EPSON

Epson RC+ 8.0 Option
Part Feeding 8.0
IF-240

Original instructions

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1. FOREWORD

1.1 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 safety and correctly.

1.2 TRADEMARKS

Microsoft, Windows, Windows logo, Visual Basic, and Visual C++ are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other brand and product names are trademarks or registered trademarks of the respective holders.

1.3 Notation

Microsoft® Windows® 10 operating system
Microsoft® Windows® 11 operating system
In this manual, the above operating systems are referred to as Windows 10 and Windows 11, respectively. Windows 10 and Windows 11 are sometimes collectively referred to as Windows.

1.4 Terms of Use

No part of this instruction manual may be reproduced or reprinted in any form without express written permission.
The information in this document is subject to change without notice.
Please contact us if you find any errors in this document or if you have any questions about the information in this document.

1.5 Manufacturer

SEIKO EPSON CORPORATION

1.6 Contact Information

Contact information details are listed in the "Supplier" section in the following manual.
Note that the contact information may vary depending on your region.
"Safety Manual - Contact Information"

The Safety Manual is also available at the following site.
URL: https://download.epson.biz/robots/

1.7 Disposal

When disposing of the product, follow the legal regulations of your country.

2. Hardware (IF-240)

2.1 Safety

2.1.1 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 "KEY POINTS." 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.

KEY POINTS

The "KEY POINTS" sections describe important information to be followed for operating the Robot system.

⚠ CAUTION

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.

KEY POINTS

The unit of scale described in this manual is millimeter (mm).

2.1.2 Safety Precautions

2.1.2.1 General Safety Precautions

2.1.2.1.1 Transport

⚠ CAUTION

Be careful of the weight when transporting the system. For more information, refer to the following:

Environment and Installation

2.1.2.1.2 General

⚠ WARNING

- 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

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

Build a safety system that shuts off the IF series power (S-Power) when the machine or mechanical system protection enclosure is opened.

2.1.2.1.3 Disposal

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

⚠ CAUTION

Observe all laws and regulations when disposing of the product.

2.1.2.2 Danger

2.1.2.2.1 Safety Considerations for Operators

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

KEY POINTS

It is the customer's responsibility to install warning signs informing anyone working around the part feeder that they must wear safety equipment.

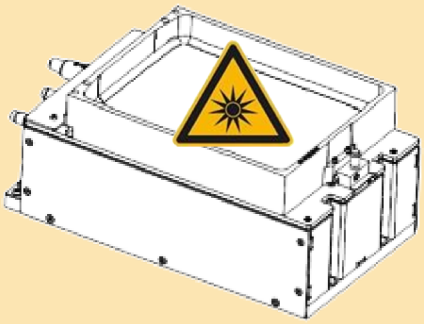
2.1.2.2.2 Specific Dangers

⚠ WARNING

Backlight

The part feeder 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. LED illumination can create discomfort and also damage the cornea, retina and lens.

Do not look at the light directly without wearing protective glasses. It is the responsibility of customers to document their own application and instruct employees on procedures to limit exposure to LED radiation.



⚠ WARNING

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.

Consider the following preventative measure:

1. If feasible in your work environment, install a fixed or movable high pass filter between the light source and employees. Use a high pass filter appropriate for the color of your LEDs. For more information, refer to the following:

   Backlight

2. If protective measure 1 is not possible, provide workers with goggles or face shields suitable for blocking radiation beyond 700nm.
3. Prohibit or limit direct access to the light source as much as possible. (exposure on the axis of radiation)

   For more information, refer to the following:

   Appendix: Conditions of Use for the Backlight - CONDITIONS OF USE FOR TPL VISION PRODUCTS
4. Establish a security perimeter to prevent operators from coming closer to the light source than the approach limit distance recommended by the manufacturer.
5. In all cases, check to make sure the measures you take are properly easing exposure (filters or goggles must be able to block the wavelengths to which operators are exposed).

To calculate the minimum safe distance for each type of backlight, refer to the following:

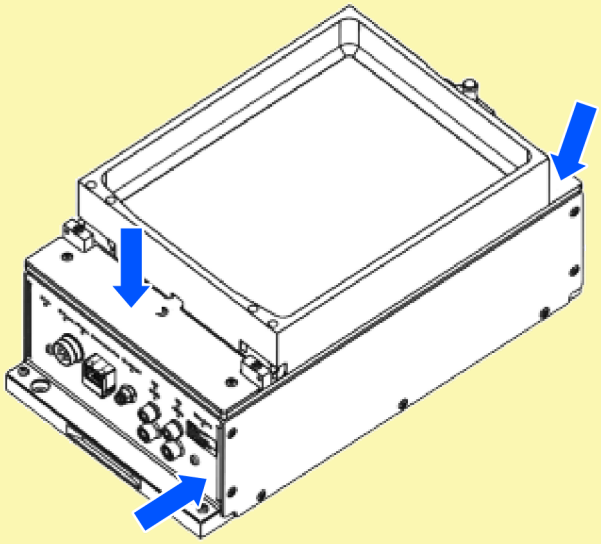
Appendix: Conditions of Use for the Backlight

⚠ CAUTION

High Temperatures

The areas indicated by arrows in the figure below reach a temperature of 40°C during normal use. This temperature can nevertheless rise to 55°C depending on the conditions of use.

It is the responsibility of customers to document their own application and employ measures to prevent employees from touching heated surfaces.



2.2 Specification

2.2.1 Characteristics of IF-240

The IF-240 sets new standards in small part feeding. Its 3D vibratory platform allows fast and flexible feeding 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 the appropriate vibrations, great flexibility is achieved in displacing parts on the platform (forward, backward, and sideways). Flipping is also made possible.

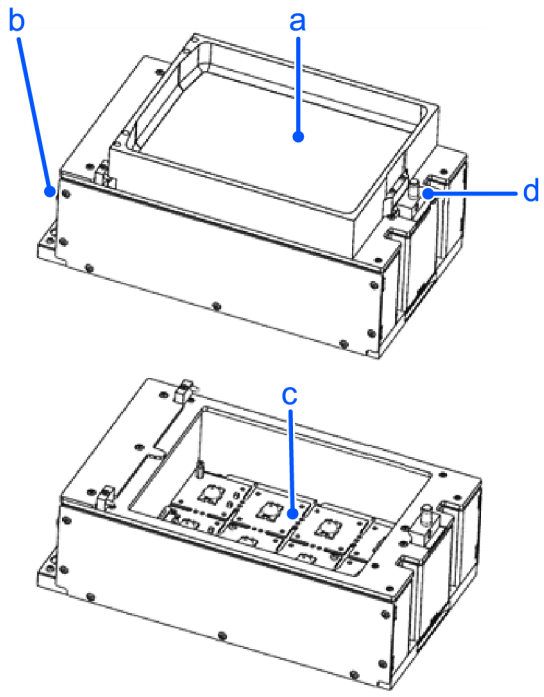
2.2.2 Model

LED	State	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

2.2.3 Part Names and External Dimensions

2.2.3.1 Part Names

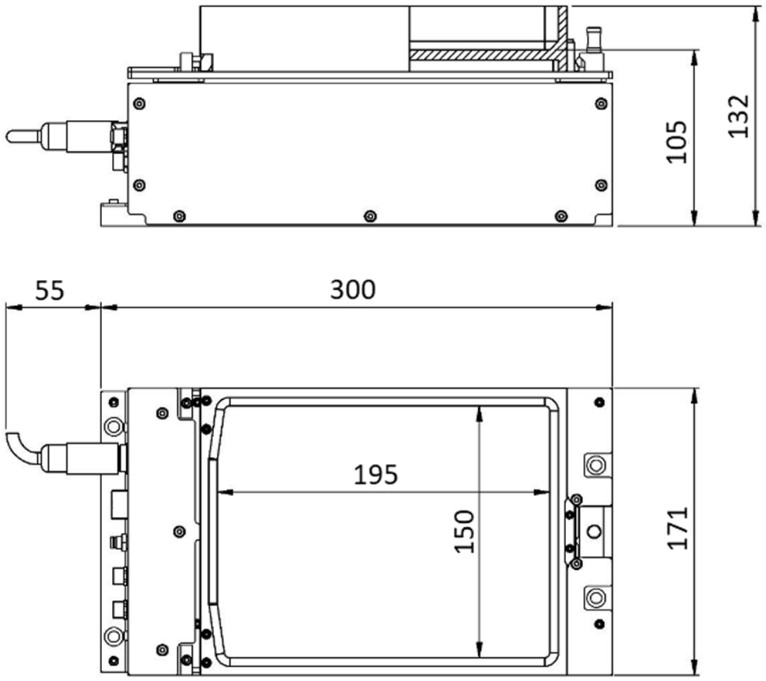
Part Names for IF-240:



Symbols	Meaning
a	3D vibrating platform
b	Electrical interfaces (communication, power supply, I/O, etc) For more information, refer to the following: **Cable Connections**
c	Integrated backlight An integrated backlight allows a camera installed above the platform to easily identify parts. For information on replacing the backlight, refer to the following: **Replacing the Backlight**
d	A lever-operated mechanism allows easy removal of the platform without additional tooling. For more information on removing the platform, refer to the following. **Remove the Platform**

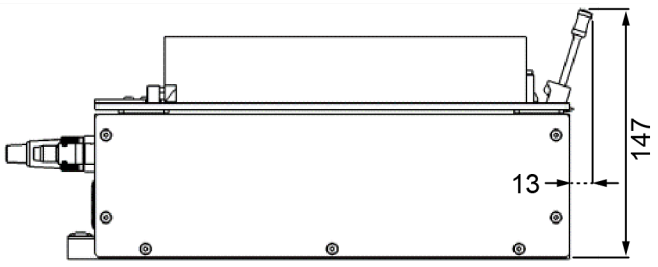
2.2.3.2 Outer Dimensions

Outer Dimensions (IF-240)



Additional space is needed around the part feeder in order to remove the platform module with the platform removal lever.

Overall dimensions including the platform removal lever:



- For details on removing the platform, refer to the following:

  Remove the Platform

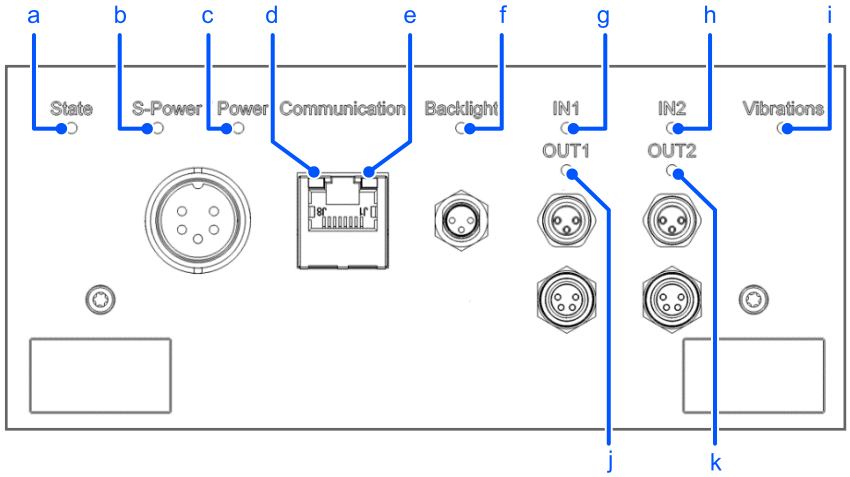
- For details on mounting dimensions, refer to the following:

  IF-240 Mounting Dimensions

2.2.3.3 LED Display

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

IF-240 Operating Indicator LEDs



LED	State	Color	Meaning
a	Blinking Time on: 100ms	Green	System on standby
	Blinking Time on: 900ms	Green	System in service
b	On	Yellow	24V on S-Power input For more information, refer to the following: **Power Connection**
c	On	Green	24V on Power input For more information, refer to the following: **Power Connection**
d	On	Green	Connection detected
e	Blinking	Yellow	Communication in progress (transmit and receive TCP packets)
f	On	Green	24V on backlight synchronization input
g	On	Green	24V on input 1
h	On	Green	24V on input 2
i	On	Green	Platform vibrating
j	On	Yellow	24V on digital output 1
k	On	Yellow	24V on digital output 2

2.2.4 Specification Table

⚠ CAUTION

Use the parts feeder according to the following specifications. Note that the basic performance of the product will not be exhibited if it is used outside of the specifications.

2.2.4.1 Specification Table

	IF-240
Typical part size *	Length of sides: 2mm to 40mm
Typical part weight	2 g or less
Backlight	Select with/without backlight. For more information, refer to the following: **Model**
Interchangeable backlight color	(green, red, blue, white, infrared) For more information, refer to the following: **Backlight**
Configurable vibration frequency	40 to 70 Hz
Maximum recommended weight on the platform (components)	0.4 kg
Output for Hoppers	2 **
Digital Input	-
Analog Input	-
RoHS	✓
Weight (Includes platform, backlight)	7.8 kg
Protection class	IP20
Operating temperature:	+5°C to +40°C
Humidity	30% to 80% maximum, non-condensing
Environment	Cleanroom class: expected ISO7
Safety Standards	CE Marking EMC Directive, Machinery Directive, RoHS Directive

* Before using parts, supply some parts to the feeder, operate the feeder, and check the following.

- The parts disperse.
- The parts move.
- Overlapping parts are not getting hung on each other.

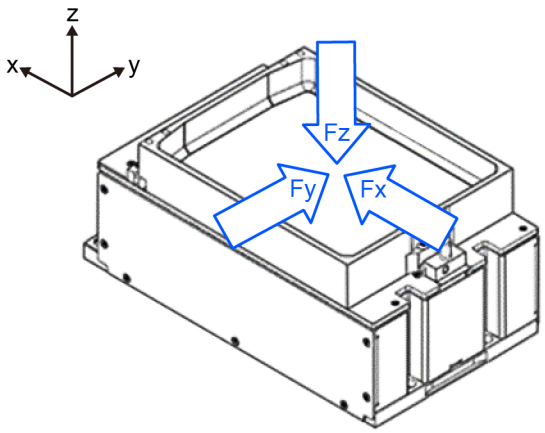
Parts that do not disperse, do not move, or get hung on each other are not suitable for feeders.

** When using a Purge Actuator Kit, the value is 1.

2.2.4.2 Maximum Permissible External Force on the Platform

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

Maximum Permissible External Force



- Fx = 10 N
- Fy = 10 N
- Fz = 20 N

> ⚠ CAUTION
>
> Note that the collision/impact of the robot gripper may damage the surface of the platform.

2.2.4.3 Permissible Platform Weight

Characteristic	
Maximum platform weight (without components)	800 g
Maximum component weight (including the maximum platform weight)	400 g

2.2.4.4 Maximum Plate Displacement

Characteristic	
Maximum displacement in the X direction	±1.5 mm
Maximum displacement in the Y direction	±2 mm
Maximum displacement in the Z direction	±1.5 mm

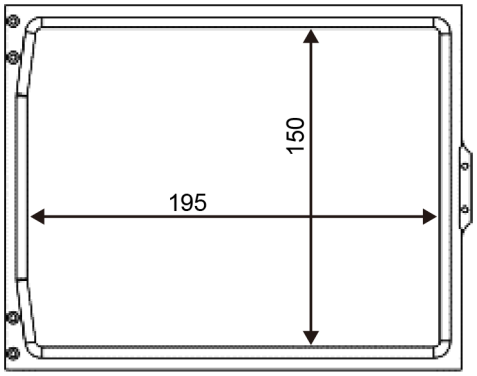
2.2.4.5 Plate Z repeatability

Characteristic	
Plate Z repeatability in the Z direction	±20 μm

2.2.4.6 Picking Area

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

Picking Area



2.3 Environment and Installation

2.3.1 Environment

2.3.1.1 Installation Environment

IF-240 can be used under the following conditions:

- Protection class is IP20 compliant
- Operating temperature:: +5°C to +40°C
- Humidity: 30% to 80% maximum, non-condensing

> ⚠ CAUTION
>
> Variations in humidity or temperature may affect the global performance of the part feeder.

