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# Operating Manual CSM 66/ 84/84V/84VZ

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# SAFETY

Read this page carefully before installation and use of the Unit.

## Introduction

Adjustment, maintenance and repair of this Unit should only be carried-out by qualified personnel who are aware of the hazards involved, unless otherwise indicated in the Instructions for use.

## Safety precautions

For the correct and safe use of this Unit it is essential that both operating and servicing personnel follow generally-accepted safety procedures in addition to the safety precautions specified in this manual. Specific warning and caution statements, where applicable are to be found through-out the manual. Warning and caution statements and/or symbols are present on the Unit where necessary.

## Caution and warning statements

A "CAUTION" is used to indicate correct operating or maintenance procedures in order to prevent damage to, or destruction of, equipment or other property.

A "WARNING" indicates a potential danger that requires correct procedures or practices in order to prevent personal injury.

# CHAPTER 1

## SPECIFICATIONS

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**Note on this Manual:**

To include the latest changes, this manual is based on software version E62. This can result that this manual describes options which are not present in your version software. Since the software is upward compatible, all functions present in software versions prior to version E62 are included in this chapter.

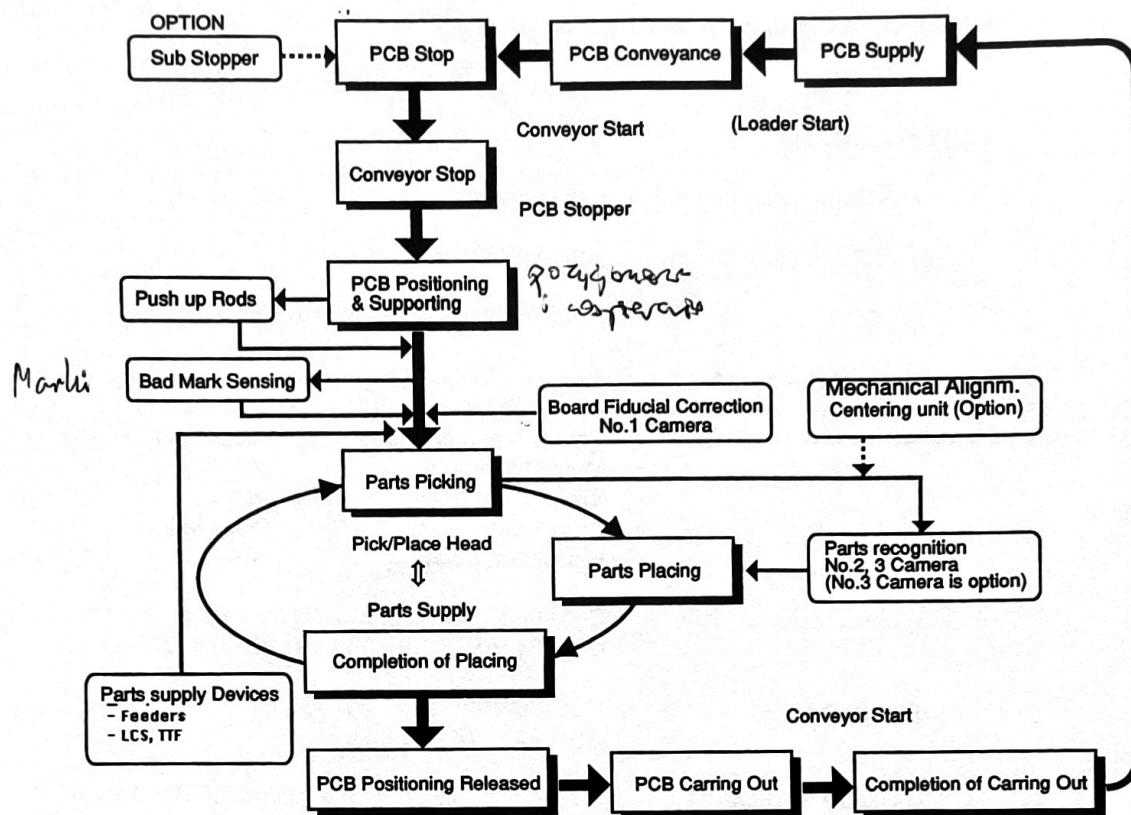


fig. 1.3

## 1-2 AXIS OVERVIEW

### 1-2-1 X-Y-R AXIS

The servo system positions the heads/fid. camera/beam pointer in X, Y and R direction by using DC driven motors and shaftencoders

(1) External diagram --- See Fig 1-5

#### (2) Specifications

Drive axis and stroke

X axis --- 595 mm

Y axis --- 620 mm

DC servo motor

X axis --- 1200 mm/sec (3600 rpm)

Y axis --- 1200 mm/sec (3600 rpm)

Combined --- 1700 mm/sec (3600 rpm)

$\pm 0.02$  mm

X axis --- 180 W, 75 V, 3.4 A, 3000 rpm

Y axis --- 300 W, 75 V, 5.0 A, 3000 rpm

Optical rotary encoder

Ballscrew --- 20 mm/rev

0.005 mm/pulse

Drive method

Max. speed

Repeatability

Motor revolution speed

Encoder

Spindle

Resolution

## (2) General Operation --- See Fig 1-3

## (3) Specifications

CSM 66/84  
CSM 84V/VZ

1) PCB transport method	Belt conveyor
2) PCB transport height	900 mm ± 10 mm
3) PCB flow direction	Left to right (right -to-left is optional)
4) No. of Head	3 pos. possible : Chuck alignment head : pos. 1,2 and 3 Chuck alignment head: pos. 1 and 2 Mech. alignment: Vision head/ANE pos. 3 Prep. head pos. 3 Dispenser head (optional) pos 1
5) Machine dimensions	CSM 66 : 1383(L) x 1378(W) x 1915(H) (mm) CSM 84V/VZ: 1600(L) x 1525(W) x1915 (H) (mm )
6) Machine weight	CSM 66 : 580 kg CSM 84V/VZ : 720 kg
7) Usable air pressure	A supply air pressure of 5 kg/cm <sup>2</sup> (6 Bar absolute) or more is required. Only purified air (42 nl/min) passed through an air dryer and air filter should be used. Polluted air may shorten the life time of the machine and cause malfunctions of the machine.
8) Power supply	AC100/ 110/ 120/ 200/ 220/ 240V ±10% 50-60Hz, single-phase 2.5KVA (peak value), nominal: 0.5 KVA 100~120V Power supply (3pin) : Pin1 --- ground : Pin2,3 --- single-phase 200~240V Power supply (4pin) : Pin1 --- ground : Pin2,3, 4 --- single-phase
9) Environment	Temperature: 15—30° Celcius. Humidity: 35—90% (with no condensation) When using a humidifier, avoid using ultrasound and spray types. Using these can cause calcium and magnesium in the water to be dispersed, which can result in deterioration of the functions of the air unit for the vacuum generator.
	Atmosphere: Do not use the unit in areas with large amounts of combustible gases, dust or dirt.
	Other: Use the unit in a room where it is sheltered from direct sunlight and wind , and where there is air-conditioning. (clean room environment)

