

# PowerCON SCARA **IXP** Series

## Program Controllers for PowerCON SCARA **MSEL-PCX/PGX**

**Series Added**

Class 10

Cleanroom specification

IP65

Dust/Splash-proof specification



# Cleanroom specification and Dust/Splash-proof specification Added in Cost-effective IXP Series Giving More Variations to the Lineup

All models come standard with battery-less absolute encoders.



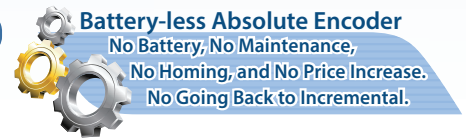
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## All models come standard with high resolution battery-less absolute encoders.

All models come standard with battery-less absolute encoders that do not require batteries. Since battery replacement is no longer necessary, maintenance labor is reduced. In addition, the encoder resolution has increased 10 times compared to the conventional IXP series.

### Advantages of Battery-less Absolute Encoders

- The SCARA will not stop due to battery errors (low voltage, etc.)
- No cost of battery replacement
- No need for absolute reset or other physical tasks associated with battery replacement



**Battery-less Absolute Encoder**  
No Battery, No Maintenance,  
No Homing, and No Price Increase.  
No Going Back to Incremental.

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## More Affordable Due to Pulse Motors

Equipped with a pulse motor for Power-Con with IAI's own technology

**...the IXP costs around 1/2 of conventional model.**

\* Compared against an IAI robot based on an arm length of 350mm.

SCARA robot 3-axis specification enables you to reduce the cost by up to about 15%. The IXP achieves a payload equivalent to that of a conventional model by adopting high-output drivers.

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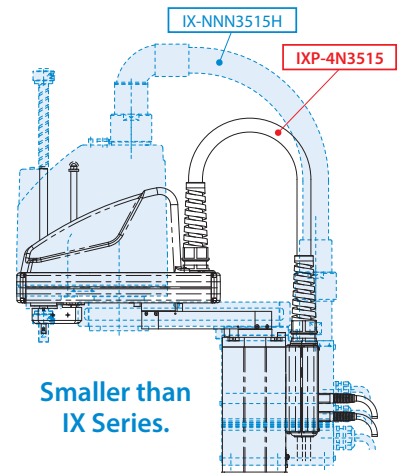
## Lighter than IX Series

**The robot weighs approx. 30% less.**

(Compared to: IX-NNN3515H)

The lightweight robot can be easily assembled into your system.

	IX Series		IXP Series
Model	IX-NNN2515H		IXP-4N2508
Mass	17.1kg	<b>-9.1kg</b> →	<b>8kg</b>
Model	IX-NNN3515H		IXP-4N3515
Mass	18kg	<b>-5kg</b> →	<b>13kg</b>
Model	IX-NNN50□□H		IXP-4N5520
Mass	29.5kg	<b>-8.5kg</b> →	<b>21kg</b>



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# 4

## Added 3-axis Specification and 4-axis\* Gripper Specification

The 3-axis specification has no rotational axis for greater allowable load moment of inertia. It can be combined with a dedicated gripper to constitute a transfer robot with ease.

\*The gripper type has four axes including three SCARA robot axes and one gripper axis. There is no 4-axis type equipped with gripper provided for Arm Length 180 Type.

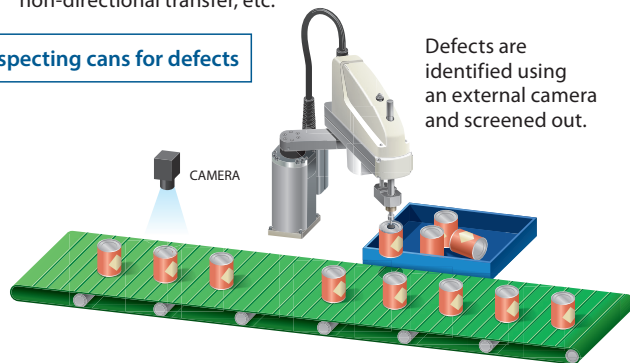


### Use Examples of the 3-axis Specification

● Work processes that require only three axes

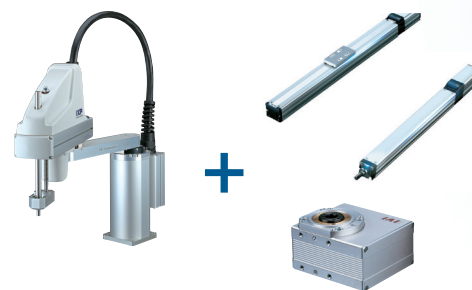
- ➔ Pickup and placement of circular parts, non-directional transfer, etc.

