

EPSON

EPSON RC+ 7.0 Option

Part Feeding 7.0

IF-240

Rev.10

ENM238S5886F

Original instructions

EPSON RC+ 7.0 Option Part Feeding 7.0 IF-240 Rev.10

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Part Feeding 7.0 IF-240

Rev.10

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FOREWORD

Thank you for purchasing our robot system.

This manual contains the information necessary for the correct use of the EPSON RC+ PartFeeding option.

Please carefully read this manual and other related manuals before installing the robot system.

Keep this manual handy for easy access at all times.

The robot system and its optional parts are shipped to our customers only after being subjected to the strictest quality controls, tests, and inspections to certify its compliance with our high performance standards. Please note that the basic performance of the product will not be exhibited if our robot system is used outside of the usage conditions and product specifications described in the manuals.

This manual describes possible dangers and consequences that we can foresee. Be sure to comply with safety precautions on this manual to use our robot system safely and correctly.

TRADEMARKS

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TRADEMARK NOTATION IN THIS MANUAL

Microsoft® Windows® 8 operating system

Microsoft® Windows® 10 operating system

Microsoft® Windows® 11 operating system

Throughout this manual, Windows 8, Windows 10 and Windows 11 refer to above respective operating systems. In some cases, Windows refers generically to Windows 8, Windows 10 and Windows 11.

NOTICE

No part of this manual may be copied or reproduced without authorization.

The contents of this manual are subject to change without notice.

Please notify us if you should find any errors in this manual or if you have any comments regarding its contents.

MANUFACTURER

SEIKO EPSON CORPORATION

CONTACT INFORMATION

Contact information is described in “SUPPLIERS” in the first pages of the following manual:

Robot System Safety Manual Read this manual first

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Hardware (IF-240)

1. Safety

1.1 Overview

Before operating your product, please read this manual in order to ensure correct use of the product. Nevertheless, if you meet difficulties during operation or maintenance, please, feel free to contact the supplier of your region.



In this manual, the safety precautions that you must follow are classified as: “Warning”, “Caution” and “NOTE”; the following symbols are used:

 WARNING	This symbol indicates that a danger of possible serious injury or death exists if the associated instructions are not followed properly.
 WARNING	This symbol indicates that a danger of possible harm to people caused by electric shock exists if the associated instructions are not followed properly.
 CAUTION	This symbol indicates that a danger of possible harm to people or physical damage to equipment and facilities exists if the associated instructions are not followed properly.
 NOTE	The “NOTE” sections describe important information to be followed for operating the Robot system.



REFER TO ...


For more information on a specific subject, the reader should read another manual, or refer to other paragraph.

 CAUTION	<ul style="list-style-type: none"> ■ Epson shall not be liable whatsoever for any loss or damage arising from a failure to observe the items specified in Safety precautions. The customer is responsible for providing the necessary instructions to the persons concerned.
 NOTE	<ul style="list-style-type: none"> ■ All dimensions in this manual are expressed in millimeters.


1.2 Safety Precautions


1.2.1 General Safety Precaution


1.2.1.1 Transport

 CAUTION	<ul style="list-style-type: none">■ Be aware of the weight and take care when transporting the system. For more information, please refer to 3. <i>Environment and Installation</i>.
--	--

1.2.1.2 General


 WARNING	<ul style="list-style-type: none">■ Be sure that all power sources and other cables to the unit are disconnected before working on the product.■ Only qualified personnel (trained by Epson and with professional experience) are authorized to work on this device.■ Do not plug or unplug cables of the system unless it is switched off.■ Never modify the product. Unauthorized modification may cause the product to malfunction, resulting in injury, electric shock, fire, etc.■ Turn off the power to the product in the event of power failure. Failure to do so may cause the product to suddenly start moving when the power is restored.■ Do not use the product in a place where it may come in contact with water or oil droplets.
--	---

 WARNING	<ul style="list-style-type: none">■ Do not access the housing of the system controls. Serious injury or death could result from electric shock. Only authorized personnel from Epson are allowed to access this part of the system for maintenance or for repair.
--	---

 CAUTION	<ul style="list-style-type: none">■ Build a safety system that shuts off the IF series power (S-Power) when the machine or mechanical system protection enclosure is opened.
--	--

1.2.1.3 Disposal


When the product becomes no longer usable or necessary, dispose of it properly as industrial waste.

 CAUTION	<ul style="list-style-type: none"> Observe the valid legal regulations for appropriate disposal protecting environment.
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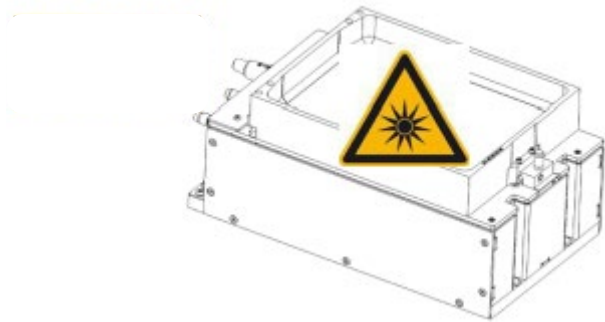
1.2.2 Danger



1.2.2.1 Safety Equipment for Operators

For safety reasons operators must wear protective eyewear when using the backlight.

NOTE 	<ul style="list-style-type: none"> It is the customer's responsibility to install warning signs informing that anyone working around the part feeder must wear safety equipment.
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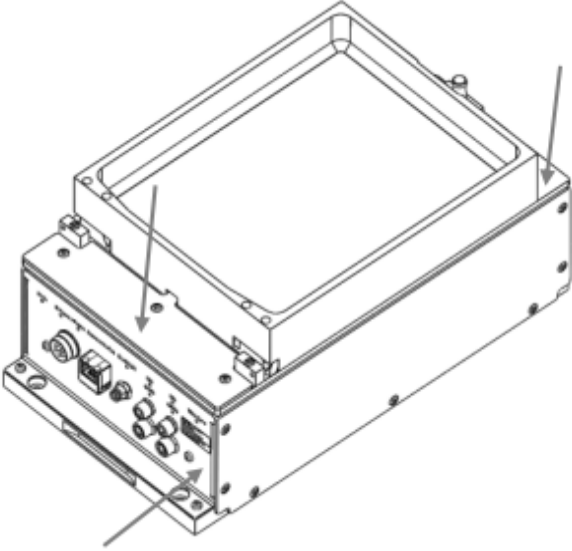
1.2.2.2 Specific Danger

 WARNING 	<ul style="list-style-type: none"> Backlight The Part feeding has an integrated Backlight that uses LEDs (Light Emitting Diodes). These LEDs emit visible or non-visible radiation depending on the color of the Backlight. LEDs illumination can create discomfort, cornea, retinal and lens damage. Do not look the light directly without wearing protect glasses on. It is the responsibility of customers to document their own application and instruct employees on procedures to limit exposure to LED radiation. <div style="text-align: center;">  </div> <p style="text-align: center;">Figure 1-1: Specific warnings</p>
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 <p>WARNING</p> 	<ul style="list-style-type: none"> ■ The LEDs used are risk group 2 according to the norm EN 62471. It is the responsibility of customers to document their own application and instruct employees on procedures to limit exposure to LED radiation. The following prevention agent can be suggested: <ul style="list-style-type: none"> A Install, insofar as the job allows, a high pass filter at x nm (see 4.2 <i>Backlight</i>) depending on the color under a fixed or adjustable connection between the source and the employee. B When the implementation of the foregoing is not possible, provide workers with goggles or face shield suitable for blocking radiation beyond 700nm. C Prohibit or limit as much as possible direct access to the source (exposure in the axis of radiation). Refer to “CONDITIONS OF USE OF PRODUCTS TPL VISION” in Appendix: Condition of use of backlight. D Establish a security perimeter to prevent operators from approaching the source at distances beyond the nominal ocular hazard recommended by the manufacturer. E In all cases, ensure that the means used properly mitigate exposure variables (characteristics of screens or goggles to choose based on wavelength which operators are exposed).
--	---



Refer to *Appendix: Condition of use of backlight* for the complete calculation sheet on minimal distance to respect for each kind of backlight.

 <p>CAUTION</p> 	<ul style="list-style-type: none"> ■ Temperature The active elements in the IF-240 make the surfaces shown in the picture heats up to 45°C in normal use. This temperature can nevertheless increase to 55°C in extreme use. It is the responsibility of customers to document their own application and instruct employees on procedures to avoid contact with these surfaces. <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: center;">Figure 1-2: Specific warnings</p>
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2. Specification

2.1 Characteristics of IF-240

The IF-240 sets new standards in small part feeding. Its 3D vibratory platform allows fast and flexible presentation of small parts (2mm - 40mm) to a robot equipped with a vision system.

The core of the IF-240 is a platform that can vibrate in three orthogonal directions. By selecting appropriate vibration signals, a high flexibility in displacing parts on the platform is reached (forward, backward, and sidewise) and flipping is made possible.

2.2 Model

Model numbers of IF-240

LED	Specification	Model number
IF240 no Light	IF240 (no backlight)	R12NZ9016W
IF240 RED	IF240+ backlight: Red	R12NZ9016X
IF240 WHITE	IF240+ backlight: White	R12NZ9016Y
IF240 GREEN	IF240+ backlight: Green	R12NZ9016Z
IF240 BLUE	IF240+ backlight: Blue	R12NZ90171
IF240 INFRARED	IF240+ backlight: Infrared light	R12NZ90172

2.3 First glimpse of product

2.3.1 Names of each Part

Names of each part for IF-240:

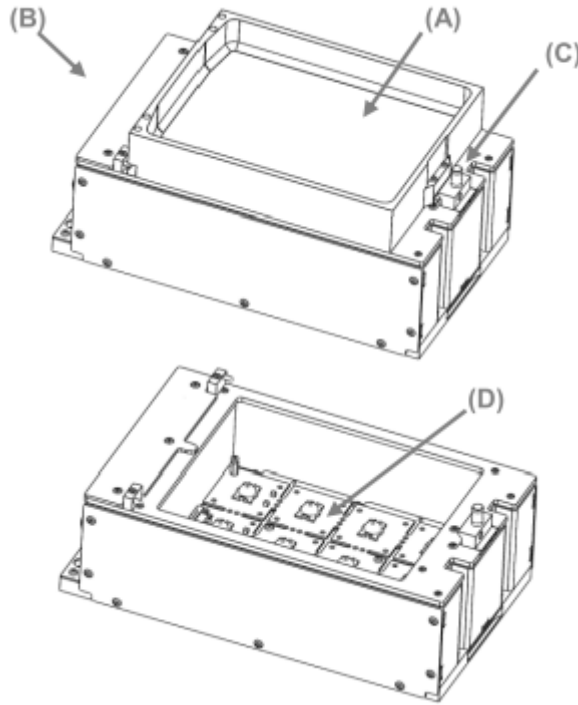


Figure 2-1: IF-240 overview

- (A) 3D vibrating platform
- (B) Electrical interfaces (communication, power supply, I/Os...)
- (C) An integrated mechanism allowing removal of the platform easily without additional tooling
- (D) An integrated backlight (optional) that allows an easy recognition of the parts from a camera placed above



For more information for (B), refer to 3.6 *Connecting Cable*.



For more information for (C) of how to remove or change the platform, refer to 5.2.2. *Removing the platform module*.



For more information for (D) of the backlight color and the procedure to exchange the backlight, refer to 5.3.1 *Exchanging / Installing the backlight*.

2.3.2 Outer Dimensions

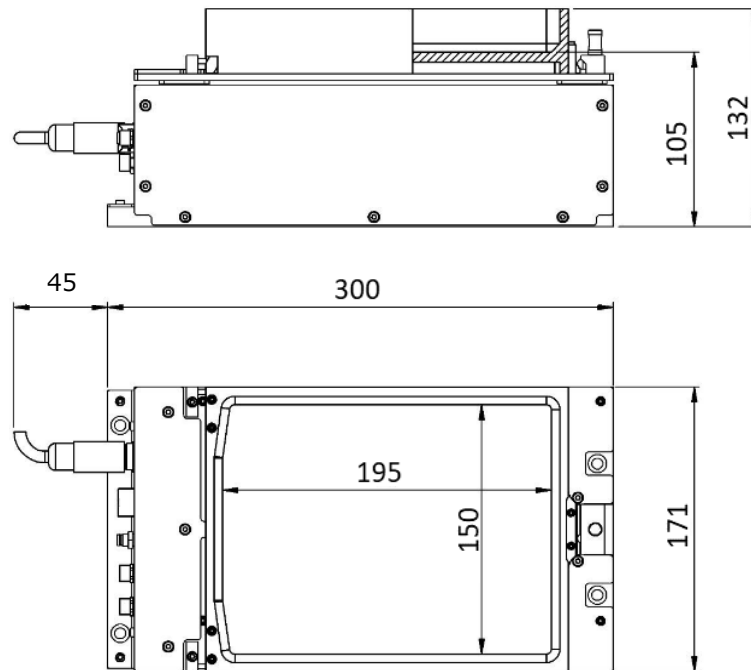


Figure 2-2: Outer Dimensions (IF-240)

Additional space is needed around the part feeder to be able to remove the platform module with the integrated tool:

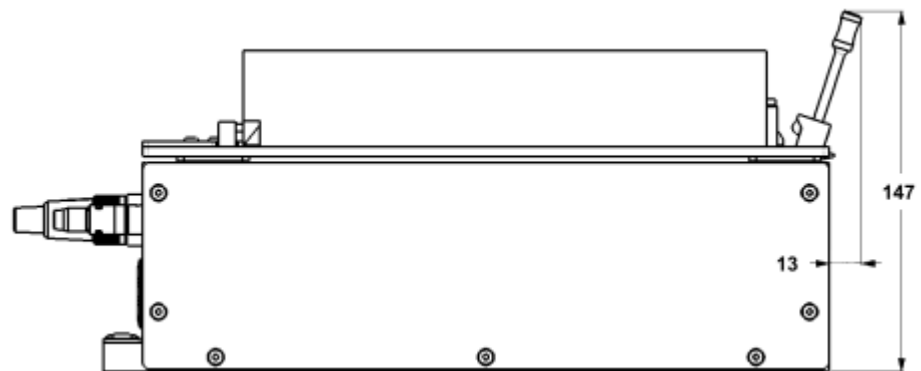


Figure 2-3: Overall dimensions with platform "lever"



Refer to 5.2.2 *Removing the platform module* for more information on how to remove the platform.



Refer to 3.3 *Installing IF-240* for more information.

2.3.3 Visual signals

The LEDs mounted on the unit give important information on the state of the IF-240:

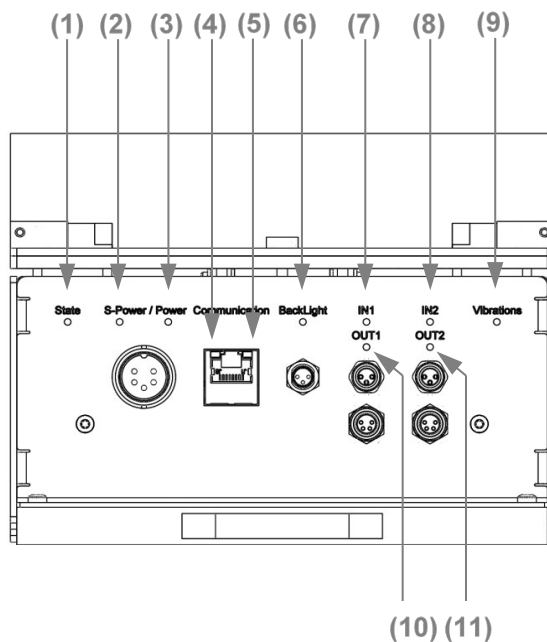


Figure 2-4: IF-240 Operating Indicator LEDs

LED	State	Color	Meaning
1	Blinking Time on: 100ms	Green	System in standby
	Blinking Time on: 900ms	Green	System in service
2	On	Yellow	24V on S-Power input (refer to 3.6.2 <i>Power connection</i> for more information)
3	On	Green	24V on Power input (refer to 3.6.2 <i>Power connection</i> for more information)
4	On	Green	Connection detected
5	Blinking	Yellow	Communication in progress (transmit and receive TCP packets)
6	On	Green	24V on backlight synchronization input
7	On	Green	24V on input 1
8	On	Green	24V on input 2
9	On	Green	Platform vibrating
10	On	Yellow	24V on output 1
11	On	Yellow	24V on output 2

2.4 Specification Table



CAUTION

- Use the parts feeder with the following specifications. Please note that the basic performance of the product will not be exhibited if it is used outside of the specifications.

2.4.1 Specification of IF-240

	IF-240
Typical part size *	length of side: 2mm to 40mm
Typical part weight	2 g or less
Backlight	Select with/without backlight. Refer to <i>2.2 Model</i> .
Interchangeable backlight color	(green, red, blue, white, Infrared) Please refer to <i>4.2 Backlight</i> for more information.
Vibration frequency configurable	40 to 70 Hz
Maximal weight on the platform	0.4 kg
Digital Output for hoppers	2
Digital Input	-
Analog Output	-
RoHS	✓
Weight (Includes platform, backlight)	7.8 kg
Protection class	IP20
Working temperature:	+5°C ~ +40°C
Humidity	30% to 80%max. non-condensing
Environment	Cleanroom class: expected ISO7
Safety Standard	CE Marking EMC Directive, Machinery Directive, RoHS Directive

*: Before using parts, try supplying the parts to the feeder, move the feeder, and check following.

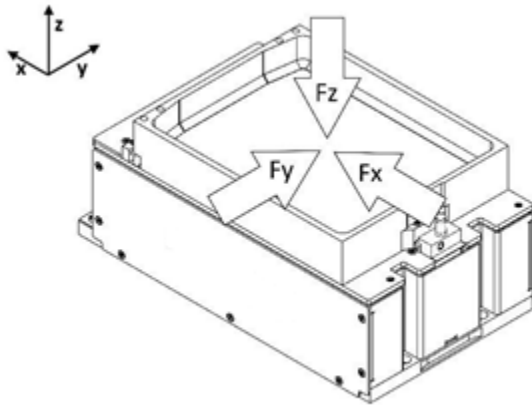
- Part disperses
- Part moves
- Overlapping parts disentangles
- etc.