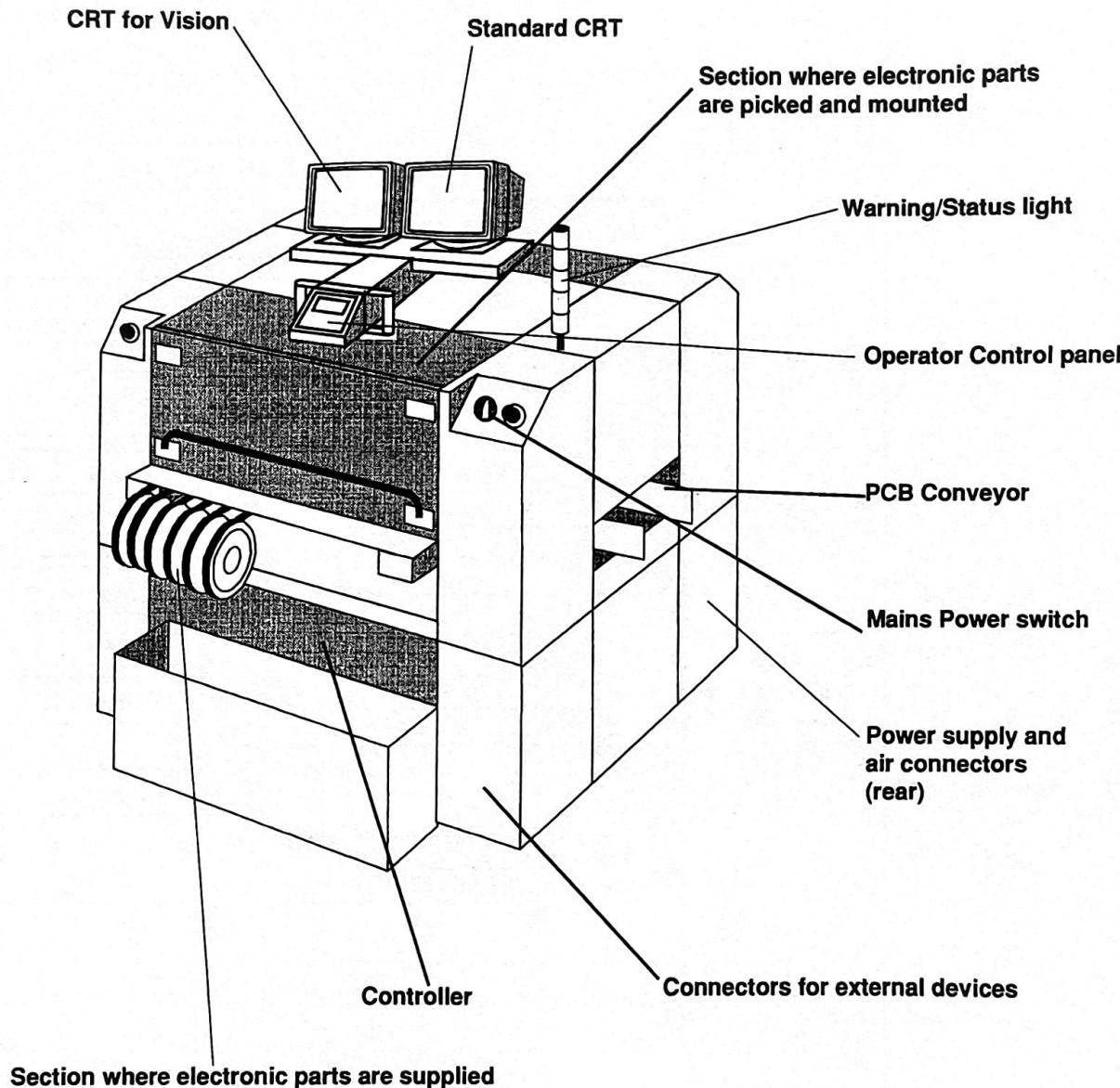
CSM 66/84/84V/84VZ

Fig 1-1

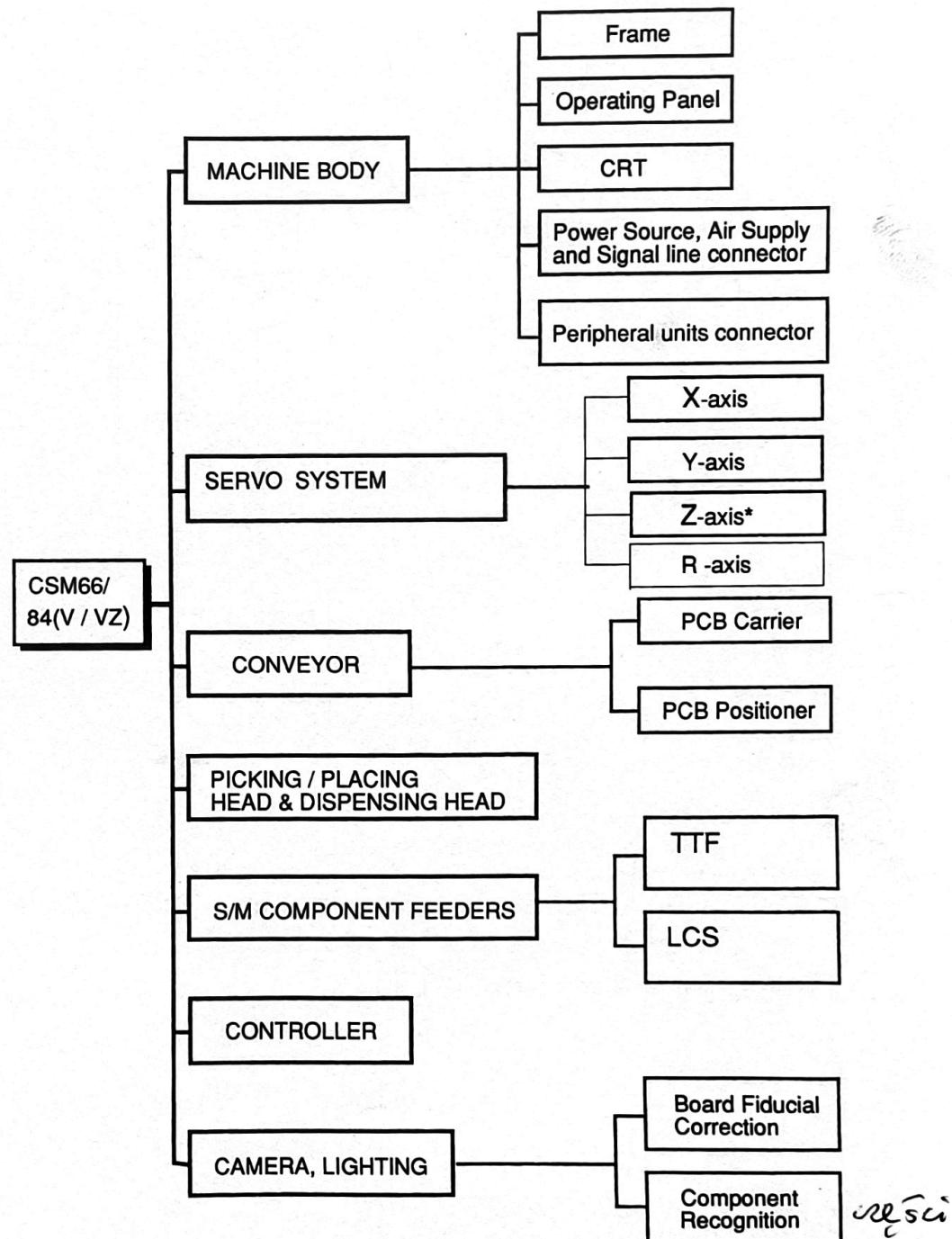
## SECTION 1 MECHANICAL SPECIFICATION

1-1  
OVERVIEW

## (1) Overall configuration

- 1) External view --- See Fig 1-1
- 2) Composition

\* NOTE: For 84VZ  
only.



### 1-2-2 Z-AXIS (CSM 84VZ ONLY)

The vision head equipped with the Z-axis enables components to be mounted without being subjected to stress. This means that components can be positioned and mounted very precisely since the height is taken into consideration during mounting.

#### Specifications:

Drive system:	DC servo motor and rack-and pinion
Rated power consumption:	24W, 24V, 2.7A
Speed:	3000 rpm
Leads:	15mm/revolution
Encoder:	Optical rotary encoder
Resolution:	0.00375 mm/pulse (=15mm/4000 pulses)

### 1-3 CONVEYOR OVERVIEW

PCBs are transported on rubber-coated belt conveyors. There are two types of positioning: Locating pin positioning which is standard +push-up PCB lift support (optional) and edge positioning.

