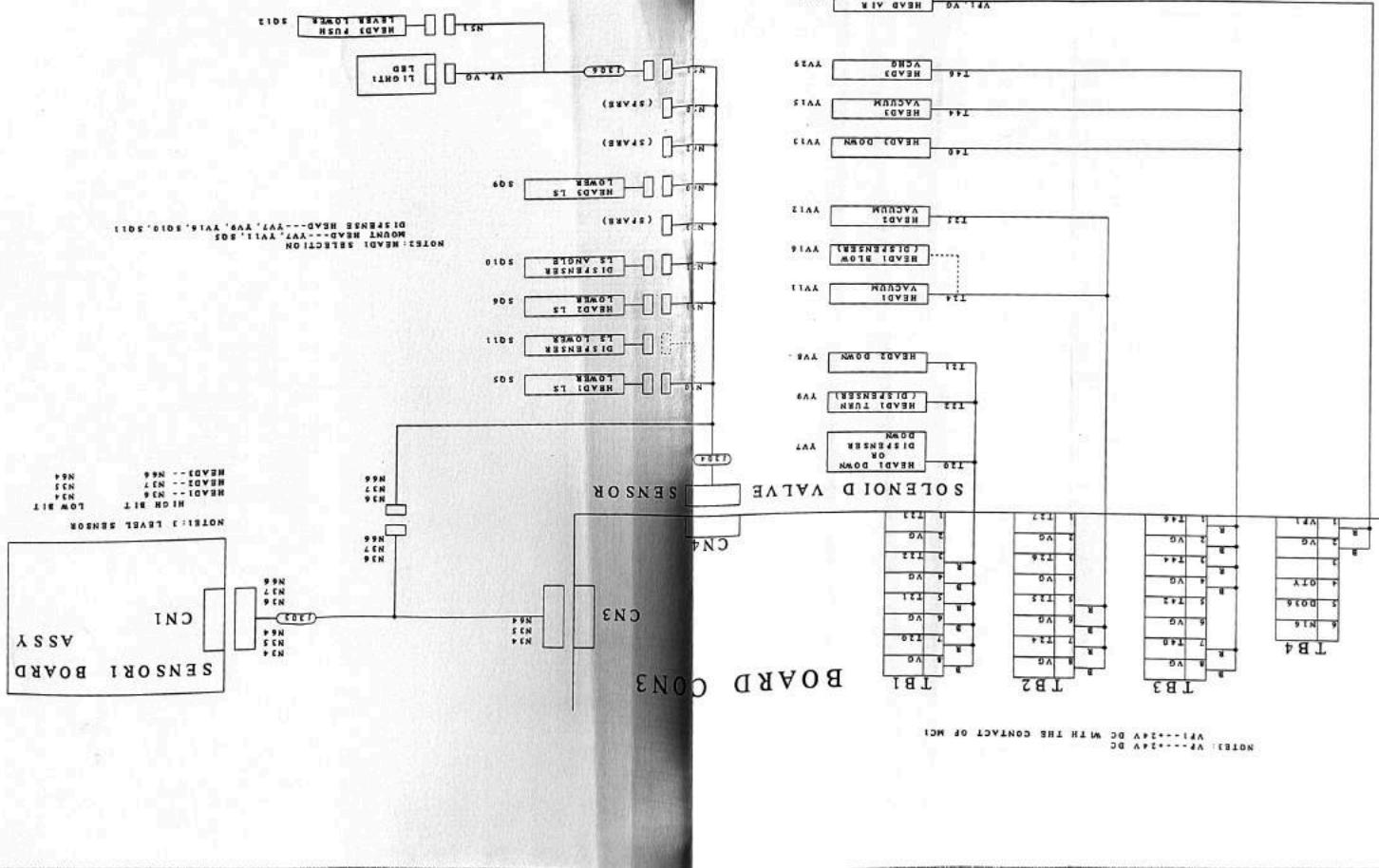
## **CSM 84 V III EMERGENCY CIRCUIT DIAGRAM**