Parts that do not disperse and do not move and do not disentangle are not suitable for feeders.

2.4.2 Maximum Permissible External Force on the Platform

The maximum permissible external force on a point of the platform (for example, with the gripper) is:

$$F_x = 10 \text{ N } F_y = 10 \text{ N } F_z = 20 \text{ N}$$



CAUTION

- Note that the shock/impact of the robot gripper may damage the surface of the platform.

2.4.3 Permissible Platform Weight

Characteristics	
Maximum platform weight (without components)	800 g
Maximum weight of components (in addition to the maximum platform weight)	400 g

2.4.4 Maximum Plate Displacement

Characteristics	
Maximum displacement x	±1.5 mm
Maximum displacement y	±2 mm
Maximum displacement z	±1.5 mm

2.4.5 Plate Z Repeatability

Characteristics	
Plate Z repeatability	±20 μm

2.4.6 Picking Surface

The maximum picking surface dimensions corresponds to the IF-240 platform size:

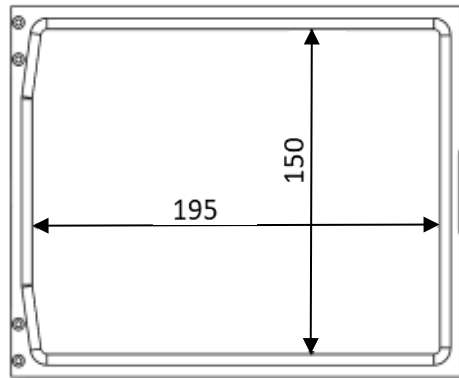


Figure 2-5: Picking surface

3. Environment and Installation

3.1 Environment

3.1.1 Installation Environment

IF-240 can be used under the following conditions:

- Protection class is IP20 compliant
- Working temperature: +5°C to +40°C
- Humidity: 30% to 80% max. non-condensing



- Variations in humidity or temperature may affect the global performance of the part feeding.

- Avoid extreme electromagnetic waves, ultraviolet rays and radiation.
- Avoid using the product in a place where the main unit or Controller may be exposed to water or oil droplets.
- Clean room application: cleanliness class ISO7.



- Do not use the product in an atmosphere of corrosive gases. Rust may form and reduce the structural strength of the product.

3.1.2 Storage environment

The storage environment should be similar to the operating environment. In addition, you should protect the IF-240 against dust

3.2 Base Table

A table to secure feeder needs to be made by customers. The shape and size of table depending on purpose of your feeder system. Also, when using multiple feeders or multiple robots, note that vibration can interfere other equipment.

For details of designing of mounting table, refer to *3.5 Installing*.

3.3 Installing IF-240



CAUTION

- The feeder must be mounted on a smooth, flat and solid surface. Ensure that the IF-240 is not submitted to mounting flexure. Failure to do so will degrade feeder performance.
- Be careful not to get hands or feet caught and/or have equipment damaged by a fall of the feeder. When working, please wear protective equipment including safety shoes.

To ensure proper behavior of the IF-240, secure fastening to a solid surface is necessary. The holes in the base plate of the IF-240 can be used to attach it with four M6 screws.

Repeatable positioning of the IF-240 can be done by using positioning pins (possible on both sides).

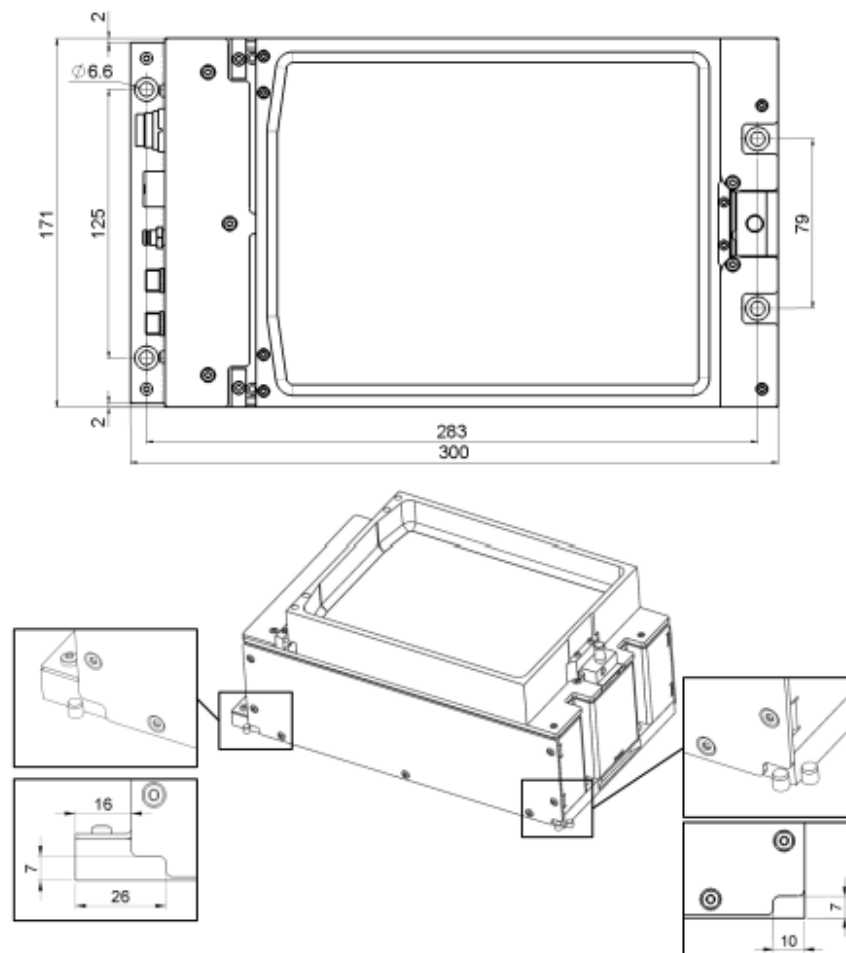




Figure 3-1: Installing IF-240

3.4 Unpacking and Transportation

3.4.1 Unpacking

 CAUTION	<ul style="list-style-type: none"> Keep the packaging material and the shipment box in case of need for return.
--	--


NOTE 	<ul style="list-style-type: none"> Do not remove the part feeding from its packaging until you are ready to install.
---	---

Look at the identification sticker at the back of the product and ensure that the product you have received is the appropriate one.

Important information is on this sticker, such as the power consumption rating and the type name and serial number that you will need for any kind of correspondence with Epson.

3.4.2 Packaging of the Product, Transportation and Handling

The transportation of the product must be made in accordance with the specific terms indicated on the package (top, bottom, fragile, etc.). In addition, pay particular attention to the following points:

 CAUTION	<ul style="list-style-type: none"> Be careful of the weight and take care when transporting the system. Always hold the system firmly with two hands. The operators should not carry heavy shipping boxes by themselves. If the shipping box is to be left standing, it should be in a horizontal position. Do not climb on the shipping box. Do not place heavy objects, on top of the shipping box.
--	---

The dimension of packaging box of IF-240 is as follows:

	IF-240
Dimensions (with optional part)	460 × 320 × 230 mm (460 × 320 × 330 mm)
Weight	12 kg

Table 3-1: Weight and dimensions of the product when packaged





3.5 Installation

This section is common for IF-80, IF-240, IF380 and IF-530. Refer each table when the values differ depending on the model.

3.5.1 Symbols and Acronyms in this Manual

This section describes symbols and acronyms.

3.5.1.1 Symbols

	Wrong implementation
	Correct implementation
ON	Active / operating feature (moving)
	Movements
OFF	Passive / NOT operating feature (NOT moving)
	Perturbation / undesired vibration

3. Environment and Installation

3.5.1.2 Acronyms

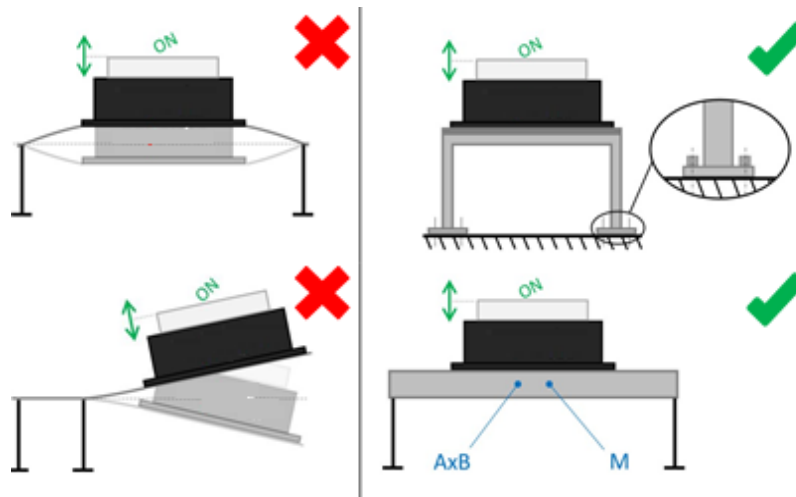
APSO	Angst + Pfister Homepage - www.apsoparts.com – (see section: Antivibration Technology) APSOvib: (Initiator of the product name)
ELESA	Elesa Homepage (www.elesa.com) – (see section: Rubber buffersw)
A	max. base table length
B	max. base table width
c	distance between feeders
ØD	diameter of the round buffer APSOvib
G	screw diameter
H	height of the round buffer APSOvib
c_z	spring constant of the round buffer APSOvib; compression in Z direction (axial direction)
F_z	max. allowed compressive force of the round buffer APSOvib
L	Length of male screws
M	mass
N/A	not applicable
Qty.	quantity
Ref.	reference
s	Depth of female screws

3.5.2 Installing Part Feeding

To ensure normal vibration behavior the Part Feeding must be correctly installed on a base table specifically defined for the application. An incorrect installation of the Part Feeding could compromise the performances of the product.

3.5.2.1 Position of Part Feeding to installing on the table and specification of the table

The Part Feeding must be installed either on a rigid base table screwed to the ground or on a not secured but heavy base table. For the second application the mass $[M]$ and the dimensions $[A \times B]$ of the base table must be large enough to absorb the vibrations generated by the feeder.



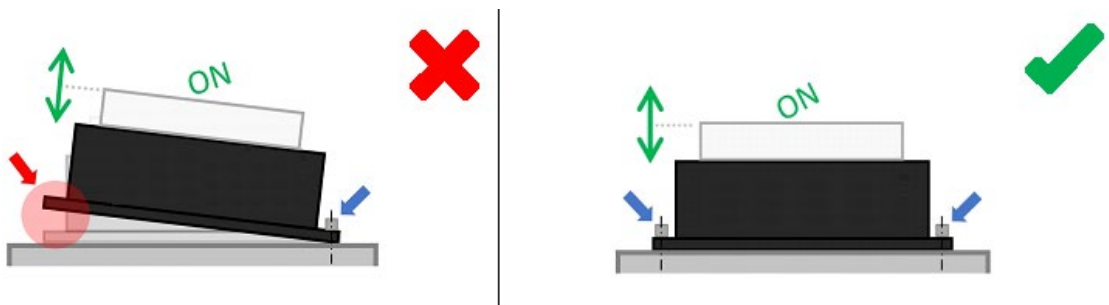
3.5.2.2 Installing Part Feeding on the table

The Part Feeding must be properly installed on the base table.

NOTE



- About number of screws and size of screws when installing on the base table, refer to 3.5.5.2 *Specification of Screw*.



3.5.3 Vibration Decoupling

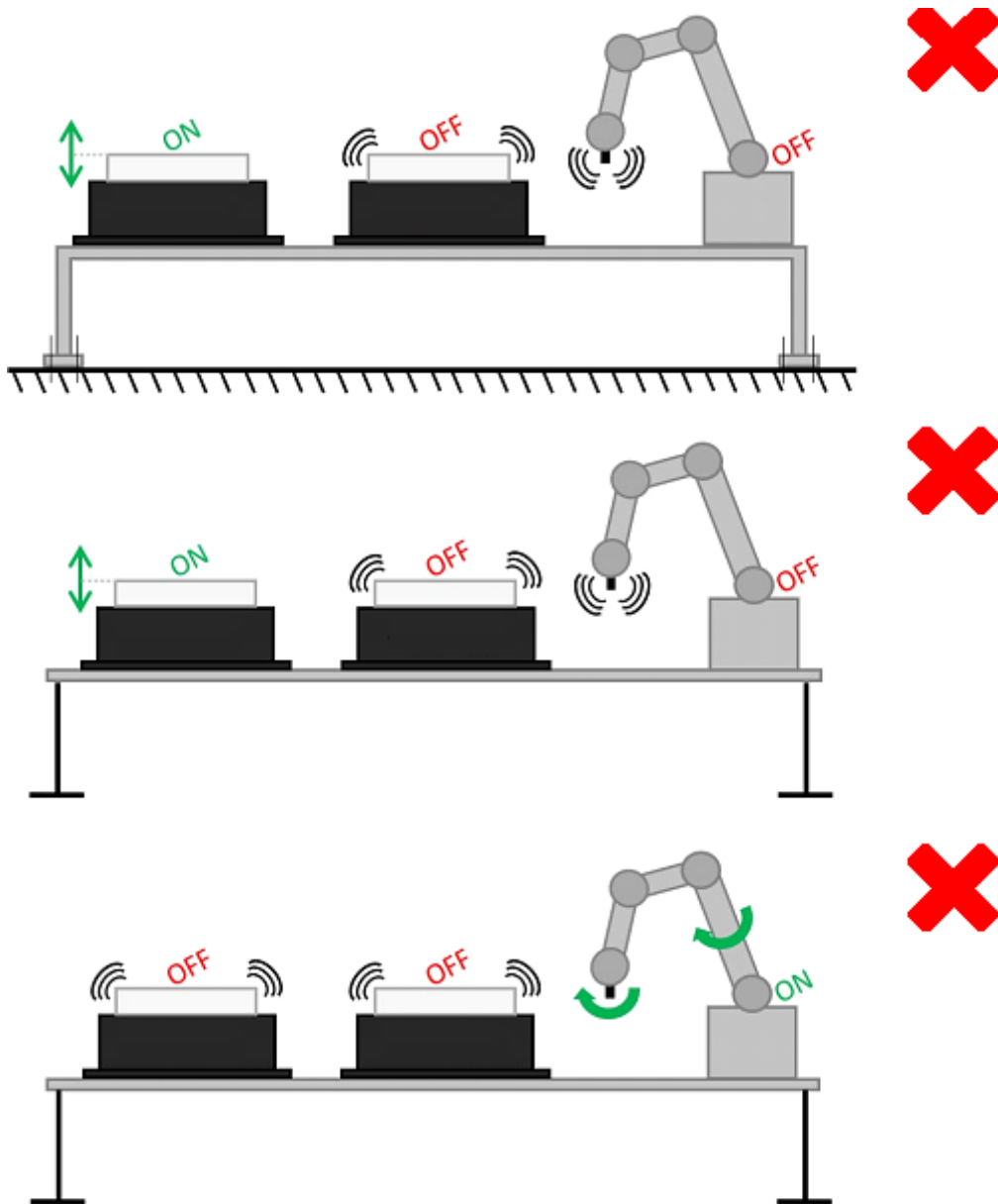
Incorrect assembly of Part Feeding, camera, robot, and hopper may compromise final system performance. To ensure the normal behavior of a system, it is necessary to avoid that all the involved devices can interfere with each other.




- Hoppers are provided with vibration isolators so that hopper vibration is not transmitted to other peripherals.

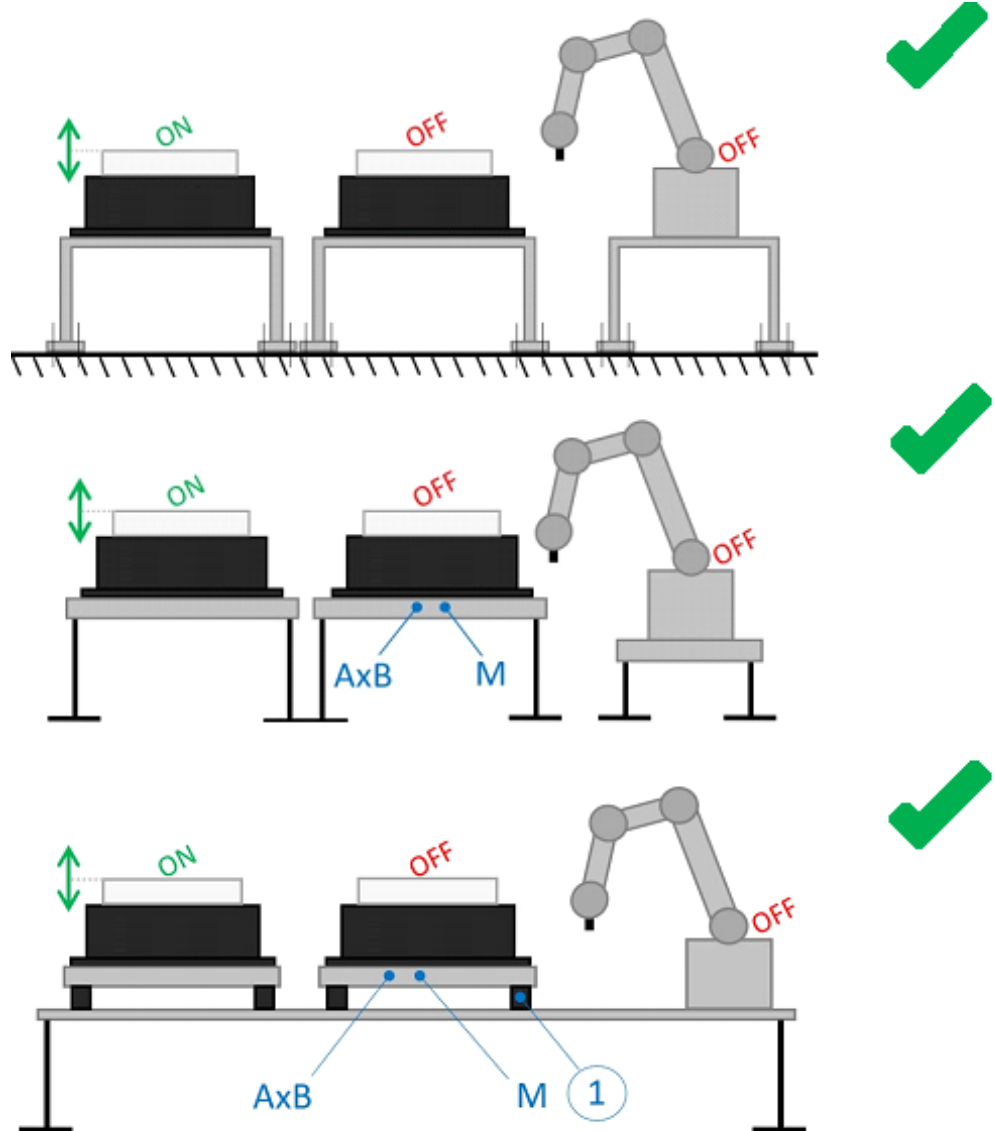
3.5.3.1 Decoupling of Moving Devices

If several moving devices are assembled in parallel, and close to each other, it is necessary to “decouple the vibrations”, to avoid that behavior of any product is disturbed by the movement of others.