- 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.
- For clean room applications, we assume use within an ISO 7-class clean room.

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

2.3.1.2 Storage Environment

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

2.3.2 Base Table

The customer must make a table to secure the feeder to. The shape and size of table will vary depending on purpose of your feeder system. Also, when using multiple feeders or multiple robots, you must be careful of vibrational interference.

For details on designing a base table, refer the following:

Installation

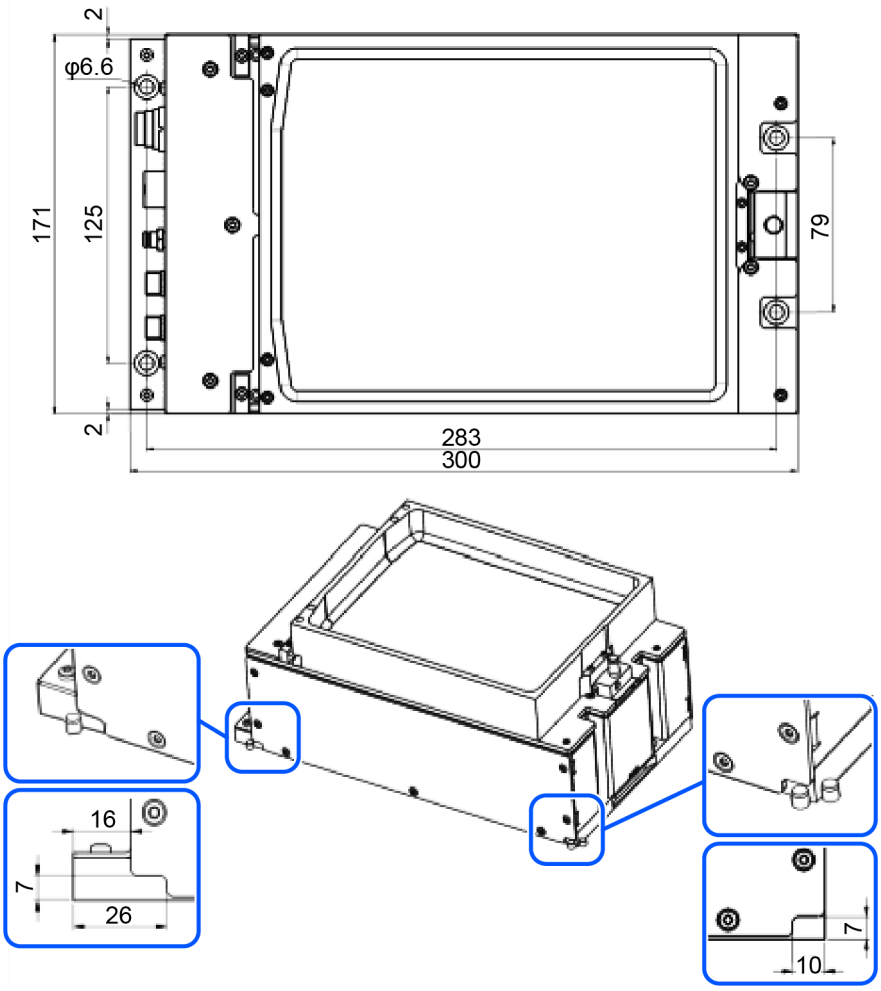
2.3.3 IF-240 Mounting Dimensions

> ⚠ CAUTION
>
> - The feeder must be mounted on a smooth, flat surface. Ensure that the IF-240 is firmly secured. Failure to do so will degrade feeder performance.
> - Be careful not to let the feeder fall; this can cause equipment damage or pin your hands or feet. When working, wear protective equipment, including safety shoes.

To ensure proper functioning of the IF-240, you must secure it firmly on a rigid, horizontal surface. The holes in the base plate of the IF-240 can be used to mount it with four M6 screws.

When re-mounting the IF-240 after having removed it, you can use the positioning pins to restore it to its prior position.

Mounting IF-240



2.3.4 Unpacking and Transportation

2.3.4.1 Unpacking

> ⚠ CAUTION
>
> Keep the packaging material and the shipment box in case of need for return.

> KEY POINTS
>
> Do not remove the part feeder from its packaging until you are ready to install it.

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.

2.3.4.2 Packaging of the Product, Transportation and Handling

When transporting the product, follow the instructions written on the shipping box (This Side Up, Fragile, etc). In addition, pay particular attention to the following points:

⚠ CAUTION

- Be careful of the weight when transporting the system.
- Always hold the system firmly with two hands.
- Workers should not carry heavy shipping boxes by themselves.
- When the shipping box is set down, make sure that it sits level in a horizontal position.
- Do not sit or stand on top of the shipping box.
- Do not place heavy objects on top of the shipping box.

The dimensions of the packing box for IF-240 are as follows:

Weight and dimensions of the product when packaged:

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

2.3.5 Installation

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

2.3.5.1 Symbols and Acronyms in this Manual

This section describes symbols and acronyms that are used in this manual.

2.3.5.1.1 Symbols

	Wrong implementation
	Correct implementation
	Active / operating feature (moving)
	Movements
	Passive / NOT operating feature (NOT moving)

	Perturbation / undesired vibration

2.3.5.1.2 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
⌀D	diameter of the vibration isolator (round buffer) APSOvib
G	screw diameter
H	height of the vibration isolator APSOvib
c_z	spring constant of the vibration isolator APSOvib; compression in Z direction (axial direction)
F_z	max. allowed compressive force of the vibration isolator APSOvib
L	Length of male screws
M	mass
N/A	not applicable
Qty.	quantity
Ref.	Reference
s	Depth of female screws

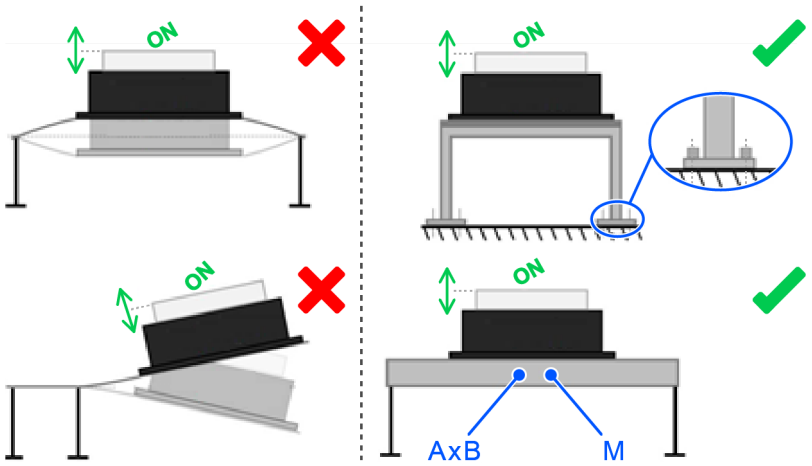
2.3.5.2 Mounting the Part Feeder

To ensure normal vibrational behavior, the part feeder must be correctly mounted on a base table specifically designed for the application. An incorrect mounting could compromise the performance of the product.

2.3.5.2.1 Position of Part Feeder and Characteristics of Base Table

The part feeder must be installed either on a rigid base table screwed to the floor or on an unsecured but heavy base table.

For unsecured base tables, the mass [M] and dimensions [A × B] must be large enough to absorb the vibrations generated by the feeder.



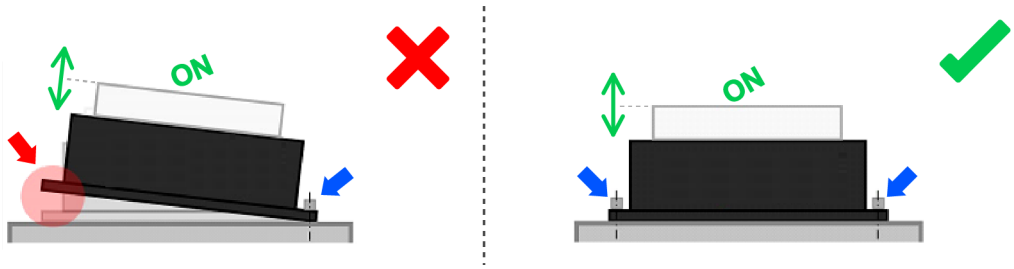
2.3.5.2.2 Installing Part Feeding on the Table

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

KEY POINTS

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

Specification of Screws



2.3.5.3 Vibration Decoupling

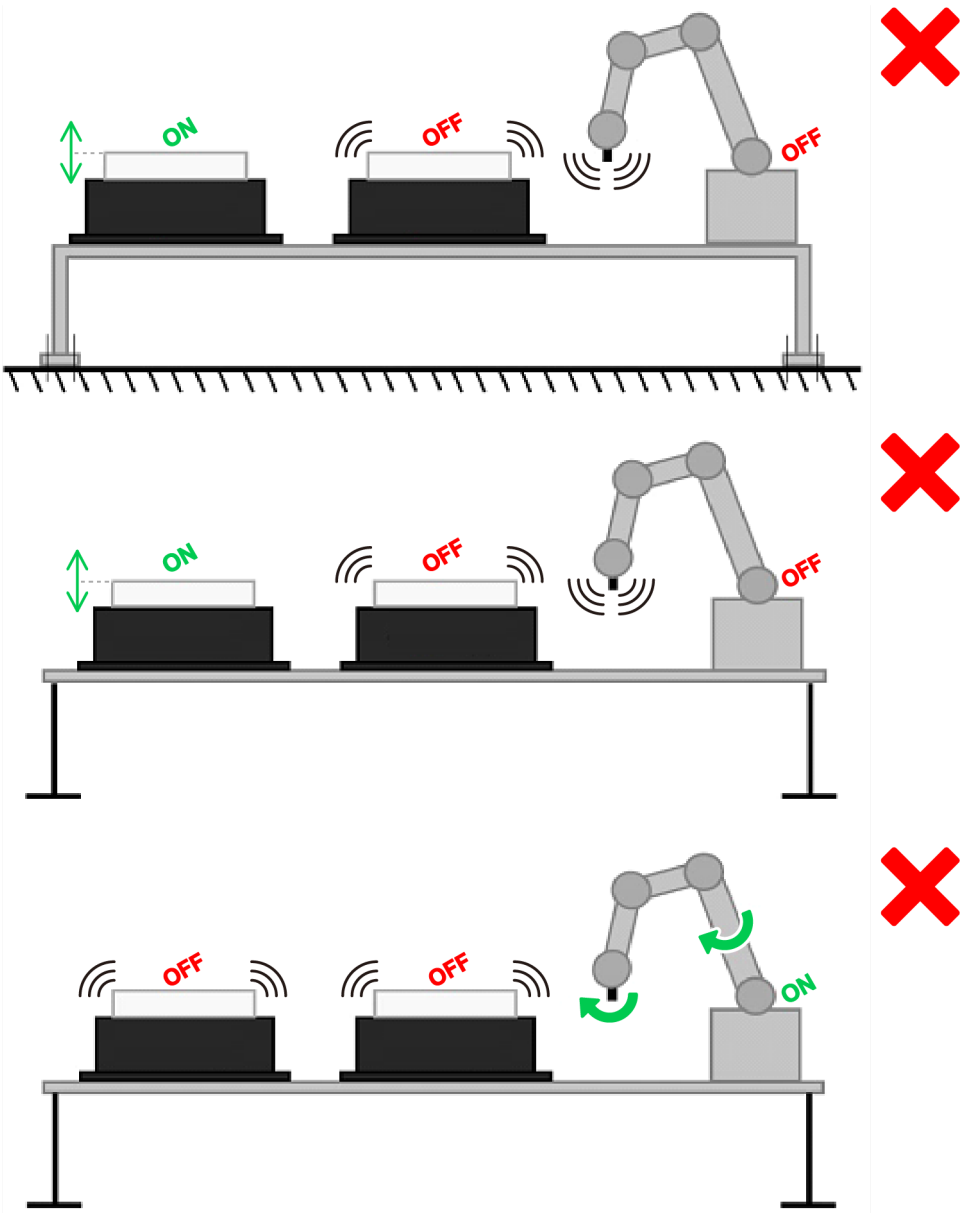
Incorrect mounting of the part feeder, camera, robot, and hopper may compromise final system performance. To ensure the normal behavior of the system, it is necessary to keep the associated devices from interfering with each other.

KEY POINTS

Vibration isolators are provided with hoppers so that hopper vibrations are not transmitted to other peripheral devices.

2.3.5.3.1 Decoupling of Moving Devices

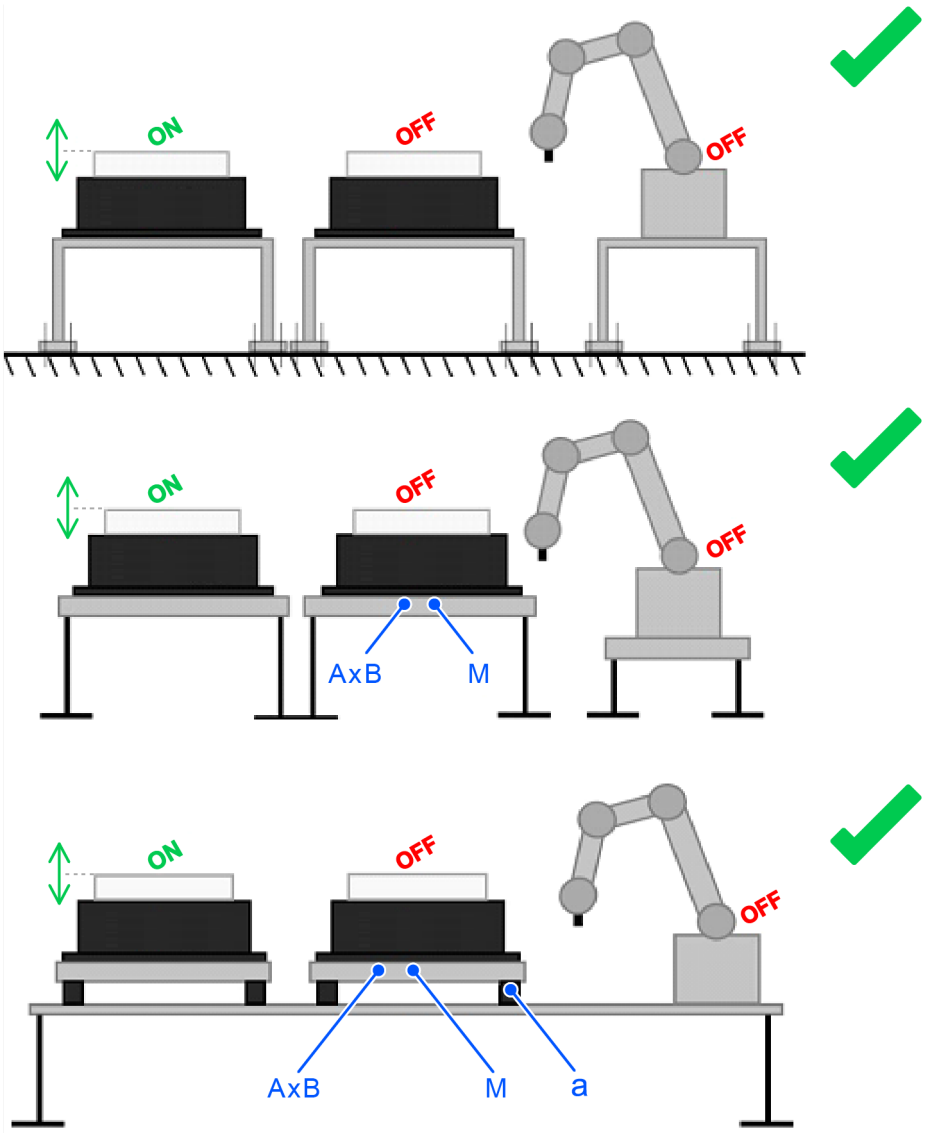
If several moving devices are mounted close to each other in parallel, it is necessary to "decouple the vibrations" to prevent the motion of one device from being affected by the motion of others.