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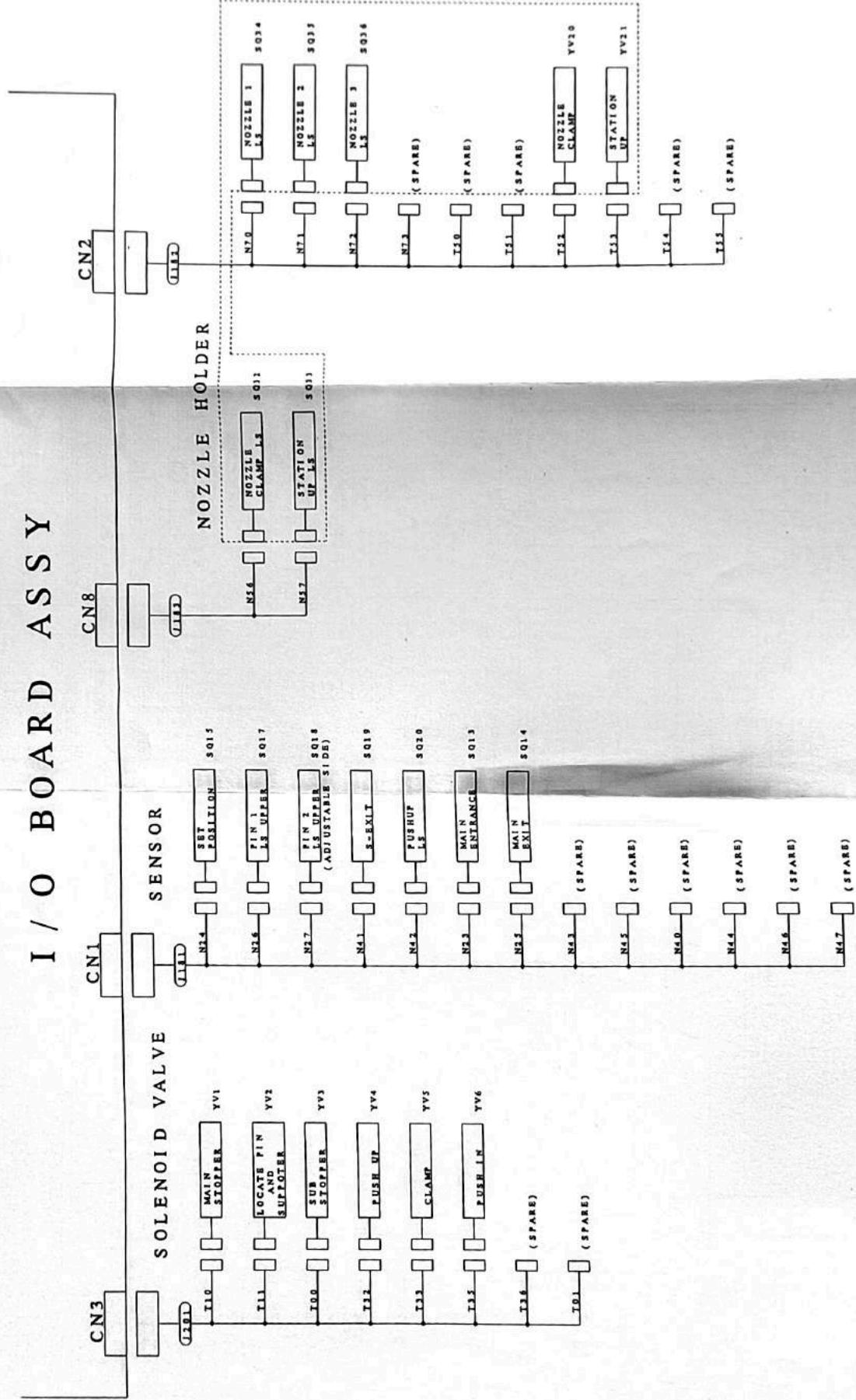
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## CHAPTER 2 ELECTRICAL DIAGRAMS