- (1) Locating pin positioning --- See Fig 1-6
  - Adjustable PCB width size:      30—250 mm (CSM 66) and  
    30—407 mm (CSM 84V/VZ)
  - The positions of locating pins (movable) can be adjusted.
  - The positions of PCB supporters 1 and 2 can be adjusted.
- (2) Edge-positioning (option) --- See Fig 1-7
  - Adjustable PCB width size:      30—222 mm (CSM 66) and  
    30—250 mm (CSM 84V/VZ)
  - The PCB push-up is configured as a number of pins placed at the desired positions, and attached so that they match the PCB specifications and can be removed when necessary.
- (3) Specifications
  - Conveyor reference : Front reference
  - PCB transport time
 

From conveyor entrance to PCB setting	: approx. 3.5 seconds*
From end of mounting to conveyor exit	: approx. 2.5 seconds*
  - \*Note: above values apply to regions using 60 Hz.
  - Conveyor speed : 23 m/min (50 Hz), 28 m/min (60 Hz)
  - PCB positioning repetition : ±0.05 mm
  - PCB width adjustment : Manual handle

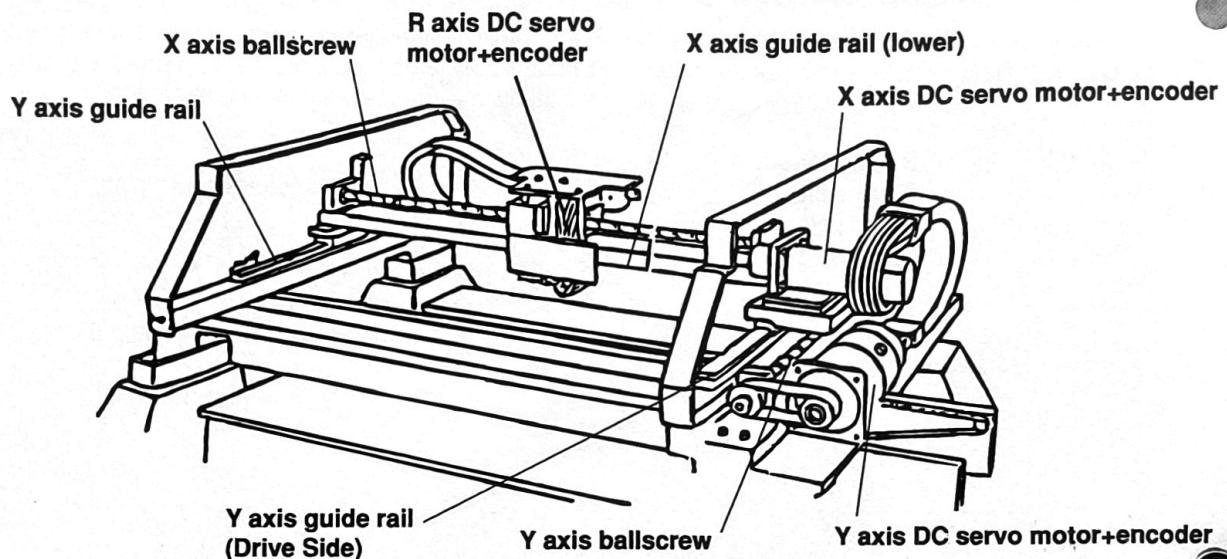


Fig 1-5

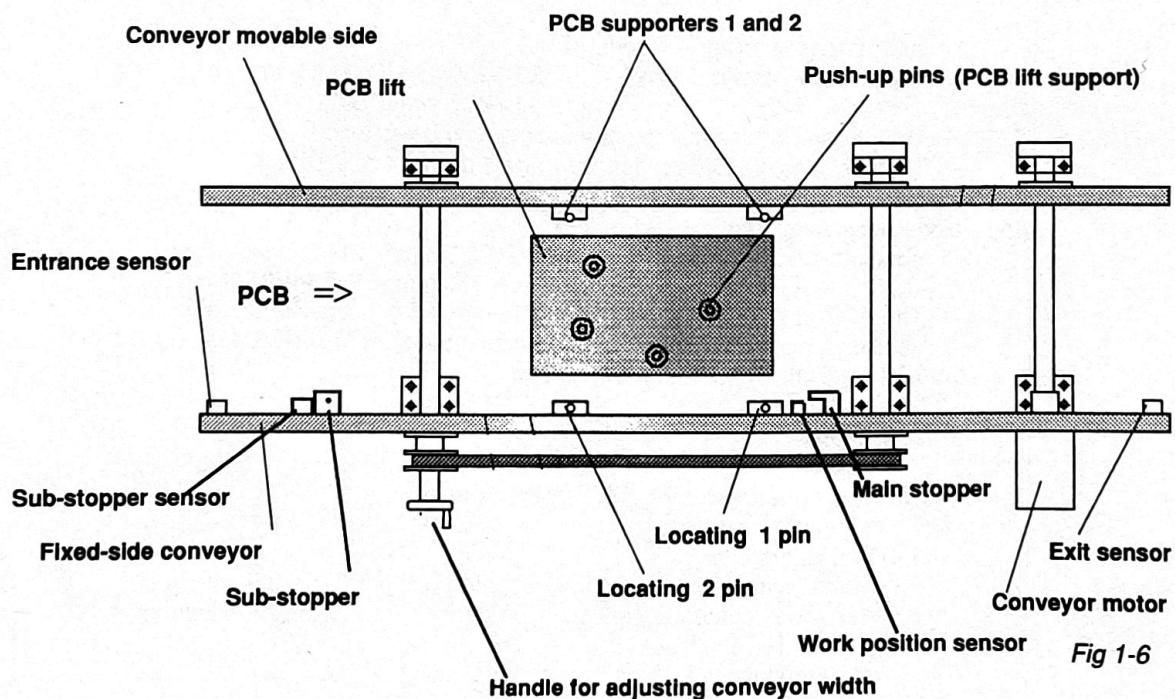


Fig 1-6

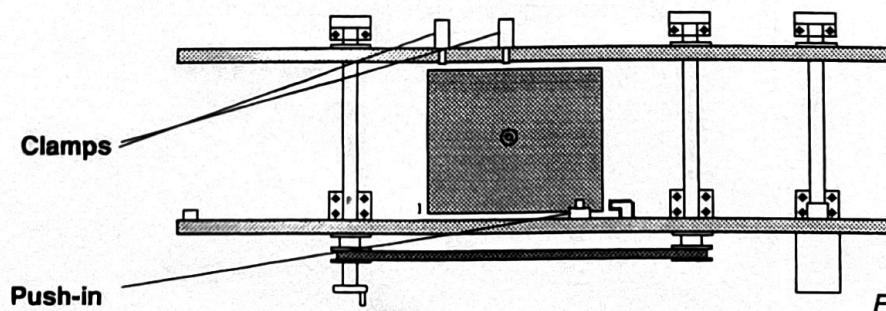


Fig 1-7

**NOTE 1**

When mounting PLCCs, image recognition with a camera is not carried out.

**NOTE 2**

The maximum part height is 6 mm.

**NOTE 3**

Since the shapes and dimensions of the parts vary depending on the manufacturer, please confirm specifications beforehand.

**NOTE 4**

The "No. 3 camera" listed in the table on the previous page is an optional unit.

**NOTE 5**

There are differences in the shapes of the arms of the chuck Type AAa, ABb, ABe and Hlg assemblies, Type FGc and FGd chuck assemblies, and the Type GJd chuck assembly. Therefore, the chucks cannot be changed merely by changing the jaws (the regulation prong).

**NOTE 6**

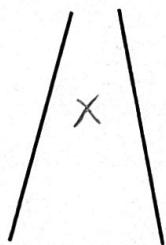
There are various types of chucks and nozzles. Be sure to match the chuck with the nozzle when installing a combination.

**NOTE 7**

With a vision head, picking is only possible when feeding parts larger than 10 mm from 24, 32, or 44 mm feeders, or feeding PLCC52, 68 or 84 pins from stick feeders, or feeding QFPs or PLCCs from trays.

**NOTE 8**

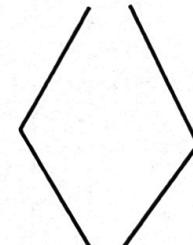
Handling of odd-shaped SMD's (multiple arrays, potmeters, coils, switches, LEDs, etc.) other than those listed in the table on the previous page is possible. Please consult PHILIPS for details.

