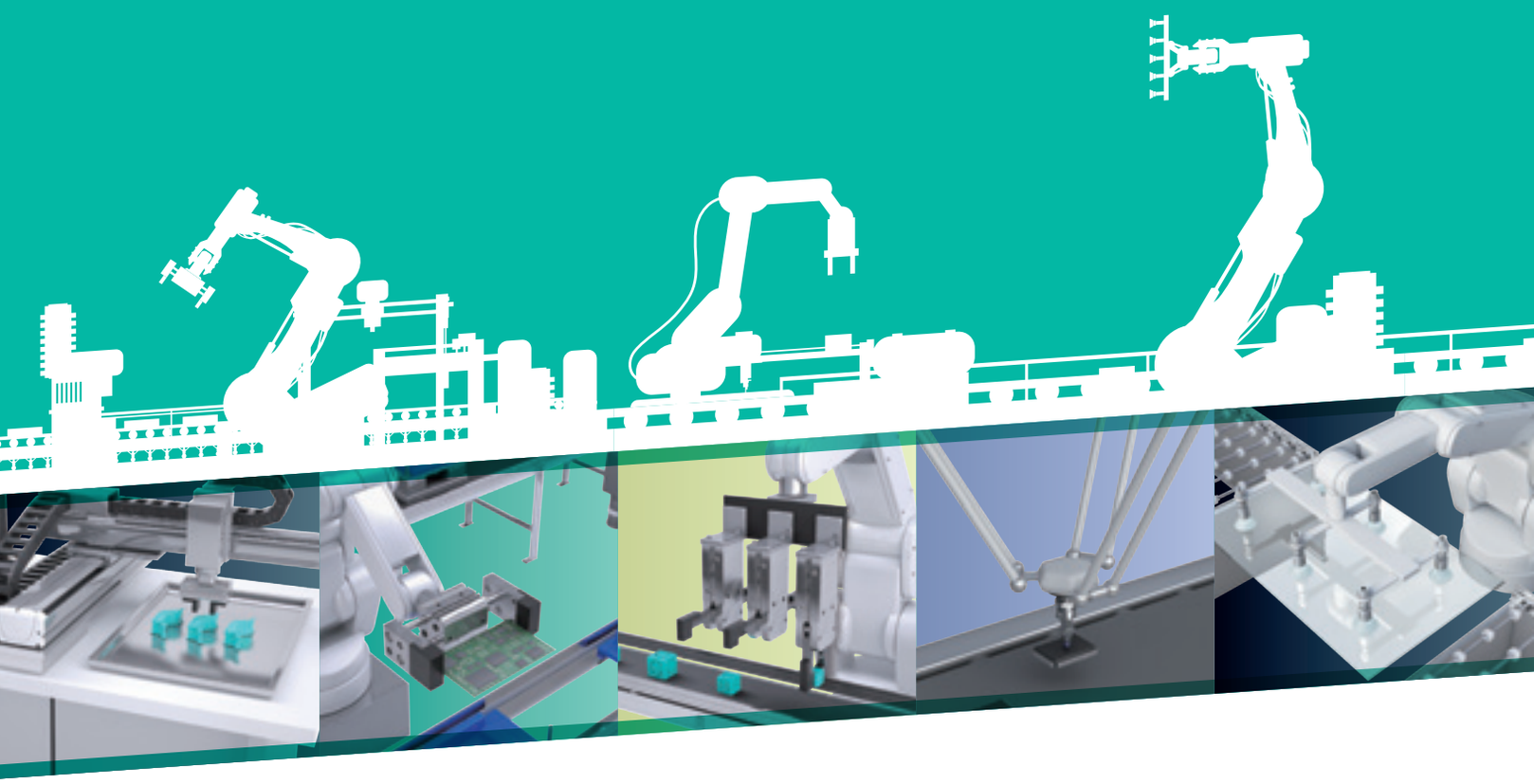
CKD



A Guide to Handling Components for Robots

CKD Corporation

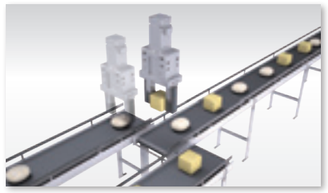
CC-1478A 5

Unparalleled Grip with Electric motion/ variations Air/Vacuum suction

Electric Gripper

2-Finger gripper

FLSH/DLSH Series



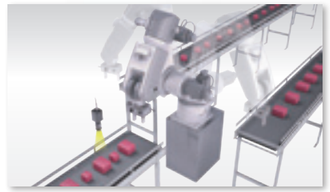
FLSH Series

The same dimensions and gripping force as Air are realized.

DLSH Series

Gripping force is continuously generated even when the power supply is not energized.

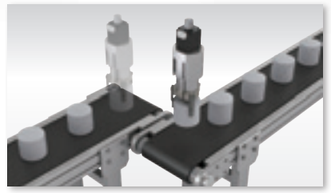
FFLD Series



High gripping force and long stroke ideal for robot arms.

3-Finger gripper

GCKW/DCKW Series



GCKW Series

The same dimensions and gripping force as Air are realized.

DCKW Series

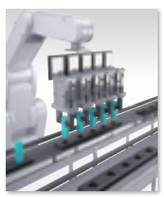
Gripping force is continuously generated even when the power supply is not energized.

Air hand/chuck

A lineup of 52 models with various shapes and diverse functions

Gripping force: 1.5N to 2000N Stroke: 4mm to 200mm

Parallel hand



Basic type with a wide variety of hands.

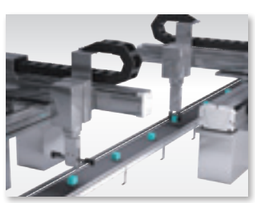
Thin parallel hand

Thin body contributes to a more compact device.

