IAI
Quality and Innovation

GB

PowerCon SCARA Robot IXP Series

PowerCon SCARA Program Controller MSEL-PGX

www.intelligentactuator.de

Introducing Arm Lengths 180/250/550/650 Added in Cost-effective IXP Series, Giving More Variations to the Lineup

All models come standard with battery-less absolute encoders.

1 More Affordable Due to Pulse Motors

By adopting pulse motors…

…the IXP is more reasonable than a conventional model.

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

The IXP achieves a payload equivalent to that of a conventional model by adopting high-output drivers.

2 All Models Come Standard with Battery-less Absolute Encoders

All IXP models come standard with battery-less absolute encoders that do not require batteries. Since battery replacement is no longer necessary, maintenance labor is reduced.

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

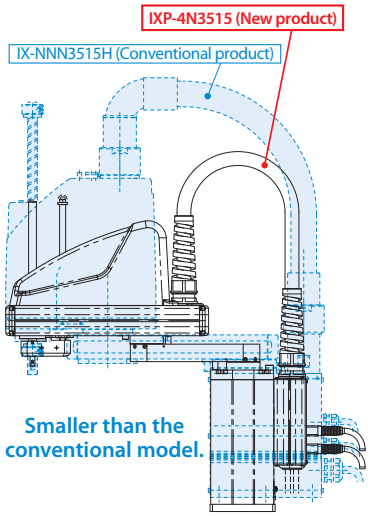
3 Lighter than a Conventional Model

The robot weighs approx. 30% less.

(Compared to: IX-NNN3515H)

The lightweight robot can be easily assembled into your system.

	Conventional product		New product
Model	IX-NNN2515H		IXP-4N2508
Mass	17.1kg	-9.1kg	8kg
Model	IX-NNN3515H		IXP-4N3515
Mass	18kg	-5kg	13kg
Model	IX-NNN50□□H		IXP-4N5520
Mass	29.5kg	-8.5kg	21kg



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.

4-axis gripper specification

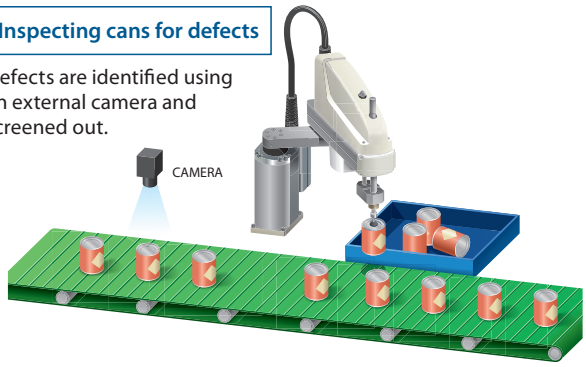
Use Examples of the 3-axis Specification

● Work processes that require only three axes

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

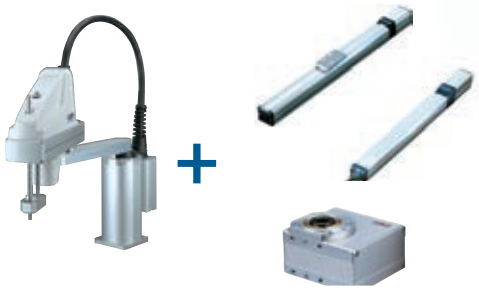
Inspecting cans for defects

Defects are identified using an external camera and screened out.



● Connecting an actuator as the fourth axis

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



5 Supporting MSEL Controller

Features of the MSEL Controller

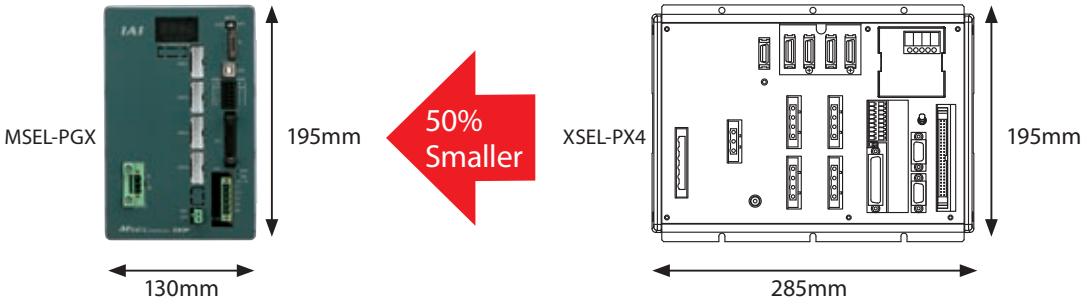
❶Accommodating Significantly More Programs and Positions

The greater storage capacity accommodates significantly more programs and positions.

	XSEL-PX (Conventional product)	**MSEL** (New product)
Number of programs	128	**255**
Number of positions	20000	**30000**

❷Smaller 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

Arm length	180mm		250mm	
SCARA type	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	
Max. speed (in PTP mode)	XY: 2053mm/s, Z: 350mm/s (R: 1200°/s)		XY: 2151mm/s, Z: 350mm/s (R: 1200°/s)	
With medium gripper Gripper model code: RCP4-GRSML	–	–	IXP-3N2508GM	–
Gripper Payload			Maximum 0.5kg *1	
Max. gripper speed			94mm/s (per finger)	

Arm length	350mm		450mm	
SCARA type	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	
Max. speed (in PTP mode)	XY: 2726mm/s, Z: 270mm/s (R: 1000°/s) *2		XY: 2438mm/s, Z: 270mm/s (R: 1000°/s) *2	
With medium gripper Gripper model code: RCP4-GRSML	IXP-3N3515GM	–	IXP-3N4515GM	–
Gripper Payload	Maximum 0.5kg *1		Maximum 0.5kg *1	
Max. gripper speed	94mm/s (per finger)		94mm/s (per finger)	
With large gripper Gripper model code: RCP4-GRSLL	IXP-3N3510GL	–	IXP-3N4510GL	–
Gripper Payload	Maximum 1.5kg *1		Maximum 1.5kg *1	
Max. gripper speed	125mm/s (per finger)		125mm/s (per finger)	

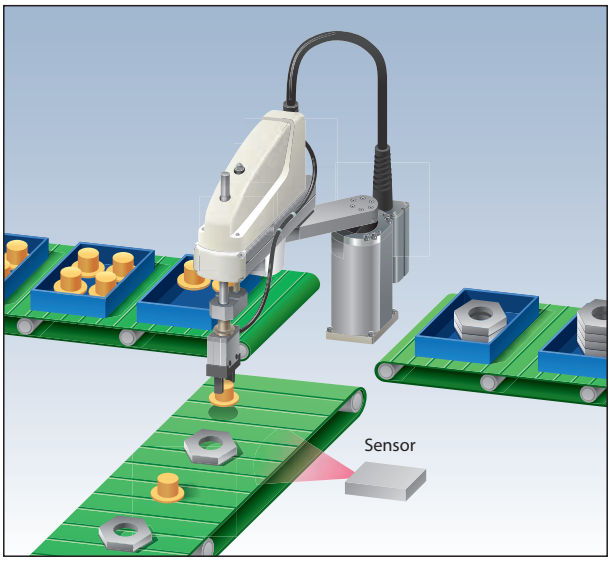
Arm length	550mm		650mm	
SCARA type	3-axis	4-axis (with rotational axis)	3-axis	4-axis (with rotational axis)
Without gripper	IXP-3N5520	IXP-4N5520	IXP-3N6520	IXP-4N6520
Payload	Rated 2kg , Maximum 6kg		Rated 2kg , Maximum 6kg	
Max. speed (in PTP mode)	XY: 2943mm/s, Z: 240mm/s (R: 700°/s)		XY: 2916mm/s, Z: 240mm/s (R: 700°/s)	
With large gripper Gripper model code: RCP4-GRSLL	IXP-3N5515GL	–	IXP-3N6515GL	–
Gripper Payload	Maximum 1.5kg *1		Maximum 1.5kg *1	
Max. gripper speed	125mm/s (per finger)		125mm/s (per finger)	
With extra-large gripper Gripper model code. RCP4-GRSWL	IXP-3N5515GW	–	IXP-3N6515GW	–
Gripper Payload	Maximum 2.5kg *1		Maximum 2.5kg *1	
Max. gripper speed	157mm/s (per finger)		157mm/s (per finger)	

*1: This is the maximum payload on the gripper. The payload may differ in some conditions of use. Refer to the gripper selection guide in our RoboCylinder General Catalog.
*2: For IXP-3N3510GL/4510GL with large gripper the max. speed of XY-axis is 1908/2060mm/s, the max. speed of Z-axis is 189mm/s.

Applications

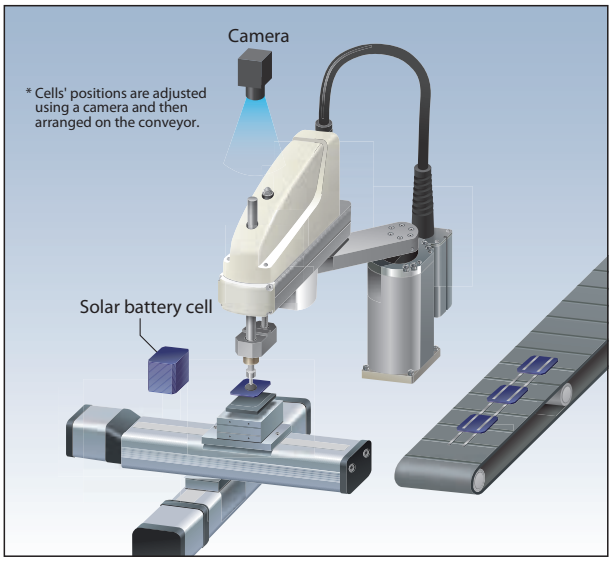
Part Screening

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



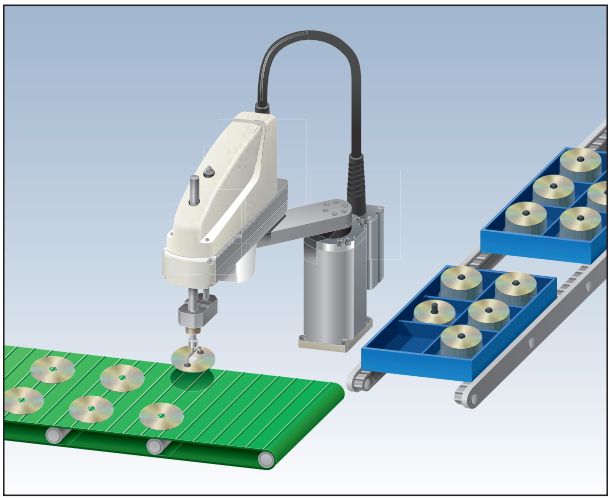
Solar Battery Module Tab Soldering

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



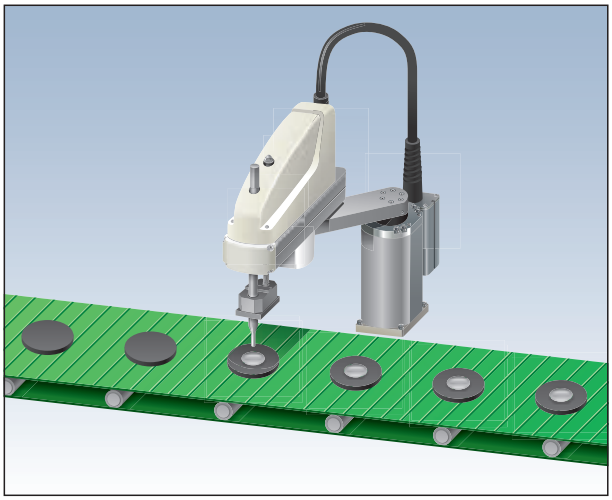
DVD-R Packing

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



Adhesive Application

Adhesive is applied onto circular parts.



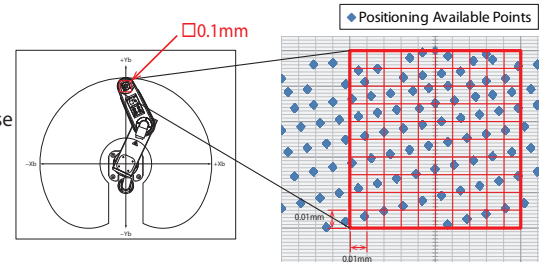
Cautionary Notes

(Note 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.

Available Positioning Points Warnings

The positioning of the IXP can be set to units of every 0.001mm. However, as seen in the chart to the right, there is a possibility of discrepancies from the target of approximately 0.05mm (for direct teaching) or 0.1mm (for position data indication). These discrepancies can arise due to the point of the positioning or the condition of the 1st and 2nd arms. The least optimal position (within the periphery of the movable range) that can be designated is an arm length of 350 and a maximum of 0.202mm. *Please see p.25 for the values for each model.



Example for positions available for positioning in 0.1mm x 0.1mm (right-arm system)

(Note 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.26. 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.

(Note 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.