**SHAPE OF THE ARMS OF THE CHUCKS**

AAa  
ABb  
ABC  
Hlg



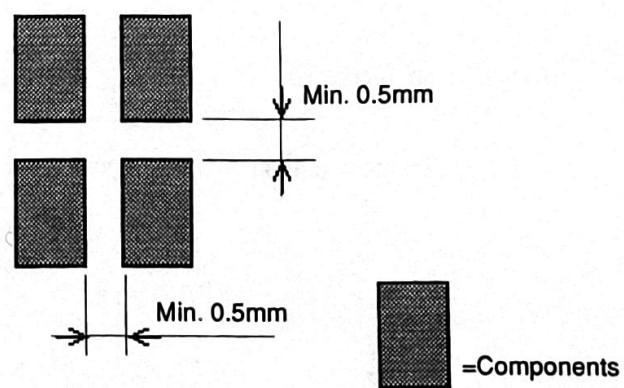
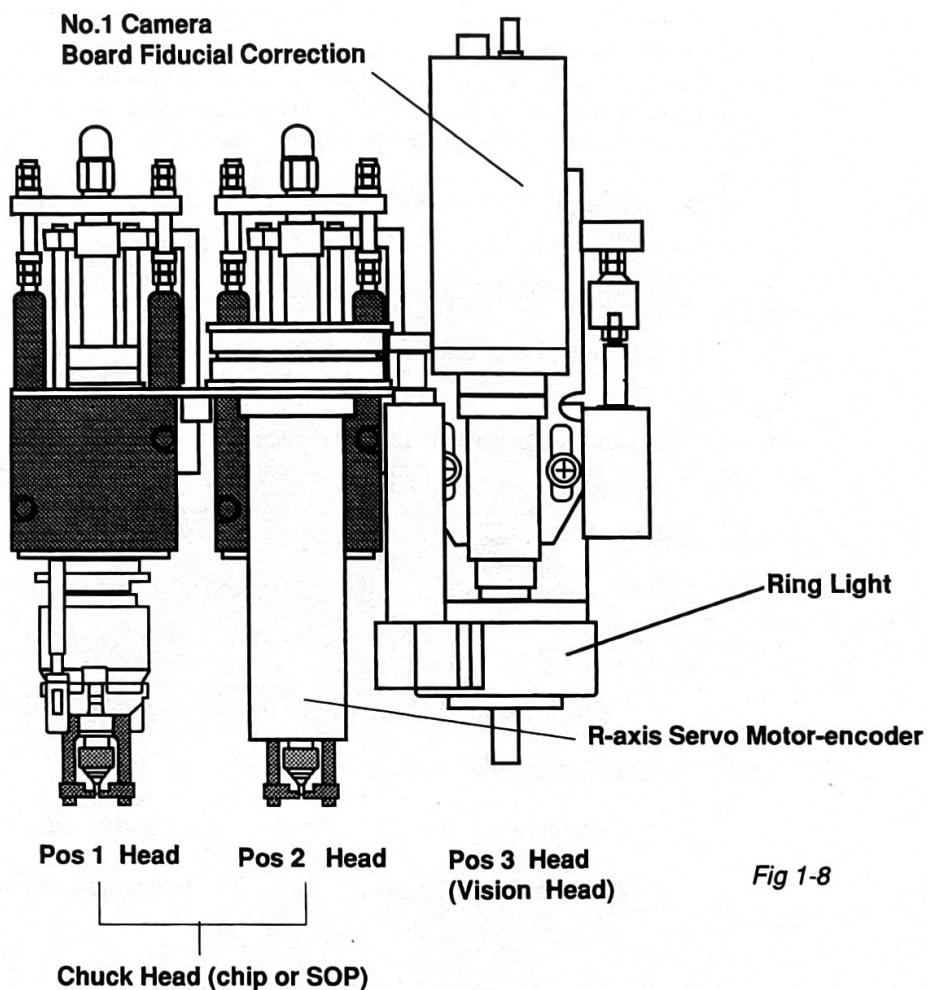
FGc  
FGd



GJd

## (4) CSM66, 84, 84V: Mountable Parts By Chuck &amp; Nozzle

Combination Types of Chuck/nozzle	Mountable Parts	
TYPE 1 - AAa	Resistor (Box Type)	(1.00 x 0.50)
TYPE 2 - ABb	Resistor, Capacitor (Box Type) Resistor, Capacitor (Melf Type) Tantalum Electrolytic Capacitor Chip Inductor Minimold Transistor Power Transistor	(1.60 x 0.80 ~ 4.50 x 2.00) (ø1.25 x 2.00 ~ ø1.35 x 3.45) (2.90 x 1.50 ~ 4.70 x 2.60) (3.20 x 2.50) (2.90 x 1.50 ~ 4.00 x 3.00) (4.60 x 2.60)
TYPE 4 - ABe	Resistor, Capacitor (Melf Type)	(ø1.25 x 2.00 ~ ø2.20 x 5.90)
TYPE 5 - Hlg	Alminum Electrolytic Capacitor	(4.30 x 4.30 ~ 6.60 x 6.60)
TYPE 8 - FGc	Capacitor (Box Type) Tantalum Electrolytic Capacitor Film Capacitor Chip Inductor Power Transistor SOP	(4.50 x 3.20 ~5.60 x 5.00) (6.00 x 3.20 ~7.30 x 4.30) (7.30 x 5.30) (4.50 x 3.20) (4.60 x 2.60) (6P ~ 24P)
TYPE 9 - FGd	SOP PLCC	(8P ~ 28P) (Max. 44P) Max. Size n 18mm
TYPE 10 - GJd	PLCC	(44P ~84P) Size n 17 ~ 30mm
Vision Head camera no. 2	QFP QFP VSOP	0.65mm pitch~ Max. Size n 32mm 0.5mm pitch~ ~100pins 0.5mm pitch~
ANE Head + Mechanical Alignment Unit	QFP QFP QFP PLCC	0.65mm pitch~ Max. Size n 32mm 0.5mm pitch~ ~100pins 0.5mm pitch~ 0.8mm pitch Max. Size n 45mm
Vision Head + camera no. 3 (optional)	QFP QFP VSOP	0.65mm pitch~ Max. Size n 32mm 0.5mm pitch~ ~100pins 0.5mm pitch~

*Fig 1-9*

1-4

## AN OVERVIEW OF THE HEAD SECTION

The heads for the CSM 66/84/84V/84VZ are numbered, left to right, No. 1, 2, 3 when viewed from the front of the machine. The No. 1 and No. 2 heads are used for mounting chips or SOPs. In non-vision systems, head 3 is also used for this purpose. In vision systems head 3 is equipped with a vision head used for mounting QFPs and PLCCs. An example of this configuration is shown in figure 1-8.

(1) External diagram of head --- See Fig 1-8

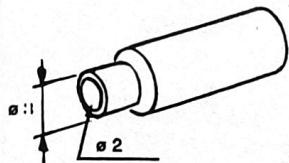
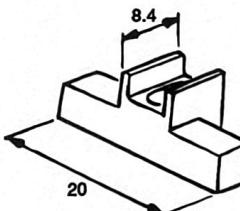
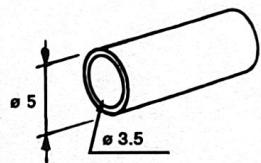
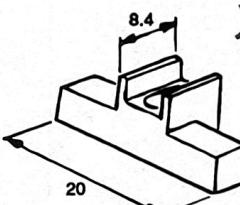
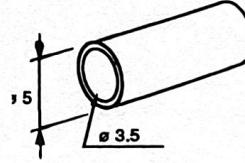
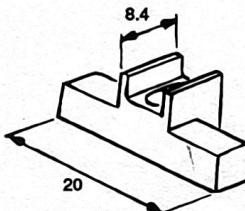
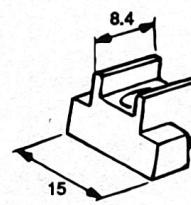
(2) Head specifications