It is recommended that each device be equipped with a separate base table to prevent vibrational interference. If this is not possible, you can use parts that have antivibration technology to isolate vibrations (e.g. vibration isolators).

KEY POINTS

The vibration isolator solution is only applicable to IF-240, 380 and 530.



Symbols	Meaning
a	vibration isolator

- For the mass [M] and dimensions [A × B] of the base table, refer to the following:

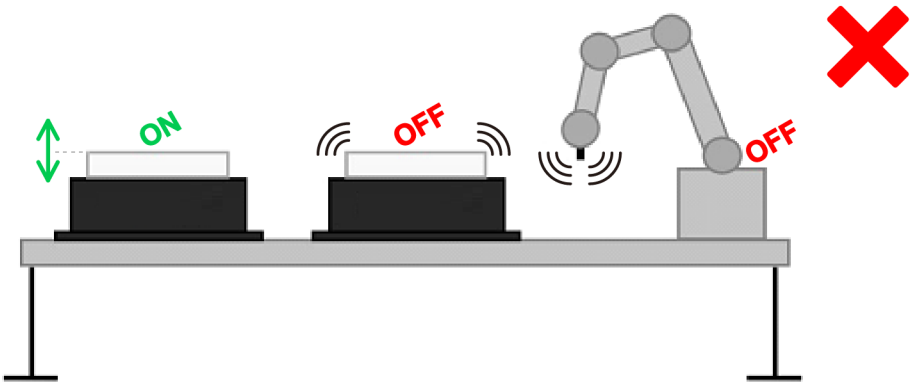
  Specification of Base Table

- For the vibration isolators, refer to the following:

  Specification of vibration isolator

KEY POINTS

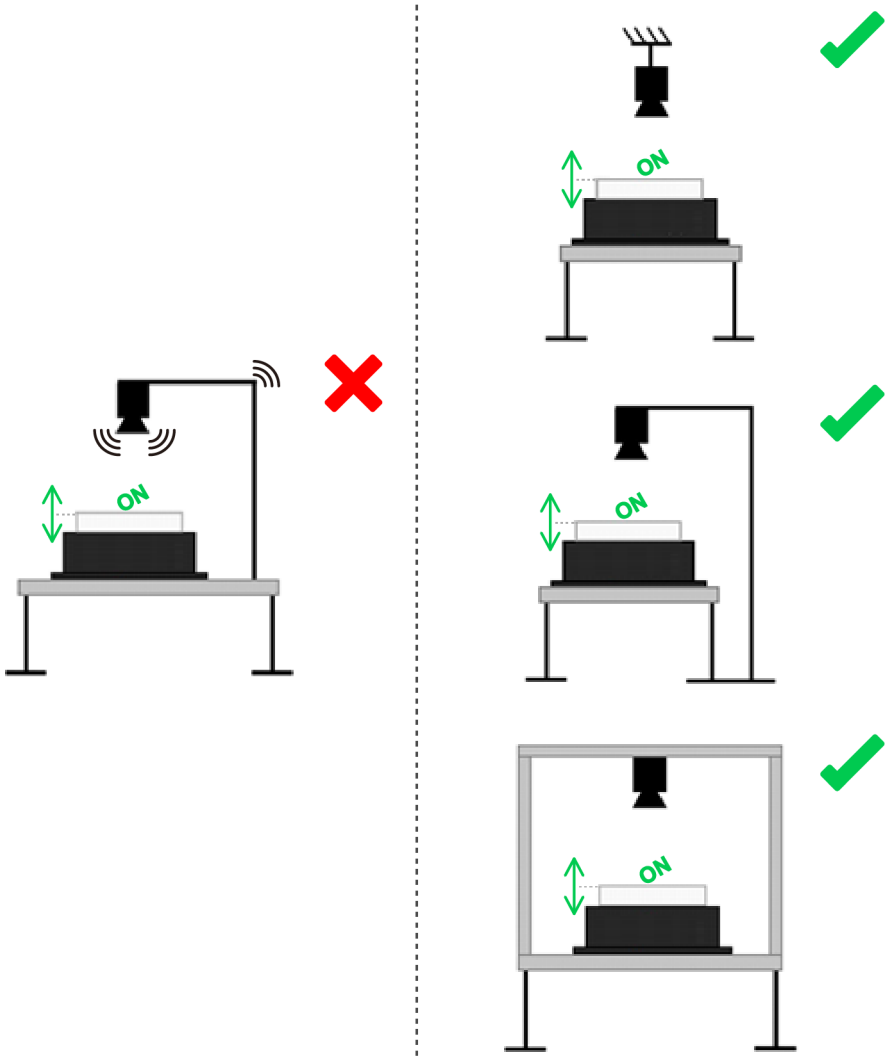
Increasing the mass of the base table to avoid using vibration isolators does not ensure that other devices can completely avoid the effect of vibrations.



2.3.5.3.2 Decoupling the Camera

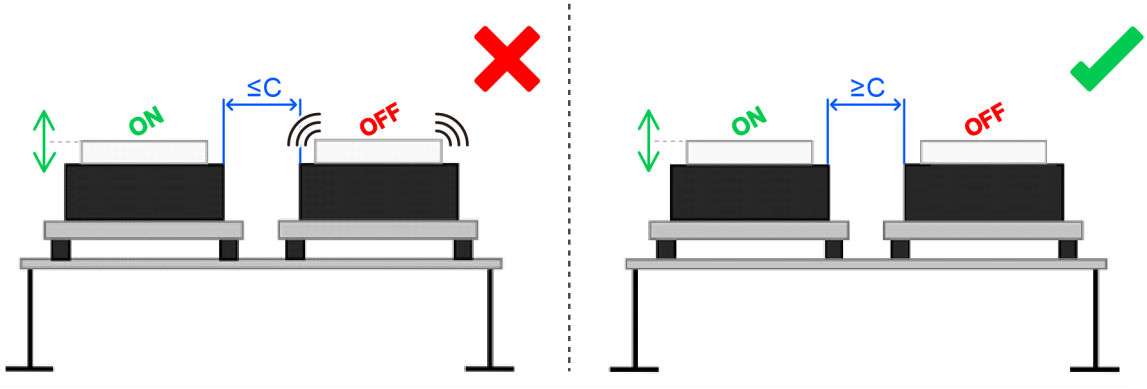
It is important that the camera is not perturbed by the vibration of the feeder or by any other moving device. If the vision system is disturbed by residual vibrations, the coordinates sent to the robot will not be reliable, thus compromising the precision of the whole system.

Therefore, it is recommended not to mount feeders and cameras on the same base table. 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.



2.3.5.4 Minimum Distance Between Part Feeders

When two or more feeders are installed close to each other, the movement of active devices can affect inactive ones. It is therefore recommended to install the feeders far enough apart to prevent interference between them.



For information on the minimum distance between part feeders, refer the following:

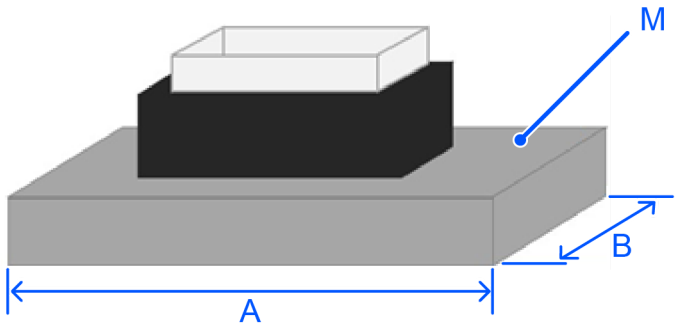
Minimum Distance Between Part Feeders

2.3.5.5 Technical Data Tables

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

2.3.5.5.1 Specification of Base Table

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

KEY POINTS

- The thickness of the base table must be calculated based with the requirements listed in the base table specification chart.
- Choose the dimensions of your base table so that the minimum mass [M] requirement is met.

2.3.5.5.2 Specification of Screws

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

2.3.5.5.3 Specification of vibration isolator

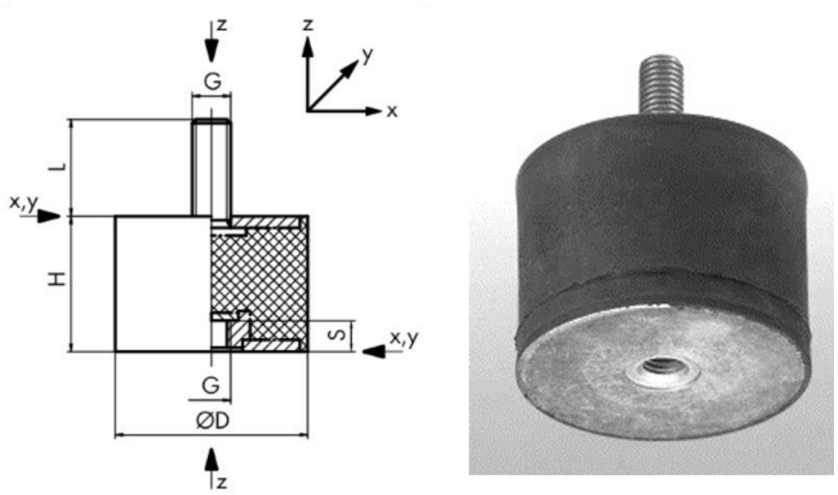
	IF-240	IF-380	IF-530
APSO *1	12.2034.0103	12.2034.0293	12.2034.0353
øD – [mm]	16	40	50
H – [mm]	20	40	50
cz – [N / mm]	50	180	190
Fz – [N]	120	690	1000
Qty. – [-]	4	4	4

ELESA *2	411771 DVA.2-15-20-M4-10-55	412021 DVA.2-50-45-M10-28-55
øD – [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

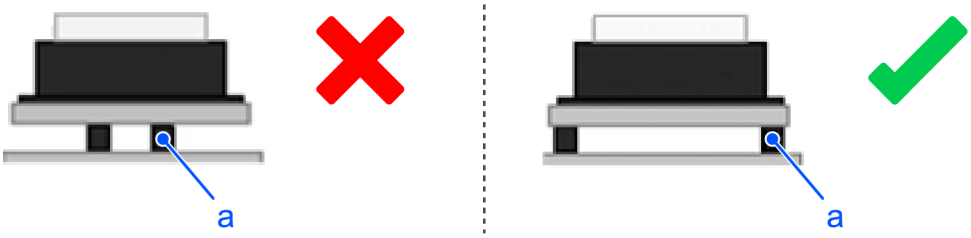
⚠ CAUTION

Make sure that the total mass of the part feeder, base table and components do not exceed the maximum allowed compressive force of the vibration isolator [Fz]. If the total mass exceeds the maximum allowed compressive force, select a new vibration isolator.

Vibration Isolator



Position of Vibration Isolator



Symbols	Meaning
a	vibration isolator

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

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

2.3.5.5.4 Minimum Distance Between Part Feeders

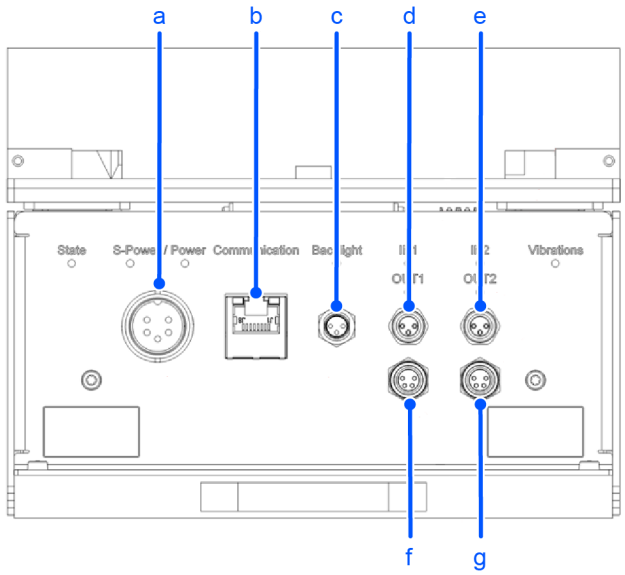
	IF-80	IF-240	IF-380	IF-530
c – [mm]	≥ 10	≥ 10	≥ 30	≥ 30

2.3.6 Cable Connections

2.3.6.1 Overview

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

Electrical interfaces of the IF-240



Symbols	Meaning
a	Power connection
b	Ethernet connection (RJ45)
c	-
d	-
e	Either the digital input for the hopper (2nd unit) or the purge gate (exclusive use)
f	Output 1 for Hoppers
g	Either the digital output for the hopper (2nd unit) or the purge gate (exclusive use)

KEY POINTS

If you install a purge gate, you can only connect one hopper.

If you install a purge gate, connect it to (g) and the hopper to (f).

For information on installing the purge actuator kit, refer to the following:

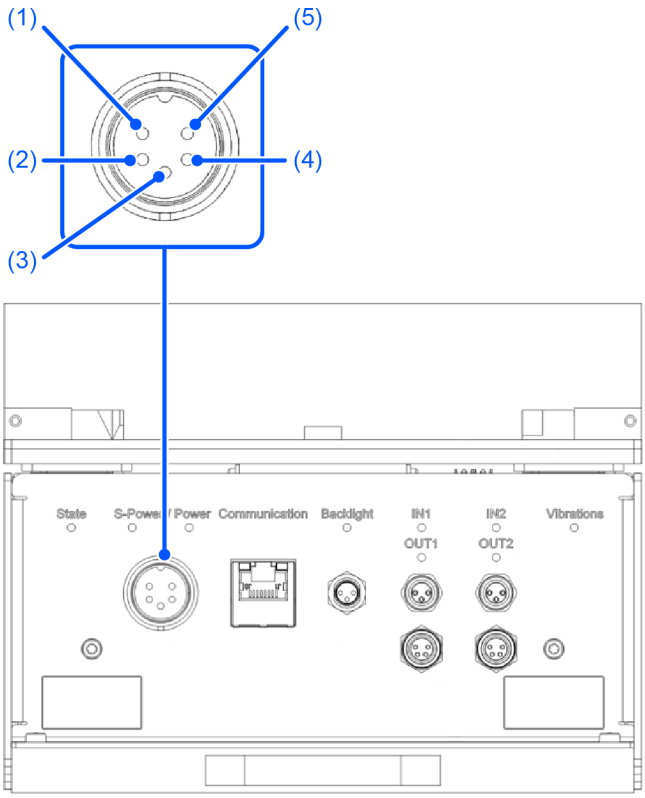
Replacing the Purging Actuator

2.3.6.2 Power Connection

⚠ CAUTION

- Before supplying power to the part feeder, make sure that the distribution voltage is the same as the nominal voltage.
- Never disconnect the power cable when the unit is on. Always turn the machine off before disconnecting the power cable.
- Use PELV (protected extra-low voltage) nominal voltage.
- Unplug the main power plug when plugging / unplugging cords.