(Note 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
450	1	300	25	0.67
550	2	300	25	0.73
650	2	300	25	0.81

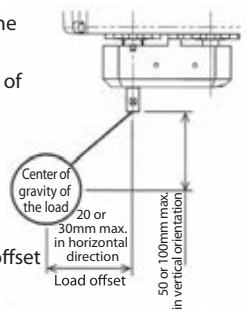
(Note 5) Allowable Inertial Moment from the Tip of the Vertical Axis

This is the allowable inertial moment calculated at the center of the rod on the vertical axis (guide shaft for 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 350/450 550/650 … horizontal direction 30mm or less, vertical direction 100mm or less

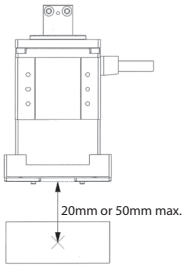
If the standard payload is exceeded, it is necessary to reduce the horizontal offset value. Please refer to the instructions manual for details.
Also, if a tool's center of gravity is away from the center of the axis-tip, it is necessary to reduce the speed and acceleration rate appropriately.



(Note 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.

(*) 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.

Acceleration/ Deceleration Setting

For acceleration/deceleration settings, please refer to "SCARA Robot Acceleration/Deceleration Settings Guide" on p. 26.

(Note 1) to (Note 6) are linked to notes in the product specifications pages (p. 7 through 18).

Explanation of the Model Items

IXP — [ ] — **WA** — [ ] — **P3** — [ ]
Series / Type / Encoder type / Cable length / Applicable controller / Option

WA	Battery-less absolute specification

N	None
P	1m
S	3m
M	5m
X□□	Specified length
R□□	Robot cable

(Up to 20m)

P3	MSEL

B	Brake

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

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 150mm
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

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

- 3: Number of axes: 3 axes
- 35: Arm length: 350mm
- 15: Vertical axis stroke: 150mm
- GM: Tip of vertical axis: RCP4-GRSML installed
- WA: Encoder type: Battery-less absolute specification
- S: Cable length: 3m
- P3: Controller: MSEL

IXP-3N1808/4N1808

Arm length 180mm
Vertical axis 80mm

■Model Specification Items

IXP	—	☐ N	1808	—	WA	—	☐☐☐	—	P3
Series	—	Number of axes 3: 3 axes 4: 4 axes	Arm length: 180mm Vertical axis: 80mm	—	Encoder type WA: Battery-less absolute specification	—	Cable length N: None P: 1m S: 3m M: 5m X☐☐: Specified length R☐☐: Robot cable Cable length described below	—	Applicable controller P3: MSEL

*Controller is not included.

CE RoHS

POINT
Notes on selection

- Refer to P. 5 for (Note 1) through (Note 5).
- There is a brake equipped on the vertical axis as a standard option.
- The vertical axis does not support push-motion control.
- The allowable push force should be 45N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)	Payload (kg) (Note 3)	
						Rated	Maximum
Axis 1	Arm 1	80	±125°	±0.01mm	2053mm/s (Composite speed)	1	3
Axis 2	Arm 2	100	±125°				
Axis 3	Vertical axis	—	80mm	±0.02mm	350mm/s		
Axis 4	Rotational axis	—	±360°	±0.01°	1200°/s		

Robot Specifications

	3-axis specification	4-axis specification
Encoder type	Battery-less absolute encoder	
User wiring	AWG26×8	
User piping	O.D. ø4, I.D. ø2.5, 2 air tubes Maximum working pressure 0.8MPa	
Standard cycle time (sec) (Note 4)	0.57	
Allowable torque (Axis 4) (N·m)	—	0.28
Allowable moment (N·m)	0.7	
Allowable inertial moment from the tip of the vertical axis (kg·m²) (Note 5)	Rated 0.001 Maximum 0.01	Rated 0.001 Maximum 0.003
Ambient operating temperature/humidity	Temperature 0 ~ 40°C , Humidity 20 ~ 85%RH (Non-condensing)	
Unit weight (kg)	7	7.5

Model Combinations

Specification	Model number
3-axis specification	IXP-3N1808
4-axis specification	IXP-4N1808

Cable Length <Per Axis*>

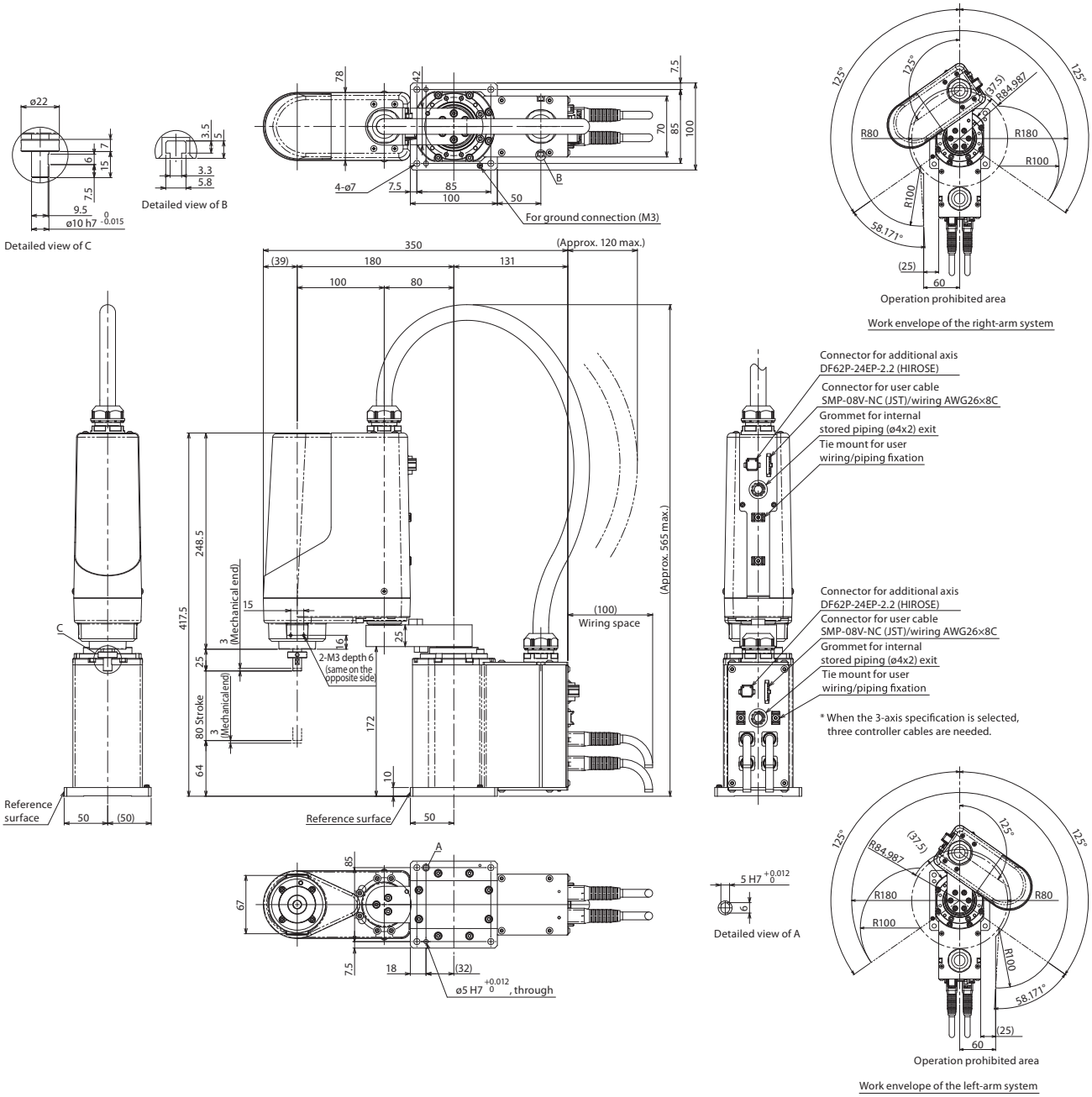
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

*The 3-axis specification requires three cables, while 4-axis specification requires four cables.

Dimensions

2D CAD 3D CAD

CAD drawings can be downloaded from the website. www.intelligentactuator.de



Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⒾⅠWAIB-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⒾⅠWAIB-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*Ⓘⅰ SCARA type (Refer to table on the right)
*Ⓘⅱ Standard I/O (NP/PN)
*ⒾⅣ Expansion I/O (Refer to table on the right)
*Refer to P. 20 if considering axis connection other than IXP series.

<SCARA type>

3N1808	4N1808

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*1) The model code is just one example. Refer to P. 19 if using such as field network.

(*2) PNP specification for expansion PIO board is coming soon.

IXP-3N2508/4N2508

Arm length 250mm
Vertical axis 80mm

■Model Specification Items

IXP — [ ] N 25 [ ] — WA — [ ] — P3

- **Series** — IXP
- **Number of axes** — N — 3: 3 axes, 4: 4 axes
- **Arm length** — 25: 250mm
- **Vertical axis stroke / Gripper** — 08: 80mm; 08GM: 80mm Medium gripper installed
  *Refer to "Attached Gripper Types" for the types of grippers installed.
- **Encoder type** — WA: Battery-less absolute specification
- **Cable length** — N: None, P: 1m, S: 3m, M: 5m, X□□: Specified length, R□□: Robot cable (Cable length described below)
- **Applicable controller** — P3: MSEL

*Controller is not included.

*The photograph shows a 4-axis specification.

POINT — Notes on selection

- Refer to P. 5 for (Note1) through (Note 5).
- There is a brake equipped on the vertical axis as a standard option.
- The vertical axis does not support push-motion control.
- The allowable push force is 45N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)		Payload (kg) (Note 3)	
					No gripper	With medium gripper (GM)	Rated	Maximum
Axis 1	Arm 1	150	±135°	±0.02mm	2151mm/s (Composite speed)	2151mm/s (Composite speed)	1	3
Axis 2	Arm 2	100	±135°					
Axis 3	Vertical axis	—	80mm	±0.02mm	350mm/s	350mm/s		
Axis 4	Rotational axis	—	±360°	±0.01°	1200°/s	—	—	0.5 (*2)
	Medium gripper GM (*1)	—	14mm (Both fingers)	±0.01mm	—	94mm/s (One finger)		

(*1) Refer to the gripper selection guide in our RCP2/RCP4/RCD Vertical Gripper Catalog.
(*2) This is the maximum payload on the gripper when it is attached to a SCARA Robot.

Robot Specifications

	3-axis specification	4-axis specification	3-axis specification with medium gripper (GM)
Encoder type	Battery-less absolute encoder *		
User wiring	AWG26×8		
User piping	O.D. ø4, I.D. ø2.5, 2 air tubes Maximum working pressure 0.8MPa		
Standard cycle time (sec) (Note 4)	0.79		0.79 (at no load on gripper)
Allowable torque (Axis 4) (N·m)	—	0.28	—
Allowable moment (N·m)	0.7		Ma, Mb, Mc : 0.7
Allowable inertial moment from the tip of the vertical axis (kg·m^2) (Note 5)	Rated 0.001 Maximum 0.01	Rated 0.001 Maximum 0.003	Maximum 0.001
Ambient operating temperature/humidity	Temperature 0 ~ 40°C, Humidity 20 ~ 85%RH (Non-condensing)		
Unit weight (kg)	7.5	8	8

*The gripper is incremental type

Attached Gripper Types

IXP-3N2508GM	RCP4-GRSML is installed at the tip of the vertical axis.

Model Combinations

Specification	Model number
3-axis specification	IXP-3N2508
3-axis specification with medium gripper	IXP-3N2508GM
4-axis specification	IXP-4N2508

Cable Length <Per Axis*>

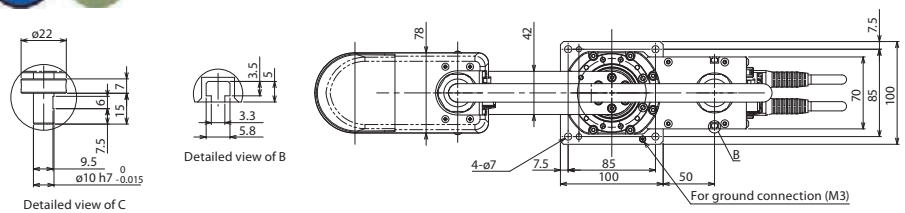
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

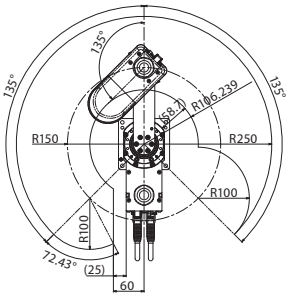
*The 3-axis specification requires three cables, while the gripper specification and 4-axis specification require four cables.