It is recommended that each device be equipped with a separate base table to prevent vibration interference. When you can not place it, you can use a part that has Antivibration Technology to isolate vibration. (e.g. vibration isolators [①])

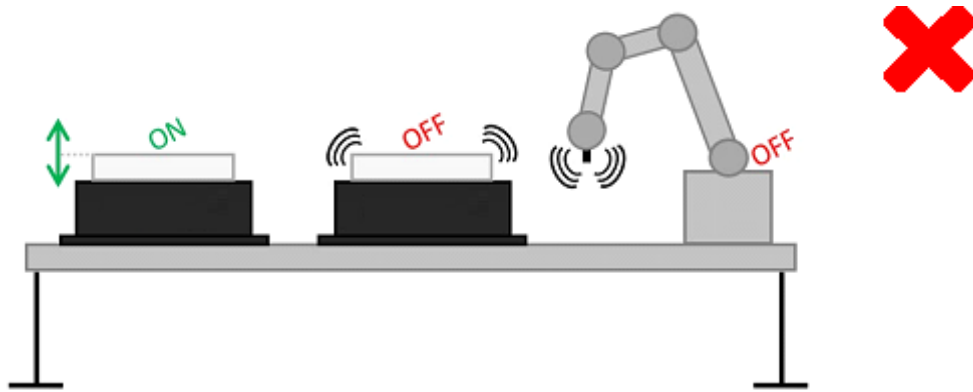
<p>NOTE</p> 	<p>■ Vibration isolators solution is only applicable to IF 240, 380 and 530.</p>
---	--



For the mass [M] and dimensions [A × B] of the base table, refer to 3.5.5.1 *Specification of Base Table*.

For the vibration isolators [①], refer to 3.5.5.3 *Specification of Vibration Isolators*.

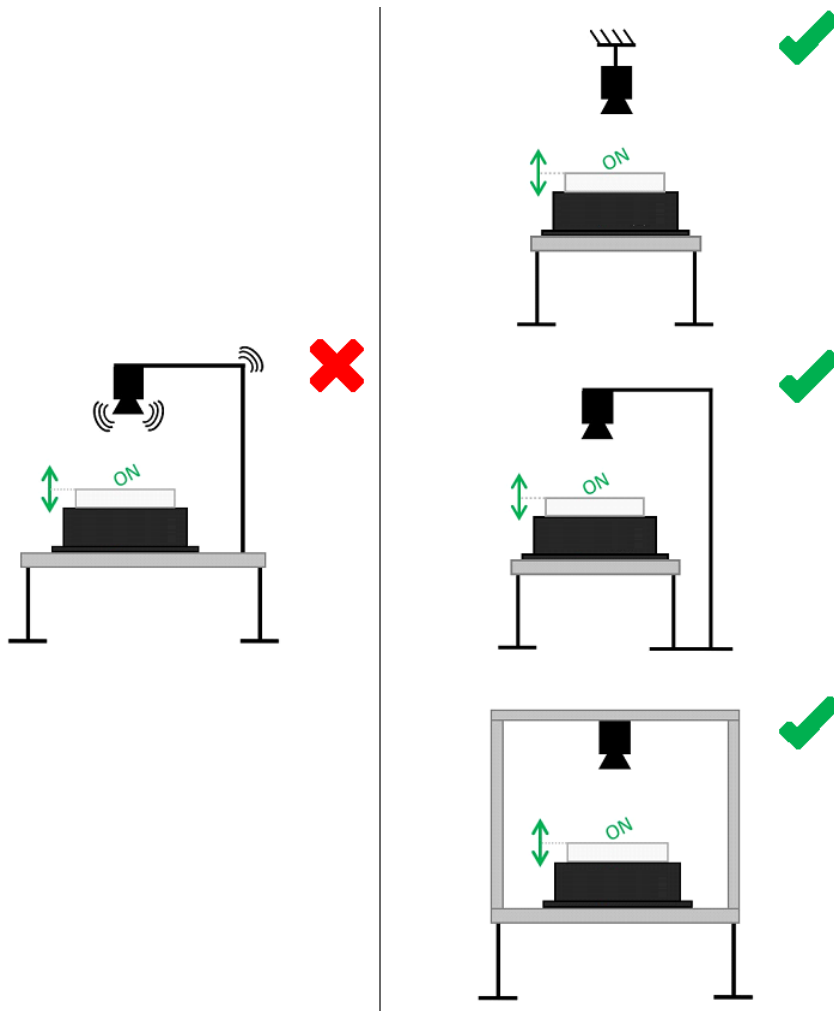
<p>NOTE</p> 	<p>■ Increasing the mass of the base table to avoid the integration of the vibration isolators does not ensure that the spread vibrations will be completely dampen-out.</p>
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3.5.3.2 Decoupling the Camera

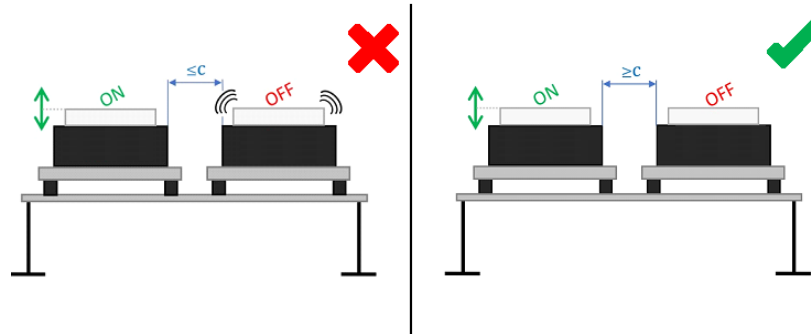
It is important that the camera is not perturbed by the vibration of the feeder or by any other moving device. If the vision system is disturbed by residual vibrations, the coordinates sent to the robot will not be reliable, thus compromising the precision of the whole system.

Therefore, it is recommended not to install feeders and cameras on the same support. When this solution is not applicable, be sure to mount the camera on a rigid and heavy enough base table to prevent back-feeding of vibrations into surrounding devices.



3.5.4 Minimal Distance Between Part Feeding

When two or more feeders are installed close to each other, the movement of the active device can excite the passive one. It is therefore recommended to install the feeders at enough distance to prevent them from disturbing each other.



For minimum distance between part feeding, refer to 3.5.5.4 *Minimal Distance Between Part Feeding*.

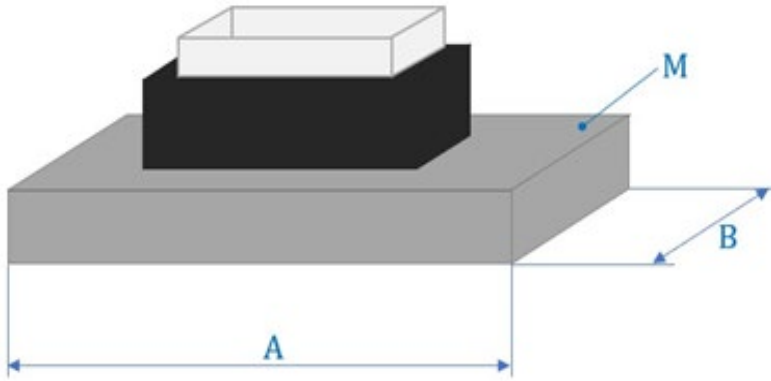
3.5.5 Technical Data Tables


This chapter contains the technical parameters required to properly install the part feeding.

3.5.5.1 Specification of Base Table

	IF-80	IF-240	IF-380	IF-530
M – [Kg]	≥ 10	≥ 40	≥ 200	≥ 250
A – [mm]	≤ 600	≤ 600	≤ 1000	≤ 1200
B – [mm]	≤ 150	≤ 350	≤ 500	≤ 750

Table 3-2: Specification of Base Table



<p>NOTE</p> 	<ul style="list-style-type: none"> ■ The thickness of the base table must be calculated basing on requirements resumed in Table 3-2: Specification of Base Table. ■ Dimension the base table so that the minimum mass [M] requirement is met.
---	---

3.5.5.2 Specification of Screw

	IF-80	IF-240	IF-380	IF-530
Quantity of screws	4	4	4	4
Screw ø	M5	M6	M8	M8


Table 3-3: Specification of Screw

3.5.5.3 Specification of vibration isolators

	IF-240	IF-380	IF-530
APSO *1	12.2034.0103	12.2034.0293	12.2034.0353
$\varnothing D$ – [mm]	16	40	50
H – [mm]	20	40	50
cz – [N / mm]	50	180	190
Fz – [N]	120	690	1000
Qty. – [-]	4	4	4

ELESA *2	411771 DVA.2-15-20-M4-10-55	412021 DVA.2-50-45-M10-28-55
$\varnothing D$ – [mm]	15	50
H – [mm]	20	45
G – [mm]	M4	M10
L – [mm]	10	28
S – [mm]	4	10
cz – [N / mm]	47	182
Fz – [N]	234	2046
Qty. – [-]	4	4

Table 3-4: Specification of vibration isolators

 CAUTION	<ul style="list-style-type: none"> Make sure that total mass of the Part Feeding, base table and components are not exceeding the max. allowed compressive force of the round buffers [Fz]. If the total mass exceeds the max. allowed compressive force, select new round buffer.
---	---

Vibration isolator (round buffer)

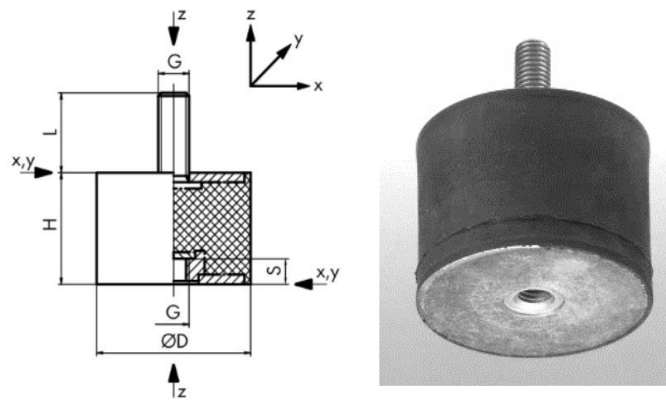
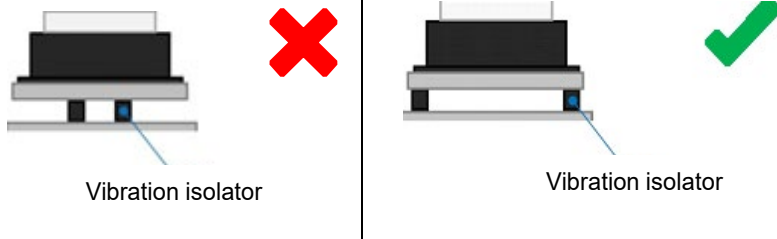


Figure 3-4: Vibration isolator (round buffer)

Position of Vibration isolator



*¹ Angst + Pfister - www.apsoparts.com – (section: Antivibration Technology; APSOvib)

*² Elessa - www.elesa.com – (section: Rubber buffers)

3.5.5.4 Minimal Distance Between Part Feeding

	IF-80	IF-240	IF-380	IF-530
c – [mm]	≥ 10	≥ 10	≥ 30	≥ 30

Table 3-5: Minimal Distance Between Part Feeding

3.6 Connecting Cable

3.6.1 Overview

The IF-240 is a standalone module with its own controller. Power supply is located on the rear panel of the product.

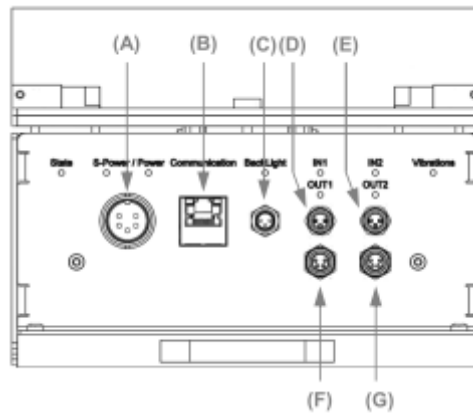



Figure 3-5: Electrical interfaces of the IF-240

- A Power connection
- B Ethernet connection (RJ45)
- C -
- D -
- E -
- F Digital Output 1 for hopper
- G Digital Output 2 for hopper

3.6.2 Power Connection



CAUTION

- Before supplying power to the part feeding, check that the distribution voltage is the same as the nominal voltage.
- Never disconnect the power cables when the unit is on. Always turn the machine off and then cut the power.
- Use PELV (protected extra-low voltage) nominal voltage.
- Unplug the main power plug when plugging / unplugging the cord.

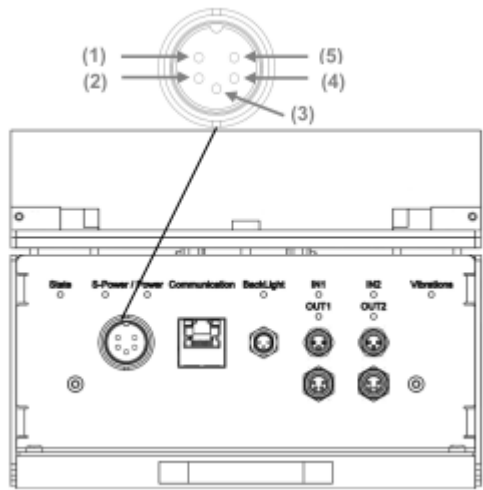



Figure 3-6: Power Connection

Pin	Signal description	Cable
(1)	24VDC PELV S-Power	1
(2)	0V GND S-Power	2
(3)	24VDC PELV Power	3
(4)	0V GND Power	4
(5)	EARTH	PE

Connector type (on IF-240 side): M16, 5 Poles, male

In case of all functions working simultaneously (vibration, backlight, outputs), the current increases to 8A.

Characteristic	Value
Voltage	+24VDC ±5%
Current Power	5A
Current S-Power	3A



NOTE

- The backlight receives power supply by S-Power. Cutting this S-Power ensures that the backlight stays OFF. (e.g. to secure IR backlight danger).
- When operating the feeder, connect both Power and S-Power to power supply.

The following connection schematic shows the methods to connect to the IF-240 depending if your application requires an external relay to ensure that the backlight is safely switched off or not.

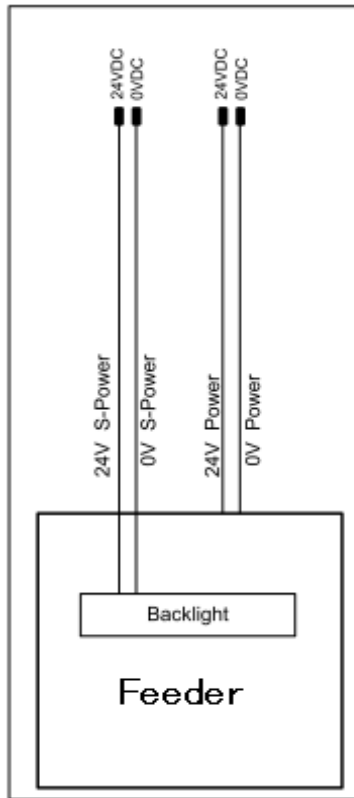


Figure 3-7:

Power connection without safety relay

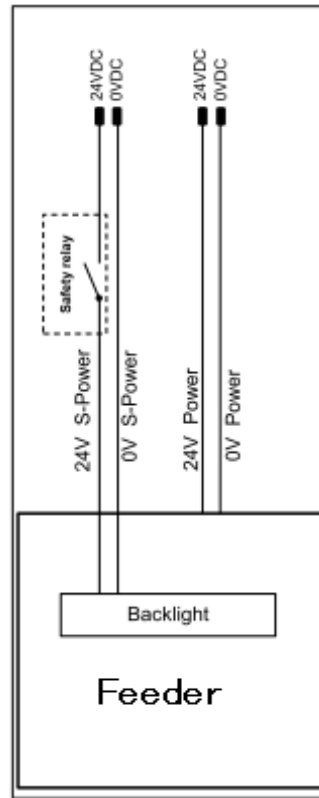



Figure 3-8:

Power connection with safety relay

<p>NOTE</p> 	<p>■ Both Power and S-Power can be connected to a single power supply or to two different power supplies.</p>
---	---

Short-circuit current rating:

	SCCR
Power	40 A
S-Power	40 A

3.6.3 Communication

The communication with the IF-240 is established by a standard Ethernet communication via RJ45 port (A)

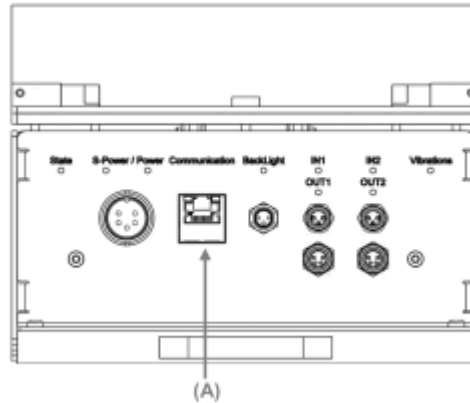


Figure 3-9: Ethernet connection RJ45

Characteristic	Value
Default IP address	192.168.0.64
Default subnet mask	255.255.255.0
Port	4001
MAC address	Can be acquired by ARP request