1) Mounting precision for:	Vision alignment	$\pm 0.08$ mm
	Mech. alignment	$\pm 0.1$ mm
2) Mounting precision:	for chuck-alignment	$\pm 0.15$ mm
	: for GJ chuck	$\pm 0.3$ mm
3) Mounting angle	0-360°	(minimum increment 0.01°)
4) Mounting Cycle time	chuck alignment : 0.75 sec/point (when using pos. 1 and pos. 2 heads) QFP: 3.90 sec/point (when using pos.3 head)	
* Above values apply only under optimum conditions.(Best case values)		
5) Vertical drive method	Air driven	
6) Rotary drive method	DC servo motor driven	
7) Picking error detection	3-level vacuum sensor	(1 of 3 picking levels can be selected to match shape of parts)
8) Chuck head and ANE head	One-touch replacement type nozzles	
9) Chuck head and ANE head	One-touch replacement type chuck assemblies	
10) No. vision recognition types	30 types (vision files)	

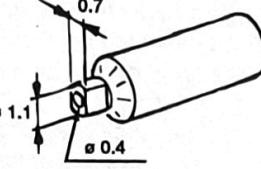
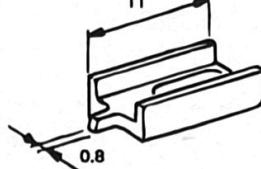
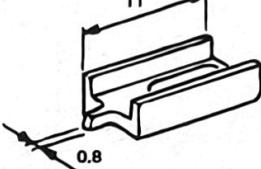
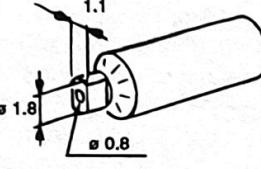
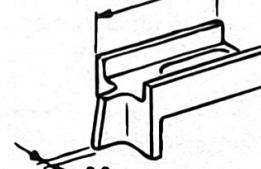
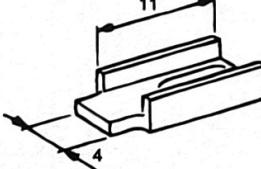
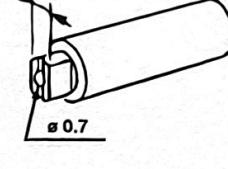
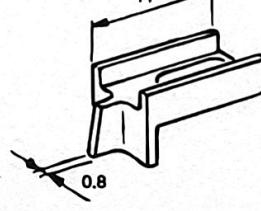
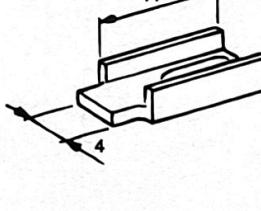
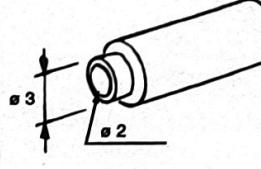
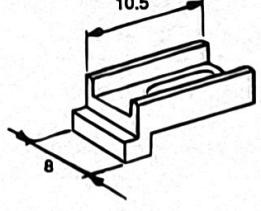
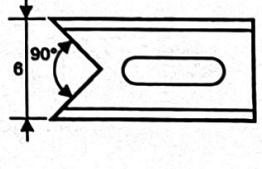
(3) Interval of mounted component min. 0.5 mm --- See Fig 1-9

## (7) Movable range of heads

- With max. PCB width 330 mm (1 or 2 fixed cameras)  
Rear feeders 86-92 cannot be attached.
- With max. PCB width of 407 mm (1 fixed camera)  
Rear feeders 78-92 cannot be attached.
- With max. PCB width of 407 mm (2 fixed cameras)  
Rear feeders 69-92 cannot be attached.

	NOZZLE	JAW
<b>TYPE 8 FGc</b>	 <b>NOZZLE c</b>	 <b>JAW SO02 F</b>  <b>JAW SO20 G</b>
<b>TYPE 9 FGd</b>	 <b>NOZZLE d</b>	 <b>JAW SO02 F</b>  <b>JAW SO20 G</b>
<b>TYPE 10 GJd</b>	 <b>NOZZLE d</b>	 <b>JAW SO20 G</b>  <b>JAW SO15 J</b>

## (6) The Combination of Jaws and Nozzles

	NOZZLE	JAW
<b>TYPE 1 AAa</b>	 <p>NOZZLE a</p>	 <p>JAW 1005-1 A</p>  <p>JAW 1005-2 A</p>
<b>TYPE 2 ABb</b>	 <p>NOZZLE b</p>	 <p>JAW 0811-Y A</p>  <p>JAW 0411-Y B</p>
<b>TYPE 4 ABe</b>	 <p>NOZZLE e</p>	 <p>JAW 0811-Y A</p>  <p>JAW 0411-Y B</p>
<b>TYPE 5 Hlg</b>	 <p>NOZZLE g</p>	 <p>JAW AEC 1 H</p>  <p>JAW AEC 2 I</p>

## (5) CSM84VZ: Mountable parts with vision head with Z-axis servo

Mounting System	Mountable parts
Vision head + PCB fiducial + Image recognition (std)	<b>QFP:</b> 0.5mm pitch minimum, with maximum external dimension of 45mm <sup>2</sup> <b>VSOP:</b> 0.5mm pitch minimum <b>PLCC:</b> 0.8mm pitch minimum, with maximum external dimension of 45mm <sup>2</sup>
Vision head + PCB fiducial + Image recognition (camera which accommodates 0.3mm pitch)	<b>QFP:</b> 0.3mm pitch minimum, with maximum external dimension of 32mm <b>VSOP:</b> 0.3mm pitch minimum <b>PLCC:</b> 0.8mm pitch minimum, with maximum external dimension of 32mm <sup>2</sup>
Vision head + PCB fiducial + Image recognition (camera which accommodates square 54mm)	<b>QFP:</b> 0.5mm pitch minimum, with maximum external dimension of 54mm <sup>2</sup> <b>VSOP:</b> 0.5mm pitch minimum <b>PLCC:</b> 0.8mm pitch minimum, with maximum external dimension of 45mm <sup>2</sup>
Vision head (precision head) + PCB fiducial + Fixed centering unit	Box type chips: (square 3mm minimum) Aluminium electrolytic capacitors: 4.3 x 4.3 ~ 6.6 x 6.6 mm  <b>SOP:</b> 6- to 28-pin <b>QFP:</b> 0.8mm pitch minimum, with maximum external dimension of 45mm <sup>2</sup> <b>PLCC:</b> 0.8mm pitch minimum, with maximum external dimension of 45mm <sup>2</sup>

**Note 1:** The maximum component height is 6mm.

**Note 2:** The shape and dimensions may vary depending on the manufacturer, please confirm details before using components.

**Note 3:** When using image recognition (standard, with a camera that can accommodate 55mm<sup>2</sup>) and image recognition (with a camera that can accommodate 0.3mm pitch) in combination, the latter system should be used to mount QFP components of 32mm<sup>2</sup> or less, with a pitch of 0.3mm or more.

**Note 4:** With the vision head, if the molded section (the flat section) is 3mm<sup>2</sup> or more, and components are being supplied from 12, 16, 24, 32 or 44mm feeders driven by air cylinders, PLCC52-, 68- and 84-pin components supplied from stick feeders and QFP and PLCC components supplied from trays can be picked up.

**Note 5:** With the vision head, mounting, using image recognition, is possible if the molded section (the flat section) is 5mm<sup>2</sup> or more.