Dimensions

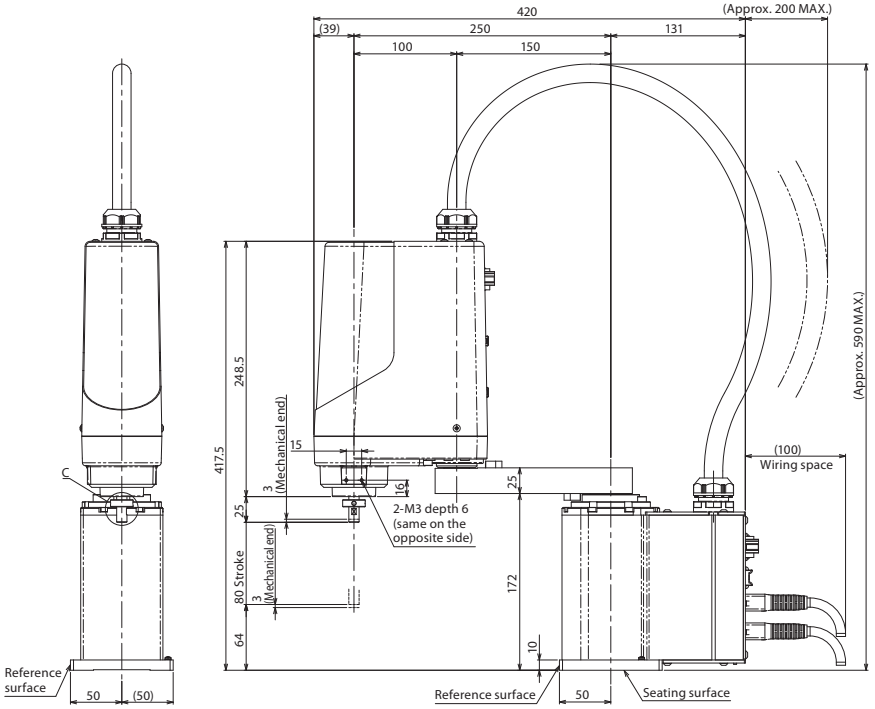
2D CAD 3D CAD

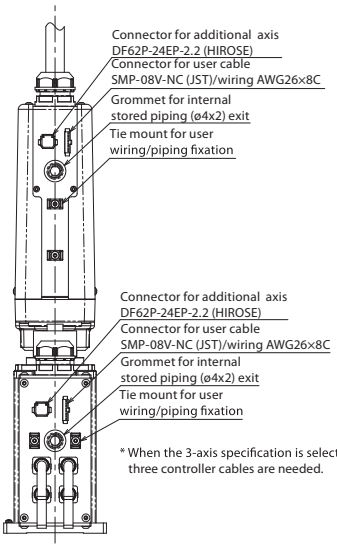
CAD drawings can be downloaded from the website. www.intelligentactuator.de



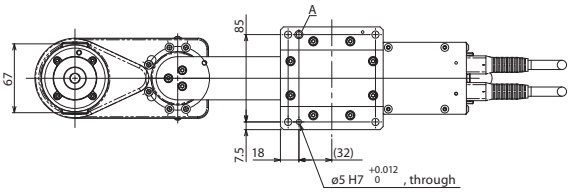


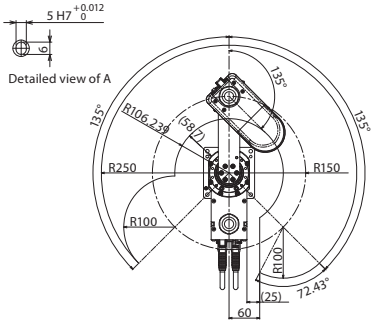
Work envelope of the right-arm system





* When the 3-axis specification is selected, three controller cables are needed.

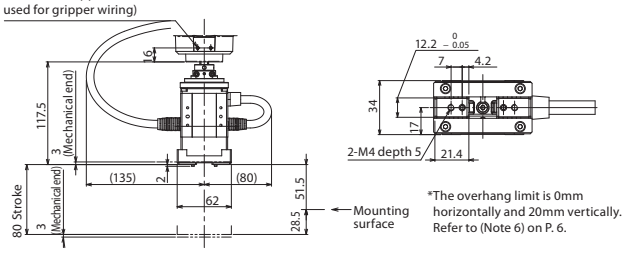




Work envelope of the left-arm system

<Gripper Specification>

GM (RCP4-GRSML)



*The overhang limit is 0mm horizontally and 20mm vertically. Refer to (Note 6) on P. 6.

Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⅡWAIB-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⅡWAIB-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*Ⅱ SCARA type (Refer to table on the right)
*Ⅲ Standard I/O (NP/PN)
*Ⅳ Expansion I/O (Refer to table on the right)
*Refer to P. 20 if considering axis connection other than IXP series.

<SCARA type>

3N2508	4N2508
3N2508GM	

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*1) The model code is just one example. Refer to P. 19 if using such as field network.

(*2) PNP specification for expansion PIO board is coming soon.

IXP- 3N3515 3N3510 /4N3515

Arm length 350mm
Vertical axis 100mm/150mm

■Model Specification Items

IXP — [ ] N [ ] [ ] — WA — [ ] — P3

Series	Number of axes	Arm length	Vertical axis stroke / Gripper	Encoder type	Cable length	Applicable controller
IXP	3: 3 axes 4: 4 axes	35: 350mm	15 :150mm No gripper 15GM :150mm Medium gripper installed 10GL :100mm Large gripper installed *Refer to "Attached Gripper Types" for the types of grippers installed.	WA: Battery-less absolute specification	N: None P: 1m S: 3m M: 5m X□□: Specified length R□□: Robot cable Cable length described below	P3: MSEL

*Controller is not included.

*The photograph shows a 4-axis specification.

POINT Notes on selection

- Refer to P. 5 for (Note1) through (Note 5).
- The vertical axis has no brake.
  The unique structure holds the load in place even when the servo is turned off.
- The vertical axis does not support push-motion control.
- The allowable push force is 60N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)			Payload (kg) (Note 3)	
					No gripper	With medium gripper (GM)	With large gripper (GL)	Rated	Maximum
Axis 1	Arm 1	160	±127°	±0.03mm	2726mm/s (Composite speed)	2726mm/s (Composite speed)	1908mm/s (Composite speed)	1	3
Axis 2	Arm 2	190	±127°						
Axis 3	Vertical axis	—	150mm (*1)	±0.02mm	270mm/s	270mm/s	189mm/s		
Axis 4	Rotational axis	—	±360°	±0.02°	1000°/s	—	—		
	Medium gripper GM (*2)	—	14mm (Both fingers)	±0.01mm	—	94mm/s (One finger)	—	—	0.5 (*3)
	Large gripper GL (*2)	—	22mm (Both fingers)	±0.01mm	—	—	125mm/s (One finger)	—	1.5 (*3)

(*1) When the large gripper is installed, the work envelope of the vertical axis becomes 100mm. (*2) Refer to the gripper selection guide in our RCP2/RCP4/RCD Vertical Gripper Catalog.
(*3) This is the maximum payload on the gripper when it is attached to a SCARA Robot.

Robot Specifications

		3-axis specification	4-axis specification	3-axis specification	
		No gripper		With medium gripper (GM)	With large gripper (GL)
Encoder type		Battery-less absolute encoder *			
User wiring		AWG24×6, AWG26×5P (shielded) *User cables are sold separately. Refer to the operation manual for detail.		User wiring is not supported because the gripper wiring is used.	
User piping		O.D. ø4, I.D. ø2.5, 3 air tubes (Maximum working pressure 0.8MPa)			
Standard cycle time (sec) (Note 4)	SCARA	0.69		0.69	1.08
	Gripper (full stroke)	—		0.51	0.56
Allowable torque (Axis 4) (N·m)		—	1.4	—	
Allowable moment (N·m)		2.9		Ma:1.9 Mb:2.7 Mc:2.9	Ma:2.9 Mb:2.9 Mc:2.9
Allowable inertial moment from the tip of the vertical axis (kg·m²) (Note 5)		Rated 0.003 Maximum 0.01	Rated 0.003 Maximum 0.003	Maximum 0.002	Maximum 0.009
Ambient operating temperature/humidity		Temperature 0 ~ 40°C Humidity 20 ~ 85%RH (Non-condensing)			
Unit weight (kg)		12	13	12.5	13

*The gripper is incremental type

Attached Gripper Types

IXP-3N3515GM	The medium gripper RCP4-GRSML is installed at the tip of the vertical axis.
IXP-3N3510GL	The large gripper RCP4-GRSLL is installed at the tip of the vertical axis.

Model Combinations

Specification	Model number
3-axis specification	IXP-3N3515
3-axis specification with medium gripper	IXP-3N3515GM
3-axis specification with large gripper	IXP-3N3510GL
4-axis specification	IXP-4N3515

Cable Length <Per Axis*>

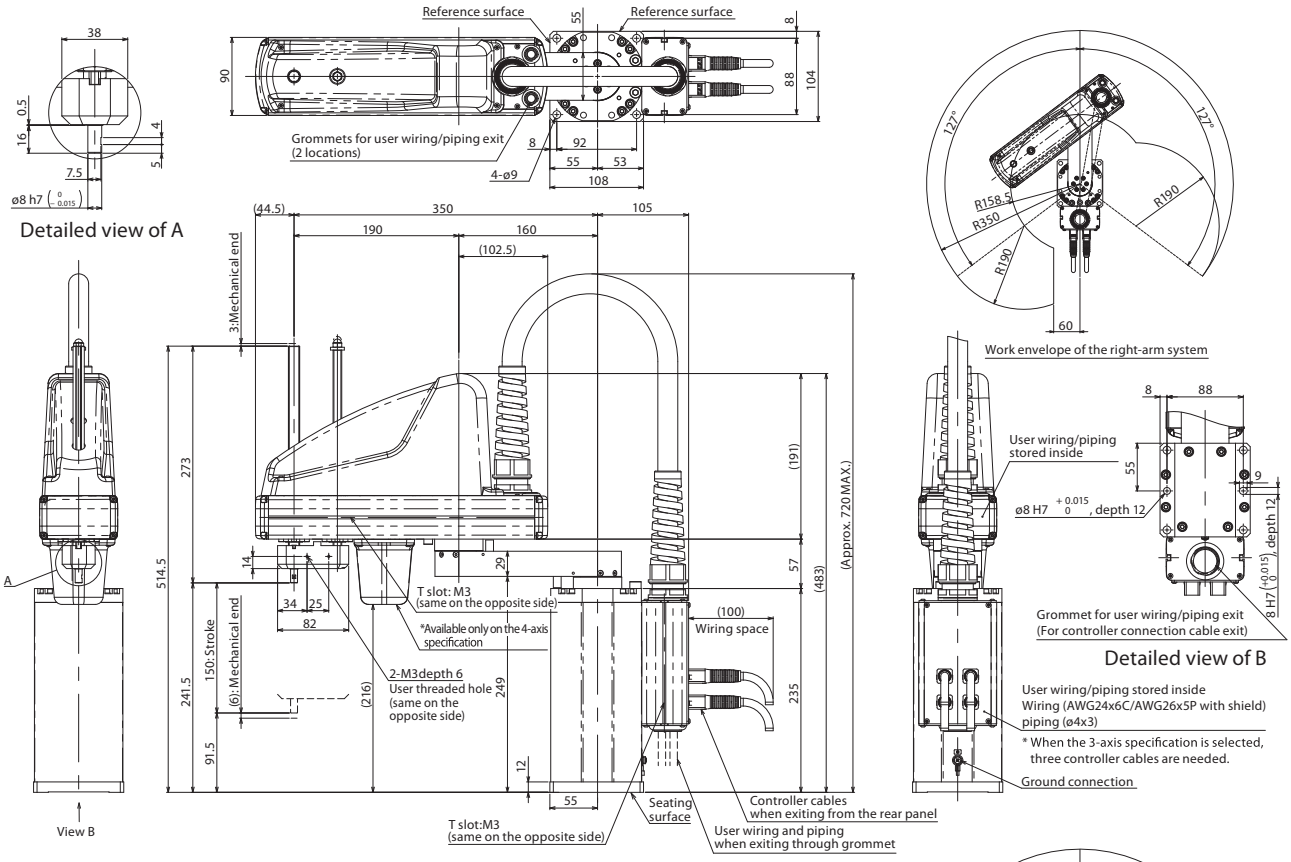
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

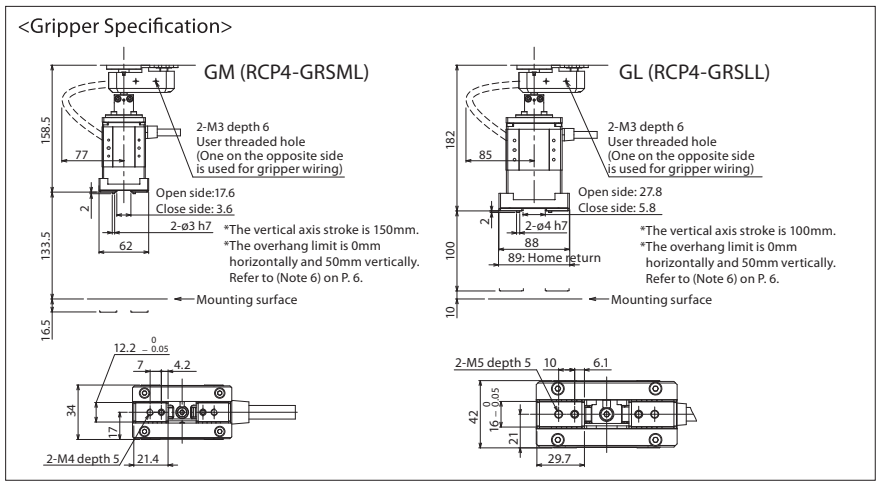
*The 3-axis specification requires three cables, while the gripper specification and 4-axis specification require four cables.

