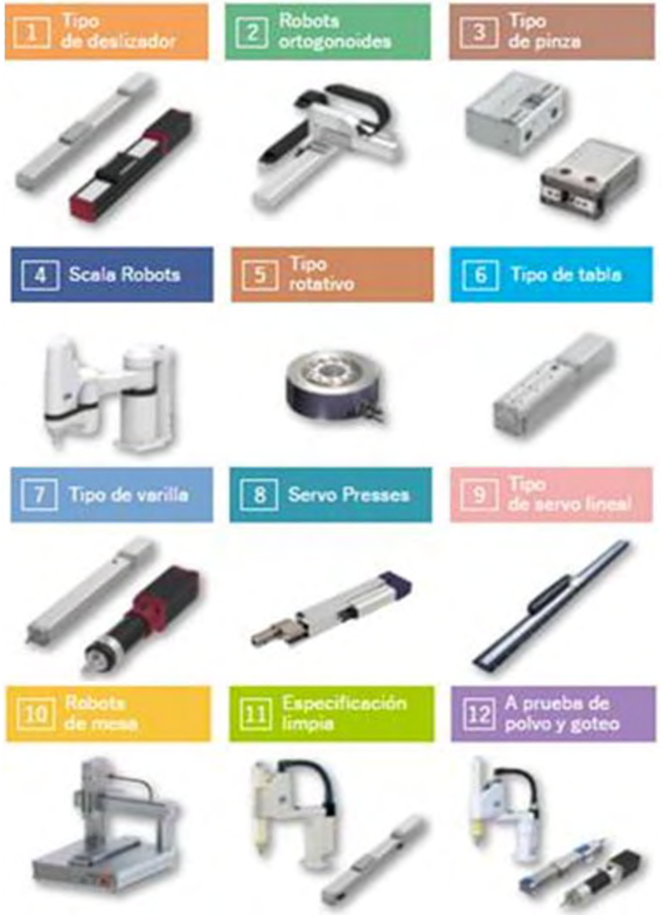
Quality and Innovation

IAI es mecatrónica

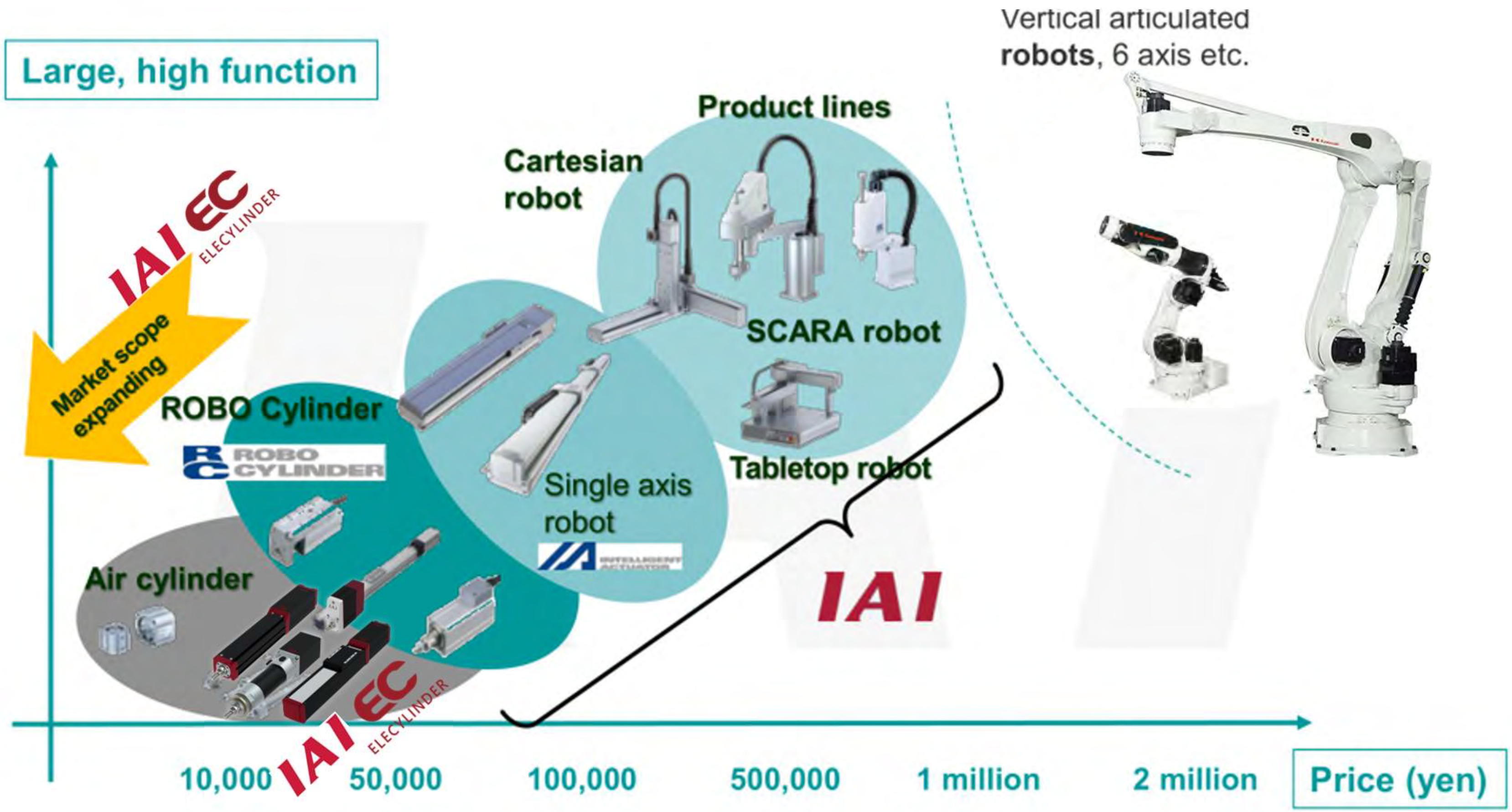
Un entorno coherente de automatización del movimiento

11
12
10
13
9
2
7
8
1
3
4
6
5


1 Tipo de deslizador
2 Robots ortogonoides
3 Tipo de pinza
4 Scala Robots
5 Tipo rotativo
6 Tipo de tabla
7 Tipo de varilla
8 Servo Presses
9 Tipo de servo lineal
10 Robots de mesa
11 Especificación limpia
12 A prueba de polvo y goteo

Movimiento controlado

Arquitecturas vs Costo


Large, high function
Vertical articulated robots, 6 axis etc.
Product lines
Cartesian robot
SCARA robot
Tabletop robot
Single axis robot
ROBO Cylinder
Air cylinder
Market scope expanding
IAI EC ELECYLINDER
IAI
10,000
50,000
100,000
500,000
1 million
2 million
Price (yen)

IAI
Quality and Innovation

Tecnologías

Movimiento eléctrico inteligente

- ROBOTS
  - Morfología
    - Scara (3-4 ejes)
    - Cartesianos (2-6 ejes)
    - Muñeca (2 ejes)
    - RTCK Pinza + rotación
  - Tecnología
    - Paso a paso
    - Servo
    - Direct Drive
    - Dust & clean
  - Controles
    - Controlador de ejes interpolador

- ACTUADORES
  - Tecnología
    - Paso a paso
    - Servo
    - Direct Drive
  - Mecánica
    - Husillo
    - Correa
    - Husillo + correa (revertidos)
    - Direct drive
    - Reforzados
    - Dustproof - clean – waterproof – food grade
  - Movimiento
    - Rotativo
    - Lineal
      - Slider
      - Multi-slider
      - Vástago
      - Paralelo
      - Servoprensa
    - Paralelo Angular
      - Pinzas
  - Controles
    - Integrados en actuador
    - Drivers IO digitales
    - Drivers con bus de campo
    - Rack de drivers con bus de campo

Elecylinder

IAI
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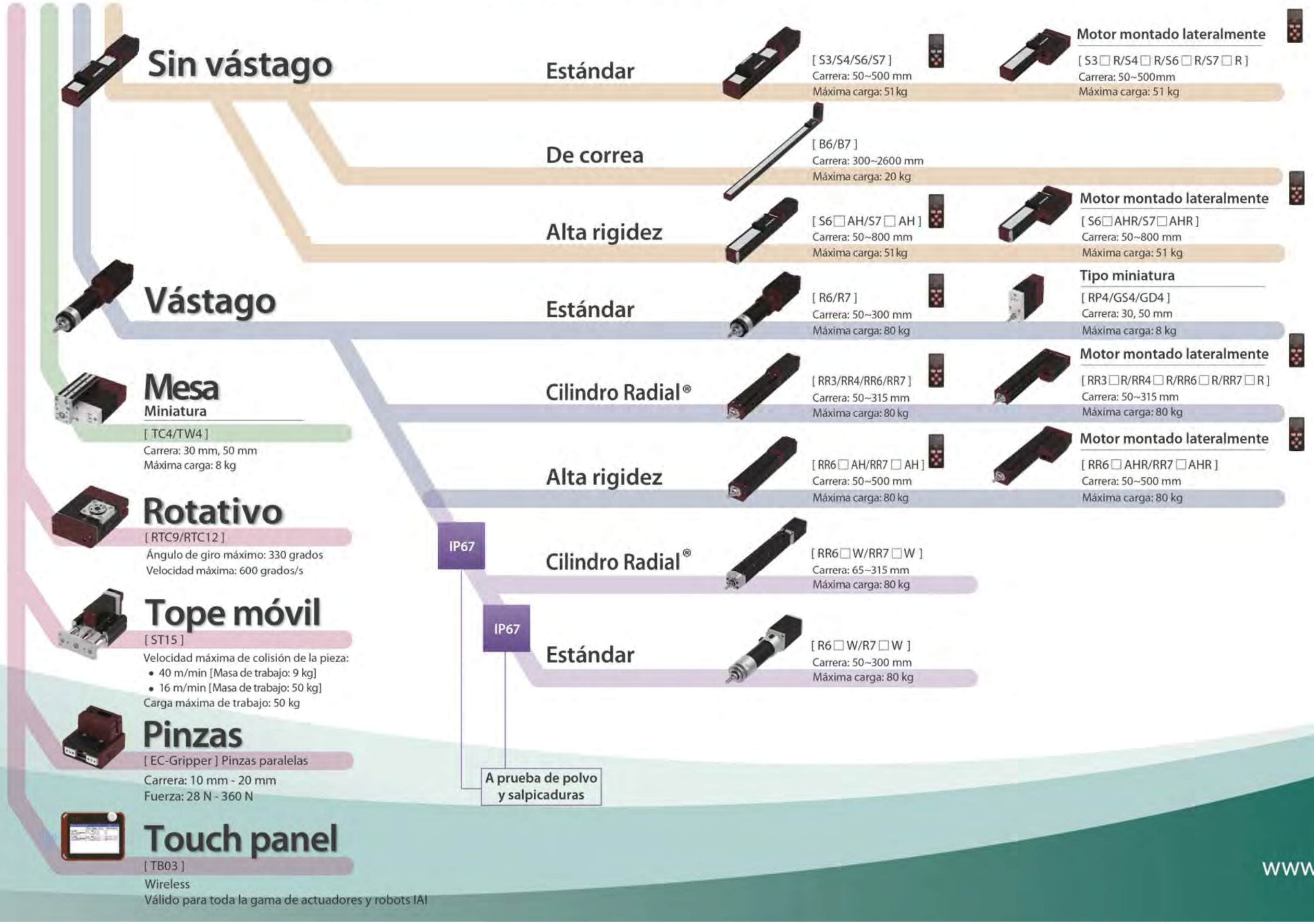
EC
ELECYLINDER

*Controlador integrado
ELECYLINDER® Línea de producto

Display digital de configuración integrado: velocidad, posición aceleración y deceleración.