#### Inspecting cans for defects



● Connecting an actuator as the fourth axis

A ROBO Cylinder of a rotary type, rod type, slider type, etc., can be connected to a SCARA robot 3-axis specification as its fourth axis.



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## Added Cleanroom specification and Dust/Splash-proof specification

Added Cleanroom specifications and Dust/Splash-proof to arm length 350mm/450mm/550mm/650mm.

You can choose the optimal product from extensive lineups.

#### Cleanroom class 10

Class 10 (0.5 μm) refers to an environment with less than 10 particles of 0.5 μm or more in 1 cubic foot. (Fed. Std. 209 D)

#### Cleanroom class 3.5

Represented with an exponent when the number of particles of 0.1 μm or more in 1 m is represented by a power of 10. (ISO 14644-1)

Cleanroom class 10

Cleanroom class 3.5

IP65

IP65	Solid foreign substance	(Summary) Dust-proof type *Dust is completely blocked and does not penetrate inside the body.
	Water	(Summary) Protect against water jet. Even if it receives direct water jet from any direction, it will not be harmfully affected.

※JIS C 0920

# 6

## Supporting MSEL Controller

### ① Accommodating Significantly More Programs and Positions

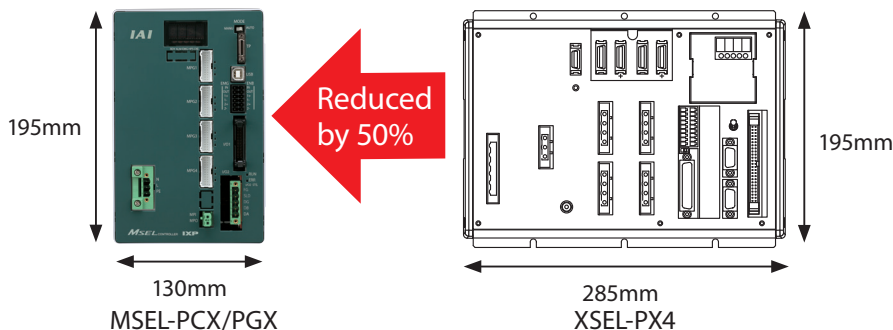
The greater storage capacity accommodates significantly more programs and positions.

	MSEL (New product)	XSEL-PX (Conventional product)
Number of programs	255	128
Number of positions	30,000	20,000

### ② Smaller Size

Having a size of 130mm in width x 195mm in height, the MSEL is significantly smaller than a conventional controller and saves space in your control panel.

The MSEL can be installed with screws or using a DIN rail.



## Product Lineup

### Standard specification

Arm length	180mm		250mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Without gripper	IXP-3N1808	IXP-4N1808	IXP-3N2508	IXP-4N2508
Payload	Rated 1kg , Maximum 3kg		Rated 1kg , Maximum 3kg	
Standard price	–	–	–	–
With medium gripper Gripper model code: RCP4-GRSML	–	–	IXP-3N2508GM	–
Payload			Maximum 0.5kg *1	
Standard price			–	

Arm length	350mm		450mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Without gripper	IXP-3N3515	IXP-4N3515	IXP-3N4515	IXP-4N4515
Payload	Rated 1kg , Maximum 3kg		Rated 1kg , Maximum 3kg	
Standard price	–	–	–	–
With medium gripper Gripper model code: RCP4-GRSML	IXP-3N3515GM	–	IXP-3N4515GM	–
Payload	Maximum 0.5kg *1		Maximum 0.5kg *1	
Standard price	–		–	
With large gripper Gripper model code: RCP4-GRSLL	IXP-3N3510GL	–	IXP-3N4510GL	–
Payload	Maximum 1.5kg *1		Maximum 1.5kg *1	
Standard price	–		–	

Arm length	550mm		650mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Without gripper	IXP-3N5520	IXP-4N5520	IXP-3N6520	IXP-4N6520
Payload	Rated 2kg , Maximum 6kg		Rated 2kg , Maximum 6kg	
Standard price	–	–	–	–
With large gripper Gripper model code: RCP4-GRSLL	IXP-3N5515GL	–	IXP-3N6515GL	–
Payload	Maximum 1.5kg *1		Maximum 1.5kg *1	
Standard price	–		–	
With extra-large gripper Gripper model code: RCP4-GRSWL	IXP-3N5515GW	–	IXP-3N6515GW	–
Payload	Maximum 2.5kg *1		Maximum 2.5kg *1	
Standard price	–		–	

\*1: This is the maximum payload. The payload may differ in some conditions of use. Refer to the gripper selection guide in our ROBO Cylinder General Catalog.

