SUSTAINABLE DEVELOPMENT GROUP

SHARE WELL

Yamaha-YSM20R
高速貼片機

苏州协纬自动化科技有限公司
SUZHOU SHARE WELL AUTOMATION TECHNOLOGY CO.,LTD.

GPP伙伴
YAMAHA

General Contents

4. After-sales service (Japanese market) 11

5. Scope of construction work and service 12

6. Preconditions 13

6.1 Effective area ····· 13
6.2 Export control by the Foreign Exchange and Foreign Trade Control Law ····· 13
6.3 Re-export control by the U.S. Government ····· 13
6.4 European region ····· 13
6.5 Intellectual property right ····· 13
6.6 Industrial machine dedicated to indoor use ····· 13
6.7 Improvement ····· 13
6.8 Registered trademark ····· 13
6.9 Resale 14
6.10 Relocation ····· 14
6.10 Reproduction of documents without permission ····· 14
6.11 Establishment date ····· 14

7. Preparations and installation 15

7.1 Responsible area when YAMAHA arranges the transportation company. 15
7.1.1 Unloading the product ····· 15
7.1.2 Transportation within factory site ····· 15
7.1.3 Securing a delivery route ····· 15
7.1.4 Dew condensation prevention ····· 15
7.1.5 Collection of transportation tools and gears ····· 15
7.2 Responsible area when the distributor or customer arranges the transportation company. ····· 16
7.3 Preparations for power source and air supply source ····· 16
7.4 Securing environmental conditions ····· 16
7.5 Network ····· 17
7.6 Anti-virus measures ····· 17

8. Inspection and acceptance 18

8.1 Inspection before shipment ····· 18
8.2 Inspection after installation ····· 18
8.3 Acceptance ····· 18

9. Warranty 19

9.1 Warranty period ····· 19
9.2 Warranty coverage and contents ····· 19
9.3 Exception to warranty ····· 20

10. Safety 21

10.1 Overview ····· 21
10.2 Ensuring the safety ····· 21
10.3 Warning labels ····· 22
10.4 Warnings regarding strong magnetic fields ····· 22
10.5 Keeping hands away from moving parts ····· 23
10.6 Warnings regarding tape cutter ····· 23
10.7 CE marking ····· 24

11. Specifications 25

11.1 Major specifications ····· 25
11.2 Mounting capability ····· 28
11.3 Mounting accuracy ····· 28
11.4 Applicable components ····· 28
11.5 Component height & mounting restrictions ····· 29
11.5.1 Height of mountable components ····· 29
11.5.2 Mounting restrictions ····· 29
11.6 Component mounting restrictions ····· 30
11.7 Applicable board dimensions ····· 31
11.8 Unmountable areas on board ····· 32
11.9 Applicable board thickness ····· 33
11.10 Applicable board weight ····· 33
11.11 Recommended board material ····· 33
11.12 Allowable board warp ····· 33
11.13 Board slits and holes ····· 33
11.14 Restrictions on mounting components on boards ····· 34
11.15 Board transport speed ····· 34

12. General specifications 35

12.1 Safety design ····· 35
12.2 Emergency stop and error detection systems ····· 35
12.3 Pause (interlock) system and error detection system ····· 36
12.4 Machine status indication ····· 36
12.5 Basic operation of machine ····· 37
12.6 Language used for operation screen and user' s manual ····· 37
12.7 Configuration of servo control axes ····· 38
12.8 Configuration of other motors ····· 40
12.9 Vision system (image recognition) ····· 41
12.9.1 Fiducial camera ····· 41
12.9.2 Scan camera (standard for HM head) ····· 42
12.9.3 Multi-view camera (standard for FM head / option for HM head) ····· 42
12.9.4 Multi-view camera with coplanarity checker (option) ····· 43
12.9.5 Side-view camera ····· 43
12.9.6 Smart recognition ····· 44
12.10 Feeder bank configuration ····· 45
12.11 Feeder lane configuration ····· 47
12.12 Signal specifications ····· 49
12.12.1 Machine-to-machine signal specifications (between this machine and post-process machine) ····· 49
12.12.2 Machine-to-machine signal specifications (between this machine and re-process machine) ····· 51
12.13 Carriage type tray supply unit ····· 53
12.14 Fixed type tray supply unit ····· 54
12.15 Recovery pallet ····· 60

13. References and details 62

13.1 Layout configuration ····· 62
13.2 Nozzle 66
13.3 Nozzle station ····· 70
13.3.1 For HM Head Nozzle station (2-beam specs.) ····· 70
13.3.2 For FM Head Nozzle station (2-beam specs.) ····· 71
13.3.3 For HM Head Nozzle station (1-beam specs.) ····· 72
13.3.4 For FM Head Nozzle station (1-beam specs.) ····· 73
13.4 Feeder ····· 74
13.4.1 ZS Feeder ····· 74
13.4.2 SS Feeder ····· 78
13.4.2 Feed pitch by feeder button operation ····· 81

4. After-sales service (Japanese market)

When the equipment is installed in Japan, six kinds of after-sales service plans that are conducted by YAMAHA about one year after installation of the equipment are available as described below according to the customer's requests and the specifications of the target machine units.

Availability	Class	Name	Target	Work schedule at site	Periodic after-sales call	Discount right
	YAMAHA's machine is installed for the first time.	Plan S	Normal machine specifications	Five days	One month / Two months / Three months	One-year inspection
		Plan Si	IT option specifications	Five days	One month / Two months / Three months	One-year inspection
	YAMAHA's machine has already been installed.	Plan A	Normal machine specifications	Three days	One month / Two months / Three months	One-year inspection
		Plan Ai	IT option specifications (first time)	Five days	One month / Two months / Three months	One-year inspection
		Plan Bi	IT option specifications (second or subsequent time)	Four days	One month / Two months / Three months	One-year inspection
		Plan C	Normal machine specifications (cost reduction plan)	Two days	One month / Two months / Three months	One-year inspection

* The contents of the work schedule at site are that YAMAHA installs and adjusts the relevant machine and follows up the customer's production start-up.
* The after call (only Japan) will telephone from YAMAHA's CS Section SMT Group.
* The one-year inspection(charged base) is announced from your distributor or special agent when ten months have elapsed after installation of the machine.

  When the customer requires the one-year inspection, the schedule is adjusted, the telephonic diagnosis is conducted, and the one-year inspection is carried out in the 12th to 14th month after installation of the machine. At this time, the basic work cost is specially discounted (limited time offer).
* The work beyond the scope of the one-year inspection is estimated separately.
* After the after-sales service shown above has been expired, YAMAHA will offer the periodic maintenance service or individual after-sales service that is proposed separately.

5. Scope of construction work and service

The following table describes the work allocation between the customer and YAMAHA.
Actually, this table summarizes the scope of the construction work, service, and utility.
So, the customer needs to check this table.

No.	Item	YAMAHA	Customer	Remarks
01	Design and manufacture of machine units	○		
02	Transportation of product			
03	Unloading of product			
04	Transportation inside work site			
05	Dew condensation prevention		○	
06	Securing of transportation route		○	
07	Preparations for power source and air supply source		○	Including connections to target products
08	Network		○	Including anti-virus measures
09	Installation environment		○	Including foundation construction work
10	Inspection before shipment	○		Including preparations for materials when YAMAHA's standard attendance inspection is conducted.
11	Installation and adjustment work	○		
12	Inspection after installation	○		Including preparations for materials when YAMAHA's standard attendance inspection is conducted.
13	Operation training	○		
14	Safety management		○	
15	After-sales service	○		

* If there are items other than YAMAHA's standard items, such as changing of attendance inspection conditions, they shall be informed beforehand and discussed separately.

6. Preconditions

6.1 Effective area

This specification assumes that YAMAHA MOTOR Co., Ltd. (hereafter referred to as "YAMAHA") or an association entrusted by YAMAHA is an interested party in Japan
In a foreign country outside Japan, the contract concluded by the overseas distributor and customer takes precedence over this specification. So, the contents of this specification become the reference information.

6.2 Export control by the Foreign Exchange and Foreign Trade Control Law

Products and technologies described in this specification are applicable to the control defined in Japanese Security Trade Control Laws, such as Foreign Exchange and Foreign Trade Control Law. So, such laws should be observed strictly. Even when YAMAHA submits the Certificate of Non-Applicability (parameter sheet) about the products and technologies described in this specification to your company, your company shall be held responsible for judgement of the final non-applicability. Additionally, when the specifications of the products and technologies described in this specification are changed or when the products or technologies are built-into other products, this Certificate of Non-Applicability cannot be used.

6.3 Re-export control by the U.S. Government

The products, technologies, and software described in this specification may include U.S. origin products. Therefore, the re-export control by the U.S. Government shall be observed strictly.

6.4 European region

To export the product to a European country, it is necessary that the product shall conform to the EC machine directives and EMC directives (CE marking compliance).
For details, see "10.7 CE marking" described later.

6.5 Intellectual property right

The contents described in this specification explain the product specifications.
YAMAHA does not warrant or permit the operation of a third person’s intellectual property right or other rights.

6.6 Industrial machine dedicated to indoor use

The product described in this specification is an industrial machine dedicated to indoor use. For operation of the product, various detailed conditions that are described later shall be confirmed.
In particular, the descriptions regarding the safety shall be read thoroughly to strictly observe them.

6.7 Improvement

The contents described in this specification are subject to change without prior notice due to continual improvement of the product or software.

6.8 Registered trademark

Microsoft, Windows, and Excel are registered trademarks of Microsoft Corporation in the United States and / or other countries.

6.9 Resale

When the owner of the product is changed after relocating or reselling the product described in this specification or the product is relocating the product to another country, the after-sales service and warranty contents become invalid afterwards.
If the after-sales support is required, the after-sales support service can be continued by concluding the service contract with our company or one of our distributors.

6.10 Relocation

Please contact YAMAHA or your distributor prior to relocating the product to another country, even if the product ownership remains unchanged. YAMAHA will investigate to determine the appropriate relocation work, and will check to see how the relocation will affect the after-sales service and warranty content.
Please note that all after-service and warranty content becomes invalid if the product is exported to another country.
If desiring a continuation of after-service in such cases, a new service contract must be made with the local distributor.

6.10 Reproduction of documents without permission

6.11 Establishment date

This specification describes the contents established as of September, 2018.

7. Preparations and installation

When the customer arranges a transportation company, be sure to thoroughly understand the responsible area (conditions) and make the judgement.

See section "7.1" to "7.1.5", Responsible area when YAMAHA arranges the transportation company.
See section "7.2", Responsible area when the distributor or customer arranges the transportation company.

7.1 Responsible area when YAMAHA arranges the transportation company.

The transportation company designated by YAMAHA transports the product to the factory site designated by the customer.

7.1.1 Unloading the product

To unload the product, the transportation company designated by YAMAHA unloads the product using heavy machines, such as forklift, crane, and car gondola prepared by the customer.
If the customer is difficult to prepare heavy machines, contact YAMAHA at least one week before the delivery date.

7.1.2 Transportation within factory site

To transport the product within the customer's factory site, YAMAHA or the transportation company designated by YAMAHA transports the product to the installation place at YAMAHA's own risk. If the customer unloads and transports the product for some reason, this shall be conducted at the customer's own risk.

7.1.3 Securing a delivery route

A delivery route necessary to transport the product is secured. In particular, securing of the opening width, elimination of stepped portions, securing of the installation place, and relocation of other equipment are conducted at the customer's own risk. For details about the width of the opening, see "11. Major specifications", 11.1 "Outline dimensions" described later.

7.1.4 Dew condensation prevention

To transport the product from a cold environment (about 10°C or less) to a temperature regulated environment, such as clean room (about 20°C or more), it is necessary to install the product while gradually balancing the product temperature so as to prevent dew condensation.
In this case, a temporary placing space suitable for the temperature balancing work needs to be secured. However, when a truck with the temperature regulation function is used, this temperature balancing work is not needed. When the customer requests this type of truck, YAMAHA will arrange it.

7.1.5 Collection of transportation tools and gears

After the transportation has been completed, the transportation company designated by YAMAHA collects the waste packing materials, hand lifters, and curing materials.
On the delivery date, the transportation company's staffs wait until completion of the production line startup work (waiting at local site until 16:00).

7.2 Responsible area when the distributor or customer arranges the transportation company.

The product is delivered to the customer at the shipping place of YAMAHA's factory.
The transportation work from loading the product onto the truck to delivery at the local installation place is the responsible area of the company that arranges the transportation company.

* The quantity check of the accessories shall be conducted before loading the product onto the truck (when both parties' responsible personnel attend).
  YAMAHA shall not be held responsible for missing or damaged accessory during transportation.
* When suspending the machine by a crane, etc., always use a gondola.
  (Attaching suspension wires/belts directly to the machine could cause machine damage.)

7.3 Preparations for power source and air supply source

The customer shall complete the air supply source and power source construction work before the delivery work. The customer connects the air supply source and power source to the product at the customer's own risk. For details, see section 11. "Main Specs.".

7.4 Securing environmental conditions

For details about conditions required for the product installation environment, see "11. Major specifications" described later. The customer needs to secure various environmental conditions before the delivery work.

* There are various conditions, such as temperature, humidity, altitude, atmosphere, floor conditions, ambient noise, ambient illumination, immunity (electro magnetic noise resistance), and emission (electro magnetic noise emission).

7.5 Network

For operation of the product connected to the network, it is preconditioned that the product is operated in the closed network environment that consists of only the product and offline PC prepared by the customer. When connecting the product to the customer's in-factory or an external network, the customer shall be held responsible for such connection work.
YAMAHA shall not be held responsible for any defect arising from the network setting or network connection if the product is connected to a network other than that consisting of only the product and offline PC.

7.6 Anti-virus measures

The product uses embedded Microsoft Windows dedicated to industrial machines. On the other hand, it is already known that there are many computer viruses that attempt invading Windows systems. From this background, YAMAHA takes the following measures for the product.

According to the reasons shown below, YAMAHA does not take any anti-virus measures.

-1- Protection of system area by Write Filter

The system data of Windows is stored into an area protected by a function called "Write Filter". Even if a computer virus invades and writes the system data, this data is not saved and the system data is restored to that before computer virus infection when the power is restarted. (This does not function if the Write Filter function is set disabled,.)

-2- Insensitivity to computer virus infection by originally developed data format (non-sensitized)

Normally, the computer virus infects a general format data file. So, it is thought that the infectivity becomes extremely low for YAMAHA's original data that is used for the product. Even if the data is infected, the data can be restored by reinstalling the application programs and backup data.

-3- Virus check before shipment

The virus check of the product is performed in YAMAHA's shipping inspection. When the virus infection is not detected and the product is considered as correct, the "Checked" label is affixed to the USB port.

-4- Reminder not to use USB flash memory with computer virus infection risk

A virus-checked dedicated USB flash memory for data backup is supplied with the product. A generally available USB flash memory, the virus infection of which has not been checked, shall not be used.

-5- Recommendations for operation in local network

YAMAHA warrants only the operation in the "closed network" that consists of the product and offline PC prepared by the customer. This prevents virus infection unless the product is connected to the customer's office LAN or an external internet.

When the customer connects the product to the office LAN at the customer's own risk, it is recommended to take anti-virus measures, such as installation of two LAN cards into offline PC and separation of the network system using different IP addresses, installation of generally available anti-virus software and Microsoft's patch programs, or stopping of Computer-Browser service.

-6- Correction patch programs disclosed by Microsoft do not apply to the product.

Since the product uses embedded Microsoft Windows dedicated to industrial machines, patch programs intended for general PC OS that are disclosed by Microsoft do not apply to this product. Note that these patch programs can be installed into the customer's offline PC.

-7- Software other than that specified (application or system software) cannot be installed.

Software specified for the target product is only OS (operating system) that is a basic program for the machine and application program that provides mounter functions. Any software other than that specified cannot be installed into the product. YAMAHA shall not be held responsible for any defect arising from installation of other software.

8. Inspection and acceptance

8.1 Inspection before shipment

The product is inspected with the customer attended at YAMAHA's factory before shipment. After this attendance inspection is considered as accepted, the product is shipped to the factory site designated by the customer.
The following describes the inspection items, inspection methods, and acceptance criteria.

-1- Inspection items

Units and quantities making up this equipment and other conditions stated in the delivery specification shall be satisfied.

-2- Inspection methods

The mounting test is performed using the materials under the conditions described below.

Board for attendance inspection	YAMAHA test boards	Customer boards. * If customer boards are to be used, please send the boards and coordinate data (and the components as well, in some cases) to Yamaha at least 2 weeks prior to the inspection date.
Component securing method	Two-sided adhesive tape.	
Witnessed inspection components	As a general rule, the following components shall be used for the witnessed inspection: Standard Yamaha square components (0603, 1005, 1608, 2012, 3216; "mm" sizes), and mini-mold TR & SOP components. In some cases, dummy SOP and dummy QFP components may also be used. * Unless otherwise specified, Yamaha shall prepare the above components.	* Separate consultations shall be required if the customer's components or special components are to be used.
Number of mountings	Total of 2,500 or more components.	
Acceptance criteria	No component mounting errors shall occur in the above inspection process (including recovery operations). * The components to be mounted in the witnessed inspection may be changed depending on the device specifications (cameras, nozzles, feeders, etc.). * When the 0402 square chip component ("mm" size) is included in the inspections, separate consultation is required regarding the component supply method and evaluation standard.	

8.2 Inspection after installation

After "8.1 Inspection before shipment" has been considered as accepted, the product is shipped to the factory site designated by the customer and the delivery work is conducted. After the installation and adjustment work have been completed at the installation site, the inspection with the same contents as described in "8.1 Inspection before shipment" is performed. This inspection is called "Inspection after installation".

8.3 Acceptance

In the same manner as "8.1 Inspection before shipment" described above, when the results of "8.2 Inspection after installation" satisfy the acceptance criteria, the product is considered as accepted.

9. Warranty

9.1 Warranty period

The warranty period of the product ends when any of the following applies (whichever comes first).

-1- One year elapses from the time of installation.
-2- 18 months elapse from the time of shipment from YAMAHA’s factory
-3- Total operation hours reach 5,000 hours.

9.2 Warranty coverage and contents

The following describes the warranty coverage and contents.

-1- The warranty coverage of the product is the portions that are described as normal contents of this delivery specification, that is, the contents stated in "1. Machine configuration" and "3. Arrangements". The warranty coverage does not include the contents of "2. Custom-order specifications and specific items". The warranty coverage of the custom-order specifications and specific items shall be discussed separately.
-2- If any defect or trouble due to YAMAHA’s design or workmanship is found in machine unit, software, or genuine part, that has been delivered to the customer’s factory with YAMAHA's Scope of responsibility and considered as accepted, during the warranty period, YAMAHA shall repair or replace the defective unit, software, or genuine part free of charge.
-3- YAMAHA shall not accept the customer’s compensations for any incidental or consequential losses, losses due to absence from work, faulty product production, cost losses, and sales opportunity losses (lost earnings).
-4- If the customer receives a claim regarding compensations for losses due to infringement on patent right, intellectual property right, or other right resulting from use of products that the customer has manufactured using this equipment, software, and genuine parts from a third party, YAMAHA shall not accept the customer’s compensations.
-5- The contents described in this specification explain the specifications of this equipment.
YAMAHA does not warrant or permit the operation of a third person’s patent right, intellectual property right or other rights.

9.3 Exception to warranty

The coverage of this warranty does not include the following terms even during the warranty period.

-01- Defects arising from earthquake, tsunami, lightning, wind or flood damage, or other natural disaster or force majeure.

-02- Malfunctions and damages arising from fire, pollution, salt damage, dew condensation, or unusual voltage.

-03- Defects arising from collision, fall, drop, or other accident.

-04- Deteriorations or defects arising from secular change.

Example: Paint or plated portion is discolored or rusted.

-05- Defects arising from worn-out consumable part during normal operation.

Example: Deterioration of consumable parts specified in separate manuals (user's and maintenance manuals, and component drawing and list).

-06- Sensuous symptoms, such as sound or vibration that do not adversely affect the quality and functions. (Unusual noise or excessive vibration is handled separately.)

Example: Controller operation sound or motor rotation sound.

-07- Defects arising from environmental conditions.

Example: Defects arising from air supply source including impurity, oil mist, dew condensation, or dust or dirt in the atmosphere.

-08- Defects arising from improper environmental conditions, or secular change or deterioration of environmental conditions.

Example: Equipment vibration arising from installation floor surface with insufficient strength or defects arising from inclination or deformation of installation floor surface.

-09- Defects arising from negligence, misuse, or mistake of correct operation procedures instructed in the manuals.

-10- Defects arising from negligence, incomplete steps, mistake of inspection and maintenance procedures instructed in the manuals.

-11- Problems which occur due to the use of non-Yamaha components (e.g., nozzles) and part supply units (tape feeders, etc.).

-12- Defects arising from use of lubricants (oil and grease, etc) other than those specified.

-13- Defects arising from modification or specification change made by the customer.

-14- Defects arising from repair or maintenance work made by personnel other than YAMAHA's engineers or those specified by YAMAHA.

-15- Defects arising from careless storage at the customer's factory or warehouse during the storage period.

-16- Defects arising from movement, relocation, or resale without prior notification to YAMAHA after completion of the acceptance inspection.

-17- Defective parts that have been replaced free of charge are not returned to the place specified by YAMAHA within 30 days.

* To locate the cause of the trouble, it is necessary to investigate the defective parts. So, please return the replaced parts as soon as possible.

10. Safety

10.1 Overview

This equipment is an industrial machine dedicated to indoor use only.
To ensure that the machine you purchased is used safely and correctly, always comply with the instructions and rules in separate manual regarding safety.
To maintain the safety of the operator or person working with this machine, it is essential that it (including external parts feeders) be installed correctly in compliance with the safety standards and onditions of that country.
Complying with the safety regulations and laws of that country is the responsibility of the customer who purchased this machine. The supervisor of this machine must take responsibility to ensure all measures have been taken for machine safety.

10.2 Ensuring the safety

The following describes typical safety instructions, such as warnings and cautions to ensure the safety. For details, check the manuals.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. These are points most essential for protecting the safety of the machine operator, inspector and service personnel.

Pictorial symbol put down with warning messages

== Examples of warning massages ==

- Never allow any part of your body (hand or head, etc.) to enter within the machine movement range during operation.
- Safety devices (safety interlocks) that stop machine operation should always be in good operating condition.
- Always shut off the power and air supply before replacing parts or performing repairs.
- During teaching or when making machine adjustments, always keep alert so that you can stop the machine whenever needed.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor injury, or material loss or damage to the machine. These points are important for protecting the safety of the machine and data, etc.

Pictorial symbol put down with caution messages

== Examples of caution messages ==

- The work person operating the machine must have been trained in correct machine operation and safety.
- If the component supply unit is installed without stopping the machine, this may cause a part of your body to be entangled in the machine.

10.3 Warning labels

To use the YAMAHA machines safely and correctly, warning labels are attached to the machine body and peripheral equipment. Check that the information on each warning label is clearly legible and comply with the instructions.

The following 3 types of marks are used on warning labels. Each mark has its own meaning and is typically used with a pictogram to emphasize the message.

Mark and pictogram

Marks and examples used with pictogram

	Definition	Shape/Color	Meaning of the above examples
Warning	Indicates a hazard, how to avoid the hazard, and potential consequences of ignoring the warning.	Yellow triangle with black border. Pictogram is black on yellow.	Risk of electrical shock
Prohibition	Indicates a prohibited action to avoid the potential hazard.	Red circle with slash. Pictogram is black and located behind slash.	Do not modify or disassemble safety cover switch.
Instruction	Indicated an action that must be taken to avoid the potential hazard.	Blue circle. Pictogram is white on blue.	Read the manual to understand procedure before starting operation.

10.4 Warnings regarding strong magnetic fields

Some machines contain parts generating strong magnetic fields which may cause death, bodily injury, or device malfunction. Always comply with the following instructions.