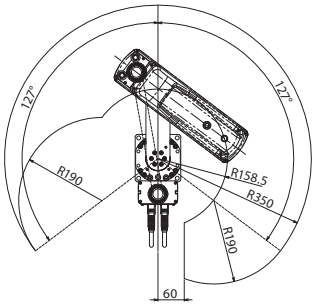
Dimensions

2D CAD 3D CAD

CAD drawings can be downloaded from the website. www.intelligentactuator.de







Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⒾⅠWAI-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⒾⅠWAI-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*Ⅱ SCARA type (Refer to table on the right)
*Ⅲ Standard I/O (NP/PN)
*Ⅳ Expansion I/O (Refer to table on the right)
*Refer to P. 20 if considering axis connection other than IXP series.

<SCARA type>

3N3515	3N4515GM
3N4515	3N4510GL
3N3515GM	4N3515
3N3510GL	4N4515

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*1) The model code is just one example. Refer to P. 19 if using such as field network.

(*2) PNP specification for expansion PIO board is coming soon.

IXP-3N4515/3N4510/4N4515

Arm length 450mm
Vertical axis 100mm/150mm

■Model Specification Items

IXP — [ ] N — 45 — [ ] — WA — [ ] — P3

Series	Number of axes	Arm length	Vertical axis stroke / Gripper	Encoder type	Cable length	Applicable controller
IXP	3: 3 axes 4: 4 axes	45: 450mm	15 :150mm No gripper 15GM :150mm Medium gripper installed 10GL :100mm Large gripper installed *Refer to "Attached Gripper Types" for the types of grippers installed.	WA: Battery-less absolute specification	N: None P: 1m S: 3m M: 5m X□□: Specified length R□□: Robot cable Cable length described below	P3: MSEL

*Controller is not included.

CE RoHS

*The photograph shows a 4-axis specification.

POINT Notes on selection

- Refer to P. 5 for (Note 1) through (Note 5).
- The vertical axis has no brake.
  The unique structure holds the load in place even when the servo is turned off.
- The vertical axis does not support push-motion control.
- The allowable push force is 60N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)			Payload (kg) (Note 3)	
					No gripper	With medium gripper (GM)	With large gripper (GL)	Rated	Maximum
Axis 1	Arm 1	260	±127°	±0.03mm	2438mm/s (Composite speed)	2438mm/s (Composite speed)	2060mm/s (Composite speed)	1	3
Axis 2	Arm 2	190	±127°						
Axis 3	Vertical axis	—	150mm (*1)	±0.02mm	270mm/s	270mm/s	189mm/s		
Axis 4	Rotational axis	—	±360°	±0.02°	1000°/s	—	—		
	Medium gripper GM (*2)	—	14mm (Both fingers)	±0.01mm	—	94mm/s (One finger)	—	—	0.5 (*3)
	Large gripper GL (*2)	—	22mm (Both fingers)	±0.01mm	—	—	125mm/s (One finger)	—	1.5 (*3)

(*1) When the large gripper is installed, the work envelope of the vertical axis becomes 100mm. (*2) Refer to the gripper selection guide in our RCP2/RCP4/RCD Vertical Gripper Catalog.
(*3) This is the maximum payload on the gripper when it is attached to a SCARA Robot.

Robot Specifications

		3-axis specification	4-axis specification	3-axis specification	
		No gripper		With medium gripper (GM)	With large gripper (GL)
Encoder type		Battery-less absolute encoder *			
User wiring		AWG24×6, AWG26×5P (shielded) *User cables are sold separately. Refer to the operation manual for detail.		User wiring is not supported because the gripper wiring is used.	
User piping		O.D. ø4, I.D. ø2.5, 3 air tubes (Maximum working pressure 0.8MPa)			
Standard cycle time (sec) (Note 4)	SCARA	0.67		0.67	0.95
	Gripper (full stroke)	—		0.51	0.56
Allowable torque (Axis 4) (N·m)		—	1.4	—	
Allowable moment (N·m)		2.9		Ma:1.9 Mb:2.7 Mc:2.9	Ma:2.9 Mb:2.9 Mc:2.9
Allowable inertial moment from the tip of the vertical axis (kg·m²) (Note 5)		Rated 0.003 Maximum 0.01	Rated 0.003 Maximum 0.003	Maximum 0.002	Maximum 0.009
Ambient operating temperature/humidity		Temperature 0 ~ 40°C Humidity 20 ~ 85%RH (Non-condensing)			
Unit weight (kg)		13	14	13.5	14

*The gripper is incremental type

Attached Gripper Types

IXP-3N4515GM	The medium gripper RCP4-GRSML is installed at the tip of the vertical axis.
IXP-3N4510GL	The large gripper RCP4-GRSLL is installed at the tip of the vertical axis.

Model Combinations

Specification	Model number
3-axis specification	IXP-3N4515
3-axis specification with medium gripper	IXP-3N4515GM
3-axis specification with large gripper	IXP-3N4510GL
4-axis specification	IXP-4N4515

Cable Length <Per Axis*>

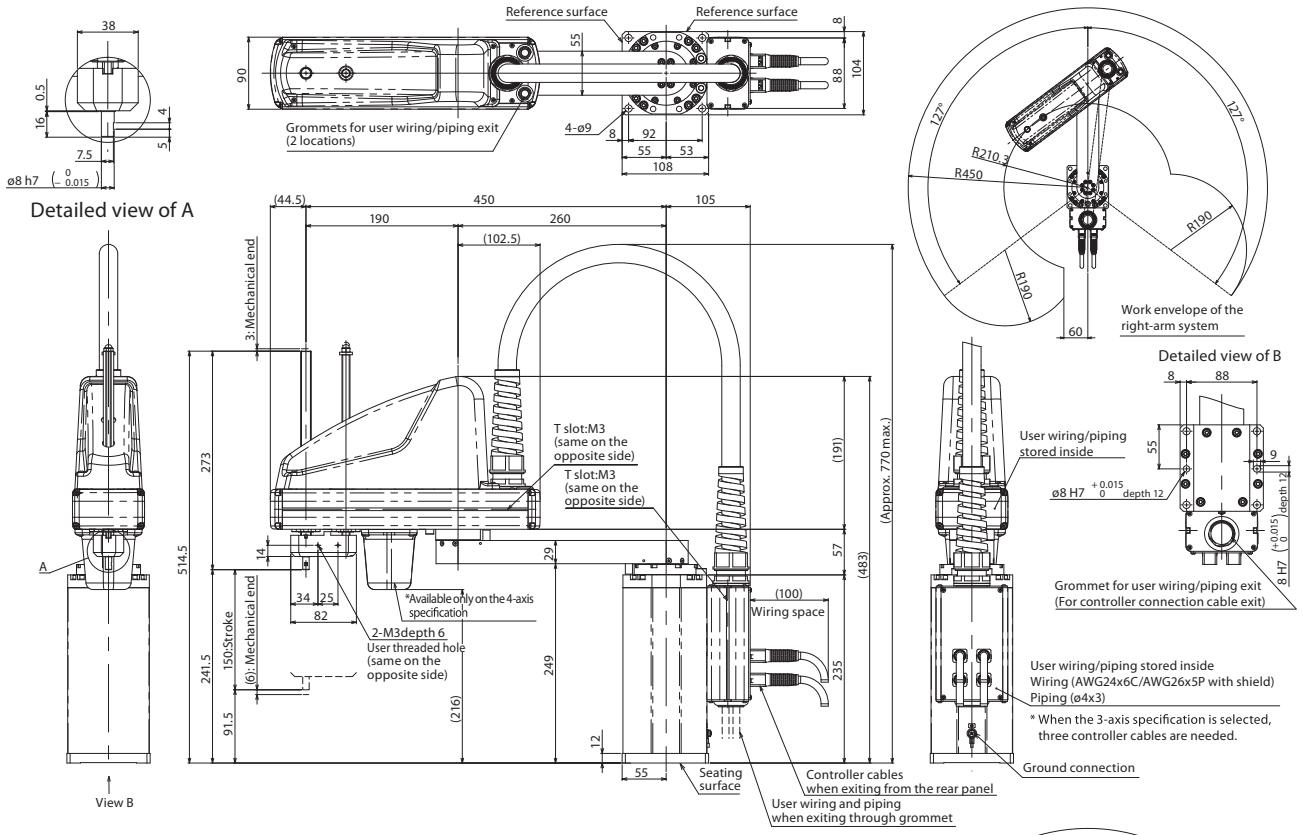
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

*The 3-axis specification requires three cables, while the gripper specification and 4-axis specification require four cables.

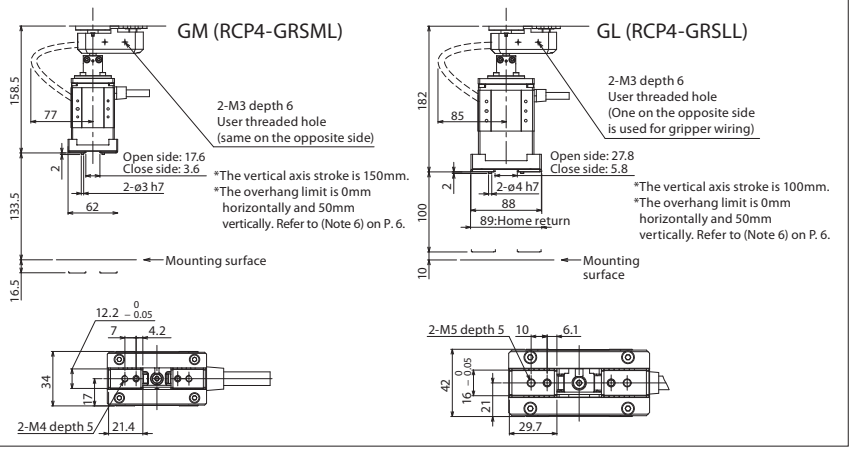
Dimensions

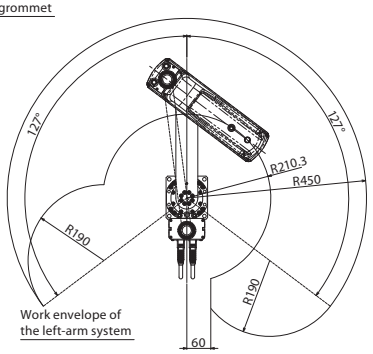
2D CAD 3D CAD

CAD drawings can be downloaded from the website. www.intelligentactuator.de



<Gripper Specification>





Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⒾⅠWAI-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⒾⅠWAI-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*ⒾⅠ SCARA type (Refer to table on the right)
*Ⅲ Standard I/O (NP/PN)
*Ⅳ Expansion I/O (Refer to table on the right)
*Refer to P. 20 if considering axis connection other than IXP series.

<SCARA type>

3N3515	3N4515GM
3N4515	3N4510GL
3N3515GM	4N3515
3N3510GL	4N4515

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*1) The model code is just one example. Refer to P. 19 if using such as field network.
(*2) PNP specification for expansion PIO board is coming soon.

IXP- 3N5520 3N5515 /4N5520

Arm length 550mm
Vertical axis 200mm/150mm

■Model Specification Items

IXP — [ ] N 55 — [ ] — WA — [ ] — P3 — [ ]

Series	Number of axes	Arm length	Vertical axis stroke	Gripper	Encoder type	Cable length	Applicable controller	Option
	3: 3 axes 4: 4 axes	55: 550mm	20 :200mm 15GL :150mm 15GW :150mm	No gripper Large gripper installed Extra-large gripper installed	WA: Battery-less absolute specification	N: None P: 1m S: 3m M: 5m X□□: Specified length R□□: Robot cable Cable length described below	P3: MSEL	B: Brake

*Refer to "Attached Gripper Types" for the types of grippers installed.

*Controller is not included.

CE RoHS

*The photograph shows a 4-axis specification.

POINT — Notes on selection

- Refer to P. 5 for (Note1) through (Note 5).
- Make sure to select the brake option when the payload is 4kg or more.
- The vertical axis does not support push-motion control.
- The allowable push force should be 90N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)			Payload (kg) (Note 3)	
					No gripper	With large gripper (GL)	With extra-large gripper (GW)	Rated	Maximum
Axis 1	Arm 1	260	±127°	±0.04mm	2943mm/s (Composite speed)	2943mm/s (Composite speed)	2943mm/s (Composite speed)	2	6
Axis 2	Arm 2	290	±127°						
Axis 3	Vertical axis	—	200mm (*1)	±0.02mm	240mm/s	240mm/s	240mm/s		
Axis 4	Rotational axis	—	±360°	±0.02°	700°/s	—	—		
	Large gripper GL (*2)	—	22mm (Both fingers)	±0.01mm	—	125mm/s (One finger)	—	—	1.5 (*3)
	Extra-large gripper GW (*2)	—	30mm (Both fingers)	±0.01mm	—	—	157mm/s (One finger)	—	2.5 (*3)

(*1) When the large/extra-large gripper is installed, the work envelope of the vertical axis becomes 150mm. (*2) Refer to the gripper selection guide in our RCP2/RCP4/RCD Vertical Gripper Catalog.
(*3) This is the maximum payload on the gripper when it is attached to a SCARA Robot.