Wide parallel hand

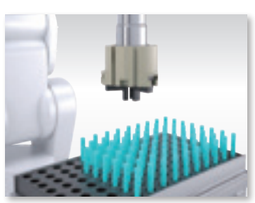
Wide opening is ideal for large workpieces.

180 degree open/close fulcrum hand



Fingers open and close 180 degrees to avoid interference with workpieces.

3-way chuck



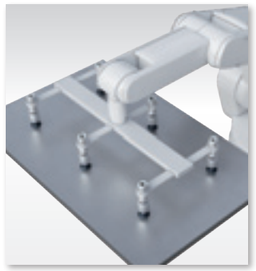
A 3-way grip ideal for cylindrical and round workpieces.

Suction pad

Lineup of 11 types of shape and 16 types of rubber material

Pad diameter: 0.7mm to 200mm

Standard (general)



Ideal for thick and flat workpieces.

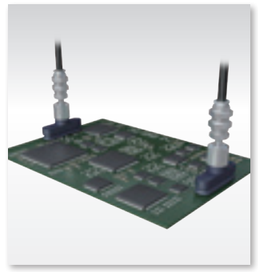
Standard (compact)

Ideal for compact workpieces and semiconductor manufacturing facilities.

Bellows

Also features a swivel pad, ideal for retort packs, etc.

Oval



Ideal for PCB and semiconductor manufacturing facilities.

Vacuum ejector

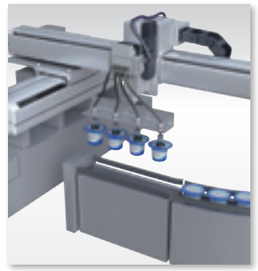
Single unit

VSY Series

Compact and lightweight with integrated ejector and vacuum burst function.

Unit

VSNM Series



Vacuum ejector unit with high speed operation.

Electric Gripper/Air Hand Selection

Here are some typical examples from a wide variety of models.

For details of each product and other models, refer to our website (https://www.ckd.co.jp/en/).