## Cleanroom specification

Arm length	350mm		450mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Model	IXP-3C3515	IXP-4C3515	IXP-3C4515	IXP-4C4515
Payload	Rated 1kg , Maximum 3kg		Rated 1kg , Maximum 3kg	
Clean class	Class 10 (Fed. Std. 209D)		Class 10 (Fed. Std. 209D)	
	Equivalent to Class 3.5 (ISO 14644-1)		Equivalent to Class 3.5 (ISO 14644-1)	
Standard price	–	–	–	–

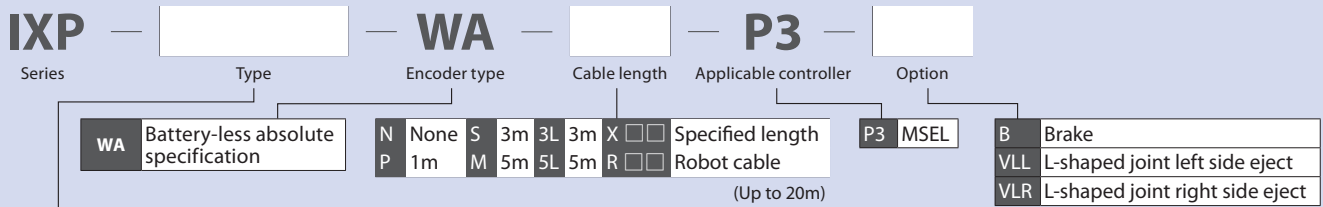
Arm length	550mm		650mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Model	IXP-3C5520	IXP-4C5520	IXP-3C6520	IXP-4C6520
Payload	Rated 2kg , Maximum 6kg		Rated 2kg , Maximum 6kg	
Clean class	Class 10 (Fed. Std. 209D)		Class 10 (Fed. Std. 209D)	
	Equivalent to Class 3.5 (ISO 14644-1)		Equivalent to Class 3.5 (ISO 14644-1)	
Standard price	–	–	–	–

## Dust/Splash-proof specification

Arm length	350mm		450mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Model	IXP-3W3515	IXP-4W3515	IXP-3W4515	IXP-4W4515
Payload	Rated 1kg , Maximum 3kg		Rated 1kg , Maximum 3kg	
Protection class	IP65		IP65	
Standard price	–	–	–	–

Arm length	550mm		650mm	
Number of axes	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Model	IXP-3W5520	IXP-4W5520	IXP-3W6520	IXP-4W6520
Payload	Rated 2kg , Maximum 6kg		Rated 2kg , Maximum 6kg	
Protection class	IP65		IP65	
Standard price	–	–	–	–