Sin vástago

Estándar
[S3/S4/S6/S7]
Carrera: 50~500 mm
Máxima carga: 51 kg

Motor montado lateralmente
[S3□R/S4□R/S6□R/S7□R]
Carrera: 50~500mm
Máxima carga: 51 kg

De correa
[B6/B7]
Carrera: 300~2600 mm
Máxima carga: 20 kg

Alta rigidez
[S6□AH/S7□AH]
Carrera: 50~800 mm
Máxima carga: 51 kg

Motor montado lateralmente
[S6□AHR/S7□AHR]
Carrera: 50~800 mm
Máxima carga: 51 kg

Vástago

Estándar
[R6/R7]
Carrera: 50~300 mm
Máxima carga: 80 kg

Tipo miniatura
[RP4/GS4/GD4]
Carrera: 30, 50 mm
Máxima carga: 8 kg

Cilindro Radial®
[RR3/RR4/RR6/RR7]
Carrera: 50~315 mm
Máxima carga: 80 kg

Motor montado lateralmente
[RR3□R/RR4□R/RR6□R/RR7□R]
Carrera: 50~315 mm
Máxima carga: 80 kg

Alta rigidez
[RR6□AH/RR7□AH]
Carrera: 50~500 mm
Máxima carga: 80 kg

Motor montado lateralmente
[RR6□AHR/RR7□AHR]
Carrera: 50~500 mm
Máxima carga: 80 kg

IP67
Cilindro Radial®
[RR6□W/RR7□W]
Carrera: 65~315 mm
Máxima carga: 80 kg

IP67
Estándar
[R6□W/R7□W]
Carrera: 50~300 mm
Máxima carga: 80 kg

A prueba de polvo
y salpicaduras

Mesa
Miniatura
[TC4/TW4]
Carrera: 30 mm, 50 mm
Máxima carga: 8 kg

Rotativo
[RTC9/RTC12]
Ángulo de giro máximo: 330 grados
Velocidad máxima: 600 grados/s

Tope móvil
[ST15]
Velocidad máxima de colisión de la pieza:
- 40 m/min [Masa de trabajo: 9 kg]
- 16 m/min [Masa de trabajo: 50 kg]

Carga máxima de trabajo: 50 kg

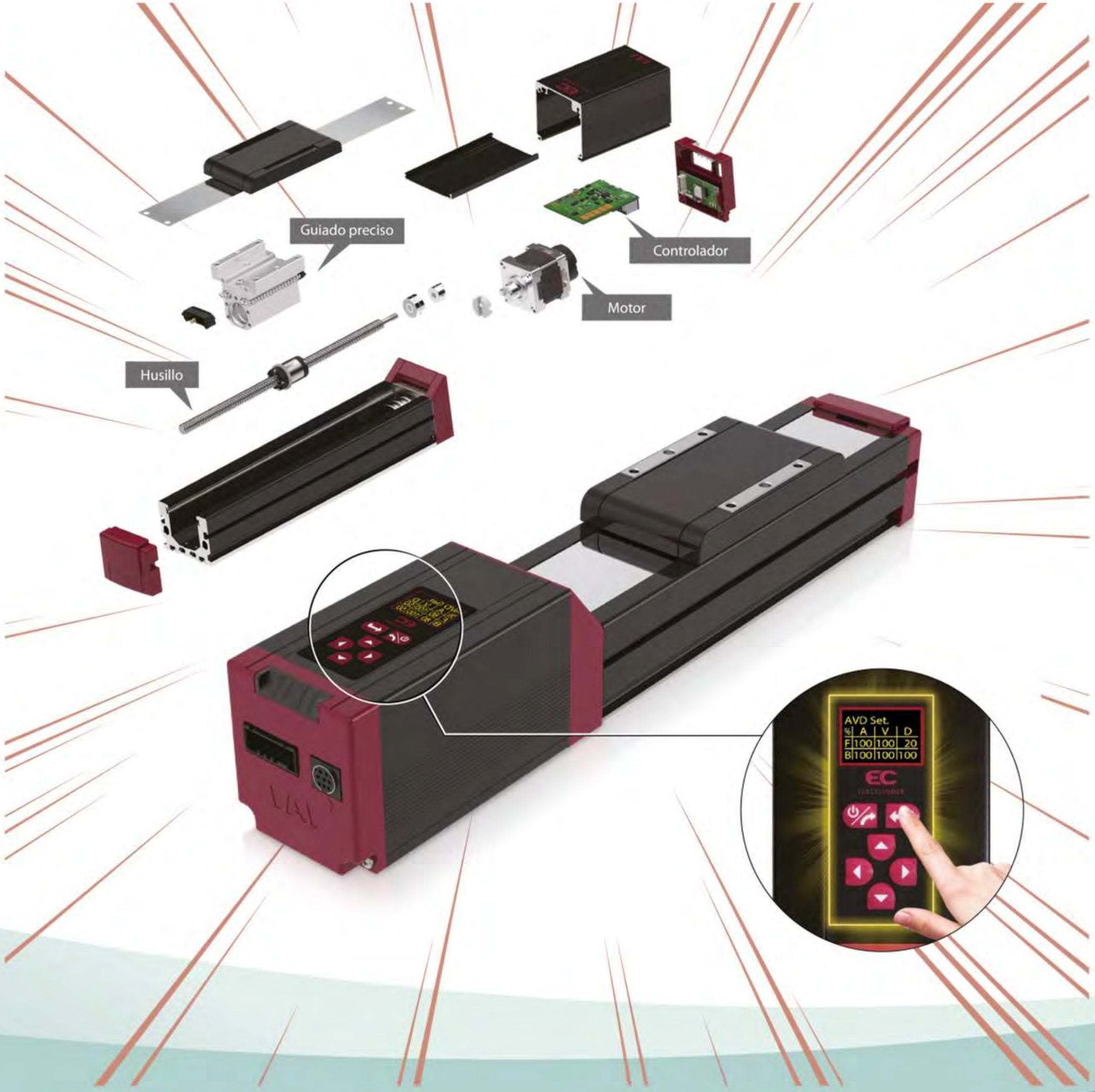
Pinzas
[EC-Gripper] Pinzas paralelas
Carrera: 10 mm - 20 mm
Fuerza: 28 N - 360 N

Touch panel
[TB03]
Wireless
Válido para toda la gama de actuadores y robots IAI

Quality and Innovation

Elecylinder

Control integrado, sustitución 1:1 de la neumática

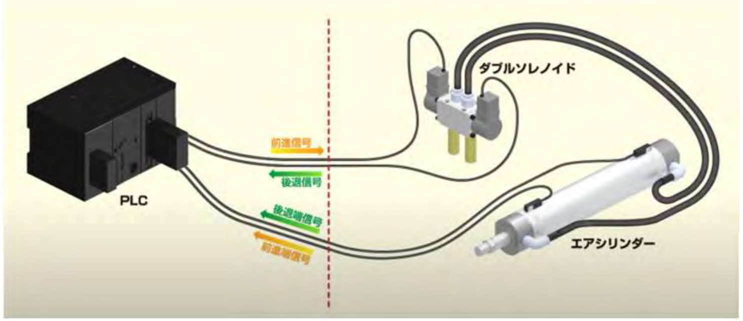

Guiado preciso
Controlador
Motor
Husillo
AVD Set.
% A V D
F 100 100 20
B 100 100 100
EC
ELECYLINDER