Electric Gripper

Category	Lineup		Features	Motor size (mm)	Gripping force* (N) per finger	Stroke (mm)
Electric 2-Finger Gripper	2-Finger gripper FLSH		Realizing dimensions and gripping force equivalent to those of the air linear slide hand. Options equivalent to air can be selected. The rubber cover and option with case combine to make IP50 compatible. Small stroke operation, workpiece identification, IoT possible	□ 20 to □ 25L (High torque)	20 to 65	6 to 22
	2-Finger gripper DLSH		This spring drive mechanism has a spring incorporated in a drive mechanism. Reduces impact on the workpiece and generates thrust even when the power supply is OFF when gripping. Ideal for gripping workpieces of the same size.	□ 28 to □ 42	10 to 40	10 to 22
	2-Finger gripper FFLD		Controller integrated. Ideal for robot end applications with a thin body and reduced wiring. Industry top gripping force and long stroke realized.	□ 20 to □ 25L (High torque)	80 to 500	100 to 160
Electric 3-Finger Gripper	3-Finger gripper GCKW		Ideal for gripping round workpieces. Connected to a high-function controller, enabling small-stroke operation, workpiece identification, and IoT.	□ 20 to □ 25L (High torque)	7 to 29	4 to 6
	3-Finger gripper DCKW		This spring drive mechanism has a spring incorporated in a drive mechanism. Reduces impact on the workpiece and generates thrust even when the power supply is OFF when gripping. Ideal for gripping round workpieces of the same size.	□ 28 to □ 42	8 to 30	4 to 8

* Gripping force is a value indicating a guide. The actual gripping force depends on the operating conditions. Consult the catalog when making a selection.

Category	Lineup		Compatible products				Supported interfaces				
			FLSH	DLSH	GCKW	DCKW	PIO	CC-Link	EtherCAT	EtherNet/IP	IO-Link
											
Comte Roller	Single axis Controller ECG		●		●		●	●	●	●	●
	Single axis Controller ESC3			●		●	●				
	Multi-axis Controller ECMG		●					●	●	●	

* 2-Finger gripper FFLD is a built-in controller type. The interface is compatible with IO-Link.

Air hand

Category	Lineup		Features	Bore size (mm)	Gripping force* (N) per finger	Stroke (mm)
Parallel hand	Linear slide Hand LSH-HP1 LSHL-HP1		Linear guide with increased rigidity to achieve high rigidity, high precision, and high durability. Helps achieve stable operation at non-stop production facilities.	LSH-HP1: ø6 to ø32 LSHL-HP1: ø10 to ø25	LSH-HP1: 3.3 to 158 LSHL-HP1: 11 to 65	LSH-HP1: 4 to 22 LSHL-HP1: 8 to 22
	Length measuring function Linear slide Hand LSHM-HP2		Length measuring hand that outputs finger position with high precision analog output. A displacement sensor integrated with amplifier realizes a high repeatability of ±0.02mm.	ø10 to ø25	11 to 65	4 to 14
	Mini-parallel hand FH100		Lightweight and compact basic model. Types with built-in speed controller can also be selected.	ø10 to ø25	6 to 30	8 to 20
Thin parallel hand	Thin long Stroke hand LST-HP1		Double piston system. High rigidity and high precision are realized by improving the performance of the linear guide. Helps achieve stable operation at non-stop production facilities.	ø8×2 to ø20 x 2	19 to 141	8 to 80
	Length measuring function Thin long Stroke hand LSTM-HP2		Displacement sensor equipped on linear slide hand. Contributes to workpiece model judgment and predictive maintenance by high-precision gripping position detection with repeatability of ±0.04mm and linearity of F.S.±0.5%.	ø12×2 to ø20 x 2	48 to 141	12 to 20
	Thin hand HLF2		Equipped with linear guide. Long stroke for precision handling. 3 types of strokes can be selected to suit the application.	ø8×2 to ø20 x 2	20 to 135	12 to 96
	High rigidity, thin hand HLC		Equipped with linear guide. Strives for high rigidity while maintaining long stroke features. Can be used in applications with large loads.	ø8×2 to ø30 x 2	18 to 310	20 to 140
	Ultra thin hand HLD		Ultimate thin hand evolved model with emphasis on thickness. High gripping power realized using 4 pistons.	ø8×4 up ø20×4	35 to 250	12 to 30
Wide parallel hand	Wide parallel Hand HMC-HP1		Guide rigidity has been increased by 1.3 times with revised guide design. Durability more than double that of conventional models is realized by sliding technology innovation. Compact and high gripping force realized by double piston structure.	ø10×2 to ø40x2	14 to 396	20 to 200
	Wide parallel hand HMF		Ideal for long stroke handling. Abundant bore size and stroke variations are available to enable optimal selection.	ø12×2 to ø40x2	32 to 430	20 to 200
	Wide parallel hand With scraper HMF-G		Increased durability compared to conventional products in environments exposed to cutting fluid.	ø16×2 to ø25 x 2	66 to 170	30 to 120
	Wide parallel hand with linear guide HMFB		Enables high precision handling of large workpieces.	ø25×2 to ø40x2	120 to 310	100 to 200
Fulcrum hand	180 degree open/close Thin wide angle hand HMD		Thin, space-saving, and flexible lines can be configured.	ø12 to ø25	16 to 120	Open angle 184°
	180 degree open/close Toggle wide angle hand HJD		Large type fulcrum hand with 180 degree open fingers. Uses a toggle mechanism to achieve high gripping force.	ø32 to ø63	200 to 1250	Open angle 184°
	Mini-fulcrum hand FH500		Lightweight and compact basic model. Types with built-in speed controller can also be selected.	ø10 to ø20	2 to 15	Open angle 20°