Robot Specifications

	3-axis specification	4-axis specification	3-axis specification	
	No gripper		With large gripper (GL)	With extra-large gripper (GW)
Encoder type	Battery-less absolute encoder *			
User wiring	AWG24×6, AWG26×5P (shielded) *User cables are sold separately. Refer to the operation manual for detail.		User wiring is not supported because the gripper wiring is used.	
User piping	O.D. ø4, I.D. ø2.5, 3 air tubes Maximum working pressure 0.8MPa			
Standard cycle time (sec) (Note 4)	0.73		0.73 (When transporting 2kg including a gripper)	
Allowable torque (Axis 4) (N·m)	—	3.06	—	
Allowable moment (N·m)	9.4		Ma:3.8 Mb:5.5 Mc:9.4	Ma:9.4 Mb:9.4 Mc:9.4
Allowable inertial moment from the tip of the vertical axis (kg·m²) (Note 5)	Rated 0.01 Maximum 0.03	Rated 0.01 Maximum 0.01	Maximum 0.026	Maximum 0.024
Ambient operating temperature/humidity	Temperature 0 ~ 40°C Humidity 20 ~ 85%RH (Non-condensing)			
Unit weight (kg)	20	21	21.3	21.9

*The gripper is incremental type

Attached Gripper Types

IXP-3N5520GL	The large gripper RCP4-GRSLL is installed at the tip of the vertical axis.
IXP-3N5520GW	The extra-large gripper RCP4-GRSWL is installed at the tip of the vertical axis.

Option

Name	Option code	Reference page
Brake	B	Refer to our RoboCylinder General Catalog

Model Combinations

Specification	Model number
3-axis specification	IXP-3N5520
3-axis specification with large gripper	IXP-3N5515GL
3-axis specification with extra-large gripper	IXP-3N5515GW
4-axis specification	IXP-4N5520

Cable Length <Per Axis*>

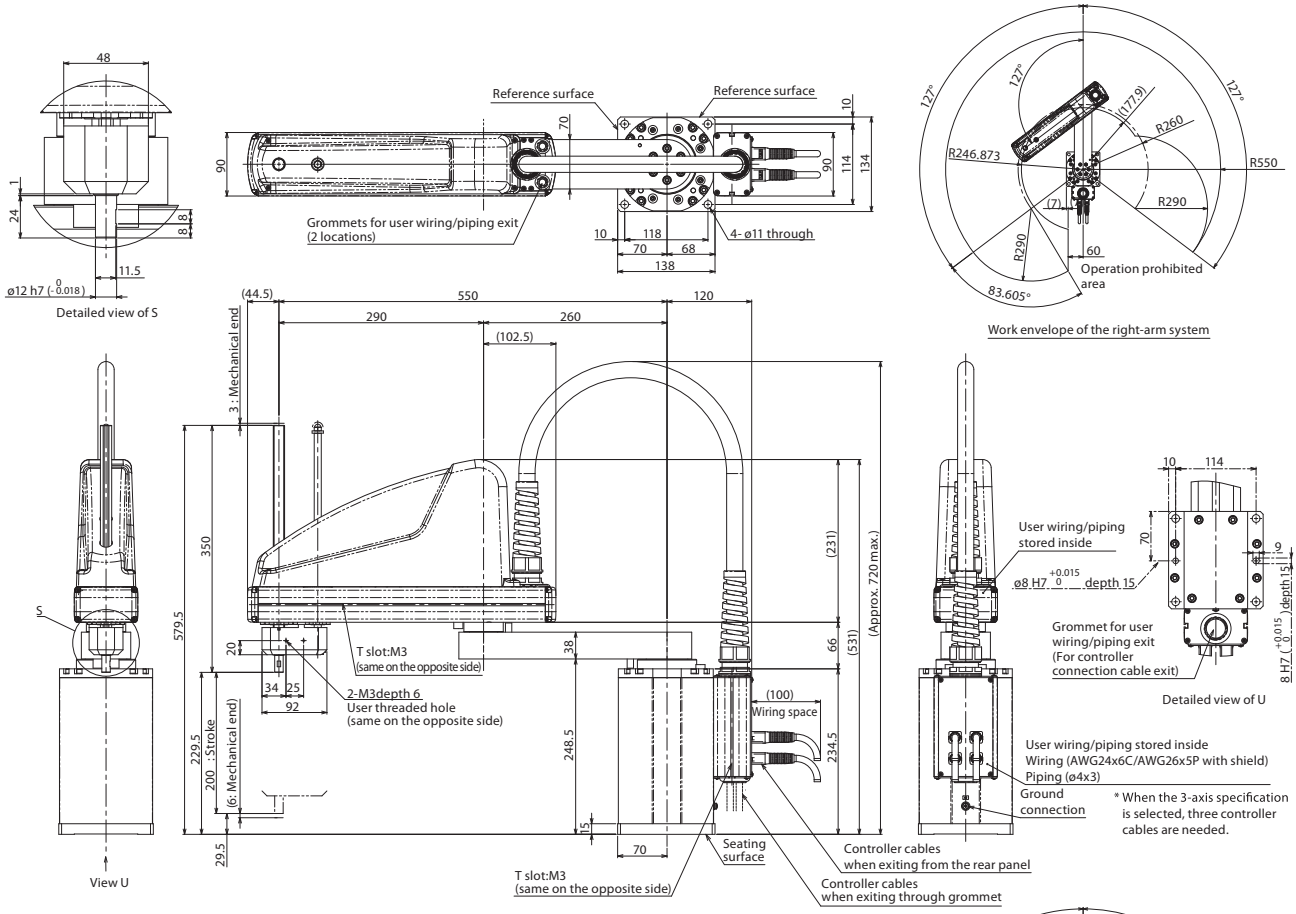
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

*The 3-axis specification requires three cables, while the gripper specification and 4-axis specification require four cables.

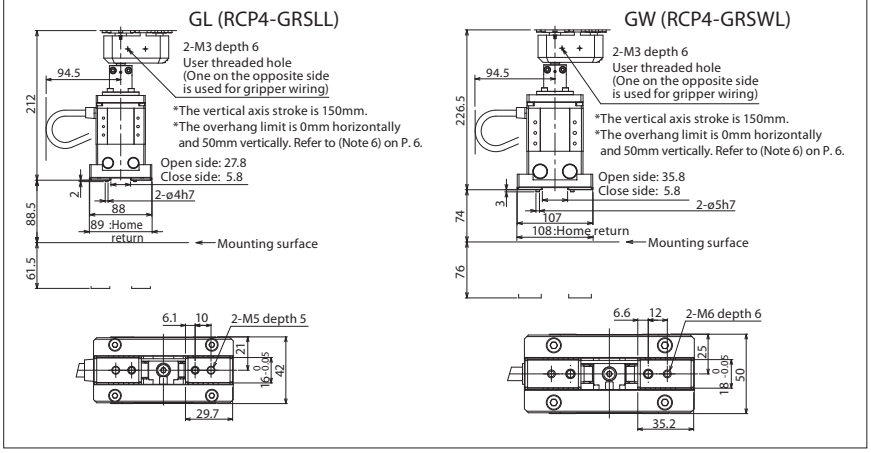
Dimensions

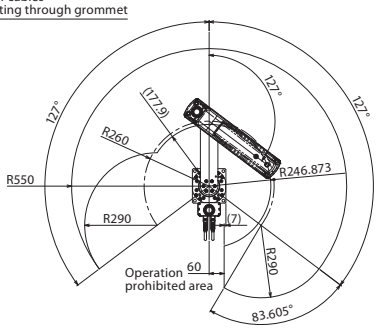
2D CAD 3D CAD

CAD drawings can be downloaded from the website. www.intelligentactuator.de



<Gripper Specification>





Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⒾⅠWAI□-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⒾⅠWAI□-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*ⒾⅠ SCARA type (Refer to table on the right)
*Ⅲ Standard I/O (NP/PN)
*Ⅳ Expansion I/O (Refer to table on the right)
*Enter "B" in □, when brake option is selected.
*Refer to P. 20 if considering axis connection other than IXP Series.
(*1) The model code is just one example. Refer to P. 19 if using such as field network.

<SCARA type>

3N5520	3N5515GL
4N5520	3N5515GW

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*2) PNP specification for expansion PIO board is coming soon.

IXP- 3N6520 3N6515 /4N6520

Arm length 650mm
Vertical axis 200mm/150mm

■Model Specification Items

IXP — [ ] N 65 — [ ] — WA — [ ] — P3 — [ ]

Series	Number of axes	Arm length	Vertical axis stroke	Gripper	Encoder type	Cable length	Applicable controller	Option
IXP	3: 3 axes 4: 4 axes	65: 650mm	20 :200mm 15GL :150mm 15GW :150mm *Refer to "Attached Gripper Types" for the types of grippers installed.	No gripper Large gripper installed Extra-large gripper installed	WA: Battery-less absolute specification	N: None P: 1m S: 3m M: 5m X□□: Specified length R□□: Robot cable Cable length described below	P3: MSEL	B: Brake

*Controller is not included.

*The photograph shows a 4-axis specification.

POINT — Notes on selection

- Refer to P. 5 for (Note1) through (Note 5).
- Make sure to select the brake option when the payload is 4kg or more.
- The vertical axis does not support push-motion control.
- The allowable push force should be 90N under condition of having a buffer such as a spring on a tool or the pressing side.
- Refer to P. 5 for the work envelope, and P. 26 for the notes on acceleration/deceleration setting.

Robot Specifications

Axis configuration		Arm length (mm)	Work envelope	Positioning repeatability (Note 1)	Maximum operating speed in PTP mode (Note 2)			Payload (kg) (Note 3)	
					No gripper	With large gripper (GL)	With extra-large gripper (GW)	Rated	Maximum
Axis 1	Arm 1	360	±127°	±0.04mm	2916mm/s (Composite speed)	2916mm/s (Composite speed)	2916mm/s (Composite speed)	2	6
Axis 2	Arm 2	290	±127°						
Axis 3	Vertical axis	—	200mm (*1)	±0.02mm	240mm/s	240mm/s	240mm/s		
Axis 4	Rotational axis	—	±360°	±0.02°	700°/s	—	—		
	Large gripper GL (*2)	—	22mm (Both fingers)	±0.01mm	—	125mm/s (One finger)	—	—	1.5 (*3)
	Extra-large gripper GW (*2)	—	30mm (Both fingers)	±0.01mm	—	—	157mm/s (One finger)	—	2.5 (*3)

(*1) When the large/extra-large gripper is installed, the work envelope of the vertical axis becomes 150mm. (*2) Refer to the gripper selection guide in our RCP2/RCP4/RCD Vertical Gripper Catalog.
(*3) This is the maximum payload on the gripper when it is attached to a SCARA Robot.

Robot Specifications

	3-axis specification	4-axis specification	3-axis specification	
	No gripper		With large gripper (GL)	With extra-large gripper (GW)
Encoder type	Battery-less absolute encoder *			
User wiring	AWG24×6, AWG26×5P (shielded) *User cables are sold separately. Refer to the operation manual for detail.		User wiring is not supported because the gripper wiring is used.	
User piping	O.D. ø4, I.D. ø2.5, 3 air tubes Maximum working pressure 0.8MPa			
Standard cycle time (sec) (Note 4)	0.81		0.81 (When transporting 2kg including a gripper)	
Allowable torque (Axis 4) (N·m)	—	3.06	—	
Allowable moment (N·m)	9.4		Ma:3.8 Mb:5.5 Mc:9.4	Ma:9.4 Mb:9.4 Mc:9.4
Allowable inertial moment from the tip of the vertical axis (kg·m²) (Note 5)	Rated 0.01 Maximum 0.03	Rated 0.01 Maximum 0.01	Maximum 0.026	Maximum 0.024
Ambient operating temperature/humidity	Temperature 0 ~ 40°C Humidity 20 ~ 85%RH (Non-condensing)			
Unit weight (kg)	21	22	22.3	22.9

*The gripper is incremental type

Attached Gripper Types

IXP-3N6520GL	The large gripper RCP4-GRSLL is installed at the tip of the vertical axis.
IXP-3N6520GW	The extra-large gripper RCP4-GRSWL is installed at the tip of the vertical axis.