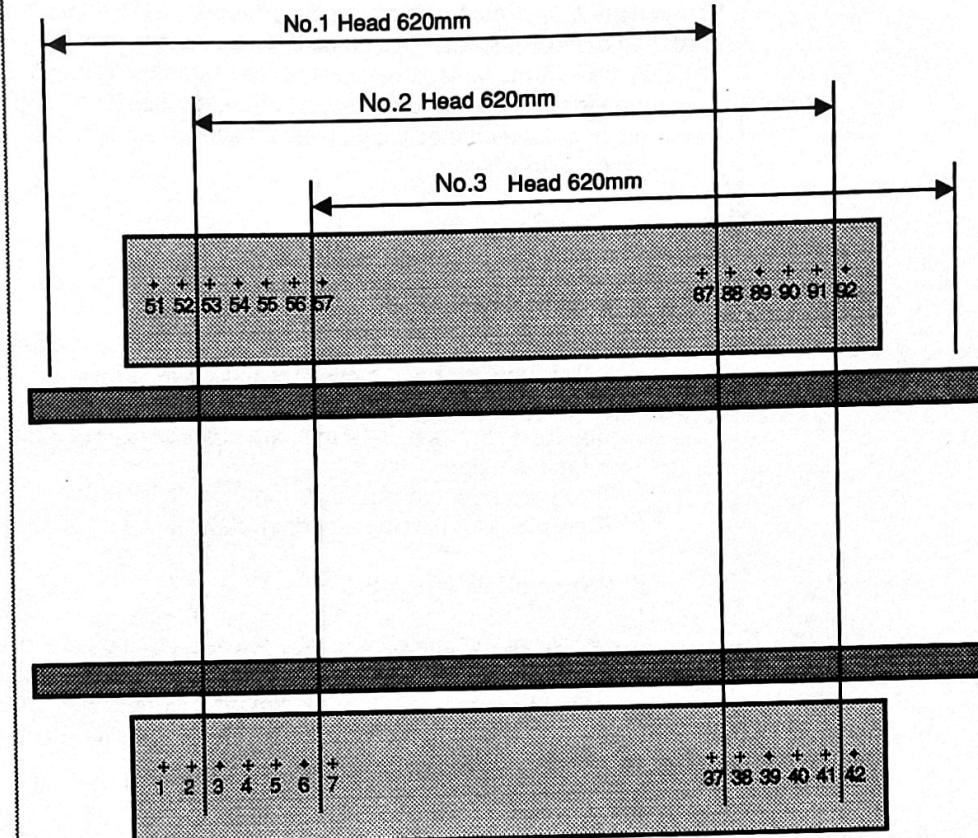
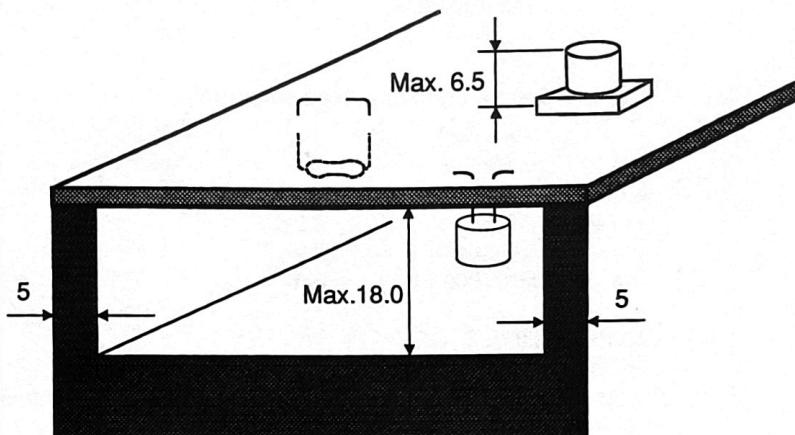


Fig 1-10

\* Numerals indicated on the drawing above are feeder numbers. Picking is possible only with feeders inside the movable range of the head. This varies, however, depending on the specifications listed below.

PCB Condition before Mounting

■ NO component should be in this area.

Fig 1-11

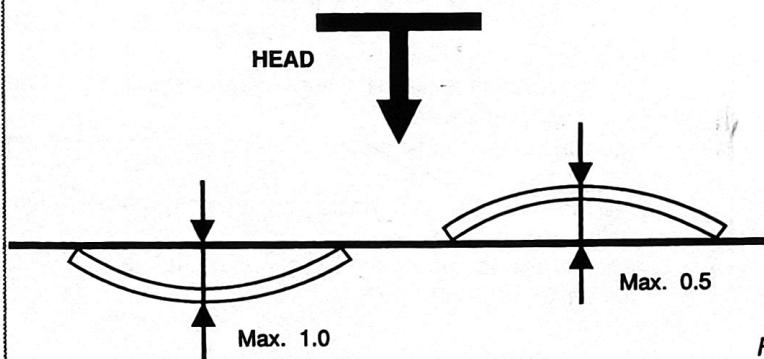
Warp of PCB

Fig 1-12

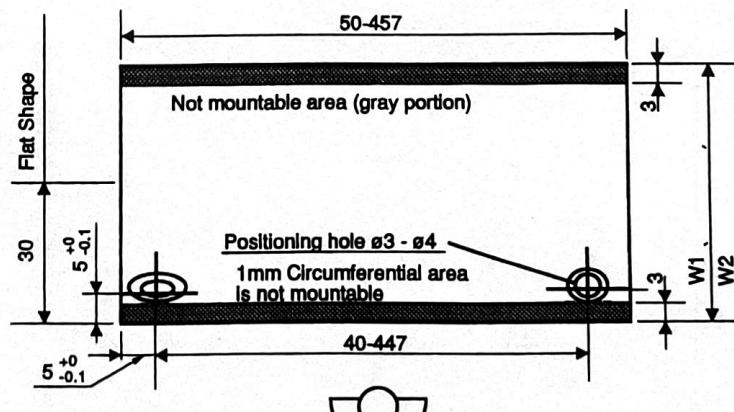
Max. PCB size

Fig 1-13

**1.6****Applicable  
limitations  
of PCB's**

(1) PCB Condition before Mounting --- See Fig 1-11

(2) Board Material

Glass Epoxy Resin, Phenol, Aluminum, Ceramic, Steel, etc.

(3) Thickness of PCB

- Ceramic --- 0.6~1.0mm
- Phenol, Glass Epoxy Resin --- 0.8~2.0mm

(4) Method of positioning

- Pin positioning (standard)
- Edge positioning (optional)

(5) Warp of PCB --- See Fig 1-12

(6) PCB Size --- See Fig 1-13

- Dimensions of W1 and W2 in the diagram

W1 [CSM 84(V/VZ)]	:Min. 30mm
	Max. 330mm or 407mm

W2 [CSM 66]	:Min. 30mm
	Max. 250mm

- PCB size of the edge positioning

CSM 84(V/VZ)	:30x50~250x330mm
CSM 66	:30x50~222x330mm

## (2) How the various feeders are attached.

The CSM66 can hold 66 thin 8 mm tape feeders and the CSM 84(V/VZ) can hold 84 (when the fixed-centering options and other options are not being used).

Since the other types of feeders are wider, however, they cannot be attached in the same way as the 8 mm tape feeders. The list below shows the number of 8mm tape feeders that can be used in place of.

feeder-type:	number of 8mm tape feeders:
12 mm feeders	3
16 mm feeders	3
24 mm feeders	3
32 mm feeders	4
44 mm feeders	5
Multi-stick feeders	8
Bulk feeders (8-series)	8
Stick feeders (8P-20P)	2
Stick feeders (20P-28P)	3
Stick feeders (PLCC44P)	3
Stick feeders (PLCC68P)	4
Stick feeders (PLCC84P)	4

**NOTE**

If, for example space is required to attach one 12 mm feeder and 3 8mm feeders, only 1/3 of the number above can be attached.

1-5

**PARTS  
FEEDERS****(1) An Overview**

Feeders can be attached to and removed from the front and rear feeder plates by means of a one-touch system, and the feeder plates themselves can be easily attached and detached. This helps to reduce setup time by a considerable amount. Since the thin-model tape feeder has eliminated the winding mechanism used with the top tape, the bothersome settling of the top tape is no longer necessary. Moreover, a tape connecting jig (splicer) allows tapes to be exchanged without stopping the machine.

**1) Tape feeders****a) Mechanically indexed.**

8 and 12 mm thin tape feeders (7-inch and 15-inch reel diameter)  
As the mounter head moves up and down, a pushrod operates to supply tape.  
The supply pitch for one movement of the pushrod is 4 mm, so that when the tape feed pitch is 8 or 12 mm, the pushrod moves 2 and 3 times, respectively, to feed the tape.

There are also available an 8 mm tape feeder which handles 0402 square chips and a 12 mm tape feeder for aluminum electrolytic capacitors.

**b) Pneumatically indexed**

12, 16, 24, 32 and 44 mm tape feeders (15-inch reel diameter)  
An air cylinder moving up and down along with the mounter head supplies the tape. Also available are a 16 mm tape feeder for aluminum electrolytic capacitors, and a 32 mm tape feeder for pressure-sensitive tape.