* Gripping force is the value with air pressure of 0.5MPa on the closed side. The actual gripping force depends on the distance from the gripping point and the finger angle. Consult the catalog when making a selection.

Gripper Selection for Air Chucks and

Here are some typical examples from a wide variety of models.

Air chuck

Category	Lineup		Features	Bore size (mm)	Gripping force* (N) per finger	Stroke (mm)
3-way chuck	3-way chuck CKW-HP1		More than twice the durability of conventional models has been realized by reinforcing guide rigidity and technological innovations in cylinder sliding. Maintenance-hours are greatly reduced by the high precision positioning hole and new switch replacement system.	ø16 to ø40	14 to 118	4 to 8
	3-way chuck CKL2		Basic 3-way chuck suitable for gripping round workpieces and cylindrical workpieces.	ø16 to ø100	17 to 780	5 to 23
	3-way jaw long stroke type CKL2-*-L1		CKL2 Series long stroke type. Approximately twice the stroke without changing the body size.	ø50 to ø100	190 to 780	30 to 40
	Rubber cover CKLG2		CKL2 Series equipped with a rubber cover. Achieves long service life by preventing intrusion of cutting chips or water droplets.	ø20 to ø100	28 to 680	5 to 23
	Thin chuck CKS		Internal structure changed and thickness reduced by half. Can be used in places where height is limited.	ø8×3 to ø32×3	17 to 320	10 to 32
	Thin chuck with hollow hole CKS-F		Equipped with hollow hole. A pusher can be installed. Pusher, air blow, sensor, etc., can be mounted.	ø16×3 to ø50×3	75 to 800	16 to 50
	Ultra long stroke chuck CKJ		Ultra-long stroke type of thin 3-way jaw chuck. The longest stroke of 130mm is realized with the 3-way jaw chuck.	ø12×6 to ø50×6	86 to 1550	40 to 130

* Gripping force is the value with air pressure of 0.5MPa on the closed side. The actual gripping force depends on the distance from the gripping point and the finger angle. Consult the catalog when making a selection.