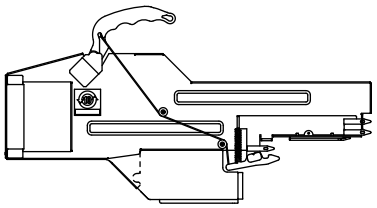
* Persons wearing a pacemakers and/or hearing aids or other electronic medical devices should stay away from the head at all times.
* Persons with implants of magnetic metal should stay away from the head at all times.
* Keep all iron and steel items such as tools and screws, etc., away from strong magnetic field warning areas.
* Keep items such as magnetic cards, etc., which could be damaged by magnetic forces away from the head.

Ferromagnetic field warning label

10.5 Keeping hands away from moving parts

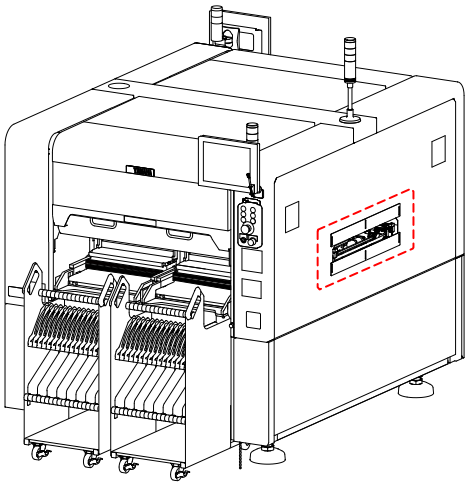
During use of this machine, the customer's equipment and operating conditions might allow the operator's hands to come into contact with moving parts.
Use the following safety measure options to avoid possible danger where openings or gaps are found on the machine.

Dummy feeder
Use dummy feeders as safety measures to fill a gap between tape feeders. Install dummy feeders on the feeder plate the same way as normal feeders in order to prevent hands from entering.



One-stop cover (for machines designed for use with feeder exchange carriage, excluding YSM40/YSM40R)
If not using a feeder exchange carriage in the machine that is to be used with feeder exchange carriages, install a one-stop cover in the position where a feeder exchange carriage is to be installed.

Muzzle plate
Use these plates as a safety measure for the board conveyor entrance and exit openings.
Each plate is movable, so adjust the mounting position to match the boards to be produced.



10.6 Warnings regarding tape cutter

Operating the built-in tape cutter in an incorrect manner can be extremely hazardous.
Always observe the following rules:

* Never supply electrical power and air to the machine while the covers for the tape cutter are removed.
* Tape cutter maintenance tasks must be performed by YAMAHA service personnel.

Tape cutter warning label

10.7 CE marking

This equipment conforms to the EU Machinery Directive 2006/42/EC (*1) and EMC Directive 2014/30/EU (*2).
However, this equipment does not bear CE marking if a custom-order item (with the special specifications) was installed.

*1 Cautions regarding the official language of EU countries and the language used in operation manuals, CE declarations, operation screen characters, and warning labels when this equipment is installed in an EU country.

Warning labels only have pictograms or else include warning messages in English, Chinese, Korean and Japanese language.

*2 Description of EMC (Electro Magnetic Compatibility)

- Electromagnetic immunity (Immunity)

  Complies with test standards as specified by EN 61000-6-2.
- Electromagnetic emissions (Emission)

  Complies with test standards for ISM category: Group 1, Class A, as specified by EN 55011.

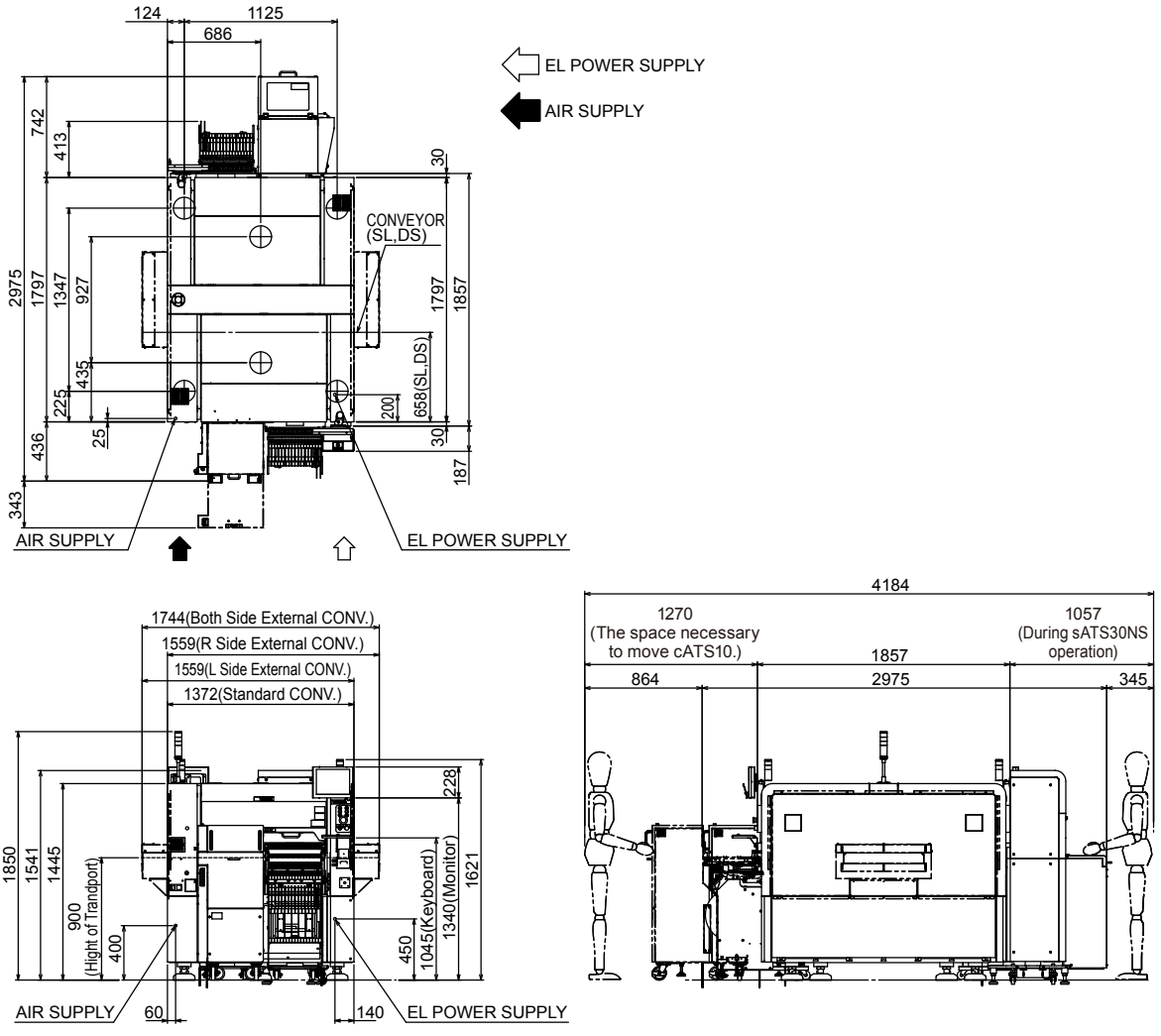
Class A equipment is intended for use in industrial environments. If used in other environments, ensuring electromagnetic compatibility (EMC) might be difficult. Refer to EN 55011 standards for detailed information.

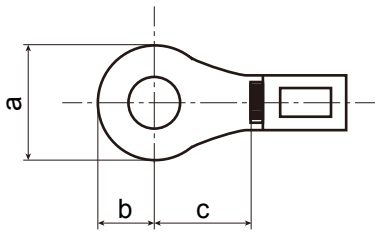
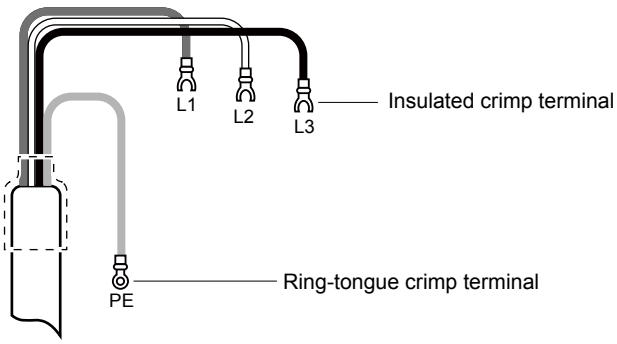
11. Specifications

11.1 Major specifications

Machine type and model	Type PV : YSM20R-2 model : KMK-000 YSM20R-1 model : KMK-100 Type SV : YSM20R (SV)-2 model : KMK-500 YSM20R (SV)-1 model : KMK-600
Outside dimensions	L 1,374 x W1,857 x H1,445 mm (Main unit only)
Weight	Approx. 2,050kg (Main unit only / 2 beams, Dual-stage specifications) Approx. 1,950kg (Main unit only / 1 beams, Single-Lane specifications) Approx. 70kg (32-feeder exchange carriage) Approx. 160kg (cATS10) Approx. 250kg (sATS30) Approx. 290kg (sATS30NS)
Noise to be generated	78dB (A) or less

* The dimensions exclude any removable projecting parts.
* For detailed dimensions or dimensions with various options installed, see the figure below.
* The following figure shows the machine with various options installed, such as feeder exchange carriage.



<table>
<tr><td>Air supply source</td><td colspan="3">0.45 MPa or more (4.5 kgf / cm^2 or more), clean and dry air
* To maintain a sufficient air flow rate, prepare a supply air hose with an inside diameter of 8mm or more.
* Supply the air with excellent quality that has passed through the air dryer and air filter on the line side of the air supply source. (The air filter built-into this machine is intended to protect the machine. To maintain the function and performance of this machine at their optimal levels for an extended period of time, the air must be kept clean and dry on the line side of the customer's air supply source.)
* Set pressure to 0.40 MPa (0.39MPa to 0.41MPa).</td></tr>
<tr><td rowspan="6">Air consumption flow rate</td><td></td><td>Average consumption</td><td>Max consumption</td></tr>
<tr><td>YSM20R-2 2Head
High-speed multi-purpose (HM) head x 2</td><td>240 ℓ / min [ANR]</td><td>340 ℓ / min [ANR]</td></tr>
<tr><td>YSM20R-2 2Head
Odd-shaped components (FM) head x 2</td><td>140 ℓ / min [ANR]</td><td>320 ℓ / min [ANR]</td></tr>
<tr><td>YSM20R-1 1Head
High-speed multi-purpose (HM) head x 1</td><td>130 ℓ / min [ANR]</td><td>290 ℓ / min [ANR]</td></tr>
<tr><td>YSM20R-1 1Head
Odd-shaped components (FM) head x 1</td><td>80 ℓ / min [ANR]</td><td>280 ℓ / min [ANR]</td></tr>
<tr><td colspan="3">* When the machine is equipped with the ATS carriage, it is necessary to add approx. 10 liters / min. (ANR) to the air consumption flow rate shown above.
* "ANR" is an abbreviation of "Atmosphere Normal de Reference" and shows the standard reference atmospheric status (temperature is 20°C, relative humidity is 65%, and absolute pressure is 101.3 kPa (1.03 kgf / cm^2 or 760mmHg)).</td></tr>
<tr><td>Power supply</td><td colspan="3">Power requirement : 3-phase AC power, 200 / 208 / 220 / 240 / 380 / 400 / 416 V ± 10%
Frequency : 50Hz / 60Hz
Power capacity : 10.4kVA
Average power consumption : 1.9kW (under standard operating conditions)</td></tr>
<tr><td>Power cable terminal size</td><td colspan="2"> 
</td><td><table>
<tr><td>Terminal Part No.</td><td>KLW-M643A-00X</td></tr>
<tr><td>Manufacturers</td><td>TOYOGIKEN CO.,LTD</td></tr>
<tr><td>Manufacturers Part No.</td><td>FPS-80</td></tr>
<tr><td>Bolt diameter</td><td>M5</td></tr>
<tr><td>Max. Terminal width (a)</td><td>12.2 mm</td></tr>
<tr><td>Max. Terminal length(b)</td><td>6.5 mm</td></tr>
<tr><td>Min. Terminal length(c)</td><td>7 mm</td></tr>
<tr><td>Tightening torque</td><td>2.0-3.0N・m</td></tr>
</table></td></tr>
<tr><td>Power supply connection</td><td colspan="3">Power cable conductor cross-section area : 6mm^2 or more.
 

* To prevent electric shock accidents, make sure that the power source is shut down securely before connecting the power cable.
* Connect the main body grounding cable securely.
* L1, L2, and L3 show the 3-phase AC power cables and PE shows the grounding cable.</td></tr>
</table>

Environmental conditions	Temperature	Function assurance : 15 to 35°C Accuracy assurance : 20 to 28°C
	Humidity	Allowable range : 20 to 80% (No condensation) Optimal range : 50 to 60% * Keep a humidity of approx. 40% or more as static electricity prevention measures. * When using an industrial humidifier, use water equivalent to DI water.
	Transient voltage category	category III
	Pollution degree	degree 2
	Atmosphere	There shall be no dirt and dust. There shall be no organic solvent vapor, sulfurous acid gas, chlorine gas, and flammable gas.
	Altitude	1,000 m or less above sea level * This avoids that the air pressure or cosmic ray adversely affects the insulation performance.
	Installation floor conditions	The floor withstanding load capacity shall be approx. 850kg / m^2. * For the floor withstanding load capacity, consult the specialists who know the installation place well with the information on equipment weight, floor sharing area, and adjuster foot positions. * The floor shall be flat and have sufficient strength so that it does not vibrate during operation. The floor shall have the concrete strength or its equivalent. In particular, wooden floor, office floor, and grating are not allowed to use. * If the floor is not concrete, consult the specialists who know the installation place well and construct the reinforcement work for the portions where the equipment adjuster feet are placed. * When the feeder exchange carriage is shared by different machine models, a flatness of 10mm or less is required for the floor installation areas of all target equipment.
	Ambient noise	There shall be no significant noise. Equipment warning beep should be heard without fail.
	Ambient light	Strong light such as sunlight does not enter the vision system (optical image processing system).
	Noise immunity	See "10.7 CE marking".
	Noise emission	See "10.7 CE marking".
Board transport height	900mm ± 10mm (From the floor surface to the upper surface of the conveyor belt)	
Input data	Number of mounting points	12,800 points (Note that the number of mounting points decreases depending on the number of boards, the number of blocks, or the number of fiducial marks.)
	Component types	255 types / board
	Board data	100 MB / unit
	Number of fiducial marks	128 sets / board
	Data entry method	Data entry unit supplied with the machine main unit
Positioning resolution	X-axis / Y-axis / Z-axis	0.001mm
	R-axis	0.001°
External interface	LAN*, 1 port (See "7.5 Network" and "7.6 Anti-virus measures".)	
Internal memory	Built-in 4GB flash card *, 1 pc. * For storage of files, such as OS, mounter application software, board data, component data, vision data, machine information, and production history information, etc.	
External memory	USB flash memory with a capacity of 8GB or more *, 1 pc. (Supplied as standard accessory : For data backup)	

11.2 Mounting capability

YSM20R-2 (2Head) High-speed multi- purpose (HM) head x 2
Type PV : 95,000CPH (0.038 sec / CHIP) * YAMAHA optimal conditions
* Compatibility with sATS30NS, Nonstop feeder exchange system. 0201 or more component correspondence. Scan camera □ 12 mm specification.
Type SV : 90,000CPH (0.040 sec / CHIP) * YAMAHA optimal conditions
* Not compatibility with sATS30NS, Nonstop feeder exchange system. 03015 or more component correspondence. Scan camera □ 8 mm specification.

The mounting capability when using the customer's boards and components can be estimated (calculated) by using the following tools. Consult with YAMAHA for details.
-1- Simple tact simulation program
-2- YAMAHA SMT line support software Y.FacT / P-Tool

11.3 Mounting accuracy

When using YAMAHA standard components for evaluation, test board, and two-faced adhesive tape.
CHIP components ± 0.035mm (± 0.025mm) Cpk ≧ 1.0 (3σ)
QFP components ± 0.035mm (± 0.025mm) Cpk ≧ 1.0 (3σ)

11.4 Applicable components

Components for which normal mounting can be expected when all conditions are good
The mounting capability of this machine is significantly affected not only by the machine performance, but also by various conditions such as the components and boards. Determining whether or not a given component can be mounted requires a test operation with an actual sample of the component in question. Some guidelines for Applicable components are given in the table below.
(Factors which determine whether or not a component can be used include the following: electrode lead's bend, lift and optical surface condition, ball electrode's deformation and height variations, background color, glossiness condition, component's weight, pickup nozzle's contact surface condition, and board warp, etc.)

Component type	Typical component size	Remarks
Square chip components Cylindrical chip components Mini-mold transistors Power transistors Aluminum electrolytic capacitors, etc.	0.2 x 0.1mm to 12 x 12mm	* For Type SV, 0.3 x 0.15 mm or more component correspondence.
Lead electrode components (SOP, SOJ, QFP, etc.)	5 x 4.5mm to 20 x 20mm	Minimum lead pitch : 0.4mm or less (0.22mm gap for a reference lead width of 0.18mm)
	20 x 20mm to 32 x 32mm	Minimum lead pitch : 0.5mm or less (0.28mm gap for a reference lead width of 0.22mm)
	32 x 32mm to 55 x 55mm	Minimum lead pitch : 0.65mm or less (0.35mm gap for a reference lead width of 0.30mm)
Ball electrode components (BGA, etc.) * Consult us for CSP with micro-ball electrodes.	Up to 20 x 20mm	Reference : Minimum ball diameter is 0.18mm or larger Reference : Minimum ball pitch is 0.3mm or larger
	20 x 20mm to 32 x 32mm	Reference : Minimum ball diameter is 0.22mm or larger Reference : Minimum ball pitch is 0.37mm or larger
	32 x 32mm to 55 x 55mm	Reference : Minimum ball diameter is 0.30mm or larger Reference : Minimum ball pitch is 0.5mm or larger
Odd-form components such as connectors, etc.	Up to 55 x 100mm	Consult us for each component.

* When handling components with a size exceeding 12 x 12mm and a thickness exceeding 6.5mm, the HM head requires a multi-view camera (option).
* The FM head can be used with a multi-view camera (standard).

11.5 Component height & mounting restrictions

11.5.1 Height of mountable components

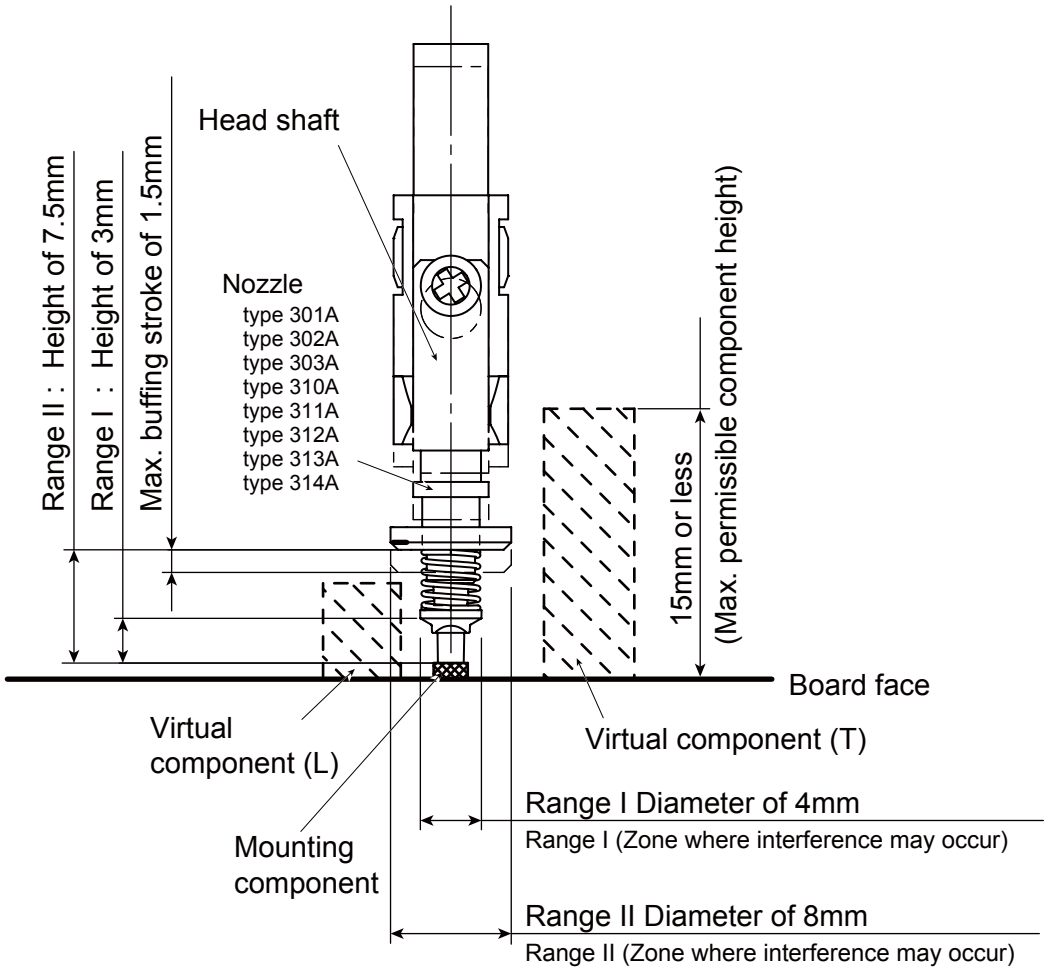
The following describes the height of the components that can be mounted (on the upper side of the board).
High-seed multi (HM) head : 15mm or less
Flexible multi (FM) head : 28mm or less

11.5.2 Mounting restrictions

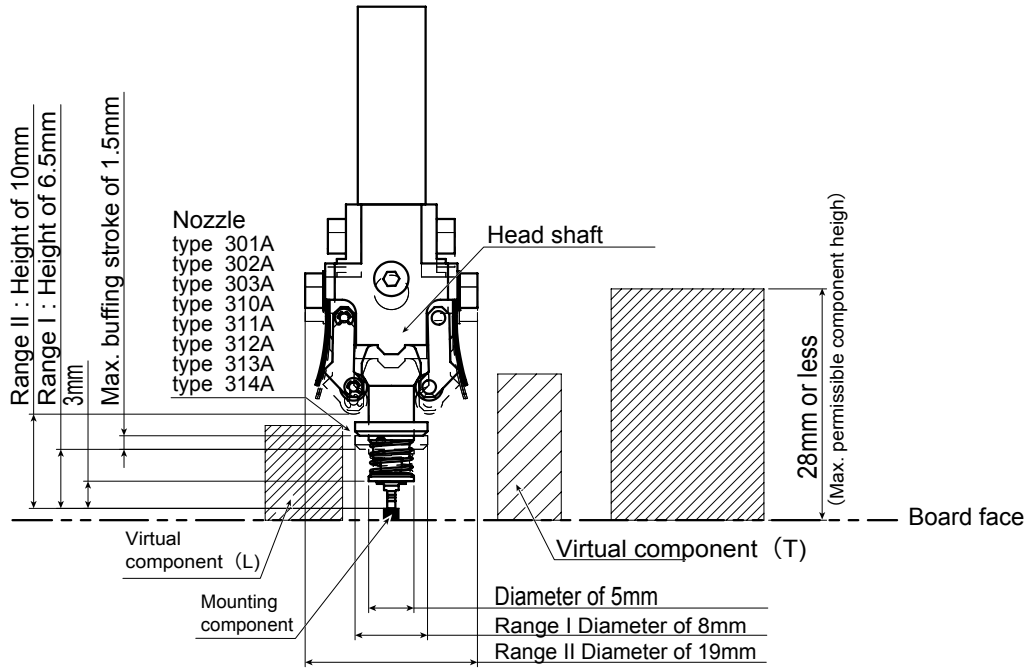
The correct mounting may not be established according to the relationship between the component size / height and the nozzle shape.