Option

Name	Option code	Reference page
Brake	B	Refer to our RoboCylinder General Catalog

Model Combinations

Specification	Model number
3-axis specification	IXP-3N6520
3-axis specification with large gripper	IXP-3N6515GL
3-axis specification with extra-large gripper	IXP-3N6515GW
4-axis specification	IXP-4N6520

Cable Length <Per Axis*>

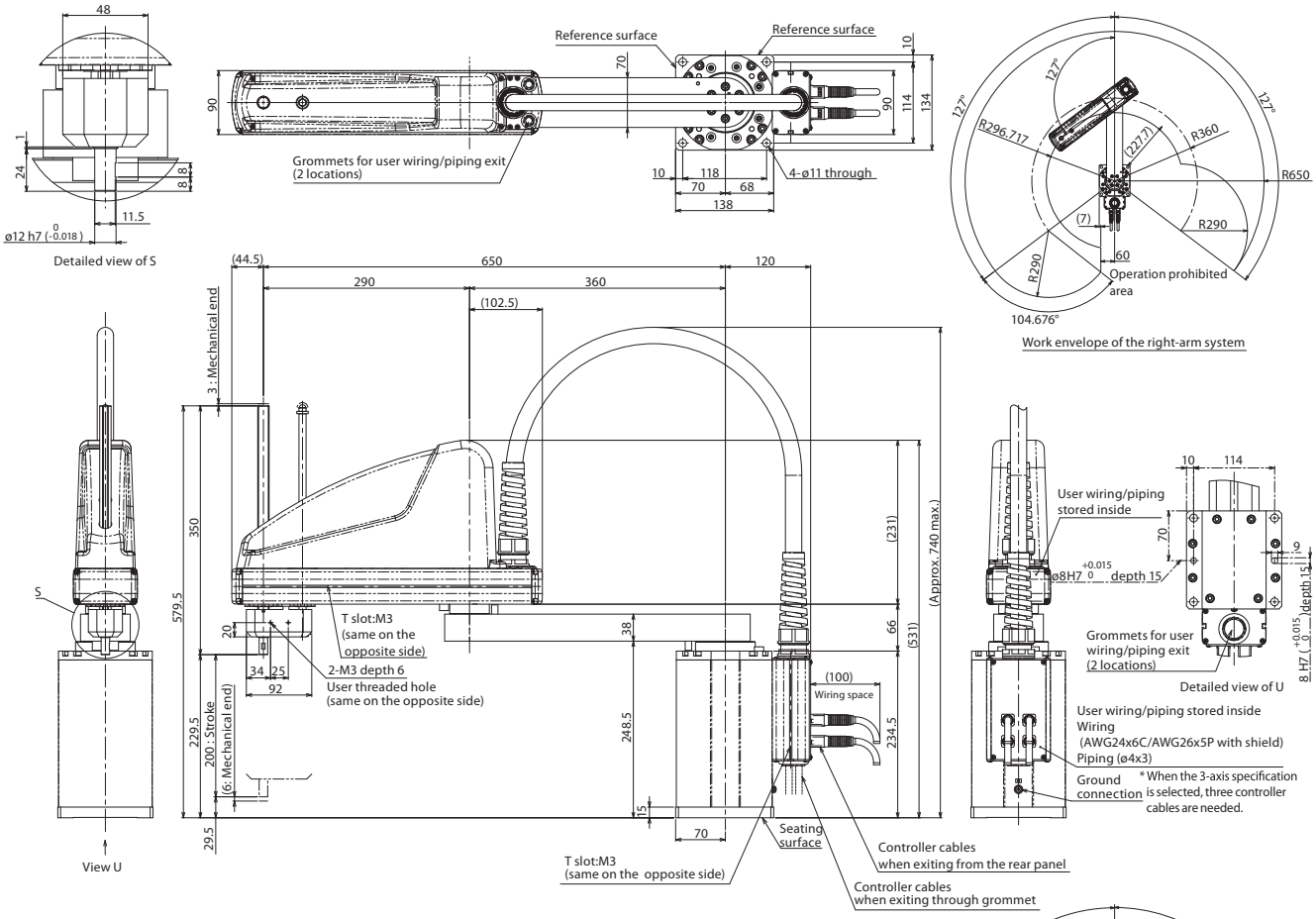
Type	Cable code
Standard type	P (1m)
	S (3m)
	M (5m)
Special length	X06 (6m) ~ X10 (10m)
	X11 (11m) ~ X15 (15m)
	X16 (16m) ~ X20 (20m)
Robot cable	R01 (1m) ~ R03 (3m)
	R04 (4m) ~ R05 (5m)
	R06 (6m) ~ R10 (10m)
	R11 (11m) ~ R15 (15m)
	R16 (16m) ~ R20 (20m)

*The 3-axis specification requires three cables, while the gripper specification and 4-axis specification require four cables.

Dimensions

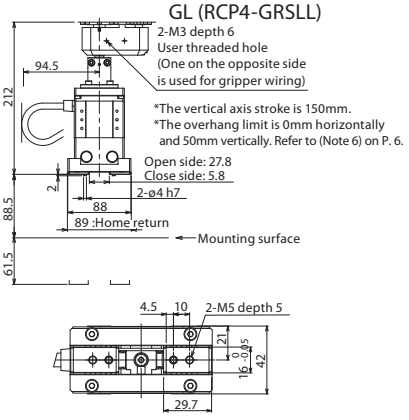
2D CAD 3D CAD

CAD drawings can be downloaded from the website. www.intelligentactuator.de

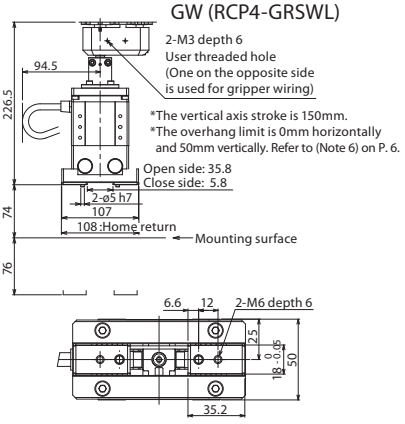


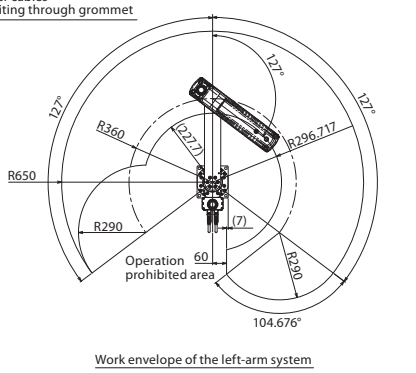
<Gripper Specification>

GL (RCP4-GRSLL)



GW (RCP4-GRSWL)





Applicable Controller Specifications

Name	External view	Model number (*1)	Max. number of controlled axes	Max. positioning points	Standard I/O points (input/output)	Input voltage	Reference page
Program control multi-axis type Safety category compliant specification		MSEL-PGXⒾ-ⒾⅠWAI□-ⅢⅣ-2-4	4	30000 points	16 points/16 points	Single-phase AC 100V ~ 230V	→P. 19
Program control multi-axis type Safety category compliant specification with network board		MSEL-PGXⒾ-ⒾⅠWAI□-ⅢⅣ-0-4					

*Ⓘ Controller type (3:3-axis specification/4:4-axis specification)
*Ⅱ SCARA type (Refer to table on the right)
*Ⅲ Standard I/O (NP/PN)
*Ⅳ Expansion I/O (Refer to table on the right)
*Enter "B" in □, when brake option is selected.
*Refer to P. 20 if considering axis connection other than IXP Series.
(*1) The model code is just one example. Refer to P. 19 if using such as field network.

<SCARA type>

3N6520	3N6515GL
4N6520	3N6515GW

<Expansion I/O>

E	Not used	CC	CC-Link board
NP/PN	Expansion PIO board NPN/PNP spec. (*2)	CC2	CC-Link board (with 2-way connector)
DV	DeviceNet board	PR	PROFIBUS-DP board
DV2	DeviceNet board (with 2-way connector)	EP	EtherNet/IP board

(*2) PNP specification for expansion PIO board is coming soon.

MSEL

MSEL-PGX
Program Controller for PowerCon SCARA

Model List

Name	Controllers for PowerCon SCARA	
External view		
Type name	PGX3	PGX4
Type	Global type with 3-axis safety category specification	Global type with 4-axis safety category specification
Safety category (*1)	Can be made compliant with categories B to 3	
Connected actuator	IXP 3-axis specification	IXP 3-axis specification + additional axis (including gripper specification) IXP 4-axis specification (with rotating axis)
I/O	Standard type: NPN, PNP (16IN/16OUT) Expansion type: NPN, PNP (*2), CC-Link, DeviceNet, PROFIBUS-DP, EtherNet/IP	
Number of positions	30000	
Power-supply voltage	Single-phase AC100 ~ 230V	

(*1) Meeting this safety category requires the customer to install a safety circuit externally to the controller. (*2) PNP specification for expansion PIO board is coming soon.

Model

*An additional axis can be selected only when the controller is of the 4-axis type and SCARA robot is of the 3-axis type (without gripper).

MSEL – [Controller type] – [SCARA type] WAI [Encoder type] [Options] – [Motor type] WAI [Encoder type] [Options] – [Standard I/O type] – [Expansion I/O type] – [PIO cable type] – 4 – [Power-supply voltage] [Actuator mounting specification]

(SCARA: SCARA type, Encoder type, Options; Additional axis: Motor type, Encoder type, Options)

Controller type

PGX3	Global type with 3-axis safety category specification
PGX4	Global type with 4-axis safety category specification

SCARA type

3N1808	For IXP-3N1808
4N1808	For IXP-4N1808
3N2508	For IXP-3N2508
4N2508	For IXP-4N2508
3N2508GM	For IXP-3N2508GM
3N3515	For IXP-3N3515
4N3515	For IXP-4N3515
3N3515GM	For IXP-3N3515GM
3N3510GL	For IXP-3N3510GL
3N4515	For IXP-3N4515
4N4515	For IXP-4N4515
3N4515GM	For IXP-3N4515GM
3N4510GL	For IXP-3N4510GL
3N5520	For IXP-3N5520
4N5520	For IXP-4N5520
3N5515GL	For IXP-3N5515GL
3N5515GW	For IXP-3N5515GW
3N6520	For IXP-3N6520
4N6520	For IXP-4N6520
3N6515GL	For IXP-3N6515GL
3N6515GW	For IXP-3N6515GW

Encoder type

B	Brake

Options

(None)	No option
B	Brake
HS	Home check sensor (*)

* The home check sensor can be selected only when an additional incremental axis is used with the SCARA 3-axis specification.

Motor type

20P	20□pulse motor
20SP	20□pulse motor (for RA2AC/AR, RA2BC/BR)
28P	28□pulse motor
28SP	28□pulse motor (for RA3C, RGD3C)
35P	35□pulse motor
42P	42□pulse motor
42SP	42□pulse motor (for RCP4W-RA6 high-thrust specification)
56P	56□pulse motor

Encoder type = same as SCARA Encoder type

Options = same as Additional axis Options

Standard I/O type

NP	NPN specification
PN	PNP specification

Expansion I/O type

E	Not used
NP	Expansion PIO board (NPN specification)
PN	Expansion PIO board (PNP specification) (*)
DV	DeviceNet board
DV2	DeviceNet board (with 2-way connector) (**)
CC	CC-Link board
CC2	CC-Link board (with 2-way connector) (**)
PR	PROFIBUS-DP board
EP	EtherNet/IP board

* PNP specification is coming soon.
** If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.

PIO cable type

0	No cable
2	2m (standard)
3	3m
5	5m

Power-supply voltage

4	AC100 ~ 230V

Actuator mounting specification

(None)	Screw fixing specification
DN	DIN rail mounting specification

System Configuration

(*1) TB-01-SJ coming soon with CE conformity. For a safety category compliant system with deadman switch type TB-01-D(R) see TB-01 brochure.

Option
Teaching pendant
(Refer to P. 24)
<Model number: TB-01-SJ (*1)>
* The MSEL-PGX is supported only by Ver. 1.02 or later.

(*2) For a safety category compliant system with safety circuit emergency stop connector type IA-101-XA-MW-JS contact IAI.

Option
PC software
(Refer to P. 24)
<Model number: IA-101-X-MW-JS (*2)>
(RS232C cable + Connector conversion cable)
<Model number: IA-101-X-USBS>
(USB cable + Dummy plug)
* The MSEL-PGX is supported only by Ver. 11.00.00.00 or later.

Standard accessory/option
Dummy plug
(Refer to P. 24)
<Model number: DP-4S>
(Supplied with the MSEL-PGX)

Standard accessory/option
Connector conversion cable
(Refer to P. 24)
<Model number: CB-SEL-SJS002>
(Supplied with the TB-01-SJ/ IA-101-X-MW-JS)

Supplied with the SCARA robot
Integrated motor-encoder cable
(Refer to P. 25)
<Model number: CB-CAN-MPA□□□>
Standard: 1m/3m/5m

Emergency stop switch

Enable switch

AC100 ~ 230V

Standard accessory
PIO flat cable
(Refer to P. 26)
<Model number: CB-PAC-PIO020>
Standard: 2m

PLC

Protective grounding

Electromagnetic contactor

Expansion PIOs/various field networks

Supplied with expansion PIO specification
PIO flat cable
(Refer to P. 26)
<Model number: CB-PAC-PIO020>
Standard: 2m

PROFIBUS DeviceNet CC-Link EtherNet/IP

*Wire the emergency stop switch, enable switch, electromagnetic contactor, etc., as necessary. The same applies to the factory settings (shorting).