CSM 84 V III HEAD SOLENOID, VALVES & SENSORS



I/O BOARD ASSY



CSM 84 V III CONVEYOR SOLENOID, VALVES & SENSORS

ITEM NR.	ITEM NAME	REMARKS
J125	HNS 2-19	X-FLEX (RP)
J141	HNS 1-7	MO1 (MO X,Y,Z)
J142	HNS 1-4	MO2 (MO R,W)
J143	HNS 2-5	Y-FLEX (MO)
J144	HNS 2-12	WM
J145	HNS 2-8	X-FLEX (RM)
J146	HNS 2-7	X-FLEX (ZP)
J161	HNS 3-2	I/O (CN4) ↔ PS1
J162	HNS 7-2	FRONT EMG STOP
J163	HNS 7-2	REAR EMG STOP
J164	HNS 7-1	FRONT COVER LIMIT SWITCH
J165	HNS 7-1	REAR COVER LIMIT SWITCH
J166	HNS 7-4	J207 ↔ XT23
J167	HNS 7-5	XT23 ↔ SERVICE KEY
J168	HNS 7-6	J208 ↔ SERVICE KEY
J169	HNS 7-7	XT23 ↔ EMG
J181	HNS 3-4	I/O (CN1) ↔ CONVEYOR SENSOR
J182	HNS 3-13	I/O (CN2) ↔ NOZZLE HOLDER
J183	HNS 3-12	I/O (CN8) ↔ NOZZLE HOLDER (N56,N57)
J184	HNS 3-10	I/O (CN14) ↔ BOARD, CON2 (CN1)
J185	HNS 3-2	I/O (CN15) ↔ Z ORG.
J186	HNS 3-1	I/O (CN17) ↔ W ORG
J187	HNS 3-12	J205 ↔ HL11,
J189	HNS 8-7	GATE IN
J201	HNS 3-6	I/O (CN3) ↔ CONVEYOR VALVE
J202	HNS 3-8	I/O (CN9) ↔ J206 (SPEED CONTROL)
J203	HNS 3-11	I./O (CN19) ↔ HL11
J204	HNS 16-5	HOUR METER
J205	HNS 9-5	GATE OUT
J206	HNS 9-6	J202 ↔ KA1, KA2
J207	HNS 7-3	I/O (CN27) ↔ EMG
J208	HNS 3-3	I/O (CN13) ↔ FRONT PANEL
J209	HNS 16-7	BUZZER
J210	HNS 16-6	COUNTER
J301	HNS 5-1	BOARD CON2 (CN3) ↔ SQ2, SQ4
J302	TERMINAL 1	BOARD CON2 (CN2) ↔ BOARD CON3 (CN1)
J303	HNS 5-3	BOARD CON3 (CN3) ↔ SENSOR 1 BOARD
J304	HNS 3-15	BOARD CON3 (CN4) ↔ HEAD SENSOR
J305	HNS 5-2	BOARD CON3 (CN2) ↔ SQ1, SQ3, SQ26
J306	HNS 9-11	LIGHT 1 (LED) ↔ J304
J501	HNS 1-8	VIDEO OUT ↔ CRT 1
J502	HNS 12-3	CAMERA 1
J503	HNS 9-5	CAMERA 2
J504	HNS 9-5	CAMERA 3 (OPTION)
J505	HNS 13-7	VIDEO OUT ↔ J506
J506	HNS 1-8	CRT 2 ↔ J211
J510	HNS 1-8	CPU (VIDEO IN) ↔ J211
J690	HNS 9-1	I/O (CN24) SHORT
J691	HNS 4-1	I/O (CN29) ↔ LCS (I/O)
J692	HNS 1-5	PI3 ↔ LCS (PI LX,LY,LZ)
J693	HNS 1-7	PI4 ↔ LCS (PI LT)