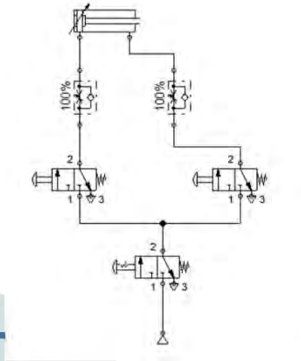
IAI
Quality and Innovation

Elecylinder

Sustituto de la neumática

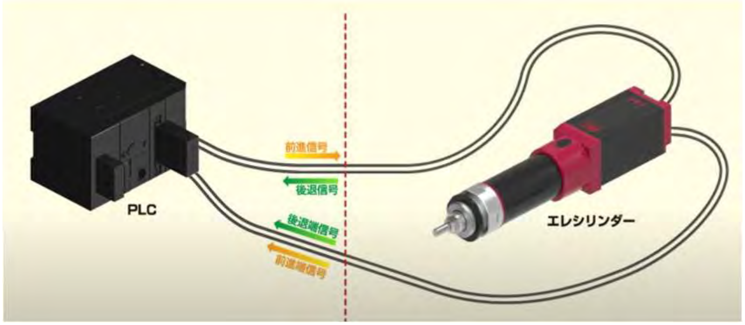
Control y ajuste velocidad en neumática

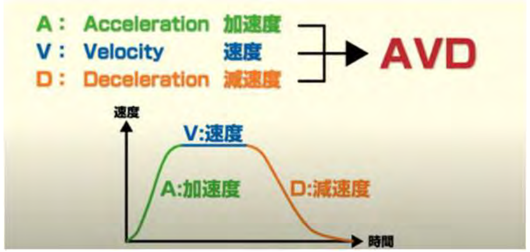

ダブルソレノイド
前進信号
後退信号
後退端信号
前進端信号
PLC
エアシリンダー


100%
100%
2
1
3
2
1
3
2
1
3

a ojo de buen cubero

Control y ajuste velocidad en ELECYLINDER

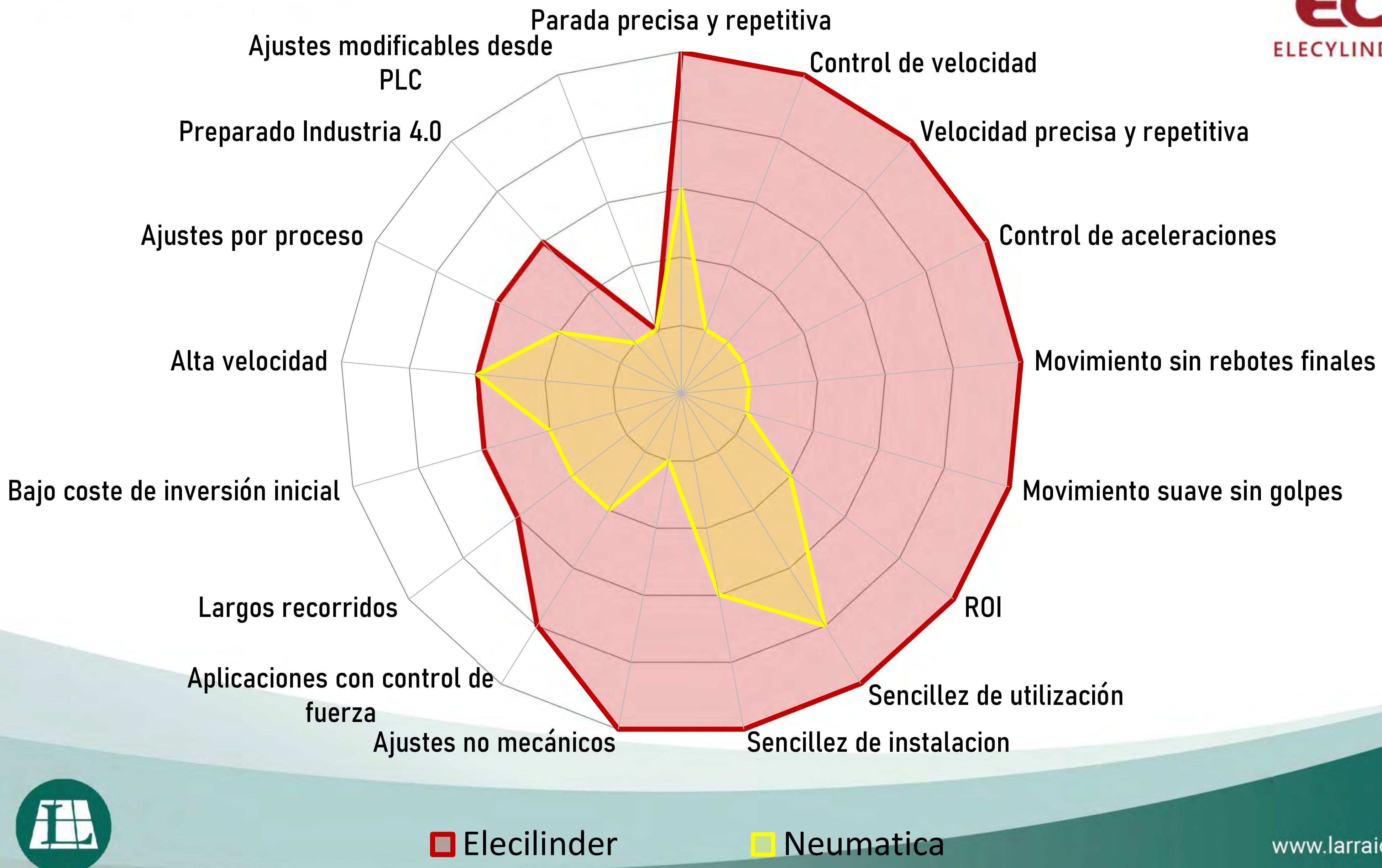

前進信号
後退信号
後退端信号
前進端信号
PLC
エレシリンダー



AVD Set
% A V D
F 100 100 20
B 100 100 100
EC
ELECYLINDER

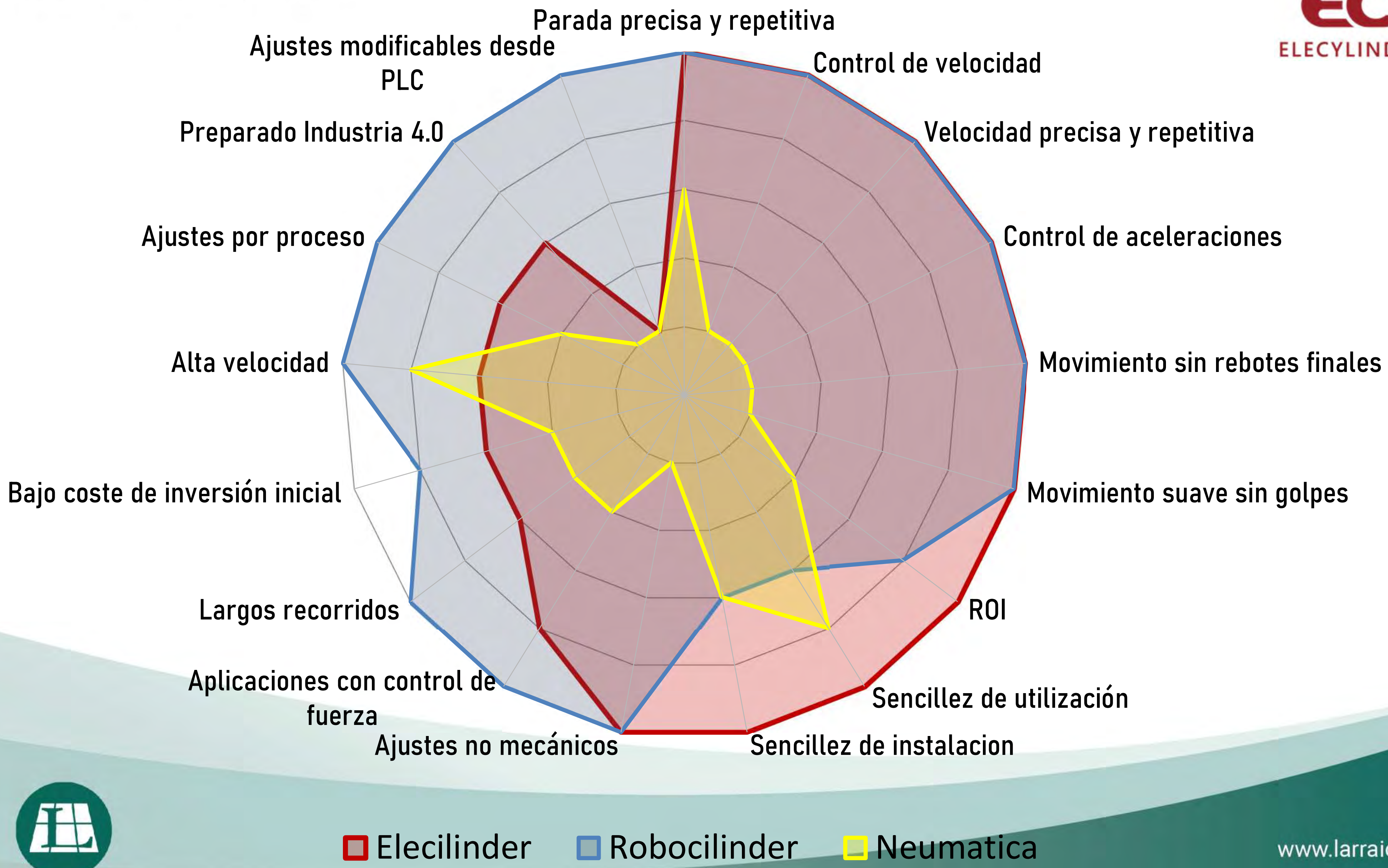
Elecylinder

Control integrado, sustitución 1:1 de la neumática



Elecylinder

Control integrado, sustitución 1:1 de la neumática



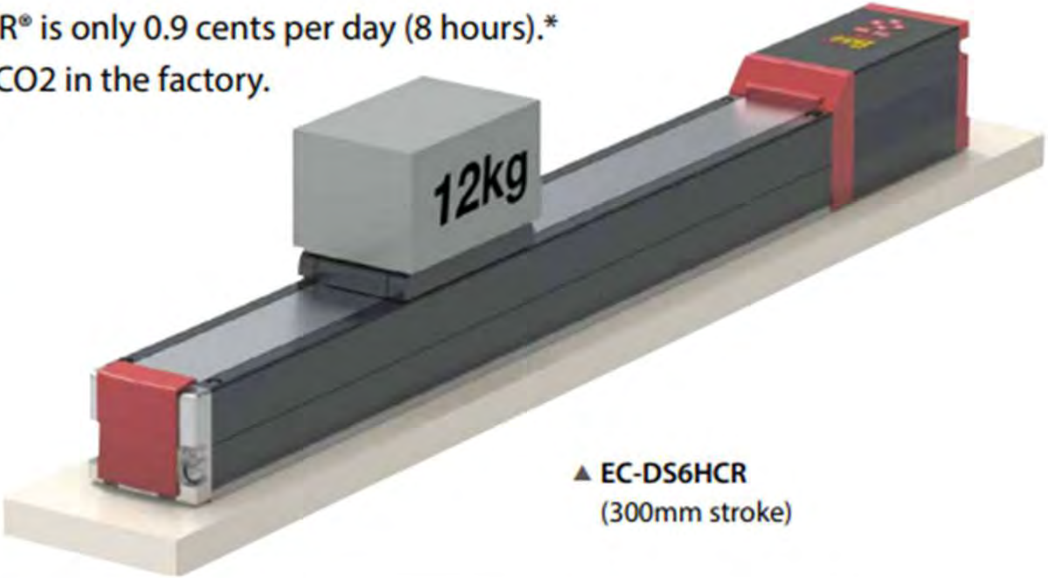
www.larraioz.com

Quality and Innovation

Elecylinder

Ahorro de energía eléctrica

Electric utility cost of ELECYLINDER® is only 0.9 cents per day (8 hours).*
It contributes to the reduction of CO2 in the factory.



▲ **EC-DS6HCR**
(300mm stroke)

ELECYLINDER operating conditions	
Stroke	300mm
Speed	300mm/s
Acceleration/deceleration	1.0G
Payload	12kg
Duty ratio	10.0%
Cycle time	20s
Travel time	2s
Stopping time	18s
Power consumption	0.0065kWh
Unit cost for electricity	US$0.17/kWh*
Operating time	8 hours
Annual operating days	240 days

*Based on our experiment data in Japan.
*Exchange Rate: 1 (USD) = 100 (Japanese Yen)

Annual Electric utility cost	**US$212*** 0.065kWh/hr. x $0.17 x 8 hrs. x 240 days
CO_2emission / year (Emission coefficient: 0.000445t-CO_2)	**5.6**kg-CO_2 0.0065kwh/hr. x 0.445kg-CO_2/kWh x 8 hrs. x 240 days

Quality and Innovation

Control posición/fuerza

Sistema unificado de control de dispositivos (CON)

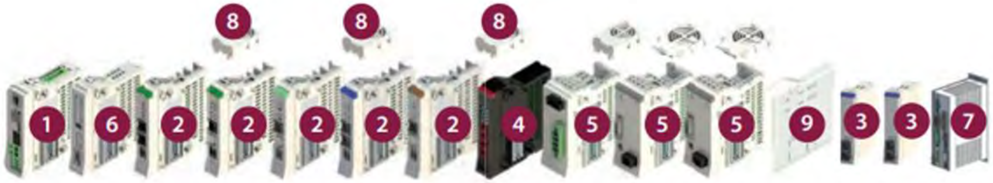
IAI
Modbus
PROFINET
EtherCAT
EtherNet/IP
CC-Link IE
PROFIBUS
CC-Link
DeviceNet