## Explanation of the Model Items



3N1808	3-axis type / Arm length 180mm / Vertical axis 80mm
4N1808	4-axis type / Arm length 180mm / Vertical axis 80mm
3N2508	3-axis type / Arm length 250mm / Vertical axis 80mm
4N2508	4-axis type / Arm length 250mm / Vertical axis 80mm
3N2508GM	3-axis type / Arm length 250mm / Vertical axis 80mm / RCP4-GRSML installed at the tip of the vertical axis
3N3515	3-axis type / Arm length 350mm / Vertical axis 80mm
4N3515	4-axis type / Arm length 350mm / Vertical axis 150mm
3N3515GM	3-axis type / Arm length 350mm / Vertical axis 150mm / RCP4-GRSML installed at the tip of the vertical axis
3N3510GL	3-axis type / Arm length 350mm / Vertical axis 100mm / RCP4-GRSLL installed at the tip of the vertical axis
3N4515	3-axis type / Arm length 450mm / Vertical axis 150mm
4N4515	4-axis type / Arm length 450mm / Vertical axis 150mm
3N4515GM	3-axis type / Arm length 450mm / Vertical axis 150mm / RCP4-GRSML installed at the tip of the vertical axis
3N4510GL	3-axis type / Arm length 450mm / Vertical axis 100mm / RCP4-GRSLL installed at the tip of the vertical axis
3N5520	3-axis type / Arm length 550mm / Vertical axis 200mm
4N5520	4-axis type / Arm length 550mm / Vertical axis 200mm
3N5515GL	3-axis type / Arm length 550mm / Vertical axis 150mm / RCP4-GRSLL installed at the tip of the vertical axis
3N5515GW	3-axis type / Arm length 550mm / Vertical axis 150mm / RCP4-GRSWL installed at the tip of the vertical axis
3N6520	3-axis type / Arm length 650mm / Vertical axis 200mm
4N6520	4-axis type / Arm length 650mm / Vertical axis 200mm
3N6515GL	3-axis type / Arm length 650mm / Vertical axis 150mm RCP4-GRSLL installed at the tip of the vertical axis
3N6515GW	3-axis type / Arm length 650mm / Vertical axis 150mm RCP4-GRSWL installed at the tip of the vertical axis
3C3515	Cleanroom specification 3-axis type / Arm length 350mm / Vertical axis 150mm
4C3515	Cleanroom specification 4-axis type / Arm length 350mm / Vertical axis 150mm
3C4515	Cleanroom specification 3-axis type / Arm length 450mm / Vertical axis 150mm
4C4515	Cleanroom specification 4-axis type / Arm length 450mm / Vertical axis 150mm
3C5520	Cleanroom specification 4-axis type / Arm length 550mm / Vertical axis 200mm
4C5520	Cleanroom specification 4-axis type / Arm length 550mm / Vertical axis 200mm
3C6520	Cleanroom specification 3-axis type / Arm length 650mm / Vertical axis 200mm
4C6520	Cleanroom specification 4-axis type / Arm length 650mm / Vertical axis 200mm
3W3515	Dust/Splash-proof specification 3-axis type / Arm length 350mm / Vertical axis 150mm
4W3515	Dust/Splash-proof specification 4-axis type / Arm length 350mm / Vertical axis 150mm
3W4515	Dust/Splash-proof specification 3-axis type / Arm length 450mm / Vertical axis 150mm
4W4515	Dust/Splash-proof specification 4-axis type / Arm length 450mm / Vertical axis 150mm
3W5520	Dust/Splash-proof specification 3-axis type / Arm length 550mm / Vertical axis 200mm
4W5520	Dust/Splash-proof specification 4-axis type / Arm length 550mm / Vertical axis 200mm
3W6520	Dust/Splash-proof specification 3-axis type / Arm length 650mm / Vertical axis 200mm
4W6520	Dust/Splash-proof specification 4-axis type / Arm length 650mm / Vertical axis 200mm

\*Only available for arm length 550/650.  
Make sure to select this when the transported object is 4kg or more.

(Example) **IXP**    **3** **N** **35** **15** **GM**    **WA**    **S**    **P3**

Number of axes: 3    Arm length: 350mm    Tip of vertical axis: RCP4-GRSML    Cable length: 3m    Controller: MSEL  
Vertical axis stroke: 150mm    Encoder type: Battery-less absolute specification

## Option

### L-shaped joint extraction direction

**Model** **VLL / VLR**

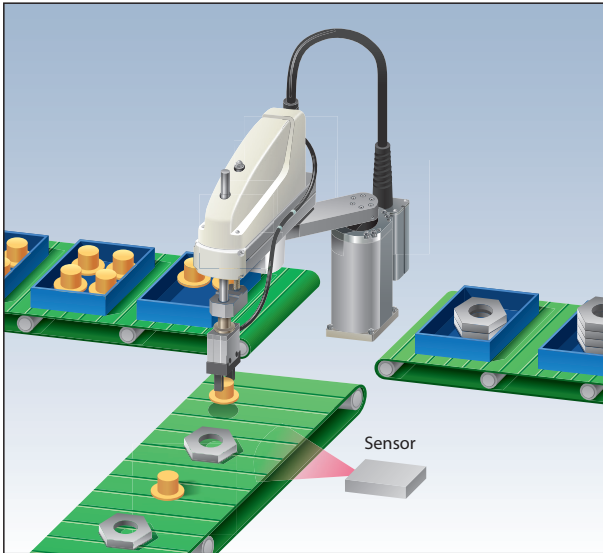
**Explanation**

You can select L-shaped joint for suction on the left side (model: VLL) or right side (model: VLR) for cleanroom specification.  
\*Please be sure to select either one.