<Actuator for Additional Axis>
(Can be connected to a SCARA robot of 3-axis specification)

Integrated motor-encoder cable
(Refer to RoboCylinder General Catalog)
<Model number: CB-PSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with the actuator

Actuator RCP2 series

Integrated motor-encoder cable
(Refer to RoboCylinder General Catalog)
<Model number: CB-RPSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with the actuator

Actuator RCP2 small rotary

Integrated motor-encoder cable
(Refer to RoboCylinder General Catalog)
<Model number: CB-APSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with the actuator

Actuator RCP3 series

Integrated motor-encoder cable
(Refer to RCP4 Catalog)
<Model number: CB-CA-MPA□□□>
<Model number: CB-CA-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with the actuator

Actuator RCP4 series

Integrated motor-encoder cable
(Refer to P. 25)
<Model number: CB-CAN-MPA□□□>
<Model number: CB-CAN-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with the actuator

Actuator RCP5 series

Basic Controller Specifications

Specification item			Contents
Power-supply input voltage			Single-phase AC100 ~ 230 V ±10%
Power-supply current			2.9A typ. (AC100V), 1.4A typ. (AC200V), 1.2A typ. (AC230V)
Power-supply frequency range			50/60Hz±5%
Motor type			Pulse motor (servo control)
Supported encoder			Incremental encoder / Battery-less absolute encoder
Data storage device			FlashROM/FRAM
Number of program steps			9999
Number of positions			30000
Number of programs			255
Number of multi-tasks			16
Operation mode	Serial communications		○
	Program		○
SIO interface	Communication method		RS232 (asynchronous communications)
	Baud rate		9.6 , 19.2 , 38.4 , 57.6 , 76.8 , 115.2kbps
	Live wire connection	TP port	—
		USB	○
Standard PIO interface	Input Specification	Number of input points	16 points
		Input voltage	DC24V±10%
		Input current	7mA/circuit
		ON voltage	DC16V Min.
		OFF voltage	DC5V Max.
		Leak current	Allowable leak current: 1mA max.
		Insulation method	Photocoupler insulation
	Output specification	Number of output points	16 points
		Load voltage	DC24V±10%
		Maximum current	100mA per point, 400mA per 8 points (Note 1)
		Saturated voltage	3V Max.
		Leak current	0.1mA Max.
		Insulation method	Photocoupler insulation
Compliant expansion I/O interface			Expansion PIO NPN specification (16IN/16OUT) (Note 2)
			CC-Link (remote device station)
			DeviceNet
			PROFIBUS-DP
			EtherNet/IP
Calendar/clock function	Retention time		Approx. 10 days
	Charge time		Approx. 100 hours (fully charged) * Data can be retained even when the batteries are not fully charged.
Protective functions			Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.
Operating temperature range			0 ~ 40°C
Operating humidity range			85% RH max. (non-condensing, non-freezing)
Installation	Installation direction		Installed vertically (exhaust side up)
	Installation method		Mounted with screws or using a DIN rail
Rush current			15Atyp. (AC100 V), 30Atyp. (AC200 V): 5ms max. (Ambient temperature 25°C/No cycling of the power)
Air cooling method			Forced air cooling
External dimensions			Width 130mm x Height 195mm x Depth 125mm
Mass			Approx. 1400g

(Note 1) The total load current shall be 400mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)
(Note 2) The expansion I/O interface is coming soon with PNP specification.

PIO Signal Chart

Pin layouts for standard PIO connector/expansion PIO connector

Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B	Output	OUT0
2A	24V	P24	2B		OUT1
3A	—	—	3B		OUT2
4A	—	—	4B		OUT3
5A	Input	IN0	5B		OUT4
6A		IN1	6B		OUT5
7A		IN2	7B		OUT6
8A		IN3	8B		OUT7
9A		IN4	9B		OUT8
10A		IN5	10B		OUT9
11A		IN6	11B		OUT10
12A		IN7	12B		OUT11
13A		IN8	13B		OUT12
14A		IN9	14B		OUT13
15A		IN10	15B		OUT14
16A		IN11	16B		OUT15
17A		IN12	17B	—	—
18A		IN13	18B	—	—
19A		IN14	19B	0V	N
20A		IN15	20B	0V	N

Internal Circuits for Standard I/Os (NPN Specifications) *

* For the standard IOs with PNP specifications refer to the operation manual.

[Input section] External input specifications (NPN specifications)

Item	Specifications
Input voltage	DC24V ±10%
Input current	7mA/circuit
On/Off voltage	On voltage: DC16.0V min. Off voltage: DC5.0V max.
Insulation method	Photocoupler insulation

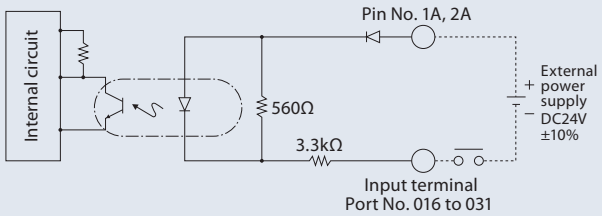
* The port numbers in the circuit diagram below represent the factory-set port numbers.
* When the input is off, the allowable leak current is 1mA max.

[Output section] External output specifications (NPN specifications)

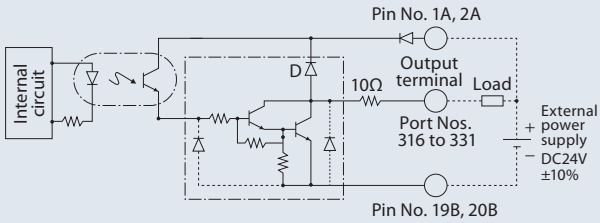
Item	Specifications	
Load voltage	DC24V ±10%	Uses TD62084 (or equivalent).
Maximum load current	100mA/point, 400mA/8 points Note)	
Leak current	0.1mA/point max.	
Insulation method	Photocoupler insulation	

* The port numbers in the circuit diagram below represent the factory-set port numbers.
Note: The total load current shall be 400 mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)

[Input circuit]



[Output circuit]



Internal Circuits for Expansion I/Os (NPN Specifications) *

* The expansion IOs with PNP specifications are coming soon.

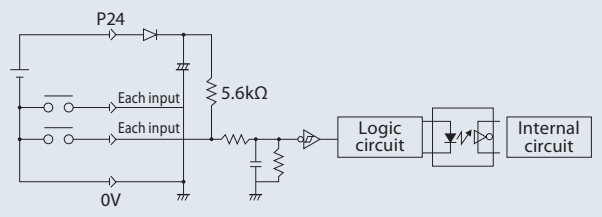
[Input section] External input specifications

Item	Specifications
Number of input points	16 points
Input voltage	DC24V ±10%
Input current	4mA/circuit
On/Off voltage	On voltage: DC18V (3.5mA) min. Off voltage: DC6V (1mA) max.
Insulation method	Photocoupler insulation

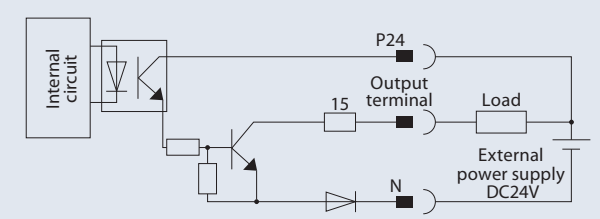
[Output section] External output specifications

Item	Specifications
Number of output points	16 points
Rated load current	DC24V ±10%
Maximum current	50mA/circuit
Insulation method	Photocoupler insulation

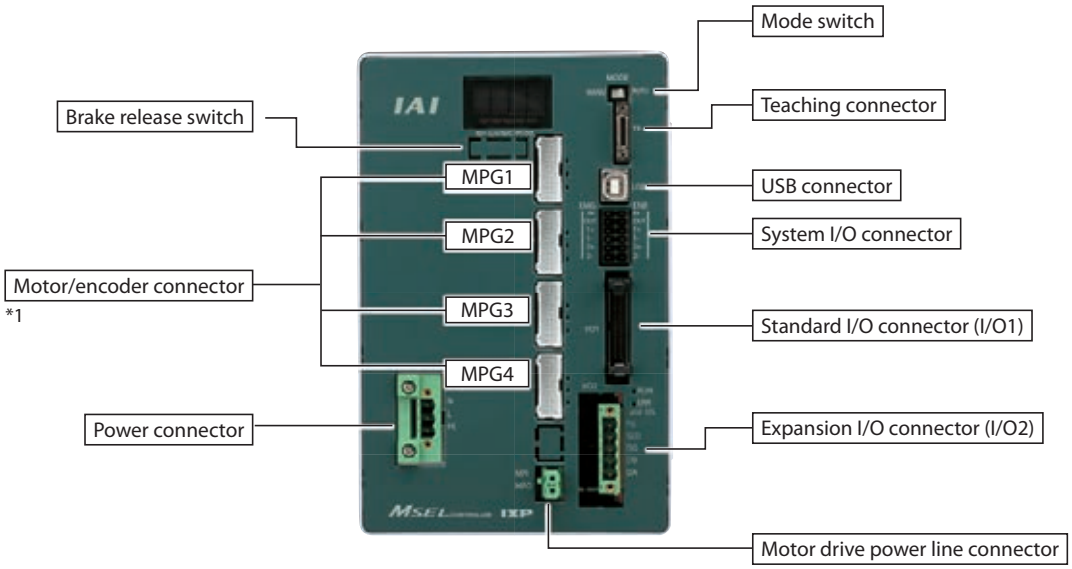
[Input circuit]



[Output circuit]



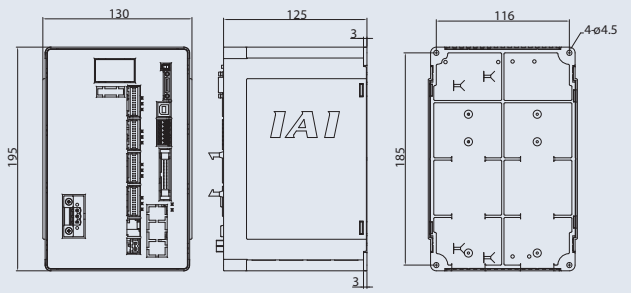
Name of Each Part



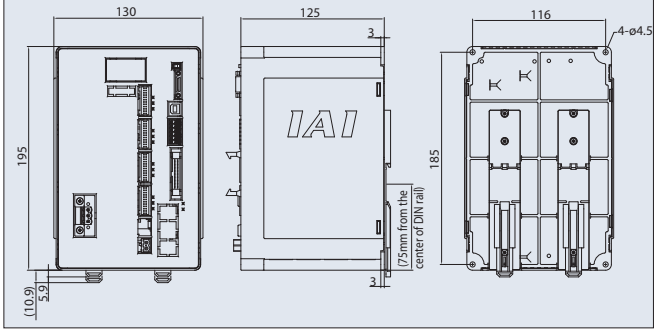
*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connector. It may cause malfunction or failure.

External dimensions

Screw fixing specification



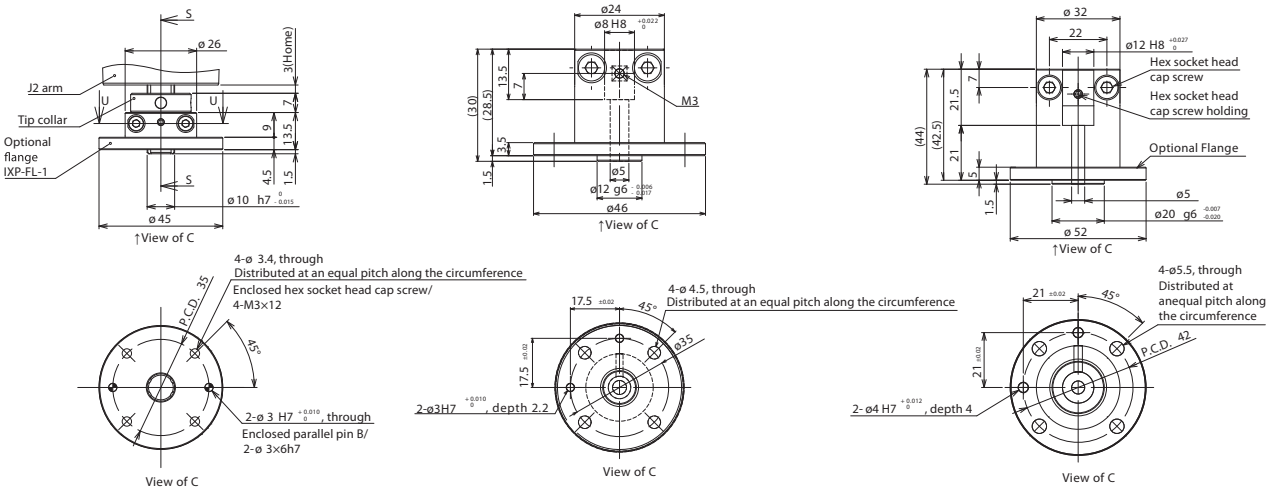
DIN rail mounting specification



Options

Flange

Features It is a tool used to attach an object on the arm tip on the Z-axis.



Model number	Applicable IXP type	Weight
IXP-FL-1	1808/2508	80g

Model number	Applicable IXP type	Weight
IXP-FL-2	3515/3510/ 4515/4510	120g

Model number	Applicable IXP type	Weight
IXP-FL-3	5520/5515/ 6520/6515	290g

Touch Panel Teaching Pendant

Features A teaching device offering program/position input, trial operation and monitoring functions.

Model number **TB-01-SJ** (Note 1)

* This model is the standard specification with connector conversion cable. If you are interested in the deadman switch specifiction, specify the model number of the applicable teaching pendant (TB-01D-N/TB-01DR-N) and that of the cable (CB-TB1-X050-JS).

Configuration

The MSEL-PGX is supported by Ver. 1.02 or later.

Dummy Plug

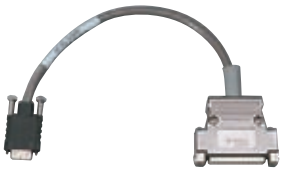
Features This plug is required for the safety category specification (MSEL-PGX) and when the MSEL is operated using a USB cable. (The MSEL-PGX type and PC Software IA-101-X-USBS come with this dummy plug.)

Model number **DP-4S**

Connector conversion cable

Features This cable is used to convert the D-sub 25-pin connector of the teaching pendant or RS232C cable to the MSEL teaching connector. (The TB-01-SJ and IA-101-X-MW-JS come with this connector conversion cable.)