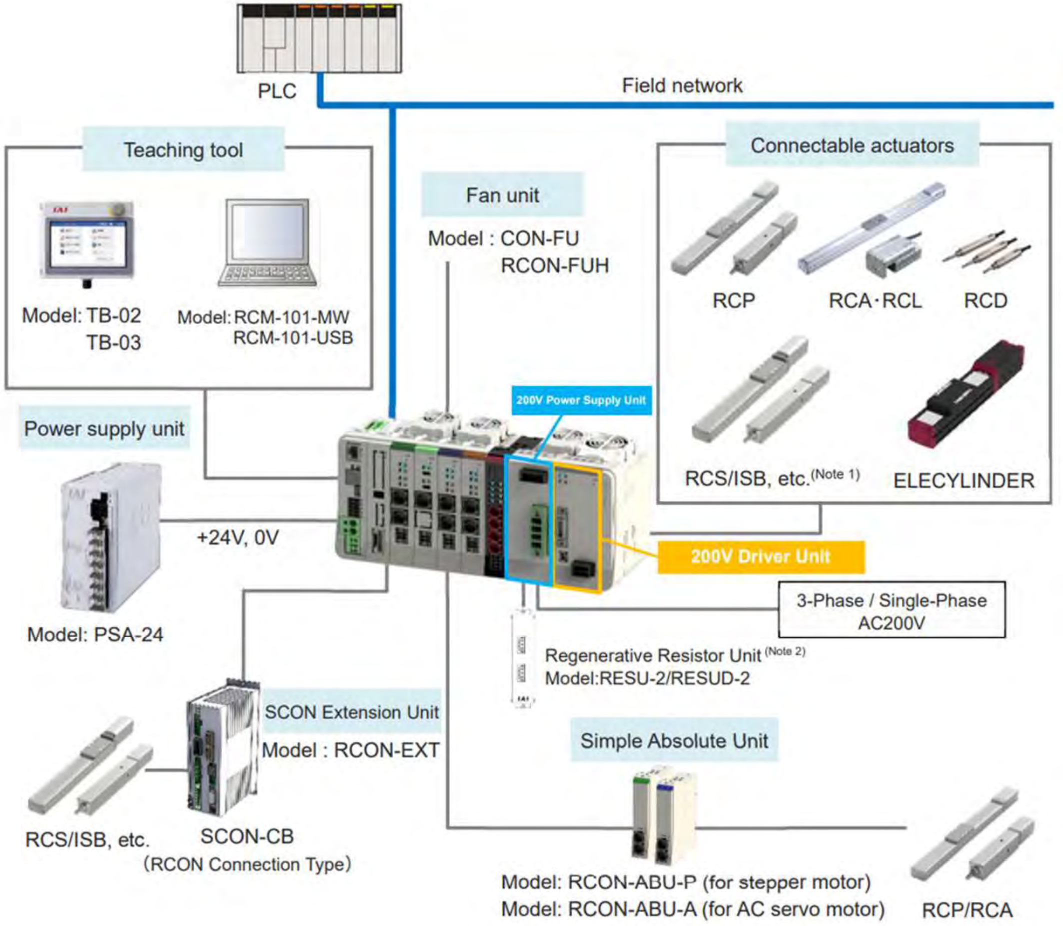
Quality and Innovation

RCON

Compatible con cualquier actuador IAI

Order model (x number of units)	Name/specification	
RCON-GW-CC-FU3-TRN	Gateway unit (with 3 fans, without terminal unit)	① ⑧
RCON-EXT	SCON expansion unit	⑥
RCON-PC-2	24V driver unit (RCP Series connection, 2-axis specification)	②
RCON-PC-1	24V driver unit (RCP Series connection, 1-axis specification)	②
RCON-PCF-1	24V driver unit (RCP Series connection, 1-axis specification, for high thrust)	②
RCON-AC-2	24V driver unit (RCA Series connection, 2-axis specification)	②
RCON-DC-1	24V driver unit (RCD Series connection, 1-axis specification)	②
RCON-ABU-A x 2 units	Simple absolute unit (for RCA Series connection)	③
RCON-EC-4	EC connection unit	④
RCON-PS2-3	230V power supply unit	⑤ ⑨
RCON-SC-1 x 2 units	230V driver unit	⑤
SCON-***-RC	RCON connection specification SCON controller *Select the model to order based on the actuator to connect.	⑦




PLC

Field network

Teaching tool

Model: TB-02
TB-03

Model: RCM-101-MW
RCM-101-USB

Fan unit

Model : CON-FU
RCON-FUH

Connectable actuators

RCP

RCA･RCL

RCD

RCS/ISB, etc.(Note 1)

ELECYLINDER

200V Power Supply Unit

Power supply unit

+24V, 0V

Model: PSA-24

200V Driver Unit

3-Phase / Single-Phase AC200V

Regenerative Resistor Unit (Note 2)
Model:RESU-2/RESUD-2

SCON Extension Unit

Model : RCON-EXT

RCS/ISB, etc.

SCON-CB
(RCON Connection Type)

Simple Absolute Unit

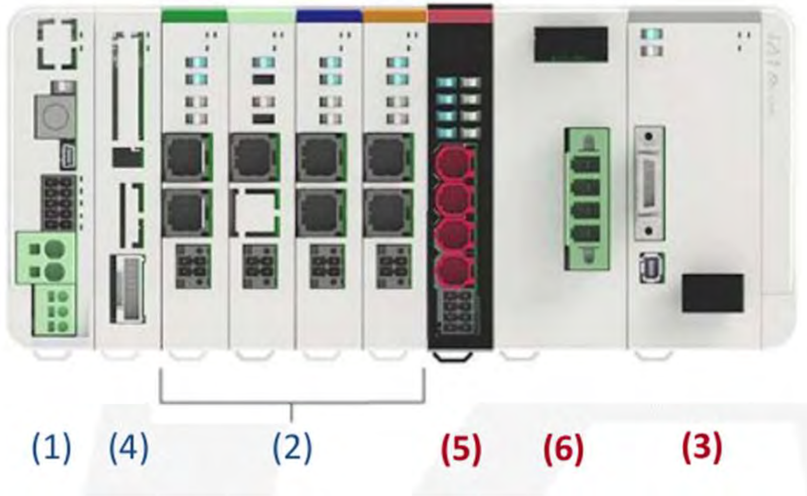
Model: RCON-ABU-P (for stepper motor)
Model: RCON-ABU-A (for AC servo motor)

RCP/RCA

IAI
Quality and Innovation

RCON

Compatible con cualquier actuador IAI

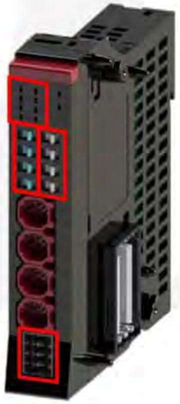


(1) Gateway unit
(2) 24V Driver unit
(3) 200V Driver unit
(4) SCON Extension unit
(5) EC connection unit
(6) 200V Power supply unit

Quality and Innovation

RCON-EC

ELECYLINDER opción ACR



- LED for LS0/LS1

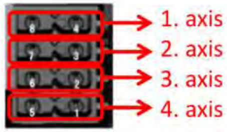
LS0
LS1
ALM
I
II
III
IV

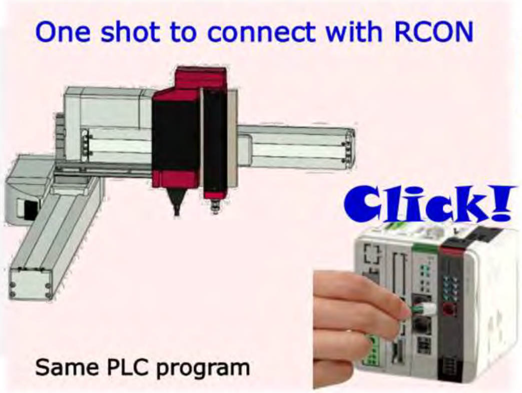
- JOG switch
  - Can be disabled in Gateway parameter configuration tool (“Option unit parameter”)
  - Disabled in AUTO mode, monitor mode in MANU mode or when JOG window is opened

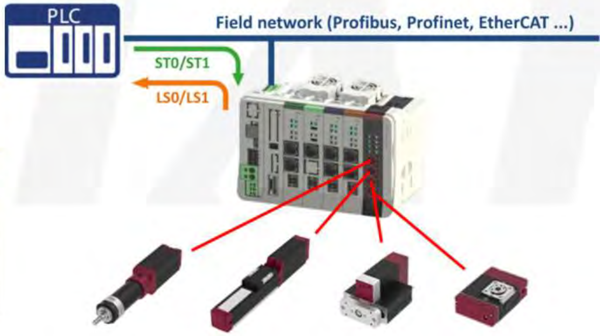
- Brake release switch

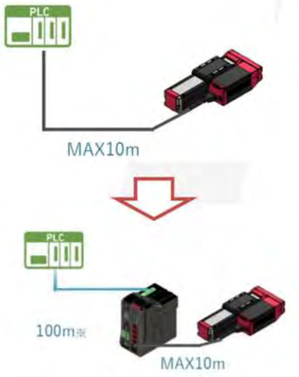
RLS
NOM
I
II
III
IV

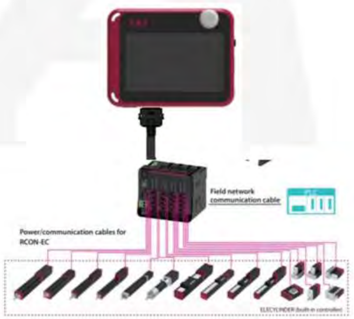
- Cut-off of motor power supply for each axis individually

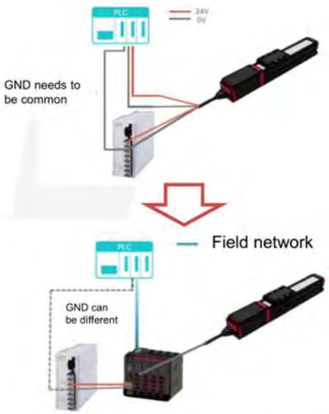

1. axis
2. axis
3. axis
4. axis


One shot to connect with RCON
Click!
Same PLC program


PLC
Field network (Profibus, Profinet, EtherCAT ...)
ST0/ST1
LS0/LS1


PLC
MAX10m
PLC
100m
MAX10m


Field network communication cable
PLC
Power/communication cables for RCON-EC
ELECYLINDER (built-in controller)


