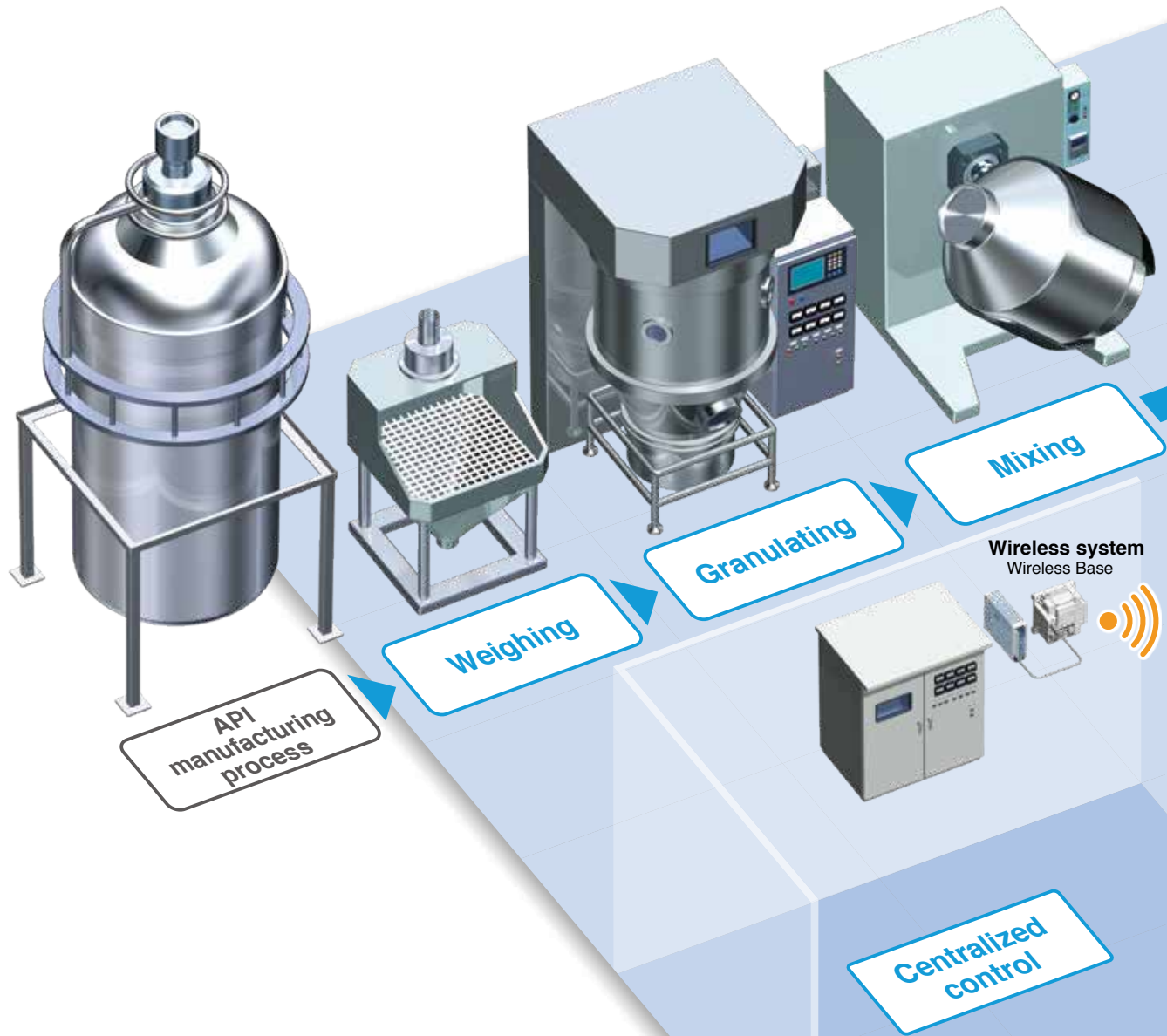






Equipment for Pharmaceutical Manufacturing





Solid Preparation Manufacturing Process



 Environmental Resistance  From p. 29

 Standards  From p. 41

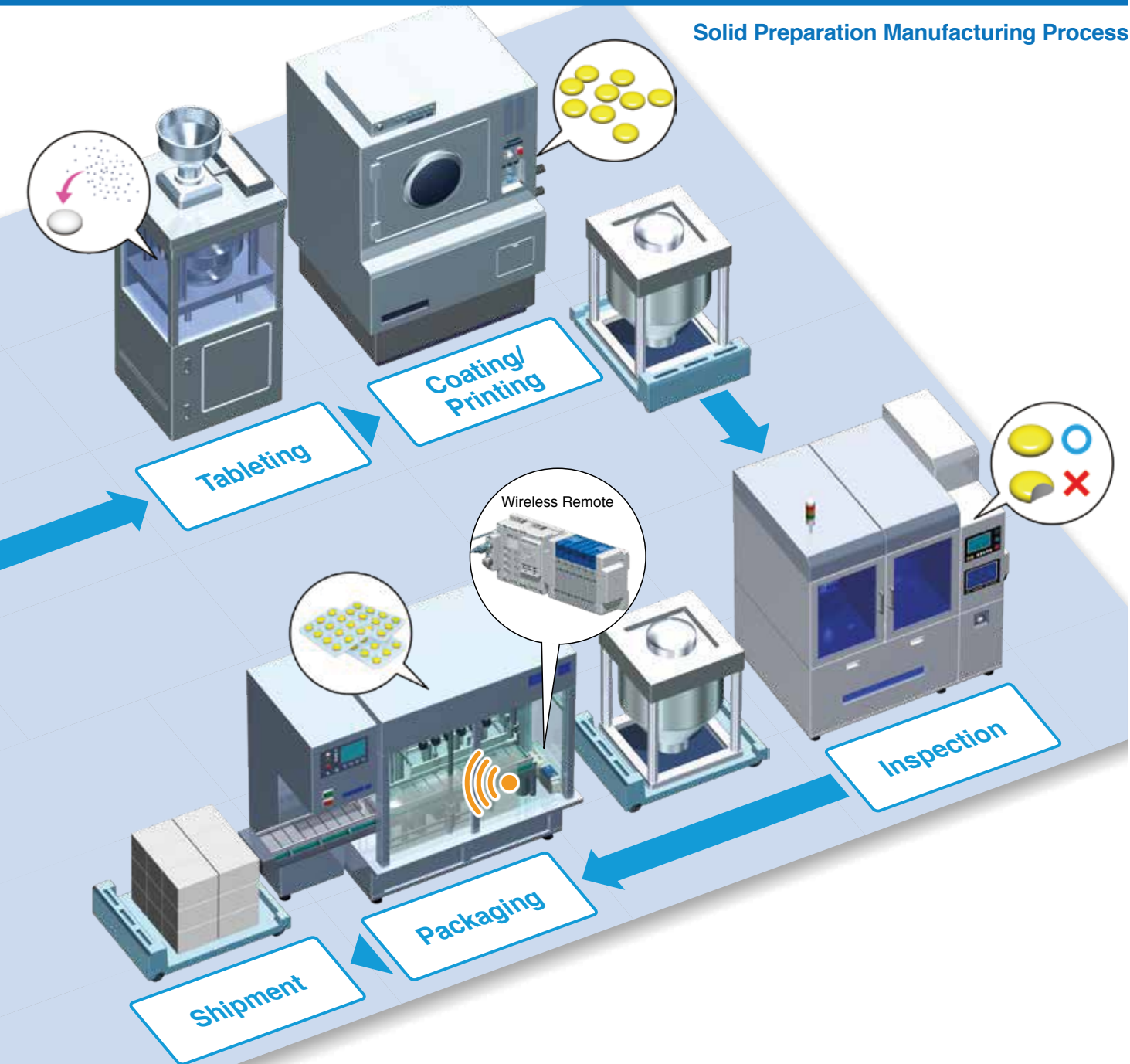
 High Speed
High-speed actuation  From p. 47


 Sanitation  From p. 39

 Clean  From p. 43

 Electricity Countermeasures  From p. 49


Solid Preparation Manufacturing Process



 **Energy Saving** From p. 51

 **Temperature Control** p. 59




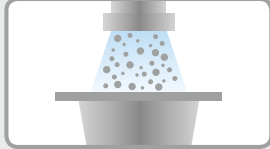
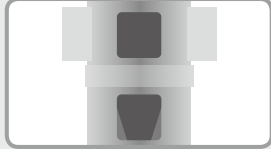
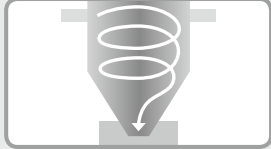
Product Support p. 63

 **Centralized Control** From p. 55

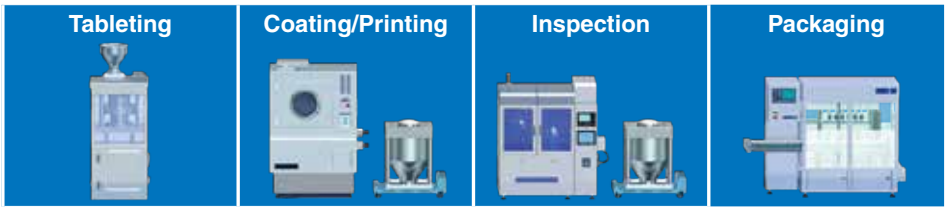
Next Generation Products From p. 60

Others From p. 64

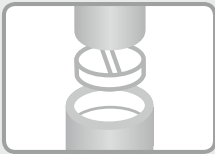
Solid Preparation Manufacturing Process

Solid Preparation Manufacturing Process		Weighing	Granulating	Mixing
		 Process for sieving pharmaceutical ingredients, implementing pretreatment (e.g. pulverization), and accurately weighing ingredients	 Process for granulating powder ingredients that have been pulverized and weighed	 Process for mixing granulated powder uniformly using a mixer
				
Environmental Resistance	Water/Corrosion Resistant (Stainless Steel)	●	●	●
	Dustproof	●	●	●
	IP67/65	●	●	●
	Heat/Cold Resistant	●	●	●
Sanitation	Hygienic	●	●	●
	Grease for Food Processing Equipment (NSF-H1)	●	●	●
Standards	Food Sanitation Law Compliant	●	●	●
	FDA (Food and Drug Administration) Compliant	●	●	●
Clean	Clean Room	●	●	●
	Clean Blow	●	●	●
	Grease-free	●	●	●
High Speed	High Speed	●	●	●
	High Frequency	●	●	●
	Electric	●	●	●
Electricity Countermeasures	Static Neutralization	●	●	●
	Explosion Proof	●	●	●
Energy Saving	Air Saving	●	●	●
	Power Saving	●	●	●
Centralized Control	Reduced Wiring	●	●	●
	IO-Link Compatible Product	●	●	●
	Pressure/Flow Control	●	●	●
Temperature Control	Temperature Control	●	●	●
	Constant Temperature	●	●	●
Next Generation Products	Air Saving, Lightweight, and Compact	●	●	●
	Wireless System	●	●	●
Product Support	Calibration Certificate	●	●	●
Others	High Pressure	●	●	●
	Steam	●	●	●
	Cleaning (Filtration Filter)	●	●	●
	Adsorption Transfer	●	●	●
	Dehumidification	●	●	●
	Various Valves for Analyzing Reagents and Others	●	●	●

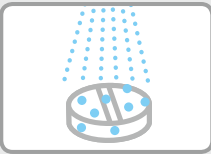
Solid Preparation Manufacturing Process



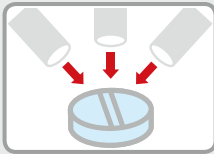
Tableting
Process for compression molding granules to produce tablets using a tableting machine



Coating/Printing
Process for coating bare tablets with polymer film using a film coater to encapsulate bitterness to make it easier to swallow tablets
Process for performing quality preservation treatment to prevent the release of medicinal components due to cracks in tablets and so forth
➔ Process for printing the name of the medicine, product number, etc., on the coated surface of the tablets using a tablet printer



Inspection
Process for checking tablets or capsules for cracks and the adhesion of dirt, foreign substances, etc., using an automatic appearance tester and then removing defective products



Packaging
Process for packaging tablets or capsules using an automatic packaging machine
➔ A label is attached with a labeler and products move on to the boxing process, where a carton is used.



●	●	●		Water/Corrosion Resistant (Stainless Steel)	Environmental Resistance
●	●	●	●	Dustproof	
●	●	●	●	IP67/65	
●	●	●		Heat/Cold Resistant	
●	●	●		Hygienic	Sanitation
●	●	●		Grease for Food Processing Equipment (NSF-H1)	
●	●	●	●	Food Sanitation Law Compliant	Standards
●	●	●	●	FDA (Food and Drug Administration) Compliant	
●	●	●	●	Clean Room	Clean
●	●	●	●	Clean Blow	
●	●	●	●	Grease-free	
●	●	●	●	High Speed	High Speed
●	●	●	●	High Frequency	
●	●	●	●	Electric	
●	●	●	●	Static Neutralization	Electricity Countermeasures
●	●	●	●	Explosion Proof	
●	●	●	●	Air Saving	Energy Saving
●	●	●	●	Power Saving	
●	●	●	●	Reduced Wiring	Centralized Control
●	●	●	●	IO-Link Compatible Product	
●	●	●	●	Pressure/Flow Control	
●	●	●	●	Temperature Control	Temperature Control
●	●	●	●	Constant Temperature	
●	●	●	●	Air Saving, Lightweight, and Compact	Next Generation Products
●	●	●	●	Wireless System	
●	●	●	●	Calibration Certificate	Product Support
●	●	●	●	High Pressure	Others
●	●	●	●	Steam	
●	●	●	●	Cleaning (Filtration Filter)	
●	●	●	●	Adsorption Transfer	
●	●	●	●	Dehumidification	
●	●	●	●	Various Valves for Analyzing Reagents and Others	

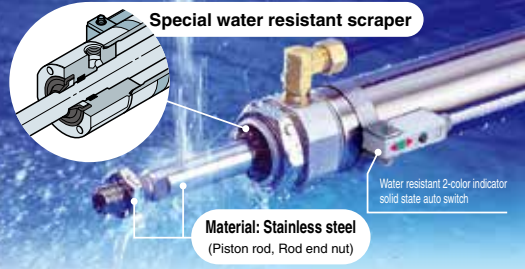
Environmental Resistance

Water Resistant

p. 29

This special scraper prevents water from entering the cylinder.