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

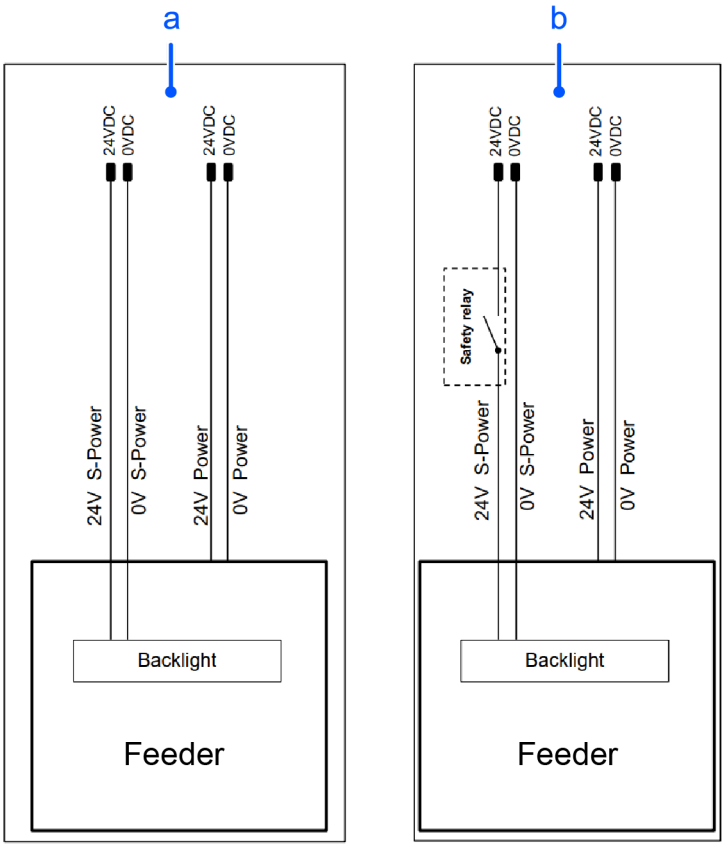
When all functions are working simultaneously (vibration, backlight, and outputs), the required current increases to 8A.

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

KEY POINTS

- The backlight receives its power supply from S-Power. Cutting this S-Power ensures that the backlight stays off. (e.g. to avoid danger from an IR backlight).
- When operating the feeder, connect both Power and S-Power to the power supply.

The following connection schematics show how to connect the IF-240 depending on whether your application uses an external relay to ensure that the backlight is safely switched off.



Symbols	Meaning
a	Power connection without safety relay
b	Power connection with safety relay

KEY POINTS

Both Power and S-Power can be connected to a single power supply or to two different power supplies.

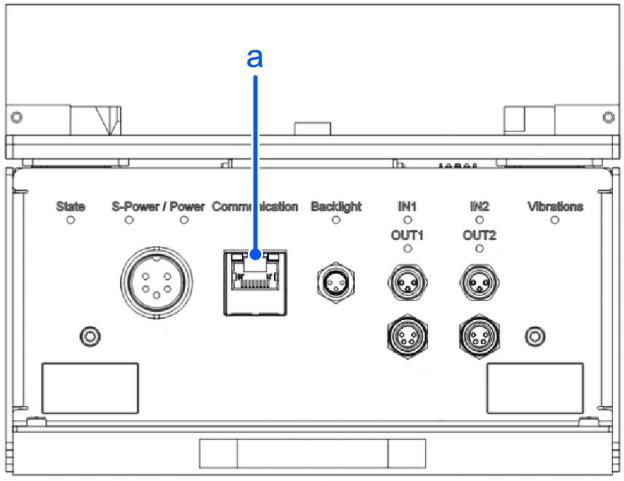
Short-circuit current rating:

	SCCR
Power	40A
S-Power	40A

2.3.6.3 Communication

Communication with the IF-240 is carried out by standard Ethernet communication via the RJ45 port (A)

Ethernet connection (RJ45)



Symbols	Meaning
a	RJ45 Port

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 information on restoring the default IP address, refer to the following:

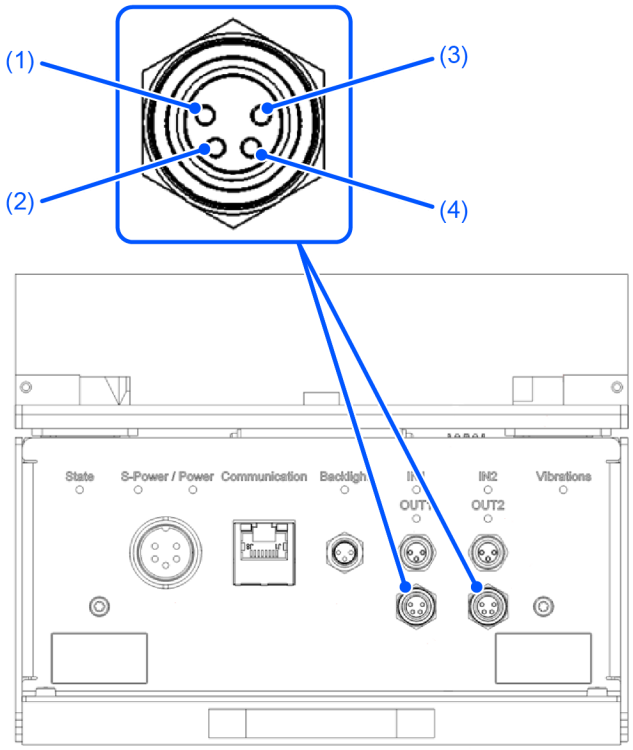
Restoring the Default IP Address

2.3.6.4 Output for Hoppers

A standard M8 four-pin male cable enables transmission of the digital output signal to hopper.

It must be connected as follows:

Output for Hoppers



Pin	Signal description	Hopper
(1)	0V GND	Analog Output 1
(2)	0 to 10VDC	
(3)	0V GND	Digital Output 1
(4)	+24VDC	

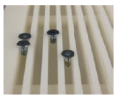
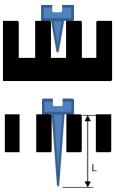
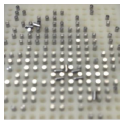
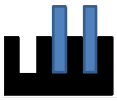
Connector type (on IF-240 side): M8, 4P, female

2.4 Options

2.4.1 Platform

2.4.1.1 Platform Type

The surface of the feeder can be structured to improve the availability of certain components. 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		 Example: Bolts	This type of platform can be used for a wide variety of components with flat surfaces that allow a stable resting position.
Grooves (deep)		 Example: Screws, rivets	A 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" described in the product list.
Grooves (wide) (anti-roll)		 Example: Cylinders, Needles	Wide grooves are useful when cylindrical components are fed. They reduce the stabilizing time significantly after components are displaced on the platform surface. (They stop the components from rolling on the surface)
Grooves (narrow) (anti-stick)		 Example: Thin washers	Narrow grooves are necessary to reduce surface contact especially for flat and light components. This reduces adhesion forces and improves displacement of parts on the feeder's surface. It also improves the robot's performance in picking parts.
Holes:		 Example: Pins	Holes are useful when cylindrical components are to be fed and presented upright.

2.4.1.2 Standard Platform Usage

Flat

Parts that have a stable orientation when placed on a tabletop can use a Flat Platform. They must be parts that stabilize quickly after vibration. For high-mix low-volume production, most applications use a Flat Platform.

Cross-sectional view

Symbols	Meaning
a	Parts
b	Platform

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

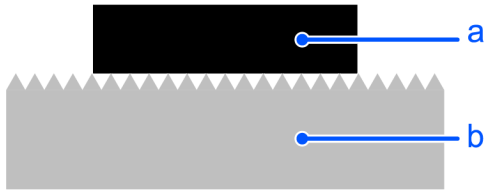
	IF-240
Flatness of the surface [mm]	0.2
Parallelism between surface and reference [mm]	0.5

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 (also called "sliding friction" or "dynamic friction") are good candidates for Anti-Stick Platforms.

Surface

Cross-sectional view



Symbols	Meaning
a	Parts
b	Platform

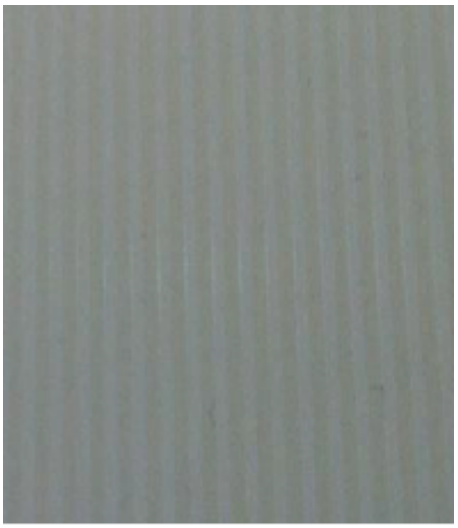
Structure of standard Anti-Stick Platform for IF-240

	a	b	c
IF-240 [mm]	0.7	1.3	0.5

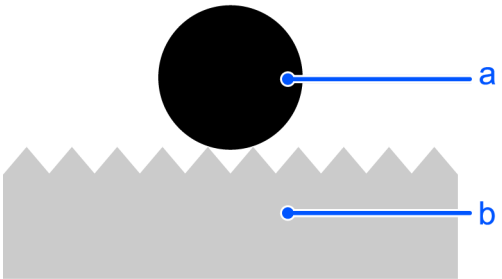
Anti-Roll

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.

Surface

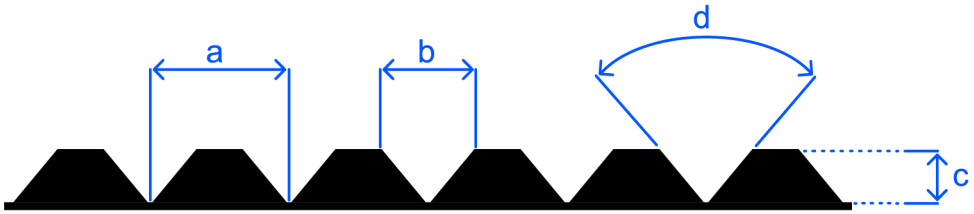


Cross-sectional view



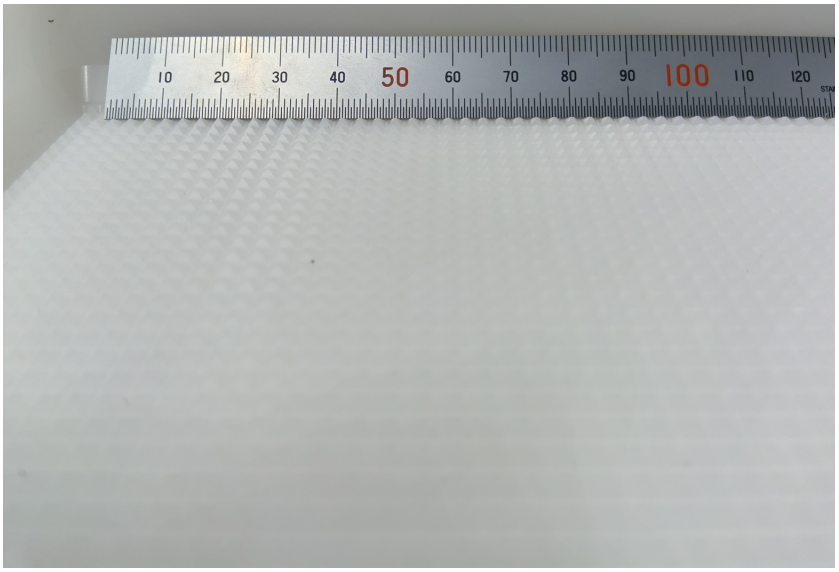
Symbols	Meaning
a	Parts
b	Platform

Structure of standard Anti-Roll Platform for IF-240



	a	b	c	d	Suitable Parts
IF-240	1.25 mm	1 mm	0.5 mm	90°	⌀ 1.7 mm - ⌀ 3.5 mm
IF-240	3 mm	2.5 mm	1.25 mm	90°	⌀ 3.5 mm - ⌀ 7 mm
IF-240	5.5 mm	5 mm	2.5 mm	90°	⌀7 mm - ⌀ 14 mm

Enlarged image



- For more information on custom platforms, refer to the following:

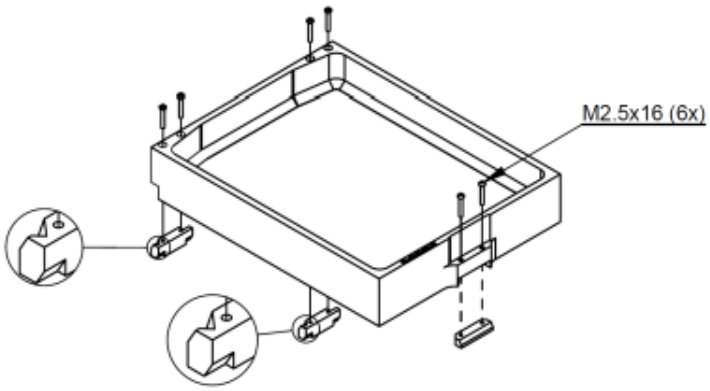
  "Epson RC+ 8.0 Option Part Feeding 8.0 Introduction & Software - Advanced - Custom Platforms"

- For model numbers of the platforms provided by Epson, refer to the following:

  Plate (series: IF-240)