Grippers for collaborative robots

Category	Lineup		Features	Bore size (mm)	Gripping force (N)	Stroke (mm)
Collaborative robots Gripper	Compact RLSH		**A compact body that does not disturb the trajectory of the robot** Equipped with an edgeless resin cover and a 360° visible LED indicator lamp, for increased safety.	ø20	42	18
	Long stroke RHLF		**Low profile, long stroke keeps height low** Equipped with an edgeless resin cover and a 360° visible LED indicator lamp, for increased safety.	ø16 x 2	85	32
	3-way finger type RCKL		**3-way finger ideal for round and cylindrical workpieces** Equipped with an edgeless resin cover and a 360° visible LED indicator lamp, for increased safety.	ø40	125	10

UNIVERSAL ROBOTS Certification	TECHMAN ROBOT Certification	OMRON Robot Certification	FANUC Robot compatible	JAKA Robot compatible	YASKAWA Robot compatible	Kawasaki Robot compatible
R***-UR Series	R***-TM Series	R***-TM Series	R***-FN Series	R***-JK Series	R***-YS Series	R***-KW Series

Cooperative Robots

For details of each product and other models, refer to our website (https://www.ckd.co.jp/en/).

Recommended hands/chucks

High-durability component HP Series
Changes manufacturing with a change in gripping

HP HIGH PRODUCTIVITY

HP1 Series

Momentary stops greatly reduced | Number of replacements greatly reduced | Significant reduction in replacement time | Dramatically improved durability

Optimized sliding parts. Does not break even with high frequency usage.

Linear Slide Hand
LSH-HP1 Series

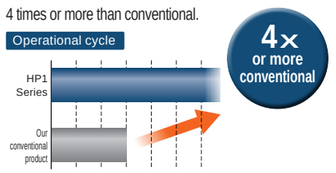
Low-Profile Long Stroke Hand
LST-HP1 Series

Wide Parallel Hand
HMC-HP1 Series

3-Way Chuck
CKW-HP1Series

Long service life

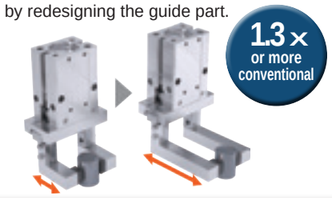
Highly advanced sliding technology has enabled durability 4 times or more than conventional.



*The HMC-HP1 and CKW-HP1 Series are more than twice the conventional models.

High rigidity

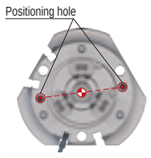
Improved guide rigidity has been achieved by redesigning the guide part.



Significant reduction in replacement time

High precision positioning hole ±0.025mm

The addition of "positioning holes" with the grip center as reference allows the centering precision to be easily reproduced.



* Excluding HMC-HP1 Series.

HP2 Series

Momentary stops greatly reduced | Number of replacements greatly reduced | Predictive maintenance available | Durability count over 20 million times

Subject to CKD prescribed conditions

Grips and measures simultaneously. Can be replaced before breakdowns.

Measuring hand
LSHM-HP2 Series

Low-profile long stroke hand with length measuring function
LSTM-HP2 Series

Integrated structure

Finger positioning with high precision analog output. The hand body has a built-in stroke detection sensor and amplifier. The integrated structure achieves high-precision.

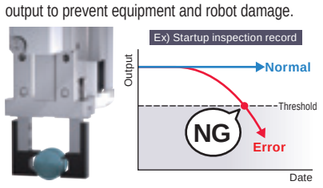
Repeatability LSHM:±0.02mm
LSTM:±0.04mm

Judges gripped/missed micro workpieces

Accurately judges whether micro workpieces were gripped or missed.

Predictive maintenance

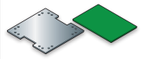
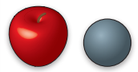
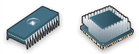
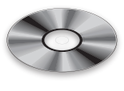
Monitors attachments for abnormal wear and deformation of fingers and jigs through changes in output to prevent equipment and robot damage.

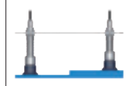


Vacuum system Best Component Selection

For details of each product and other models, refer to our website (https://www.ckd.co.jp/en/).