## CSM 84 III ITEM LIST

HARNESS (HNS) ITEMS		ITEM NR.	ITEM NAME	REMARKS
J2	HNS 15-2		XB11 ↔ QF11	
J3	HNS 1-1		QF11 ↔ NF11 (1,2)	
J4	HNS 1-2		NF11 (3,4) ↔ QS11	RJ, SJ, PE
J5	HNS 6-4			NF11:FG
J6	HNS 6-5			
J11	HNS 5-1		XT21 ↔ CRT 2 (CRT POWER)	
J13	HNS 5-3		XT21, KM12 ↔ CONTROL BOX	
J14	HNS 5-4		TM11 ↔ QF24	
J15	HNS 5-5		QF24 ↔ KM11	
J16	HNS 5-6		KM11 (2,4) ↔ KM12 (1,3)	
J17	HNS 5-7		KM12 ↔ QF25	
J18	HNS 5-8		KM11 (22) ↔ KM12 (21)	
J19	HNS 5-9		KM10 ↔ KM11, KM12	
J20	HNS 5-10		KM10 ↔ J207 (EMG)	
J21	HNS 5-11		KM10 T12-T22 SHORT	
J22	HNS 5-15		KM10 A1 ↔ 43, 53	
J23	HNS 5-12		TC11 ↔ QF21, QF22, QF23	
J24	HNS 5-13		TC11 ↔ XT21	
J25	HNS 5-14		QF21, QF22, QF23 ↔ XT21	
J26	HNS 5-1		XT21 ↔ CRT 1 (CRT POWER)	
J31	HNS 3-11		I/O (CN18) ↔ STICK FEEDER POWER	
J32	HNS 3-7		XT21 ↔ THERMO CONT POWER	
J33	HNS 3-4		I/O (CN33) ↔ FEEDER SENSOR	
J34	HNS 3-14		I/O (CN34) SHORT	
J36	HNS 2-10		THERMO CONT ↔ Y-FLEX	
J37	HNS 2-11		X-FLEX ↔ J16	
J51	HNS 6-8		QF25 ↔ KA1	
J52	HNS 10-1		KA1 ↔ SPEED CONTROLLER	
J53	HNS 5-16		I/O (CN31) ↔ HHK POWER	
J58	HNS 10-2		KA2 ↔ CONVEYOR VR	
J59	HNS 10-3		KA2 ↔ CONVEYOR MOTOR	
J61	HNS 3-11		CONVEYOR VR, H	
J62	HNS 3-12		CONVEYOR VR, L	
J76	HNS 4-3		MOVING CONVEYOR, FG	
J77	HNS 4-1		X-FLEX, FG	
J78	HNS 4-2		Y-FLEX, FG	
J79	HNS 4-6		TC11 ↔ FG (TERMINAL)	
J80	HNS 4-6		TM11 ↔ FG (TERMINAL)	
J81	HNS 301		PLATE POWER BOX ↔ FG	
J82	HNS 301		YB11 ↔ FG (TERMINAL)	
J84	HNS 4-5		FRONT DOOR ↔ FG (TERMINAL)	
J85	HNS 301		CONTROLLER ↔ FG	
J101	HNS 1-1		CONTROLLER ↔ HOST	
J107	HNS 1-4		CONTROLLER ↔ HHK	
J110	HNS 4-8		CONTROLLER ↔ FD	
J121	HNS 1-2		P1 (PI X, Y, Z)	
J122	HNS 1-3		P12 (PI R, W)	
J123	HNS 2-4		Y-FLEX (PI)	
J124	HNS 2-13		WP	