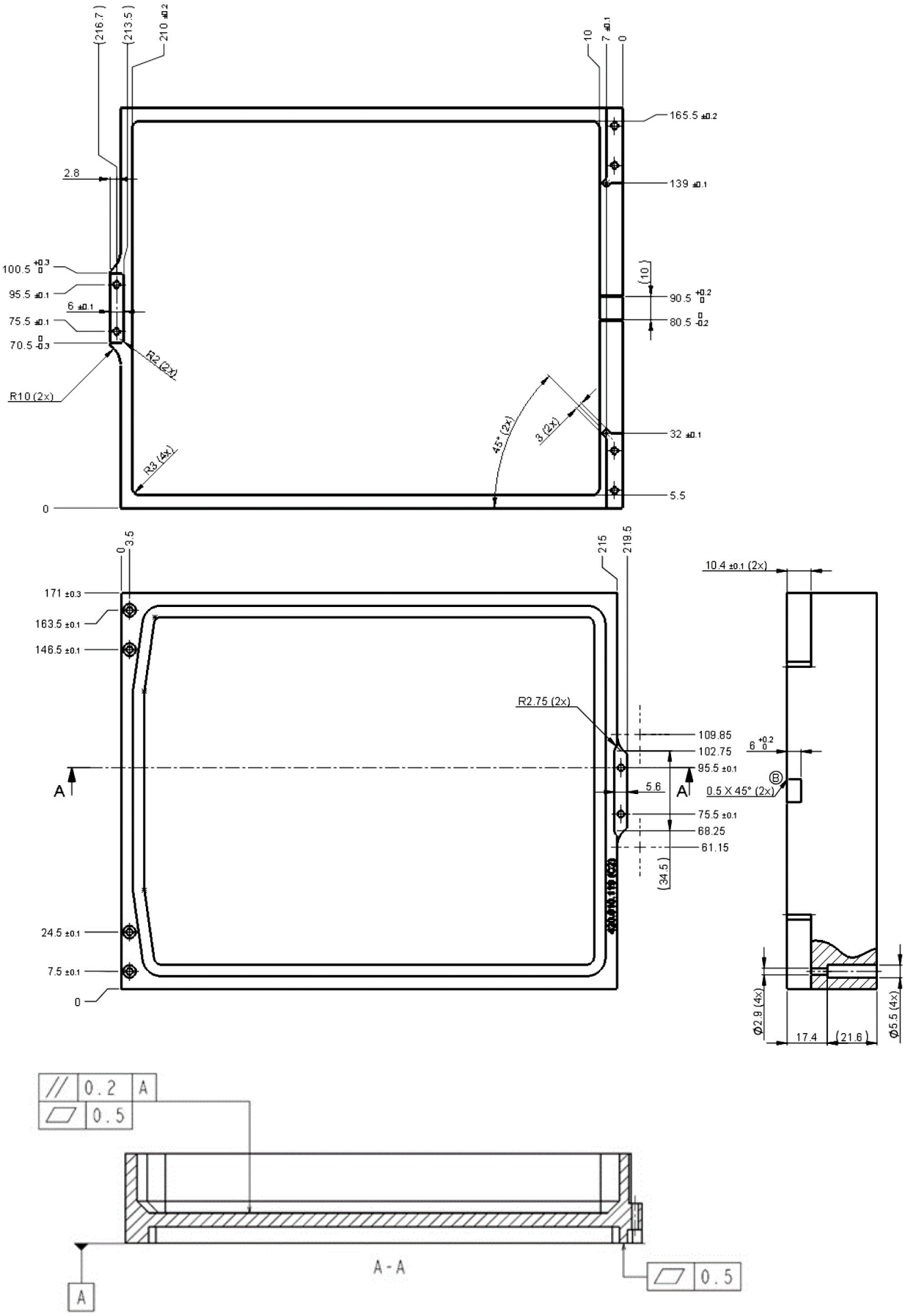
2.4.1.3 Plate Fixing Kit

When customers make their own platform, a plate fixation kit can be ordered from Epson.



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

2.4.1.4 Dimensions of Platform



2.4.2 Backlight

2.4.2.1 Color Options

The following backlights are available:

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

- For details about the backlight's color and instructions for exchanging the backlight, refer to the following:

  Replacing the Backlight

- For model numbers of standalone backlights, refer to the following:

  Backlight (series:IF-240)

⚠ WARNING

Infrared light (IR) is invisible to human eyes. NEVER use the infrared light without the platform secured. When the platform is attached to the part feeder, the system does not pose a risk for the operator.

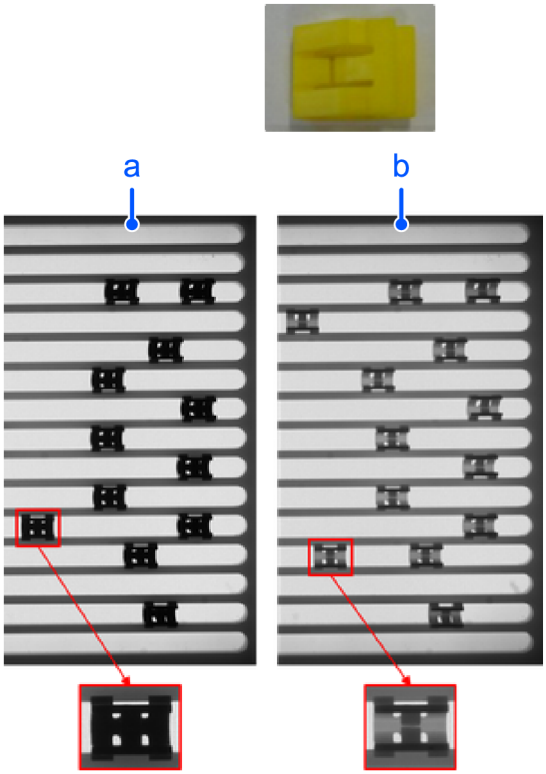
2.4.2.2 Selecting a Backlight Color

For most applications, 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 parts may appear to blend into the background. This may be the case even with plastic parts that look opaque to the eye.

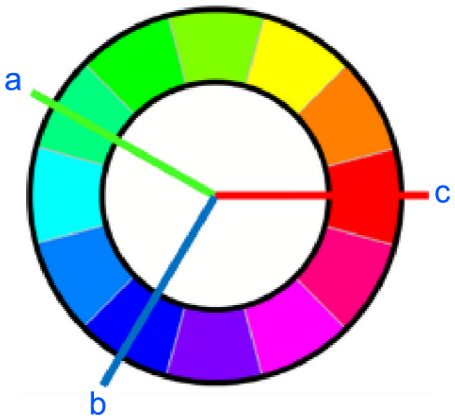
In the example below, when illuminated with a red backlight, the contrast between the yellow clips and the background is compromised (even if the clips look opaque with ambient light).

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



Symbols	Meaning
a	Blue backlight
b	Red backlight

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



Symbols	Meaning
a	Green backlight
b	Blue backlight
c	Red backlight

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

2.4.2.3 IR Backlights

Infrared light can be dangerous to human sight if there is no protection (filters) on the machine's enclosure. Thus, we advise using an IR backlight only if it is really required, as in the following situations:

- Different colored parts that are mixed together may appear similar regardless of their color.
- Translucent parts may appear opaque in near-infrared light.

2.4.3 Hoppers

- For information on hoppers, refer to the following:

  "Epson RC+ 8.0 Option Part Feeding 8.0 Hopper"

- For model numbers of hoppers, refer to the following:

  Hopper (Gen.1, series: IF-240)

  Hopper (Gen.2, series: IF-240)

2.4.4 Purging Platform (Side Purging Platform)

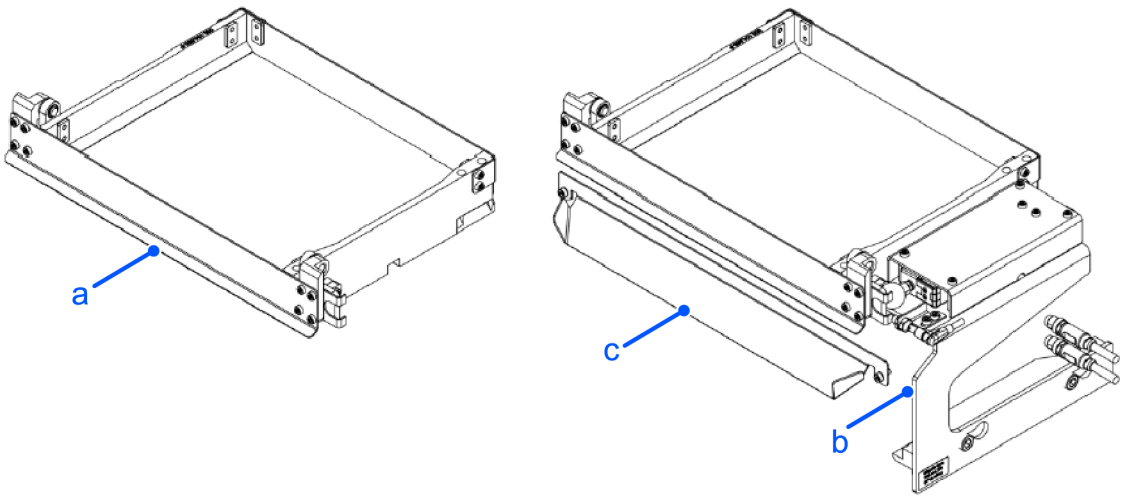
2.4.4.1 Overview of Purging Platform

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.

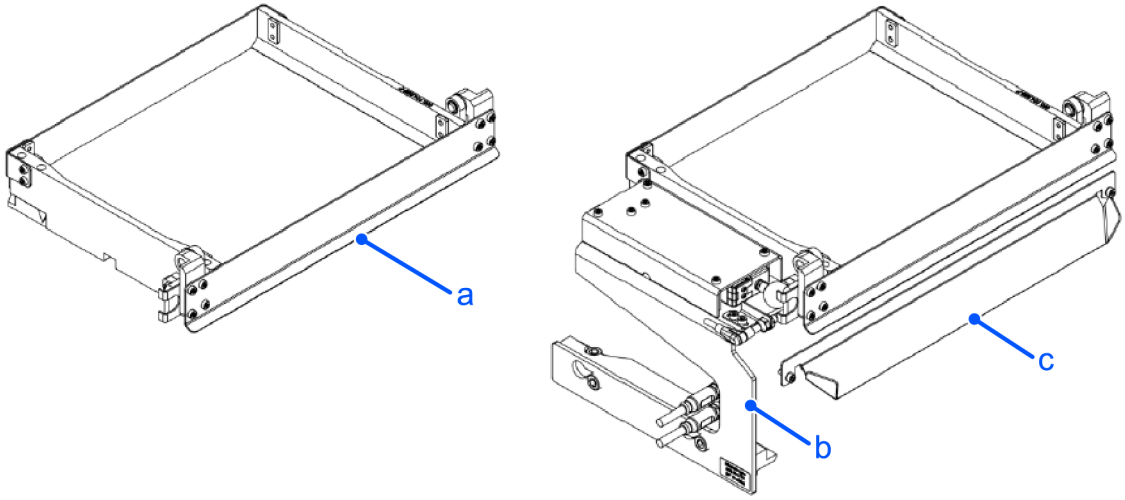
For information on installing a purge actuator kit, refer to the following:

Installing a Purge Actuator Kit

Left purging actuator kit



Right purging actuator kit



Symbols	Meaning
a	Flap
b	Purge Actuator Kit
c	Purge spout

The operation of the flap (1) and whether it closed properly are checked by a sensor and an electric actuator mounted on a purging actuator kit. 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

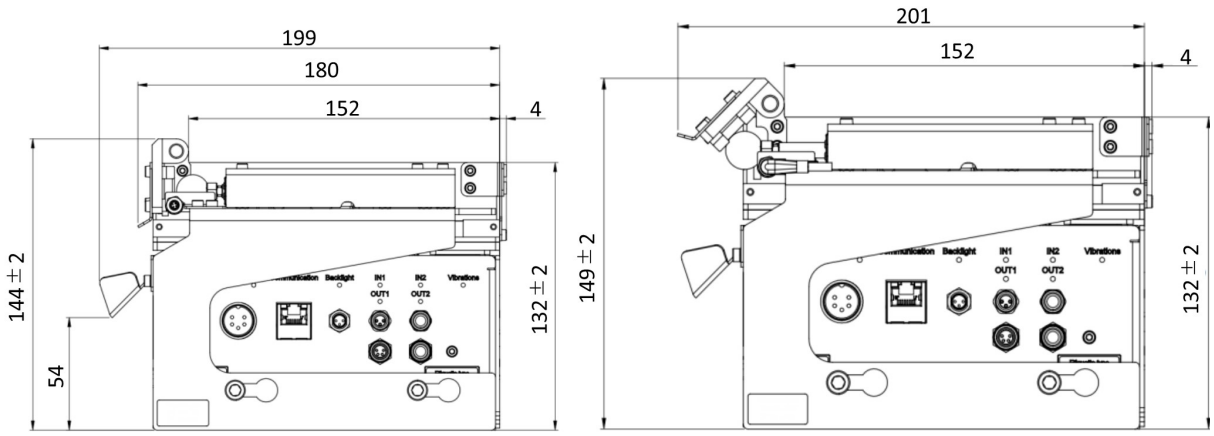
KEY POINTS

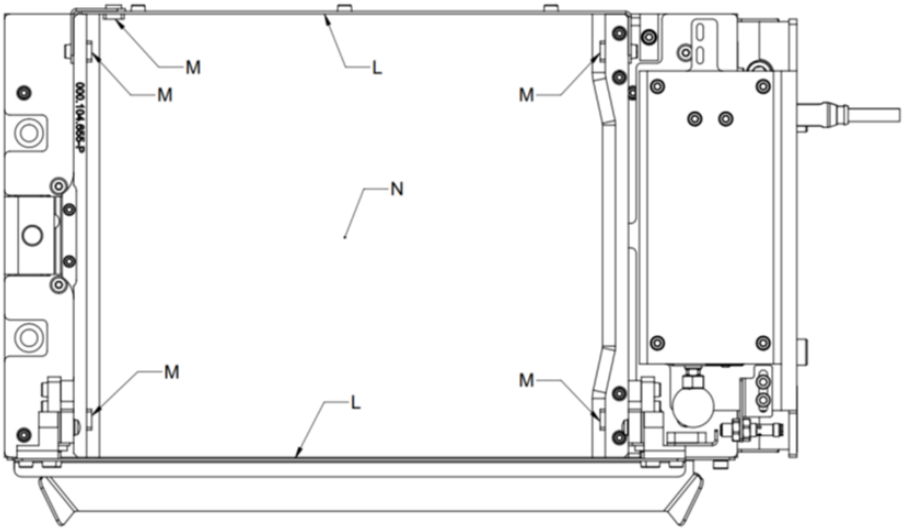
- The actuator kit does not include a purging plate.

  For model numbers of purging plates, refer to the following:

  - **Plate for Purge (POM-C: White)**
  - **Plate for Purge (Anti-static)**
- A purge spout (A) is included with the purging actuator kit (2).
- The connecting cable is included with the actuator kit (2).