For more information on the procedure to restore the default IP address, please refer to 5.3.2 *Recovering IP address using default IP address.*

3.6.4 Digital Output for Hoppers 1 and 2

A standard M8 four-pins male cable enables transmission of the digital output signal to hopper. It must be connected as follows:

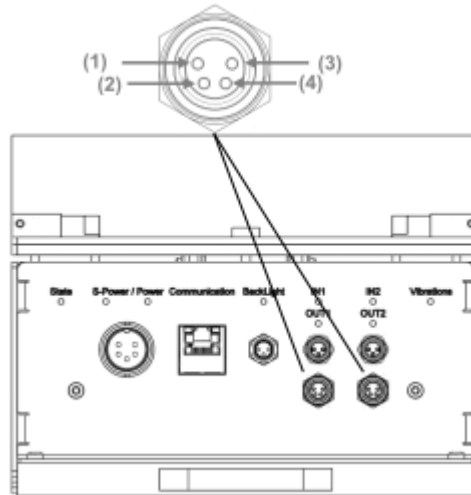


Figure 3-10: Digital output for hoppers

Pin	Signal description	Hopper
(1)	-	-
(2)	-	
(3)	0V GND	Digital Output 1
(4)	+24VDC	




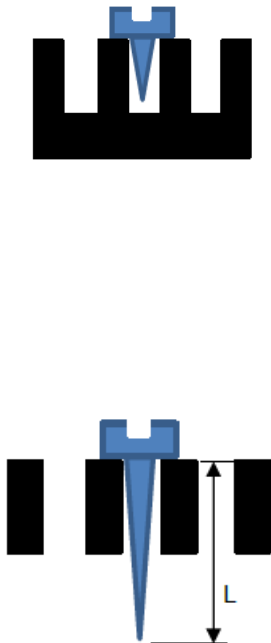
Connector type (on IF-240 side): M8, 4P, female



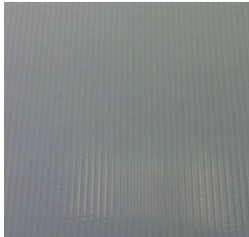

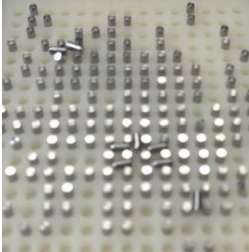
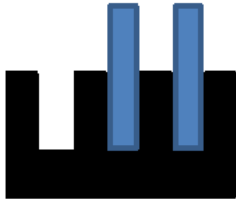
4. Option

4.1 Platform

4.1.1 Platform Type

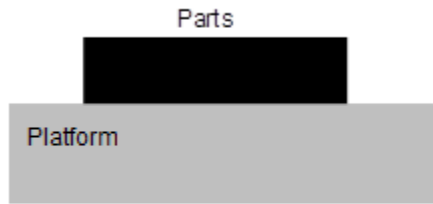
To improve the availability of certain components on the surface of the feeder, it is possible to structure the platform surface. EPSON offers various types of platforms including Flat, Anti-Stick and Anti-roll. Custom platforms with slots, holes or pockets must be designed and fabricated by the customer.

Platform type	Example-picture	Example-drawing	Advantage
Flat		 Ex: Bolts	This type of platform can be used for a large variety of components with a flat surface allowing a stable resting position.
Grooves (deep)		 Ex: Screws, Rivets	A structured platform with deep grooves is used to supply screw-type components to be fitted vertically. A platform with transverse grooves is used to supply components with a maximum length of 60 mm. Note: in case of grooves going through the plate, it is necessary to use the "INTERNAL DIFFUSING PLATE KIT" according product list

Platform type	Example-picture	Example-drawing	Advantage
Grooves (wide) (Anti-roll)		 <p data-bbox="866 600 1117 683">Ex: Cylinders, Needles</p>	Wide grooves are useful when cylindrical components are fed. They reduce the stabilizing time significantly after component displacements on the platform surface. (stop the components from rolling on the surface)
Grooves (narrow) (Anti-stick)		 <p data-bbox="866 1086 1082 1120">Ex: Thin washers</p>	Narrow grooves are necessary to reduce surface contact especially for flat and light components. This reduces adhesion forces and improves the pick-performance of the robot.
Holes		 <p data-bbox="866 1406 970 1440">Ex: Pins</p>	Holes are useful when cylindrical components are to be fed and presented upright.

4.1.2 Standard Platforms Usage

Flat: Parts that have a stable orientation when seated on a tabletop can use a Flat Platform. The parts should have a stable equilibrium and fast stabilization time after vibration. For high-mix low-volume production, most applications use a Flat Platform.

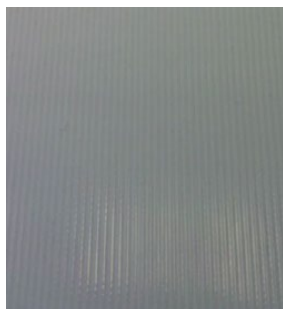


Cross-sectional view

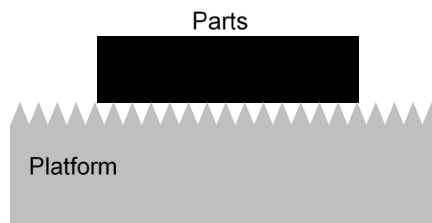
The platforms supplied by Epson meet a flatness and parallelism specification to ensure picking precision as summarized in the table below.

	IF-240
Flatness of the surface [mm]	0.2
Parallelism between surface and reference [mm]	0.5

Anti-Stick: Anti-stick platforms have narrow grooves to reduce surface contact for flat and light components. This reduces friction forces and improves the component movement on the platform surface. Parts that do not spread well because of kinetic friction (sliding friction or dynamic friction) are a good candidate for Anti-Stick platforms.



Surface



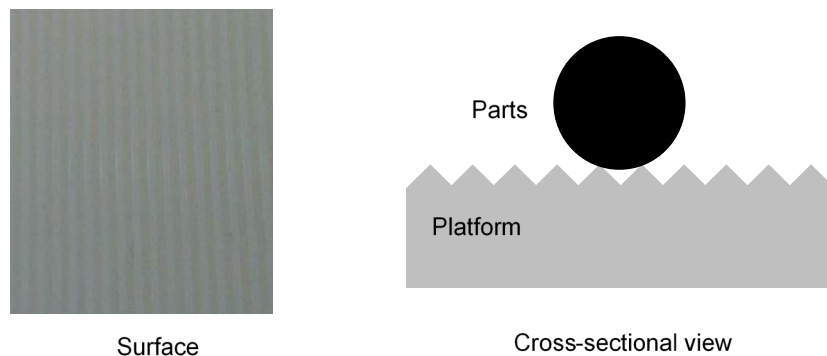
Cross-sectional view

	A	B	C
IF-240	0.7	1.3	0.5

Geometry of standard anti-stick platform for IF-240

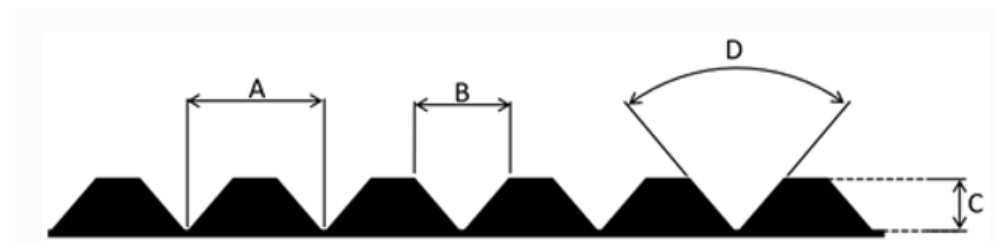


Anti-Roll: Anti-Roll platforms have a machined, structured surface that can stabilize parts that tend to roll on the platform. The Anti-Roll platform is particularly useful when cylindrical components are being fed. The Anti-Roll platform reduces the stabilization time by preventing the parts from rolling.



	A	B	C	D	Suitable for Parts
IF-240	1.25	1	0.5	90	ø 1.7mm – ø 3.5mm
IF-240	3	2.5	1.25	90	ø 3.5mm – ø 7mm
IF-240	5.5	5	2.5	90	ø7mm – ø 14mm

Geometry of standard anti-roll platform structure for IF-240



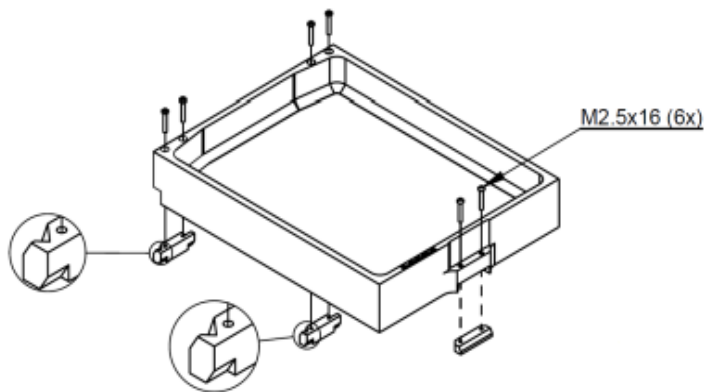
For more information on custom platforms, refer to the the Advanced section of the *Part Feeding Introduction Manual* called “2.2 Custom Platforms”



For model number of platform provided by Epson, refer to 6.2 *Plate (series: IF-240)*.

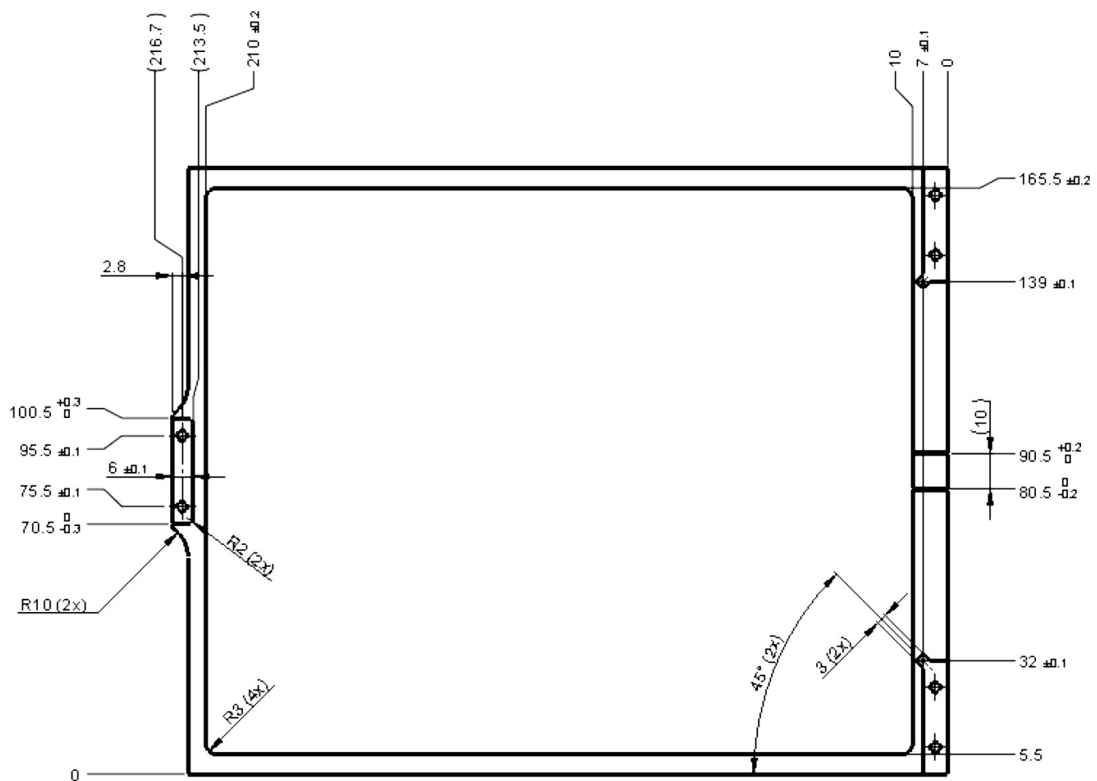
4.1.3 Plate Fixation Kit

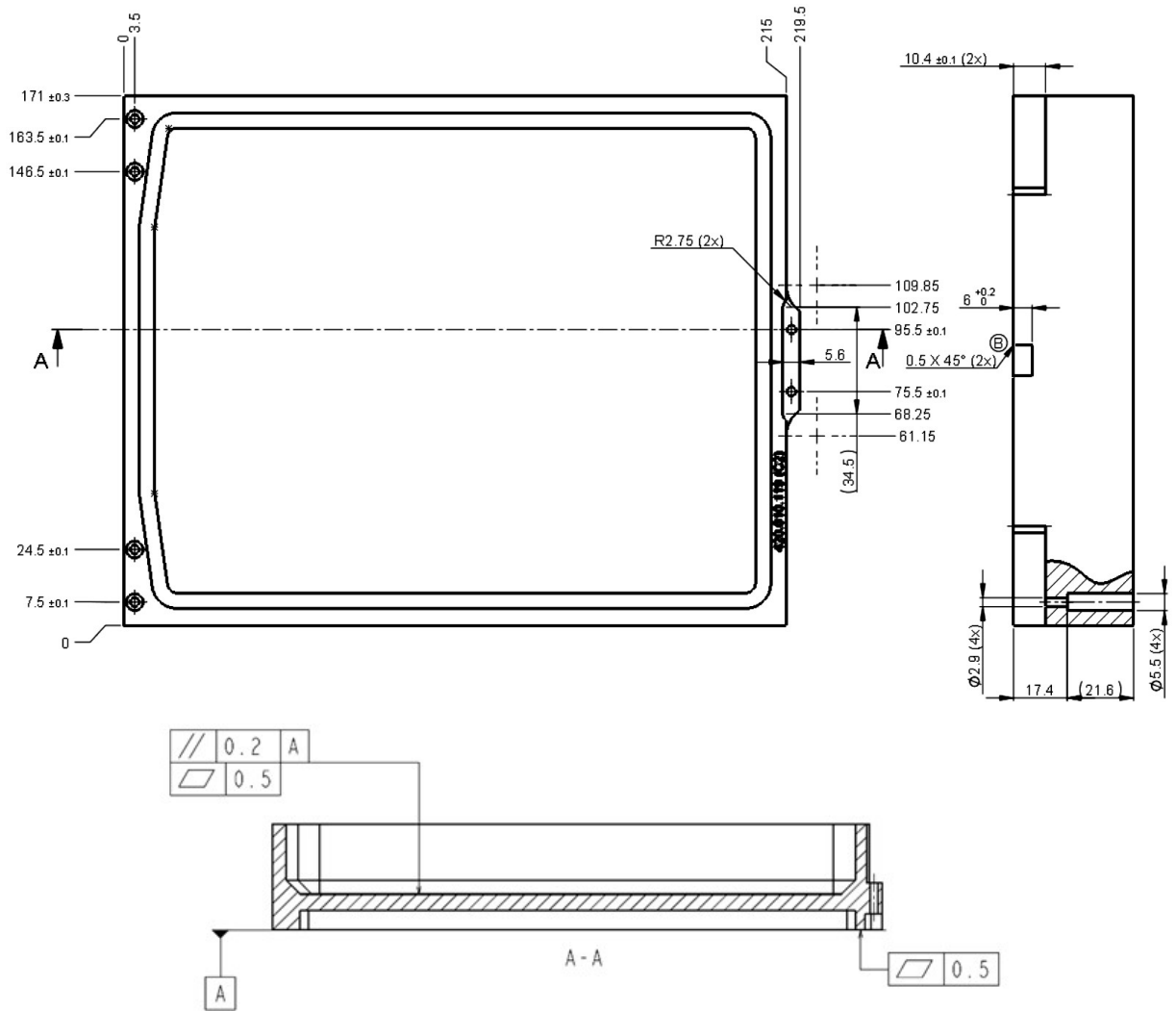
In the case of customer making own platforms, a plate fixation kit can be ordered from Epson.



Product name	Specification	Model name
PLATE FIXATION KIT-240	Plate fixation kit	R12NZ90183

4.1.4 Dimension of Platform





4.2 Backlight

4.2.1 Color Options

The following backlights are available:



Backlight color	Wavelength
Blue	465 nm
Green	550 nm
Infrared	850 nm
Red	645 nm
White	6500 K



For color of backlight and procedure of exchanging backlight, refer to 5.3.1 *Exchanging Backlight*.



For model number of backlight, refer to 6.4 *Backlight (series: IF-240)*.

 WARNING 	<ul style="list-style-type: none">■ Infrared light (IR) is invisible to human eyes. NEVER use the infrared light without the platform (A) secured. When the platform (A) is attached to the part feeding, the system does not pose a risk for the operator.
--	---

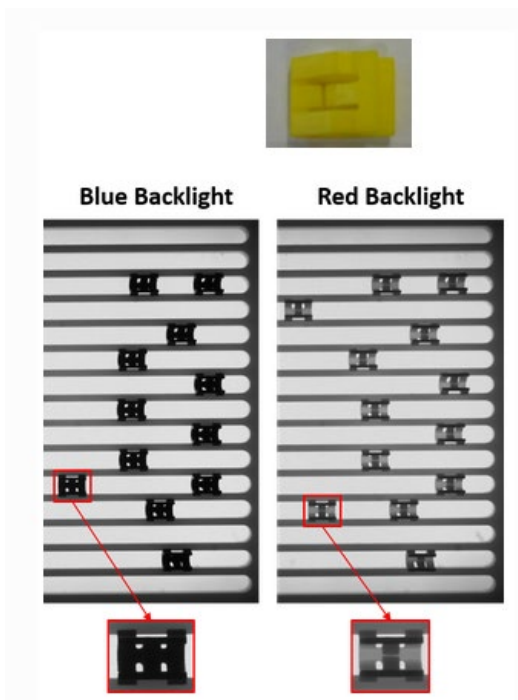
4.2.2 Selecting a Backlight Color

For most of the application, the color of the lighting does not matter, especially for opaque parts. For this reason, we advise the standard red color.