**2) Stick feeders**

Stick feeders are "shooters" whose shape is specially designed to fit customized parts such as SOPs and PLCCs. One stick feeder can only supply one type of parts. There are two types of stick feeders: a) airdriven and b) gravity.

**3) Bulk feeders**

Bulk feeders can supply loose square chips and MELF parts. One feeder can supply eight types of parts. However, these feeders cannot be used if the parts have a specific polarity or if the front and back are differentiated.

**4) Tray feeders**

See options.

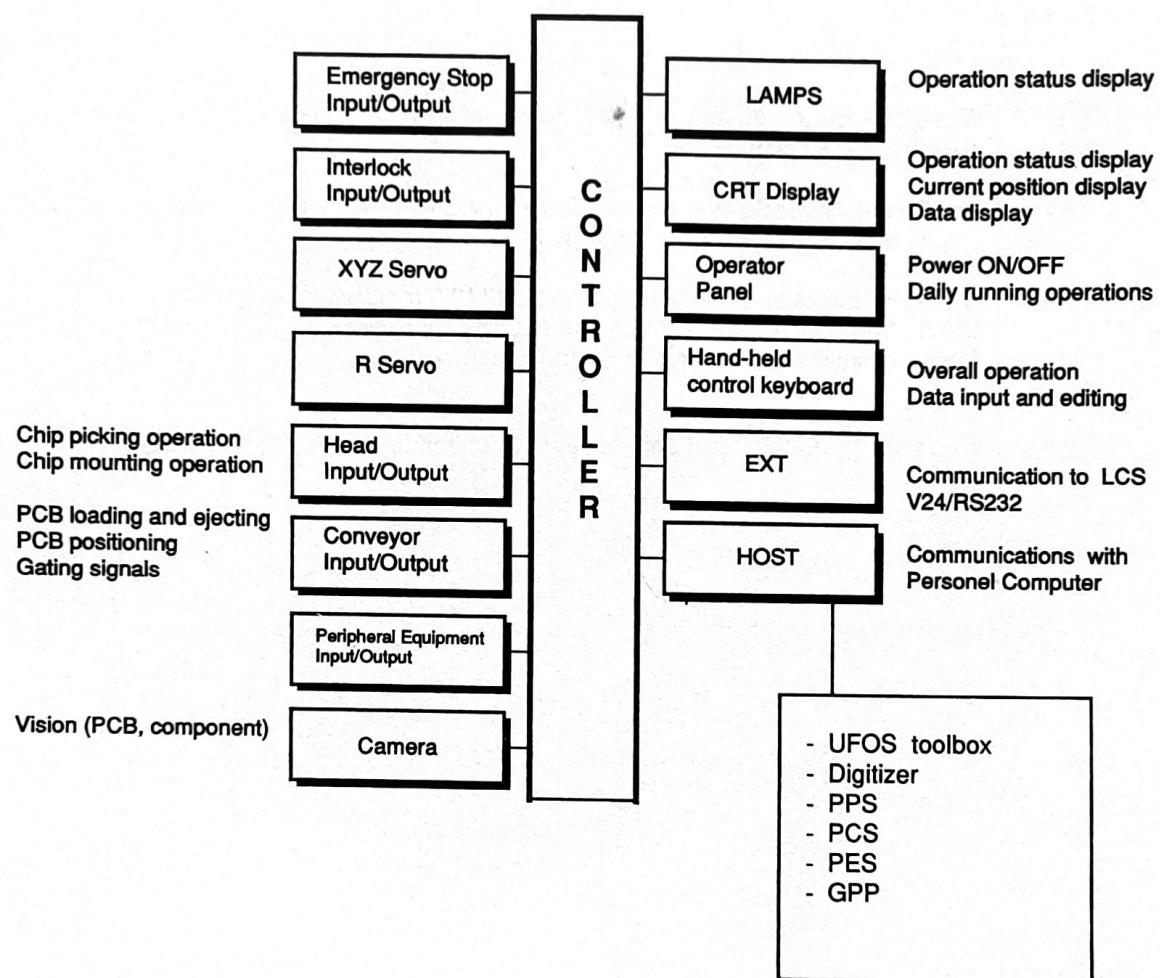
RCH40F (CSM 66/84/84V/84VZ) System Configuration

Fig 1-14

## SECTION 2 ELECTRICAL SPECIFICATION

**2-1  
EQUIPMENT  
COMBINATION  
SYSTEM**

The electrical control system of this unit is an application system designed for application and optimization of surface mounting work. The optimization function applies to all mechanisms, electrical units, and software. --- See Fig 1-14

**2-2  
MAINS POWER****CAUTION:**

**When connecting the power, make sure that it is the correct voltage. Check specifications first!!**

The CSM 66/84/84V/84VZ can run on single -phase 100V / 110V / 120V / 200V / 220V / 240V, 50/60Hz. The rating is 2.5 KVA Max.

The mains has to be connected with a cable of 3.5 mm<sup>2</sup> when using 100V, 110V or 120V. When using 200V, 220V or 240V a cable of minimal 2.5 mm<sup>2</sup> is recommended. Always connect a ground wire (3.5 mm<sup>2</sup>) to terminal M4.

**NOTE:**

**When changing the input voltage, always check first with a PHILIPS service centre.**

1-7

## AN OVERVIEW OF THE VISION CAMERA AND OTHER FUNCTIONS

- (1) Camera
  - No. 1 camera (movable) : Used for detecting PCB fiducial and bad marks
  - No. 2 and No. 3 cameras (fixed cameras) : Used for part recognition (No. 3 camera is optional)
- (2) Vision files:
  - For part recognition e.g. : total 30 files
  - For PCB recognition e.g. : 28 types
  - For bad mark recognition e.g. : 1 type
- (3) Recognition time
  - PCB fiducial recognition : approx. 1 second per fiducial
  - Part recognition : approx. 0.9 seconds
- (4) Bad mark detection function
  - Detects bad marks (normally reflective seals) on the PCB and cancels dispensing and mounting operations for those PCBs.
- (5) Fiducial function
  - Corrects for error in PCB base holes and edge positioning, error deriving from PCB fixing mechanisms, and partial distortion of the PCB surface.
- (6) Fiducial marks
  - Round marks of about ø1-2 mm (diameter precision of about ±0.02 mm, uniform shape within mark)
  - Square-shaped marks can also be recognized, but recognition is easiest with perfectly round marks.
  - The optimum PCB material is glass epoxy (white ceramic or reflective materials are not appropriate).
  - Within the area 4 mm from the center of the mark, there should be no resist), silk screening, or patterns.

Controller basic specifications

ITEM	SPECIFICATION
Model Name	RCH 40F
Robots Compatible	CSM 66/84/84V/84VZ
Axes Controlled	Maximum of 4 Axes
CPU	80186 plus 8087
Memory Capacity	192kb (approx. 2560 points)
Memory Type	IC Memory, 3 volts Lithium Battery Backup (10 year life)
Speed Control	Each 1% speed control is available from 1% up to 100%
Minimum Unit Setting	X,Y Coordinates : 5 mm / Pulse. Z Coordinate : 15mm/4000pulses X,Y,R Coordinates : 0.01mm or 0.01degree
I/O Signals	Input : MAX 60point Input : MAX 40point
Communication (RS232C)	External Memory Device : 1 Channel (for LCS) Communication Port for Personel Computer : 1 Channel (RS232)
Self-Diagnostic Capability	Watchdog Timer, Over Travel, Overload, CPU Malfunction, Encoder Malfunction, Servo Driver malfunction, Battery Voltage Irregularity, Power Voltage Irregularity, Overheat, etc.
Peripherals	Hand-held control keyboard (YPU-SC), M.I.S. P.C. utility
Power Source	AC100V, 110V, 120V, 200V, 220V, 240V. Single Phase, 50/60Hz
Environment	Noise: 1500V/uS or less Temperature : 0 to 40 degree C Humidity : 35 to 90%
Dimensions	525(W) x 233(H) x 371 (D)mm
Weight	about 15kg (different for option)