Suction pad

Category	Lineup				Recommended workpiece		Pad diameter	
Suction pad	Standard	Standard	VSP-*R			Flat workpieces (hard and inflexible workpieces)	18 types	ø1 to ø200
		Deep type	VSP-*A			Spherical workpieces (apples or balls)	9 types	ø15 to ø100
		Compact	VSP-*RM			Semiconductor parts	6 types	ø0.7 to ø4
	Sponge		VSP-*S			Workpieces such as building outer wall materials, small stones and shells	9 types	ø10 to ø100
	Bellows		VSP-*B			Retort-packs and bags containing food, etc.	12 types	ø6 to ø100
	Multi-stage bellows		VSP-*W				5 types	ø10 to ø50
	Oval		VSP-*E			Long workpieces such as substrates, round bars and semiconductor parts	13 types	2×4 to 8×30
	Soft		VSP-*L			Unloading molded products and easily damaged workpieces	8 types	ø4 to ø40
	Soft bellows		VSP-*LB				5 types	ø6 to ø20

Category	Lineup			Recommended workpiece		Pad diameter	
Suction pad	Anti-slip	VSP-*K			Workpieces with oil adhered such as press parts	5 types	ø10 to ø50
	Thin object type	VSP-*P			Thin workpieces such as copy paper and vinyl	4 types	ø8 to ø20
	Flat	VSP-*F			Thin workpieces such as sheets and vinyl	5 types	ø10 to ø30
	Suction mark prevention	VSP-*Q			Liquid crystal glass, painting process and semiconductor manufacturing equipment, etc.	3 types	ø10 to 30
	Long stroke Holder type	VSP: various pad shapes			Height difference stacked workpieces, etc.	24 types	Compatible pads

Holder type

Code	Standard	VSP-A	VSP-B	VSP-C	VSP-D	VSP-E	VSP-F
	Compact	VSP-MA	VSP-MB	VSP-MC	VSP-MD	VSP-ME	-
Shape		Fixed Vacuum outlet top	Fixed Vacuum outlet side	Buffer type Vacuum outlet top	Buffer type Vacuum outlet side	Direct mounting, Fixed	Direct mounting, Buffer

Code	Standard	VSP-HC	VSP-HD	VSP-HDW	VSP-HE	VSP-HEW	VSP-AE	VSP-BE
Shape		Lightweight with buffer Vacuum outlet top	Lightweight with buffer Vacuum outlet side	Lightweight with buffer Vacuum outlet both sides	Low back direct mounting, fixed Vacuum outlet side	Low back direct mounting, fixed Vacuum outlet both sides	Screw fixing Vacuum outlet top	Screw fixing Vacuum outlet side