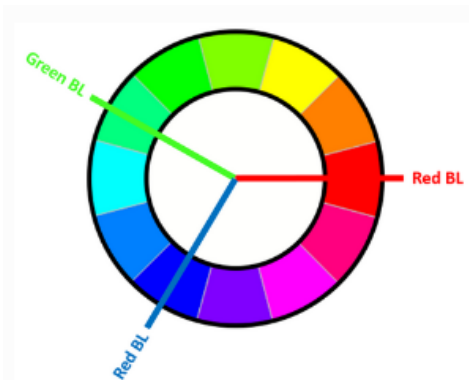
It may be difficult to see translucent parts if their color is close to the color of the backlight. The part may merge a bit with the background. This may be the case even with plastic parts that looks opaque to the eye.

In the example below, when illuminated with a red backlight, the contrast between the yellow clips and the background is compromised (even if the clips look opaque with ambient light).

When illuminated with a blue backlight, the same part will have a much higher contrast against the background. This is because the blue color is the complementary color of the yellow and is therefore better absorbed than the red one.



This is because the yellow color is closer to the red than to the blue in the chromatic circle.



To maximize the contrast, the color of the backlight should be at the opposite of the color of the part.

4.2.3 IR Backlight

IR light can be dangerous for the human sight if no protection (filters) are used on the machine fences. Thus, we advise to use the IR backlight only if it is really required, for example in the following situations:

- Different colored parts that are mixed together may appear similar regardless of their color.
- Translucent parts may appear opaque with a near IR.

4.3 Hopper



For hopper, refer to manual *EPSON RC+ 7.0 Option Part Feeding 7.0 Hopper (IF-240, 380, 530)*.

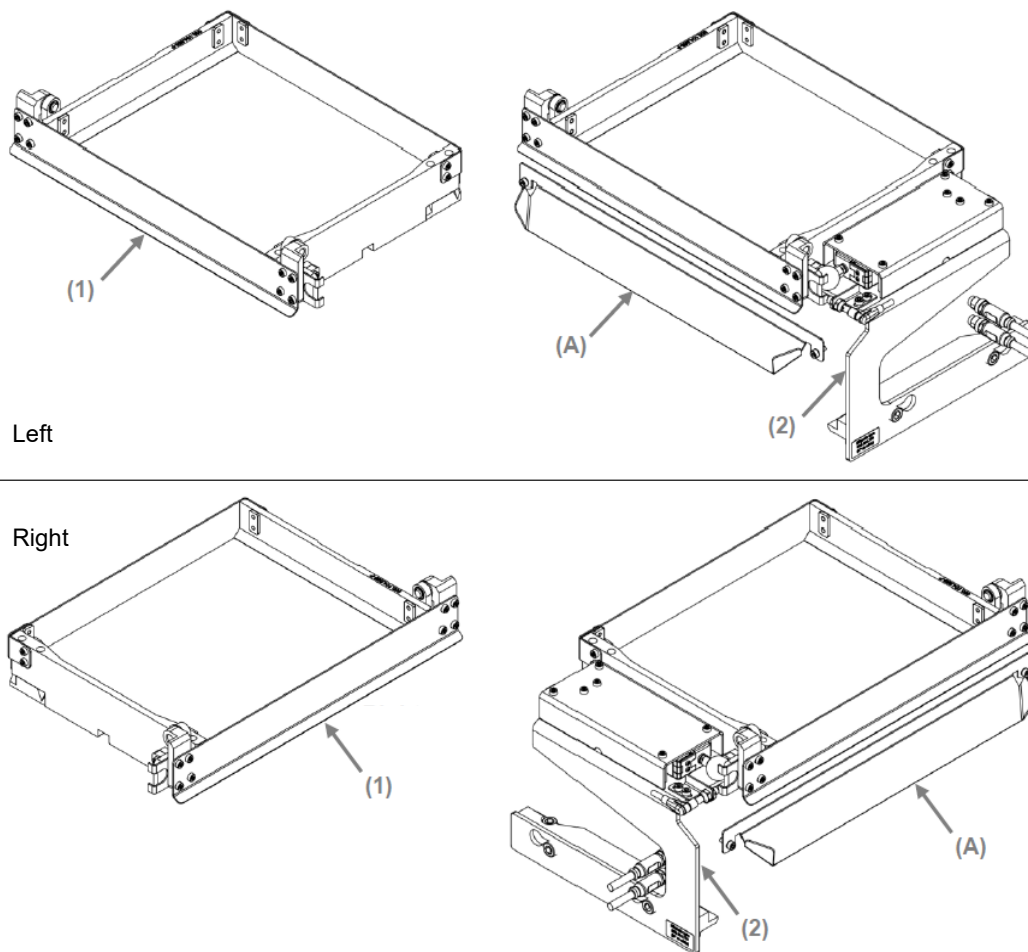


For model number of hopper, refer to *6.5 Hopper (series IF-240)*.

4.4 Purging Platform (Side Purging Platform)


4.4.1 Overview of Purging Platform

Purging platforms for discarding parts either to the left or the right are available for the IF 240. The purging direction cannot be reconfigured after purchase.

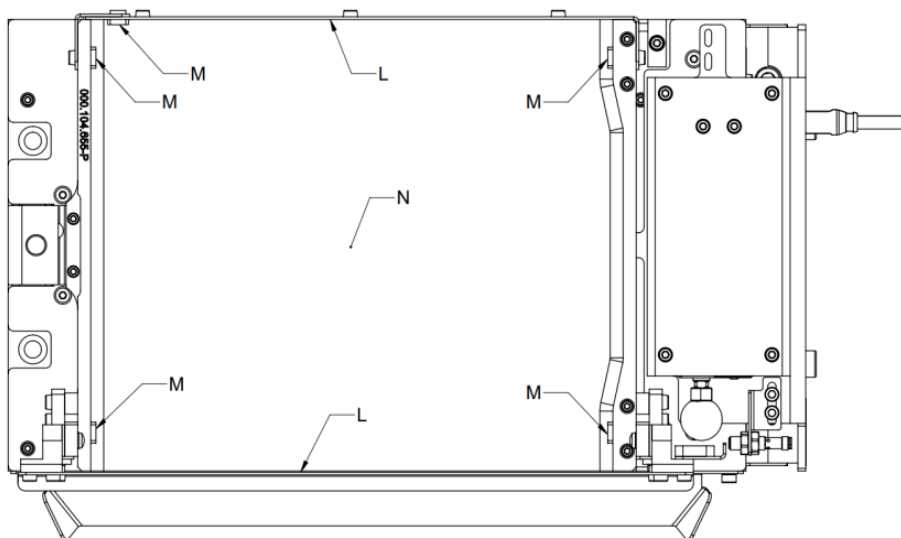
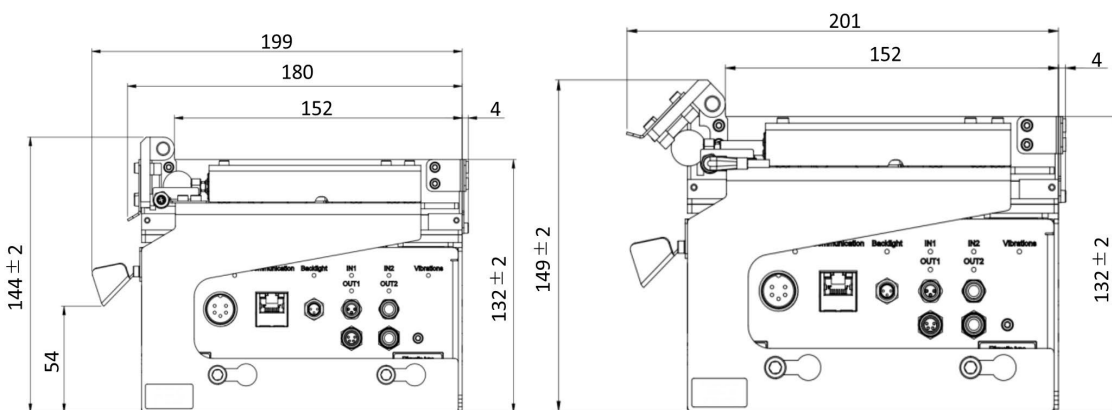


The operation of flap (1) and whether it is closed properly are driven by an electric motor which mounted on purging actuator kit (2), and a sensor. The mechanism is controlled directly by the feeder.


Product name	Specification	Model number
LEFT PURGE ACTUATOR KIT 240	Left purging actuator kit (For IF-240)	R12NZ901DY
RIGHT PURGE ACTUATOR KIT 240	Right purging actuator kit (For IF-240)	R12NZ901DZ

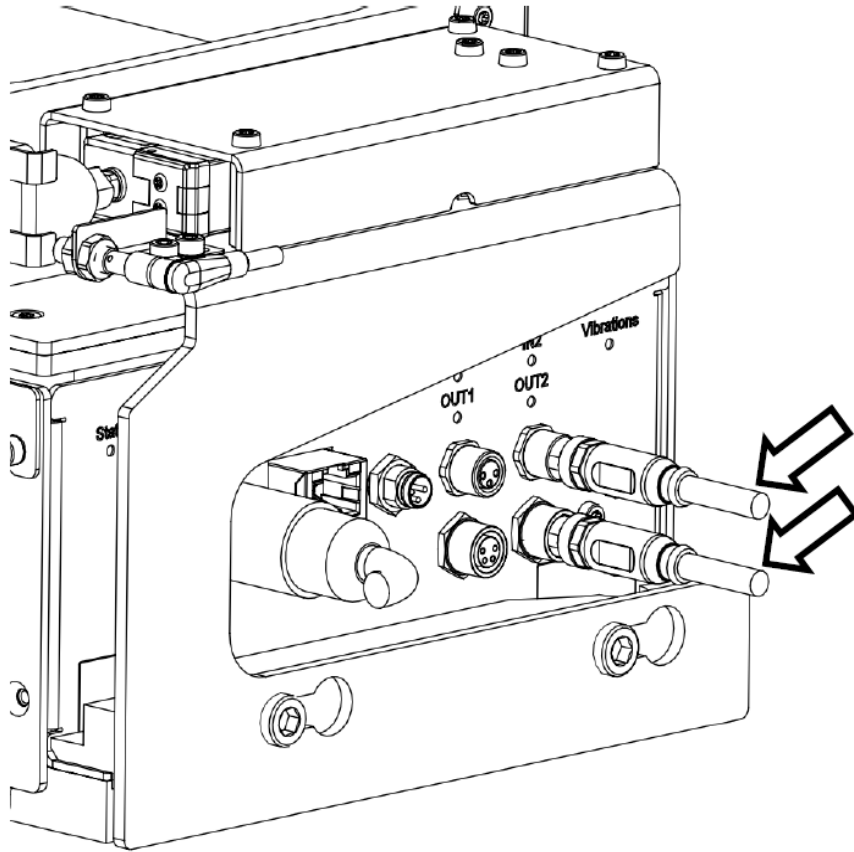
<p>NOTE</p> 	<ul style="list-style-type: none"> ■ The actuator kit is not included purging plate. For model number of purging plate, refer to 6.2.4, 6.2.5. ■ A purge spout (A) is included with the Purging actuator kit (2). ■ The connecting cable is included with the actuator kit (2).
---	--

4.4.2 Outer Dimension of Purging Platform



	Material
L	Stainless steel 1.4301
M	Stainless steel 1.4301
N	POM (Refer: 6.2 Plate (series IF-240))

 <p>CAUTION</p>	<ul style="list-style-type: none"> ■ To use the purge actuator kit, plug the cable in the feeder “IN2” / “OUT2” outputs. Remember to unplug the cable should you need to remove the system.
--	--



NOTE



- When plugging in the purge platform, the motor will seek its origin position, hence emitting some noise. That noise may be heard while operating too, under certain circumstances.




CAUTION


- To prevent the motor from being prematurely damaged, all movements that don't aim at emptying the platform must not be used.
(e.g. consider a purging system with the flap on the left. Only the "Left" vibration may be used. Similarly, with a purging system whose flap is on the right, only the "Right" vibration may be used).


5. Maintenance and Component Replacement

5.1 Safety Precautions


5.1.1 General Safety Precautions

 WARNING	<ul style="list-style-type: none"> ■ There are no user serviceable parts inside the product. Contact the supplier of your region or your local supplier for maintenance. In cases of nonconformity, the product guarantee will expire.
--	---

 CAUTION	<ul style="list-style-type: none"> ■ Do not operate the system when it is damaged. Please ensure before use that there are no visual defects.
--	--

 WARNING	<ul style="list-style-type: none"> ■ Failure to observe the instructions may result in electrocution or serious injury due to electric shock. ■ Power down the system and unplug it from the mains before any kind of maintenance. ■ Do not pour water or any other liquids onto the product. Spraying water over the product, washing it with water or using it in water may cause the product to malfunction, resulting in injury, electric shock, fire, etc.
--	--

5.1.2 Specific warnings

 CAUTION	<ul style="list-style-type: none"> ■ Be sure that the platform is unloaded before any kind of maintenance.
--	---

5.2 Maintenance



CAUTION

- For any kind of maintenance, use Epson products.

5.2.1 Regular Maintenance Schedule

Perform inspections regularly and ensure optimum performances, and safety operating.

	Item	Period	Reference
General	Cleaning of the machine	Weekly	
	Visual check of electrical harness	Year	
	Visual check and cleaning of the plate	Weekly	Section 5.2.4
Specific process	It is the customer's responsibility to schedule the maintenance of his specific process	/	/
Backlight	Visual check	Month	
Purging actuator	Replacing purging actuator	20,000 cycle	Section 5.3.3



Table 5-1: Maintenance schedule

NOTE



- “The information given in the “Table 5-1: Maintenance schedule” is only informative, maintenance and times must be modified with your particular system, its operating environment and the amount of usage.

5.2.2 Removing the Platform Module

 CAUTION 	<ul style="list-style-type: none"> Be sure that the backlight is off before removing the platform module. <p>When it is not followed below procedures, the backlight may be damaged.</p>
---	---



Risk of crushing. Do not place your finger between the platform and the locking mechanism.

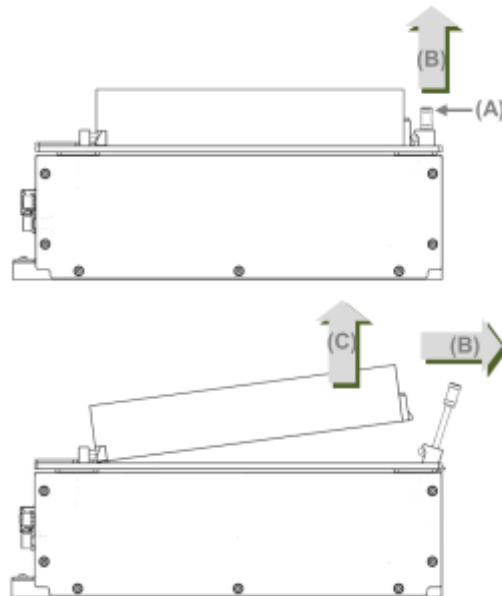


Figure 5-1: Remove the platform

Step 1

Pull out the integrated tool (A) and move it away for freeing the platform (B).

Step 2

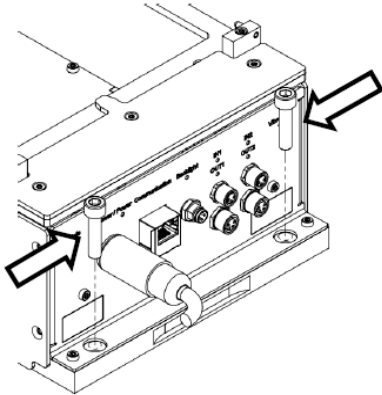
Take the platform out (C). Release the tool – the mechanism as reverse operation from step 1 to let it return to its initial position.

5.2.3 Installing Purge Actuator Kit

Step 1

Unscrew the feeder on the connector side.

2 screws I5

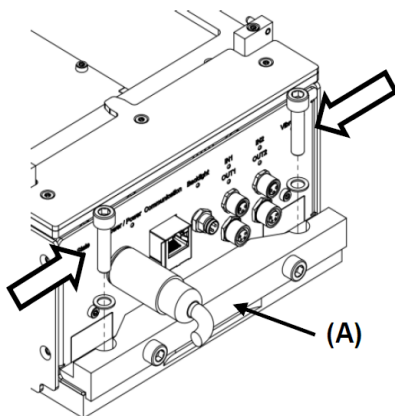


Step 2

Position the support (A) and screw back the feeder.

(In this step, take care to push it on the surface of the feeder.)

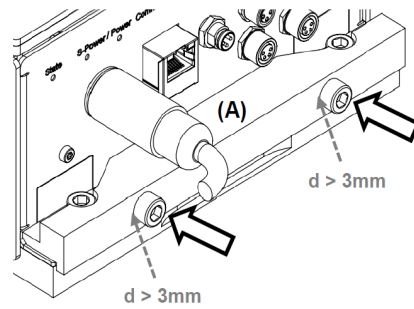
2 screws I5



Step 3

Loosen the screws of the support to ensure a distance: $d > 3\text{mm}$, between the surface of the support (A) and the head of the screws.

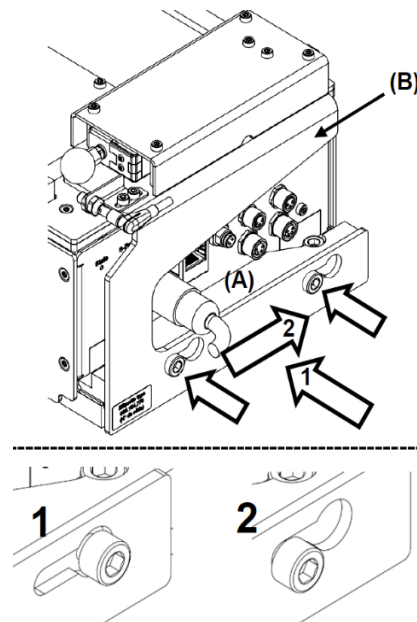
2 screws I5



Step 4

Position the purge actuator kit (B) (1)-(2) and tighten the screws of the support (A).