PLC
24V
0V
GND needs to be common
Field network
PLC
GND can be different

IAI
Quality and Innovation

Buses de campo

CON y SEL

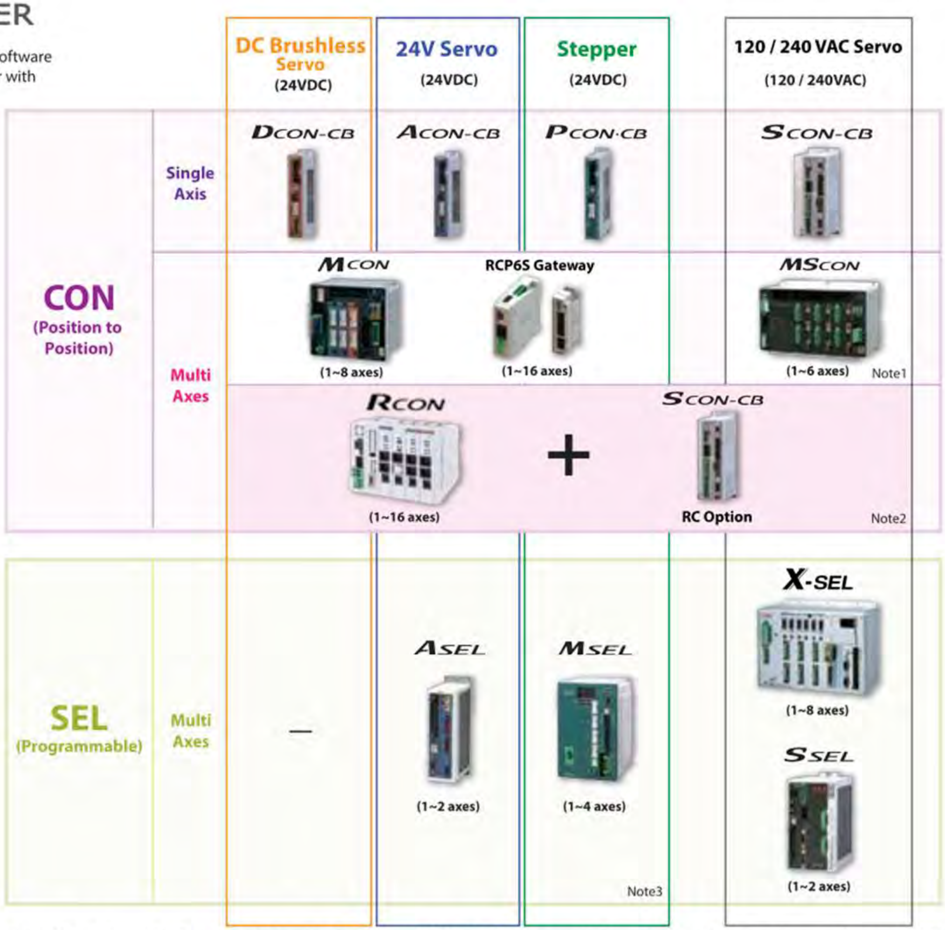
EtherNet/IP CompoNet DeviceNet CC-Link PROFIBUS PROFINET MECHATROLINK EtherCAT SSCNET III/H

LC-LADDER

Free Ladder Programming Software is available for our controller with PLC function

Controller series		Ellipsis	position controller									program controller					
			PCON -CB	ACON -CB	SCON -CB	SCON -CAL	SCON-CB (servo press specification)	DCON -CB	MCON -C	MSCON	RCON	SSEL	TTA	RSEL	MSEL	XSEL -P/Q	XSEL -RA/SA
Field network type	DeviceNet	DV	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CompoNet	CN	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–
	EtherCAT	EC	●	●	●	●	●	●	●	●	●	–	●	●	●	–	●
	EtherCAT Motion	ECM	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
	EtherNet/IP	EP	●	●	●	●	●	●	●	●	●	●	● (*3)	●	● (*3)	● (*3)	● (*4)
	CC-Link	CC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CC-Link IE Field CIE	CIE	●	●	●	–	●	●	●	–	●	–	–	●	–	–	–
	SSCNET Ⅲ/H	SSN	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
	MECHATRO LINK Ⅰ/Ⅱ (*1)	ML	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–
	MECHATRO LINK Ⅲ (*1)	ML3	●	●	●	–	–	●	●	–	–	–	–	–	–	–	–
	PROFIBUS-DP	PR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PROFINET IO	PRT	●	●	●	●	●	●	●	–	●	–	–	●	●	–	–
	IA net	IA	–	–	–	–	–	–	–	–	–	●	●	–	●	–	–
Number of positioning points (*2)			768						256		128	20000	30000	36000	30000	20000	55000
Operating method	Position No. Movement by specifying positions		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Direct number Movement by specifying direct values		●	●	●	●	–	●	●	●	●	–	–	–	–	–	–
Reference page for controllers			P7-137	P7-1163	P7-187	P7-217	P7-203	P7-163	P7-117	P7-231	P7-38	P7-243	P7-615	P7-45	P7-257	P7-271	P7-289

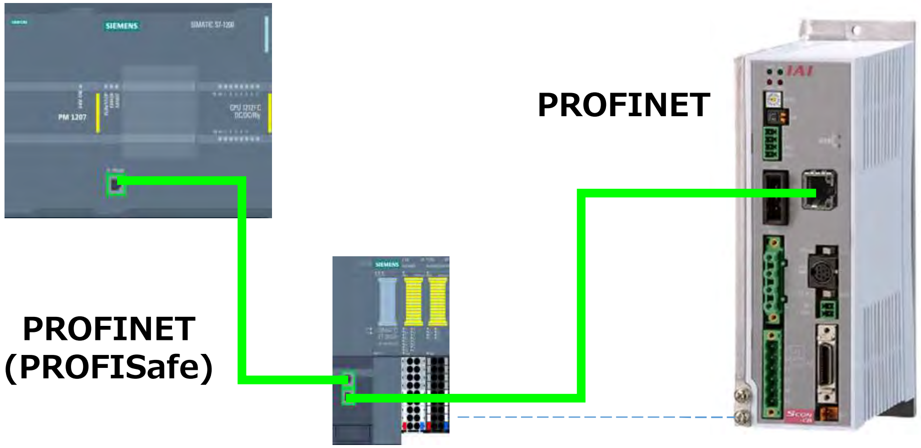
(*1) MECHATROLINK I/II is treated as an intelligent I/O, and supports only non-synchronous communication. MECHATROLINK III is compatible with the standard ServoProfile.
(*2) When it is operated by movement by specifying direct values, the number of positioning points is unlimited.
(*3) Able to cope with EtherNet (TCP/IP: message communication) when switching the parameters for EtherNet/IP.
(*4) It corresponds to Ethernet (TCP/IP: message communication) only for standard Ethernet.


DC Brushless Servo (24VDC)
24V Servo (24VDC)
Stepper (24VDC)
120 / 240 VAC Servo (120 / 240VAC)
CON (Position to Position)
Single Axis
DCON-CB
ACON-CB
PCON-CB
SCON-CB
Multi Axes
MCON
(1~8 axes)
RCP6S Gateway
(1~16 axes)
MSCON
(1~6 axes)
Note1
RCON
(1~16 axes)
+
SCON-CB
RC Option
Note2
SEL (Programmable)
Multi Axes
—
ASEL
(1~2 axes)
MSEL
(1~4 axes)
Note3
X-SEL
(1~8 axes)
SSEL
(1~2 axes)

Note1: SSEL (1~2 axes) has Positioner Mode. Note2: Additional SCON-CB RC Option required per axis. Note3: PSEL (1~2 axes) only supports RCP2 / RCP3

Integración en redes seguras

Controladores IAI que soportan PROFIsafe



PROFINET

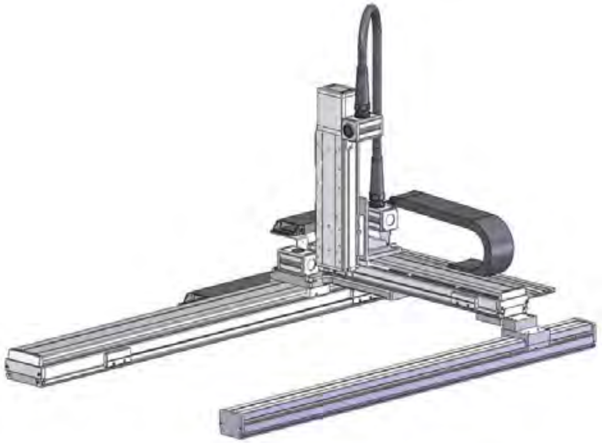
PROFINET
(PROFISafe)

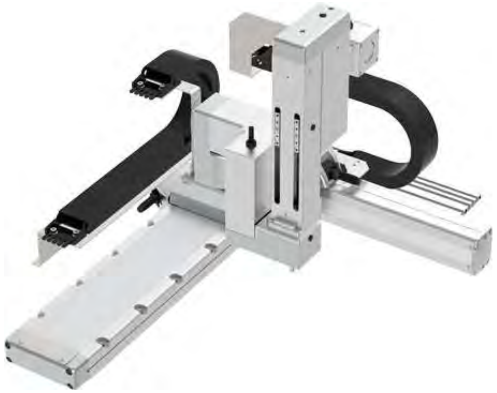
Tipo de Controlador	Tipo CON (posicionador)							Tipo SEL (CPU robot con interpolación real e IOS)					
Serie de Controlador	PCON	ACON	SCON	DCON	MCON	MSCON	RCON	PSEL	ASEL	SSEL	TTA	MSEL	XSEL
Aspecto							new						
PROFINET	✓	✓	✓	✓	✓	✓	✓					✓	
PROFIBUS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

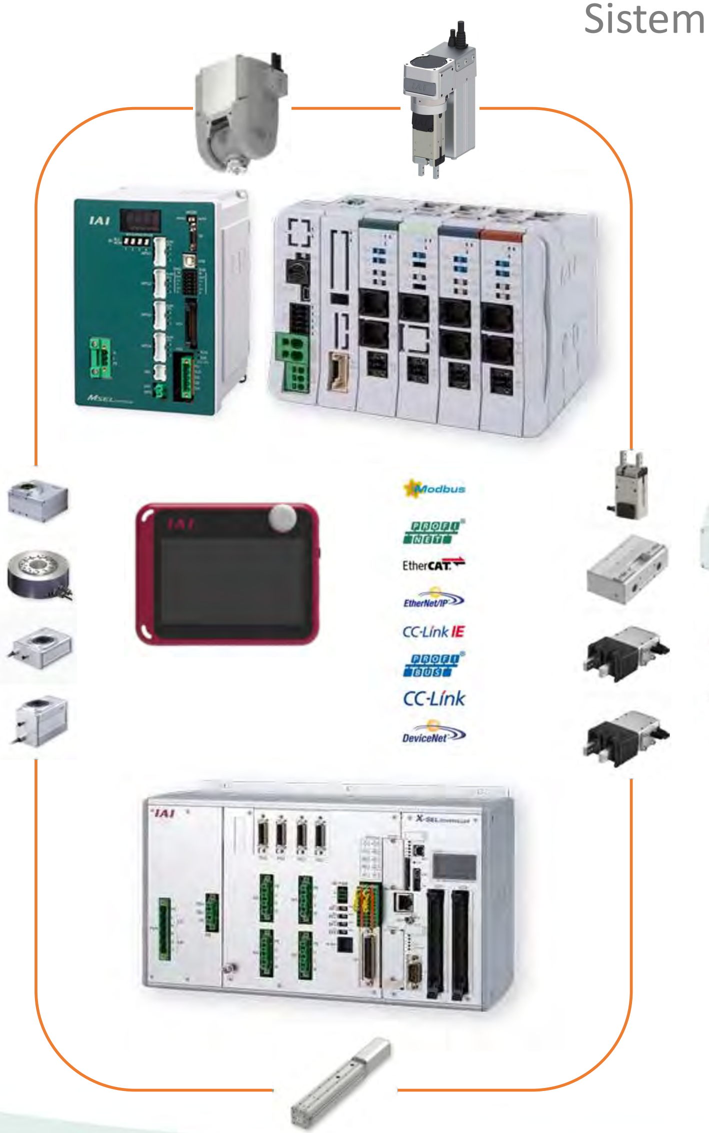
IAI
Quality and Innovation

Controles programables

Sistema unificado de sistemas robóticos (SEL)