Water Resistant Cylinder



Corrosion Resistant (Stainless Steel)

p. 31

Stainless Steel Cylinder CJ5-S/CG5-S



Dustproof

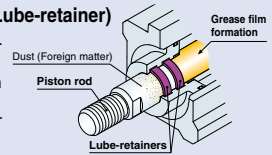
p. 33, 34

With stable lubrication function (Lube-retainer)

Lube-retainers are mounted at two locations.

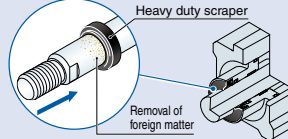
This provides the following two benefits.

- Grease film is formed on the piston rod surface to improve durability.
- The entry of dust and foreign matter is prevented.



With heavy duty scraper

Removes foreign matter adhered to the rod



With rod boot/dust cover



Heat/Cold Resistant

p. 38

Heat Resistant: up to 150°C

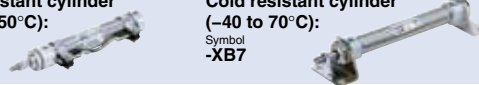
Seal: Fluororubber
Heat-resistant grease

Heat resistant cylinder
(-10 to 150°C):
Symbol
-XB6

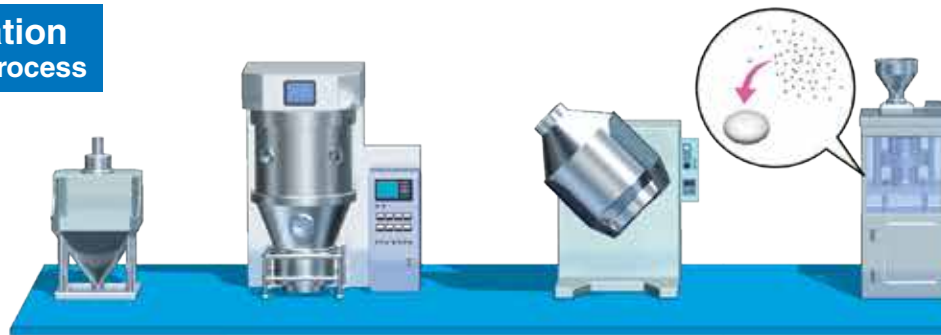
Cold Resistant: up to -40°C

Seal: Low nitrile rubber
Cold-resistant grease

Cold resistant cylinder
(-40 to 70°C):
Symbol
-XB7



Solid Preparation Manufacturing Process



API manufacturing process

Weighing

Granulating

Mixing

Tableting

Sanitation

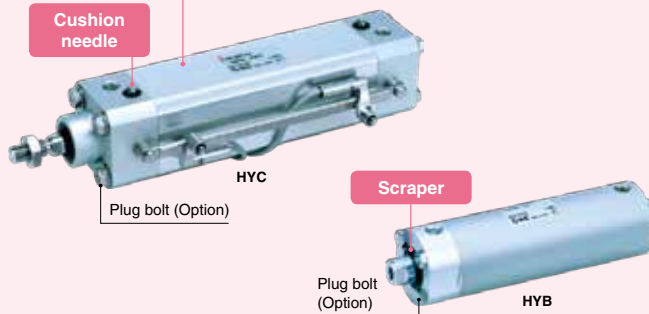
Hygienic

p. 39

A water-resistant cylinder configured for easy cleaning

Flat, grooveless configuration

Eliminates the auto switch grooves, the cushion needle holes, etc.



Grease for Food Processing Equipment (Certified by NSF-H1)

p. 40



Food grade grease (certified by NSF-H1) is used for all parts on which grease is applied.

<Applicable Series>

Series	Symbol (Suffix)	Series	Symbol (Suffix)
MXQ	-X9	CM2	-XC85
MXF		CG1	
MXW		CA2	
MXP		CQ2	
MXPJ		CQS	
MXY		MGP	
MIW	-X79A		
MIS			
MH□			

Electricity Countermeasures



IP67/65 compliant **p. 35, 36**

IP67

Pressure Switch Gap Checker



5-Port Solenoid Valve



IP65

Pressure Switch



Digital Flow Switch



Static Neutralization **p. 49**

Bar Type IZS40/41/42

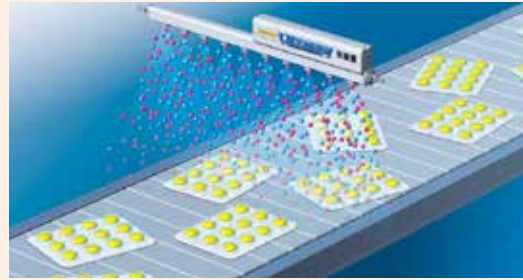
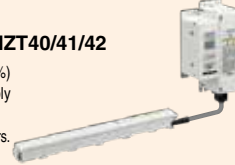
- Potential amplitude of 25 V or less with the dual AC type*1 (IZS42)
- Rapid neutralization of static electricity by a feedback sensor (IZS41)



*1 At an installation height of 300 mm

Separate Controller Bar Type IZT40/41/42

- Space saving: Height reduced by 57 mm (60%)
- The controller and high-voltage power supply module can be mounted separately.
- One controller can control a maximum of 4 ionizers.



Explosion Proof **p. 50**

Intrinsically Safe Explosion-proof System
5-Port Solenoid Valve

51-SY5000/7000/9000

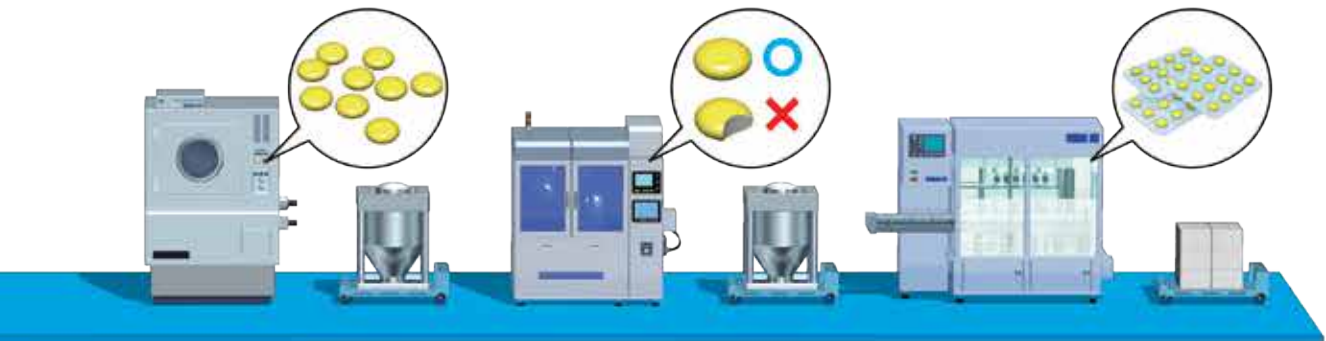
- Exia II BT4 (TIIS approved product)



Pressure-resistant
3/5-Port Solenoid Valve

50-VFE/50-VPE

- Exd II BT4 (TIIS approved product)
- Waterproof: IP*6 equivalent



Coating/Printing

Inspection

Packaging

Shipment

High Speed

High Speed

p. 47

High Power Cylinder RHC

Smooth cushioning from high-speed operation (3000 mm/s) with light loads to low/medium-speed operation with heavy loads

Made to Order

Large Flow Speed Controller
AS3201F-01-□□SA-X778

The orifice diameter has been enlarged to support the high-speed operation of cylinders.

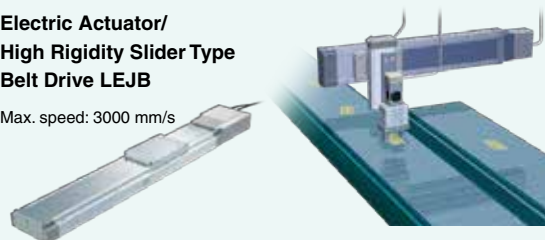


Electric

p. 48

Electric Actuator/
High Rigidity Slider Type
Belt Drive LEJB

Max. speed: 3000 mm/s



High Speed

High Frequency

p. 47

High speed, High frequency actuation MQML□□H

H type (without fixed orifice) achieves speeds up to 3000 mm/s.



High Speed 2-Port Valve SX10

High-speed response ON: 0.45 ms
OFF: 0.4 ms (±0.05 ms)
Long service life: 5 billion cycles or more



Solid Preparation Manufacturing Process

Energy Saving

Power Saving

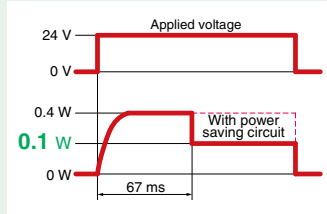
p. 54

Power consumption is reduced by power saving circuit.

Power consumption

0.1 w With power saving circuit **0.4 w** Standard (With indicator light)

[Electrical power waveform with power saving circuit]



Next Generation Products

Air Saving, Lightweight, and Compact

p. 61

Reduction in cylinder air consumption

* Please contact SMC for details.

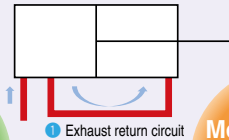
1/3 the air consumption

Total air consumption reduced by **70%**

Exhaust return circuit
Reduced by 45%

Tubing size
Reduced by 17%

Medium bore
Reduced by 20%



API manufacturing process

Weighing

Granulating

Mixing

Tableting

Temperature Control

Temperature Control

p. 59

Thermo-chiller Lineup

Standard Type HRS



1.1 kW to 5.9 kW With heating function

Temperature stability $\pm 0.1^{\circ}\text{C}$

Outstanding performance and multiple functions are now the global standard.

Lightweight/Compact

*1 UL Standards: Applicable to 60 Hz only



Standard Type HRS100/150



10 kW / 15 kW With heating function

Temperature stability $\pm 1.0^{\circ}\text{C}$

A model designed for outdoor use (HRS series)



Inverter Type HRSH090



9.5 kW to 11 kW With heating function

Temperature stability $\pm 0.1^{\circ}\text{C}$

Only for indoor use (HRSH series)

Lightweight and compact triple inverter model



Inverter Type HRSH



10 kW to 28 kW With heating function

Temperature stability $\pm 0.1^{\circ}\text{C}$

Globally compatible powerful and intelligent chiller

Outstanding energy saving due to the triple inverter



Basic Type HRSE



1.0 kW to 2.2 kW

Temperature stability $\pm 2.0^{\circ}\text{C}$

Convenient cooling of the required location

Efficient energy saving due to the triple control



High-performance Type HRZ, HRZD, HRW



1.0 kW to 30 kW With heating function

Temperature stability $\pm 0.1/0.3^{\circ}\text{C}$

High-performance type for semiconductor manufacturing equipment, etc.



Centralized Control

Reduced Wiring p. 55

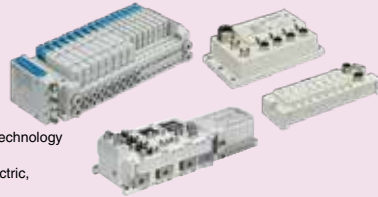
Reduced-wiring Fieldbus System

Communication protocols



Trademark

DeviceNet™ is a trademark of ODVA.
 EtherNet/IP™ is a trademark of ODVA.
 CompoNet™ is a trademark of ODVA.
 EtherCAT® is a registered trademark and patented technology licensed by Beckhoff Automation GmbH, Germany.
 Modbus® is a registered trademark of Schneider Electric, licensed to the Modbus Organization, Inc.



IO-Link Compatible Product p. 56



Standards p. 41, 42

Food Sanitation Law Compliant Products

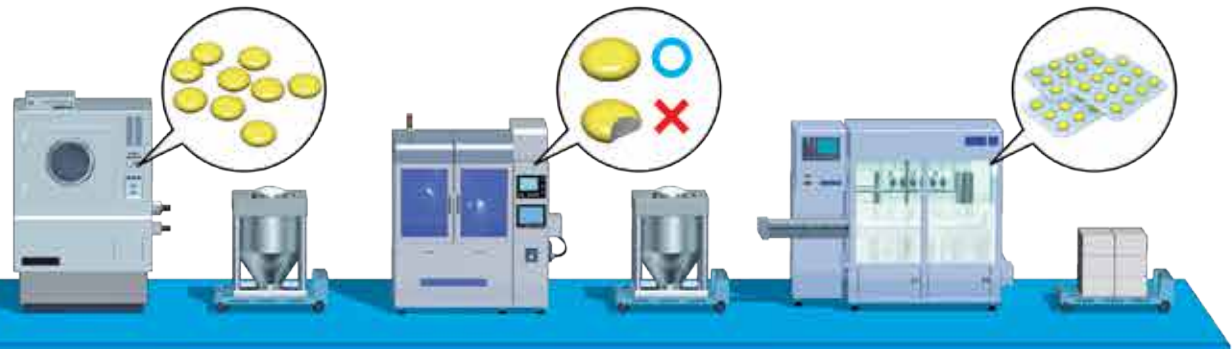
FDA (Food and Drug Administration) Compliant

Food Sanitation Law compliant
 Component materials have met apparatus and container-package standards.