* In the figure below, since the virtual component (L) is located on the outside of the range I, the correct mounting is established. If this component is located on the inside of the range, interference may occur.
* In the figure below, since the virtual component (T) is located on the outside of the range II, the correct mounting is established. If this component is located on the inside of the range, interference may occur.
* An area where any component cannot be mounted may arise around the components that have already been mounted before carrying into this machine in the same manner as described in the figure below.
* The component presence is not permitted in an area of 3mm from both ends in the transport direction. support system, programming tool "P-Tool", is prepared to take measures against restrictions on mounting, such as possibility of interference as described above. Please order this tool. See "3. Arrangements / -4- Support systems".

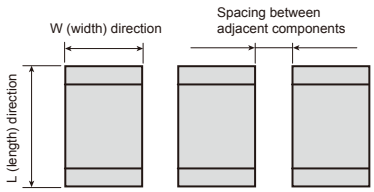
HM Head



FM Head



11.6 Component mounting restrictions



Mountable components ("mm" size)	Spacing between adjacent components			
	Standard 30X nozzles		Standard 31X nozzles	
0603 square chips (L0.6 x W0.3mm)	301A nozzle	0.35mm or more	311A nozzles	W-direction 0.15mm or more
1005 square chips (L1.0 x W0.5mm)			312A nozzles	W-direction 0.15mm or more

* The above values apply under YAMAHA standard conditions
(when using YAMAHA standard evaluation test board, standard components, and two-faced adhesive tape).

* The above values may not be obtained depending on the shapes and dimensions of tape reels and components.

* A mounting space smaller than those shown above requires a custom nozzle (consult us).

11.7 Applicable board dimensions

YSM20R-2

L size : L50 x W50 (min.) to L810 x W 490 (max.) [dual-stage and single lane model]

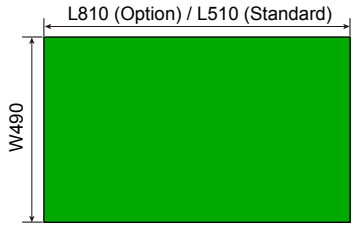
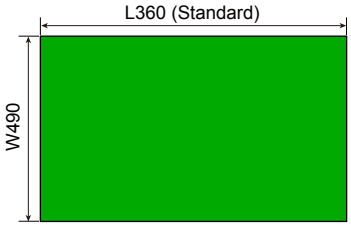
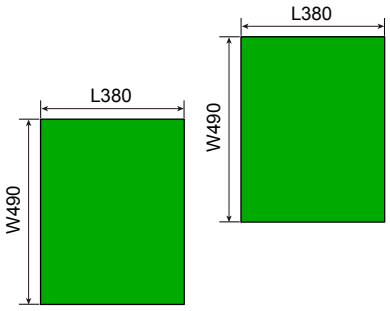
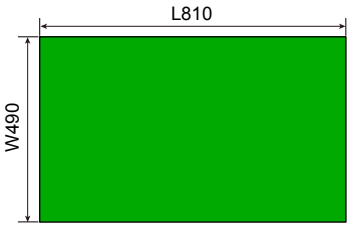
YSM20R-1

L size : L50 x W50 (min.) to L810 x W 490 (max.) [single lane model]
M size : L50 x W50 (min.) to L360 x W 490 (max.) [single lane model]

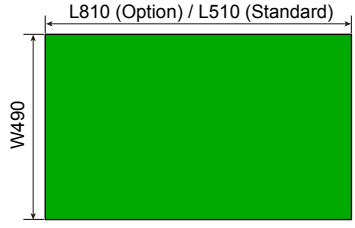
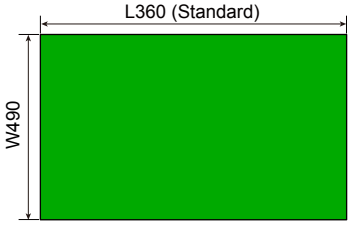
* "L" is a direction along the transport direction while "W" is a direction perpendicular to the transport.

* Maximum dimensions are illustrated below.

YSM20R-2

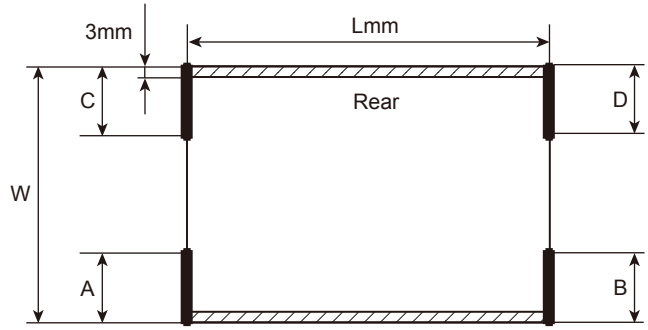
<table>
<tr><td colspan="3">Single lane model ====> [SL]</td></tr>
<tr><td colspan="2">Machine layout type
(See "13. References and details".)</td><td>Applicable Maximum PCB (L size)</td><td>Applicable Maximum PCB (M size)</td></tr>
<tr><td>#001
#002
#003
#004
#005
#006
#007
#008
#00S
#00T</td><td>#011
#012
#013
#014
#015
#016
#017
#018
#01S
#01T</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="3">Dual-stage model ====> [DS]</td></tr>
<tr><td colspan="2">Machine layout type
(See "13. References and details".)</td><td>Applicable Maximum PCB
(For dual-stage transport)</td><td>Applicable Maximum PCB
(For sigle-stage transport)</td></tr>
<tr><td>#009
#00A
#00B
#00C
#00D
#00E
#00F
#00G
#00U
#00V</td><td>#019
#01A
#01B
#01C
#01D
#01E
#01F
#01G
#01U
#01V</td><td> 
</td><td> 
</td></tr>
</table>

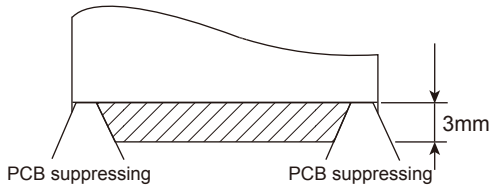
YSM20R-1

<table>
<tr><td colspan="3">Single lane model ====> [SL]</td></tr>
<tr><td colspan="2">Machine layout type
(See "13. References and details".)</td><td>Applicable Maximum PCB (L size)</td><td>Applicable Maximum PCB (M size)</td></tr>
<tr><td>#001
#002
#003
#004
#005
#006
#007
#008
#10S
#10T</td><td>#011
#012
#013
#014
#015
#016
#017
#018
#11S
#11T</td><td> 
</td><td> 
</td></tr>
</table>

11.8 Unmountable areas on board

As illustrated below, the board includes areas where no components can be mounted due to the interference with the conveyor rail, particularly with the board clamp claws.
Additionally, 30mm-straight zones expressed by "A" to "D" are required for the board edge to halt against the stopper. The stopper is installed at a position of "A" to "D" depending on the machine configuration determined by the conveyor type, board transport direction, and conveyor reference.





"Mounting not possible" range

Dual-stage & single-lane model

A : Right-to-left transport and front conveyor reference
B : Left-to-right transport and front conveyor reference
C : Right-to-left transport and rear conveyor reference
D : Left-to-right transport and rear conveyor reference

* Rear conveyor reference is a special order item.

11.9 Applicable board thickness

0.4 to 3.0mm

11.10 Applicable board weight

0.65kg or less per sheet

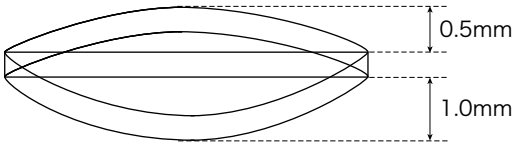
* Consult us for board weights exceeding 0.65kg.

11.11 Recommended board material

Glass fiber reinforced epoxy resin

* Consult us for other materials.

11.12 Allowable board warp



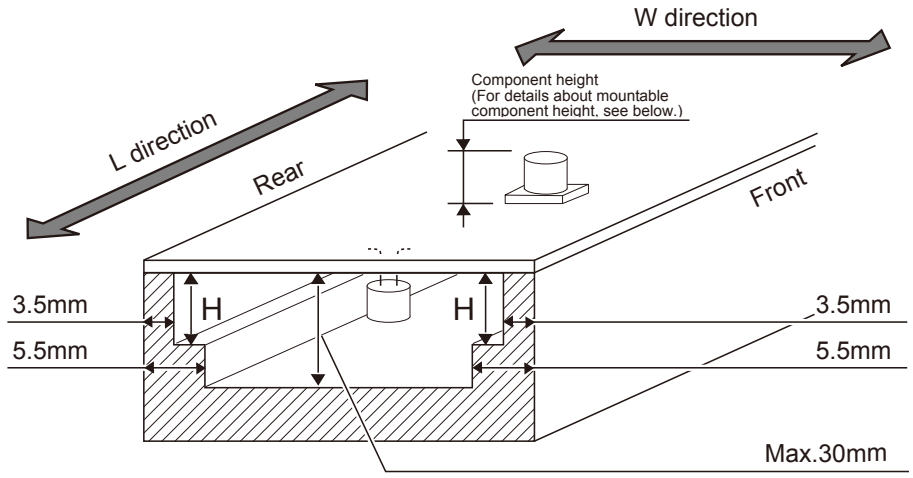
Upward warp: 0.5mm or less
Downward warp: 1.0mm or less

* Warps which exceed the above values (particularly the upward warp) may significantly reduce the component mounting accuracy. An excessive warp may cause interference with the head, nozzle, or camera, so use caution.

11.13 Board slits and holes

The conveyor is equipped with sensors (light transmission type) to check the position of boards being conveyed. The position of the boards may not be detected correctly if they have slits and holes. Consult us when using such boards.

11.14 Restrictions on mounting components on boards



H：19mm (Dual-stage conveyor)
17.5mm (Single lane)

Upper side of board: See "11.5.1 Height of mountable components".

* No components can be placed in areas of 3mm from both ends in the board transport direction. See also the figure in "11.8 Unmountable areas on board".

Back side of board: 30mm or less

* No components can be placed in areas of 3.5mm from both ends in the board transport direction. No components can be mounted in the shaded areas in the above figure.

11.15 Board transport speed

50 to 500mm / sec (Speed setting can be changed.)

* The transport speed may vary depending on the board weight.

12. General specifications

12.1 Safety design

This machine conforms to the EU Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU (CE marking). However, this machine does not bear CE marking if a special order item with custom specifications is installed. See "10.7 CE marking" for details.

12.2 Emergency stop and error detection systems

To ensure the safety, this machine has an emergency stop system and error detection system shown in the table below.

No.	System area and item	Registration name	Built-in		Remarks
			YSM20R-2	YSM20R-1	
01	Emergency stop on front operation console	SB31	◎	◎	Push-lock, turn-reset button
02	Emergency stop on rear operation console	SB31	◎	◎	Push-lock, turn-reset button
03	Front safety cover	SQ101	◎	◎	Mechanical switch with key
04	Rear safety cover	SQ102	◎	◎	Mechanical switch with key
05	Front left 32-feeder bank (*1)	-	△	△	Feeder exchange carriage and ATS docking check
06	Front right 32-feeder bank (*1)	-	△	△	Feeder exchange carriage docking check
07	Rear right 32-feeder bank (*1)	-	△	△	Feeder exchange carriage and ATS docking check
08	Rear left 32-feeder bank (*1)	-	△	△	Feeder exchange carriage docking check
09	Servo 1 group of control box	-	◎		YA1, YA2, UA, PUA axis error detection
10	Servo 2 group of control box	-	◎	◎	YB1, YB2, UB, PUB axis error detection
11	Servo 3 group of control box	-	◎	◎	XA, SCA, XB, SCB axis error detection
12	Servo 4 group of control box	-	△	△	AZA and AZB axis error detection, ATS option
13	Remote servo 1 of control box	-	◎		ZA1-10, RA1, RA2 (HM head) / ZA1-5, RA1-5 (FM head) axis error detection
14	Remote servo 2 of control box	-	◎	◎	ZB1-10, RB1, RA2 (HM head) / ZB1-5, RB1-5 (FM head) axis error detection
15	Remote servo 3 of control box	-	◎	◎	CV1-4, W1-4, ATA, ATB, AHA, AHB axis error detection
16	Axis interference detection	SQ027	◎		YA and YB axis interference detection

* Meaning of "Built-in" mark ==> ◎ : Provided, △ : Selectable as option
* "Registration name" is the name described in the control wiring diagram for maintenance support (YAMAHA Support & Service Website).
* (*1) Not available when a fixed feeder plate is used.
* Other hardware-related detection errors include temperature errors, fan stop, and power supply errors. For details, see the user's manuals.

12.3 Pause (interlock) system and error detection system

To protect the machine or continue the operation, this machine as a pause system and error stop system shown in the table below.

No.	System area and item	Registration name	Built-in		Remarks
			YSM20R-2	YSM20R-1	
01	Front left feeder group	SQ131	◎	◎	Check for feeder setup
02	Front right feeder group (*1)	SQ132	△	△	Check for feeder setup
03	Rear right feeder group	SQ133	◎	◎	Check for feeder setup
04	Rear left feeder group (*1)	SQ134	△	△	Check for feeder setup
05	Front head air pressure	SP11	◎	-	Air pressure drop
06	Rear head air pressure	SP12	◎	◎	Air pressure drop
07	Front-side chip dump box	SQ196	◎	◎	With or without chip dump box
08	Rear-side chip dump box	SQ197	◎	-	With or without chip dump box
09	Front-side shaft blow	SQ191	◎	◎	With or without nozzle
10	Rear-side shaft blow	SQ192	◎	-	With or without nozzle

* Meaning of "Built-in" mark ==> ◎ : Provided, △ : Selectable as option, No mark : not available
* "Registration name" is the name described in the control wiring diagram for maintenance support (YAMAHA Support & Service Website).
* (*1) Not available when a fixed feeder plate is used.
* Other hardware-related detection errors include temperature errors, fan stop, and power supply errors. For details, see the user's manuals.

12.4 Machine status indication

The status of this machine is displayed using the signal tower as described in the table below.
According to the shipment destination or the customer's equipment specifications, the desired lighting pattern can be selected using Lighting color pattern in "1. Machine configuration".

No.	Machine status	Lighting portion	Lighting color	
			General Europe	YAMAHA standard
01	Emergency stop status, safety cover open, CPU error, etc.	Upper portion	White	Red
02	Pickup error, transport error, component supply run-out, etc.	Middle portion	Blue	Yellow
03	Automatic operation is running.	Lower portion	Green	Green

12.5 Basic operation of machine

The basic operation of this machine is performed with the buttons on the operation panel as described in the table below.
According to the shipment destination or the customer's equipment specifications, the desired identification color pattern can be selected using Lighting color pattern in "1. Machine configuration".

No.	Basic operation	Button name		Identification color	
		English	Chinese	General Europe	YAMAHA standard
01	Designation of active side on the front or rear operation console	ACTIVE	激活	White	White
02	Emergency stop status reset and servo ON	READY	准备就绪	White	White
03	Data reset or mounting order indexing	RESET	复位	White	White
04	Automatic operation start	START	开始	Green	Green
05	Automatic operation stop	STOP	停机	White	Red
06	Error lock status reset	ERROR CLEAR	清除错误	Blue	Yellow

12.6 Language used for operation screen and user's manual

For language used for operation screens and user's manual of this equipment, select a desired language from English, Chinese, Korean, and Japanese.
Select the desired language using Display language in "1. Machine configuration" and Language written in manual in "3. Arrangements / -1- Accessories".

* When installing this machine in an EU country, see "10.7 CE marking".

12.7 Configuration of servo control axes

According to the total number of axes and machine configuration, 16 to 48 axes are controlled by the AC servo motors.

YSM20R-2 main unit

No.	System area and item	Registration name	Motor name	Built-in	Remarks
01	Frame beam A, left	YA1	M01	◎	Linear motor
02	Frame beam A, right	YA2	M02	◎	Linear motor
03	Frame beam B, right	YB1	M03	◎	Linear motor
04	Frame beam B, left	YB2	M04	◎	Linear motor
05	Frame beam A	XA	M05	◎	
06	Frame beam B	XB	M06	◎	

YSM20R-1 main unit

No.	System area and item	Registration name	Motor name	Built-in	Remarks
01	Frame beam A, right	YA1	M03	◎	Linear motor
02	Frame beam A, left	YA2	M04	◎	Linear motor
03	Frame beam A	XA	M06	◎	

DS conveyor

No.	System area and item	Registration name	Motor name	Built-in	Remarks
				YSM20R-2	
01	Push-up 1	PU1	M07	△	Electromagnetic brake is built-in.
02	Push-up 2	PU2	M08	△	Electromagnetic brake is built-in.
03	Table shift 1	U1	M09	△	
04	Table shift 2	U2	M10	△	
05	Conveyor 1	CV1	M11	△	
06	Conveyor 2	CV2	M12	△	
07	Conveyor 3	CV3	M13	△	
08	Conveyor 4	CV4	M14	△	
09	Conveyor 1 width	W1	M15	△	
10	Conveyor 2 width	W2	M16	△	
11	Conveyor 3 width	W3	M17	△	
12	Conveyor 4 width	W4	M18	△	

SL conveyor

No.	System area and item	Registration name	Motor name	Built-in		Remarks
				YSM20R-2	YSM20R-1	
01	Push-up 1	PU1	M08	△	◎	Electromagnetic brake is built-in.
02	Conveyor 1	CV1	M11	△	◎	
03	Conveyor 1 width	W1	M15	△	◎	

HM head

No.	System area and item	Registration name	Motor name	Built-in		Remarks
				YSM20R-2	YSM20R-1	
01	HM head 1 up/down	ZA1 / ZB1	M31	△	△	Linear motor
02	HM head 2 up/down	ZA2 / ZB2	M32	△	△	Linear motor
03	HM head 3 up/down	ZA3 / ZB3	M33	△	△	Linear motor
04	HM head 4 up/down	ZA4 / ZB4	M34	△	△	Linear motor
05	HM head 5 up/down	ZA5 / ZB5	M35	△	△	Linear motor
06	HM head 6 up/down	ZA6 / ZB6	M36	△	△	Linear motor
07	HM head 7 up/down	ZA7 / ZB7	M37	△	△	Linear motor
08	HM head 8 up/down	ZA8 / ZB8	M38	△	△	Linear motor
09	HM head 9 up/down	ZA9 / ZB9	M39	△	△	Linear motor
10	HM head 10 up/down	ZA10 / ZB10	M40	△	△	Linear motor
11	HM head 1 rotation	RA1 / RB1	M41	△	△	
12	HM head 2 rotation	RA2 / RB2	M42	△	△	
13	HM head Scan	SCA / SCB	M43	△	△	Linear motor

FMhead

No.	System area and item	Registration name	Motor name	Built-in		Remarks
				YSM20R-2	YSM20R-1	
01	FM head 1 up/down	ZA1 / ZB1	M51	△	△	
02	FM head 2 up/down	ZA2 / ZB2	M52	△	△	
03	FM head 3 up/down	ZA3 / ZB3	M53	△	△	
04	FM head 4 up/down	ZA4 / ZB4	M54	△	△	
05	FM head 5 up/down	ZA5 / ZB5	M55	△	△	
06	FM head 1 rotation	RA1 / RB1	M56	△	△	
07	FM head 2 rotation	RA2 / RB2	M57	△	△	
08	FM head 3 rotation	RA3 / RB3	M58	△	△	
09	FM head 4 rotation	RA4 / RB4	M59	△	△	
10	FM head 5 rotation	RA5 / RB5	M60	△	△	

cATS10 / sATS30 / sATS30NS

No.	System area and item	Registration name	Motor name	Built-in		Remarks
				YSM20R-2	YSM20R-1	
01	rack up/down	AZ1 / AZ2	M71	△	△	Electromagnetic brake is built-in.
02	Table back / forth	AT1 / AT2	M72	△	△	
03	Hook back / forth	AH1 / AH2	M73	△	△	
04	Supply hook back / forth	AHS1 / AHS2	M74	△	△	

* Meaning of "Built-in" mark ==> ◎ : Provided, △ : Selectable as option, No mark : not available

* "Motor name" is the name described in the control wiring diagram for maintenance support (YAMAHA Support & Service Website).

12.8 Configuration of other motors

To cool the control box, motors, and cameras, FAN motors are installed at appropriate positions.

12.9 Vision system (image recognition)

The vision system shown in the table below is used to recognize components and board marks.
The number of vision systems and their arrangement can be set according to the size of components to be mounted and electrical specifications, etc. Select the setting using Fiducial camera / Multi-view camera in "1. Machine Configuration".

* Actual component mounting is affected by other factors in addition to the image recognition capability. Determining whether or not a given component can be mounted requires a test operation with an actual sample of the component in question.

12.9.1 Fiducial camera

Item	Remarks	
System	Fiducial camera	
Camera position	YSM20R-2	Right side of front head
		Left side of front head
		Right side of rear head
		Left side of rear head
	YSM20R-1	Right side of head
		Left side of head
Fieldof view	8 x 8mm	
Application	Fiducial mark detection, bad mark detection, teaching	
Mark shape	Round mark 0.5 to 2mm dia. (YAMAHA recommended), square 0.5 to 2mm, diamond-shaped 0.5 to 2mm. The mark surface must not be scratched or soiled. The contrast between the mark and the background board must be adequate (clear contrast). Either of the mark and background can be reflective.	
Mark surface	Copper foil, gold plating, solder leveler	
Background material	Glass fiber reinforced epoxy resin boards are ideal. * When using ceramic or polyimide boards (flexible types), check to see if they are appropriate.	
Detection area	The detection area dimensions must be within the field-of-view range, and specified by entering their numeric values. (This minimizes wasted vision processing time.)	
Scan range	Within an area of 0.2mm from the outer edge of the mark, there must be no resist, silk printing, thru-holes, or any pattern with the same optical characteristics as the mark. The mark to be scanned must be the only unique shape in the detection area. * Specify the detection area so that it contains no similar shapes.	
Mark layout	2 points or 4 points on board. It is preferable that the marks are located on the diagonal line.	