Model number
CB-SEL-SJS002

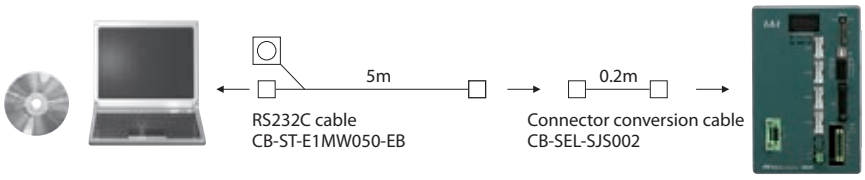


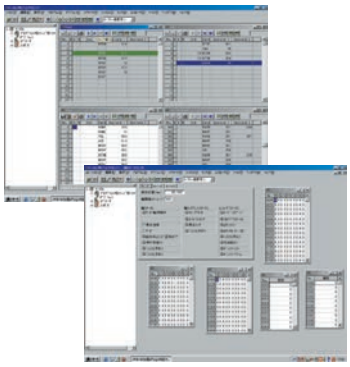
PC Software (Windows Only)

Features The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time.

Model number **IA-101-X-MW-JS** (RS232C cable + Connector conversion cable) (Note 2)

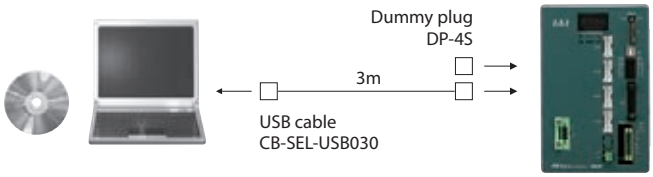
Configuration





Model number **IA-101-X-USBS** (USB cable + Dummy plug)

Configuration



The MSEL-PGX is supported by Ver. 11.00.00.00 or later.

(Note 1)

TB-01-SJ is coming soon with CE conformity.
For a safety category compliant system with deadman switch type TB-01-D(R) see TB-01 brochure.

(Note 2)

The RS232C standard cable CB-ST-**E**1MW050-EB cannot be used when "Building an enable system that uses a system I/O connector and external power supply" or "Building a redundant safety circuit."
(The RS232C safety category cable CB-ST-**A**1MW050-EB must be used instead.)
For more details of a safety category compliant system with a safety circuit emergency stop connector kit IA-101-X**A**-MW-JS contact IAI.

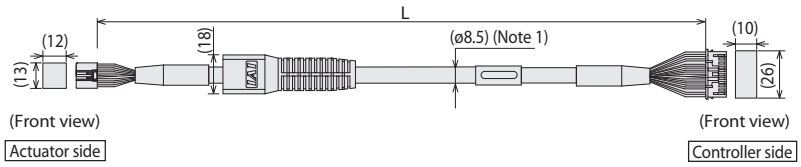
Service Parts

Please refer to the models listed below when arrangements such as cable replacement are needed after purchasing the product.

(Check in the general or dedicated single catalog for the cable for added axis.)

Model Number			
	CB-CAN-MPA□□□	Integrated Motor-Encoder Cable	for IXP / RCP4-SA3/RA3 / RCP5
	CB-CAN-MPA□□□-RB	Integrated Motor-Encoder Robot Cable	

* Please indicate cable length (L) in □□□, maximum 20m. e.g.) 080 = 8m



Pin No.	Signal name	Pin No.	Signal name
3	øA/U	1	øA/U
5	VMM/V	2	VMM/V
10	ø A/W	3	ø A/W
9	øB/–	4	øB/–
4	VMM/–	5	VMM/–
15	ø B/-	6	ø B/–
8	LS+/BK+	7	LS+/BK+
14	LS–/BK–	S	LS-/BK–
12	–/A+	11	–/A+
17	–/A-	12	–/A-
1	A+/B+	13	A+/B+
6	A–/B-	14	A–/B-
11	B+/Z+	15	B+/Z+
16	B–/Z-	16	B–/Z-
20	BK+/LS+	9	BK+/LS+
2	BK–/LS-	10	BK–/LS-
21	LS_GND	17	LS_GND
7	VPS	19	VPS
15	VCC	15	VCC
13	GND	20	GND
19	—	22	—
22	BAT+	21	BAT+
23	—	23	—
24	FG	24	FG

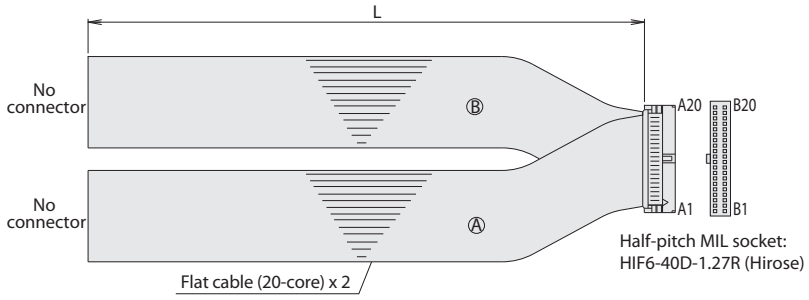
Minimum bending radius 5m or less length R = 68mm or more (Dynamic bending condition)
Longer than 5m R = 73mm or more (Dynamic bending condition)

* The robot cable is designed for flex-resistance: Please use the robot cable if the cable has to be installed through a cable track.

(Note 1) If the cable is 5m or longer, ø9.1 cable diameter applies for a non-robot cable and ø10 for a robot cable.

Model Number			
	CB-PAC-PIO□□□	PIO Flat Cable	for MSEL / PCON-CA / MSEP-LC

* Please indicate cable length (L) in □□□, maximum 10m. e.g.) 080 = 8m



HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring
A1	24V	Brown-1	Flat cable Ⓐ (crimped) AWG28
A2	24V	Red-1	
A3	—	Orange-1	
A4		Yellow-1	
A5	IN0	Green-1	
A6	IN1	Blue-1	
A7	IN2	Purple-1	
A8	IN3	Gray-1	
A9	IN4	White-1	
A10	IN5	Black-1	
A11	IN6	Brown-2	
A12	IN7	Red-2	
A13	IN8	Orange-2	
A14	IN9	Yellow-2	
A15	IN10	Green-2	
A16	IN11	Blue-2	
A17	IN12	Purple-2	
A18	IN13	Gray-2	
A19	IN14	White-2	
A20	IN15	Black-2	

No.	Signal name	Cable color	Wiring
B1	OUT0	Brown-3	Flat cable Ⓑ (crimped) AWG28
B2	OUT1	Red-3	
B3	OUT2	Orange-3	
B4	OUT3	Yellow-3	
B5	OUT4	Green-3	
B6	OUT5	Blue-3	
B7	OUT6	Purple-3	
B8	OUT7	Gray-3	
B9	OUT8	White-3	
B10	OUT9	Black-3	
B11	OUT10	Brown-4	
B12	OUT11	Red-4	
B13	OUT12	Orange-4	
B14	OUT13	Yellow-4	
B15	OUT14	Green-4	
B16	OUT15	Blue-4	
B17	—	Purple-4	
B18		Gray-4	
B19	0V	White-4	
B20	0V	Black-4	

Pitch of Available Positioning Points

		IXP-3N1808	IXP-3N2508	IXP-4N1808	IXP-4N2508
Pitch of Available Positioning Points	On horizontal surface (J1 axis + J2 axis) (mm)	0.081 (Maximum)	0.097 (Maximum)	0.081 (Maximum)	0.097 (Maximum)
	Vertical axis (mm)	0.011	0.011	0.011	0.011
	Rotational axis (degree)	–	–	0.099	0.099

		IXP-3N3515	IXP-3N4515	IXP-4N3515	IXP-4N4515
Pitch of Available Positioning Points	On horizontal surface (J1 axis + J2 axis) (mm)	0.202 (Maximum)	0.179 (Maximum)	0.202 (Maximum)	0.179 (Maximum)
	Vertical axis (mm)	0.009	0.009	0.009	0.009
	Rotational axis (degree)	–	–	0.113	0.113

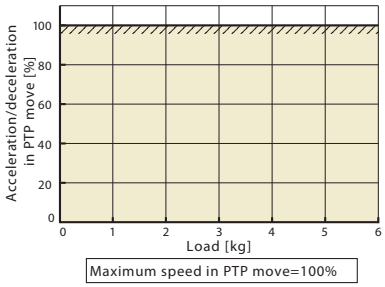
		IXP-3N5520	IXP-3N6520	IXP-4N5520	IXP-4N6520
Pitch of Available Positioning Points	On horizontal surface (J1 axis + J2 axis) (mm)	0.200 (Maximum)	0.224 (Maximum)	0.200 (Maximum)	0.224 (Maximum)
	Vertical axis (mm)	0.009	0.009	0.009	0.009
	Rotational axis (degree)	–	–	0.053	0.053

Reference for SCARA Robot Acceleration/Deceleration Settings

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.

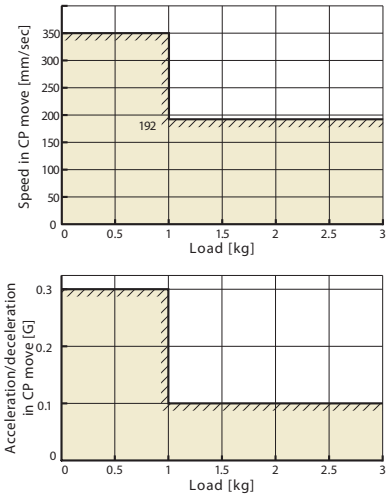
CP Move

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

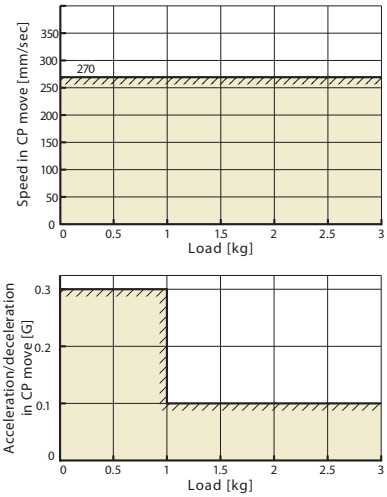
Notes

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

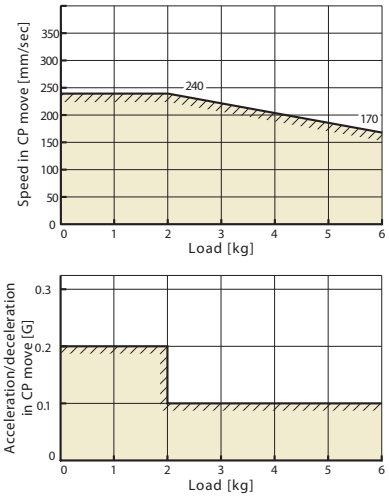
IXP-3/4N1808, 2508



IXP-3/4N3515, 4515



IXP-3/4N5520, 6520



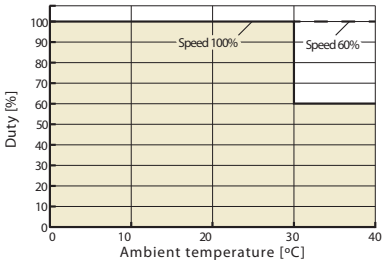
Duty Cycle Setting

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.

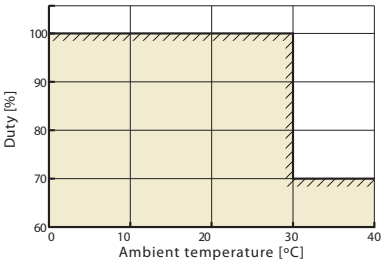
Notes

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

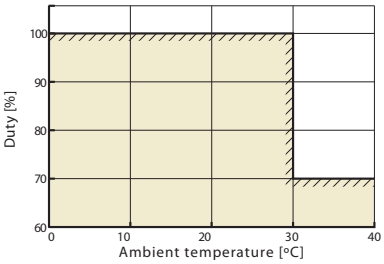
IXP-3/4N1808, 2508



IXP-3/4N3515, 4515



IXP-3/4N5520, 6520



IXP SCARA Series V3
Catalogue No. 0815-E

The information contained in this catalog is subject to change without notice for the purpose of product inprovement

IX INTELLIGENT ACTUATOR

IAI
Quality and Innovation

IAI Industrieroboter GmbH
Ober der Röth 4
D-65824 Schwalbach / Frankfurt
Germany
Tel.:+49-6196-8895-0
Fax:+49-6196-8895-24
E-Mail: info@IAI-GmbH.de
Internet: http://www.eu.IAI-GmbH.de

IAI America, Inc.
2690 W. 237th Street, Torrance, CA 90505, U.S.A
Phone: +1-310-891-6015, Fax: +1-310-891-0815

IAI (Shanghai) Co., Ltd
Shanghai Jiahua Business Center A8-303, 808,
Hongqiao Rd., Shanghai 200030, China
Phone: +86-21-6448-4753, Fax: +86-21-6448-3992

IAI CORPORATION
577-1 Obane, Shimizu-Ku, Shizuoka, 424-0103 Japan
Phone: +81-543-64-5105, Fax: +81-543-64-5192

IAI Robot (Thailand) Co., Ltd
825 PhairojKijja Tower 12th Floor, Bangna-Trad RD.,
Bangna, Bangna, Bangkok 10260, Thailand
Phone: +66-2-361-4457, Fax: +66-2-361-4456