2.4.4.2 Outer Dimension of Purging Platform



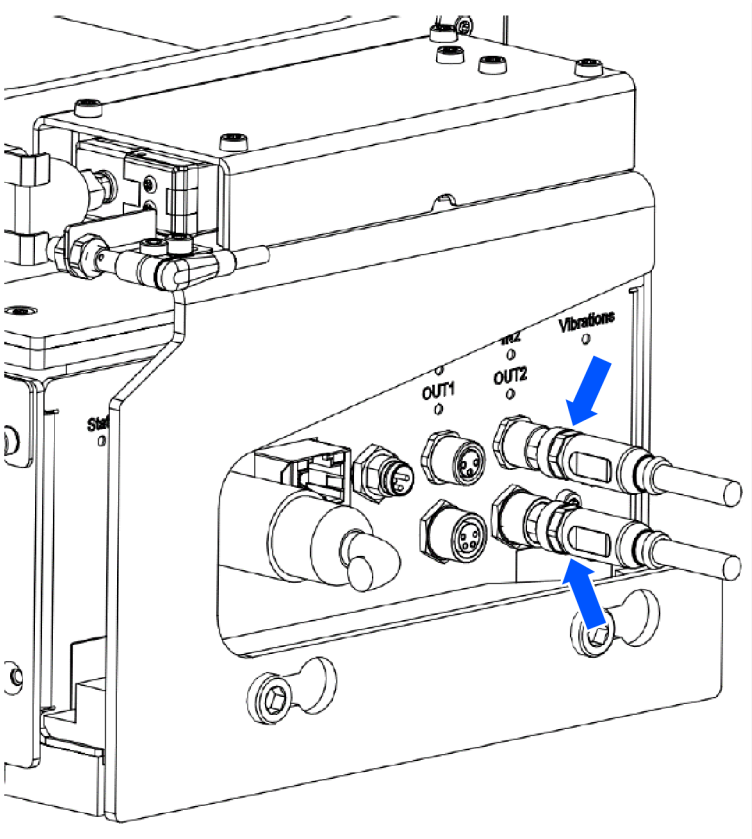


	Material
L	Stainless steel
M	Stainless steel
N	POM (Refer to the following:) **Plate (series: IF-240)**

⚠ CAUTION

To use the purge actuator kit, plug the cable in the feeder "IN2" / "OUT2" outputs.

Do not unplug the cable unless you are removing the purge actuator kit.



KEY POINTS

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

⚠ CAUTION

To prevent the motor from being prematurely damaged, make sure all movements are aimed at emptying the platform.

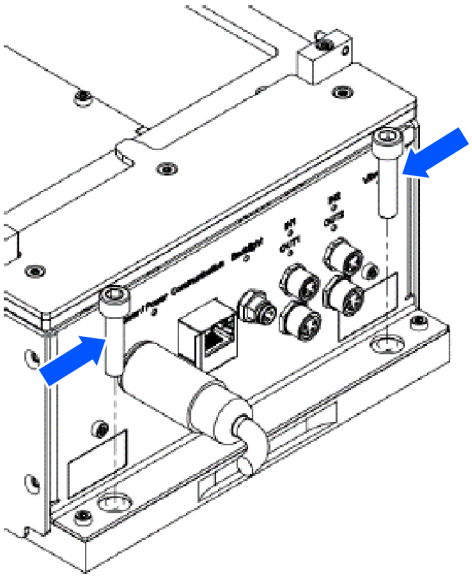
(e.g. consider a purging system with the flap on the left. Only the "Left" vibration may be used. Similarly, with a purging system whose flap is on the right, only the "Right" vibration may be used).

2.4.4.3 Installing a Purge Actuator Kit

⚠ CAUTION

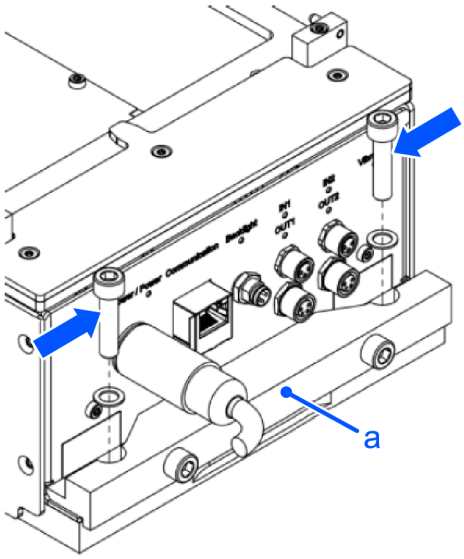
- The [Purge gate installed] setting influences vibration parameters. It is critical that you check the [Purge gate installed] checkbox prior to adding new parts in the Part Feeding dialog. If the checkbox is checked after adding new parts, the default vibration parameters will be incorrect. Also, the feeder will not perform properly.
- CAUTION: When the purge flap is open, do not use any vibrations other than left or right. If this precaution is not followed, the mechanism could be irreparably damaged.
- CAUTION: Installing the purge kit and enabling the purge option will modify the vibration behavior. Do not forget to deactivate the purge option when your remove the purge kit.
- When connecting the purge kit, connect the hopper to Output 1 and the purge kit to Input2 and Output2.

1. Unscrew the two bolts (I5) on the connector side of the feeder.



2. Position the support and fasten the feeder's two (I5) bolts.

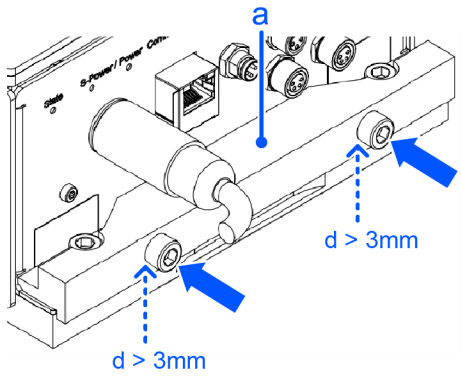
   At this time, carefully push the support onto the surface of the feeder.



Symbols	Meaning
a	Support

3. Loosen the 2 bolts (I5) of the sensor holder.

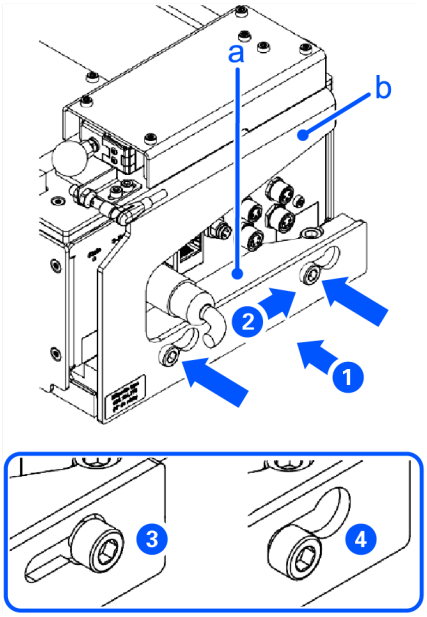
   Loosen the bolts of the support to ensure a distance: d > 3mm, between the surface of the support and the head of the bolts.



Symbols	Meaning
a	Support

4. Position the purge actuator kit using the movements of arrows (1) and (2), and tighten the bolts of the support.

   Tighten the two bolts (I5) with a tightening torque of 4.5 Nm Before tightening the bolts, slide the purge actuator kit as shown in (4) in the figure below.



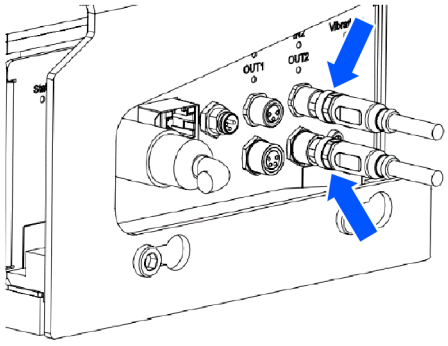
Symbols	Meaning
a	Support
b	Purge Actuator Kit

5. Connect the purge actuator kit to the feeder.

   Use the outputs: IN2 / OUT2.

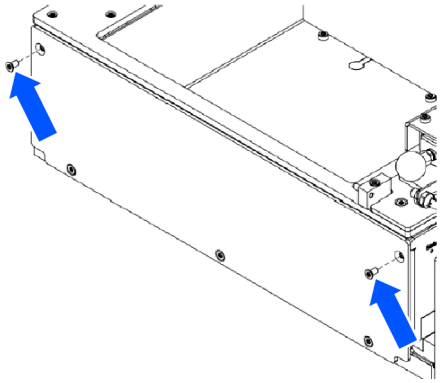
   For information on connecting the cable, refer to the following:

   Cable Connections



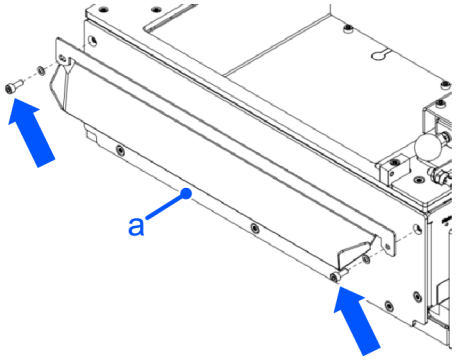
6. Remove the two screws from the side plate.

   Two screws Tx10



7. Screw the purge spout (discharge plate) onto the feeder.

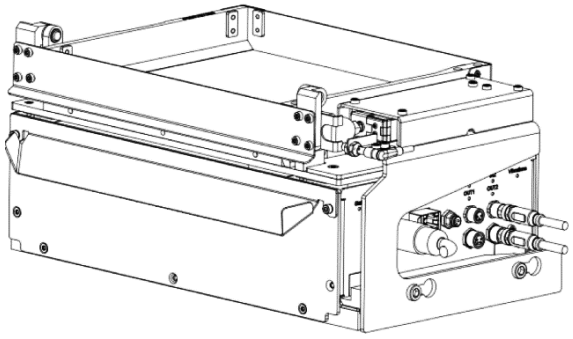
   Two bolts I2.5 - 1.2 Nm



Symbols	Meaning
a	Purge spout

8. Position the platform on the feeder. For more information, refer to the following:

   Remove the Platform

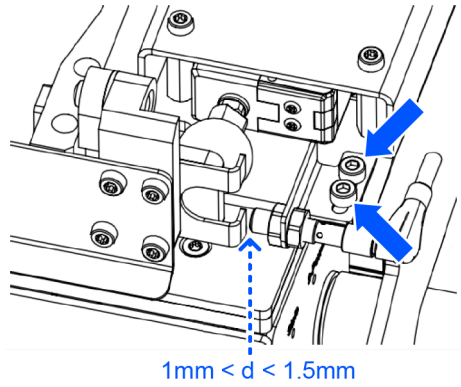


9. Loosen the sensor holder's two bolts.

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

   Tighten the sensor holder's two bolts.

   Two bolts I2.5 - 1.2 Nm



A red light comes on when the sensor picks up the detection plate.

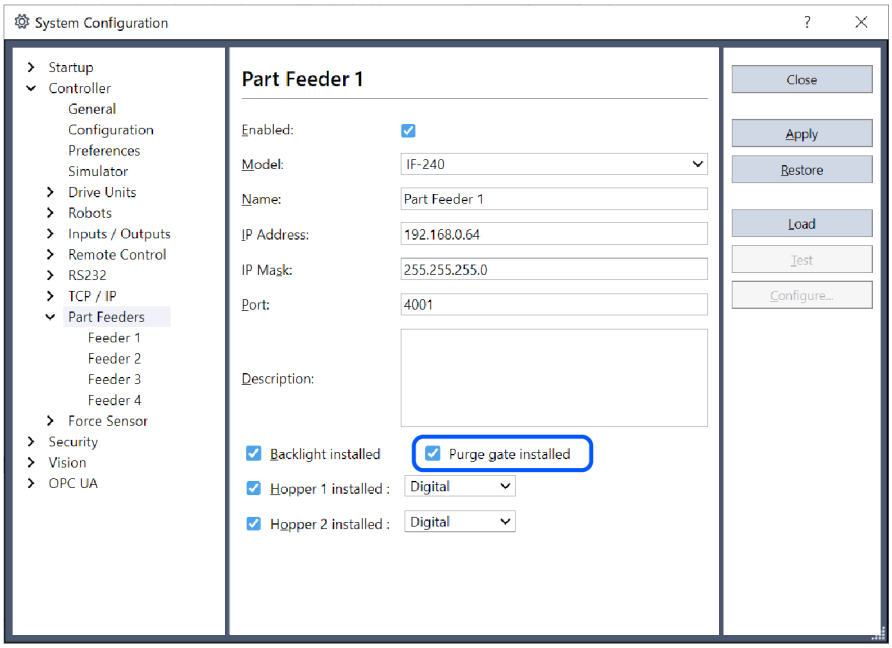
10. Turn on the feeder and Controller. Open Epson RC+ and connect to the Controller.

    If you have not already done so, configure the settings to connect the feeder to the Controller in the Epson RC+ 8.0-Menu-[Setup]-[System Configuration].

    For more details, refer to following:

    "Epson RC+ 8.0 Option Part Feeding 8.0 Introduction & Software - System Configuration"

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



New parts now can be added using Epson RC+ 8.0-Menu-[Tools]-[Part Feeding].

2.5 Maintenance and Part Replacement

2.5.1 Safety Precautions

2.5.1.1 General Safety Precautions

⚠ WARNING

There are no user-serviceable parts inside the product. Contact the supplier of your region or your local supplier for repairs. If the customer carries out repairs, the product's warranty will expire.

⚠ CAUTION

Do not operate the system when it is suspected of being damaged. Before use, make visual confirmation that there are no irregularities.

⚠ WARNING

- Failure to observe these 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.

2.5.1.2 Specific warnings

⚠ CAUTION

Be sure that the platform is removed before any kind of maintenance.

2.5.2 Maintenance

⚠ CAUTION

For any kind of maintenance, use Epson products.

2.5.2.1 Regular Maintenance Schedule

Perform the following periodic inspections to keep the product functioning properly and safely.

Maintenance schedule

	Item	Period	Reference
General	Cleaning of the machine	Weekly	
	Visual check of electrical harness	Year	
	Visual check and cleaning of the platform	Weekly	**Cleaning and Management of the Platform**
Specific processes	It is the customer's responsibility to create and carry out a maintenance plan for specific processes	/	/
Backlight	Visual check	Monthly	
Purging actuator	Replacing purging actuator	20,000 cycles	**Replacing the Purging Actuator**

KEY POINTS

The information given in the Maintenance schedule table is only informative. The type of maintenance done and the cycle on which it is carried out will vary according to your particular system, its operating environment and the amount of usage.

2.5.2.2 Remove the Platform

CAUTION

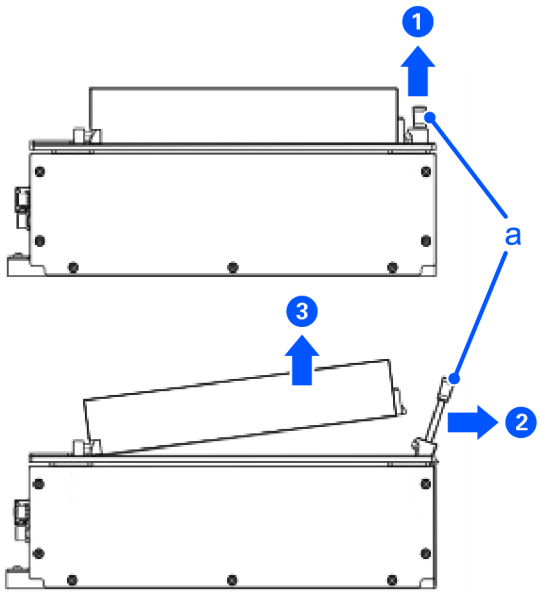
Be sure that the backlight is off before removing the platform module. Failure to follow the instructions below may result in damage to the backlight.

CAUTION

Crushing hazard.

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

Removing the Platform



Symbols	Meaning
a	Lever

1. Pull out the lever (1). Pull the lever down away from the platform (2). This will release the platform's lock.
2. Remove the platform (3). When securing the platform, perform step 1 in reverse.

2.5.2.3 Cleaning and Management of the Platform

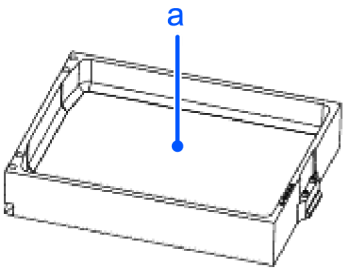
⚠ CAUTION

Platforms are consumables.