12.9.2 Scan camera (standard for HM head)

Item	Remarks	
System	Scan camera (with coaxial lighting)	
Camera position	HM head	Bottom side of head
Field of view	18 x 18mm, Width 6mm (Side)	
Application	Component recognition	
Maximum recognizable size	12 x 12mm * For Type SV, 8 x 8 mm	
Minimum recognizable size	0201 square chip components ("mm" size)	
Allowable component height	6.5mm	
Recognizable lead pitch	0.4mm or more	

12.9.3 Multi-view camera (standard for FM head / option for HM head)

Item	Remarks	
System	Multi-view camera * In addition to detecting whether ball electrodes exist or not, the camera also detects whether they are good or not by side lighting provided as standard.	
Camera position	Front right side of conveyor system Front right side of rear conveyor system	
Field of view	50mm	
Application	Component recognition	
Maximum recognizable size	55 x 100mm * Consult us for odd-form components such as long connectors. * Recognition of components larger than 45mm sq. is available by Split recognition.	
Minimum recognizable size	03015 square chip component ("mm" size)	
Allowable component height	HM head	15mm or less
	FM head	28mm or less
Recognizable lead pitch	0.3mm or more	
Ball electrode size for present/absent judgment	ϕ 0.1mm or more	
Ball electrode size for pass/fail judgment	ϕ 0.15mm or more	

12.9.4 Multi-view camera with coplanarity checker (option)

Item	Remarks	
System	Multi-view camera with coplanarity checker * Component recognition performance is the same as that of the multi-view camera (in 12.9.3) excep for the coplanarity checker function.	
Camera position	Installed in the multi-view camera for component recognition	
Field of view	50mm	
Application	Detection of variations in the height direction of multiple row lead electrodes and ball electrodes, that is, the detection of lead coplanarity and linearity. Also called lead float inspection.	
Maximum recognizable size	45 x 45mm	
Allowable component height	HM head	15mm or less
	FM head	28mm or less
Coplanrity detection accuracy	± 0.025mm	
Recognizable lead pitch	0.3mm or more	
Recognizable lead width	0.12mm or more	
Recognizable ball electrode	ϕ 0.25mm or more	

12.9.5 Side-view camera

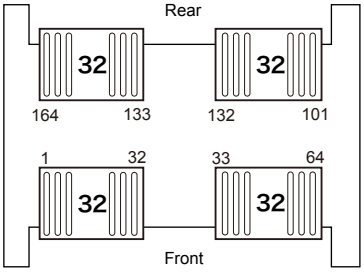
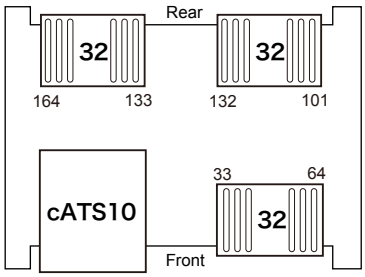
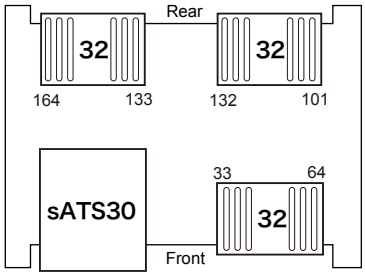
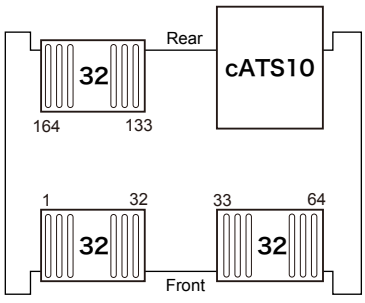
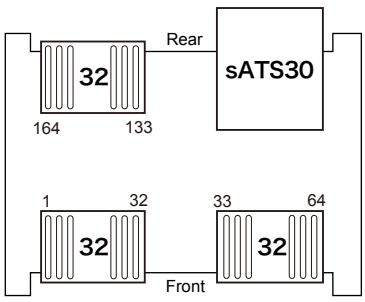
Item	Remarks	
System	Side-view camera	
Camera position	HM head	Installed in the scan camera
	FM head	Bottom side of head
Application	Front and back side check for lead components (mini-mold transistors, two-terminal diodes, etc.) with 1.2mm or less thickness Pickup error detection, soiled nozzle detection, component release check	
Maximum recognizable size	3.2 x 3.2mm	
Allowable component height	1.2mm or less	

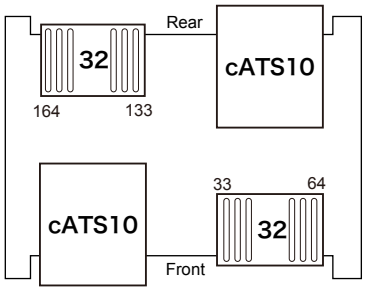
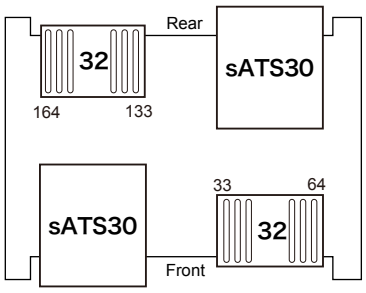
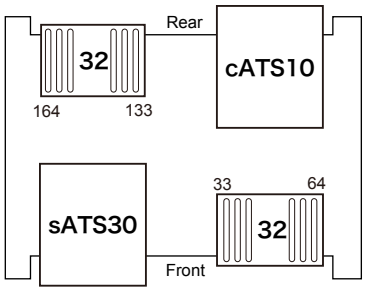
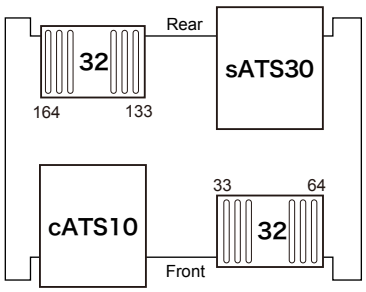
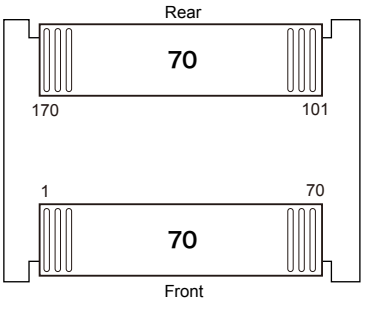
12.9.6 Smart recognition

Item	Remarks
System	Applicable component size
Application	This function is intended to provide a recognition algorism with high versatility and robustness. A component shape model is created from the component image that has been captured. The positioning of the component is performed using this component shape model. This allows the recognition of components that are impossible or difficult to define with existing algorisms.
Recognition accuracy (3σ)	± 0.03mm, ± 1 deg.
Applicable component size	1.0 x 0.5mm to 45 x 45mm

12.10 Feeder bank configuration

The feeder bank configuration of this machine can be selected from those shown in the table below.
Select using Feeder Bank in "1. Machine Configuration".

Configura-tion	Number of 8mm wide tape feeders	Layout		layout illustration	Details
		YSM20R-2	YSM20R-1		
F64 / 64	128	#001 #011 #009 #019 #00H #01H	#101 #111		Front right : 32-feeder exchange carriage Front left : 32-feeder exchange carriage Rear right : 32-feeder exchange carriage Rear left : 32-feeder exchange carriage
F32 / 64	96	#002 #012 #00A #01A #00J #01J	#102 #112		Front right : 32-feeder exchange carriage Front left : CATS10 Rear right : 32-feeder exchange carriage Rear left : 32-feeder exchange carriage
		#005 #015 #00D #01D #00M #01M	#105 #115		Front right : 32-feeder exchange carriage Front left : sATS30 or sATS30NS Rear right : 32-feeder exchange carriage Rear left : 32-feeder exchange carriage
F64 / 32		#003 #013 #00B #01B #00K #01K	#103 #113		Front right : 32-feeder exchange carriage Front left : 32-feeder exchange carriage Rear right : CATS10 Rear left : 32-feeder exchange carriage
		#006 #016 #00E #01E #00N #01N	#106 #116		Front right : 32-feeder exchange carriage Front left : 32-feeder exchange carriage Rear right : sATS30 or sATS30NS Rear left : 32-feeder exchange carriage

Configura-tion	Number of 8mm wide tape feeders	Layout		layout illustration	Details
		YSM20R-2	YSM20R-1		
F32 / 32	64	#004 #014 #00C #01C #00L #01L	#004 #114		Front right : 32-feeder exchange carriage Front left : CATS10 Rear right : CATS10 Rear left : 32-feeder exchange carriage
		#007 #017 #00F #01F #00P #01P	#107 #117		Front right : 32-feeder exchange carriage Front left : sATS30 or sATS30NS Rear right : sATS30 or sATS30NS Rear left : 32-feeder exchange carriage
		#00S #01S #00U #01U #00W #01W	#10S #11S		Front right : 32-feeder exchange carriage Front left : sATS30 or sATS30NS Rear right : CATS10 Rear left : 32-feeder exchange carriage
		#00T #01T #00V #01V #00X #01X	#10T #11T		Front right : 32-feeder exchange carriage Front left : CATS10 Rear right : sATS30 or sATS30NS Rear left : 32-feeder exchange carriage
N70 / 70	140	#008 #018 #00G #01G #00R #01R	#108 #118		Front : 70-feeder fixed plate Rear : 70-feeder fixed plate

12.11 Feeder lane configuration

For an overall feeder lane layout, refer to the figure and table stated in "12.10 Feeder bank configuration". The feeders that can be used by each head may vary depending on the relationship between the head shape and X-axis movable range and the feeder bank layout.
The feeder set numbers that can be used by each head of the machine are as follows:

HM head	Supply form	Head	Feeder set number	
			Table A	Table B
YSM20R-2	32-feeder exchange carriage	1	1 to 55	101 to 155
		2	1 to 56	101 to 156
		3	1 to 57	101 to 157
		4	1 to 58	101 to 158
		5	1 to 59	101 to 159
		6	2 to 60	102 to 160
		7	3 to 61	103 to 161
		8	4 to 62	104 to 162
		9	5 to 63	105 to 163
		10	6 to 64	106 to 164
	70-feeder fixed plate	1	1 to 61	101 to 161
		2	1 to 62	101 to 162
		3	1 to 63	101 to 163
		4	1 to 64	101 to 164
		5	1 to 65	101 to 165
		6	2 to 66	102 to 166
		7	3 to 67	103 to 167
		8	4 to 68	104 to 168
		9	5 to 69	105 to 169
		10	6 to 70	106 to 170
YSM20R-1	32-feeder exchange carriage	1	6 to 64	101 to 155
		2	5 to 63	101 to 156
		3	4 to 62	101 to 157
		4	3 to 61	101 to 158
		5	2 to 60	101 to 159
		6	1 to 59	102 to 160
		7	1 to 58	103 to 161
		8	1 to 57	104 to 162
		9	1 to 56	105 to 163
		10	1 to 55	106 to 164
	70-feeder fixed plate	1	6 to 70	101 to 161
		2	5 to 69	101 to 162
		3	4 to 68	101 to 163
		4	3 to 67	101 to 164
		5	2 to 66	101 to 165
		6	1 to 65	102 to 166
		7	1 to 64	103 to 167
		8	1 to 63	104 to 168
		9	1 to 62	105 to 169
		10	1 to 61	106 to 170

FM head	Supply form	Head	Feeder set number	
			Table A	Table B
YSM20R-2	32-feeder exchange carriage	1	1 to 55	101 to 155
		2	1 to 57	101 to 157
		3	2 to 59	102 to 159
		4	4 to 61	104 to 161
		5	6 to 63	106 to 163
	70-feeder fixed plate	1	1 to 61	101 to 161
		2	1 to 63	101 to 163
		3	2 to 65	102 to 165
		4	4 to 67	104 to 167
		5	6 to 69	106 to 169
YSM20R-1	32-feeder exchange carriage	1	6 to 63	101 to 155
		2	4 to 61	101 to 157
		3	2 to 59	102 to 159
		4	1 to 57	104 to 161
		5	1 to 55	106 to 163
	70-feeder fixed plate	1	6 to 63	101 to 161
		2	4 to 61	101 to 163
		3	2 to 59	102 to 165
		4	1 to 57	104 to 167
		5	1 to 55	106 to 169

12.12 Signal specifications

12.12.1 Machine-to-machine signal specifications (between this machine and post-process machine)

*** Next Interface**

According to the operating conditions, such as machine combination and signal cable selection, make appropriate selections from the table shown below.
These specifications must match the selected settings in "12.12.2 Machine-to-machine signal specifications" (between this machine and pre-process machine: Previous interface).

* When connecting to other company's machine, the customer shall be held responsible for maintenance of the functions related to other company's machine.

Selection									
Next interface connector on this machine AMP: 206043-1 (Receptacle 14 pins)			GATE signal specifications		ADVANCED (extended) GATE specifications		ADVANCED (extended) GATE 2 specifications		SMEMA signal specifications
			YAMAHA YV series or earlier (YV or earlier) and other company's machine		YAMAHA X series or later (X / Xg / YG / YS)		YAMAHA YS series (YS) or later *1		SMEMA signal compatible machine
Pin No	**Class**		**Signal name**		**Signal name**		**Signal name**		**Signal name**
1	DC +24V		GATE IN (com)	Board unloading request signal input from the post-process machine	BUSY IN (com)	Status signal input showing that the post-process machine is loading the board.	Same as left.		SMEMA specifications
2	PNP input (Judged as ON when the voltage is +24V.)		GATE IN (input)		BUSY IN (input)				
3	Relay contact output	Conducted / Closed when turned ON.	Not used.		BA OUT (output)	Status signal output showing that this machine is ready to unload the board.	Same as left.		
4	Relay contact output		Not used.		BA OUT (output)				
5	Incorrect connection prevention function application	Key plug inserted.	Dedicated to mating designation (Blocked)		Dedicated to mating designation (Blocked)		Dedicated to mating designation (Blocked)		
6			Dedicated to mating designation (Receivable)		Dedicated to mating designation (Receivable)		Dedicated to mating designation (Receivable)		
7	DC 0V		Not used.		Not used.		Not used.		
8	Reserved.		Reserved.		Reserved.		Reserved.		
9	Relay contact output	Conducted / Closed when turned ON.	Not used.		UR OUT (output)	Status signal output showing that this machine is running in the automatic operation mode.	Same as left		
10	Relay contact output		Not used.		UR OUT (output)				
11	DC +24V		Not used.		LR IN (com)	Status signal input showing that the post-process machine is running in the automatic operation mode.	Same as left		
12	PNP input (Judged as ON when the voltage is +24V.)		Not used.		LR IN (input)				
13	DC +24V		Not used. *2		Not used. *2		LE IN (com)	Signal input showing the board presence status at the standby position of the post process machine	
14	PNP input (Judged as ON when the voltage is +24V.)		Not used. *2		Not used. *2		LE IN (input)		

*1 : The YS / YG series mounters have already been applicable to the ADVANCED GATE 2 specifications from the machines shipped in November, 2009. When connecting the YS / YG series mounter shipped before this date to the line, the machine (except for YS24) needs to be modified.

*2 : This signal can be handled as the counter reset signal input.
(The signal waits for replacement of the magazine rack of the unloader.)

[GATE IN] : When this signal turns ON (conducts), this machine judges that the board unloading is requested from the post-process machine and so unloads the board if the work of this machine has been completed. The post-process machine output is a relay contact (dry contact : no-voltage circuit).

[BUSY IN] : This input signal informs this machine that the post-process machine is loading a board. The post-process machine output is a relay contact (dry contact: no-voltage circuit).

[BA OUT] : This output signal informs the post-process machine that this machine is ready to unload a board.

[UR OUT] : This output signal informs the post-process machine that this machine is running in automatic mode.

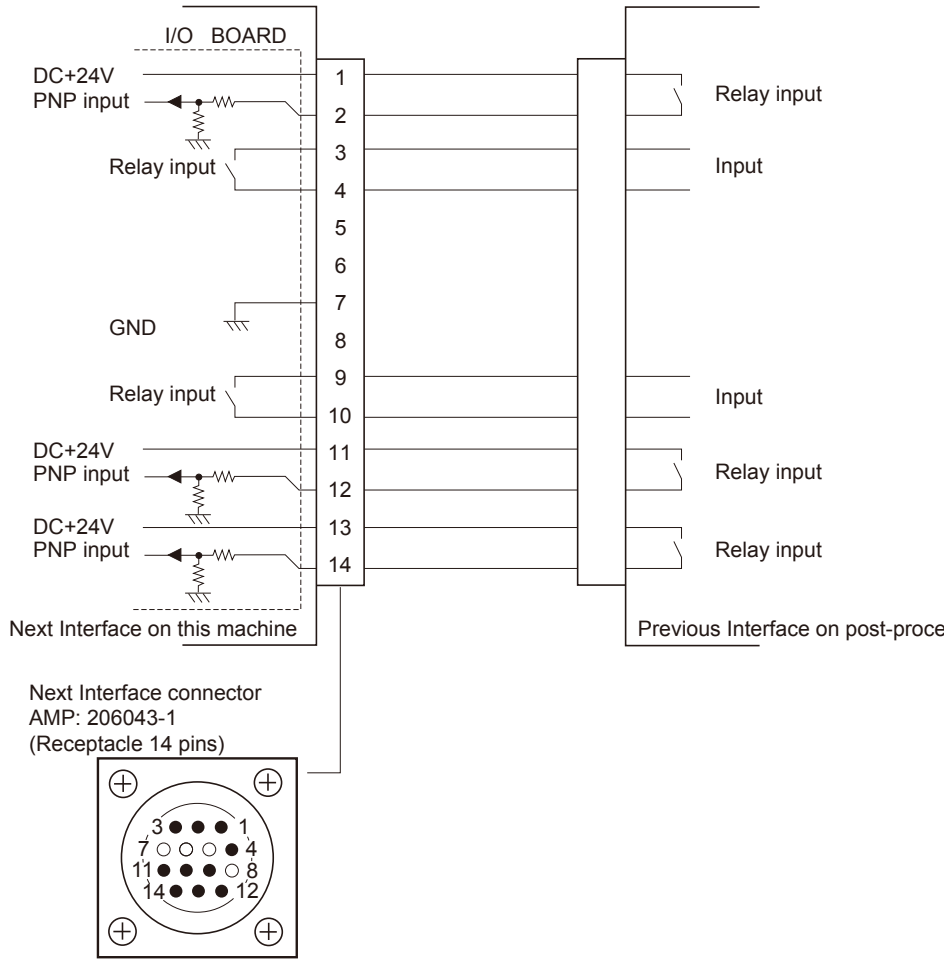
[LR IN] : This input signal informs this machine that the post-process machine is running in automatic mode. The post-process machine output is a relay contact (dry contact : no-voltage circuit).

[LE IN] : This signal is used for Advanced (extended) GATE 2 signal specifications when the "inter-machine board standby function" used between mounters is enabled. This input signal informs this machine that a board is at the standby position between this machine and post-process machine.

The post-process machine output is a relay contact (dry contact: no-voltage circuit).
The cable with a yellow marking put close to the connector should be used for the machine-to-machine cable.

Machine-to-machine signal specifications (between this machine and post-process machine)

*** Next Interface**



12.12.2 Machine-to-machine signal specifications (between this machine and re-process machine)

*** Previous Interface**

According to the operating conditions, such as machine combination and signal cable selection, make appropriate selections from the table shown below.
These specifications must match the selected settings in "12.12.1 Machine-to-machine signal specifications" (between this machine and post-process machine: Next interface).

* When connecting to other company's machine, the customer shall be held responsible for maintenance of the functions related to other company's machine.

Selection											
Next interface Connector on this machine AMP: 206043-1 (Receptacle, 14 pins)			GATE signal specifications		ADVANCED (extended) GATE specifications		ADVANCED (extended) GATE 2 specifications		SMEMA signal specifications	
			YAMAHA YV series or earlier (YV or earlier) and other company's machine		YAMAHA X series or later (X / Xg / YG / YS)		YAMAHA YS series (YS) or later *1		SMEMA signal compatible machine	
Pin No	**Class**		**Signal name**		**Signal name**		**Signal name**		**Signal name**	
1	Relay contact output	Conducted / Closed when turned ON.	GATE OUT (output)	Board unloading request signal output to the pre-process machine	BUSY OUT (output)	Status signal output showing that this machine is loading the board.	Same as left		SMEMA specifications	
2	Relay contact output		GATE OUT (output)		BUSY OUT (output)					
3	DC +24V		Not used.		BA IN (com)	Status signal input showing that the pre-process machine is ready to unload the board.	Same as left			
4	PNP input (Judged as ON when the voltage is +24V.)		Not used.		BA IN (input)					
5	ncorrect connection prevention function application		Dedicated to mating designation (Receivable)		Dedicated to mating designation (Receivable)		Dedicated to mating designation (Receivable)			
6		Key plug inserted.	Dedicated to mating designation (Blocked)		Dedicated to mating designation (Blocked)		Dedicated to mating designation (Blocked)			
7	Reserved.		Reserved.		Reserved.		Reserved.			
8	Reserved.		Reserved.		Reserved.		Reserved.			
9	DC +24V		Not used.		UR IN (com)	Status signal input showing that the pre-process machine is running in the automatic operation mode.	Same as left.			
10	PNP input (Judged as ON when the voltage is +24V.)		Not used.		UR IN (input)					
11	Relay contact output	Conducted / Closed when turned ON.	Not used.		LR OUT (output)	Status signal output showing that this machine is running in the automatic operation mode.	Same as left.			
12	Relay contact output		Not used.		LR OUT (output)					
13	Relay contact output	Conducted / Closed when turned ON.	Not used.		Not used.		LE OUT or LS OUT (output)	Machine-to-machine board standby status signal output to the pre-process machine or board carry-in priority lane selection signal output during dual-lane operation		
14	Relay contact output		Not used.		Not used.		LE OUT or LS OUT (output)			

*1 : The YS / YG series mounters have already been applicable to the ADVANCED GATE 2 specifications from the machines shipped in November, 2009. When connecting the YS / YG series mounter shipped before this date to the line, the machine (except for YS24) needs to be modified.

[GATE OUT] : When this machine is ready for operation, it outputs this board unloading request ON (conduct) signal to the pre-process machine.

[BUSY OUT] : This output signal informs the pre-process machine that this machine is loading a board.

[BA IN] : This input signal informs this machine that the pre-process machine is ready to unload a board. The pre-process machine output is a relay contact (dry contact : no-voltage circuit).

[UR IN] : This input signal informs this machine that the pre-process machine is running in automatic mode. The pre-process machine output is a relay contact (dry contact: no-voltage circuit).

[LR OUT] : This output signal informs the pre-process machine that this machine is running in automatic mode.

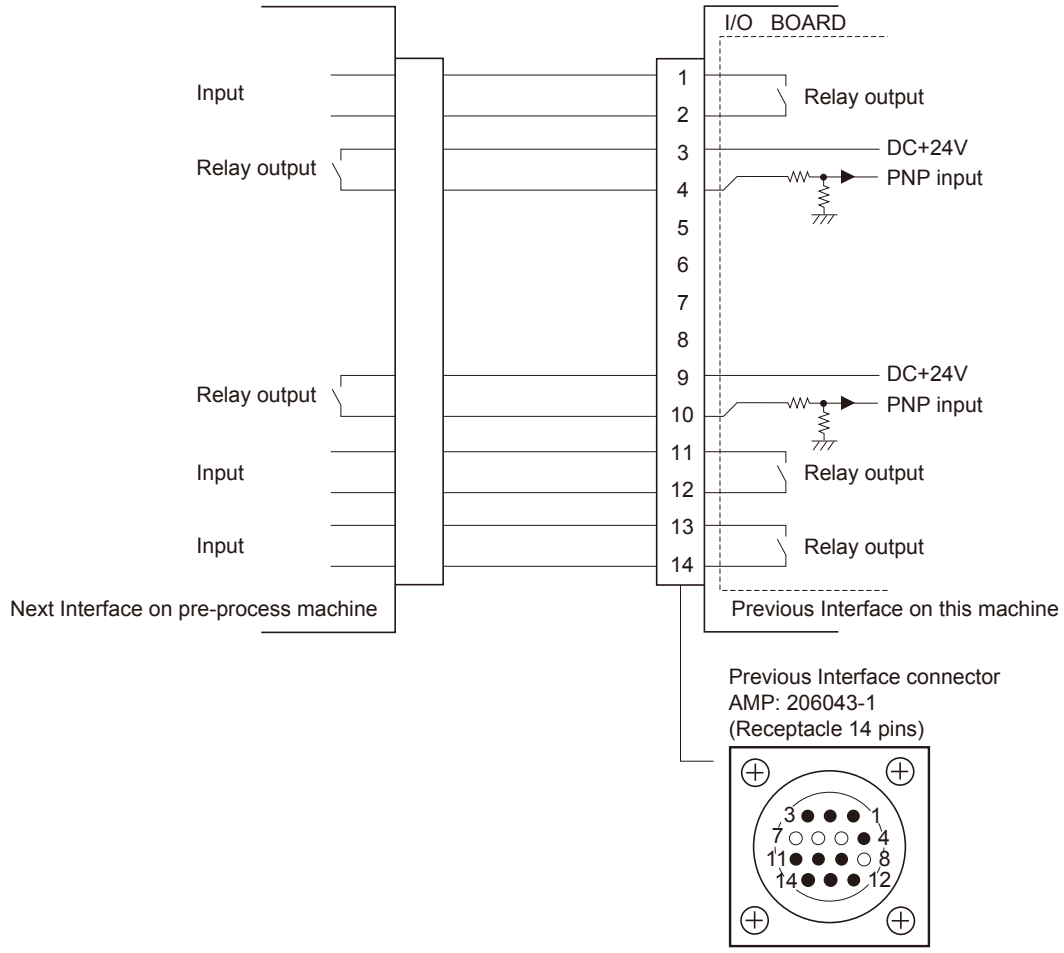
[LE OUT] : This signal is used for the Advanced (extended) GATE 2 specifications when the "inter-machine board standby function" used between mounters is enabled. This output signal informs the pre-process machine that a board is at the standby position between this machine and pre-process machine. The cable with a yellow marking put close to the connector should be used for the machine-to-machine cable.