2 screw I5 -4.5Nm



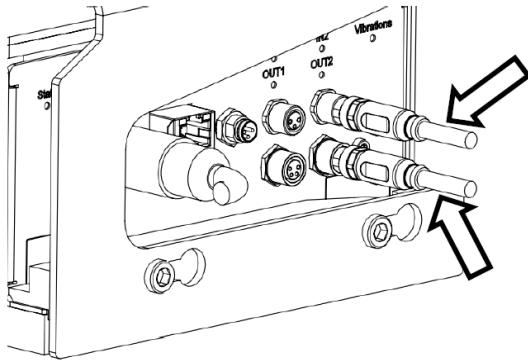
Slide the purge actuator kit (B) install against the screws before tightening them.
(Operation 2)

5. Maintenance and Component Replacement

Step 5

Connect the purge actuator kit to the feeder.

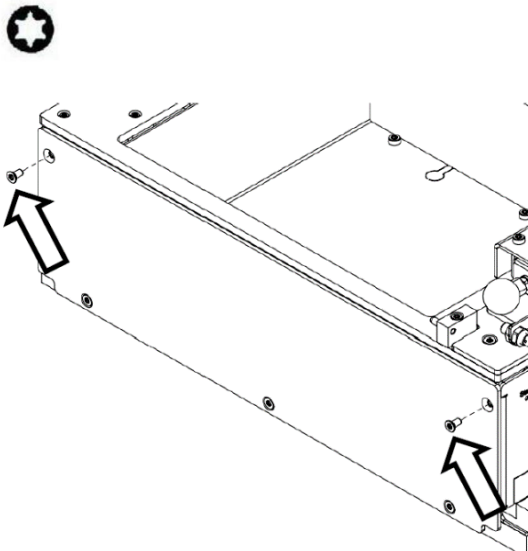
Use the outputs: IN2 / OUT2.



Step 6

Remove 2 screws from the side plate.

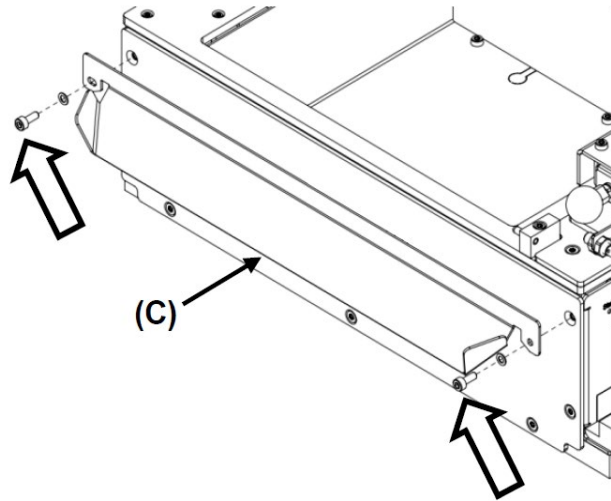
2 screws Tx10)



Step 7

Screw the purge spout (C) on the base of the feeder.

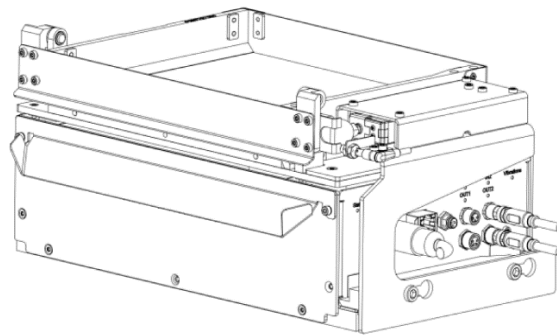
2 screws I2.5 - 1.2Nm



Step 8

Position the platform on the feeder.

for more details, refer to 5.2.2 *Removing the Platform module.*



5. Maintenance and Component Replacement

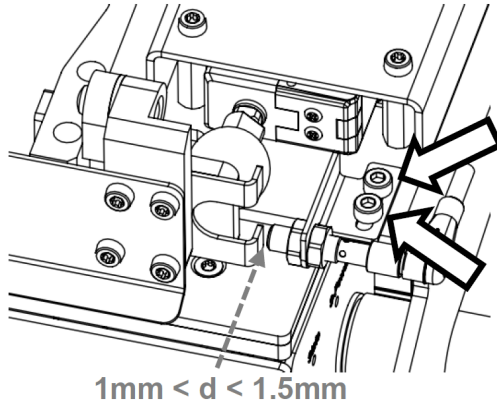
Step 9

Unscrew the sensor holder.

Set the sensor at a distance between 1mm to 1.5mm from the sensor plate.

Tighten the 2 screws of the sensor holder.

2 screws I2.5 - 1.2Nm



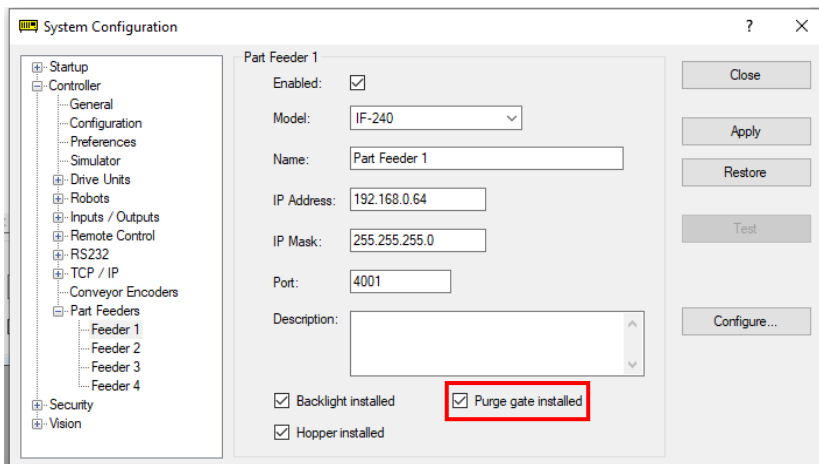
A red-light signal lights up when the sensor picks up the detection plate.

Step 10

Power ON the feeder and Controller. Open EPSON RC+ and Connect to the Controller.

If you have not already done so, configure the settings to connect the feeder to the Controller in the EPSON RC+ 7.0-Menu-[Setup]-[System Configuration]. Refer to section “2.1 System Configuration” in the “Part Feeding 7.0 Introduction & Software” Manual for further details.

Check the [Purge gate installed] checkbox and click <Apply>.




New parts now can be added from EPSON RC+ 7.0-Menu-[Tools]-[Part Feeding].




CAUTION

- The [Purge gate installed] setting influences vibration parameters. It is critical that you check the [Purge gate installed] checkbox prior to adding new Parts in the Part Feeding dialog. If the checkbox is checked after adding new Parts then the default vibration parameters will be incorrect and the feeder will not perform properly.

 CAUTION	<ul style="list-style-type: none"> ■ When the purge flap is open, do not use any other vibrations than left or right. If this constraint is not respected the mechanism could be irreparably damaged. ■ The purge kit and the purge option activation modify the vibration behavior. Do not forget to deactivate the purge option when you remove the purge kit. ■ When connecting the purge kit, connect hopper to Output 1, and connect the purge kit to Input2 and Output2.
--	---

5.2.4 Control and cleaning of the platform

 CAUTION	<ul style="list-style-type: none"> ■ Platforms are consumables. <p>If the surface is damaged so as to obstruct vision or the behavior of parts, its replacement must be preceded.</p> <p>For more information about maintenance parts, please contact the supplier of your region.</p>
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Material needed:

- Lint-free cloth
- Isopropanol alcohol

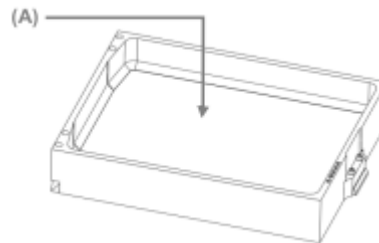


Figure 5-2: Platform

Step 1

Control the surface state of the platform (A) and be particularly careful of the following points:


- Scratches
- Dirt or spotted surface
- Oily or greasy surface

Step 2

Clean the surface of the platform.

5.3 Component Replacement


For a list of the components which can be replaced directly by the customer, please contact the supplier of your region. For any other repair, the product must be returned to the manufacturer.

 CAUTION	<ul style="list-style-type: none"> For any kind of replacement, always use Epson products.
--	---

Replaceable parts

Product name	Model number
GREEN BACKLIGHT - 240	R12NZ90185
RED BACKLIGHT - 240	R12NZ90186
BLUE BACKLIGHT - 240	R12NZ90187
WHITE BACKLIGHT - 240	R12NZ90188
INFRARED BACKLIGHT - 240	R12NZ90189
PURGE ACTUATOR ASSEMBLY - 240	1889173

5.3.1 Exchanging / Installing the Backlight

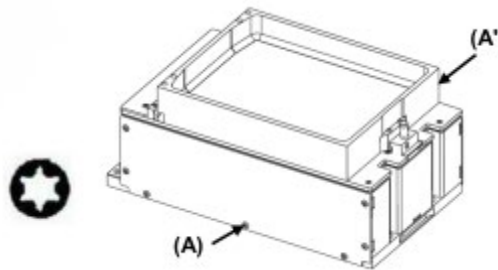
 CAUTION	<ul style="list-style-type: none"> Be sure that all power sources and other cable connectors to the unit are disconnected before changing the backlight.
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Material needed:

- New backlight assembly ordered from the supplier of your region. (Please ask part code to the supplier.)
- Flat wrench size 5.5
- Torx key size 10

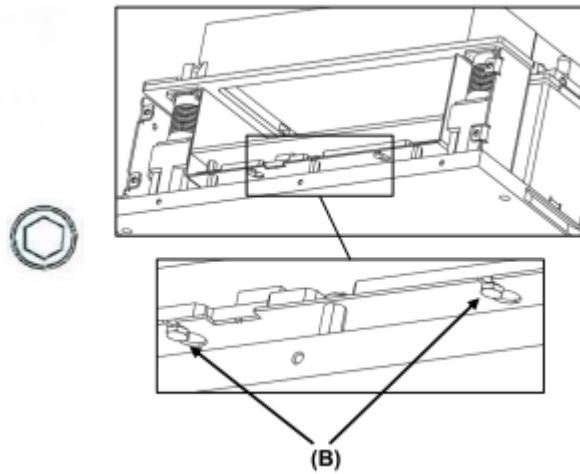
Step 1

Unscrew the 7 screws on both sides (A) and (A') and remove the two side covers Use a Torx key size 10.



Step 2

On both sides, unscrew the four bolts (B). Use a flat wrench size 5.5.



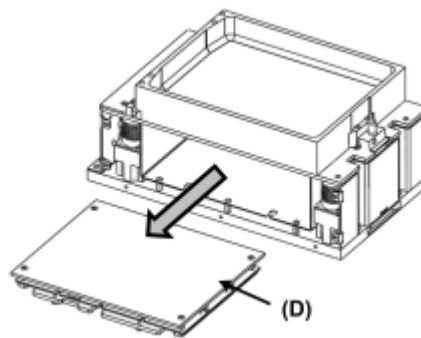
Step 3

Unplug the backlight connector (C).

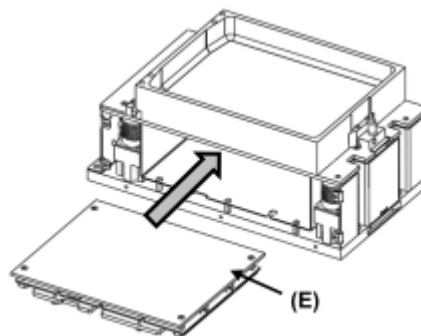


Step 4

Remove the old backlight (D).



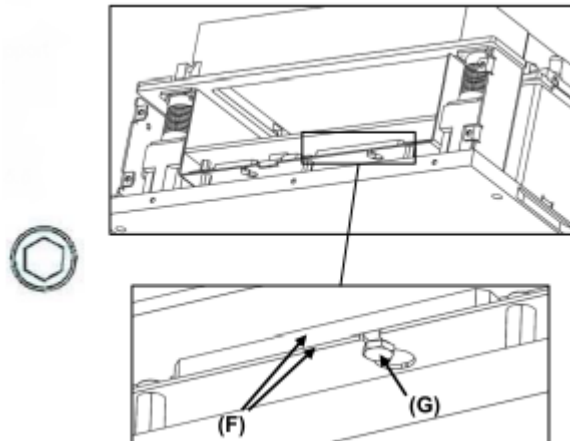
Insert the new backlight (E).



5. Maintenance and Component Replacement

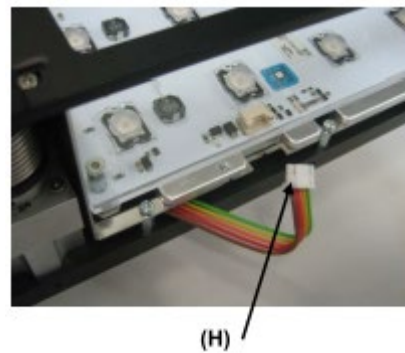
Step 5

Align the backlight module flush with the mirror support (F) and tighten the four bolts (G).
Use a flat wrench size 5.5.



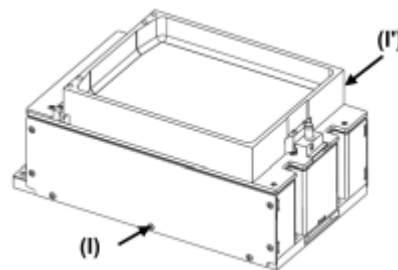
Step 6

Plug in the backlight connector (H).



Step 7

Remount the covers (I) and (I') on both sides.



5.3.2 Recovering IP address using default IP address

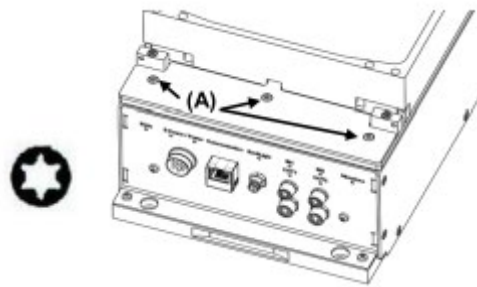
The following procedure explains how to reboot the IF-240 so that it uses the default IP address, subnet mask and TCP port number to be able to modify the IP address, subnet mask and TCP port number when they are unknown and cannot be found. Following this procedure, you are able to connect to the IF-240 with default parameters and then modify parameters.

Material needed:

– Torx key size 10

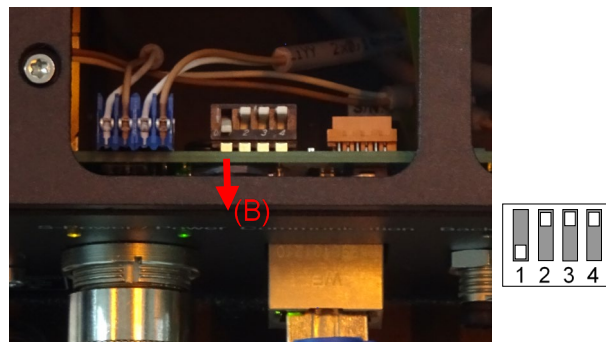
Step 1

Unscrew the 3 screws (A) and remove the cover. Use a Torx key size 10



Step 2

Place selector 1 in the “on” position (B)



Step 3

Disconnect and reconnect the power cable
(or switch off and switch on the power of the IF-240).

The IF-240 will use the following default parameters at startup:

IP: 192.168.0.64

SubnetMask: 255.255.255.0

TCP Port: 4001

5. Maintenance and Component Replacement

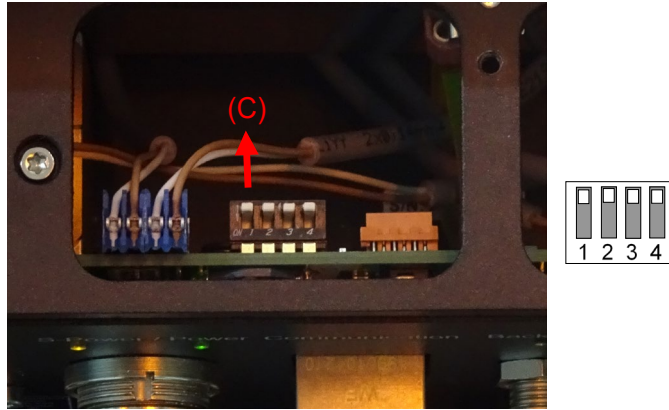
Step 4

Parameters in memory can now be modified by RC+.

For more details, refer to *EPSON RC+ 7.0 Option Part Feeding 7.0 Introduction & Software "Software 2.1 System Configuration"*.

Step 5

When parameters are defined as desired, replace selector 1 in position (C).



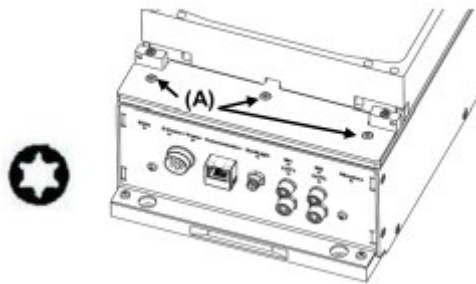
Step 6

Disconnect and reconnect the power cable (or switch off and switch on the power of the IF-240).

The IF-240 will use the parameters defined by the new startup.

Step 7

Replace the cover and screw the 3 screws (A) Use a torx key size 10 (0.9N·m)



5.3.3 Replacing the Purging Actuator

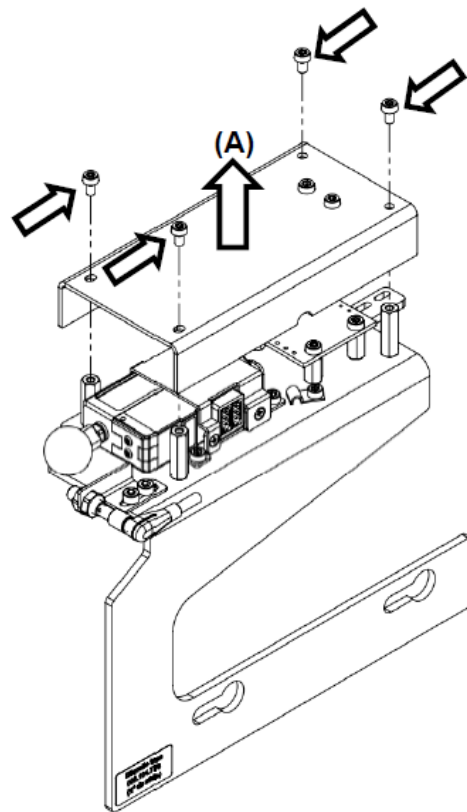


- Before replacing the actuator, unplug the purging actuator kit from the feeder. And remove the platform and remove the purging actuator kit.