If the surface becomes damaged or worn to the point of impeding the vision system or flow of parts, it must be replaced. For information on obtaining replacement parts, please contact the supplier of your region.

Items needed:

- Lint-free cloth
- Isopropanol alcohol



Symbols	Meaning
a	Platform

1. In checking the state of the platform's surface, be particularly careful of the following:
   - Scratches
   - Dirt or spots on the surface

- Oil or grease having adhered to the surface

2. Clean the surface of the platform.

2.5.3 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**
>
> 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

2.5.3.1 Replacing the Backlight

> **⚠ WARNING**
>
> Be sure that all power sources and other cable connectors to the unit are disconnected before changing the backlight.

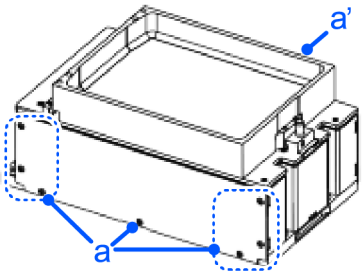
Items needed:

- New backlight assembly ordered from the supplier of your region.

  (Ask your supplier for the part code.)

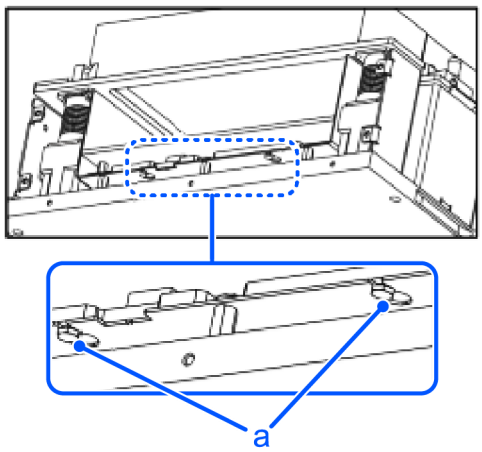
- Flat wrench, size 5.5
- Torx key, size 10

1. Unscrew the seven screws on both sides and remove the two side covers. Use a Torx key, size 10.



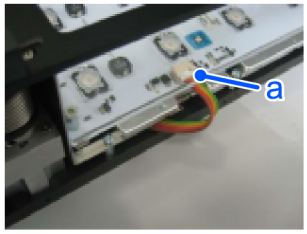
Symbols	Meaning
a (a')	screw

2. On both sides, unscrew the four bolts. Use a flat wrench, size 5.5.



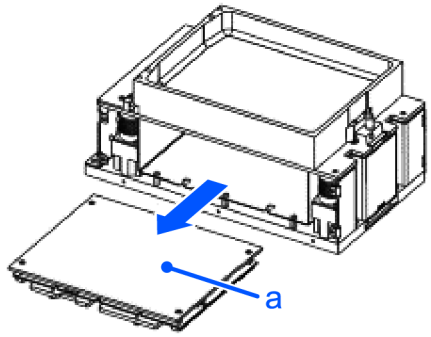
Symbols	Meaning
a	Bolts

3. Unplug the backlight connector.



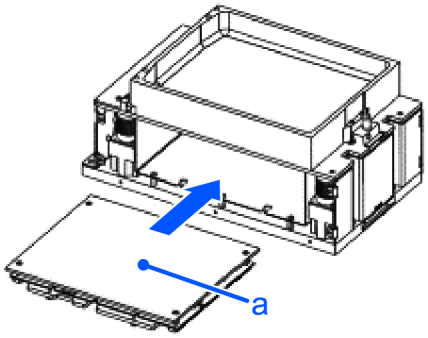
Symbols	Meaning
a	Backlight connector

4. Remove the old backlight.



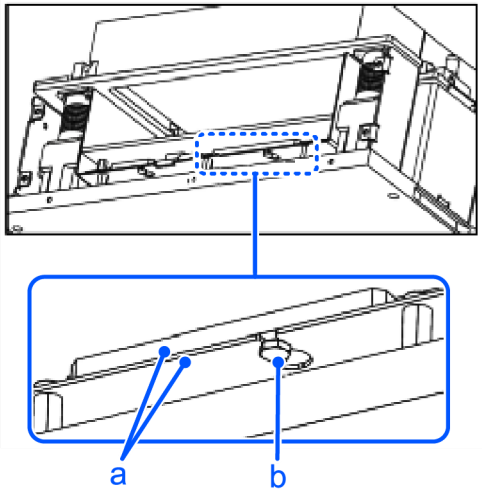
Symbols	Meaning
a	Backlight unit

5. Insert the new backlight.



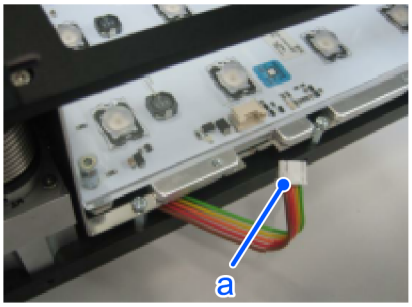
Symbols	Meaning
a	New backlight unit

6. Align the backlight module flush with the mirror support and tighten the four bolts. Use a flat wrench, size 5.5.



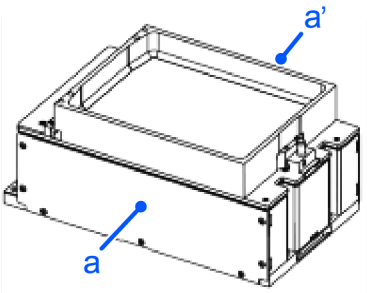
Symbols	Meaning
a	Mirror support
b	Bolts

7. Plug in the backlight connector.



Symbols	Meaning
a	Backlight connector

8. Remount the covers on both sides.



Symbols	Meaning
a (a')	Cover

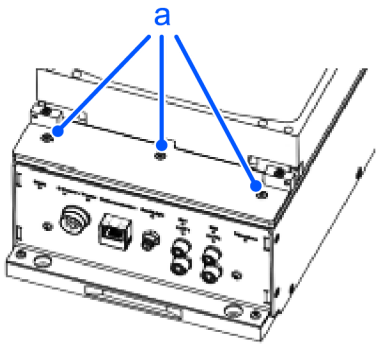
2.5.3.2 Restoring the Default IP Address

The following procedure explains how to reboot the IF-240 so that it uses the default IP address, subnet mask and TCP port number. Perform this operation when the IP address, subnet mask, and TCP port are unknown and you cannot connect to the IF-240.

Items needed:

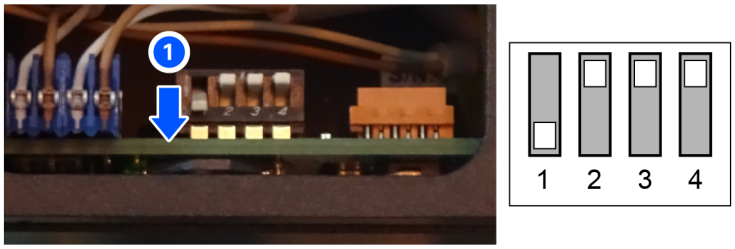
- Torx key, size 10

1. Unscrew the three screws and remove the cover. Use a Torx key, size 10.



Symbols	Meaning
a	screw

2. Set DIP switch 1 as shown in Figure 1.



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:

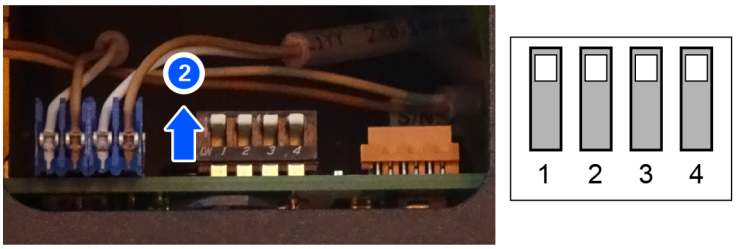
   - IP Address: 192.168.0.64
   - SubnetMask: 255.255.255.0
   - TCP Port: 4001

4. You can use Epson RC+ to modify these parameters as you wish.

   For more details, refer to following:

   "Epson RC+ 8.9 Option Part Feeding 8.0 Introduction & Software - System Configuration"

5. When the parameters are defined to your liking, set DIP switch 1 as shown in Figure 2.

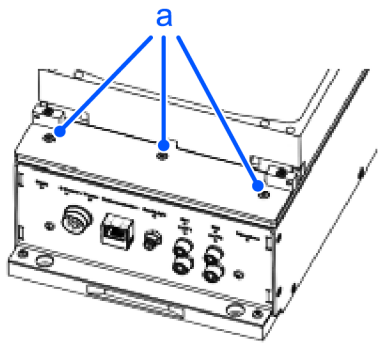


6. Disconnect and reconnect the power cable. (or switch off and switch on the power of the IF-240)

   The IF-240 will start up using the new parameters.

7. Fasten the screws in the three places shown in the figure below. Use a torx key, size 10.

   The tightening torque is 0.9 Nm.



Symbols	Meaning
a	screw

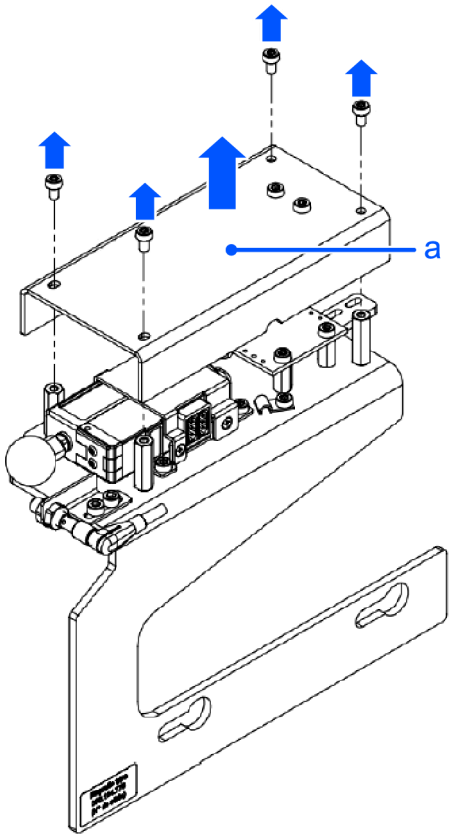
2.5.3.3 Replacing the Purging Actuator

⚠ CAUTION

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

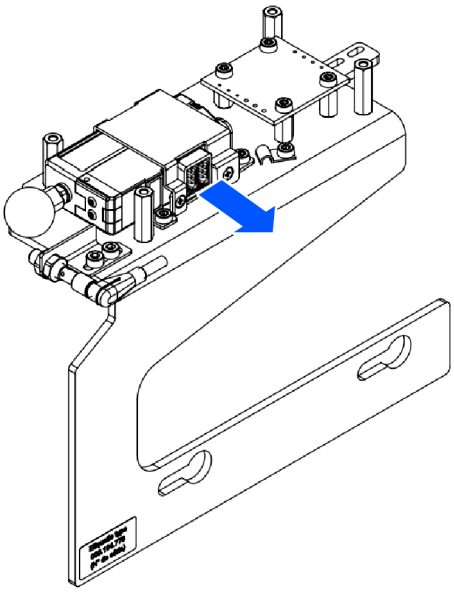
1. Remove the protective cover.

   4 screws Tx10



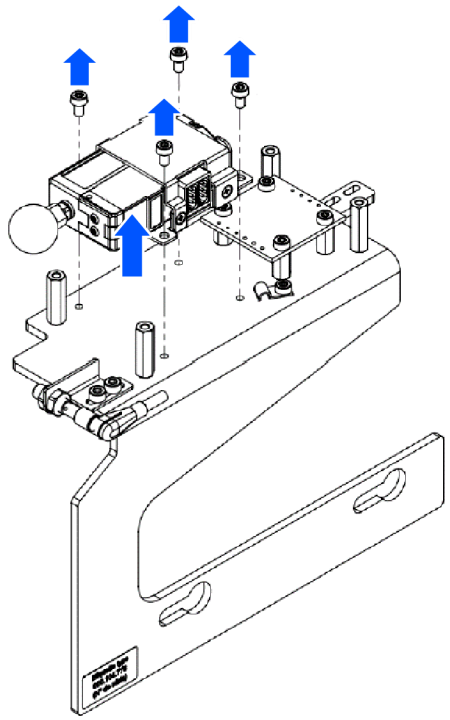
Symbols	Meaning
a	Protective cover

2. Disconnect the actuator by pulling on the connector, and not on the cable itself.



3. Unscrew the actuator block.

4 screws Tx10



4. Unscrew and open the support (1).

   4 screws X0

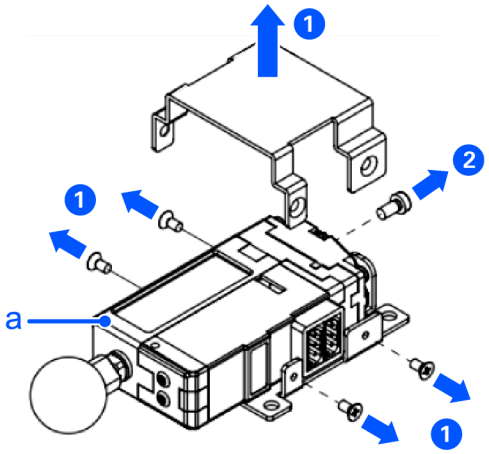
   

   Unscrew the actuator (2).

   1 screws Tx8

   Swap out the actuator.



Symbols	Meaning
a	Actuator

5. Screw back the actuator in the support (1).

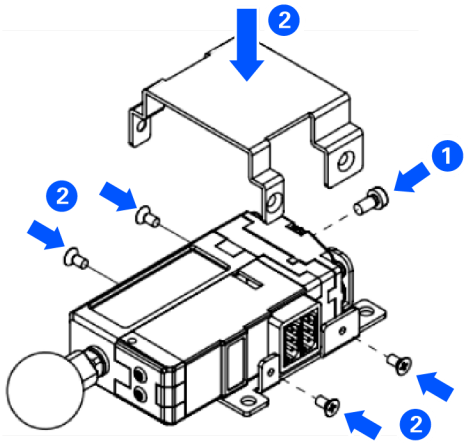
   1 screw, Tx8, - 0.8Nm

   Close and screw support (2).