Vacuum system Best Component Selection

Ejector system/vacuum pump system

●: Standard equipment ○: Option

Category	Lineup			Features	System components: With valve: For generation	With valve: Vacuum breaking	With switch: Mechanical	With switch: Switch output	With switch: Analog output	With vacuum filter	With silencer	Common exhaust	With check valve	Achieved vacuum pressure (-kPa) *	Intake flow rate (L/min(ANR)) *
Ejector	Vacuum ejector Discrete type	VSY		Vacuum ejector equipped with vacuum burst function. A compact lightweight body that condenses the necessary functions for easy use with robot hands.						○	○	○		H: 90 L: 66 E: 90	H: 7 to 12.5 L: 12 to 21 E: 3 to 9
		VSH		Solenoid valve direct mounting The supply port is M5/R thread, allowing direct attachment to the solenoid valve.							○	○		H: 90 to 93 L: 66 E: 92	H: 7 to 104 L: 12 to 174 E: 10.5 to 82
		VSU		Tubular (inline) Supply port and vacuum port are arranged linearly for easy installation.						●	○	○		H: 90 to 92 L: 66 E: 90	H: 7 to 12.5 L: 12 to 22 E: 10
		VSC		Pad direct mounting The vacuum port has an R thread that allows direct attachment to the pad.							○	○		H: 90 to 93 L: 66 E: 92	H: 7 to 110 L: 11 to 180 E: 10.5 to 84
		VSB		Square (box) Box shape enables fixing to the body.			○				●			H: 90 to 93 L: 66 E: 92	H: 7 to 38 L: 12 to 42 E: 10.5 to 27
	Vacuum ejector unit	VSK/ VSKM		All-mighty type that can be used universally with full functions and well-balanced performance.	○	○	○	○	○	●	○	○	○	H: 91 to 93 L: 67 E: 91	H: 7 to 38 L: 11 to 50 E: 21 to 27
		VSN/ VSNM		Achieves fast and stable response. Recommended for high speed pick & place. ON/OFF responsivity = 5msec or less.	●	●		○	○		○	○		H: 90.4 L: - E: 90.4	H: 7 to 9.5 L: - E: 2 to 4.5
		VSQ		Ideal for controlling large flow rates. Can also be used for applications that require a high vacuum flow rate, such as suction of leaky workpieces.	●	●		○		●	○	○		H: 93 L: 66 to 93 E: 92 to 93	H: 24 to 110 L: 24 to 180 E: 24 to 84
Vacuum pump	Vacuum switching unit	VSXP/ VSXPM		Balanced performance is incorporated into a compact body for general use.	●	●		○	○	With filter ●				Effective cross-sectional area of vacuum valve 2-way valve specifications: 3.5mm²(ø4) 4.5 mm²(ø6) 3-way valve specifications: 3.0mm²(ø4) 3.6 mm²(ø6)	
		VSNP/ VSNPM		For high speed Pick & Place. ON/OFF responsivity = 5 msec or less.	●	●		○	○					0.4 mm²	
		VSQP		Ideal for controlling large flow rates. Can also be used for applications that require high vacuum flow rates, such as suction of leaky workpieces.	●	●		○		●				16.5 mm²	

* Supply pressure of H and L is 0.5 MPa and supply pressure of E is 0.35 MPa. Achieved vacuum pressure and suction flow rate differ depending on supply pressure and nozzle diameter.
H type High vacuum/medium flow = high vacuum
L type Medium vacuum/large flow = large flow
E type High vacuum/low flow = low supply pressure High vacuum (energy saving)

For details of each product and other models, refer to our website (https://www.ckd.co.jp/en/).

Peripheral components

Vacuum-related products

Position locking valve
VSECV Series

Even if the workpiece comes off, the pressure in the source circuit is maintained.

Compact vacuum regulator
VSRVV Series

Both source pressure and terminals can be controlled.

Burst unit assembly
VSLF Series

Burst air flow rate & vacuum burst control valve with relief pressure adjustment needle.

Vacuum pressure switch with digital display
VSUS Series

Digital display of set pressure and applied pressure.

Catalog No. CC-796A

Handling related Components

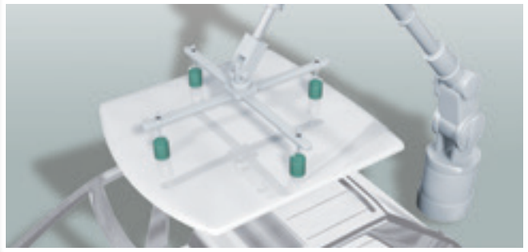
Magnet suction hand Special-order product
MHC Series

The new hand that uses magnetic force to suction workpieces. Ideal for adhering thin copper plates with oil or punch holes and magnetic materials that are difficult to suction with general pads.

Catalog No. CC-974A

MHC2 Series

Catalog No. CC-1209A



Auto hand changer
CHC Series

Automatic replacement of robot tip tools.

Catalog No. CB-030SA

Air booster
ABP2-HP1 Series

Air booster with longer service life than twice that of conventional models.

Catalog No. CC-1533A

3D suction hand Special-order product
FSH Series

Holds the pad at the desired tracking position.

Catalog No. CC-1562A

Quick exhaust valve with push-in fitting
QEL Series

Ideal for preventing condensation of the hand chuck.

Catalog No. CC-1461A

Robot

Electric actuator
KBX Series

Flexible combination of modules allows application in a variety of transporting situations.