Step 1

Remove the protective cover (A).

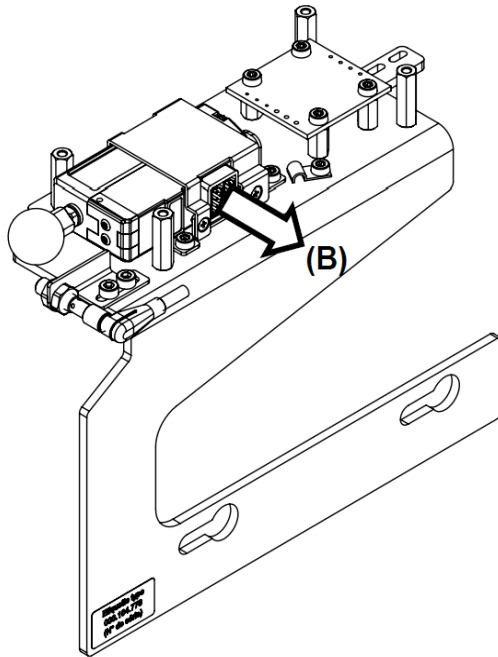
4 screws, Tx10



5. Maintenance and Component Replacement

Step 2

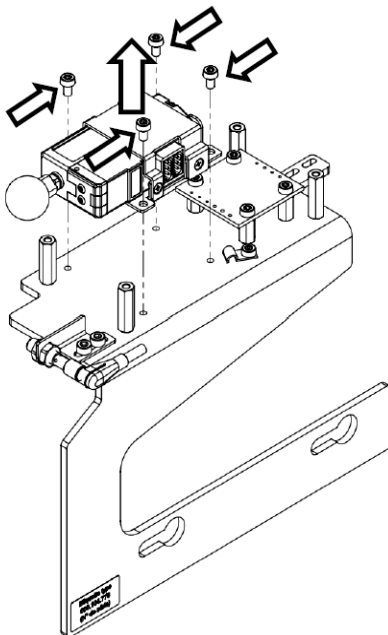
Disconnect the actuator by pulling on the connector, and not on the cable itself (B).



Step 3

Unscrew the actuator block.

4 screws, Tx10



Step 4

Unscrew and open the support (1).

4 screws, X0

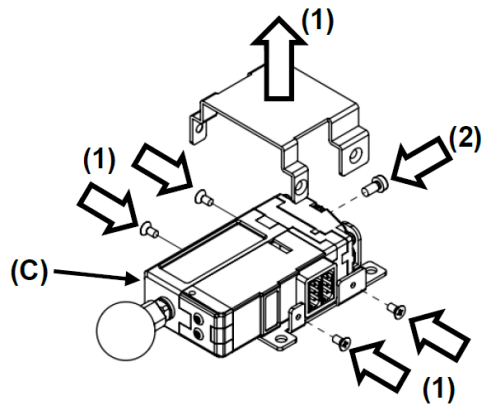


Unscrew the actuator (2).

1 screw, Tx8



Swap out the actuator (C).



Step 5

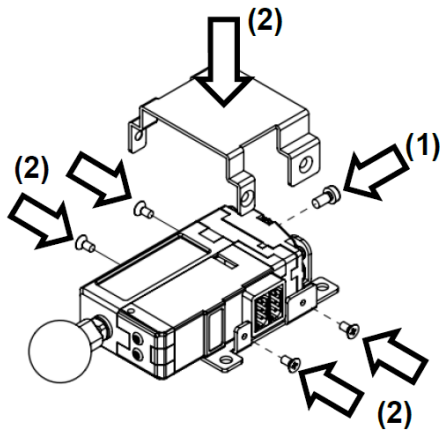
Screw back the actuator in the support (1).

1 screw, Tx8, - 0.8Nm



Close and screw support (2).

4 screws, X0, - 0.6Nm

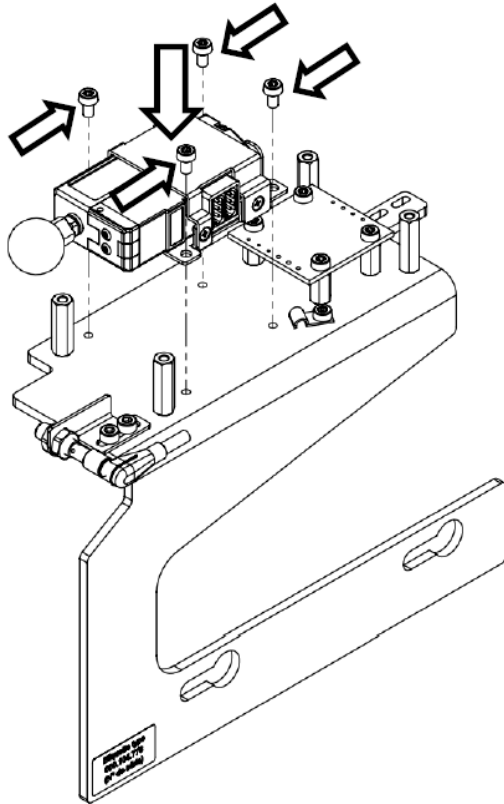


5. Maintenance and Component Replacement

Step 6

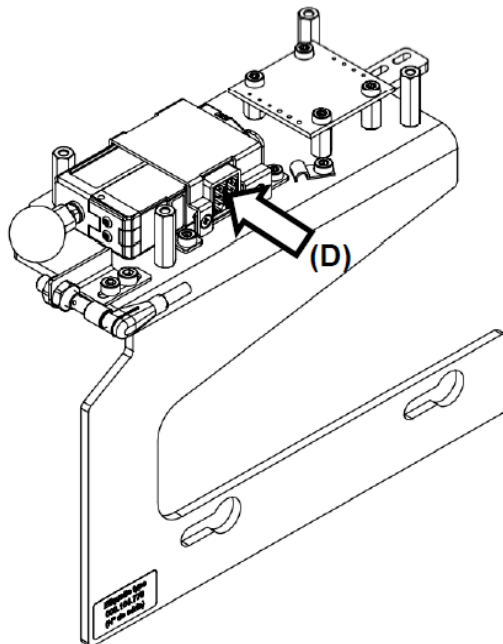
Screw back the actuator block on the main plate.

4 screws, Tx10 - 1Nm



Step 7

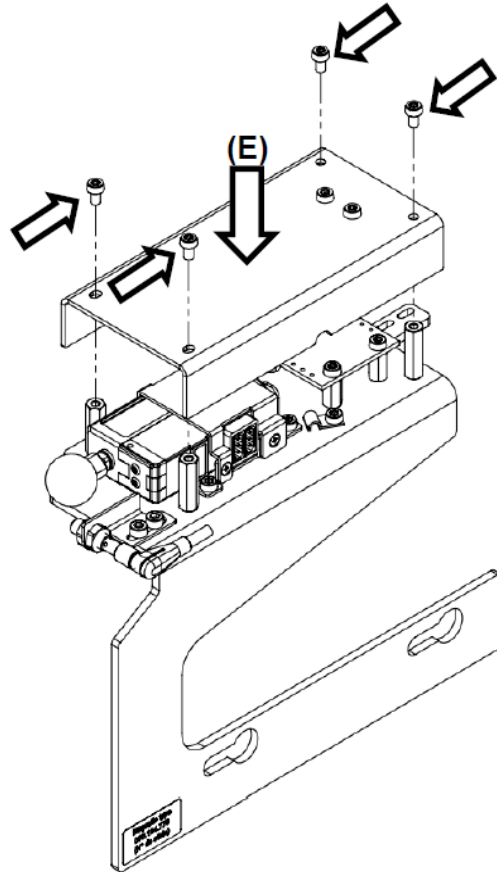
Plug in the actuator (D).



Step 8

Screw the protective cover (E) back into position.

4 screws, Tx10, - 0.6Nm



6. Option Part List

6.1 Feeder (series: IF-240)

Product name	Specification	Model name
IF240 no Light	IF240 (no Backlight)	R12NZ9016W
IF240 RED	IF240+Backlight: Red	R12NZ9016X
IF240 WHITE	IF240+Backlight: White	R12NZ9016Y
IF240 GREEN	IF240+Backlight: Green	R12NZ9016Z
IF240 BLUE	IF240+Backlight: Blue	R12NZ90171
IF240 INFRARED	IF240+Backlight: Infrared light	R12NZ90172

6.2 Plate (series: IF-240)

6.2.1 Plate (POM-C: White)

The plate includes plate fixing kit.

Product name	Specification	Model name
FLAT PLATE-240	Flat (White) Material: POM-C (white)	R12NZ90173
ANTI-ROLLING PLATE-240dia.1.7-3.5	Anti-roll (White) Supported work piece: \varnothing 1.7-3.5 Material: POM-C (white)	R12NZ90174
ANTI-ROLLING PLATE-240dia.3.5-7.0	Anti-roll (White) Supported work piece: \varnothing 3.5-7.0 Material: POM-C (white)	R12NZ90175
ANTI-ROLLING PLATE-240dia.7.0-14	Anti-roll (White) Supported work piece: \varnothing 7.0-14.0 Material: POM-C (white)	R12NZ90176
ANTI-STICK PLATE-240	Anti-stick (White) Material: POM-C (white)	R12NZ90177

6.2.2 Plate (Anti-static)

The plate includes plate fixing kit.

Product name	Specification	Model number
FLAT PLATE ESD-240	Flat (Ocher) Material: POM-C ED (Anti-static)	R12NZ90178
ANTI-ROLLING PLATE ESD-240dia.1.7-3.5	Anti-roll (Ocher) Supported work piece: \varnothing 1.7-3.5 Material: POM-C ED (Anti-static)	R12NZ90179
ANTI-ROLLING PLATE ESD-240dia.3.5-7.0	Anti-roll (Ocher) Supported work piece: \varnothing 3.5-7.0 Material: POM-C ED (Anti-static)	R12NZ9017A
ANTI-ROLLING PLATE ESD-240dia.7.0-14	Anti-roll (Ocher) Supported work piece: \varnothing 7.0-14.0 Material: POM-C ED (Anti-static)	R12NZ9017B
ANTI-STICK PLATE ESD-240	Anti-stick(Ocher) Material:POM-C ED (Anti-static)	R12NZ9017C
FLAT PLATE(BK)-240	Flat (Black) Material: POM-C EC (Anti-static)	R12NZ9017D
ANTI-ROLLING PLATE(BK)-240dia.1.7-3.5	Anti-roll (Black) Supported work piece: \varnothing 1.7-3.5 Material: POM-C EC (Anti-static)	R12NZ9017E
ANTI-ROLLING PLATE(BK)-240dia.3.5-7.0	Anti-roll (Black) Supported work piece: \varnothing 3.5-7.0 Material: POM-C EC (Anti-static)	R12NZ9017F
ANTI-ROLLING PLATE(BK)-240dia.7.0-14	Anti-roll (Black) Supported work piece: \varnothing 7.0-14.0 Material: POM-C EC (Anti-static)	R12NZ9017G
ANTI-STICK PLATE(BK)-240	Anti-stick (Black) Material: POM-C EC (Anti-static)	R12NZ9017H

6.2.3 Plate (FDA)

The plate includes plate fixing kit.

* We use materials which conformed FDA (Food and Drug Administration).
(FDA 21CFR177.2470 & 21CFR178.3297)

Product name	Specification	Model number
FLAT PLATE MED-240	Flat (White)/* FDA Material: POM-C (white) (FDA)	R12NZ9017J
ANTI-ROLL PLATE MED-240dia.1.7-3.5	Anti-roll(White)/* FDA Supported work piece: \varnothing 1.7-3.5 Material: POM-C (white) (FDA)	R12NZ9017K
ANTI-ROLL PLATE MED-240dia.3.5-7.0	Anti-roll(White)/* FDA Supported work piece: \varnothing 3.5-7.0 Material: POM-C (white) (FDA)	R12NZ9017L
ANTI-ROLL PLATE MED-240dia.7.0-14	Anti-roll(White)/* FDA Supported work piece: \varnothing 7.0-14.0 Material: POM-C (white) (FDA)	R12NZ9017M
ANTI-STICK PLATE MED-240	Anti-stick(White)/* FDA Material: POM-C (white) (FDA)	R12NZ9017N
ANTI-ROLL PLATE MED(BK)-240dia.1.7-3.5	Anti-roll(Black)/* FDA Supported work piece: \varnothing 1.7-3.5 Material: POM-C (black) (FDA)	R12NZ9017P
ANTI-ROLL PLATE MED(BK)-240dia.3.5-7.0	Anti-roll(Black)/* FDA Supported work piece: \varnothing 3.5-7.0 Material: POM-C (black) (FDA)	R12NZ9017Q
ANTI-ROLL PLATE MED(BK)-240dia.7.0-14	Anti-roll(Black)/* FDA Supported work piece: \varnothing 7.0-14.0 Material: POM-C (black) (FDA)	R12NZ9017R
ANTI-STICK PLATE MED(BK)-240	Anti-stick(Black)/* FDA Material: POM-C (black) (FDA)	R12NZ9017T

6.2.4 Plate for Purge (POM-C: White)

The plate includes plate fixing kit.

The purge able direction of the specification is as seen from the connector side of the feeder.

To use the purging, you will need optional purge actuator kit.

Product name	Specification	Model name
PURGE L FLAT PLATE-240	Plate for purge /purge direction: Left Flat (White) Material: POM-C (white)	R12NZ901CF
PURGE R FLAT PLATE-240	Plate for purge /purge direction: Right Flat (White) Material: POM-C (white)	R12NZ901CG
PURGE L ANTI-ROLL PLATE 240 d1.7-	Plate for purge /purge direction: Left Anti-roll (White) Supported work piece: ϕ 1.7 -3.5 Material: POM-C (white)	R12NZ901CQ
PURGE R ANTI-ROLL PLATE 240 d1.7-	Plate for purge /purge direction: Right Anti-roll (White) Supported work piece: ϕ 1.7 -3.5 Material: POM-C (white)	R12NZ901CP
PURGE L ANTI-ROLL PLATE 240 d3.5-	Plate for purge /purge direction: Left Anti-roll (White) Supported work piece: ϕ 3.5 -7.0 Material: POM-C (white)	R12NZ901CN
PURGE R ANTI-ROLL PLATE 240 d3.5-	Plate for purge /purge direction: Right Anti-roll (White) Supported work piece: ϕ 3.5 -7.0 Material: POM-C (white)	R12NZ901CM
PURGE L ANTI-ROLL PLATE 240 d7-	Plate for purge /purge direction: Left Anti-roll (White) Supported work piece: ϕ 7.0 -14.0 Material: POM-C (white)	R12NZ901CL
PURGE R ANTI-ROLL PLATE 240 d7-	Plate for purge /purge direction: Right Anti-roll (White) Supported work piece: ϕ 7.0 -14.0 Material: POM-C (white)	R12NZ901CK
PURGE L ANTI-STICK PLATE 240	Plate for purge /purge direction: Left Anti-stick (White) Material: POM-C (white)	R12NZ901CJ
PURGE R ANTI-STICK PLATE 240	Plate for purge /purge direction: Right Anti-stick (White) Material: POM-C (white)	R12NZ901CH

6.2.5 Plate for Purge (Anti-static)

The plate includes plate fixing kit.

The purge able direction of the specification is as seen from the connector side of the feeder.

To use the purging, you will need optional purge actuator kit.

Product name	Specification	Model number
PURGE L FLAT PLATE ESD 240	Plate for purge /purge direction: Left Flat (Ocher) Material: POM-C ED (Anti-static)	R12NZ901CR
PURGE R FLAT PLATE ESD 240	Plate for purge /purge direction: Right Flat (Ocher) Material: POM-C ED (Anti-static)	R12NZ901CT
PURGE L ANTI-ROLL PLATE ESD 240 d1.7-	Plate for purge /purge direction: Left Anti-roll (Ocher) Supported work piece: \varnothing 1.7 -3.5 Material: POM-C ED (Anti-static)	R12NZ901CU
PURGE R ANTI-ROLL PLATE ESD 240 d1.7-	Plate for purge /purge direction: Right Anti-roll (Ocher) Supported work piece: \varnothing 1.7 -3.5 Material: POM-C ED (Anti-static)	R12NZ901CW
PURGE L ANTI-ROLL PLATE ESD 240 d3.5-	Plate for purge /purge direction: Left Anti-roll (Ocher) Supported work piece: \varnothing 3.5 -7.0 Material: POM-C ED (Anti-static)	R12NZ901CV
PURGE R ANTI-ROLL PLATE ESD 240 d3.5-	Plate for purge /purge direction: Right Anti-roll (Ocher) Supported work piece: \varnothing 3.5 -7.0 Material: POM-C ED (Anti-static)	R12NZ901CX
PURGE L ANTI-ROLL PLATE ESD 240 d7-	Plate for purge /purge direction: Left Anti-roll (Ocher) Supported work piece: \varnothing 7.0 -14.0 Material: POM-C ED (Anti-static)	R12NZ901CY
PURGE R ANTI-ROLL PLATE ESD 240 d7-	Plate for purge /purge direction: Right Anti-roll (Ocher) Supported work piece: \varnothing 7.0 -14.0 Material: POM-C ED (Anti-static)	R12NZ901CZ
PURGE L ANTI-STICK PLATE ESD 240	Plate for purge /purge direction: Left Anti-stick (Ocher) Material: POM-C ED (Anti-static)	R12NZ901D1
PURGE R ANTI-STICK PLATE ESD 240	Plate for purge /purge direction: Right Anti-stick (Ocher) Material: POM-C ED (Anti-static)	R12NZ901D2
PURGE L FLAT PLATE (BK)240	Plate for purge /purge direction: Left Flat (Black) Material: POM-C EC (Anti-static)	R12NZ901D3
PURGE R FLAT PLATE (BK)240	Plate for purge /purge direction: Right Flat (Black) Material: POM-C EC (Anti-static)	R12NZ901D4

Product name	Specification	Model number
PURGE L ANTI-ROLL PLATE(BK)240 d1.7-	Plate for purge /purge direction: Left Anti-roll (Black) Supported work piece: \varnothing 1.7 -3.5 Material: POM-C EC (Anti-static)	R12NZ901D5
PURGE R ANTI-ROLL PLATE(BK)240 d1.7-	Plate for purge /purge direction: Right Anti-roll (Black) Supported work piece: \varnothing 1.7 -3.5 Material: POM-C EC (Anti-static)	R12NZ901D6
PURGE L ANTI-ROLL PLATE(BK)240 d3.5-	Plate for purge /purge direction: Left Anti-roll (Black) Supported work piece: \varnothing 3.5 -7.0 Material: POM-C EC (Anti-static)	R12NZ901D7
PURGE R ANTI-ROLL PLATE(BK)240 d3.5-	Plate for purge /purge direction: Right Anti-roll (Black) Supported work piece: \varnothing 3.5 -7.0 Material: POM-C EC (Anti-static)	R12NZ901D8
PURGE L ANTI-ROLL PLATE(BK)240 d7-	Plate for purge /purge direction: Left Anti-roll (Black) Supported work piece: \varnothing 7.0 -14.0 Material: POM-C EC (Anti-static)	R12NZ901D9
PURGE R ANTI-ROLL PLATE(BK)240 d7-	Plate for purge /purge direction: Right Anti-roll (Black) Supported work piece: \varnothing 7.0 -14.0 Material: POM-C EC (Anti-static)	R12NZ901DA
PURGE L ANTI-STICK PLATE(BK)240	Plate for purge /purge direction: Left Anti-stick (Black) Material: POM-C EC (Anti-static)	R12NZ901DB
PURGE R ANTI-STICK PLATE(BK)240	Plate for purge /purge direction: Right Anti-stick (Black) Material: POM-C EC (Anti-static)	R12NZ901DC

6.2.6 Plate for Purge (FDA)

The plate includes plate fixing kit.