Modbus
PROFINET
EtherCAT
EtherNet/IP
CC-Link IE
PROFIBUS
CC-Link
DeviceNet

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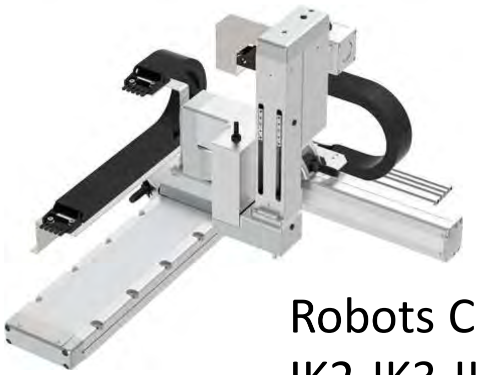
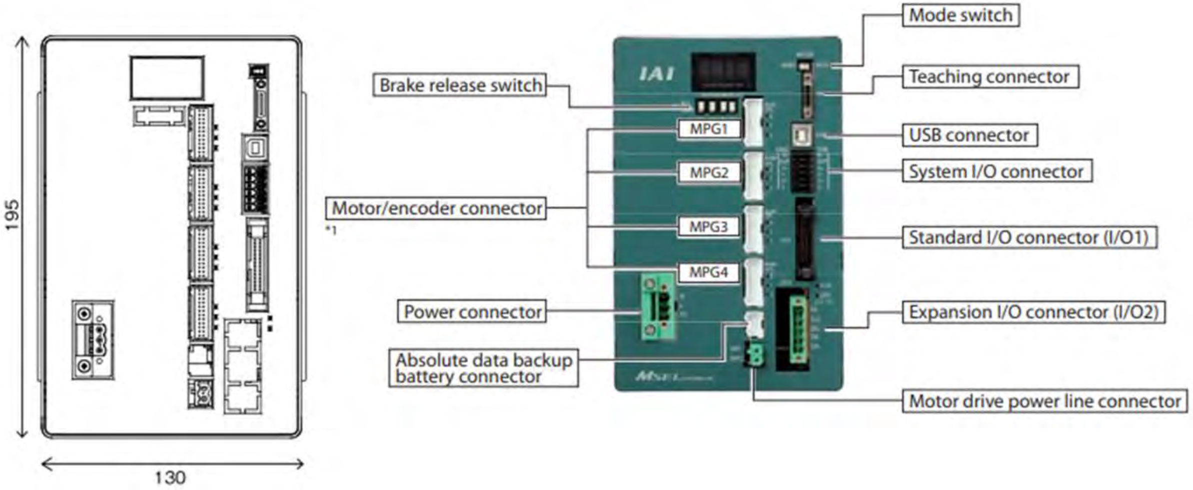
MSEL

Control programable interpolador motores paso a paso



Robots Cartesianos
IK2-IK3-IK4

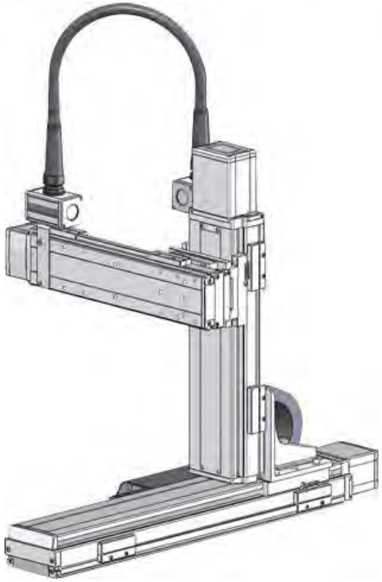

195
130
Mode switch
Brake release switch
Teaching connector
USB connector
MPG1
MPG2
MPG3
MPG4
System I/O connector
Motor/encoder connector
*1
Standard I/O connector (I/O1)
Power connector
Expansion I/O connector (I/O2)
Absolute data backup battery connector
Motor drive power line connector
IAI
MSEL

Robots Scara IXP

- Bajo consumo y pequeño tamaño
- De 2 a 4 ejes con interpolación real
- Lenguaje SEL
- PLC integrado
- 16/16 IO ampliables, Bus de campo
- Comunicaciones Ethernet y Serie

XSEL

Control programable interpolador motores servo



Robots Cartesianos
ICSB/ICSA/ICSPA

IAI
IAI
X-SEL

IXA
IAI Corporation

Robots Scara IXA

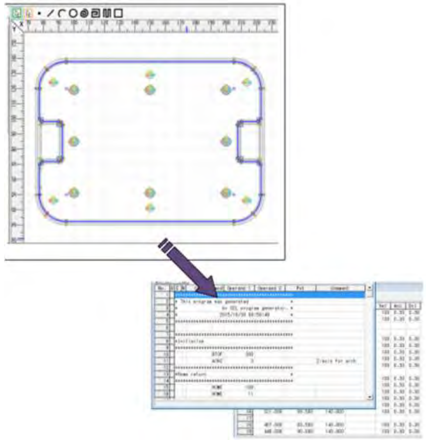
De 2 a 8 ejes con interpolación real
Lenguaje SEL
PLC integrado
32/16 IO ampliables, Bus de campo
Comunicaciones Ethernet y Serie

Quality and Innovation

TTA-Robot

Robots cartesianos de sobremesa

Asistentes tecnológicos: Programar sin programar



Programación desde el CAD
- Atornillado
- Dispensado
- Soldadura

Conectar a 220Vca y listo para trabajar
De 2 a 4 ejes con interpolación real
Motores paso a paso y servo a 220Vca
Lenguaje SEL
PLC integrado
16/16 IO ampliables, Bus de campo
Comunicaciones Ethernet y Serie

Quality and Innovation

Robot cartesiano modular

Cómo diseñarlo en 3 pasos

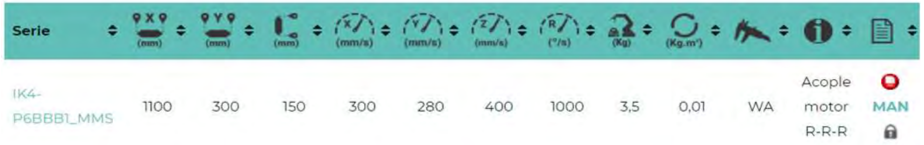
Seleccionar arquitectura

[20 variantes: Robots cartesianos | Larraioz Elektronika]

Robots cartesianos de 4 ejes XYZR en cantilever, eje Y sobre su base, eje Z+R sobre su base

Seleccionar prestaciones

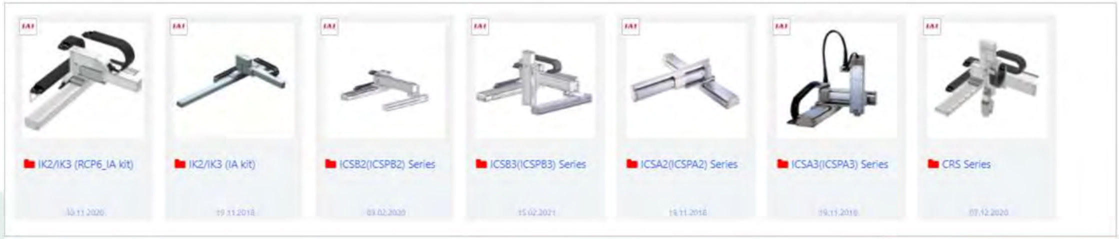
Carrera de cada eje, velocidad, carga, Repetitividad, Manual instalación



Serie	X (mm)	Y (mm)	(mm)	X (mm/s)	Y (mm/s)	Z (mm/s)	R (°/s)	(Kg)	(Kg.m²)			
IK4-P6BBB1_MMS	1100	300	150	300	280	400	1000	3,5	0,01	WA	Acople motor R-R-R	MAN