[LS OUT] : This signal is used for the Advanced (extended) GATE 2 signal specifications only when the "priority lane signal output" setting is enabled.

When using the dual-lane, this output signal is used to select the priority lane on the pre-process machine that unloads the next board. (Example of pre-process machine: dual-lane branching conveyors, solder printers, etc.) The cable with a yellow marking put close to the connector should be used for the machine-to-machine cable.

Machine-to-machine signal specifications (between this machine and pre-process machine)

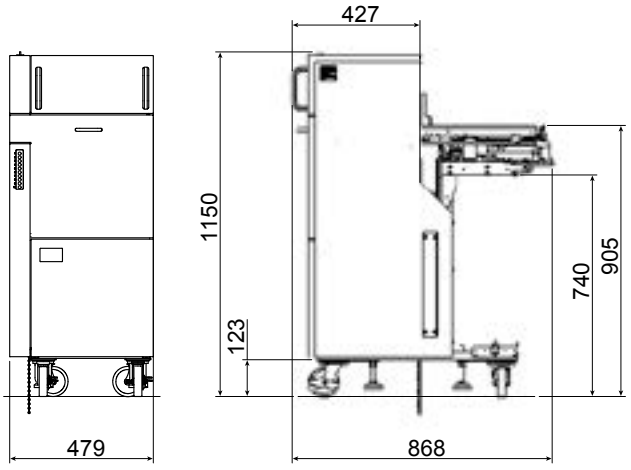
*** Previous Interface**

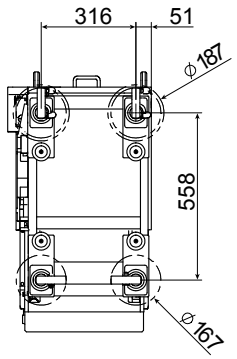


12.13 Carriage type tray supply unit

The cATS10 is compatible with the YSM20R-2 and YSM20R-1, and can be installed on the front and rear of the machine.

Unit	cATS10 (Carriage type tray supply unit)	
Type	**KLX-000, KLX-100**	
Outline dimensions	L480 x W870 x H1,150 mm	
Weight	Approx. 160kg	
Power supply / air supply source	Supplied from this machine	
Component pickup head	See the illustration on the following page.	
Component supply format	Tray loaded components	
Maximum tray size	L335 x W230mm	
Allowable height <Tray + components> * Height of mountable components depends on the head type. For details, see "11.5.1 Height of mountable components".	With a 12.5mm pallet pitch	8.5mm or less
	With a 25mm pallet pitch	20mm or less
	With a 37.5mm pallet pitch	32mm or less
Number of component types	Number of magazine racks that can be stored: 1 set Number of pallets that can be stored: Maximum of 10 * Each magazine rack can be replaced at a time.	
Maximum loading weight	Maximum loaading weight (940g) = Standard pallet (approx. 440g) + tray and electronic components (500g or less) * When special-order pallets are used, check the weight of each pallet itself.	





* The magazine racks and pallets are available in two types: standard type and IT-Option type (with barcode).

* The pallets used for the cATS are identical with the YS pallets.

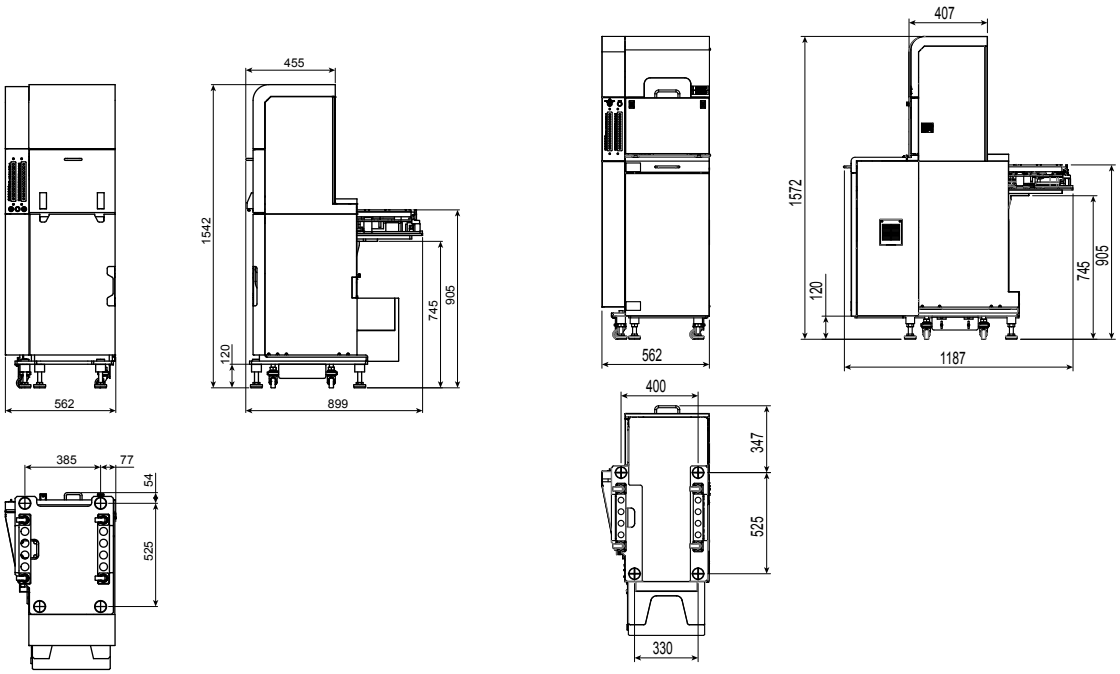
* One recovery pallet (option) can be used in each magazine rack.
Select using QFP recovery pallet in "1. Machine Configuration".

12.14 Fixed type tray supply unit

sATS30 and sATS30NS are compatible with the YSM20R-2 and YSM20R-1, and can be installed on the front and rear of the machine.

Unit	sATS30 (Fixed type tray supply unit)		sATS30NS (ATS for nonstop tray replacement)
Type	**KMA-000**		**KMH-000**
Outline dimensions	L562 x W899 x H1,542 mm		L562 x W1,187 x H1,542 mm
Weight	Approx. 250kg		Approx. 290kg
Power supply / air supply source	Supplied from this machine		
Component pickup head	See the illustration on the following page.		
Component supply format	Tray loaded components		
Compatible tray size	L335 x W230mm or smaller		
Allowable height <Tray + components> * Height of mountable components depends on the head type. For details, see "11.5.1 Height of mountable components".	With a 12.5mm pallet pitch	8.5mm or less	
	With a 25mm pallet pitch	20mm or less	
	With a 37.5mm pallet pitch	32mm or less	
Number of component types	Number of magazine racks that can be stored: 2 set Number of pallets that can be stored: Maximum of 30 * Each magazine rack can be replaced at a time.		Number of magazine racks that can be stored: 2 set Number of pallets that can be stored: Maximum of 30 * Allow pallet supply at any time by supply station.
Maximum loading weight	Maximum loaading weight (940g) = Standard pallet (approx. 440g) + tray and electronic components (500g or less) * When special-order pallets are used, check the weight of each pallet itself.		

sATS30 **sATS30NS**



* The magazine racks and pallets are available in two types: standard type and IT-Option type (with barcode).

* The pallets used for the cATS are identical with the YS pallets.

* One recovery pallet (option) can be used in each magazine rack.
Select using QFP recovery pallet in "1. Machine Configuration".

Relationship between the tray size / pallet area and the component pickup heads (Common cATS10 and sATS30)

YSM20R-2 HM head

Table B

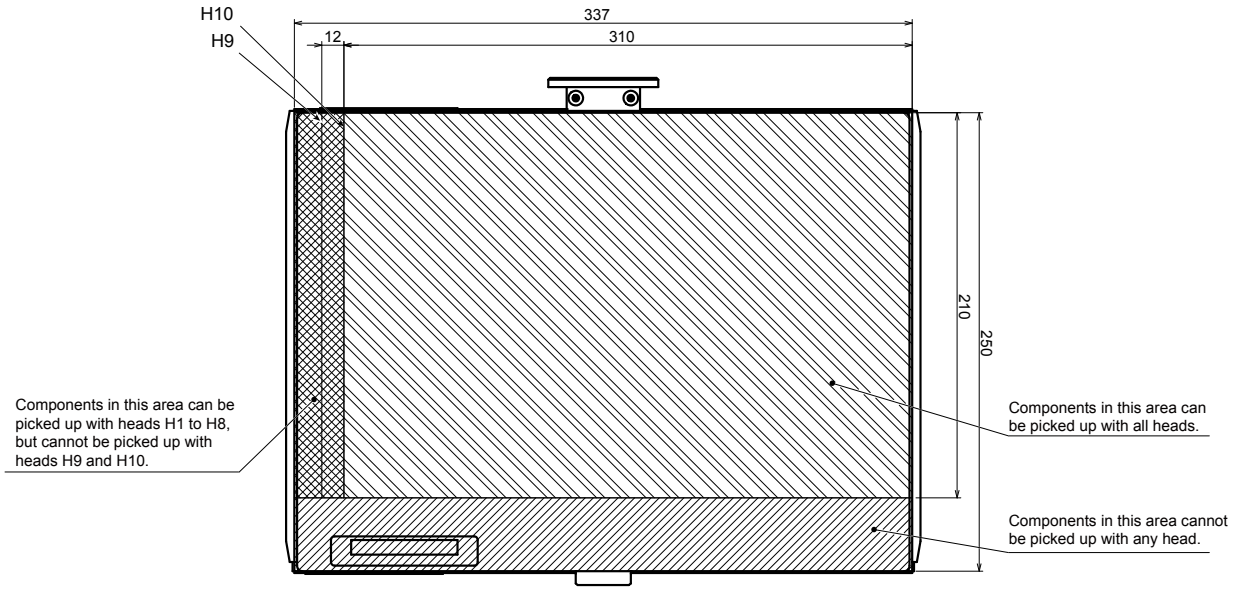
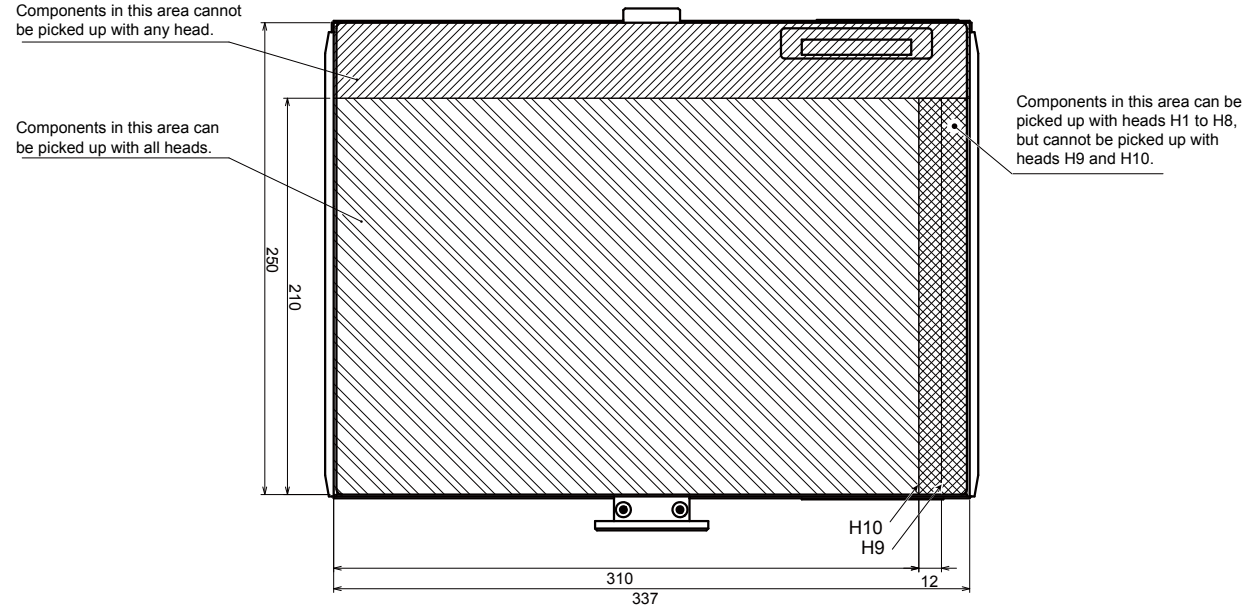


Table A



YSM20R-2 FM head

Table B

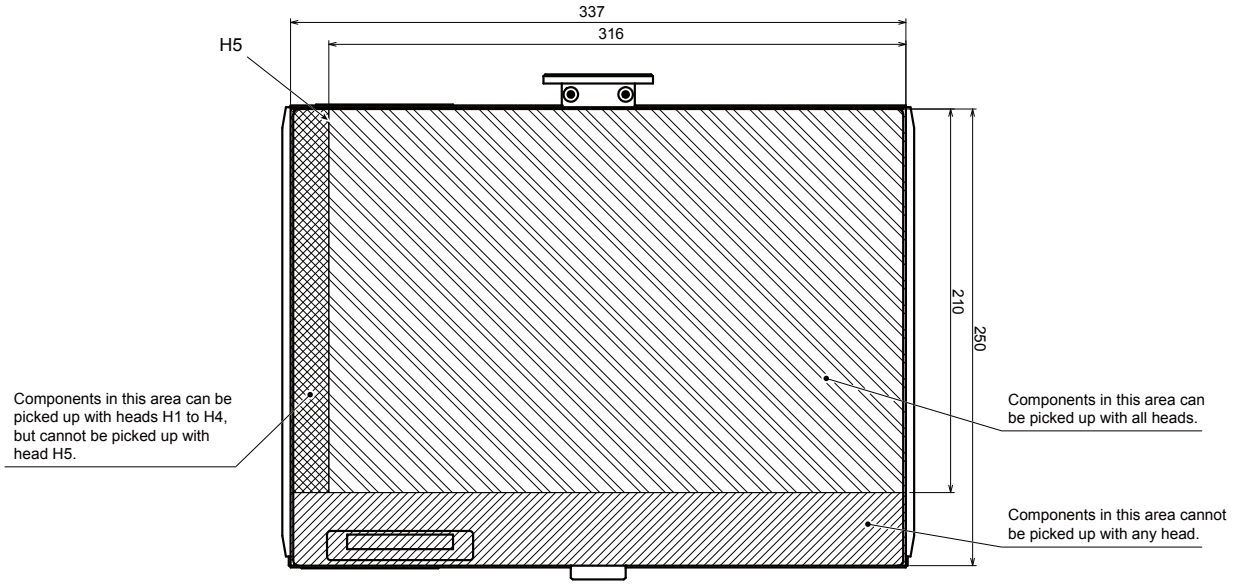
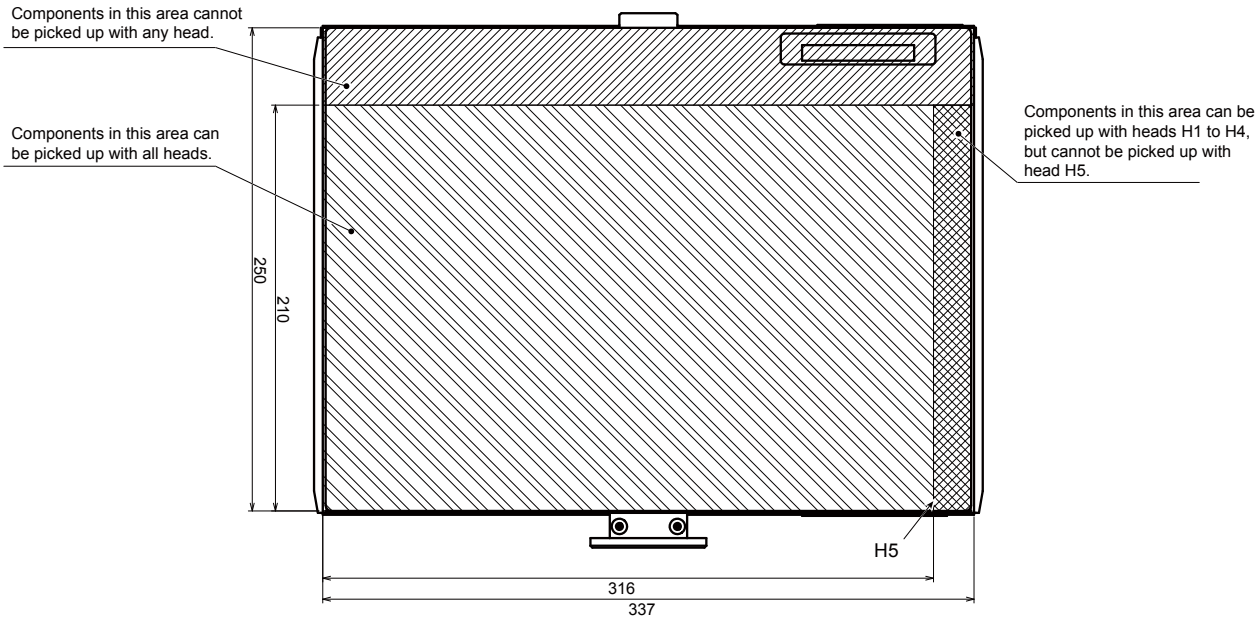
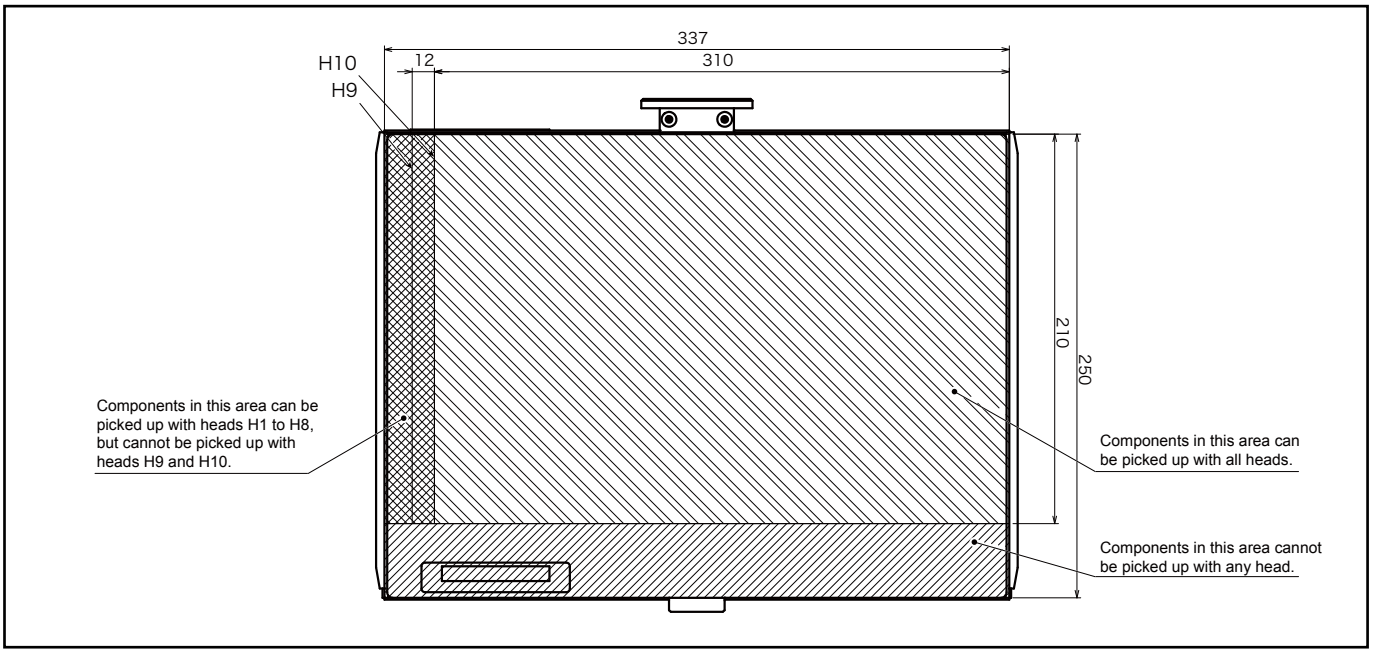