FDA (Food and Drug Administration) compliant

*1 Compliant with the FDA's (Food and Drug Administration) § 177-1550 dissolution test
 *2 Compliant with the FDA's (Food and Drug Administration) § 177-2600 dissolution test
 *3 Compliant with the FDA's (Food and Drug Administration) 21CFR§177.2600 dissolution test

	Series	Food Sanitation Law compliant	FDA (Food and Drug Administration) compliant
Tubing	TL/TIL	●	● ^{*1}
	TLM/TILM	●	● ^{*1}
	TH/TH	●	● ^{*1}
	TD/TID	●	● ^{*1}
	TU-X217	●	—
Fittings	TU-X214	—	● ^{*2}
	KQG2	●	—
	KFG2	●	—
Vacuum pad	KP	●	—
	ZP3P	—	● ^{*3}



Temperature Control

Constant Temperature p. 59

Peltier-type Thermo-con/Thermoelectric Bath Lineup

Thermo-con HEC/HECR CE, MET, IEC
 140 W to 1200 W With heating function
 Temperature stability ±0.01 to 0.03°C
 High-precision temperature control type for semiconductor manufacturing equipment, medical equipment, etc.



Chemical Thermo-con HED CE, SEM
 300 W to 750 W With heating function
 Temperature stability ±0.1°C
 All wetted parts are made of fluororesin.
 Controls the temperature of chemicals by directly cooling and heating them



Thermoelectric Bath HEB/INR-244 CE, MET, IEC
 140 W to 320 W With heating function
 Temperature stability ±0.01°C
 Accurately controls the temperature of the water in the bath



Others

Dehumidification p. 69

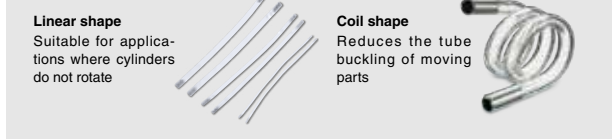
Membrane Air Dryer IDG□A/IDG CE
 Non-fluorocarbon
 Compatible with low dew points (-60°C)
 No vibration or heat discharge

Dry air can be easily supplied using the hollow fiber membrane.

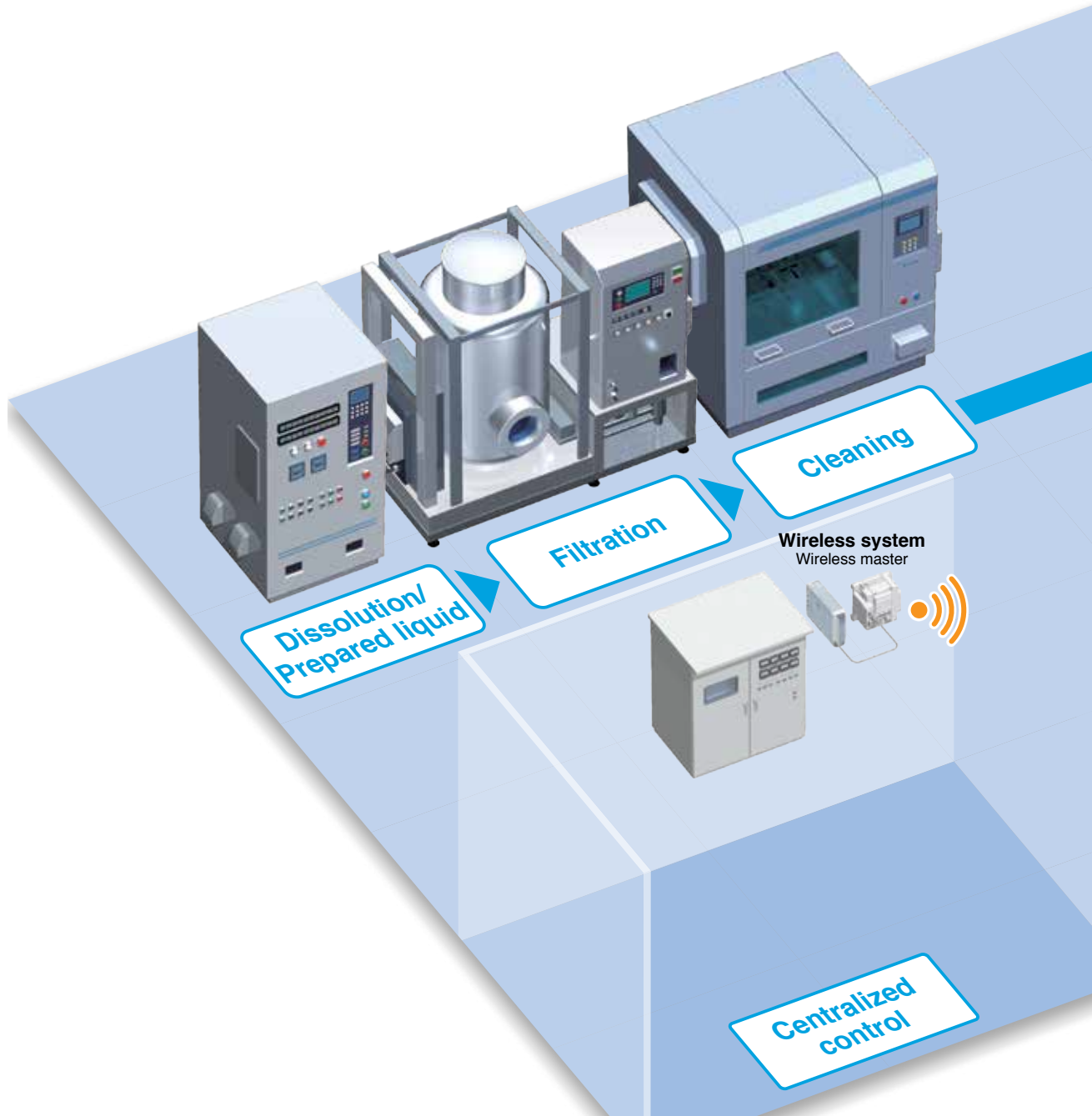


Thermo-dryer IDH□ CE
 Stable supply of temperature and pressure controlled dry clean air


Moisture Control Tube IDK
 Prevents condensation in piping for small cylinders/air grippers




Solid Preparation Manufacturing Process



 Environmental Resistance **From p. 29**

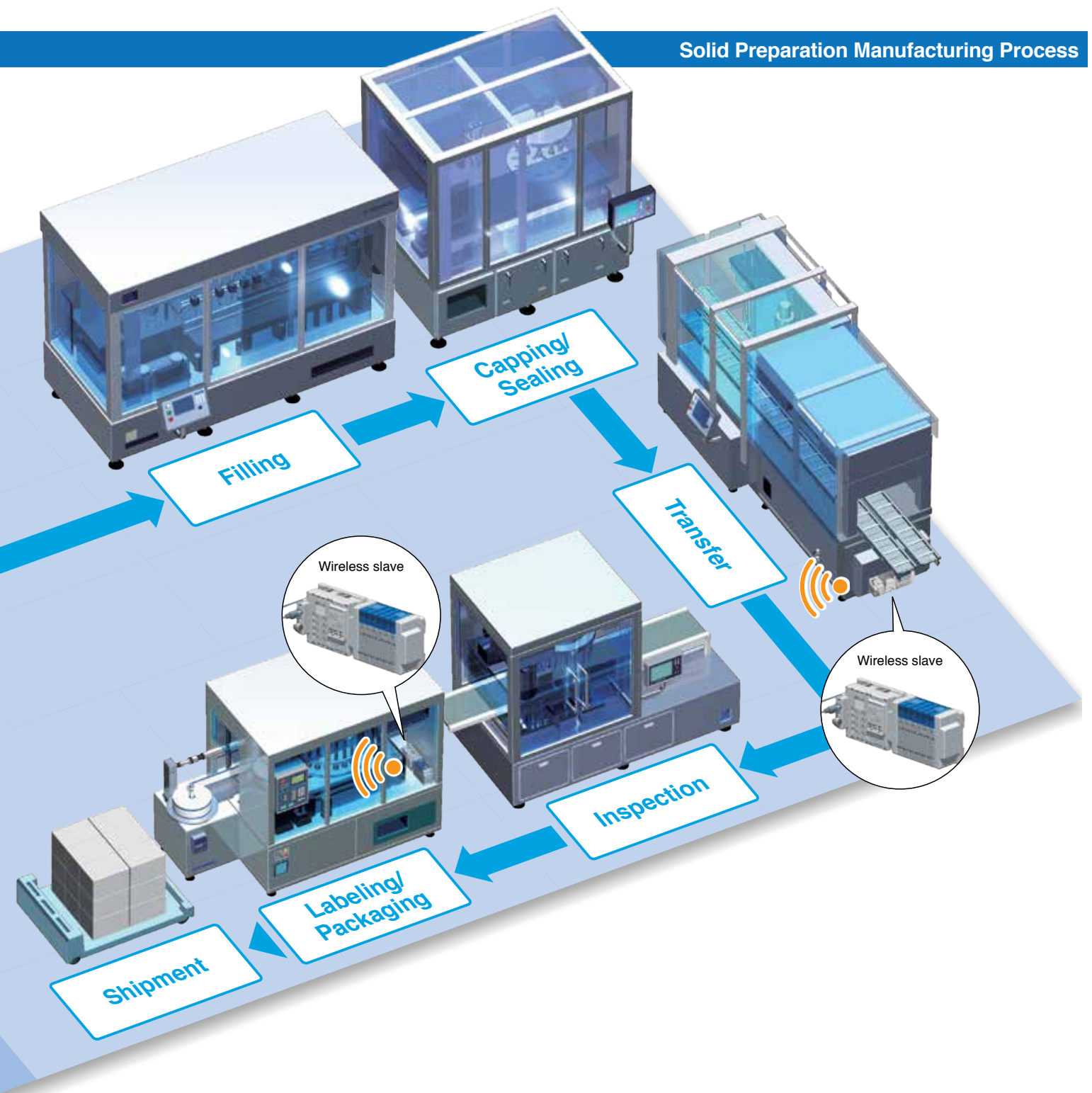
 Standards **From p. 41**


 High Speed **From p. 47**
High-speed actuation

 Sanitation **From p. 39**

 Clean **From p. 43**


 Electricity Countermeasures **From p. 49**



 **Energy Saving** From p. 51

 **Temperature Control** p. 59





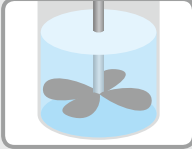
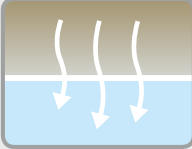
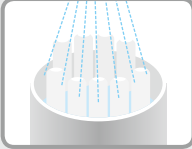

Product Support p. 63

 **Centralized Control** From p. 55





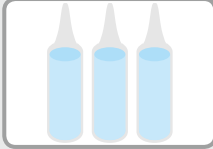
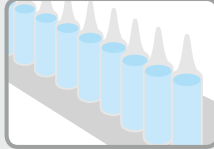
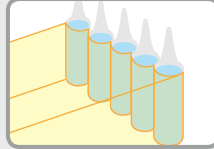
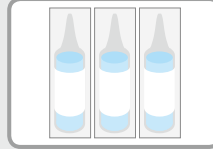
Next Generation Products From p. 60

Others From p. 64

Solution Preparation Manufacturing Process

Solution Preparation Manufacturing Process		Dissolution/ Prepared liquid	Filtration	Cleaning	Filling
		 Process for dissolving solid medicinal substances or additive agents in a solvent to produce solution preparations, such as injection solutions, ophthalmic solutions, and transfusions	 Process for removing bacteria and foreign substances from the dissolved preparation and for manufacturing a clean prepared liquid	 Process for aseptically drying vials, ampules, syringes, etc., after ultrasonic cleaning	 Process for filling ampules, vials, etc., with the dissolved and filtered solution preparations using various filling machines
					
Environmental Resistance	Water/Corrosion Resistant (Stainless Steel)	●	●	●	●
	Dustproof			●	●
	IP67/65	●	●	●	●
	Heat/Cold Resistant	●	●	●	●
Sanitation	Hygienic	●	●	●	●
	Grease for Food Processing Equipment (NSF-H1)	●	●	●	●
Standards	Food Sanitation Law Compliant	●	●	●	●
	FDA (Food and Drug Administration) Compliant	●	●	●	●
Clean	Clean Room	●	●	●	●
	Clean Blow	●	●	●	●
	Grease-free	●	●	●	●
High Speed	High Speed				●
	High Frequency				●
	Electric				●
Electricity Countermeasures	Static Neutralization				●
	Explosion Proof	●	●	●	●
Energy Saving	Air Saving				●
	Power Saving				●
Centralized Control	Reduced Wiring				●
	IO-Link Compatible Product				●
	Pressure/Flow Control	●	●	●	●
Temperature Control	Temperature Control	●	●		●
	Constant Temperature	●	●		●
Next Generation Products	Air Saving, Lightweight, and Compact			●	●
	Wireless System			●	●
Product Support	Calibration Certificate	●	●	●	●
Others	High Pressure	●	●	●	●
	Steam	●	●	●	●
	Cleaning (Filtration Filter)	●	●	●	●
	Adsorption Transfer				●
	Dehumidification				●
	Various Valves for Analyzing Reagents and Others	●	●	●	●