   4 screws, X0, - 0.6Nm

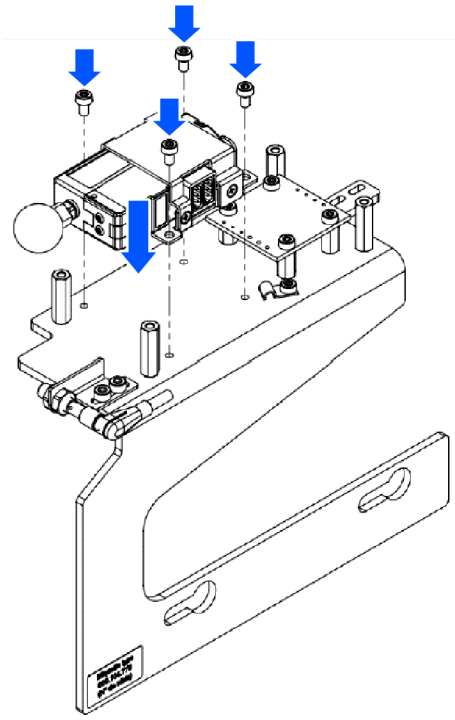
   

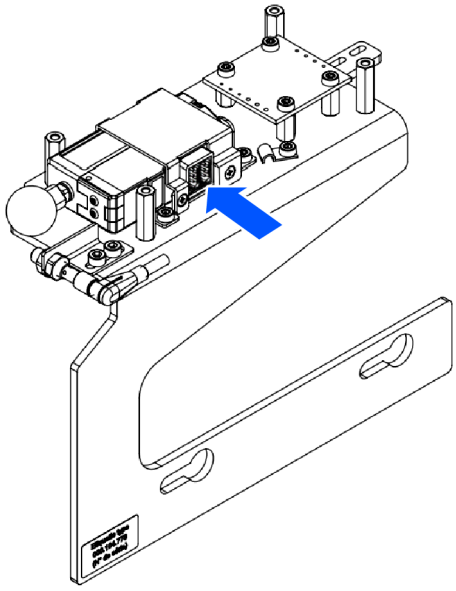
6. Screw back the actuator block on the main plate.

   4 screws, Tx10 - 1Nm

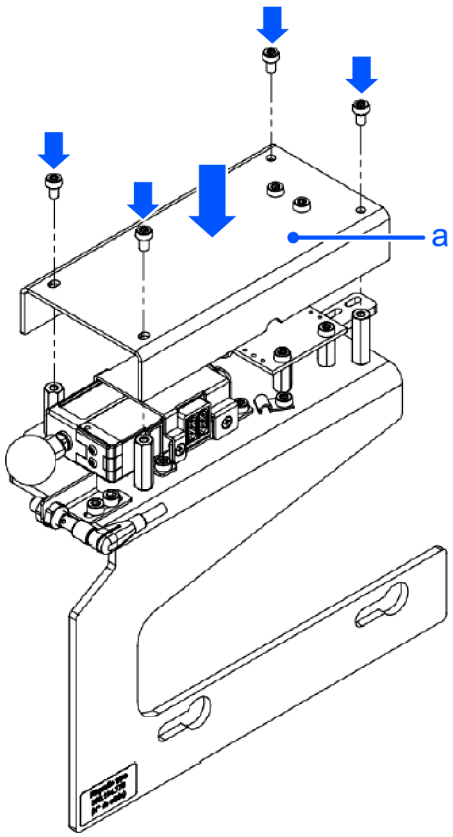


7. Plug in the actuator.



8. Screw the protective cover back into position.

   4 screws, Tx10, - 0.6Nm



Symbols	Meaning
a	Protective cover

2.6 Option Part List

2.6.1 Feeder (series: IF-240)

Product name	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

2.6.2 Plate (series: IF-240)

2.6.2.1 Plate (POM-C: White)

The plate includes plate fixing kit.

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

2.6.2.2 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: ⌀ 1.7-3.5 Material: POM-C ED (Anti-static)	R12NZ90179

Product name	Specification	Model number
ANTI-ROLLING PLATE ESD-240dia.3.5-7.0	Anti-roll (Ocher) Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 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

2.6.2.3 Plate (FDA)

The plate includes a plate fixing kit.

* We use materials which conform to FDA (Food and Drug Administration) standards in the United States.

(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: ⌀ 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: ⌀ 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: ⌀ 7.0-14.0 Material: POM-C (white) (FDA)	R12NZ9017M

Product name	Specification	Model number
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: ⌀ 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: ⌀ 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: ⌀ 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

2.6.2.4 Plate for Purge (POM-C: White)

The plate includes a plate fixing kit.

The specification's purging direction is as seen from the connector side of the feeder.

To use purging (sideways discharge function), you will need the separate purge actuator kit.

Product name	Specification	Model number
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: ⌀ 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: ⌀ 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: ⌀ 3.5-7.0 Material:POM-C (white)	R12NZ901CN

Product name	Specification	Model number
PURGE R ANTI-ROLL PLATE 240 d3.5-	Plate for purge /purge direction: Right Anti-roll (White) Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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

2.6.2.5 Plate for Purge (Anti-static)

The plate includes a plate fixing kit.

The specification's purging direction is as seen from the connector side of the feeder.

To use purging (sideways discharge function), you will need the separate 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: ⌀ 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: ⌀ 1.7-3.5 Material: POM-C ED (Anti-static)	R12NZ901CW

Product name	Specification	Model number
PURGE L ANTI-ROLL PLATE ESD 240 d3.5-	Plate for purge /purge direction: Left Anti-roll (Ocher) Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 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
PURGE L ANTI-ROLL PLATE(BK)240 d1.7-	Plate for purge /purge direction: Left Anti-roll (Black) Supported work piece: ⌀ 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: ⌀ 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: ⌀ 3.5-7.0 Material: POM-C EC (Anti-static)	R12NZ901D7

Product name	Specification	Model number
PURGE R ANTI-ROLL PLATE(BK)240 d3.5-	Plate for purge /purge direction: Right Anti-roll (Black) Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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

2.6.2.6 Plate for Purging (FDA)

The plate includes a plate fixing kit.

The specification's purging direction is as seen from the connector side of the feeder.

To use purging (sideways discharge function), you will need the separate purge actuator kit.

* We use materials which conform to FDA (Food and Drug Administration) standards in the United States.

(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: ⌀ 1.7-3.5 Material: POM-C (white) (FDA)	R12NZ901DF

Product name	Specification	Model number
PURGE R ANTI-ROLL PLATE MED 240 d1.7-	Plate for purge /purge direction: Right Anti-roll (White)/ * Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 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
PURGE L ANTI-ROLL PLATE MED(BK)240 d1.7-	Plate for purge /purge direction: Left Anti-roll (Black)/ * Supported work piece: ⌀ 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: ⌀ 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: ⌀ 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: ⌀ 3.5-7.0 Material:POM-C (black)(FDA)	R12NZ901DT

Product name	Specification	Model number
PURGE L ANTI-ROLL PLATE MED(BK)240 d7-	Plate for purge /purge direction: Left Anti-roll (Black)/ * Supported work piece: ⌀ 7.0-14.0 Material:POM-C (black)(FDA)	R12NZ901DU
PURGE R ANTI-ROLL PLATEMED(BK)240 d7-	Plate for purge /purge direction: Right Anti-roll (Black)/ * Supported work piece: ⌀ 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

2.6.3 Other: Accessories (series: IF-240)

The specification's purging direction 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 Details ▪ Auto actuator to open purge gate ▪ Frame (Material: Stainless steel) ▪ Connecting cable (Plate for purge is not included.)	R12NZ901DY
RIGHT PURGE ACTUATOR KIT 240	Right purging actuator kit (For IF-240) Purge direction: Right Details ▪ Auto actuator to open purge gate ▪ Frame (Material: Stainless steel) ▪ Connecting cable (Plate for purge is not included.)	R12NZ901DZ
PURGE ACTUATOR ASSEMBLY - 240	Purging actuator	1889173

2.6.4 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

2.6.5 Hopper (Gen.1, series: IF-240)

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

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

Also, you cannot change the voltage and frequency.

2.6.6 Hopper (Gen.2, series: IF-240)

Product name	Model number
HOPPER BASE S	R12NZ901MA
HOPPER BASE M	R12NZ901MB
1 LITER CONTAINER	R12NZ901MD
2 LITER CONTAINER	R12NZ901ME
3 LITER CONTAINER	R12NZ901MF
7 LITER CONTAINER	R12NZ901MG
HOPPER FIXATION KIT FOR L/M	R12NZ901MJ
MALE/FEMALE M8 4P 1m CABLE	R12NZ901ML
MALE/FEMALE M8 4P 2m CABLE	R12NZ901MM
POWER CABLE 80/240	R12NZ9016K

2.6.7 License (series: common)

Product name	Specification	Model number
Part Feeding 8.0 License	Part Feeding 8.0 License	R19NZ901JU
Part Feeding 8.0 License for USB Key	Part Feeding 8.0 License for USB Key	R19NZ901K9

2.7 Troubleshooting

For information on troubleshooting, refer to the following:

"Epson RC+ 8.0 Option Part Feeding 8.0 Introduction & Software - Troubleshooting"

2.8 Appendix: Conditions of Use for the Backlight

	**CONDITIONS OF USE FOR TPL VISION PRODUCTS** **TABLE OF CALCULATION** THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471. THIS DOCUMENT IS NOT A CERTIFICATE AND CAN BE USED ONLY AS A DECLARATION TO USERS.	

Board Specifications

1 brick 8 LEDs 200x150 Green

Information for Reference			
Exposure time to the source		0.25	Seconds
1	Wavelength	525	nm
	Color temperature		K
2	Total angle	150	°
3	**For visible light:**		
	Output intensity		Cd
	Output power	150	Lm
	For non-visible light:		
	Power density	0.000	W/m²
4	Number of LEDs	8	LED
5	Efficiency in candelas per lumen when lens is used	2.5	Cd/Lm

Information About the Light Source		
Maximum Permissible Exposure (MPE):	25.456	W/m²
	13665.66445	Lm/m²
Power density for a visible source:		
Surface area illuminated by the source:	0.437567409	m²
Power of one LED:	150	Lm
Power density for one LED:	342.804324	Lm/m²
Power density for a non-visible source:		
Surface area illuminated by the source:	0.4376	m²
Power density for one LED:	0.000	W/m²
Danger to Human Body		

Information About the Light Source		
Hazardous light source:		
Power density for a visible source:	2742.434592	Lm/㎡
Power density for a non-visible source:	0.000	W/㎡

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

* Consider all positions within the envelope of the remote DNRO and within areas where the irradiance or radiant exposure exceeds the Maximum Permissible Exposure (MPE) to be optically hazardous areas (NRA).

[Basics]

- Exposure time is fixed to 0.25 s 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 LEDs: These numbers assume that the worker sees all of the LED light sources.

	**CONDITIONS OF USE FOR TPL VISION PRODUCTS** **TABLE OF CALCULATION** THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471. THIS DOCUMENT IS NOT A CERTIFICATE AND CAN BE USED ONLY AS A DECLARATION TO USERS.	

Board Specifications

1 brick 8 leds 200x150 red

Reference Information			
Exposure time to the source		0.25	Seconds
1	Wavelength	630	nm
	Color temperature		K
2	Total angle	150	°
3	**For visible light:**		
	Output intensity		Cd
	Output power	80	Lm
	For non-visible light:		
	Power density	0.000	W/m²
4	Number of LEDs	8	LED
5	Efficiency in candelas per lumen when lens is used	2.5	Cd/Lm

Information About the Light Source		
Maximum Permissible Exposure (MPE):	25.456	W/m²
	4607.380507	Lm/m²
Power density for a visible source:		
Surface area illuminated by the source:	0.437567409	m²
Power of one LED:	80	Lm
Power density for one LED:	182.8289728	Lm/m²
Power density for a non-visible source:		
Surface area illuminated by the source:	0.4376	m²
Power density for one LED:	0.000	W/m²
Danger to Human Body		
Hazardous light source:		
Power density for a visible source:	1462.631782	Lm/m²

Information About the Light Source		
Power density for a non-visible source:	0.000	W/㎡

	NOMINAL DISTANCE TO AVOID OCULAR HAZARD (DNRO) FOR AN EXPOSURE TIME OF (Seconds): 0.25	
Minimum safe distance in this case *	**161**	**mm**

* Consider all positions within the envelope of the remote DNRO and within areas where the irradiance or radiant exposure exceeds the Maximum Permissible Exposure (MPE) to be optically hazardous areas (NRA).

[Basics]

- Exposure time is fixed to 0.25 s 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 LEDs: These numbers assume that the worker sees all of the LED light sources.

	**CONDITIONS OF USE FOR TPL VISION PRODUCTS** **TABLE OF CALCULATION** THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471. THIS DOCUMENT IS NOT A CERTIFICATE AND CAN BE USED ONLY AS A DECLARATION TO USERS.	

Board Specifications

1 brick 8 leds 200x150 Blue

Information for Reference			
Exposure time to the source		0.25	Seconds
1	Wavelength	470	nm
	Color temperature		K
2	Total angle	150	°
3	**For visible light:**		
	Output intensity		Cd
	Output power	39	Lm
	For non-visible light:		
	Power density	0.000	W/m²
4	Number of LEDs	8	LED
5	Efficiency in candelas per lumen when lens is used	2.5	Cd/Lm

Information About the Light Source		
Maximum Permissible Exposure (MPE):	25.456	W/m²
	1582.15708	Lm/m²
Power density for a visible source:		
Surface area illuminated by the source:	0.437567409	m²
Power of one LED:	39	Lm
Power density for one LED:	89.12912424	Lm/m²
Power density for a non-visible source:		
Surface area illuminated by the source:	0.4376	m²
Power density for one LED:	0.000	W/m²
Danger to Human Body		
Hazardous light source:		
Power density for a visible source:	713.0329939	Lm/m²

Information About the Light Source		
Power density for a non-visible source:	0.000	W/㎡

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

* Consider all positions within the envelope of the remote DNRO and within areas where the irradiance or radiant exposure exceeds the Maximum Permissible Exposure (MPE) to be optically hazardous areas (NRA).

[Basics]

- Exposure time is fixed to 0.25 s 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 LEDs: These numbers assume that the worker sees all of the LED light sources.

	**CONDITIONS OF USE FOR TPL VISION PRODUCTS** **TABLE OF CALCULATION** THE REQUIREMENTS BELOW ARE IN STRICT COMPLIANCE WITH THE STANDARD NF EN62471. THIS DOCUMENT IS NOT A CERTIFICATE AND CAN BE USED ONLY AS A DECLARATION TO USERS.	

Board Specifications

1 brick 8 leds 200x150 infrared

Information for Reference			
Exposure time to the source		10	Seconds
1	Wavelength	850	nm
	Color temperature		K
2	Total angle	150	°
3	**For visible light:**		
	Output intensity		Cd
	Output power		Lm
	For non-visible light:		
	Power density	1.028	W/m²
4	Number of LEDs	8	LED
5	Efficiency in candelas per lumen when lens is used	2.5	Cd/Lm

Information About the Light Source		
Maximum Permissible Exposure (MPE):	19.953	W/m²
	Non-visible source	Lm/m²
Power density for a visible source:		
Surface area illuminated by the source:	Non-visible source	m²
Power of one LED:	Non-visible source	Lm
Power density for one LED:	Non-visible source	Lm/m²
Power density for a non-visible source:		
Surface area illuminated by the source:	0.4376	m²
Power density for one LED:	8.227	W/m²
Danger to Human Body		
Hazardous light source:		
Power density for a visible source:	Non-visible source	Lm/m²

Information About the Light Source		
Power density for a non-visible source:	8.227	W/㎡

	NOMINAL DISTANCE TO AVOID OCULAR HAZARD (DNRO) FOR AN EXPOSURE TIME OF (Seconds): 10	
Minimum safe distance in this case *	**183**	**mm**

* Consider all positions within the envelope of the remote DNRO and within areas where the irradiance or radiant exposure exceeds the Maximum Permissible Exposure (MPE) to be optically hazardous areas (NRA).

[Basics]

- 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 LEDs: These numbers assume that the worker sees all of the LED light sources.