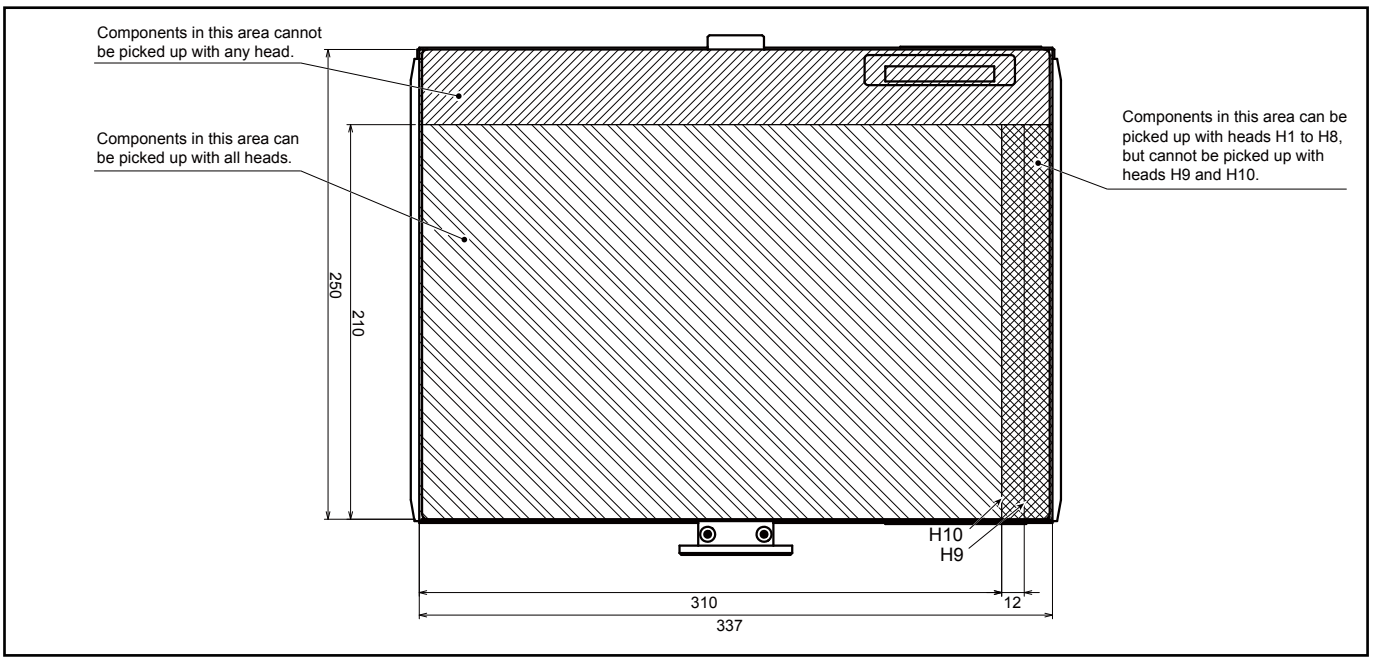
Table A



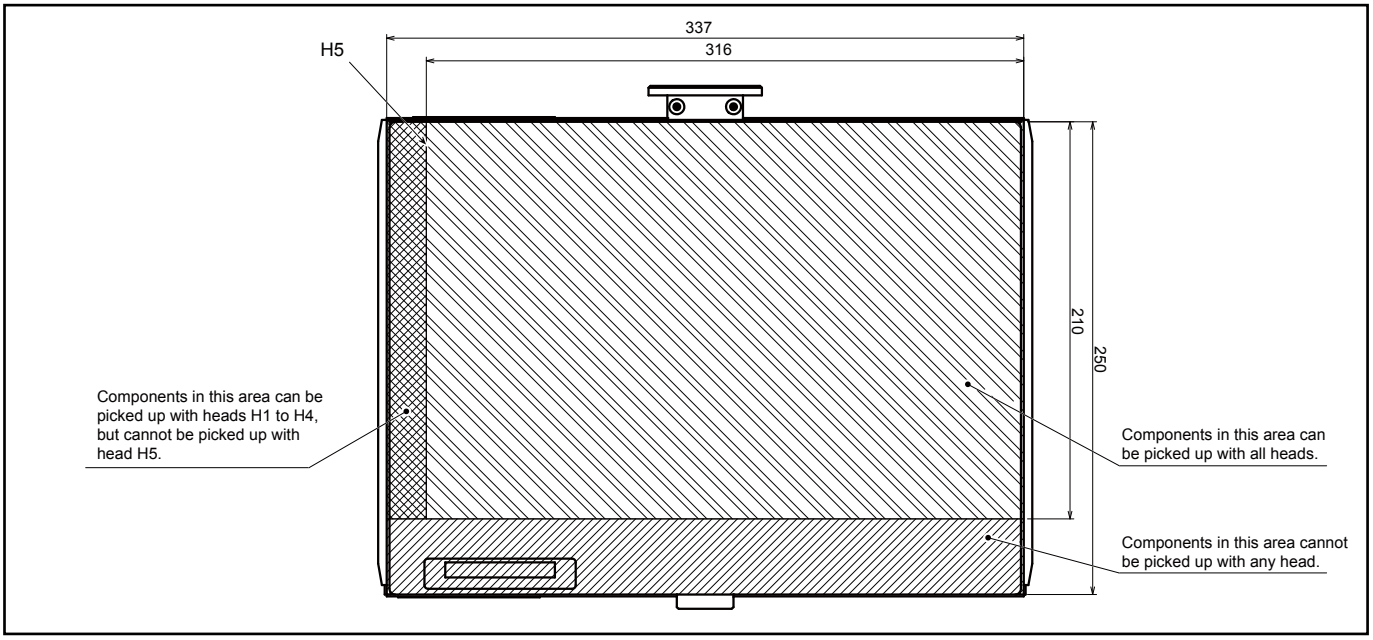
YSM20R-1 HM head Rear side



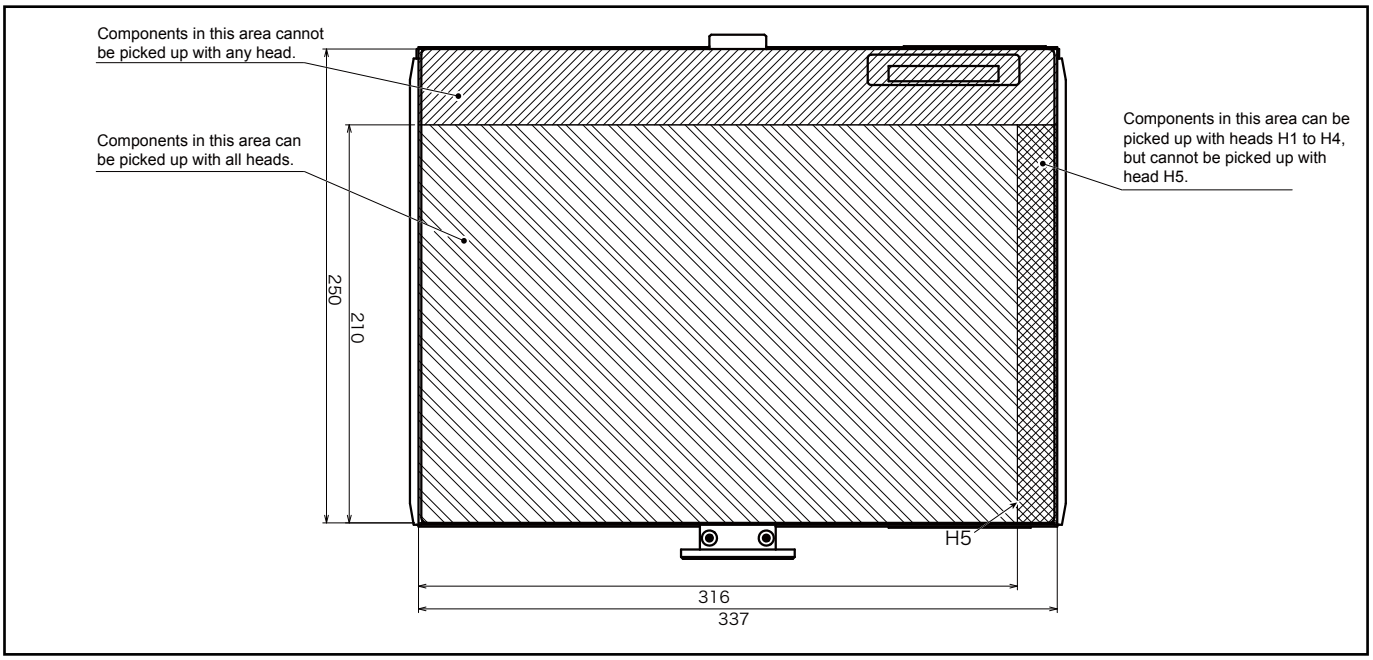
YSM20R-1 HM head Front side



YSM20R-1 FM head Rear side

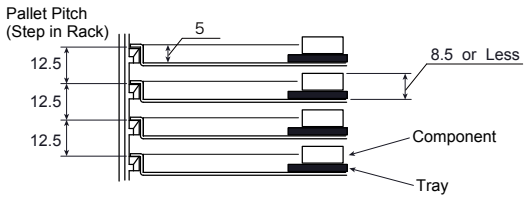


YSM20R-1 FM head Front side



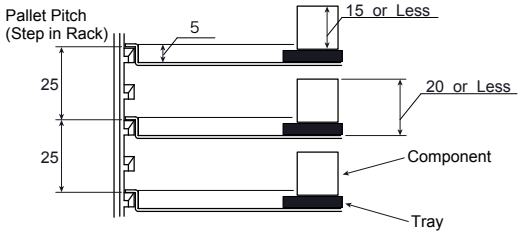
Allowable component height <tray + component> (Common cATS10, sATS30 and sATS30NS)

When pallet pitch is 12.5mm => 8.5mm or less



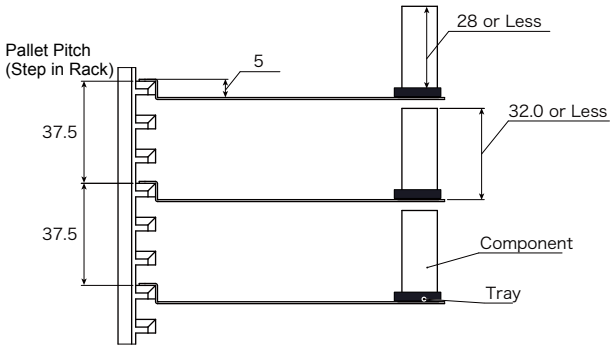
When pallet pitch is 25mm => 20mm or less

* Height must be 15mm or less when HM heads are used.

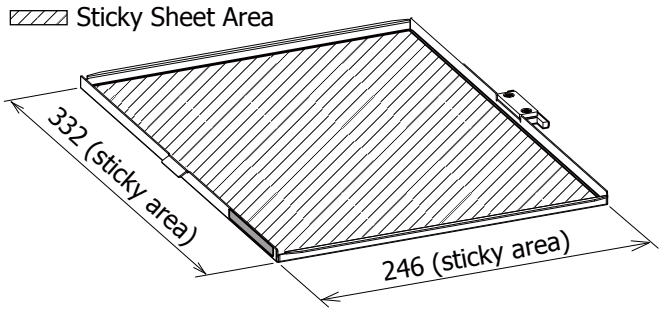


When pallet pitch is 37.5mm => 32mm or less

* This applies only to FM heads.

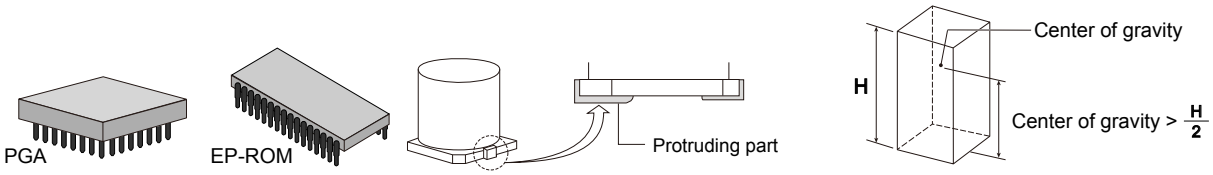


12.15 Recovery pallet



This pallet is used to collect defective components detected by the image recognition system without discarding them. One recovery pallet can be set per magazine rack. Note that this reduces the number of pallets used for component supply.
An adhesive resin sheet attached on the surface of the recovery pallet temporarily holds the components that were returned and placed on the recovery pallet.

Default setting for the number of components that can be collected: 18
The components like those shown below will not be collected, because it is difficult to hold them on the adhesive sheet on the recovery pallet.



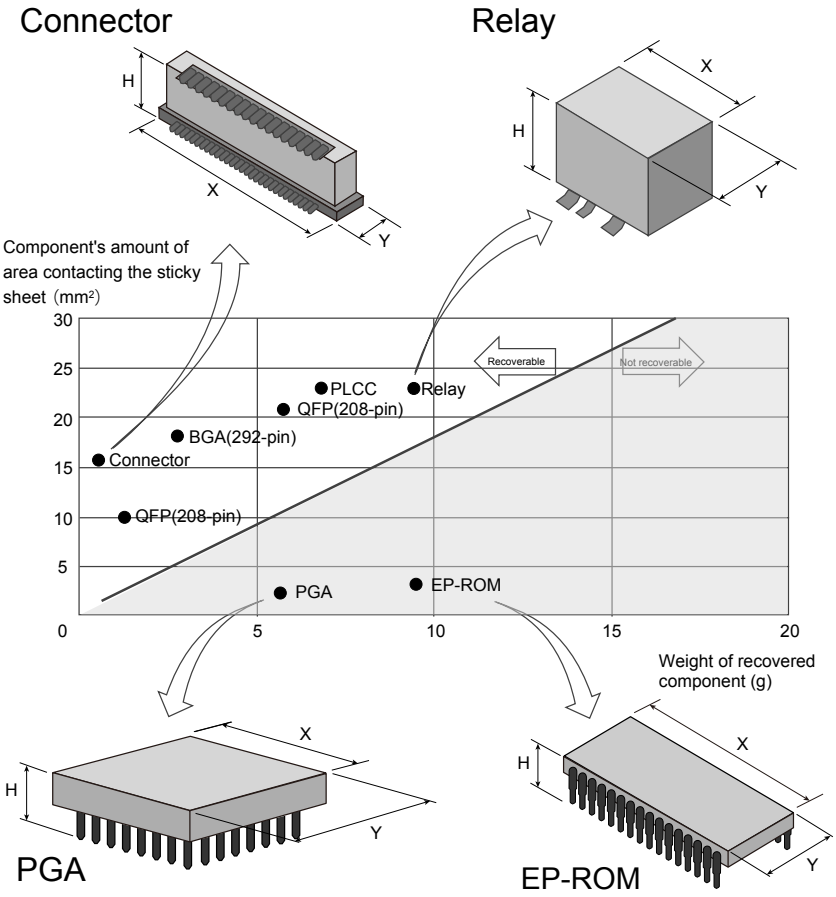
The graph and table on the next page show a general guide for components that can be collected or not. This mainly depends on the component weight and the area that makes contact with the adhesive sheet.

Recoverable component size: ⇒ 5 x 5mm to 45 x 45mm *

* A setting change is required for components larger than this. A setting to accommodate larger components will reduce the number of components which can be recovered.

Recoverable component height: ⇒ H8.5mm or less (pallet pitch of 12.5mm)
H15mm or less (pallet pitch of 25mm)

Relationship of component's weight and the amount of area which contacts the sticky sheet



	Component name	X(mm)	Y(mm)	Height H (mm)	Weight (g)	Contact area (mm^2)	Remarks
Compatible component examples	PLCC	30.0	30.0	4.3	6.8	21.0	
	Relay	18.8	12.8	14.2	8.7	23.0	See figure above.
	QFP208pin	30.6	30.6	4.1	5.5	21.0	
	BGA292pin	27.0	27.0	2.2	2.7	17.9	
	Connector	22.5	3.5	5.8	0.8	15.4	See figure above.
	QFP100pin	24.7	18.7	2.9	1.7	10.0	

	Component name	X(mm)	Y(mm)	Height H (mm)	Weight (g)	Contact area (mm^2)	Remarks
Incompatible component examples	PGA	25.0	25.0	8.2	5.8	2.4	See figure above.
	EP ROM	35.7	14.7	7.1	8.8	3.9	See figure above.

13. References and details

13.1 Layout configuration

The layout is composed of items ① to ⑪ shown below.

YSM20R-2 - HM - HM - R - F - DS - 2 - F64/64 - N - N - #009#BN
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

Layout

No.	Item	Remarks
①	Frame beam type	YSM20R-2 : 2 beams YSM20R-1 : 1beams
②	Head A	HM : HM head FM : FM head
③	Head B	HM : HM head FM : FM head N : None
④	Conveyor entrance	R : Right L : Left
⑤	Conveyor reference	F : Front R : Rear
⑥	Conveyor type	DS : Dual stage SL3 : Single lane (L360) SL5 : Single lane (L510)
⑦	Number of multi-view cameras	N : None 1A : A (front) side 1B : B (rear) side 2 : Front/rear
⑧	Feeder specficaitions	F64 / 64 : 32-feeder carriage x 4 F32 / 64 : 32-feeder carriage, 1 on front and 2 on rear F64 / 32 : 32-feeder carriage, 2 on front and 1 on rear F32 / 32 : 32-feeder carriage, 1 on front and 1 on rear N70 / 70 : 70-feeder fixed plate on front and rear
⑨	Conveyor length	N : Standard 1374mm E1 : Entrance extension 1559mm E2 : Exit extension 1559mm E3 : Both 1744mm S : Special order
⑩	Tray Supply	N : None CF : cATS10 (Front) CR : cATS10 (Rear) C2 : cATS10 (Front and Rear) SF : sATS30 (Front) SR : sATS30 (Rear) S2 : sATS30 (Front and Rear) SC : sATS30 (Front) / cATS10 (Rear) CS : cATS10 (Front) / sATS30 (Rear) NF : sATS30NS (Front) NR : sATS30NS (Rear) N2 : sATS30NS (Front and Rear) NC : sATS30NS (Front) / cATS10 (Rear) CN : cATS10 (Front) / sATS30NS (Rear) SN : sATS30 (Front) / sATS30NS (Rear) NS : sATS30NS (Front) / sATS30 (Rear) Special order : Other than those above
⑪	Type	#xxx#xx

* Rear conveyor reference is a special order item.

Layouts list (2 Beam)

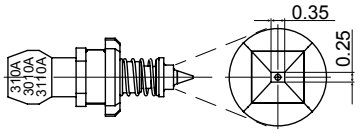
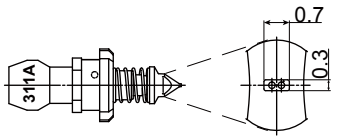
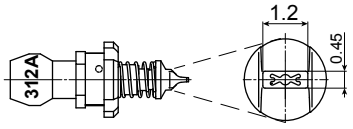
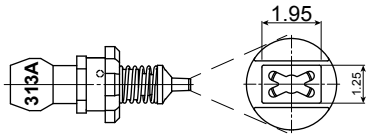
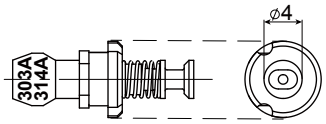
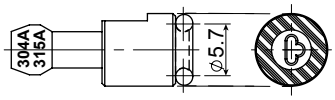
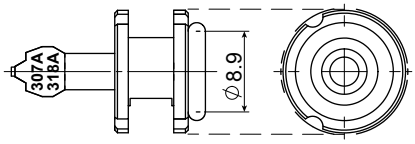
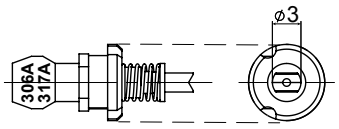
Layouts No.	Maximum PCB size	Conveyor entrance	Conveyor reference	Number of multi camera	Feeder bank Composition	Conveyor type	Conveyor length	Tray feeder
#001	L510mm × W490mm (Option : L810mm ×W490mm) or L360mm × W490mm	Right	Front	None 1 : Front 1 : Rear 2 : Both	F64 / 64	Single Lane	1,374mm (Normal) 1,559mm (Entrance extension) 1,559mm (Exit extension) 1,744mm (Both)	None
#002					F32 / 64			cATS10 (Front)
#003					F64 / 32			cATS10 (Rear)
#004					F32 / 32			cATS10 (Both)
#005					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#006					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#007					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#008					N70 / 70			None
#00S					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#00T								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)
#009	L810mm x W490mm				F64 / 64	Dual Stage		None
#00A					F32 / 64			cATS10 (Front)
#00B					F64 / 32			cATS10 (Rear)
#00C					F32 / 32			cATS10 (Both)
#00D					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#00E					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#00F					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#00G					N70 / 70			None
#00U					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#00V								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)

Layouts No.	Maximum PCB size	Conveyor entrance	Conveyor reference	Number of multi camera	Feeder bank Composition	Conveyor type	Conveyor length	Tray feeder
#011	L510mm × W490mm (Option : L810mm ×W490mm) or L360mm × W490mm	Left	Front	None 1 : Front 1 : Rear 2 : Both	F64 / 64	Single Lane	1,374mm (Normal) 1,559mm (Entrance extension) 1,559mm (Exit extension) 1,744mm (Both)	None
#012					F32 / 64			cATS10 (Front)
#013					F64 / 32			cATS10 (Rear)
#014					F32 / 32			cATS10 (Both)
#015					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#016					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#017					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#018					N70 / 70			None
#01S					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#01T								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)
#019	L810mm x W490mm				F64 / 64	Dual Stage		None
#01A					F32 / 64			cATS10 (Front)
#01B					F64 / 32			cATS10 (Rear)
#01C					F32 / 32			cATS10 (Both)
#01D					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#01E					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#01F					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#01G					N70 / 70			None
#01U					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#01V								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)

Layouts list (1 Beam)

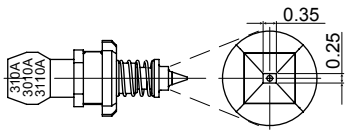
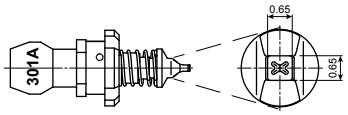
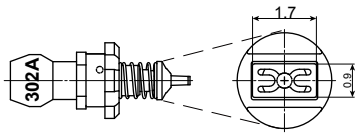
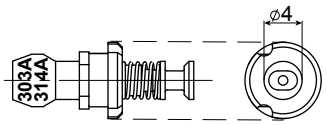
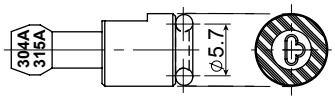
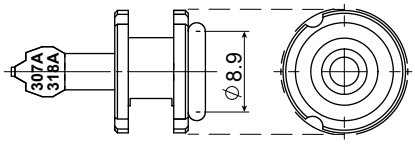
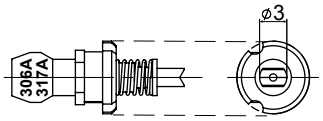
Layouts No.	Maximum PCB size	Conveyor entrance	Conveyor reference	Number of multi camera	Feeder bank Composition	Conveyor type	Conveyor length	Tray feeder
#101	L510mm × W490mm (Option : L810mm ×W490mm) or L360mm × W490mm	Right	Front	None 1 : Front 1 : Rear 2 : Both	F64 / 64	Single Lane	1,374mm (Normal) 1,559mm (Entrance extension) 1,559mm (Exit extension) 1,744mm (Both)	None
#102					F32 / 64			cATS10 (Front)
#103					F64 / 32			cATS10 (Rear)
#104					F32 / 32			cATS10 (Both)
#105					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#106					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#107					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#108					N70 / 70			None
#10S					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#10T								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)
#111		Left			F64 / 64			None
#112					F32 / 64			cATS10 (Front)
#113					F64 / 32			cATS10 (Rear)
#114					F32 / 32			cATS10 (Both)
#115					F32 / 64			sATS30 (Front) or sATS30NS (Front)
#116					F64 / 32			sATS30 (Rear) or sATS30NS (Rear)
#117					F32 / 32			sATS30 (Front) or sATS30NS (Front) / sATS30 (Rear) or sATS30NS (Rear)
#118					N70 / 70			None
#11S					F32 / 32			sATS30 (Front) or sATS30NS (Front) / cATS10 (Rear)
#11T								cATS10 (Front) / sATS30 (Rear) or sATS30NS (Rear)

13.2 Nozzle

"Narrow-pitch" 31X nozzle				Parts number
Type	Outer shape	Applicable Components (mm)	Applicable Components (inch)	
3110A		0402 dedicated	01005 dedicated	KHY-M77A0-A0X, NZL.310 / 3010 / 3110
311A		0603 dedicated	0201 dedicated	KHY-M7710-A4X, NOZZLE 311A ASSY.
312A		1005 1608 * Default setting	0402 0603	KHY-M7720-A3X, NOZZLE 312A ASSY.
313A		2012 3216 3225	0805 1206 1210	KHY-M7730-A2X, NOZZLE 313A ASSY.
314A		SOP		KHY-M7740-A0X, NOZZLE 303A / 314A AS.
315A		QFP (□32mm or less)		KHY-M7750-A0X, NOZZLE 304A / 315A AS.
318A		Large component (□32mm to 45X100mm) * HM head can be attached only H3 / H8		KHY-M7780-A0X, NOZZLE 307A / 318A AS.
317A		Cylindrical components * With V-cut		KHY-M7770-A0X, NOZZLE 306A / 317A AS.

* Select either nozzle for the head to be used. The nozzle must be selected exclusively.

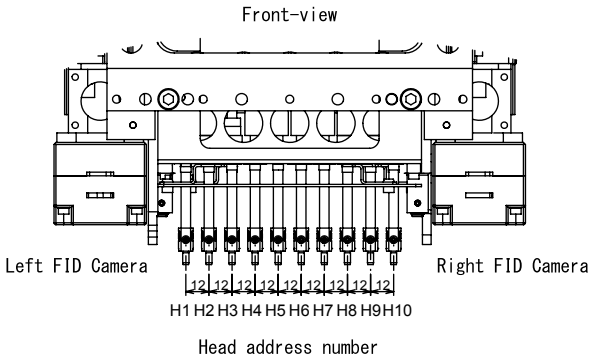
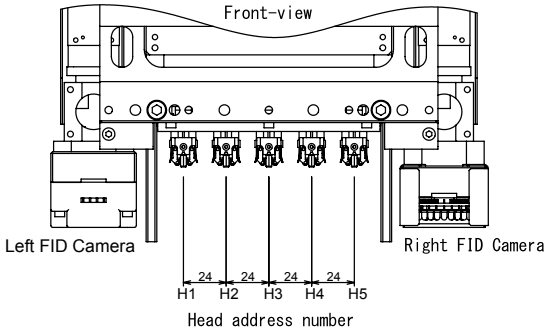
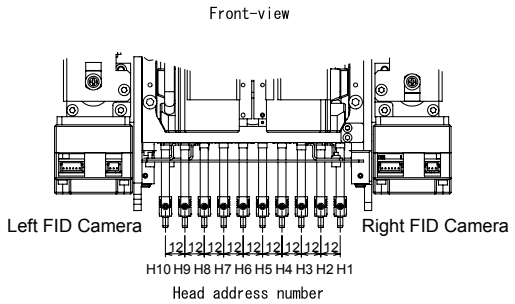
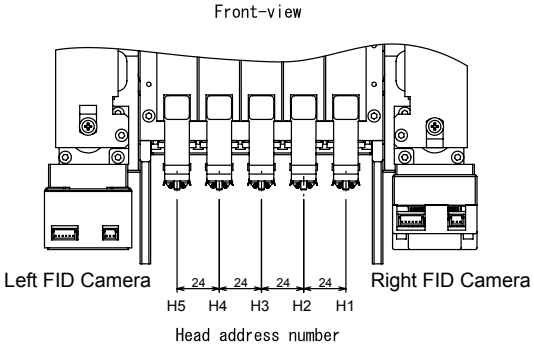
* According to the restrictions on operating program, 31X nozzle and 30X nozzle cannot be mixed within one head.