Solution Preparation Manufacturing Process

Capping/Sealing	Transfer	Inspection	Labeling/Packaging		
					
Process for sealing ampoules, vials, etc., using a sealing machine	Process for transferring capped and sealed ampoules, vials, etc., to the inspection machine	Process for measuring insoluble particulates and inspecting appearance, etc., using various automatic inspection machines	Process for protecting pharmaceutical products with specified packaging materials which prevent the transformation or deterioration of the pharmaceuticals		
					
●	●			Water/Corrosion Resistant (Stainless Steel)	Environmental Resistance
●	●			Dustproof	
●	●			IP67/65	
				Heat/Cold Resistant	
●	●			Hygienic	Sanitation
●	●	●	●	Grease for Food Processing Equipment (NSF-H1)	
●	●			Food Sanitation Law Compliant	Standards
●	●	●	●	FDA (Food and Drug Administration) Compliant	
●	●			Clean Room	Clean
●	●			Clean Blow	
●	●			Grease-free	
●	●			High Speed	High Speed
●	●	●	●	High Frequency	
●	●	●	●	Electric	
●	●	●	●	Static Neutralization	Electricity Countermeasures
●	●	●	●	Explosion Proof	
●	●	●	●	Air Saving	Energy Saving
●	●	●	●	Power Saving	
●	●	●	●	Reduced Wiring	Centralized Control
●	●	●	●	IO-Link Compatible Product	
●	●	●	●	Pressure/Flow Control	
				Temperature Control	Temperature Control
				Constant Temperature	
●	●	●	●	Air Saving, Lightweight, and Compact	Next Generation Products
●	●	●	●	Wireless System	
●	●	●	●	Calibration Certificate	Product Support
●				High Pressure	Others
●				Steam	
●				Cleaning (Filtration Filter)	
●	●	●	●	Adsorption Transfer	
●	●			Dehumidification	
●				Various Valves for Analyzing Reagents and Others	

Solution Preparation Manufacturing Process

Sanitation

Hygienic

p. 39

A water-resistant cylinder configured for easy cleaning

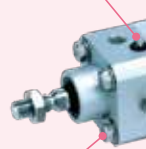
Grease for food processing equipment (certified by NSF-H1) is available.

Flat, grooveless configuration

Eliminates the auto switch cushion needle holes, etc.

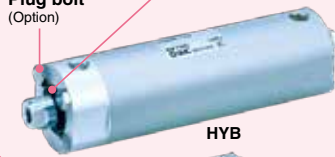


Cushion needle



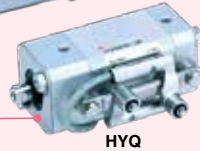
Plug bolt (Option)

Scraper



HYB

External cover (Option)

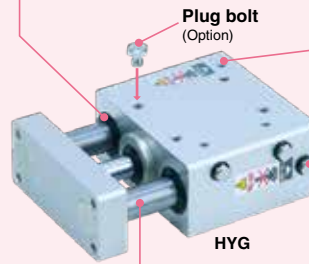


HYC

HYQ

New scraper

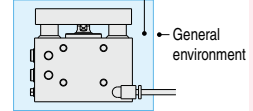
Grease retention in guide rod and cylinder rod



Plug bolt (Option)

Breathing port on guide

<Application example> Water dispersion environment



Piping at the breathing port on guide allows breathing outside the water dispersion environment.

Special coating

Guide accommodates a special coating.

Solution Preparation Manufacturing Process



Dissolution/
Prepared liquid

Filtration

Cleaning

Filling

Capping/Sealing

Sanitation

Grease for Food Processing Equipment (Certified by NSF-H1) p. 39, 40

Cylinder
CJ5-S/CG5-S



Made to Order

Series	Symbol (Suffix)	Series	Symbol (Suffix)
CM2	-XC85	MXQ	-X9
CG1		MXF	
CQ2		MXW	
CQS		MXP	
MGP		MXPJ	
		MXY	-X79
		MIW	
		MIS	
		MH□	

Energy Saving

Air Saving

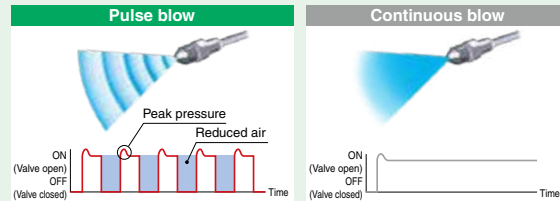
p. 51

Pulse Blowing Valve

Made to Order

AXTS040□-□□-X2

The peak pressure of repeatedly colliding air permits efficient blowing. Air consumption reduced by 50% or more



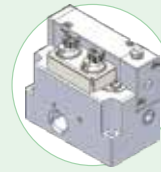
ON time adjustment needle
OFF time adjustment needle



Port size: 1/2
AXTS040□-□□-X2

Related product

* Please contact SMC for details.



Port size: 1/4
AXTS020-1P-X2

Sanitation

Hygienic

p. 39

Service life 5 times longer than the existing model (SMC ratio)

Waterproof examination result (Reference data)

	1	2	3	4	5
Hygienic Design Cylinder (HYB, HYQ, HYC, HYG)					
Water resistant cylinder	Compared with the existing model: Approx. 5 times				
Standard cylinder					

Washing in water/Temperature: 30°C, Flow rate: 160 cc/min

Hygienic Design Cylinder

HY□

External seal material: Choice of NBR or FKM
Mounting section: Conforms to ISO/VDMA standard (HYC series)



Transfer

Inspection

Labeling/Packaging

Shipment

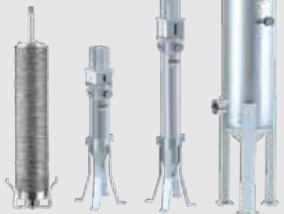
Others

Cleaning (Filtration Filter)

p. 66

Low Maintenance Filter
FN1/FN4

No more element replacement
Our unique element construction
with back-flushing capability
Eco-friendly regenerative filter



Filter for Cleaning Fluid/
Quick Change Filter
FQ1



HEPO II Element
for FQ1
EJ101S

Material: PET



HEPO II Element
EJ102S

All parts of this element are made of polypropylene, which is optimal for various cleaning fluids including alkali and organic solvents.



Clean

Clean Blow

p. 44

Clean Air Filter
SFD

(Hollow fiber element)
Filtration: 0.01 μm (Filtration efficiency: 99.99%)



SFD100
Up to 100 L/min (ANR)



SFD200
Up to 500 L/min (ANR)



SFD101/102
Made to Order
Up to 100 L/min (ANR)

Centralized Control

Pressure/Flow Control

p. 58

Electro-Pneumatic Regulator

Stepless control of air pressure in proportion to electrical signals

ITV0000

Max. flow rate: 6 L/min (ANR)



ITV1000

Max. flow rate: 200 L/min (ANR)
Grease-free (Wetted parts)



ITV2000

Max. flow rate: 1500 L/min (ANR)



ITV3000

Max. flow rate: 4000 L/min (ANR)



High Pressure Electro-Pneumatic Regulator

Max. flow rate: 3000 L/min (ANR)

ITVX



ITVH



Electronic Vacuum Regulator

ITV009□



ITV209□



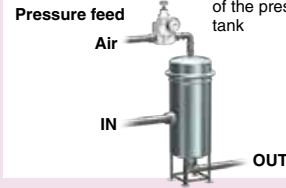
Precision Regulator IR1000-A/IR2000-A/IR3000-A

Sensitivity: **0.2%** (Full span)

Repeatability: **±0.5%** (Full span)

Series	Set pressure range [MPa]
IR1000-A	0.005 to 0.2
	0.01 to 0.4
	0.01 to 0.8
IR2000-A	0.005 to 0.2
	0.01 to 0.4
	0.01 to 0.8
IR3000-A	0.01 to 0.2
	0.01 to 0.4
	0.01 to 0.8

[Application Example] For the adjustment of the pressure in a tank



Solution Preparation Manufacturing Process



Dissolution/
Prepared liquid

Filtration

Cleaning

Filling

Capping/Sealing

Product Support

Calibration Certificate

p. 63

All of our pressure switches and flow switches come with a calibration certificate.

Pressure Switch: Suffix -X5

- Traceability system chart attached
- Calibration certificate of the product attached
- Traceability system chart of standard instruments attached
- Calibration certificate of standard instruments attached

Applicable Series

3-Screen Display
High-Precision Digital
Pressure Switch
ZSE20□(F)/ISE20□



·ZSE10(F)/ISE10

3-Screen Display
High-Precision Digital
Pressure Switch
ISE7□/7□G



·PSE53□
·PSE54□
·PSE550

Pressure Sensor
for General Fluids
PSE56□



·PSE200
·PSE300
·PSE57□

3-Screen Display
Sensor Monitor
PSE300AC



Flow Switch: Standard model no. (Available with -A)

- Inspection certificate (with serial number) attached
- Traceability system chart attached (Traceability system chart of standard instruments attached)

Applicable Series

2-Color Display
Digital
Flow Switch
PFMB



·PFM
·PF2D

3-Color Display
Digital
Flow Switch
PFMC



3-Color Display
Digital
Flow Switch
for Large Flow
PF3A7□H



3-Color Display
Digital
Flow Switch
for Water
PF3W



* Products other than those listed above are also available.
Please contact SMC for details.

Environmental Resistance



Corrosion Resistant (Stainless Steel)

p. 30 to 32

Cylinder
CJ5-S/CG5-S

All stainless steel specifications (External parts)
Stainless steel 304 is used for external metal parts.
Corrosion resistance is improved even in environments with exposure to water.



Stainless Steel Foot Bracket,
Flange Bracket,
Single Knuckle Joint,
Double Knuckle Joint



Description	Model
External stainless steel cylinder	-XB12
Made of stainless steel	-XC6
Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel	-XC7
Double clevis and double knuckle joint pins made of stainless steel	-XC27
Made of stainless steel (Combination of XC7 and XC68)	-XC65
Made of stainless steel (with hard chrome plated piston rod)	-XC68

Floating Joint JS



Clean Regulator SRH



Stainless Steel 316 One-touch/Insert Fittings KQG2/KFG2



S Couplers KKA



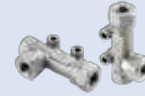
Speed Controller ASG



Pressure Sensor for General Fluids PSE56□



All Stainless Steel Vacuum Ejector ZH□□-X267



Chemical Liquid Valve LVA



Transfer

Inspection

Labeling/Packaging

Shipment

Others

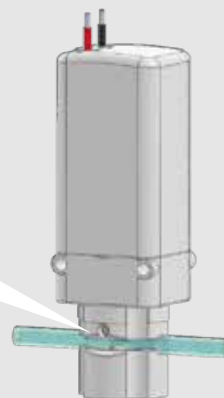
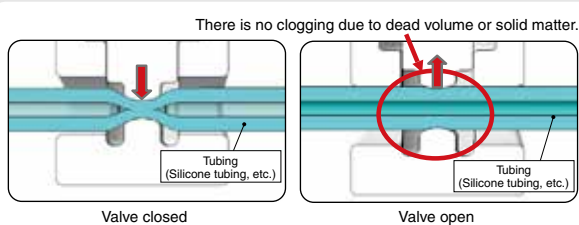
Various Valves for Analyzing Reagents and Others

p. 70

Pinch Valve

The flow volume of the fluid is controlled by directly clamping the tube so as to open or close it.

- The fluid does not come into contact with the moving parts of the valve, so there is no inflow of contaminants.
- By discarding a tube after use, the need for a washing process is eliminated, thus ensuring good hygiene.
- Tubes can be set or replaced easily.



Solenoid valve type



LPV

Solution Preparation Manufacturing Process

Next Generation Products

Air Saving, Lightweight, and Compact p. 60, 61

* Please contact SMC for details.

<5-Port Solenoid Valve/Plug-in Type>

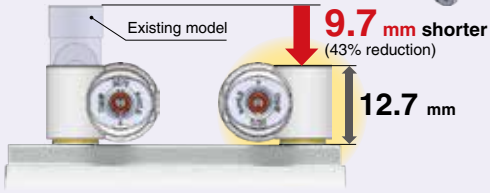
Volume: **39% reduction**
Weight: **32% reduction**



JSY3000 Series

<Compact Speed Controller>

Height: **43% reduction**
(22.4 mm → 12.7 mm)



Wireless System p. 62

Noise resistance

Uses the 2.4 GHz ISM frequency band
Frequency hopping: Every 5 ms

High-speed connection

From power supply ON to start of communication: **Min. 250 ms***1
*1 For wireless slave

Communication response

Signal response time: **5 ms**

Communication cables not required

Reduced wiring work, space, and cost
Minimized disconnection risk

Number of I/O points

Max. 1280 inputs/1280 outputs
(Max. 128 inputs/128 outputs per module)

Compatible protocols

EtherNet/IP



■ Trademark
EtherNet/IP™ is a trademark of ODVA.

Solution Preparation Manufacturing Process



Dissolution/
Prepared liquid

Filtration

Cleaning

Filling

Capping/Sealing

Next Generation Products

Air Saving, Lightweight, and Compact p. 60

* Please contact SMC for details.