# Applications

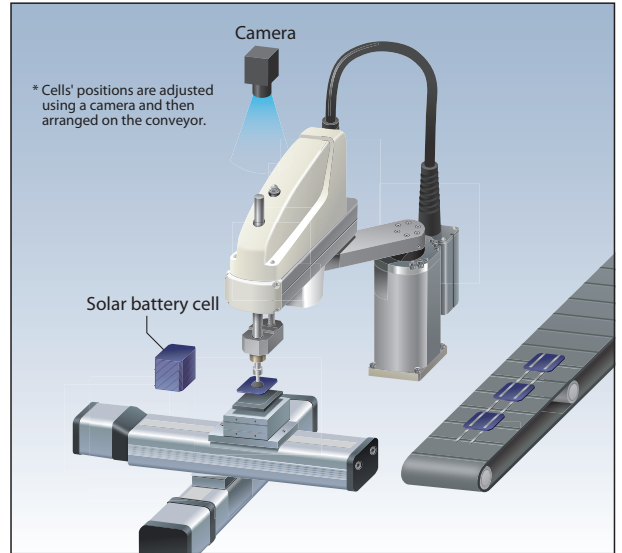
## Part Screening

Parts of two different sizes are classified using a sensor and sorted into different boxes.



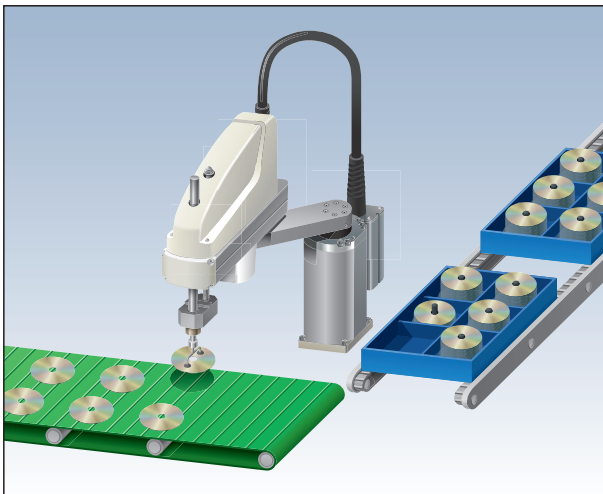
## Solar Battery Module Tab Soldering

Solar battery module cells are transferred while positions are adjusted so that electrodes can be soldered onto the cells.



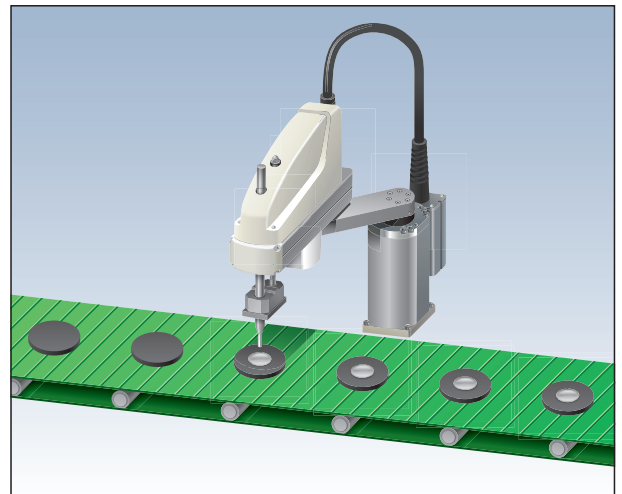
## DVD-R Packing

DVD-Rs are picked up from the conveyor and placed.



## Adhesive Application

Adhesive is applied onto circular parts.



# Warnings

## (\*1) Positioning Repeatability

This refers to the degree to which the robot can accurately repeat the same target position when operated at the same speed, acceleration rate, and arm-type. (The values are measured at a constant room temperature of 20°C) Please note that this is not an absolute positioning accuracy. In addition, please be aware that the positioning accuracy may deviate in situations where the operating conditions have changed; for example switching the robot arms, changing from multiple opposing positions to one set position, or changing the operating speed and acceleration/deceleration rate.