Standard 30X nozzle				Parts number
Type	Outer shape	Applicable Components (mm)	Applicable Components (inch)	
3010A		0402 dedicated	01005 dedicated	KHY-M77A0-A0X, NZL.310 / 3010 / 3110
301A		0603 1005 * Default setting	0201 0402	KHN-M7710-A4X, NOZZLE 301A ASSY.
302A		1608 2012 3216	0603 0805 1206	KHN-M7720-A3X, NOZZLE 302A ASSY.
303A		SOP		KHY-M7740-A0X, NOZZLE 303A / 314A AS.
304A		QFP (□32mm or less)		KHY-M7750-A0X, NOZZLE 304A / 315A AS.
307A		Large component (□32mm to 45X100mm) * HM head can be attached only H3 / H8		KHY-M7780-A0X, NOZZLE 307A / 318A AS.
306A		Cylindrical components * With V-cut		KHY-M7770-A0X, NOZZLE 306A / 317A AS.

* Select either nozzle for the head to be used. The nozzle must be selected exclusively.

* According to the restrictions on operating program, 31X nozzle and 30X nozzle cannot be mixed within one head.

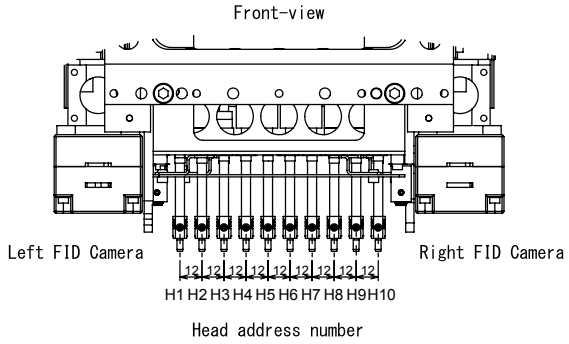
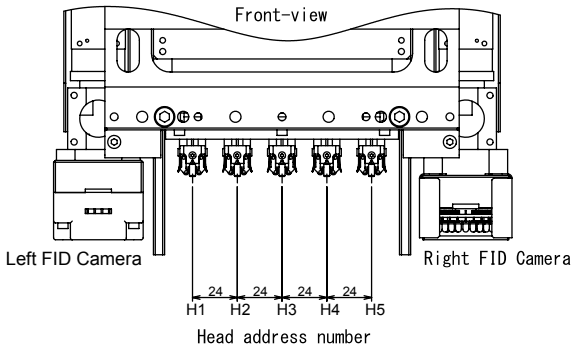
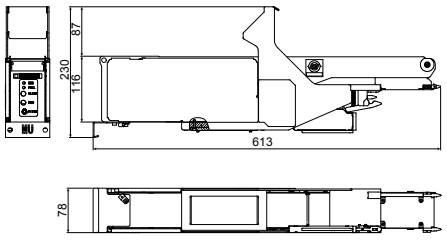
Installation nozzle (2-beam specs.)

Item	Details
Installation nozzle * Write when no nozzle station is provided. * According to the restrictions on operating program, 31X nozzle and 30X nozzle cannot be mixed within one head. * The initial setting is either 312A or 301A. * For narrow pitch mounting, install 312A nozzles for the number of heads. For standard pitch mounting, install 301A nozzles for the number of heads. (When no nozzle station is provided.)	Front head * Table A HM head  FM head  Rear head * Table B HM head  FM head 

Type	Outer shape	Applicable (Metric)
"Narrow-pitch" 31X nozzle	3110A	0402
	311A	0603
	312A	1005 / 1608
	313A	2012 / 3216 / 3225
	314A	SOP
	315A	QFP(□32mm or less)
	318A	QFP * HM head can be attached only H2 / H8
	317A	Cylindrical components
Standard 30X nozzle	3010A	0402
	301A	0603 / 1005
	302A	1608 / 2012 / 3216
	303A	SOP
	304A	QFP(□32mm or less)
	307A	QFP * HM head can be attached only H2 / H8
	306A	Cylindrical components

Installation nozzle (1-beam specs.)

<table>
<tr><th>Item</th><th>Details</th></tr>
<tr><td rowspan="5">Installation nozzle
* Write when no nozzle station is provided.
* According to the restrictions on operating program, 31X nozzle and 30X nozzle cannot be mixed within one head.
* The initial setting is either 312A or 301A.
* For narrow pitch mounting, install 312A nozzles for the number of heads. For standard pitch mounting, install 301A nozzles for the number of heads. (When no nozzle station is provided.)

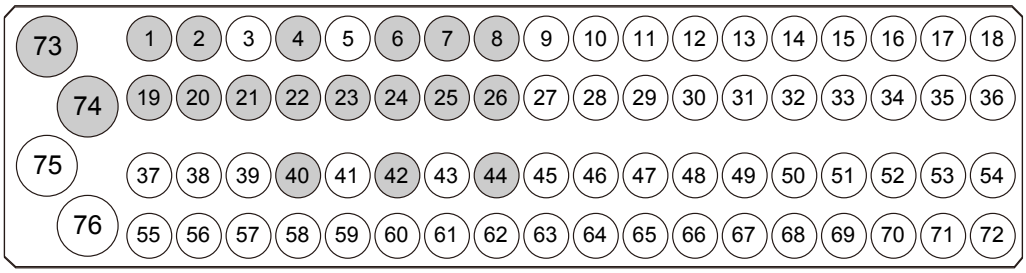
<table>
<tr><th>Type</th><th>Outer shape</th><th>Applicable (Metric)</th></tr>
<tr><td rowspan="8">"Narrow-pitch" 31X nozzle</td><td>3110A</td><td>0402</td></tr>
<tr><td>311A</td><td>0603</td></tr>
<tr><td>312A</td><td>1005 / 1608</td></tr>
<tr><td>313A</td><td>2012 / 3216 / 3225</td></tr>
<tr><td>314A</td><td>SOP</td></tr>
<tr><td>315A</td><td>QFP(□32mm or less)</td></tr>
<tr><td>318A</td><td>QFP
* HM head can be attached only H2 / H8</td></tr>
<tr><td>317A</td><td>Cylindrical components</td></tr>
<tr><td rowspan="8">Standard 30X nozzle</td><td>3010A</td><td>0402</td></tr>
<tr><td>301A</td><td>0603 / 1005</td></tr>
<tr><td>302A</td><td>1608 / 2012 / 3216</td></tr>
<tr><td>303A</td><td>SOP</td></tr>
<tr><td>304A</td><td>QFP(□32mm or less)</td></tr>
<tr><td>307A</td><td>QFP
* HM head can be attached only H2 / H8</td></tr>
<tr><td>306A</td><td>Cylindrical components</td></tr>
</table>
</td><td>Head</td></tr>
<tr><td>HM head</td></tr>
<tr><td> 
</td></tr>
<tr><td>FM head</td></tr>
<tr><td> 
</td></tr>
<tr><td>Automatic Push-up Pin Exchange System
(Matrix Type)</td><td>None (Standard)</td></tr>
<tr><td></td><td>Provided. (Option)
Standard number of push-up pins
Dual Stage 80pics (20 pics / pin stations, 4 pin stations)
Single Lane 40pics (20 pics / pin stations, 2 pin stations)</td></tr>
<tr><td rowspan="2">QFP recovery conveyor
 

<u>Applicable component height</u>
HM head (Max. component height, 15 mm)
70-feeder fixed, ZS carriage, SS carriage: 15 mm or less
FM head (Max. component height, 28 mm)
70-feeder fixed, SS carriage: 28 mm or less
ZS carriage: 15 mm or less
* For combinations other than those shown above, consult your distributor.</td><td>KLF-M9400-01X, Dump Station Assy.MU
* Counter specs. (C-specs.)
* The permissible quantity can be set.</td></tr>
<tr><td>KLF-M9400-11X, Dump Station Assy.MU
* Sensor specs. (S-specs.)
* "Full" sensor / the permissible quantity can be set.</td></tr>
</table>

13.3 Nozzle station

13.3.1 For HM Head Nozzle station (2-beam specs.)

Each table uses one nozzle station. Each of the front and rear nozzle stations can be installed selectively.
The same head numbers that correspond to each station number are applied to the A table and B table.



Front Side

: Custom-order Area

No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
1	-	Custom-order	
2			
3	1	Type304A	Type315A
4	-	Custom-order	
5	3	Type304A	Type315A
6	-	Custom-order	
7			
8			
9	1	Type303A	Type314A
10	2		
11	3		
12	4		
13	5		
14	6		
15	7		
16	8		
17	9		
18	10		
19	-	Custom-order	
20			
21			
22			
23			
24			
25			
26			
27	1	Type302A	Type313A
28	2		
29	3		
30	4		
31	5		
32	6		
33	7		
34	8		
35	9		
36	10		
37	1	Type3010A	Type3110A
38	2		

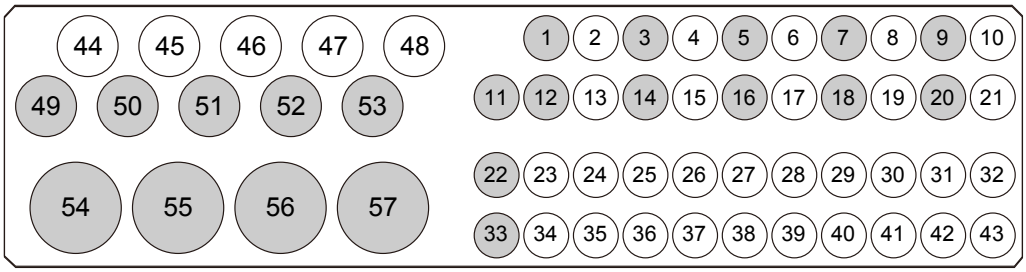
No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
39	5	Type304A	Type315A
40	-	Custom-order	
41	7	Type304A	Type315A
42	-	Custom-order	
43	9	Type304A	Type315A
44	-	Custom-order	
45	1	Type301A	Type312A
46	2		
47	3		
48	4		
49	5		
50	6		
51	7		
52	8		
53	9		
54	10		
55	3	Type3010A	Type3110A
56	4		
57	5		
58	6		
59	7		
60	8		
61	9		
62	10		
63	1	Custom-order	Type311A
64	2		
65	3		
66	4		
67	5		
68	6		
69	7		
70	8		
71	9		
72	10		
73	-	φ13.5 Custom-order	
74			
75	3	Type307A	Type318A
76	8		

* "-" described above shows that there is no initial setting.

* The head numbers corresponding to the station number are different from those of the 1-beam specifications.

13.3.2 For FM Head Nozzle station (2-beam specs.)

Each table uses one nozzle station. Each of the front and rear nozzle stations can be installed selectively. The same head numbers that correspond to each station number are applied to the A table and B table.



Front Side

: Custom-order Area

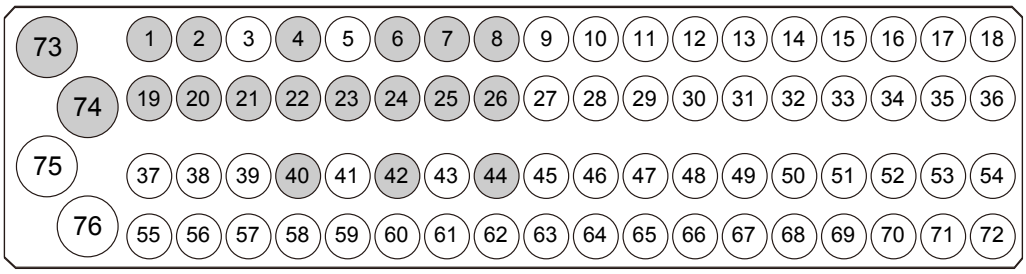
No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
1	-	Custom-order	
2	1	Type303A	Type314A
3	-	Custom-order	
4	2	Type303A	Type314A
5	-	Custom-order	
6	3	Type303A	Type314A
7	-	Custom-order	
8	4	Type303A	Type314A
9	-	Custom-order	
10	5	Type303A	Type314A
11	-	Custom-order	
12	-		
13	1	Type302A	Type313A
14	-	Custom-order	
15	2	Type302A	Type313A
16	-	Custom-order	
17	3	Type302A	Type313A
18	-	Custom-order	
19	4	Type302A	Type313A
20	-	Custom-order	
21	5	Type302A	Type313A
22	-	Custom-order	
23	1	Type304A	Type315A
24	1	Type301A	Type312A
25	2	Type304A	Type315A
26	2	Type301A	Type312A
27	3	Type304A	Type315A
28	3	Type301A	Type312A
29	4	Type304A	Type315A

No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
30	4	Type301A	Type312A
31	5	Type304A	Type315A
32	5	Type301A	Type312A
33	-	Custom-order	
34	1	Type3010A	Type3110A
35	1	Custom-order	Type311A
36	2	Type3010A	Type3110A
37	2	Custom-order	Type311A
38	3	Type3010A	Type3110A
39	3	Custom-order	Type311A
40	4	Type3010A	Type3110A
41	4	Custom-order	Type311A
42	5	Type3010A	Type3110A
43	5	Custom-order	Type311A
44	1	Type307A	Type318A
45	2		
46	3		
47	4		
48	5		
49	-	φ13.5 Custom-order	
50			
51			
52			
53			
54		φ25 Custom-order	
55			
56			
57			

* "-" described above shows that there is no initial setting.

* The head numbers corresponding to the station number are different from those of the 1-beam specifications.

13.3.3 For HM Head Nozzle station (1-beam specs.)



Front Side

: Custom-order Area

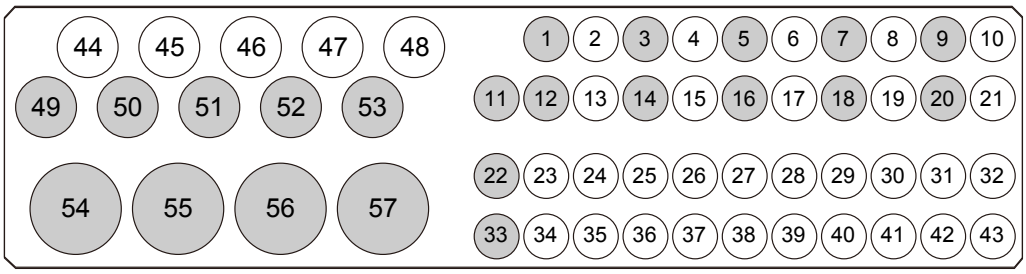
No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
1	-	Custom-order	
2			
3	9	Type304A	Type315A
4	-	Custom-order	
5	7	Type304A	Type315A
6	-	Custom-order	
7			
8			
9	10	Type303A	Type314A
10	9		
11	8		
12	7		
13	6		
14	5		
15	4		
16	3		
17	2		
18	1		
19	-	Custom-order	
20			
21			
22			
23			
24			
25			
26			
27	10	Type302A	Type313A
28	9		
29	8		
30	7		
31	6		
32	5		
33	4		
34	3		
35	2		
36	1		
37	10	Type3010A	Type3110A
38	9		

No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
39	5	Type304A	Type315A
40	-	Custom-order	
41	3	Type304A	Type315A
42	-	Custom-order	
43	1	Type304A	Type315A
44	-	Custom-order	
45	10	Type301A	Type312A
46	9		
47	8		
48	7		
49	6		
50	5		
51	4		
52	3		
53	2		
54	1		
55	8	Type3010A	Type3110A
56	7		
57	6		
58	5		
59	4		
60	3		
61	2		
62	1		
63	10	Custom-order	Type311A
64	9		
65	8		
66	7		
67	6		
68	5		
69	4		
70	3		
71	2		
72	1		
73	-	φ13.5 Custom-order	
74			
75	8	Type307A	Type318A
76	3		

* "-" described above shows that there is no initial setting.

* The head numbers corresponding to the station number are different from those of the 2-beam specifications.

13.3.4 For FM Head Nozzle station (1-beam specs.)



Front Side

: Custom-order Area

No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
1	-	Custom-order	
2	5	Type303A	Type314A
3	-	Custom-order	
4	4	Type303A	Type314A
5	-	Custom-order	
6	3	Type303A	Type314A
7	-	Custom-order	
8	2	Type303A	Type314A
9	-	Custom-order	
10	1	Type303A	Type314A
11	-	Custom-order	
12	-		
13	5	Type302A	Type313A
14	-	Custom-order	
15	4	Type302A	Type313A
16	-	Custom-order	
17	3	Type302A	Type313A
18	-	Custom-order	
19	2	Type302A	Type313A
20	-	Custom-order	
21	1	Type302A	Type313A
22	-	Custom-order	
23	5	Type304A	Type315A
24	5	Type301A	Type312A
25	4	Type304A	Type315A
26	4	Type301A	Type312A
27	3	Type304A	Type315A
28	3	Type301A	Type312A
29	2	Type304A	Type315A

No.	Head No.	Nozzle Type	
		Standard	Narrow-pitch
30	2	Type301A	Type312A
31	1	Type304A	Type315A
32	1	Type301A	Type312A
33	-	Custom-order	
34	5	Type3010A	Type3110A
35	5	Custom-order	Type311A
36	4	Type3010A	Type3110A
37	4	Custom-order	Type311A
38	3	Type3010A	Type3110A
39	3	Custom-order	Type311A
40	2	Type3010A	Type3110A
41	2	Custom-order	Type311A
42	1	Type3010A	Type3110A
43	1	Custom-order	Type311A
44	5	Type307A	Type318A
45	4		
46	3		
47	2		
48	1		
49	-	φ13.5 Custom-order	
50			
51			
52			
53			
54		φ25 Custom-order	
55			
56			
57			

* "-" described above shows that there is no initial setting.

* The head numbers corresponding to the station number are different from those of the 2-beam specifications.

13.4 Feeder

13.4.1 ZS Feeder

Details		
ZS feeder 4mm wide (KLJ-MCN00-00X, ZS FEEDER ASSY. 4MM)		
Dimensions and weight of feeder	Length 507mm, Height 228mm, Width 11.5mm	
	Weight 1.10Kg	
Applicable carrier tape specifications	Width 4mm, Maximum thickness 0.4mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 1mm	
	Feed pitch setting 1mm	
Applicable reel specifications	Width 7.95mm or less, 180mm or less	
Empty tape feed groove	Width 1.7mm, Depth1.7mm	
8mm-converted installation occupied width	12mm pitch	1
	16mm pitch	1
ZS feeder 8mm wide (KLJ-MC100-00X, ZS FEEDER ASSY. 8MM) * ZS feeder 8mm-tape guide is a part dedicated to the ZS feeder. (SS feeder 8mm-tape guide is not allowed to install.)		
Dimensions and weight of feeder	Length 507mm, Height 228mm, Width 11.5mm	
	Weight 0.95Kg	
Applicable carrier tape specifications	Width 8mm, Maximum thickness 1.0mm	
	Material Paper / Emboss	
	Convex emboss pocket, Maximum size 3mm	
	Feed pitch setting 1mm / 2mm / 4mm / 8mm	
Applicable reel specifications	Width 14.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 4.6mm, Depth 3.2mm	
8mm-converted installation occupied width	12mm pitch	1
	16mm pitch	1
ZS feeder 12 / 16mm wide (KLJ-MC200-00X, ZS FEEDER ASSY. 12 / 16MM) *Tape guide is replaced with an included one (GUIDE12) to make the feeder width applicable to 12mm / 16mm.		
Dimensions and weight of feeder	Length 507mm, Height 228mm, Width 23.5mm	
	Weight 1.31Kg	
Applicable carrier tape specifications	12mm Width	Width 12mm, Maximum thickness 1.0mm
		Material Paper / Emboss
	16mm Width	Width 16mm, Maximum thickness 0.8mm
		Material Emboss
	Convex emboss pocket, Maximum size 15mm	
	Feed pitch setting 2mm / 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm	
Applicable reel specifications	12mm Width	Width 18.4mm or less, ϕ 382mm or less
	16mm Width	Width 22.4mm or less, ϕ 382mm or less
Empty tape feed groove	12mm Width	Width 8.3mm, Depth 17mm
	16mm Width	Width 11.9mm, Depth 17mm
8mm-converted installation occupied width	12mm pitch	2
	16mm pitch	2

Details		
ZS feeder 24mm wide (KLJ-MC400-00X, ZS FEEDER ASSY. 24MM)		
Dimensions and weight of feeder	Length 507mm, Height 228mm, Width 31.5mm	
	Weight 1.47Kg	
Applicable carrier tape specifications	Width 24mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 15mm	
	Feed pitch setting 2mm / 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm	
Applicable reel specifications	Width 30.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 20.2mm, Depth 17mm	
8mm-converted installation occupied width	12mm pitch	3
	16mm pitch	2
ZS feeder 32mm wide (KLJ-MC500-00X, ZS FEEDER ASSY. 32MM) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 39.5mm	
	Weight 1.76Kg	
Applicable carrier tape specifications	Width 32mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 38.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 25mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	4
	16mm pitch	3
ZS feeder 44mm wide (KLJ-MC600-00X, ZS FEEDER ASSY. 44MM) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 51.5mm	
	Weight 2.03Kg	
Applicable carrier tape specifications	Width 44mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 50.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 37mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	5
	16mm pitch	4

Details		
ZS feeder 56mm wide (KLJ-MC700-00X, ZS Feeder Assy 56mm) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 63.5mm	
	Weight 2.29Kg	
Applicable carrier tape specifications	Width 56mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 62.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 49mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	6
	16mm pitch	4
ZS feeder 72mm wide (KLJ-MC800-00X, ZS Feeder Assy 72mm) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 79.5mm	
	Weight 2.82Kg	
Applicable carrier tape specifications	Width 72mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 89.0mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 65mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	7
	16mm pitch	5
ZS feeder 88mm wide (KLJ-MC900-00X, ZS Feeder Assy 88mm) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 95.5mm	
	Weight 3.23Kg	
Applicable carrier tape specifications	Width 88mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56 mm	
Applicable reel specifications	Width 105.0mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 81mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	8
	16mm pitch	6

Details		
ZS feeder 104mm wide (KLJ-MCA00-00X, ZS Feeder Assy 104mm) * When installing in YS series models, the applicable emboss depth becomes 17mm.		
Dimensions and weight of feeder	Length 508mm, Height 228mm, Width 111.5mm	
	Weight 3.62Kg	
Applicable carrier tape specifications	Width 104mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 24mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 121.0mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 97mm, Depth 25mm	
8mm-converted installation occupied width	12mm pitch	10
	16mm pitch	7