<Square Air Cylinder>

Weight: Max. **57% reduction**



<Aluminum Rod Cylinder>

CQ2 Series

Weight:
Max. **20% reduction**



MB Series

Weight:
Max. **24% reduction**



CM2 Series

Weight:
Max. **20% reduction**



MGP Series

Weight:
Max. **39% reduction**



Others

High Pressure p. 64

3-Screen Display

High-Precision Digital Pressure Switch

ISE7□G IP67

It is possible to change the settings while checking the measured value.

General Fluids

5.0 MPa: ISE76G
10 MPa: ISE77G



Steam p. 65

Angle Seat Valve/Air Operated Type

VXB

Fluid temperature: 183°C (Steam) or less
Long service life: 3 million cycles (Steam),
5 million cycles (Air)



Bronze (CAC)

Stainless steel 316L equivalent

High Speed

High Speed p. 47

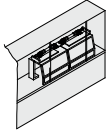
High Power Cylinder RHC

Smooth cushioning from high-speed operation (3000 mm/s) with light loads to low/medium-speed operation with heavy loads

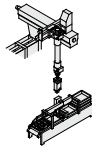


[Application Examples]

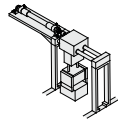
For the opening/closing of doors (2000 mm/s, several tens kg)



For high-speed Z-axis operation (Up to 3000 mm/s, several kg)



For transfer equipment (40 kg, 1000 mm/s (For ø32))



Made to Order

Large Flow Speed Controller AS3201F-01-□□SA-X778

The orifice diameter has been enlarged to support the high-speed operation of cylinders.



Electric p. 48

Electric Gripper LEH

Z Type (2 fingers)
Compact, lightweight



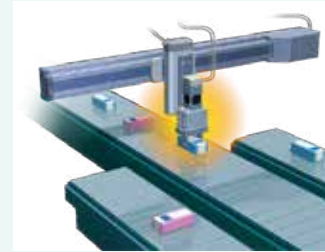
ZJ Type (2 fingers)
With dust cover (IP50 equivalent)



F Type (2 fingers)
Can hold various types of workpieces with a long stroke



S Type (3 fingers)
Can hold round workpieces



Electricity Countermeasures

Static Neutralization p. 49

Fan Type

- Extensive static neutralization possible without using compressed air
- Wide ranging static neutralization devices from simple compact types to optional types with a louver



IZF10R

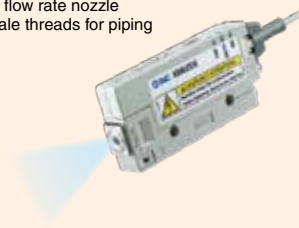
IZF21

IZF31

Nozzle Type IZN10E

The nozzle type can be selected according to the application.

- Energy-saving static neutralization nozzle
- High flow rate nozzle
- Female threads for piping



For static neutralization and particle elimination on reagent bottles

Desktop Duster Box ZVB

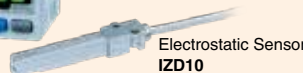
Static neutralization, dust removal, and dust collection processes have been integrated into one box.



Electrostatic Sensor



Electrostatic Sensor Monitor IZE11



Electrostatic Sensor IZD10

Handheld Electrostatic Meter IZH10



Solution Preparation Manufacturing Process

Temperature Control

Temperature Control

p. 59

Peltier-Type Chiller/Thermo-con HEC

Can precisely control the temperature of a heat source or process fluid



Reagent cooling equipment



Rack Mount Type HECR



Mountable in a 19-inch rack

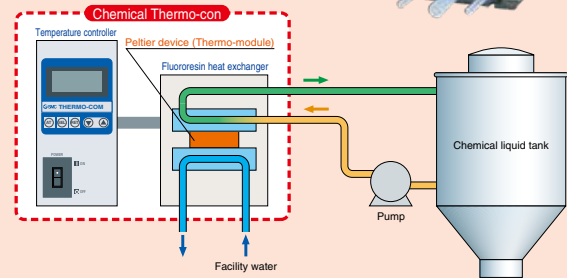


Constant Temperature

p. 59

Chemical Thermo-con HED

A fluororesin heat exchanger allows for the direct temperature control of chemical liquids. Industry-leading withstand pressure: 0.35 MPa



Solution Preparation Manufacturing Process



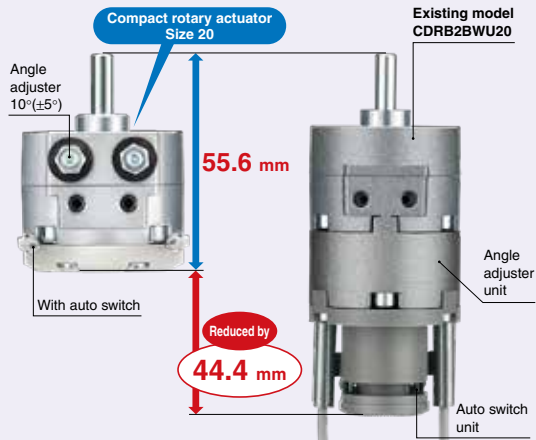
Next Generation Products

Air Saving, Lightweight, and Compact

p. 60, 61

Compact Rotary Actuator (Vane Type)

Size: 10, 15, 20, 30, 40

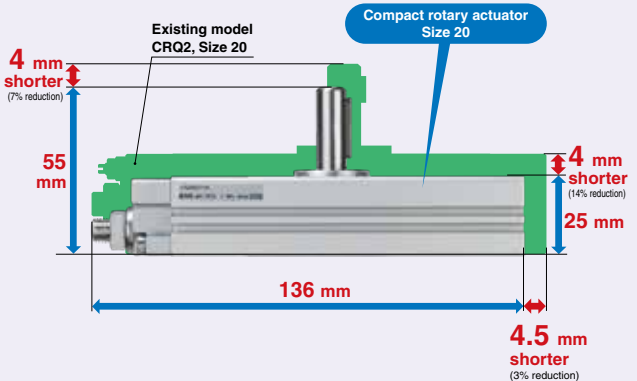


Weight: **48%** reduction (222 g → 115 g) (For size 20)
Overall length: **44%** reduction (100 mm → 55.6 mm) (For size 20)

Compact Rotary Actuator (Rack & Pinion Type)

Size: 10, 15, 20, 30, 40

* Please contact SMC for details.



Weight: **29%** reduction (700 g → 500 g) (For size 20)
Height: **7%** reduction (59 mm → 55 mm) (For size 20)

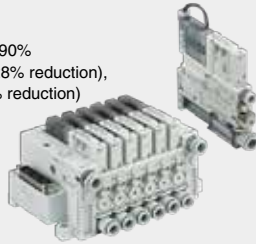
Others

Adsorption Transfer

p. 67

Vacuum Unit ZK2

Air saving: Air consumption reduced by 90%
 Compact/Lightweight: Volume 88 cm³ (28% reduction),
 Weight 81 g (59% reduction)
 Nozzle diameter: ø0.7, ø1.0, ø1.2, ø1.5



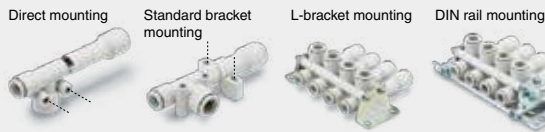
Vacuum Pad ZP3P

Good for film packaging applications where the shape of the workpiece changes easily from being lifted.
 Silicone rubber compliant with the FDA (USA Food and Drug Administration) 21CFR§177.2600 elution test is used.



Body Ported Type Vacuum Ejector ZH

Overall length: Max. 11% reduction
 Weight: Max. 74% reduction



All Stainless Steel Vacuum Ejector ZH□□-X267

All stainless steel (SCS13: Equivalent to stainless steel 304)
 Sealant not required
 Max. operating temperature: 260°C
 Grease-free



Transfer

Inspection

Labeling/Packaging

Shipment

Next Generation Products

Air Saving, Lightweight, and Compact

p. 61

Compact Rotary Table (Rack & Pinion Type)

Size: 10, 20, 30, 50



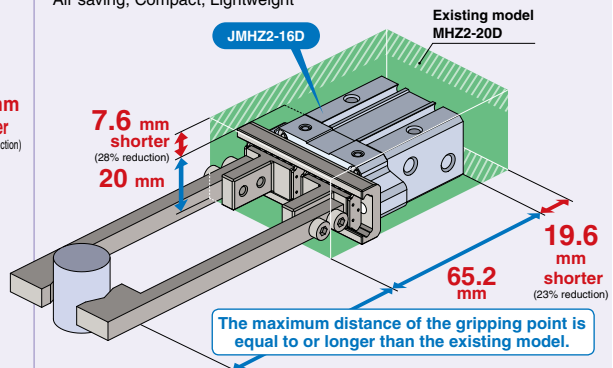
Weight: **32%** reduction (940 g → 640 g) (For size 20)
 Height: **28%** reduction (54 mm → 39 mm) (For size 20)

Compact Air Gripper

ø8, ø12, ø16, ø20

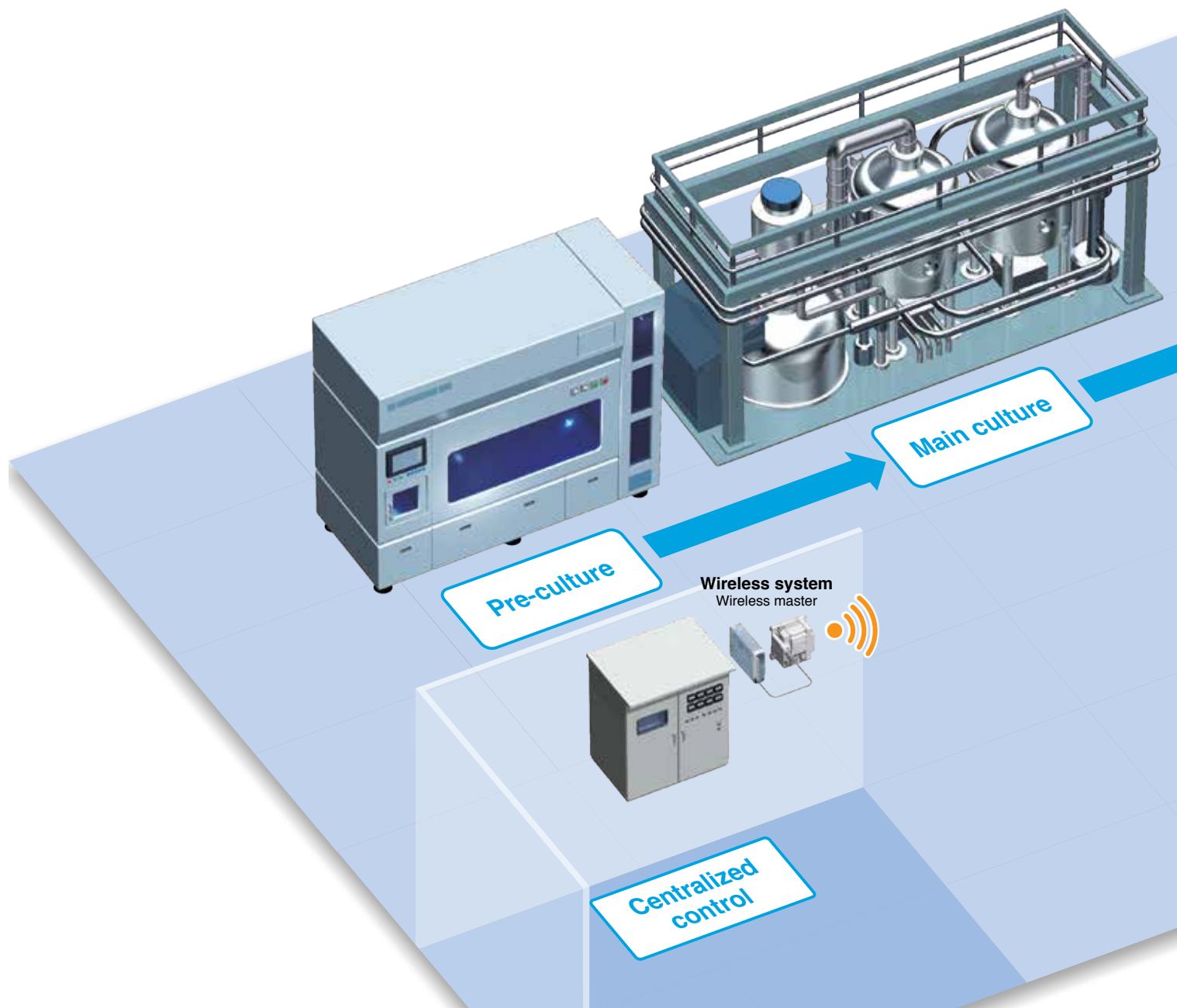
Thanks to downsizing (Size 20 → 16),
 Air saving, Compact, Lightweight

* Please contact SMC for details.