## (\*2) Maximum Operating Speed for PTP Operation

The maximum operating speed in the specification table assumes PTP command operation. In the case of CP command operation (interpolation), there is a limit to the speed. For more details, please refer to the "CP Operation" section of the "Estimate of SCARA Robot Acceleration/Deceleration Settings" on p.8. In addition, please note that in order to operate the vertical axis at the lowest position, the speed and acceleration rate must be appropriately reduced as well.

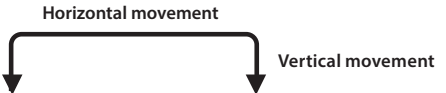
## (\*3) Payload

The options are rated payload and maximum payload. The rated payload refers to the maximum load that can be transferred at the maximum speed and acceleration rate. The maximum payload refers to the load that can be transferred at a reduced speed and acceleration rate. When transporting a load that is greater than the rated payload, by programming the load and moment of inertia, the appropriate speed and acceleration rate will automatically be applied.

## (\*4) Standard Cycle Time

The standard cycle time is the round-trip operation times under the conditions outlined below. This is a general estimate of high-speed performance.

\*For gripper-equipped models, the weight of the gripper will also be included in the transported weight.



Arm length	Transferring weight(kg)	Horizontal movement distance(mm)	Vertical movement distance(mm)	Cycle time (sec)
180	1	100	25	0.57
250	1	300	25	0.79
350	1	300	25	0.69 (Standard specification) 0.76 (Clean /Dust/Splash-proof specification)
450	1	300	25	0.67 (Standard specification) 0.74(Clean /Dust/Splash-proof specification)
550	2	300	25	0.73 (Standard specification) 0.79(Clean /Dust/Splash-proof specification)
650	2	300	25	0.81 (Standard specification) 0.93(Clean /Dust/Splash-proof specification)

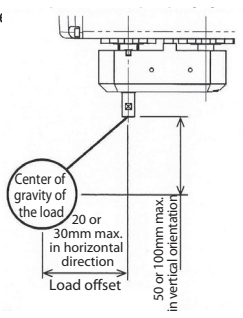
## (\*5) Allowable Inertial Moment from the Tip of the Vertical Axis

This is the allowable inertial moment calculated at the center of the rod on the v 3-axis type, and rotational axis for 4-axis type).

The offset value from the center of the rotational axis to the center of gravity of the load is shown below.

- Arm length 180/250 ... horizontal direction 20mm or less, vertical direction 50mm or less
- Arm length 350/450 ... horizontal direction 30mm or less, vertical direction 50mm or less
- 550/650 ... horizontal direction 30mm or less, vertical direction 50mm or less

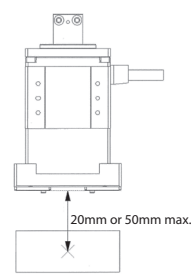
If the standard payload is exceeded, it is necessary to reduce the horizontal offset value. Please refer to the instructions manual for details. Also, if a tool's center of gravity is away from the center of the axis-tip, it is necessary to reduce the speed and acceleration rate appropriately.



## (\*6) Overhang Limits for the Gripper Options

The overhang limit for gripper-equipped models (GM/GL/GW) is 0mm horizontally and 20mm or 50mm vertically from the gripper finger-tip to the piece's center of gravity. Please refer to the figure on the right.

- \*1 Arm length 250 ... 20mm
- Arm length 350/450/550/650 ... 50mm



## Work Envelope

When switching arm orientation (left/right), please be careful that no peripheral objects interfere with the arm when fully extends.

## (\*7) Air suction inside the unit

In order to use the SCARA Cleanroom specification in clean class 10, the air in the unit must be sucked from the air suction port of the unit base. Please make piping that can flow the flow rate for each specification. Since the amount of dust are depending on the operating pattern, it is necessary to increase the amount of suction at high speed and high acceleration.

## (\*8) Air purge pressure

To use SCARA Dust/Splash-Proof specification with IP65, it is necessary to supply dry air (air purge) to a single air tube in the cable between controller and robot. Refer to the specification of each type for the air purge pressure. Please make piping that can flow the flow rate of each specification.

(\*1) to (\*8) are linked to notes in the product specifications pages (p. 9 through 36).



# SCARA Robot IXP Acceleration/Deceleration Settings Guide

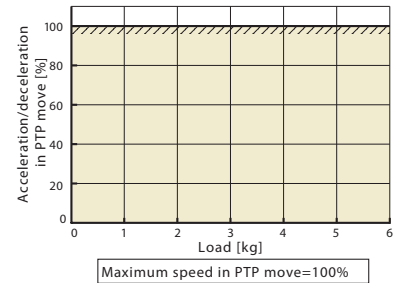
If the robot must be operated continuously, make sure its setting falls within the ranges of the reference graphs for acceleration/deceleration setting and duty cycle setting.