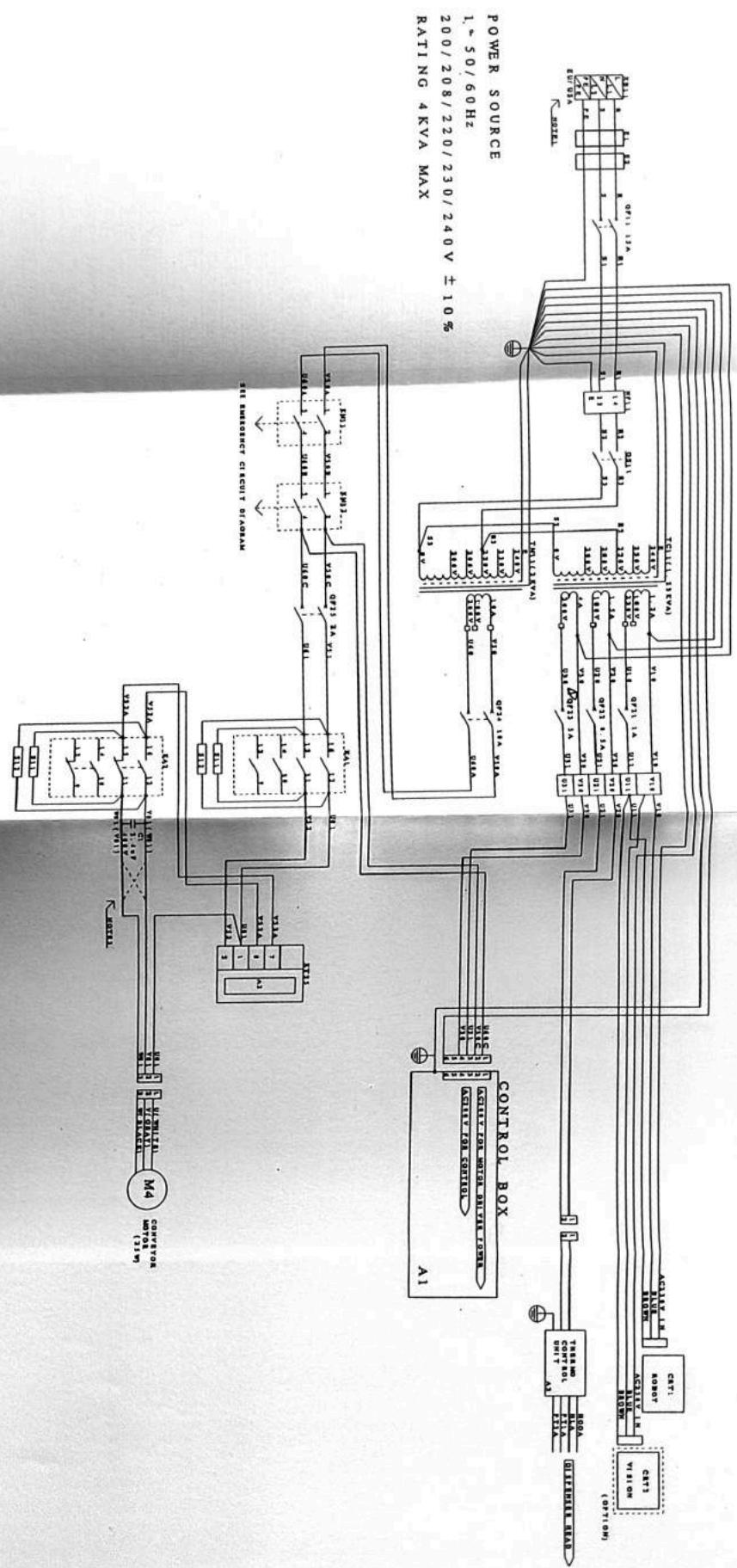


TABLE I  
THE SELECTION  
OF  
POWER SOURCE

CSM 84 VIII POWER CIRCUIT DIAGRAM

ITEM NR	ITEM NAME	REMARKS
M1	MOTOR ASSY	X-AXIS MOTOR
M2	MOTOR ASSY	Y-AXIS MOTOR
M3	MOTOR ASSY	R-AXIS MOTOR
M4	MOTOR ASSY	CONVEYOR MOTOR 25W/200V
M5	MOTOR ASSY	Z-AXIS MOTOR 40W
M6	MOTOR ASSY	W-AXIS MOTOR
A1	CONTROL BOX	-
A2	SPEED CONTROLLER	SOFT STOP SPEED CONTROLLER
A3	THERMO CONTROL UNIT	-
A8	DISK DRIVE	FLOPPY DISK DRIVE 3.5 INCH, 3 MODES
NOZZLE HOLDER	ATC STATION	
MTF	TRAY ASSY	TRAY ATTACHMENT ASSY
LCS	TRAYFEEDER	CSM TRAYFEEDER 31
KM 10	CONTACTOR 1	GREEN BOX
KM 11	CONTACTOR 1	-
KM 12	CONTACTOR 1	-
KA 1	RELAY 1	4 RELAY'S WITH TERMINAL
KA 2	RELAY 1	-
PS 1	GAUGE	PRESSURE GAUGE
XB 11	TERMINAL ASSY	POWER
S1/S2	SPARK KILLER	-
S11-14	SPARK KILLER	-
W 1-3	PARTS 3-7	PARTS FOR SHORT.
E 1	FERRITE CORE	-
E 2	FERRITE CORE	-
E 3	FERRITE CORE	-
E 4	FERRITE CORE	-
E 5	FERRITE CORE	-
E 7	FERRITE CORE	-
E 8	FERRITE CORE	-
E 9	FERRITE CORE	-
E 10	FERRITE CORE	-
E 11	FERRITE CORE	MX U
E 12	FERRITE CORE	MX V
E 13	FERRITE CORE	MX W
E 14	FERRITE CORE	MY U
E 15	FERRITE CORE	MY V
E 16	FERRITE CORE	MY W
E 17	FERRITE CORE	1 TURN
E 18	FERRITE CORE	1 TURN
E 19	FERRITE CORE	1 TURN
E 20	FERRITE CORE	1 TURN
E 21	FERRITE CORE	1 TURN
E 22	FERRITE CORE	1 TURN
E 23	FERRITE CORE	1 TURN
E 24	FERRITE CORE	1 TURN
E 25	FERRITE CORE	1 TURN
E 26	FERRITE CORE	1 TURN
E 27	FERRITE CORE	-
E 28	FERRITE CORE	-

ITEM NR.	ITEM NAME	REMARKS