Weight: **46%** reduction (235 g → 127 g)
 Height: **28%** reduction (27.6 mm → 20 mm)
 Overall length: **23%** reduction (84.8 mm → 65.2 mm)


Bio-pharmaceuticals Manufacturing Process



 Environmental Resistance **From p. 29**

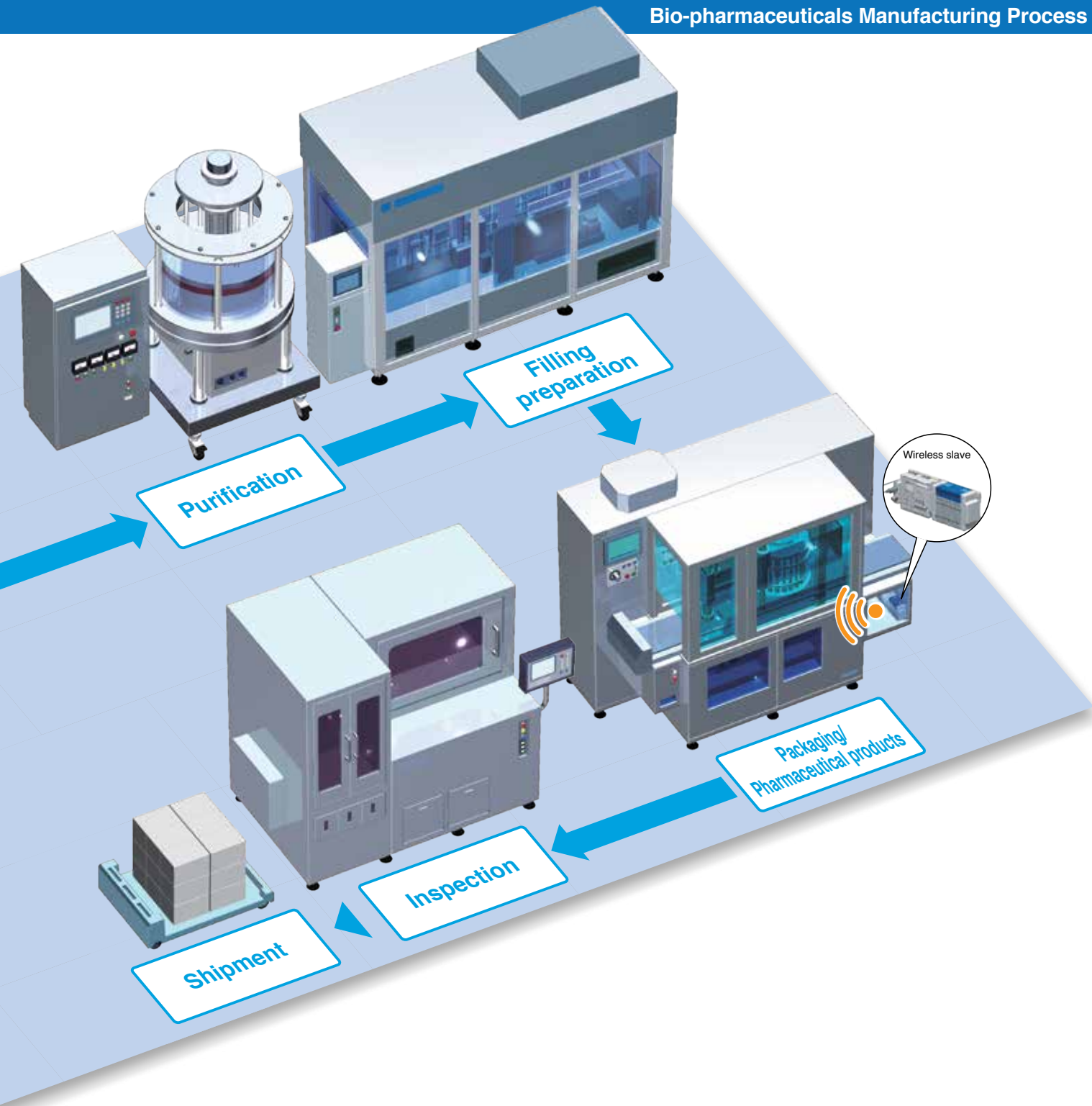
 Standards **From p. 41**

 High Speed **From p. 47**
High-speed actuation

 Sanitation **From p. 39**

 Clean **From p. 43**


 Electricity Countermeasures **From p. 49**



 **Energy Saving** From p. 51

 **Temperature Control** p. 59





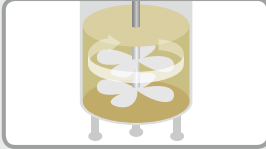
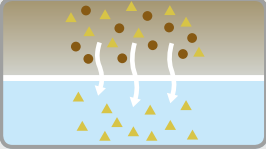
Product Support p. 63

 **Centralized Control** From p. 55

Next Generation Products From p. 60

Others From p. 64

Bio-pharmaceuticals Manufacturing Process

Bio-pharmaceuticals Manufacturing Process		Pre-culture	Main culture	Purification
				
		Process for culturing cells (The cells are grown in a culture medium.)	Process for further culturing cells using a large culture tank subsequent to the pre-culture	Process for removing cells from the culture medium, and then removing impurities using a chromatography to enhance the purity of the API
				
Environmental Resistance	Water/Corrosion Resistant (Stainless Steel)	●	●	●
	Dustproof			
	IP67/65	●	●	●
	Heat/Cold Resistant			
Sanitation	Hygienic	●	●	●
	Grease for Food Processing Equipment (NSF-H1)			
Standards	Food Sanitation Law Compliant	●	●	●
	FDA (Food and Drug Administration) Compliant	●	●	●
Clean	Clean Room	●	●	●
	Clean Blow	●	●	●
	Grease-free	●	●	●
High Speed	High Speed			
	High Frequency			
	Electric			
Electricity Countermeasures	Static Neutralization			
	Explosion Proof	●	●	●
Energy Saving	Air Saving	●	●	●
	Power Saving	●	●	●
Centralized Control	Reduced Wiring	●	●	●
	IO-Link Compatible Product	●	●	●
	Pressure/Flow Control	●	●	●
Temperature Control	Temperature Control			
	Constant Temperature	●	●	●
Next Generation Products	Air Saving, Lightweight, and Compact			●
	Wireless System			●
Product Support	Calibration Certificate	●	●	●
Others	High Pressure			●
	Steam			●
	Cleaning (Filtration Filter)	●	●	●
	Adsorption Transfer			●
	Dehumidification	●	●	●
	Various Valves for Analyzing Reagents and Others			●

Bio-pharmaceuticals Manufacturing Process

Filling preparation 	Packaging/ Pharmaceutical products 	Inspection 		
Process for filling containers with the purified API using a filling machine 	Process for packaging finished pharmaceutical products 	Process for inspecting finished products for cracks, the adhesion of foreign substances, etc. 		
●			Water/Corrosion Resistant (Stainless Steel)	Environmental Resistance
●			Dustproof	
●			IP67/65	
			Heat/Cold Resistant	
●			Hygienic	Sanitation
●			Grease for Food Processing Equipment (NSF-H1)	
●	●	●	Food Sanitation Law Compliant	Standards
●	●	●	FDA (Food and Drug Administration) Compliant	
●			Clean Room	Clean
●			Clean Blow	
●			Grease-free	
●			High Speed	High Speed
●			High Frequency	
●			Electric	
●			Static Neutralization	Electricity Countermeasures
●			Explosion Proof	
●			Air Saving	Energy Saving
●			Power Saving	
●			Reduced Wiring	Centralized Control
●			IO-Link Compatible Product	
●			Pressure/Flow Control	
●			Temperature Control	Temperature Control
●			Constant Temperature	
●			Air Saving, Lightweight, and Compact	Next Generation Products
●			Wireless System	
●			Calibration Certificate	Product Support
●			High Pressure	Others
●			Steam	
●			Cleaning (Filtration Filter)	
●	●	●	Adsorption Transfer	
●			Dehumidification	
●			Various Valves for Analyzing Reagents and Others	

Environmental Resistance



Corrosion Resistant (Stainless Steel)

p. 30

Process Gas Equipment

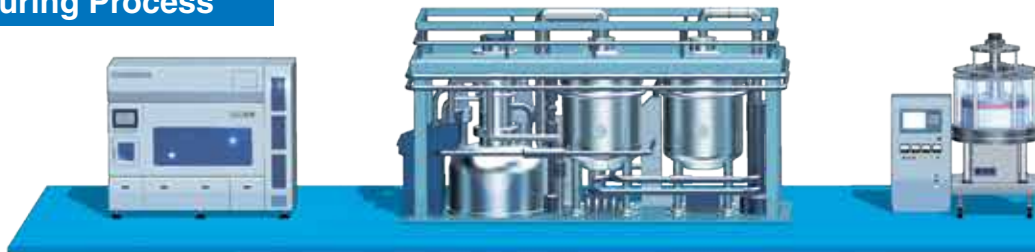
- Regulator
- Diaphragm Valve
- Check Valve
- Vacuum Generator
- Flow Switch



Gas supply unit for culture equipment



Bio-pharmaceuticals Manufacturing Process



Pre-culture



Main culture



Purification



Centralized Control



Reduced Wiring

p. 55

Fieldbus System

Select from 3 product types and 14 protocols.

Type 1 Output type for solenoid valves

Compact equipment with decentralized valve manifolds

EX120/121/122/124/126/140/180/260

Type 2 Gateway type

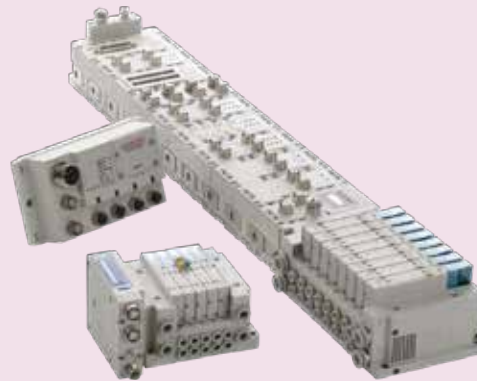
The use of a gateway unit further reduces wiring.

EX500/510

Type 3 Integrated input-output type

Valve manifolds and other units are installed in the same place.

EX245/250/600



Communication Protocols



Trademark

DeviceNet™ is a trademark of ODVA.
EtherNet/IP™ is a trademark of ODVA.
CompoNet™ is a trademark of ODVA.
EtherCAT® is a registered trademark and patented technology licensed by Beckhoff Automation GmbH, Germany.
Modbus® is a registered trademark of Schneider Electric, licensed to the Modbus Organization, Inc.

Clean 

Clean Room p. 43

Assembly and inspection in a standard workshop

↓

Clean room ISO Class 8 equivalent
Surface wiped with alcohol (to remove oil)

↓

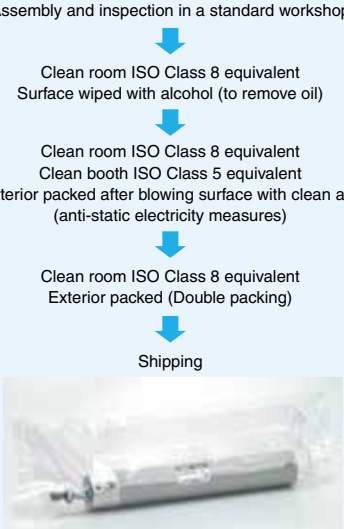
Clean room ISO Class 8 equivalent
Clean booth ISO Class 5 equivalent
Interior packed after blowing surface with clean air
(anti-static electricity measures)

↓


Clean room ISO Class 8 equivalent
Exterior packed (Double packing)

↓


Shipping




Directional Control Valve




Clean Regulator




Clean One-touch Fittings (For blowing)




Air Cylinder




Air Gripper




Clean Air Module




Digital Flow Switch



Rotary Actuator




Pressure Control Equipment Modular F.R.




Clean Blow p. 44

Clean Gas Filter




Clean Air Filter



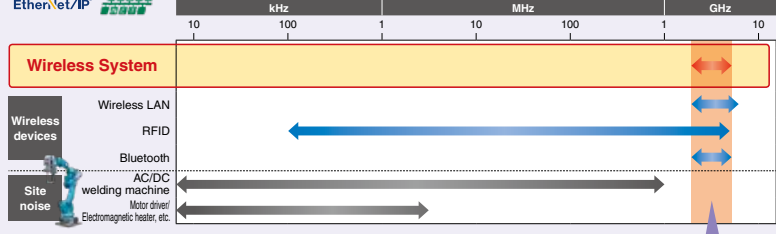


Next Generation Products p. 62

Wireless master unit Wireless slave unit

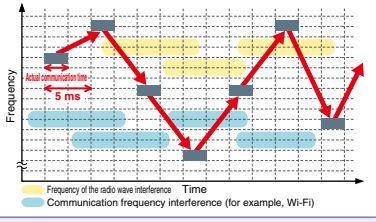


Wireless System EX600-W
Uses the 2.4 GHz ISM frequency band

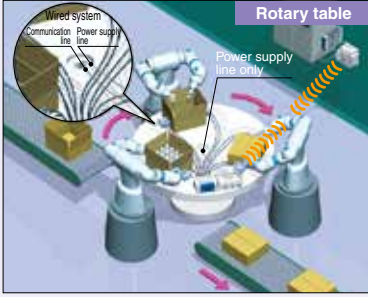


Frequency hopping: Every 5 ms


A stable wireless environment is established using an original protocol which is not affected by interference. Interference from other wireless equipment is prevented.