## PTP Move

The maximum speed and acceleration/deceleration at which the robot can operate carrying the applicable load are applied as 100% (optimal speed & optimal acceleration/deceleration function). Make adjustments so that the target speed and acceleration/deceleration can be achieved.

### Notes

- The optimal speed & optimal acceleration/deceleration function does not guarantee robot operation in all operation patterns.
- If significant vibration generates, reduce the speed and/or acceleration/deceleration because the robot may fail or die prematurely.



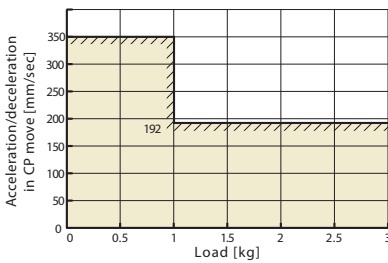
## CP Move

Set the speed and acceleration/deceleration at or below the applicable values according to the graphs below.

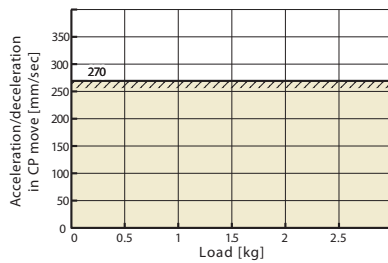
### Notes

- If significant vibration generates, reduce the speed and/or acceleration/deceleration because the robot may fail or die prematurely.

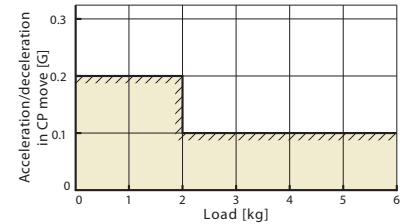
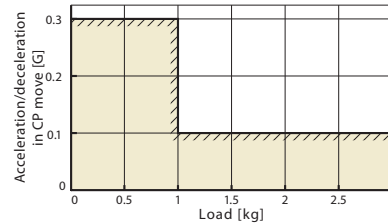
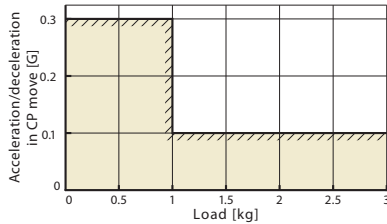
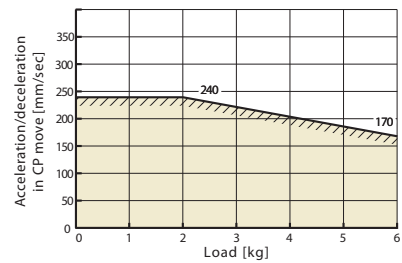
IXP-3/4N1808, 2508



IXP-3/4N3515, 4515



IXP-3/4N5520, 6520



## Duty Cycle Setting

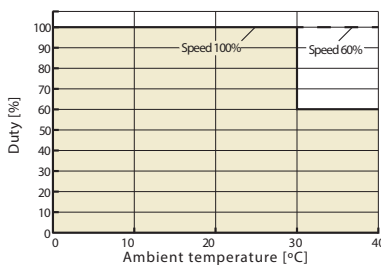
The duty cycle refers to a utilization ratio expressed by the percentage of the robot operating time per cycle.

For this robot, the duty cycle is limited according to the ambient temperature in order to suppress heat generation from the motor unit and reduction gears. In both PTP move and CP move, the maximum value according to the graphs below must not be exceeded. Also remember to complete a continuous operation within 30 minutes.

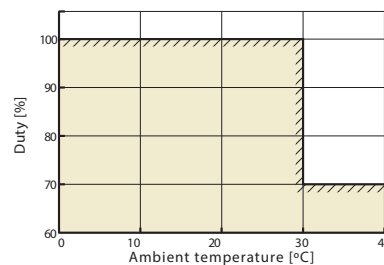
### Notes

- The duty cycle must not exceed the maximum limit, as it may significantly reduce the life of the motor unit or reduction gears.

IXP-3/4N1808, 2508



IXP-3/4N3515, 4515



IXP-3/4N5520, 6520