Obtener el CAD a medida

Configurador de sistemas IAI: CAD a medida gratuito



IK2/IK3 (RCP6_IA kit) 10.11.2020

IK2/IK3 (IA kit) 19.11.2018

ICSB2(ICSPB2) Series 03.02.2020

ICSB3(ICSPB3) Series 15.02.2021

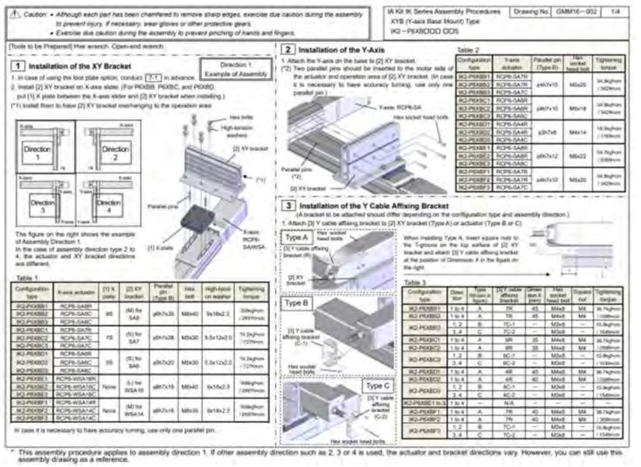
ICSA2(ICSPA2) Series 19.11.2018

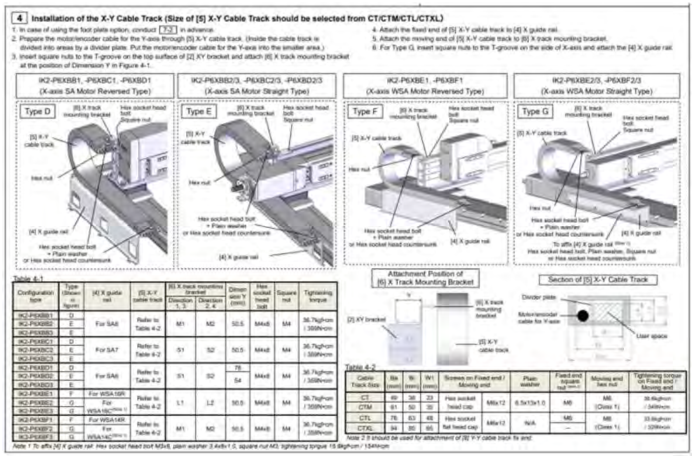
ICSA3(ICSPA3) Series 19.11.2018

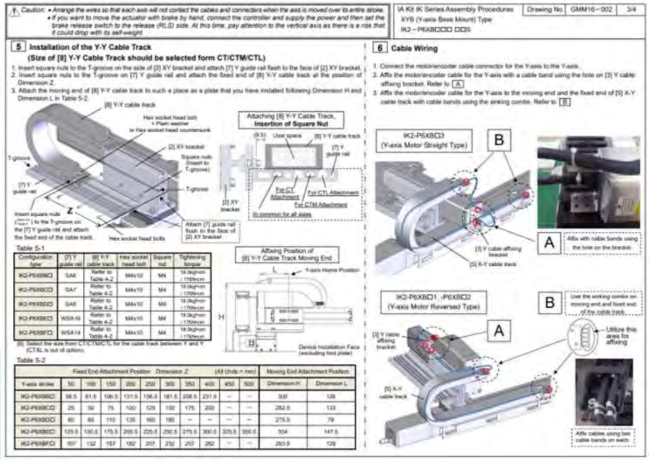
CRS Series 07.12.2020

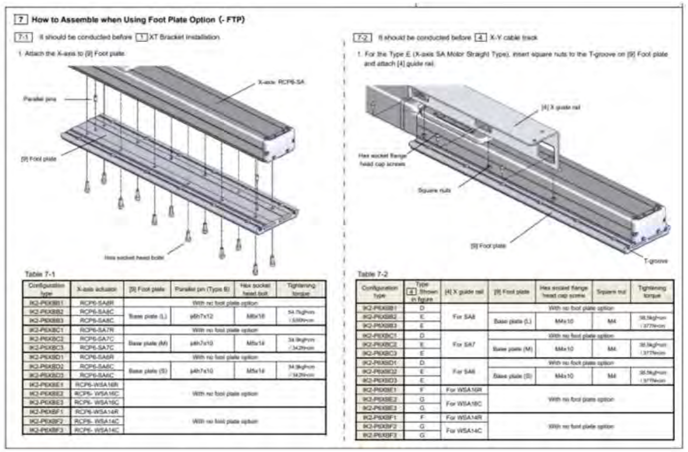
IK2-KIT

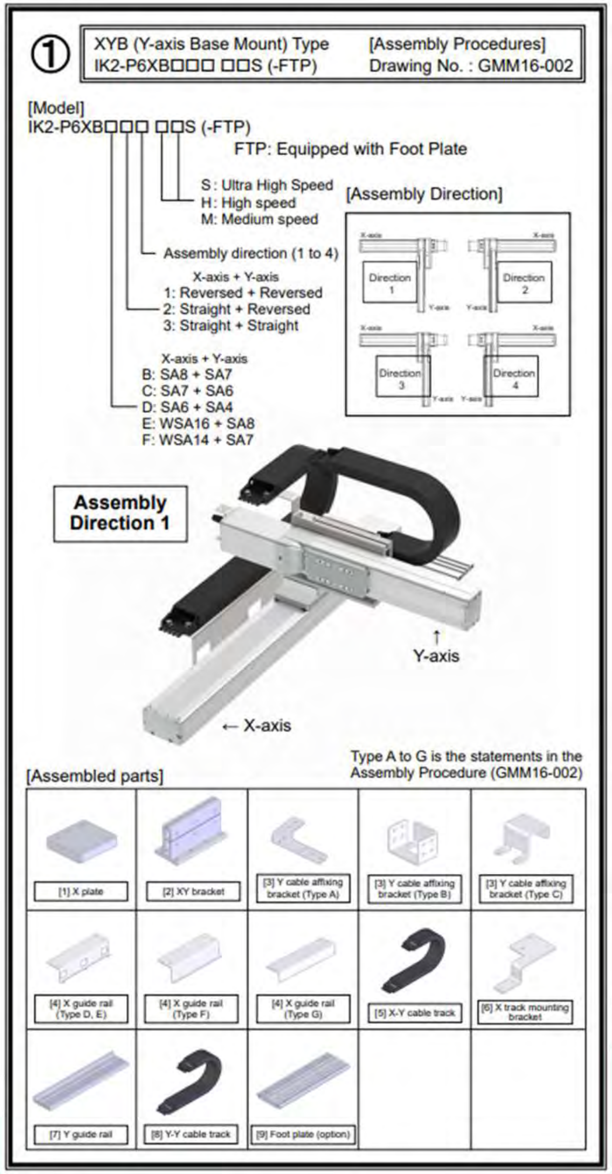
Ejemplo: Robot cartesiano de 2 ejes











① XYB (Y-axis Base Mount) Type
IK2-P6XB□□□ □□S (-FTP)

[Assembly Procedures]
Drawing No. : GMM16-002

[Model]
IK2-P6XB□□□ □□S (-FTP)

FTP: Equipped with Foot Plate

S : Ultra High Speed
H: High speed
M: Medium speed

Assembly direction (1 to 4)

X-axis + Y-axis
1: Reversed + Reversed
2: Straight + Reversed
3: Straight + Straight

X-axis + Y-axis
B: SA8 + SA7
C: SA7 + SA6
D: SA6 + SA4
E: WSA16 + SA8
F: WSA14 + SA7

[Assembly Direction]

Assembly Direction 1

Type A to G is the statements in the Assembly Procedure (GMM16-002)

[Assembled parts]

X-axis
Y-axis
Direction 1
Direction 2
Direction 3
Direction 4
← X-axis
↑ Y-axis
[1] X plate
[2] XY bracket
[3] Y cable affixing bracket (Type A)
[3] Y cable affixing bracket (Type B)
[3] Y cable affixing bracket (Type C)
[4] X guide rail (Type D, E)
[4] X guide rail (Type F)
[4] X guide rail (Type G)
[5] X-Y cable track
[6] X track mounting bracket
[7] Y guide rail
[8] Y-Y cable track
[9] Foot plate (option)

Quality and Innovation

Acelera tu oficina técnica

Herramientas para ingenierías

Los recursos de las oficinas técnicas son caros y escasos.
Hay que centrarse en los problemas no resueltos

Mover objetos ya está resuelto, son componentes comerciales listos para usar y estándar.
Seleccionar y configurar, no diseñar y asumir riesgos innecesarios en aquello que no aporta valor

Carga útil
Tiempo de ciclo
Velocidad lineal
Grados de libertad
Volumen / Área trabajo

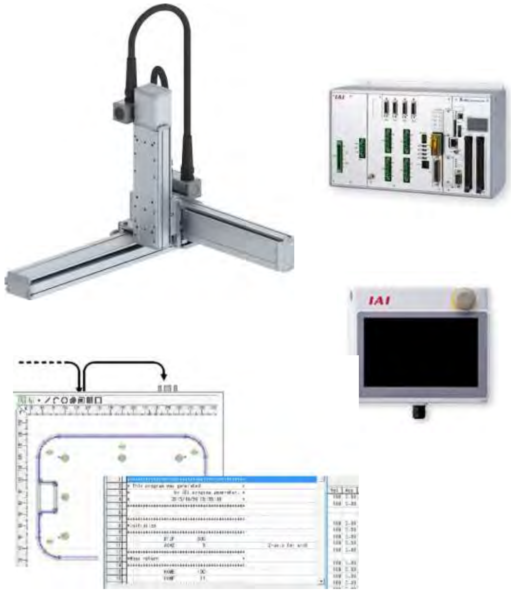
Arquitectura
- Robots cartesianos | Larraioz Elektronika
- 2 ejes
- 3 ejes
- 4 ejes

Prestaciones mecánicas
- Carga útil
- Volumen trabajo
- Repetitividad

Prestaciones dinámicas
- Velocidad
- Aceleración

Control avanzado
- Bus de campo
- Asistente tecnológico
- Comunicaciones
- PLC integrado

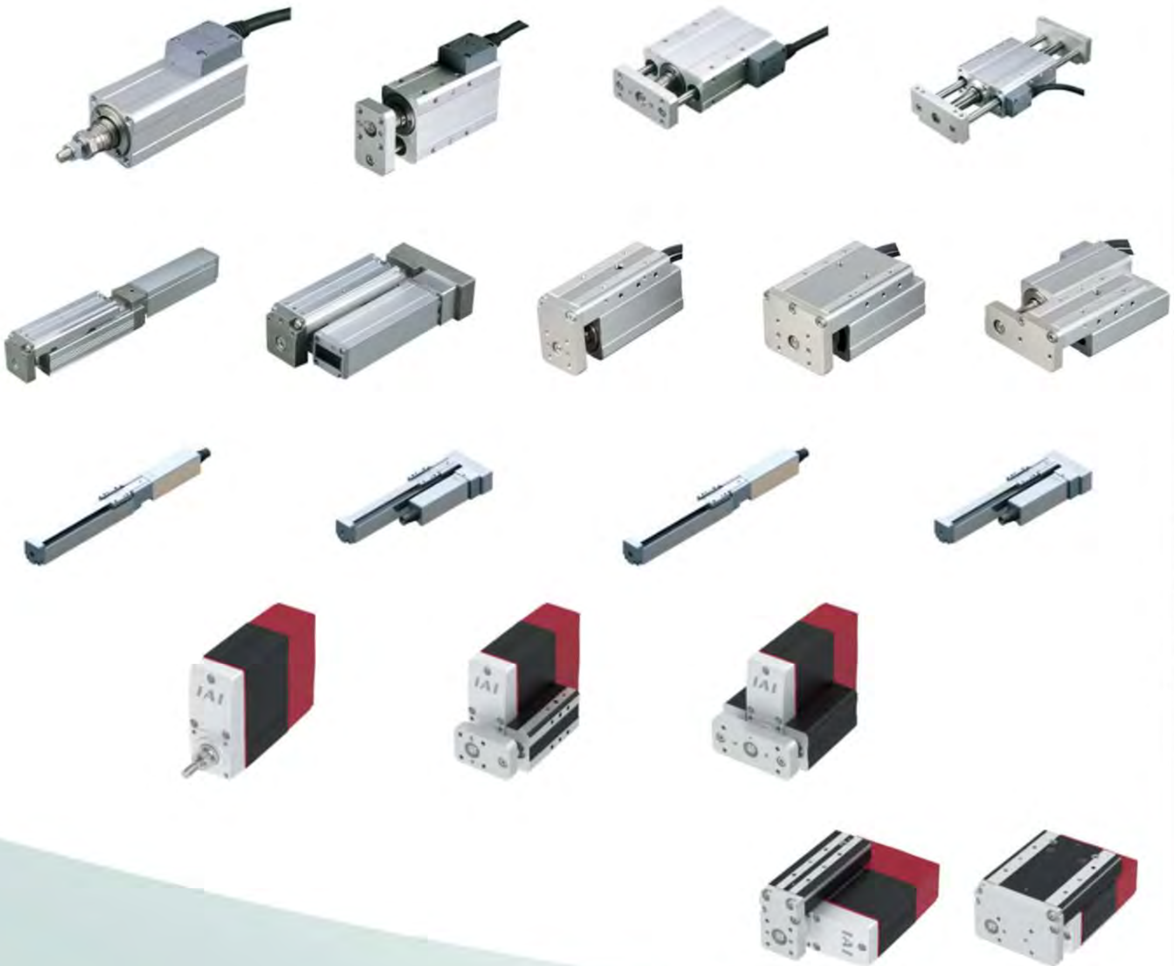
Recursos
- CAD
- Presupuesto
- Manual Instalación