Rotary table



Blocking of radio waves



Others

Various Valves for Analyzing Reagents and Others

p. 70

Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids LVM

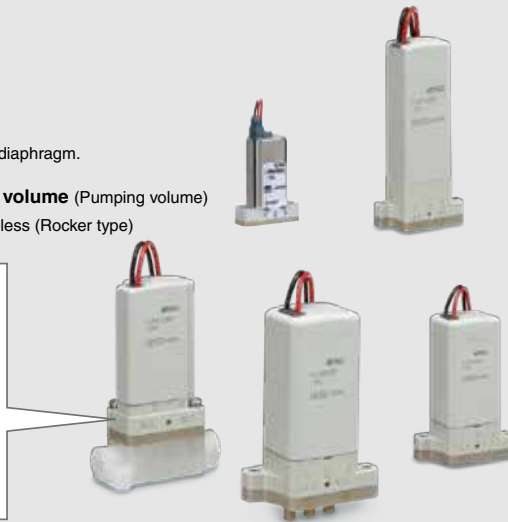
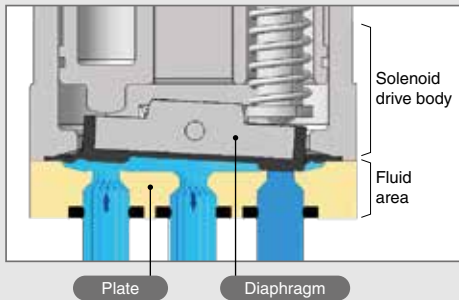
Low Particle Generation Oil-free Metal-free

* Wetted parts

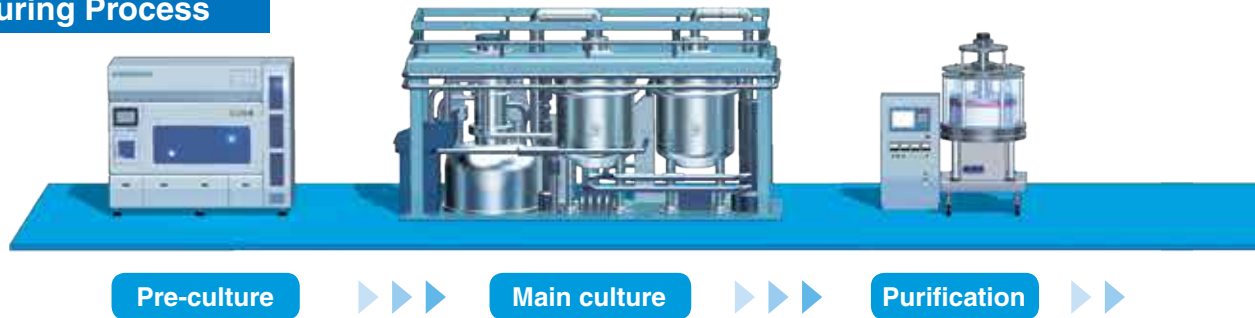
Isolated structure

Direct operated rocker type/poppet type
The solenoid drive body is separated from the fluid area by a diaphragm.

Power consumption (With power-saving circuit) **1.0 W** or less
Change in volume (Pumping volume) **0.01 μL** or less (Rocker type)



Bio-pharmaceuticals Manufacturing Process



Others

Various Valves for Analyzing Reagents and Others

p. 70

Pinch Valve

The flow volume of the fluid is controlled by directly clamping the tube so as to open or close it.

The fluid does not come into contact with the moving parts of the valve, so there is no inflow of contaminants.

By discarding a tube after use, the need for a washing process is eliminated, thus ensuring good hygiene.

Tubes can be set or replaced easily.



[Application Examples]

Waste liquid line for the blood analyzer

DNA analyzer



Others

Various Valves for Analyzing Reagents and Others

p. 70

Composite Manifold

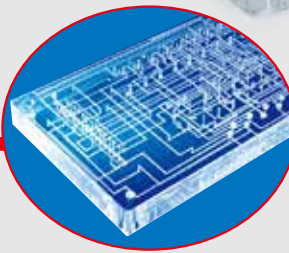
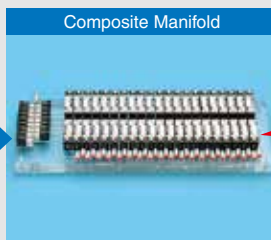
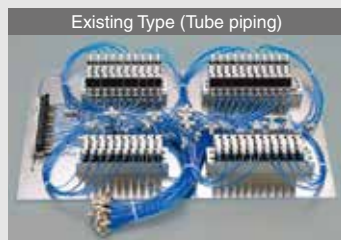
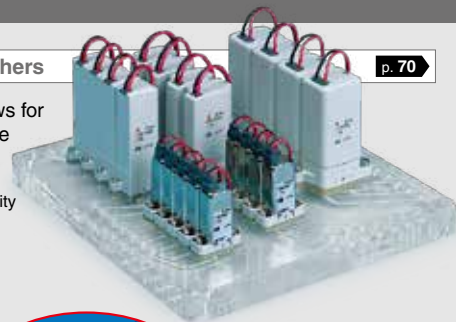
Weight reduced by 70%

Required space reduced by 50%

No piping work required

The unitization of devices allows for the whole unit to be made more compact.

- Space saving
- Flow passage style with high flexibility
- Lightweight
- Reduced piping work
- Reduced wiring
- Transparent flow passage (Acrylic)



Environmental Resistance

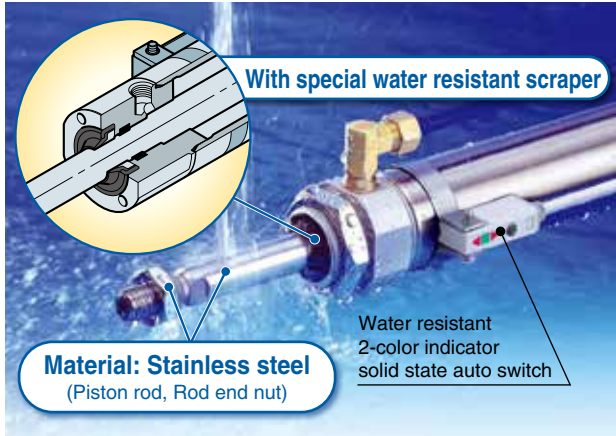
Water Resistant

Water Resistant Cylinders

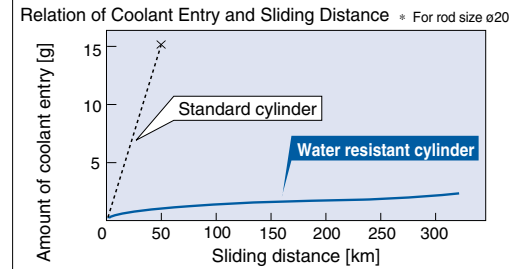
- Applicable for use in environments with water splashing
CM2/CG1/CQ2/CA2/MB/MB1/MGPM/MGGM

p. 89

- The use of a special scraper allows for improved water resistance compared with standard cylinders.

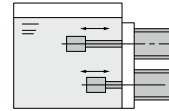


Dramatically improved water resistance



Conditions

Operating conditions.....Air
 Pressure0.5 MPa
 CoolantWater-soluble
 Piston speed.....200 mm/s
 Operating cycle.....60 cpm



Description	Series	Bore size [mm]
Air cylinder	CM2	20, 25, 32, 40
Air cylinder	CG1	32, 40, 50, 63, 80, 100
Compact cylinder	CQ2	20, 25, 32, 40, 50, 63, 80, 100
Air cylinder	CA2	40, 50, 63, 80, 100
Air cylinder	MB	32, 40, 50, 63, 80, 100
Square tube type air cylinder	MB1	32, 40, 50, 63, 80, 100
Compact guide cylinder	MGPM	20, 25, 32, 40, 50, 63, 80, 100
Guide cylinder	MGGM	32, 40, 50, 63, 80, 100

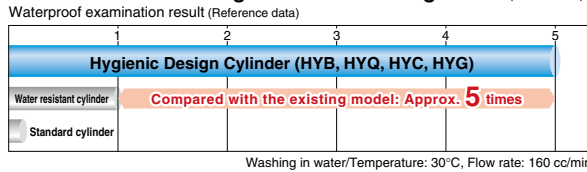
Hygienic Design Cylinder HY□

- Service life 5 times longer than water resistant cylinders



Service life 5 times longer than the existing model (SMC ratio)

p. 89



Type	Series	Action	Bore size [mm]
Round type	HYB	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Basic type	HYQ		20, 25, 32, 40, 50, 63
ISO standard type	HYC		32, 40, 50, 63
With guide	HYG		20, 25, 32, 40, 50, 63

Stainless Steel Cylinder CJ5-S/CG5-S

p. 88

- With special water resistant scraper
- External metal parts: Stainless steel 304, Seal: Choose from NBR or FKM
- Grease for food processing equipment (certified by NSF-H1)

Series	Action	Bore size [mm]
CJ5-S	Double acting	10, 16
CG5-S		20, 25, 32, 40, 50, 63, 80, 100



High Power Cylinder RHC-XC93

p. 96

XC93: With greater water resistance + a stable lubrication function

- Smooth cushioning from high-speed operation (3000 mm/s) with light loads to low/medium-speed operation with heavy loads
- Provides 10 to 20 times the energy absorption capacity of general purpose cylinders*1

*1 CG1 series



Environmental Resistance Corrosion Resistant (Stainless Steel)

Stainless Steel Equipment

Pressure Control Equipment

Clean Regulator SRH
Stainless Steel 316
p. 133



Fittings

Stainless Steel One-touch/
Insert Fittings KQG2/KFG2
Stainless Steel 316
p. 136, 137



Stainless Steel One-touch
Fittings KQ2-G
p. 136



Miniature Fittings/Stainless
Steel 316 MS
Stainless Steel 316
p. 137



S Couplers

Stainless Steel Type
KKA
p. 137



Flow Control Equipment

Stainless Steel Speed Controller
ASG
Stainless Steel 316
p. 145



Check Valve INA-14-□
Made to Order
p. 146



Pressure Switches

3-Screen Display High-Precision
Digital Pressure Switch
ZSE20C(F)/SE20C(H)
p. 148



Pressure Switches

Pressure Sensor for General Fluids
PSE56□
Stainless Steel 316
IP65
p. 149



Flow Switches

3-Color Display Electromagnetic
Type Digital Flow Switch
LFE-X8
p. 153



Ejectors

All Stainless Steel Vacuum Ejector
ZH□□-X267
p. 117



Process Gas Equipment

Regulator
Diaphragm Valve
Check Valve
Vacuum Generator
Flow Switch
p. 169, 170



2-Port Valves for Fluid Control

High Purity Chemical
Liquid Valve LVA
Stainless Steel 316
p. 160



Angle Seat Valve/
Air Operated Type
VXB
p. 156



Direct Operated 2-Port Solenoid Valve
VX2/VDW
p. 156, 157



High Vacuum Equipment

Stainless Steel High Vacuum
Angle/In-line Valve
XM/XY
p. 168



External Stainless Steel Compact Guide Cylinder MGPM□-X2532 Made to Order

For details on this product, refer to the Web Catalog.

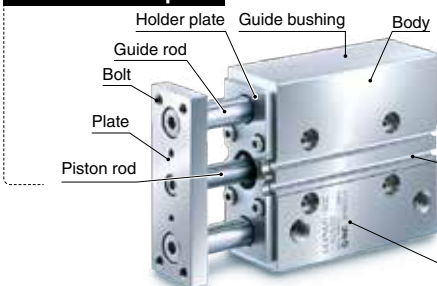
- Stainless steel is used for all external metal parts.

- Improved durability

A Lube-retainer (stable lubrication function) is installed on the guide rod. A special water resistant scraper is installed on the piston rod.

- The overall length and mounting are the same as those of the standard model.

Stainless steel parts



Water resistant solid state auto switches can be mounted.
D-M9□A

Laser marking (Cylinder plate)
Can not be peeled off, even when wet

- For use with grease for food processing equipment (certified by NSF-H1)

Environmental Resistance Corrosion Resistant (Stainless Steel)

Stainless Steel Cylinder **CJ5-S/CG5-S**

- External metal parts: Stainless steel 304, Seal: Choose from NBR/FKM
- Grease for food processing equipment (certified by NSF-H1)

Series	Action	Bore size [mm]
CJ5-S	Double acting	10, 16
CG5-S		20, 25, 32, 40, 50, 63, 80, 100



p. 88

Floating Joint

Stainless Steel Type
JS

p. 90



Stainless Steel Foot Bracket, Flange Bracket, Single Knuckle Joint, Double Knuckle Joint

p. 88



Made to Order

Stainless steel parts improve corrosion resistance.

p. 89

External Stainless Steel Cylinder: **-XB12**

Symbol

A cylinder that uses stainless steel that excels in rust resistance for all external parts that are exposed to the surrounding environment. Its external dimensions and installation dimensions are identical to those of the standard CM2 series.

<Applicable Series>

Series	Description	Model
CM2	Air cylinder	CM2
		CM2W
	Non-rotating rod type	CM2K

Made of Stainless Steel: **-XC6**

Symbol

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

<Applicable Series>

Series	Description	Model
CM2	Air cylinder	CM2-Z CM2W-Z
	Non-rotating rod type	CM2K-Z CM2KW-Z
	Direct mount type	CM2R-Z
	Non-rotating rod, Direct mount type	CM2RK-Z
	Centralized piping type	CM2□□P
	Smooth cylinder	CM2Y-Z
	Air-hydro type	CM2H-Z
	Direct mount type, Air-hydro type	CM2RH-Z
	End lock cylinder	CBM2
CG1	Air cylinder	CG1-Z
	Double rod type	CG1W-Z
	Direct mount type	CG1R-Z
	Smooth cylinder	CG1Y-Z
MB *2	Air cylinder	MB-Z*3 MBW-Z*3
	Air cylinder	MB1-Z*3
CA2 *2	End lock cylinder	CBA2*1
	Air-hydro type	CA2H CA2W□H
CS1 *2	Air cylinder	CS1 CS1W
	Air-hydro type	CS1H

Series	Description	Model		
CQS	Compact cylinder	CQS CQSW		
	Non-rotating rod type	CQSK		
	Anti-lateral load type	CQS□S		
CQ2	Compact cylinder	CQ2-Z CQ2W-Z		
	Axial piping type (Centralized piping type)	CQP2		
	Long stroke	CQ2-Z		
	Anti-lateral load type	CQ2□S-Z		
	Water-resistant compact cylinder	CQ2□□ ^R -Z		
	Water resistant, axial piping	CQP2□□ ^R		
MU	Plate cylinder	MU-Z		
CV	Valve mounted air cylinder	CVM5 CVM5K CV3 CVS1		
		MGP	Compact guide cylinder	MGP-Z
		MGG	Guide cylinder	MGG
		MGC	Guide cylinder	MGC
CXS	Dual rod cylinder	CXSM		
CXSJ	Dual rod cylinder compact type	CXSJM		
RHC	High power cylinder	RHC		

*1 Head side locking type only

*2 There is a maximum stroke limit for CA2, MB, MB1 (ø100), and CS1 cylinders.