The purge able direction of the specification is as seen from the connector side of the feeder.

To use the purging, you will need optional purge actuator kit.

* We use materials which conformed FDA (Food and Drug Administration).
(FDA 21CFR177.2470 & 21CFR178.3297)

Product name	Specification	Model number
PURGE L FLAT PLATE MED 240	Plate for purge /purge direction: Left Flat (White)* Material: POM-C (white) (FDA)	R12NZ901DD
PURGE R FLAT PLATE MED 240	Plate for purge /purge direction: Right Flat (White)* Material: POM-C (white) (FDA)	R12NZ901DE
PURGE L ANTI-ROLL PLATE MED 240 d1.7-	Plate for purge /purge direction: Left Anti-roll (White)* Supported work piece: \varnothing 1.7 -3.5 Material: POM-C (white) (FDA)	R12NZ901DF
PURGE R ANTI-ROLL PLATE MED 240 d1.7-	Plate for purge /purge direction: Right Anti-roll (White)* Supported work piece: \varnothing 1.7 -3.5 Material: POM-C (white) (FDA)	R12NZ901DG
PURGE L ANTI-ROLL PLATE MED 240 d3.5-	Plate for purge /purge direction: Left Anti-roll (White)* Supported work piece: \varnothing 3.5 -7.0 Material: POM-C (white) (FDA)	R12NZ901DH
PURGE R ANTI-ROLL PLATE MED 240 d3.5-	Plate for purge /purge direction: Right Anti-roll (White)* Supported work piece: \varnothing 3.5 -7.0 Material: POM-C (white) (FDA)	R12NZ901DJ
PURGE L ANTI-ROLL PLATE MED 240 d7-	Plate for purge /purge direction: Left Anti-roll (White)* Supported work piece: \varnothing 7.0 -14.0 Material: POM-C (white) (FDA)	R12NZ901DK
PURGE R ANTI-ROLL PLATE MED 240 d7-	Plate for purge /purge direction: Right Anti-roll (White)* Supported work piece: \varnothing 7.0 -14.0 Material: POM-C (white) (FDA)	R12NZ901DL
PURGE L ANTI-STICK PLATE MED 240	Plate for purge /purge direction: Left Anti-stick (White)* Material: POM-C (white) (FDA)	R12NZ901DM
PURGE R ANTI-STICK PLATE MED 240	Plate for purge /purge direction: Right Anti-stick (White)* Material: POM-C (white) (FDA)	R12NZ901DN

Product name	Specification	Model number
PURGE L ANTI-ROLL PLATE MED(BK)240 d1.7-	Plate for purge /purge direction: Left Anti-roll (Black)/ Supported work piece: \varnothing 1.7 -3.5 Material: POM-C (black)(FDA)	R12NZ901DP
PURGE R ANTI-ROLL PLATE MED(BK)240 d1.7-	Plate for purge /purge direction: Right Anti-roll (Black)/ Supported work piece: \varnothing 1.7 -3.5 Material: POM-C (black)(FDA)	R12NZ901DQ
PURGE L ANTI-ROLL PLATE MED(BK)240 d3.5-	Plate for purge /purge direction: Left Anti-roll (Black)/ Supported work piece: \varnothing 3.5 -7.0 Material: POM-C (black)(FDA)	R12NZ901DR
PURGE R ANTI-ROLL PLATE MED(BK)240 d3.5-	Plate for purge /purge direction: Right Anti-roll (Black)/ Supported work piece: \varnothing 3.5 -7.0 Material: POM-C (black)(FDA)	R12NZ901DT
PURGE L ANTI-ROLL PLATE MED(BK)240 d7-	Plate for purge /purge direction: Left Anti-roll (Black)/ Supported work piece: \varnothing 7.0 -14.0 Material: POM-C (black)(FDA)	R12NZ901DU
PURGE R ANTI-ROLL PLATE MED(BK)240 d7-	Plate for purge /purge direction: Right Anti-roll (Black)/ Supported work piece: \varnothing 7.0 -14.0 Material: POM-C (black)(FDA)	R12NZ901DV
PURGE L ANTI-STICK PLATE MED(BK)240	Plate for purge /purge direction: Left Anti-stick (Black)/ Material: POM-C (black)(FDA)	R12NZ901DW
PURGE R ANTI-STICK PLATE MED(BK)240	Plate for purge /purge direction: Right Anti-stick (Black)/ Material: POM-C (black)(FDA)	R12NZ901DX

6. Option Part List

6.3 Others, Accessories (series: IF-240)

The purge able direction of the specification is as seen from the connector side of the feeder.

Product name	Specification	Model number
PLATE FIXATION KIT-240	Plate fixing kit	R12NZ90183
INTERNAL DIFFUSING PLATE KIT - 240	Internal diffusing plate kit	R12NZ90184
POWER CABLE 80/240	Power cable	R12NZ9016K
RJ45 CAT5e -SF/UTP 5m GREY CABLE	Ethernet cable	R12NZ9016L
LEFT PURGE ACTUATOR KIT 240	Left purging actuator kit (For IF-240) Purge direction: Left Including: - Auto actuator to open purge gate - Frame (Material: Stainless steel 304/1.4301) - Connecting cable (Plate for purge is not included.)	R12NZ901DY
RIGHT PURGE ACTUATOR KIT 240	Right purging actuator kit (For IF-240) /purge direction: Right Including - Auto actuator to open purge gate - Frame (Material: Stainless steel 304/1.4301) - Connecting cable (Plate for purge is not included.)	R12NZ901DZ
PURGE ACTUATOR ASSEMBLY - 240	Purging actuator	1889173

6.4 Backlight (series: IF-240)

Product name	Specification	Model number
GREEN BACKLIGHT - 240	Backlight (Green)	R12NZ90185
RED BACKLIGHT - 240	Backlight (Red)	R12NZ90186
BLUE BACKLIGHT - 240	Backlight (Blue)	R12NZ90187
WHITE BACKLIGHT - 240	Backlight (White)	R12NZ90188
INFRARED BACKLIGHT - 240	Backlight (Infrared light)	R12NZ90189

6.5 Hopper (series: IF-240)

Product name	Specification	Model number
2I HOPPER 230VAC 50Hz - 240	2L/230VAC/50Hz	R12NZ9017U
2I HOPPER 230VAC 60Hz - 240	2L/230VAC/60Hz	R12NZ9017V
2I HOPPER 115VAC 50Hz - 240	2L/115VAC/50Hz	R12NZ9017W
2I HOPPER 115VAC 60Hz - 240	2L/115VAC/60Hz	R12NZ9017X
3I HOPPER 230VAC 50Hz - 240	3L/230VAC/50Hz	R12NZ9017Y
3I HOPPER 230VAC 60Hz - 240	3L/230VAC/60Hz	R12NZ9017Z
3I HOPPER 115VAC 50Hz - 240	3L/115VAC/50Hz	R12NZ90181
3I HOPPER 115VAC 60Hz - 240	3L/115VAC/60Hz	R12NZ90182

* NOTE: Model number will defer depending on the voltage and frequency used.

Also, you cannot change the voltage and frequency.

6.6 License (series: common)



Product name	Specification	Model number
Part Feeding License	Part Feeding license	R12NZ90106
Part Feeding License for USB Key	Part Feeding License for USB Key	R12NZ90107

7. Troubleshooting

For trouble, refer to following manual.

*EPSON RC+ 7.0 Option Part Feeding 7.0 Introduction & Software
" Troubleshooting "*

Appendix: Condition of use of backlight

		<p>CONDITIONS OF USE OF PRODUCTS TPL VISION</p> <p>TABLE OF CALCULATION</p> <p>THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD</p> <p>NF EN62471 "LAMPS PHOTOBIOLOGICAL SAFETY"</p> <p><small>THIS DOCUMENT ISN'T A CERTIFICATE AND CAN'T BE USED AS WELL BUT ONLY AS PRECONISATIONS FOR USERS</small></p>		
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Board specifications
1 brick 8 leds 200x150 green

Info Source to LEARN			
	Exposure time to the source	0.25	Seconds
1	Wavelength	525	nm
	Color temperature		K
2	Total Angle	150	°
<i>For the visible:</i>			
3	Output Intensity		Cd
	Output Power	150	Lm
<i>For the Non-Visible:</i>			
	Power density	0.000	W/m ²
4	Number of LED	8	LED
5	If you use a lens, Efficiency in candela per lumen	2.5	Cd/Lm

CALCULATION from information about the Source			
	Calculation of maximum permissible exposure (MPE):	25.456	W/m ²
		13665.66445	Lm/m ²
<i>Calculation of power density for visible source:</i>			
	Surface illuminated by the source:	0.437567409	m ²
	Power of one LED:	150	Lm
	Power density for one LED:	342.804324	Lm/m ²
<i>Calculation of power density for a non-visible source:</i>			
	Surface illuminated by the source:	0.4376	m ²
	Power density for one LED:	0.000	W/m ²
CALCULATION for the safety of persons			
<i>Source Hazardous:</i>			
	Power density for a visible source:	2742.434592	Lm/m ²
	Power density for a non-visible source:	0.000	W/m ²

NOMINAL DISTANCE TO AVOID OCULAR HAZARD(DNRO)		
FOR AN EXPOSURE TIME OF (Seconds): 0.25		
Minimum safe distance in this case*	128	mm



* Consider as Hazard Zone Optics (NRA), or area within which the irradiance or radiant exposure exceeds the maximum permissible exposure (MPE), all positions within an envelope of the remote DNRO.

Information:

Exposure time is fixed to 0.25s for this calculation table, which is the latency blink of the eye duration.

Output power: The maximum output power for the type of LED used in the product is 150 Lm under 350mA.

Number of Led: In the worst case, we can imagine that the person can see entirely the light.

	CONDITIONS OF USE OF PRODUCTS TPL VISION TABLE OF CALCULATION THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471 "LAMPS PHOTOBIOLOGICAL SAFETY" <small>THIS DOCUMENT ISN'T A CERTIFICATE AND CAN'T BE USED AS WELL BUT ONLY AS PRECONISATIONS FOR USERS</small>	
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Board specifications

1 brick 8 leds 200x150 red

Info Source to LEARN

	Exposure time to the source	0.25	Seconds
1	Wavelength	630	nm
	Color temperature		K
2	Total Angle	150	°
3	<i>For the visible:</i>		
	Output Intensity		Cd
	Output Power	80	Lm
3	<i>For the Non-Visible:</i>		
	Power density	0.000	W/m ²
4	Number of LED	8	LED
5	If you use a lens, Efficiency in candela per lumen	2.5	Cd/Lm

CALCULATION from information about the Source

	Calculation of maximum permissible exposure (MPE):	25.456	W/m ²
		4607.380507	Lm/m ²
	<i>Calculation of power density for visible source:</i>		
	Surface illuminated by the source:	0.437567409	m ²
	Power of one LED:	80	Lm
	Power density for one LED:	182.8289728	Lm/m ²
	<i>Calculation of power density for a non-visible source:</i>		
	Surface illuminated by the source:	0.4376	m ²
	Power density for one LED:	0.000	W/m ²

CALCULATION for the safety of persons

	<i>Source Hazardous:</i>		
	Power density for a visible source:	1462.631782	Lm/m ²
	Power density for a non-visible source:	0.000	W/m ²

NOMINAL DISTANCE TO AVOID OCULAR HAZARD(DNRO)
FOR AN EXPOSURE TIME OF (Seconds): 0.25

	Minimum safe distance in this case*	161	mm
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* Consider as Hazard Zone Optics (NRA), or area within which the irradiance or radiant exposure exceeds the maximum permissible exposure (MPE), all positions within an envelope of the remote DNRO.

Information:

Exposure time is fixed to 0.25s for this calculation table, which is the latency blink of the eye duration.

Output power: The maximum output power for the type of LED used in the product is 80 Lm under 350mA.

Number of Led: In the worst case, we can imagine that the person can see entirely the light.

CONDITIONS OF USE OF PRODUCTS TPL VISION	
TABLE OF CALCULATION	
THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE	
STANDARD	
NF EN62471 "LAMPS PHOTOBIOLOGICAL SAFETY"	
<small>THIS DOCUMENT ISN'T A CERTIFICATE AND CAN'T BE USED AS WELL BUT ONLY AS PRECONISATIONS FOR USERS</small>	

Board specifications
1 brick 8 leds 200x150 Blue

Info Source to LEARN			
	Exposure time to the source	0.25	Seconds
1	Wavelength	470	nm
	Color temperature		K
2	Total Angle	150	°
3	<i>For the visible:</i>		
	Output Intensity		Cd
	Output Power	39	Lm
	<i>For the Non-Visible:</i>		
	Power density	0.000	W/m ²
4	Number of LED	8	LED
5	If you use a lens, Efficiency in candela per lumen	2.5	Cd/Lm

CALCULATION from information about the Source			
	Calculation of maximum permissible exposure (MPE):	25.456	W/m ²
		1582.15708	Lm/m ²
	<i>Calculation of power density for visible source:</i>		
	Surface illuminated by the source:	0.437567409	m ²
	Power of one LED:	39	Lm
	Power density for one LED:	89.12912424	Lm/m ²
	<i>Calculation of power density for a non-visible source:</i>		
	Surface illuminated by the source:	0.4376	m ²
	Power density for one LED:	0.000	W/m ²
CALCULATION for the safety of persons			
	<i>Source Hazardous:</i>		
	Power density for a visible source:	713.0329939	Lm/m ²
	Power density for a non-visible source:	0.000	W/m ²

NOMINAL DISTANCE TO AVOID OCULAR HAZARD(DNRO) FOR AN EXPOSURE TIME OF (Seconds): 0.25		
	191	mm
Minimum safe distance in this case*		



* Consider as Hazard Zone Optics (NRA), or area within which the irradiance or radiant exposure exceeds the maximum permissible exposure (MPE), all positions within an envelope of the remote DNRO.

Information:

Exposure time is fixed to 0.25s for this calculation table, which is the latency blink of the eye duration.

Output power: The maximum output power for the type of LED used in the product is 39 Lm under 350mA.

Number of Led: In the worst case, we can imagine that the person can see entirely the light.

	CONDITIONS OF USE OF PRODUCTS TPL VISION TABLE OF CALCULATION THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471 "LAMPS PHOTOBIOLOGICAL SAFETY" <small>THIS DOCUMENT ISN'T A CERTIFICATE AND CAN'T BE USED AS WELL BUT ONLY AS PRECONISATIONS FOR USERS</small>	
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Board specifications

1 brick 8 leds 200x150 infrared

Info Source to LEARN

	Exposure time to the source	10	Seconds
1	Wavelength	850	nm
	Color temperature		K
2	Total Angle	150	°
3	<i>For the visible:</i>		
	Output Intensity		Cd
	Output Power		Lm
4	<i>For the Non-Visible:</i>		
	Power density	1.028	W/m ²
5	Number of LED	8	LED
5	If you use a lens, Efficiency in candela per lumen	2.5	Cd/Lm

CALCULATION from information about the Source

	Calculation of maximum permissible exposure (MPE):	19.953	W/m ²
		Source Non-Visible	Lm/m ²
	<i>Calculation of power density for visible source:</i>		
	Surface illuminated by the source:	Source Non-Visible	m ²
	Power of one LED:	Source Non-Visible	Lm
	Power density for one LED:	Source Non-Visible	Lm/m ²
	<i>Calculation of power density for a non-visible source:</i>		
	Surface illuminated by the source:	0.4376	m ²
	Power density for one LED:	8.227	W/m ²

CALCULATION for the safety of persons

	<i>Source Hazardous:</i>		
	Power density for a visible source:	Source Non-Visible	Lm/m ²
	Power density for a non-visible source:	8.227	W/m ²

NOMINAL DISTANCE TO AVOID OCULAR HAZARD(DNRO)
FOR AN EXPOSURE TIME OF (Seconds): 10

	Minimum safe distance in this case*	183	mm
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* Consider as Hazard Zone Optics (NRA), or area within which the irradiance or radiant exposure exceeds the maximum permissible exposure (MPE), all positions within an envelope of the remote DNRO.

Information:

Exposure time is fixed to 10s for this calculation table, which is the max duration according to the standard compliance.

Output power: The maximum output power for the type of LED used in the product is 450mW under 350mA.

Number of Led: In the worst case, we can imagine that the person can see entirely the light.