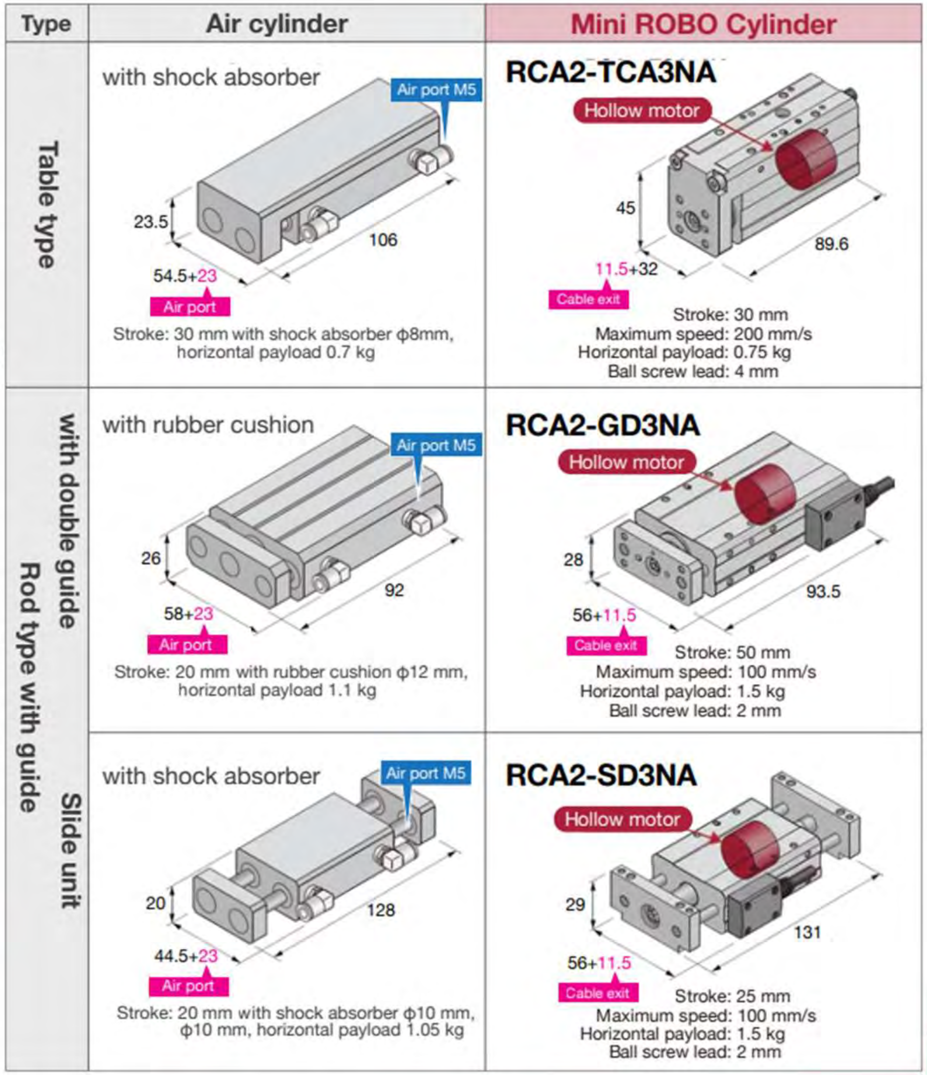


IAI
Quality and Innovation

Mini Robo Cylinder

Sustitución de mini cilindros neumáticos guiados



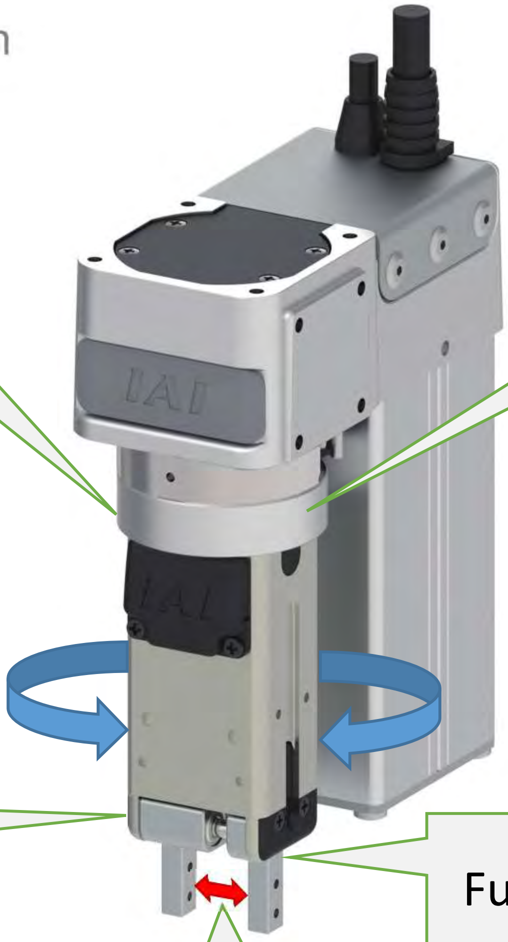


Type	Air cylinder	Mini ROBO Cylinder
Table type	with shock absorber Air port M5 23.5 106 54.5+23 Air port Stroke: 30 mm with shock absorber ϕ8mm, horizontal payload 0.7 kg	**RCA2-TCA3NA** Hollow motor 45 89.6 11.5+32 Cable exit Stroke: 30 mm Maximum speed: 200 mm/s Horizontal payload: 0.75 kg Ball screw lead: 4 mm
Rod type with guide with double guide	with rubber cushion Air port M5 26 92 58+23 Air port Stroke: 20 mm with rubber cushion ϕ12 mm, horizontal payload 1.1 kg	**RCA2-GD3NA** Hollow motor 28 93.5 56+11.5 Cable exit Stroke: 50 mm Maximum speed: 100 mm/s Horizontal payload: 1.5 kg Ball screw lead: 2 mm
Slide unit	with shock absorber Air port M5 20 128 44.5+23 Air port Stroke: 20 mm with shock absorber ϕ10 mm, ϕ10 mm, horizontal payload 1.05 kg	**RCA2-SD3NA** Hollow motor 29 131 56+11.5 Cable exit Stroke: 25 mm Maximum speed: 100 mm/s Horizontal payload: 1.5 kg Ball screw lead: 2 mm

Quality and Innovation

RCP6-RTCK

Pinza con rotación integrada



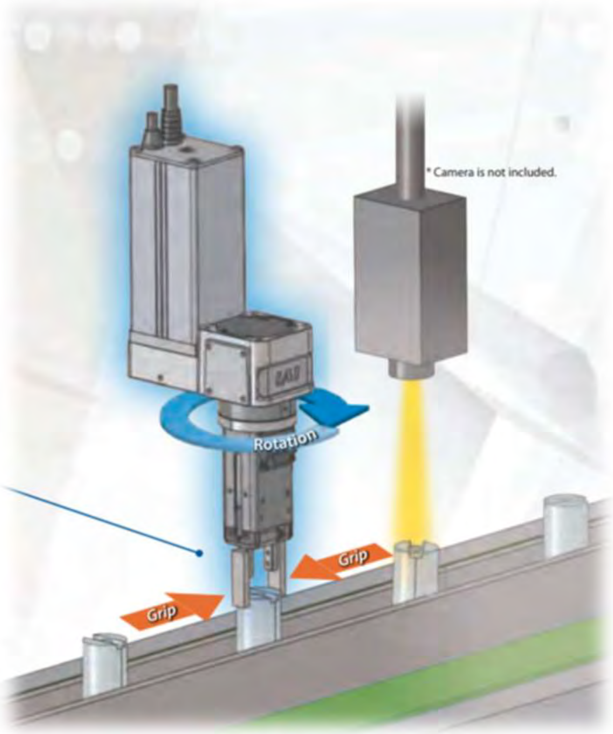
Giro
1800º/seg

Angulo max.
360º

Tiempo o/c
0.03”

Fuerza 20N

Carrera
4mm


* Camera is not included.
Rotation
Grip
Grip

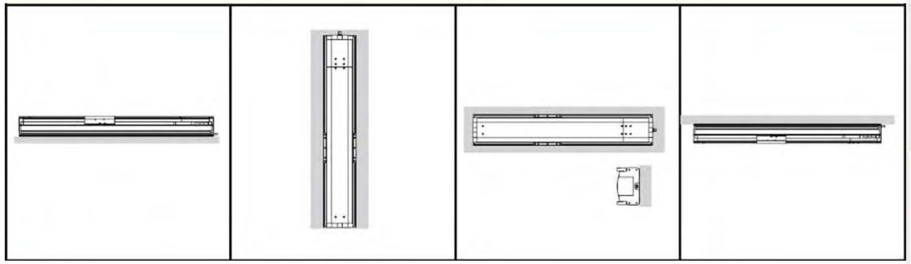
Quality and Innovation

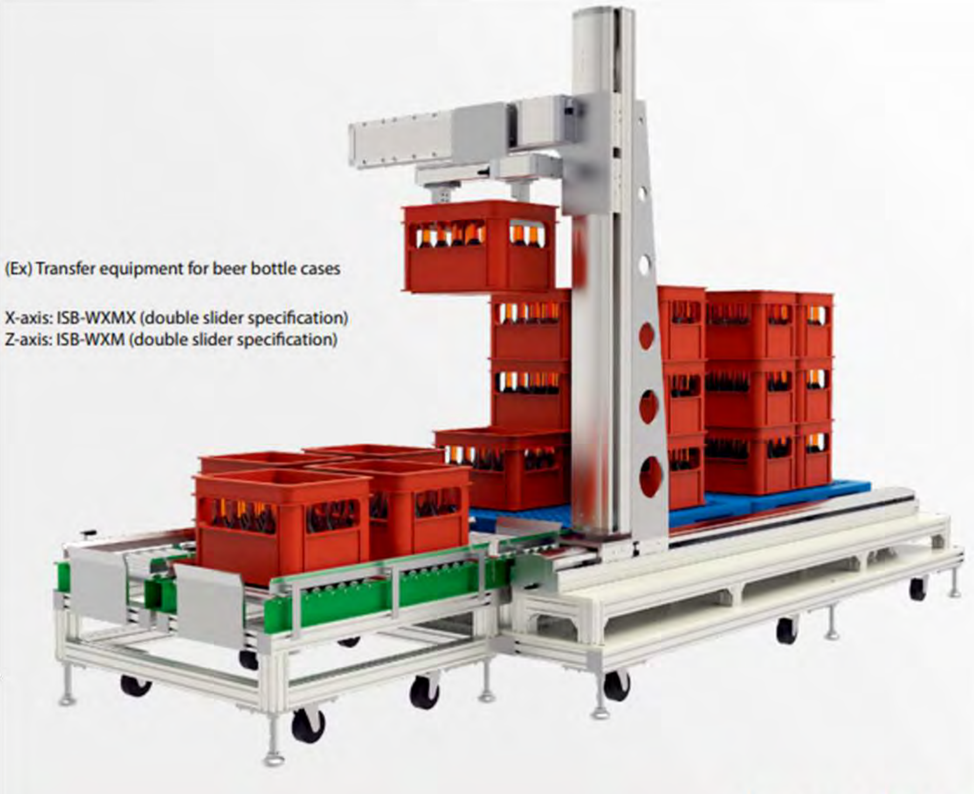
ISB-WXM

Ejes lineales de alta carga

10kg UP!
400kg
80kg

Horizontal up to 400kg,
Vertical up to 80kg





(Ex) Transfer equipment for beer bottle cases

X-axis: ISB-WXMX (double slider specification)
Z-axis: ISB-WXM (double slider specification)

* Maximum values of each item

Model	Stroke	Payload	Speed	Acceleration/ deceleration
IS(P)B-WXM	1300mm	Horizontal 400kg Vertical 80kg	2500mm/s	1.2G
IS(P)B-WXMX	3000mm	Horizontal 160kg Vertical 32kg	2500mm/s	1.2G