Item	Details
Splicing sensor built-in ZS feeder, 8 mm wide	KLJ-MC100-10X, ZS FEEDER ASSY.8-S
Splicing sensor built-in ZS feeder, 12 / 16 mm wide	KLJ-MC200-10X, ZS FEEDER ASSY.1216S
Splicing sensor built-in ZS feeder, 24 mm wide	KLJ-MC400-10X, ZS FEEDER ASSY.24-S
Splicing sensor built-in ZS feeder, 32 mm wide	KLJ-MC500-10X, ZS FEEDER ASSY.32-S
Splicing sensor built-in ZS feeder, 44 mm wide	KLJ-MC600-10X, ZS FEEDER ASSY.44-S
Splicing sensor built-in ZS feeder, 56 mm wide	KLJ-MC700-10X, ZS FEEDER ASSY.56-S
Splicing sensor built-in ZS feeder, 72 mm wide	KLJ-MC800-10X, ZS FEEDER ASSY.72-S
Splicing sensor built-in ZS feeder, 88 mm wide	KLJ-MC900-10X, ZS FEEDER ASSY.88-S
Splicing sensor built-in ZS feeder, 104 mm wide	KLJ-MCA00-10X, ZS FEEDER ASSY.104S
Additional splicing sensor for feeder width of 8 mm	KHJ-MC1A5-10X,Splice sensor 8mm
Additional splicing sensor for feeder width of 12 mm or more	KHJ-MC2A5-10X,Splice sensor Large

13.4.2 SS Feeder

Details		
SS feeder 8mm wide (KHJ-MC100-0XX, SS feeder Assy 8mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 11.5mm	
	Weight 0.7Kg	
Applicable carrier tape specifications	Width 8mm, Maximum thickness 1.0mm	
	Material Paper / Emboss	
	Convex emboss pocket, Maximum size 3mm	
	Feed pitch setting 1mm / 2mm / 4mm / 8mm	
Applicable reel specifications	Width 14.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 4.6mm, Depth 3mm	
8mm-converted installation occupied width	12mm pitch	1
	16mm pitch	1
SS feeder 12 / 16mm wide (KHJ-MC200-00X, SS FEEDER ASSY. 12 / 16mm) * Top cover is replaced with an included one to make the feeder width applicable to 12mm / 16mm.		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 23.5mm	
	Weight 1.2Kg	
Applicable carrier tape specifications	12mm Width	Width 12mm, Maximum thickness 1.0mm
		Material Paper / Emboss
	16mm Width	Width 16mm, Maximum thickness 0.8mm
		Material Emboss
	Convex emboss pocket, Maximum size 15mm	
	12mm Width	Feed pitch setting 4mm / 8mm / 12mm / 16mm
	16mm Width	Feed pitch setting 4mm / 8mm / 12mm / 16mm
Applicable reel specifications	12mm Width	Width 18.4mm or less, ϕ 382mm or less
	16mm Width	Width 22.4mm or less, ϕ 382mm or less
Empty tape feed groove	12mm Width	Width 8.3mm, Depth 17mm
	16mm Width	Width 11.9mm, Depth 17mm
8mm-converted installation occupied width	12mm pitch	2
	16mm pitch	2
SS feeder 24mm wide (KHJ-MC400-0XX, SS feeder Assy 24mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 31.5mm	
	Weight 1.35Kg	
Applicable carrier tape specifications	Width 24mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 15mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm	
Applicable reel specifications	Width 30.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 20.2mm, Depth 17mm	
8mm-converted installation occupied width	12mm pitch	3
	16mm pitch	2

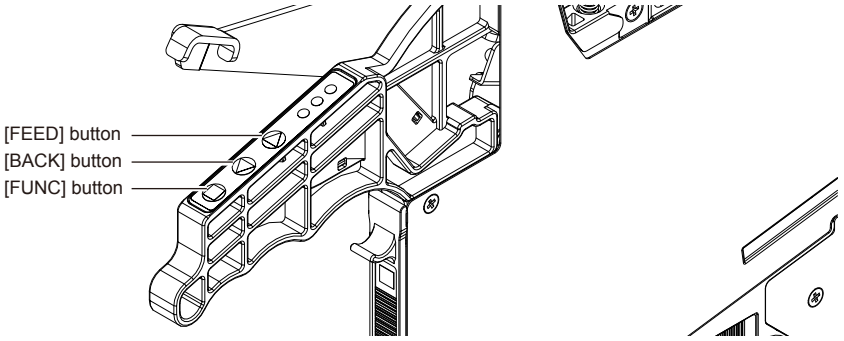
Details		
SS feeder 32mm wide (KHJ-MC500-0XX, SS feeder Assy 32mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 39.5mm	
	Weight 1.5Kg	
Applicable carrier tape specifications	Width 32mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 17mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 38.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 25mm, Depth 18.5mm	
8mm-converted installation occupied width	12mm pitch	4
	16mm pitch	3
SS feeder 44mm wide (KHJ-MC600-0XX, SS feeder Assy 44mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 51.5mm	
	Weight 1.8Kg	
Applicable carrier tape specifications	Width 44mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 17mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 50.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 37mm, Depth 18.5mm	
8mm-converted installation occupied width	12mm pitch	5
	16mm pitch	4
SS feeder 56mm wide (KHJ-MC700-0XX, SS feeder Assy 56mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 63.5mm	
	Weight 2.0Kg	
Applicable carrier tape specifications	Width 56mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 17mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 62.4mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 49mm, Depth 18.5mm	
8mm-converted installation occupied width	12mm pitch	6
	16mm pitch	4

Details		
SS feeder 72mm wide (KHJ-MC800-0XX, SS feeder Assy 72mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 79.5mm	
	Weight 2.4Kg	
Applicable carrier tape specifications	Width 72mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 17mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 89.0mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 65mm, Depth 18.5mm	
8mm-converted installation occupied width	12mm pitch	7
	16mm pitch	5
SS feeder 88mm wide (KHJ-MC900-0XX, SS feeder Assy 88mm)		
Dimensions and weight of feeder	Length 425mm, Height 226mm, Width 95.5mm	
	Weight 2.93Kg	
Applicable carrier tape specifications	Width 88mm, Maximum thickness 0.6mm	
	Material Emboss	
	Convex emboss pocket, Maximum size 17mm	
	Feed pitch setting 4mm / 8mm / 12mm / 16mm / 20mm / 24mm / 28mm / 32mm / 36mm / 40mm / 44mm / 48mm / 52mm / 56mm	
Applicable reel specifications	Width 105.0mm or less, ϕ 382mm or less	
Empty tape feed groove	Width 81mm, Depth 18.5mm	
8mm-converted installation occupied width	12mm pitch	8
	16mm pitch	6

Item	Details
Splicing sensor built-in SS feeder, 8 mm wide	KHJ-MC100-1XX, SS feeder Assy 8-S
Splicing sensor built-in SS feeder, 12 / 16 mm wide	KHJ-MC200-1XX, SS feeder Assy 12 / 16-S
Splicing sensor built-in SS feeder, 24 mm wide	KHJ-MC400-1XX, SS feeder Assy 24-S
Splicing sensor built-in SS feeder, 32 mm wide	KHJ-MC500-1XX, SS feeder Assy 32-S
Splicing sensor built-in SS feeder, 44 mm wide	KHJ-MC600-1XX, SS feeder Assy 44-S
Splicing sensor built-in SS feeder, 56 mm wide	KHJ-MC700-1XX, SS feeder Assy 56-S
Splicing sensor built-in SS feeder, 72 mm wide	KHJ-MC800-1XX, SS feeder Assy 72-S
Splicing sensor built-in SS feeder, 88 mm wide	KHJ-MC900-1XX, SS feeder Assy 88-S
Additional splicing sensor for 8mm width	KHJ-MC1A5-10X, Splice sensor 8mm
Additional splicing sensor for 12mm and larger widths	KHJ-MC2A5-10X, Splice sensor Large

13.4.2 Feed pitch by feeder button operation

ZS feeder

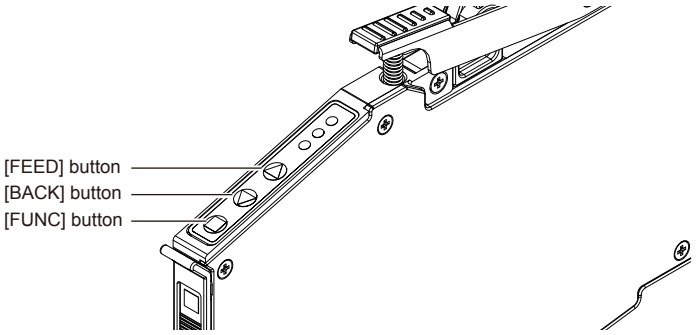


Feeder type	Set pitch	[FEED] or [BACK] is pressed once.	[FUNC + FEED] or [FUNC + BACK] are pressed once.
ZS feeder 4mm wide	All pitches	1mm	1mm
ZS feeder 8mm wide	0	2mm	1mm
	1	1mm	
	2 or more	2mm	
ZS feeder 12/16mm wide, 24mm wide, 32mm wide, 44mm wide, 56mm wide, 72mm wide, 88mm wide, 104mm wide	0	2mm	2mm
	2 or more		Set pitch

* Pressing the [FEED] or [BACK] button for a long time will enter the continuous feed mode.

* Even when pressing the [FUNC + FEED] or [FUNC + BACK] buttons for a long time, the operation does not enter the continuous feed mode.

SS feeder



Feeder type	Set pitch	[FEED] or [BACK] is pressed once.	[FUNC + FEED] or [FUNC + BACK] are pressed once
SS feeder 8mm wide	0	2mm	2mm
	1	1mm	Set pitch
	2 or more	2mm	
SS feeder 12/16mm wide, 24mm wide, 32mm wide, 44mm wide, 56mm wide, 72mm wide, 88mm wide	0	2mm	2mm
	4 or more		Set pitch

* Pressing the [FEED] or [BACK] button for a long time will enter the continuous feed mode.

* Pressing the [FUNC] + [FEED] buttons will feed the tape by the set pitch feed width.

* 1mm-feed of the SS feeder 8mm-wide and 44mm-feed or longer of the SS feeder 32mm-wide or more may vary depending on the feeder version. So, please contact your distributor for further information.

<table>
<tr><th>Item</th><th>Details</th></tr>
<tr><td rowspan="3">IT option basic package
* To operate this package, IT-system is needed.</td><td>Provided. (Option) / Without barcode reader

Function 1: Setup verify
Function 2: Remaining quantity counter

* To operate the setup verify, wireless handy reader is needed.</td></tr>
<tr><td>Provided. (Option) / With barcode reader
Function 1: Setup verify
Function 2: Remaining quantity counter

* Barcode reader is assembled into portions before and after the machine.</td></tr>
<tr><td>None (Standard)</td></tr>
<tr><td rowspan="2">Lot trace output</td><td>Provided. (Option)
* IT option basic package and T-Tool are needed.</td></tr>
<tr><td>None (Standard)</td></tr>
<tr><td rowspan="2">Automatic setup change-over</td><td>Provided. (Option)
* IT option basic package is needed.
* Carefully check the price of the fist machine and that or the second or subsequent machine.</td></tr>
<tr><td>None (Standard)</td></tr>
<tr><td rowspan="2">Material time limit management</td><td>Provided. (Option)
* IT option basic package and wireless handy reader are needed.</td></tr>
<tr><td>None (Standard)</td></tr>
<tr><td rowspan="2">Bin Code Management Option</td><td>Provided. (Option)
* IT option basic package is needed.</td></tr>
<tr><td>None (Standard)</td></tr>
<tr><td>Load control
(FM head)</td><td>Provided. (Standard)<table><tr><th>Load</th><th>Load tolerance</th></tr><tr><td>5N - 13N</td><td>Set load + / - 2N</td></tr><tr><td>14N - 30N</td><td>Set load + / - 15%</td></tr></table></td></tr>
</table>

Yamaha SMT line support software
Y.FacT

* Requires a separate personal computer, hub, LAN wiring, etc.For details, please contact your distributor.

Item	Details
P-Tool / programming tool (with USB hardware key) ⇒ Board data creation package & production startup preparation (CAD / CAM support) * Function package of the Y.FacT support software. * "YVi-OS" is required for editing the checking device data. K88-M4920-B0X, Software Y.FacT P-Tool Assy " K88-M4921-71X, FacT Tools instal l" *1 " K88-M4923-21X, Box for FD Assy " *1 " K88-M4926-40X, Registerd Hard-key P-Tool " *1	[Configuration elements] (1) Main unit functions ⇒ Board editor / board explorer / data base editor / feeder viewer (2) USB protection key (also referred to as a "hard key" or "dongle") (3) ASCII conversion function ⇒ CAD-BOM format (2 files) Compatible BOM: Bill of Materials (parts list) (4) Line data distribution function (multiple machine optimization) (5) Common setup optimizing function (6) Visual editor ⇒ simple desktop test mounting / automatic measurement of component dimensions
Manual teaching / P-Tool option (Visual editor function extension)	[Function] Shortens initial data creation time and improves quality. Component image pasting (shape drawing) verify / angle correction / coordinate correction (* POT2 function import selection)
M-Tool View (with USB hardware key) ==> Floor Monitoring & Line Monitoring * Function package of the Y.FacT support software. * "Tool Drive", "Machine Monitoring OP" are required. K88-M4931-00X, Software Y.FacT M-Tool View Assy " K88-M4921-71X, FacT Tools install " *1 " K88-M4923-21X, Box for FD Assy " *1 " K88-M4926-P0X, Registered Hard-key M-Tool View" *1	[Configuration elements] (1) USB protection key (also referred to as a "hard key" or "dongle") (2) Floor Monitoring (3) Line Monitoring
M-Tool / monitoring tool (with USB hardware key) ==> Line management package & Line remote monitoring (general-purpose LAN support) * Function package of the Y.FacT support software. K88-M4920-C0X, Software Y.FacT M-Tool Assy " K88-M4921-71X, FacT Tools install " *1 " K88-M4926-50X, Registered Hard-key M-Tool " *1	[Configuration elements] (1) Main unit functions ⇒ Board editor / board explorer / data base editor / feeder viewer / single machine optimizing (2) USB protection key (also referred to as a "hard key" or "dongle") (3) Line control function (4) Data communication (transmission / reception) (5) "Remaining component quantity" centralized management monitor (linked to IT option).

Item	Details
IT-System / server utility program (with USB hardware key) * Prerequisite item for S-Tool / IT option. * For building a LAN system in a machine where S-Tool or IT option is installed. * For installing in the server personal computer. * One of these programs is required for each data management block (floor units, line units, etc.). K88-M4920-V0X, Software IT-System Assy " K88-M4921-90X, IT-System Installation Assy " *1 " K88-M4923-21X, Box for FD Assy " *1 " K88-M4926-B0X, Registered Hard-key System " *1	[Configuration elements] (1) Server system building software (2) USB protect key (also referred to as a hard key or dongle) (3) Communication utility for each client personal computer other than the S-Tool personal computer
Tool Drive / server utility program (with USB hardware key) * For installing in the server personal computer. * "Tool Drive", "Machine Monitoring OP" are required. K88-M4931-10X, Software Tool Drive Assy " K88-M4921-71X, FacT Tools install " *1 " K88-M4923-21X, Box for FD Assy " *1 " K88-M4926-R0X, Registered Hard-key Tool Drive " *1	[Configuration elements] (1) Basic functions ==> board explorer (2) Server system building software (3) USB protection key (also referred to as a "hard key" or "dongle")
S-Tool / external navigation (with USB hardware key) ⇒ Setup task package & mounting components preparation support * Support software Y.FacT function package * This function requires the IT-System / server utility program. K88-M4920-L0X , Software Y.FacT S-Tool Assy " K88-M4921-71X, FacT Tools install " *1 " KGA-M55B2-00X, Bar-Code-Reader USB" *1 " K88-M4923-21X, Box for FD Assy" *1 " K88-M4928-00X, Tool FDR Pos Assy (Labels) " *1 " K88-M4926-C0X, Registered Hard-key S-Tool " *1	[Configuration elements] (1) Basic functions ⇒ Board editor / board explorer / database editor / feeder viewer / single machine optimizing (2) External navigation function software (3) USB protection key (also referred to as a hard key or dongle) (4) Wired USB to personal computer connection Barcode reader *1 unit (5) Barcode ID label *1 set
S-Tool / Material time limit management (with USB hardware key) * This function requires S-Tool / Set-up navigation. * This function requires the wireless Handy Reader function. K88-M4920-S0X, SOFT Y.FacT S-Tlim Assy " K88-M4926-F0X, Registerd HK S-Tlim" *1 " K88-M4921-71X, FacT Tools install " *1 " K88-M4923-21X, Box for FD Assy" *1	[Function] By preventing the use of life-expired printer materials, this function contributes to a higher production quality. This function manages the life of materials (solder and tray components, etc.,) with consideration to factors such as their storage conditions, and notifies the operator when a material life has expired or expiration date approaches. This function also enhances quality control by maintaining information regarding dates when components were received and released from the warehouse.
S-Tool / Bin Code Management Option * IT option basic package is needed. K88-M4931-20X, Software Y.FacT Srank Assy " K88-M4926-U00, Registerd HK S-Rank" *1 " K88-M4921-71X, FacT Tools install " *1 " K88-M4923-21X, Box for FD Assy" *1	[Function] Component characteristics, such as rank of the LED component, etc. are verified to prevent incorrect setup in the production. Whether or not the rank is used and whether or not the component applicable to the rank is used that have been preset are verified in the setup phase.

Item	Details
S-Tool Option / carriage communication cable set (with license protection key)	
* For the external setup work, Carriage external setup power unit is required.	
KHJ-M668B-000, HNS FESCOM 3M KHJ-M668B-100, HNS FESCOM 5M KHJ-M668B-200, HNS FESCOM 7M	
T-Tool / production record management tool (with USB hardware key)	[Configuration elements] (1) Product lot trace software (2) USB protection key (also referred to as a hard key or dongle)
⇒ Production lot & product ID record management	
* Support software Y.FacT function package	
K88-M4920-R0X , Software Y.FacT T-Tool Assy " K88-M4921-A0X, T-Tools install " *1 " K88-M4923-21X, Box for FD Assy " *1 " K88-M4926-D0X, Registerd Hard-key T-Tool " *1	

Item	Details
Version upgrade P-Tool (No license protection key)	K88-M4920-F0X, Software Y.FacT Version-Up * Only functions for which the customer possesses a license key are activated.
Version upgrade M-Tool View (No license protection key)	K88-M4920-F0X, Software Y.FacT Version-Up * Only functions for which the customer possesses a license key are activated.
	* Installation CD-R only K88-M4921-71X, FacT Tools instal
Version upgrade M-Tool (No license protection key)	K88-M4920-F0X, Software Y.FacT Version-Up * Only functions for which the customer possesses a license key are activated.
	* Installation CD-R only K88-M4921-71X, FacT Tools instal
Version upgrade IT-System (No license protection key)	K88-M4920-P0X, Software IT-System Version-Up
	* Installation CD-R only K88-M4921-90X, IT-System Installation Assy
Version upgrade Tool Drive (No license protection key)	K88-M4920-F0X, Software Y.FacT Version-Up * Only functions for which the customer possesses a license key are activated.
	* Installation CD-R only K88-M4921-71X, FacT Tools install
Version upgrade S-Tool (No license protection key)	K88-M4920-F0X, Software Y.FacT Version-Up
	* Installation CD-R only K88-M4921-71X, FacT Tools instal
Version upgrade T-Tool (No license protection key)	K88-M4920-U0X, Software T-Tool Version-Up
	* Installation CD-R only K88-M4921-A0X, T-Tools install

POT2
/ P-Tool external support system

(PFA brand)

* Installed and operated in the same personal computer where P-Tool is installed.
Production startup support CAM system.

[Basic functions]
Component & mark & block image automatic teaching / Desktop test mounting / automatic measurement of component dimensions / automatic polarity check, etc.

Item

Item	Gerber image tool	Scanner accuracy correction kit	Automatic teaching & polarity check	PLUS kit	Standard CAM Converter	Mount Variation Importer	Glass gauge	Scanner Stand
Gerber image tool Gerber image Conversion software KHN-M49D0-01X, POT2 GERBER ASSY	○							
Scanner accuracy correction kit Scanner accuracy correction software Accuracy correction tool (Glass gauge, Scanner Stand) KHN-M49D0-11X, POT2 SCANNER ASSY		○					○	○
Automatic teaching & polarity check Automatic teaching & polarity check function KHN-M49D0-21X, POT2 AUTO-TCH ASSY			○					
PLUS kit General-purpose software Fluorescent sheet KHN-M49D0-31X, POT2 PLUS-KIT ASSY				○				
Standard CAM Converter Standard CAM Converter Software KHN-M49D0-41X, POT2 STD-CAM ASSY					○			
Mount Variation Importer Mount Variation Importer function KHN-M49D0-91X, POT2 BOMS ASSY						○		

Package

Item	Gerber image tool	Scanner accuracy correction kit	Automatic teaching & polarity check	PLUS kit	Standard CAM Converter	Mount Variation Importer	Glass gauge	Scanner Stand
Gerber set KHN-M49D0-51X, POT2 GERBER-SET ASY	○		○	○				
Gerber set + Standard CAM Converter KHN-M49D0-A1X, POT2 G-SET S-CAM ASY	○		○	○	○			
Gerber set + Mount Variation Importer KHN-M49D0-D1X, POT2 G-SET BOMS ASY	○		○	○		○		
Gerber set + Standard CAM Converter + Mount Variation Importer KHN-M49D0-G1X, POT2 G-SET SC BM ASY	○		○	○	○	○		
Scanner set KHN-M49D0-61X, POT2 SCANNER-SET ASY		○	○	○			○	○
Scanner set + Standard CAM Converter KHN-M49D0-B1X, POT2 S-SET S-CAM ASY		○	○	○	○		○	○
Scanner set + Mount Variation Importer KHN-M49D0-E1X, POT2 S-SET BOMS ASY		○	○	○		○	○	○
Scanner set + Standard CAM Converter + Mount Variation Importer KHN-M49D0-H1X, POT2 S-SET SC BM ASY		○	○	○	○	○	○	○
Scanner set (Exclude accuracy correction tool) KHN-M49D0-L1X, POT2 SS-GL ASY		○	○	○				
Scanner set (Exclude accuracy correction tool) + Standard CAM Converter KHN-M49D0-M1X, POT2 SS-GL SC ASY		○	○	○	○			
Scanner set (Exclude accuracy correction tool) + Mount Variation Importer KHN-M49D0-N1X, POT2 SS-GL BM ASY		○	○	○		○		
Scanner set (Exclude accuracy correction tool) + Standard CAM Converter + Mount Variation Importer KHN-M49D0-P1X, POT2 SS-GL SC BM ASY		○	○	○	○	○		
Full set KHN-M49D0-71X, POT2 FULL-SET ASY	○	○	○	○			○	○
Full set + Standard CAM Converter KHN-M49D0-C1X, POT2 F-SET S-CAM ASY	○	○	○	○	○		○	○
Full set + Mount Variation Importer KHN-M49D0-F1X, POT2 F-SET BOMS ASY	○	○	○	○		○	○	○
Full set + Standard CAM Converter + Mount Variation Importer KHN-M49D0-J1X, POT2 F-SET SC BM ASY	○	○	○	○	○	○	○	○
Full set (Exclude accuracy correction tool) KHN-M49D0-R1X, POT2 FS-GL ASY	○	○	○	○				
Full set (Exclude accuracy correction tool) + Standard CAM Converter KHN-M49D0-S1X, POT2 FS-GL SC ASY	○	○	○	○	○			
Full set (Exclude accuracy correction tool) + Mount Variation Importer KHN-M49D0-T1X, POT2 FS-GL BM ASY	○	○	○	○		○		
Full set (Exclude accuracy correction tool) + Standard CAM Converter + Mount Variation Importer KHN-M49D0-U1X, POT2 FS-GL SC BM ASY	○	○	○	○	○	○		
Standard CAM set KHN-M49D0-81X, POT2 STD-CAM-SET ASY			○	○	○			
Standard CAM set + Mount Variation Importer KHN-M49D0-K1X, POT2 SC-SET BOMS ASY			○	○	○	○		

Hardware

Item	Gerber image tool	Scanner accuracy correction kit	Automatic teaching & polarity check	PLUS kit	Standard CAM Converter	Mount Variation Importer	Glass gauge	Scanner Stand
Glass gauge KHN-M49D0-W0X, POT2 GLASS GAUGE ASY							◯	