CAPABILITY	EXPLANATION
Operation Modes	Automatic Operation Mode, Manual Operation Mode Data Input Mode.
Cartesian Coordinate	Arithmetic, Logic, etc.
Coordinate	Orthogonal Coordinate
Monitors	CRT Display, VIDEO OUTPUT
Communication	Off-Line Mode, On-Line Mode (Constant Communication Possible)
Data Files	5 Types (MCH, BRD, FDR, PRD (M.I.S.) , VIS)
Other	Error Messages, Safety Features, Self-Diagnostic Capabilities

**VISION BOARD  
SPECIFICATIONS****Standard Vision Board Specification**

Item	Specification	Note
Resolution	256 x 240 pixels	
Gray level	256 gradations	
Number of Camera	Max. 4	Selection
Frame Memory	Multiple (8 bits) 2 panels	For video I/O
Image Memory	Multiple (18 bits) 4 panels Binary 4 panels	1 panel/1 frame
Host CPU Memory	RAM 128KB, ROM 384KB	
Number of Window	Max. 4	
Number of Cross Carsol	Max. 2	
Robot Interface	Data 8 bits, Input 1ch, Output 1ch	Host System
Serial Port	RS-232C 1ch	Consol
Power Source	5V ±5% 4A, ±12V ±10% 0.5A	Noise: 50mV or less

**SBIP: Enhanced Vision Board Specifications**

Item	Specifications	Remarks
Resolution	512 x 512 pixels	
Gray level	256 gradations	
Number of Camera	Max. 4	Selection
Video Memory	512 x 512 x 8 bits	For video I/O
System Memory	256 Kbytes 16 bits	
D/A convertor	3 x 8 Bits	R-G-B
Graphics Processor	TMS34010	
Correlators	2 Febris (16 x 16 bits)	2K16 Correlator M.
Look-up table	input: 12bit to 8 bit output 256x8 bit ram	
Robot Interface	Data 8 bits, parallel I/O	Host System
Serial Port	RS-232C 1ch	Consol

**3-4 Software  
PC resident****(1) CSM Toolbox.**

This package integrates a group of utilities like: File transfer from/to a PC system, File editing, back-up and restore of files, data communication between CSM and PC.

**(2) CSM Digitizer.**

This package allows the user to create 'raw' board files from a layout drawing of a PCB. It then converts the digitized input into a board file which can be used by the CSM or into a FTIP file which can be used by the APG package.

**(3) PPS**

Production Preparation System. This is used to prepare off-line the pick-and-place programs required to enable the CSM production line to build boards. The PPS speeds up cycle and throughput times via automatic optimization of CSM equipment programs.

**(4) PCS**

Production Control System. This program assists production line operators in controlling the production line with minimum operator intervention.

**(5) PES**

Production Evaluation System. This program is used to generate, display and print batch and/or shift reports after boards are processed on the CSM production line(s). Each report contains detailed information about production results, equipment alarms and overall line performance.

**(6) GPP**

General Post Processor. This off-line program gives the power to simply create templates for each CAD system. The templates specify how to transform any given CAD format into, e.g., a FTIP format.

**3-5  
Other****(1) Teaching camera**

This camera is used for teaching, and allows accurate and easy input of position data. In addition, when the PIC function is used, the teaching camera moves above the created position data, enabling checking, correcting, and mounting inspection to be carried out.

**(2) Empty tape box.**

This is a box used to store discarded items no longer necessary, such as empty tapes and top tapes. Positioned under the feeders, empty tapes and top tapes drop neatly into the box for disposal.

**(3) Mechanical alignment unit.**

This is used in conjunction with a precision head or QFP head to enable loading of '3 mm to '45 mm parts (PLCCs, QFPs, aluminum electrolytic capacitors, etc.).

## SECTION 3 OPTION SPECIFICATIONS

3-1  
HEADS

## (1) Dispenser heads

Dispenser heads are used to apply a layer or draw lines of adhesive material and cream solder on the land of the PCB surface, in order to mount electronic parts. There are two types of nozzle, one with one hole and one with two holes. The pitch of the two holes is 1.25 mm.

3-2  
CONVEYOR

## (1) Edge-positioning.

This is one method of positioning PCBs. A push-up provides support from underneath, while the air cylinder of the clamp serves to press the PCB from the underside of the conveyor, holding the PCB in place on the conveyor belt. The PCB is positioned by the air cylinder of the push-in pressing it against the main stopper.

## (2) One-side track extension

With this conveyor, either the loading or the unloading side is extended by 380 mm.

## (3) Sub stopper

The standby stopper shortens PCB loading time by holding the next PCB in standby status at the upstream end of the conveyor while the mounting (or dispensing) operation is in progress.

## (4) Lift unit

The push-up supporting the PCB from below is provided with pins as standard equipment, but a plate covered with a sheet of sponge is also available for softer support.

3-3  
TRAY  
FEEDERS

## (1) Manual tray feeder

A manual tray feeder can be set behind the feeder plate, and the tray of the user secured on top of it to supply parts from a tray.

## (2) Triple tray feeder

The triple tray feeder is a device used to load and unload pallets. Up to three pallets can be stacked in it.

## (3) Large Component Sequencer. (LCS)

The LCS selects large components from up to 16 trays held in an easily replaceable container or from the sequencer's additional tape or stick feeders.

The LCS is programmable with its own programs for selecting components.

It presents these components to the CSM without introducing extra time for producing completed PCB boards.

## 2-2-1 VIDEO I/O Specifications

Item		Specification	Note
Camera Inter-face	Output Signal	Frequency 15.73KHz	2:1 interface
		Pulsewidth 9.83μs	
		Level 5Vp-p	Open
	VD	Frequency 59.94KHz	Field Frequency
		Pulsewidth 9H (572μs)	
		Level 5Vp-p	Open
Monitor Inter-face	Input Signal	Composite video signal	NTSC standard
	Input level	0.5Vp-p to 2Vp-p (75Ω terminus)	Input level adjustable
	Input resistance	75Ω ± 2%	
	Connector	12-pin round connector (HR10A-10R-12S)	Made by Hirose denki, Ltd.
Monitor Inter-face	Output Signal	Composite video signal	NTSC standard
	Output level	1Vp-p (image 0.714V, synchronous 0.268V)	75Ω terminus
	No. of scanning lines	525 lines, 2:1 interface	
	Hor. frequency	15.73KHz	
	Nert. frequency	Frame frequency 29.97Hz	
		Field frequency 59.94Hz	
	Connector	BNC connector	

## 2.3

### INPUT / OUTPUT

#### I/O overview Inside the Machine

The I/O signals are described in the CSM service manual.

##### 1) Input signals

- DI (20) : Emergency Stop (hold) input
- DI (21) : Pause (interlock) input
- DI (22) - DI (27) : Conveyor periphery input
- DI (30) - DI (37) : Heads 1 and 2 periphery input
- DI (40) - DI (47) : Optional equipment input
- DI (50) - DI (57) : Optional equipment input
- DI (60) - DI (67) : Heads 3 and 4 periphery input
- DI (70) - DI (77) : Optional equipment input

##### 2) Output signals

- DO (02) : CPU-NG output
- DO (05) : Output during running (RUN)
- DO (06) - DO (11) : Conveyor periphery input
- DI (20) - DI (27) : Heads 1 and 2 periphery output
- DI (30) - DI (37) : Optional equipment output
- DI (40) - DI (47) : Heads 3 and 4 periphery output
- DI (50) - DI (57) : Optional equipment output

CSM 84VZ only

## VICS1000: Enhanced Vision Board Specifications

Item	Specifications	Remarks
Processing resolution	512 pixels (horizontal) x 480 pixels (vertical)	
Density resolution	256 levels	
No. of cameras	Maximum of 3	Selectable
Host memory capacity	128KB RAM, 512KB ROM	
No. of cross cursors	Maximum of 2	
Robot interface	Data: 8bits, 1 input channel 1 output channel	Host system
Serial Port	RS-232C, 1 channel	Console Unit
Power supply voltage and current	5V ± 5%, 4A 12V ± 10%, 0.5A	Noise: 50mV max.