YV 8	VALVE	HEAD 2 DOWN
YV 9	VALVE	HEAD 1 TURN
YV 11	VACUUM PUMP	HEAD 1 VACUUM
YV 12	VACUUM PUMP	HEAD 2 VACUUM
YV 13	VALVE	HEAD 3 DOWN
YV 15	VACUUM PUMP	HEAD 3 VACUUM
YV 16	VALVE	HEAD 1 BLOW
YV 20	VALVE	NOZZLE CLAMP (NOZZLE STATION)
YV 21	VALVE	STATION UP (NOZZLE STATION)
YV 29	VALVE	HEAD 3 VACUUM CHANGE
YV 50	VALVE	HEAD AIR SOURCE ON/OFF
YV 51	VALVE	DISPENSOR AIR BLOW ON/OFF
YV 52	VALVE	COVER LOCK

**SEVERAL ITEMS**

ITEM NR	ITEM NAME	REMARKS
QF 11	CIRCUIT PROTECTOR 2	15 AMPS.
QF 21	CIRCUIT PROTECTOR 3	1 AMP.
QF 22	CIRCUIT PROTECTOR 3	0.5 AMPS.
QF 23	CIRCUIT PROTECTOR 3	3 AMPS.
QF 24	CIRCUIT PROTECTOR 5	10 AMPS.
QF 25	CIRCUIT PROTECTOR 5	2 AMPS.
NF 11	NOISE FILTER	→ J3, J4, J6
PT 1	HOUR METER	→ J204
PC 1	COUNTER	→ J210
LS 4A	SWITCH SAFETY	COVER SAFETY SWITCH → J164
LS 5A	SWITCH SAFETY	COVER SAFETY SWITCH → J165
QS 11	MAIN SWITCH	→ J4
HL 11	LIGHT 1 ASSY	→ J187
TM 11	POWER TRAFO	2 KVA MOTOR
TC 11	POWER TRAFO	1.25 KVA CONTROL
SW 1	SWITCH STOP	EMERGENCY STOP SWITCH → J162
SW 2	SWITCH STOP	EMERGENCY STOP SWITCH → J163
CRT 1	CRT 1 ASSY	UFOS USER INTERFACE
CRT 2	CRT 2 ASSY	VISION SCREEN
CAMERA 1	CCD CAMERA	FIDUCIAL CAMERA WITHOUT LENS
CAMERA 2	CCD CAMERA	FIXED CAMERA WITHOUT LENS
CAMERA 3	CCD CAMERA	FIXED CAMERA WITHOUT LENS
LIGHT 1	LED BOARD	LED (PCB BOARD ONLY) FOR CAMERA 1
LIGHT 2	BACK LIGHT BOARD ASSY	WITHOUT COVER FOR CAMERA 2 & CAMERA 3
P21	SENSOR 1 BOARD ASSY	-
P22	CONNECTION 2 BOARD ASSY	-
P23	CONNECTION 3 BOARD ASSY	-