Catalog No. CC-1275A

Horizontal articulated robot [Japan only]
KHL/KHE Series

A SCARA robot that is compact and has high operation performance.

Catalog No. CC-1436A

Image processing software

Visual programming tool for image processing
Facilea

20-min easy image processing even for beginners.

Catalog No. CC-1548A

High speed/high precision handling components

We respond to various handling needs.

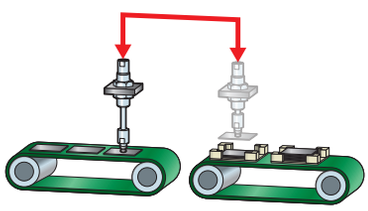
For handling delicate parts

Fine buffer

FBU2 Series

Catalog No. CB-024SA

Buffer unit used in vacuum suction transport. Magnetic springs are used instead of metal springs, enabling transfer of delicate workpieces without damaging them. Moreover, it is clean and long-life.



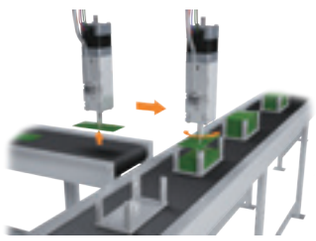
Adjustment of the rotation position of precision parts

Active Fine Buffer

AFB-RB Series

Catalog No. CC-1415A

Integrated motor and fine buffer. Damage-free transport and rotation position adjustment of delicate workpieces are simultaneously realized.



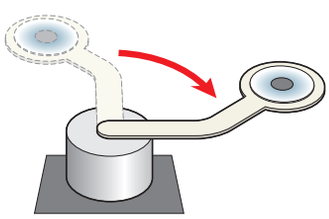
Damage-free transport of thin workpieces

Precise suction plate

PVP Series

Catalog No. CB-024SA

High precision suction plate with suction surface flatness of 2 µm and parallelism of 5 µm. Suction of the entire surface by porous material eliminates distortion and deformation of ultra-thin materials such as wafers and films.



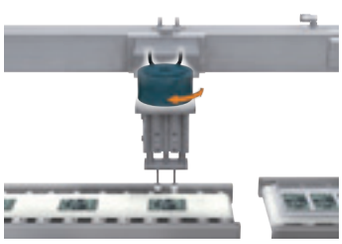
Highly accurate Z-axis rotation position

ABSODEX

AX6000M Series

Catalog No. CB-054A

A 80mm diameter, palm-sized compact direct drive motor. Realizes Z-axis rotation positioning and Θ correction at high speed and with high precision.



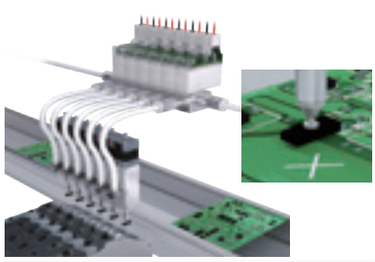
Ideal for high speed positive/negative pressure switching and high speed small object transport

Direct acting 3-port valve

3QB Series

Catalog No. CC-1330A

High-speed response of less than 5 ms allows fast switching between positive pressure and low vacuum. High-speed operation such as mounting of electronic components is realized.



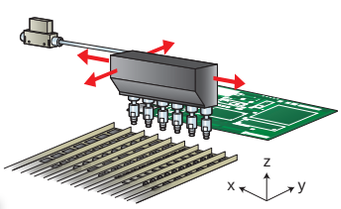
Semiconductor fine chip suction/release confirmation

RAPIFLOW

FSM-X Series

Catalog No. CB-024SA

The platinum sensor chip realizes a high speed response. High-speed detection of semiconductor fine chip suction/release. Ultra-compact with an ultra-thin 8 mm that can be mounted just near the measurement section.



If the goods and/or their replicas, the technology and/or software found in this catalog are to be exported from Japan, Japanese laws require the exporter makes sure that they will never be used for the development and/or manufacture of weapons for mass destruction.

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