ITEM NR.	ITEM NAME	REMARKS
J694	HNS 1-3	MO3 ↔ LCS (MO LX,LY,LZ)
J695	HNS 1-4	MO4 ↔ LCS (MO LT)
J903	HNS 3-9	I/O (CN11) ↔ SMEMA
J904	HNS 17-1	FG ↔ TC11, V10
J905	HNS 17-1	FG ↔ TC11, V20
J906	HNS 17-1	FG ↔ TC11, V30
J912	HNS 8-7	STICKFEEDER ↔ J31
J914	HNS 8-3	KEY SWITCH
J915	HNS 16-8	SMEMA PREVIOUS
J916	HNS 16-9	SMEMA NEXT
J917	HNS 8-3	KEY SWITCH

**SENSOR ITEMS**

SENSOR NR.	SENSOR NAME	REMARKS
SQ 1	SENSOR 1-1	X-AXIS SECOND LIMIT SENSOR
SQ 2	SENSOR 1-1	Y-AXIS SECOND LIMIT SENSOR
SQ 3	SENSOR 1-2	X-AXIS ORG. SENSOR
SQ 4	SENSOR 1-2	Y-AXIS ORG SENSOR
SQ 5	SENSOR 1-8	HEAD 1 LS LOWER
SQ 6	SENSOR 1-8	HEAD 2 LS LOWER
SQ 9	SENSOR 1-8	HEAD 3 LS LOWER
SQ 10	SENSOR 1-8	DISPENSER ANGLE SENSOR
SQ 11	SENSOR 1-8	DISPENSER LOWER SENSOR
SQ 13	SENSOR 1-2	MAIN ENTRANCE
SQ 14	SENSOR 1-2	MAIN EXIT
SQ 15	SENSOR 1-2	SET POSITION
SQ 17	SENSOR SPARE 2	PIN 1 LS UPPER
SQ 18	SENSOR SPARE 2	PIN 2 LS UPPER (ADJUSTABLE SIDE)
SQ 19	SENSOR 1-2	S-EXIT
SQ 20	SENSOR SPARE 1	PUSH UP LS
SQ 26	SENSOR 1-2	R-AXIS ORIGIN SENSOR
SQ 32	SENSOR	NOZZLE CLAMP LS (NOZZLE STATION)
SQ 33	SENSOR	STATION UP LS (NOZZLE STATION)
SQ 34	SENSOR 1-1	NOZZLE 1 LS (NOZZLE STATION)
SQ 35	SENSOR 1-1	NOZZLE 2 LS (NOZZLE STATION)
SQ 36	SENSOR 1-1	NOZZLE 3 LS (NOZZLE STATION)
SQ 37	SENSOR 1-3	Z-AXIS ORG. SENSOR
SQ 38	SENSOR 1-2	W-AXIS ORIGIN SENSOR
SQ 50 A	SENSOR S	FRONT FEEDER FLOATING SENSOR (SOURCE)
SQ 50 B	SENSOR R	FRONT FEEDER FLOATING SENSOR (DETECTOR)
SQ 60 A	SENSOR S	REAR FEEDER FLOATING SENSOR (SOURCE)
SQ 60 B	SENSOR R	REAR FEEDER FLOATING SENSOR (DETECTOR)

**PNEUMATICAL ITEMS**

ITEM NR.	ITEM NAME	REMARKS
YV 1	VALVE	MAIN STOPPER
YV 2	VALVE	LOCATE PIN AND SUPPORTER
YV 3	VALVE	SUB STOPPER
YV 4	VALVE	PUSH UP
YV 5	VALVE	CLAMP
YV 6	VALVE	PUSH IN
YV 7	VALVE	HEAD 1 DOWN