*3 Only available for ø125 type

Environmental Resistance Corrosion Resistant (Stainless Steel)

Made to Order

Stainless steel parts improve corrosion resistance.

p. 89

Tie-rod, Cushion Valve, Tie-rod Nut, etc. Made of Stainless Steel: -XC7

Symbol

When using in locations where the rust generation or corrosion likelihood exists, the standard parts material have been partly changed to the stainless steel.

<Applicable Series>

Series	Description	Model
MB	Standard type	MB-Z MBW-Z
	Non-rotating rod type	MBK-Z MBKW-Z
	Cylinder with end lock	MBB
	Smooth cylinder	MBY-Z
MB1	Standard type	MB1-Z MB1W-Z
	Non-rotating rod type	MB1K-Z

Series	Description	Model
CA2	Standard type	CA2-Z CA2W-Z
	Non-rotating rod type	CA2K CA2KW
	End lock cylinder	CBA2
	Smooth cylinder	CA2Y-Z
CV	Valve mounted air cylinder	CV3 CVS1 CV3K CVS1K

Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel: -XC27

Symbol

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

<Applicable Series>

Series	Description	Model
CM2	Standard type	CM2-Z
	Non-rotating rod type	CM2K-Z
	End lock cylinder	CBM2
	Smooth cylinder	CM2Y-Z
CG1	Standard type	CG1-Z
	Non-rotating rod type	CG1K-Z
MB	Standard type	MB-Z
	Non-rotating rod type	MBK-Z
	With end lock	MBB
	Smooth cylinder	MBY-Z
MB1	Standard type	MB1-Z
	Non-rotating rod type	MB1K-Z
CA2	Standard type	CA2-Z
	Non-rotating rod type	CA2K
	End lock cylinder	CBA2
	Smooth cylinder	CA2Y-Z
CS1	Standard type	CS1
	Low friction	CS1Q

Series	Description	Model
CS2	Standard type	CS2
	Smooth cylinder	CS2Y
CV	Valve mounted air cylinder	CVS1 CVS1K
CQS	Standard type	CQS
	Long stroke	CQS
	Anti-lateral load type	CQS□S
	Non-rotating rod type	CQSK
CQ2	Standard type	CQ2-Z
	Long stroke	CQ2-Z
	Anti-lateral load type	CQ2□S-Z
	Non-rotating rod type	CQ2K-Z
	Magnetic field resistant	CDQ2□P

Made of Stainless Steel (Combination of XC7 and XC68): -XC65

Symbol

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

<Applicable Series>

Series	Description	Model
MB	Air cylinder	MB-Z MBW-Z
	Smooth cylinder	MBY-Z
MB1	Air cylinder	MB1-Z MB1W-Z
CA2	Smooth cylinder	CA2Y-Z

Made of Stainless Steel (With Hard Chrome Plated Piston Rod): -XC68

Symbol

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

<Applicable Series>

Series	Description	Model
MB	Standard type	MB-Z MBW-Z
	Smooth cylinder	MBY-Z
MB1	Standard type	MB1-Z MB1W-Z
CA2	Standard type	CA2-Z CA2W-Z
	Smooth cylinder	CA2Y-Z
CS1	Standard type	CS1
CS2	Standard type	CS2 CS2W
	Smooth cylinder	CS2Y

Environmental Resistance

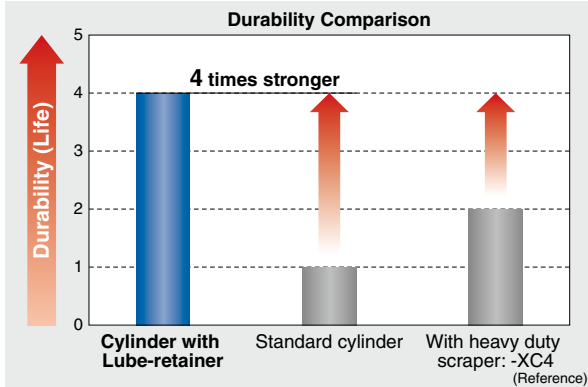
Dustproof

Cylinder with Stable Lubrication Function (Lube-retainer)

Applicable to operation in micro-powder (10 to 100 μm)/general environments
 CM2-Z/CG1-Z/CA2-Z/CDQS/CDQ2/MXQ□A/MGP/CXS

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Durability is 4 times stronger than the standard model in micro-powder environments.



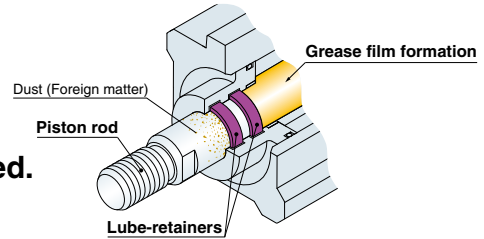
Even with the built-in stable lubrication function (Lube-retainer),
the overall length and mounting are the same as those of the standard model.

* Excludes some models

Comparison with the standard model and model with heavy duty scraper (-XC4) (Relative ratio of B10)
 * The durability test is conducted in accordance with SMC test conditions.

Lube-retainers are mounted at two locations.
 This provides the following two benefits.

- Grease film is formed on the piston rod surface to improve durability.
 - The entry of dust and foreign matter is prevented.
 - The number of operating cycles can be improved even in general environments.
 - The overall length and mounting are the same as those of the standard model.
- * Excludes some models



Applicable Cylinders

Air Cylinder CM2 Series ø20 to ø40 	Air Cylinder CG1 Series ø20 to ø100 	Air Cylinder CA2 Series ø40 to ø100 	Compact Cylinder/Compact Type CQS Series ø20 to ø25 
Compact Cylinder CQ2 Series ø32 to ø100 	Air Slide Table MXQ□A Series ø6 to ø25 	Compact Guide Cylinder MGP Series ø20 to ø100 	Dual Rod Cylinder CXS Series ø6 to ø32 

Dust Resistant Actuators (Made to Order)

The overall length dimensions are compatible with models with a heavy duty scraper (-XC4) (CQ2, MGP).
 (The CM2 series dimensions are the same as the standard model.)

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Applicable Cylinders

Air Cylinder CM2-XC92 Series ø20 to ø40 	Compact Cylinder/Compact Type CQS-XC92 Series ø12 to ø25 	Compact Cylinder CQ2-XC92 Series ø32 to ø100 	Compact Guide Cylinder MGP-XC92 Series ø12 to ø100 
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Environmental Resistance

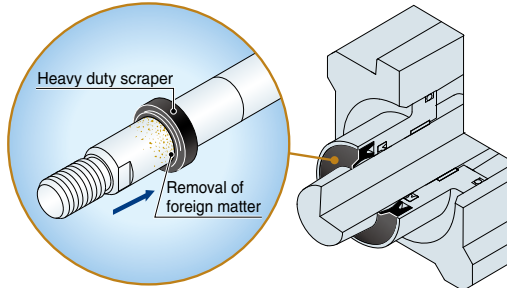
Dustproof

With Heavy Duty Scraper (-XC4)

The heavy duty scraper adopted on the wiper ring makes the cylinder suitable for use in powdery or dusty environments.

p. 90

Removes foreign matter adhered to the rod



Air Cylinder CM2



Air Cylinder CG1



Air Cylinder MB



Square Tube Type Air Cylinder MB1



Air Cylinder CA2



Air Cylinder CS1



Compact Cylinder CQ2



Compact Cylinder with Air Cushion RQ



Compact Guide Cylinder MGP



Guide Cylinder MGG



Guide Cylinder/Compact Type MGC



Valve Mounted Air Cylinder CVM5



Valve Mounted Air Cylinder CV3



Cylinder with Lock CNA2



Cylinder with Lock CNG



With Rod Boot/Dust Cover

The rod is protected by the rod boot. Prevents the adhesion of powder or dust to the rod



With rod boot

Air Cylinder CM2



Air Cylinder CG1



Air Cylinder MB



Square Tube Type Air Cylinder MB1



Air Cylinder CA2



Air Cylinder CS1



Air Cylinder CS2



Valve Mounted Air Cylinder CVM5



Valve Mounted Air Cylinder CV3



Valve Mounted Air Cylinder CVS1



Cylinder with Lock CNA2



Cylinder with Lock CNG



With dust cover

Linear Guide Parallel Type Air Gripper MHZJ2



Wedge Cam Operation Slide Guide Air Gripper MHK2



Slide Guide Round Body Air Gripper 3-Finger Type MHS



Made to order

For micro-powder (10 to 100 μm) environments
→ With double Lube-retainer (-X85)

For dusty environments
→ With heavy duty scraper + Lube-retainer (-X86□)





Environmental Resistance

IP65/67

Enclosure: IP67

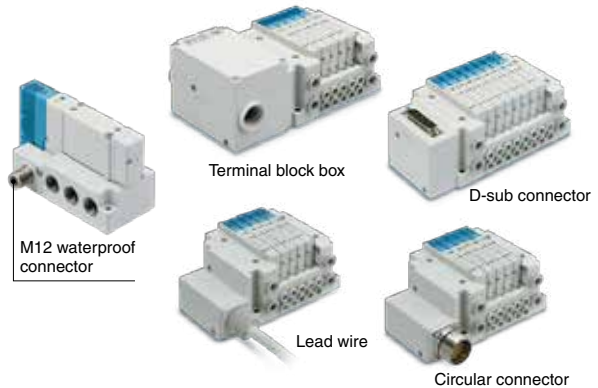
Plug-in Type

5-Port Solenoid Valve SY Connector Connecting Base

- Due to the flow increase, the valve size can be reduced.
Saves energy and space

Series	Flow rate characteristics		Applicable cylinder size
	4/2 → 5/3(A/B → EA/EB)		
	C[dm ³ /(s·bar)]	b	
SY3000	1.6	0.19	ø50
SY5000	3.6	0.17	ø63
SY7000	5.9	0.20	ø80

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3-Screen Display High-Precision Digital Pressure Switch ISE7□/7□G

- It is possible to change the settings while checking the measured value.
- Angled display
- IO-Link compatible



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3-Color Display Digital Gap Checker ISA3

- Check at a glance to see if a workpiece is placed or not.
- The clearance distance between the detection surface and the workpiece can be found intuitively.



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Enclosure: IP65

3-Screen Display High-Precision Digital Pressure Switch ZSE20B(F)/ISE20B ZSE20C(F)/ISE20C(H)

- It is possible to change the settings while checking the measured value.
- Visualization of settings



20B Series

20C Series

p. 148

Pressure Sensor for General Fluids PSE56□

- Wetted parts: Stainless steel 316L



p. 149

Pressure Sensor for General Fluids PSE57□

- Materials of parts in contact with fluid
Piping port: C3604 + Nickel plating
Pressure sensor: Al₂O₃ (Alumina 96%)
O-ring: FKM + Grease (PSE570/573/574)
Square ring: FKM (PSE575/576/577)



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3-Screen Display Sensor Monitor PSE300AC

- It is possible to change the settings while checking the measured value.
- NPN/PNP switch function
- Input range selection (for pressure/flow rate)



p. 150

Multi-Channel Digital Pressure Sensor Controller PSE200

p. 150



* Front face: IP65
Others: IP40

Environmental Resistance

IP65/67

Enclosure: IP65

3-Color Display Digital Flow Switch
PFMC

p. 151

- 3-color/2-screen display
- Flow ratio 100:1
- Bypass structure



3-Color Display Digital Flow Switch for Large Flow
PF3A7□H

p. 151

- Flow range: Max. 12000 L/min
- Flow ratio 100:1
- Through bore construction



3-Color Display Digital Flow Switch for Water
PF3W

p. 152

- 3-color/2-screen display
- Integrated temperature sensor
- PVC piping type: Applicable to deionized water, chemical liquids, etc.

Integrated display



PVC piping type



Remote type



Sensor unit

Monitor unit*1

*1 Front face only

Digital Flow Switch for Air
PF2A

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Integrated display



Remote type



Monitor unit*1

*1 Front face only

Sensor unit

3-Color Display Electromagnetic Type Digital Flow Switch
LFE

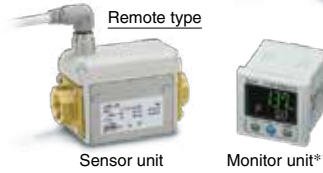
p. 153

- Applicable fluids: Water, Water-soluble coolant
- Pressure loss: 0.02 MPa or less

Integrated display



Remote type



Sensor unit

Monitor unit*1

*1 Front face only

Digital Flow Switch for Deionized Water and Chemical Liquids
PF2D

p. 153



Sensor unit



Monitor unit*1

*1 Front face only

Made to Order

5-Port Solenoid Valve
SY5000-X500

- Enclosure: IP69K



* Please contact SMC for details.



Environmental Resistance

IP65/67

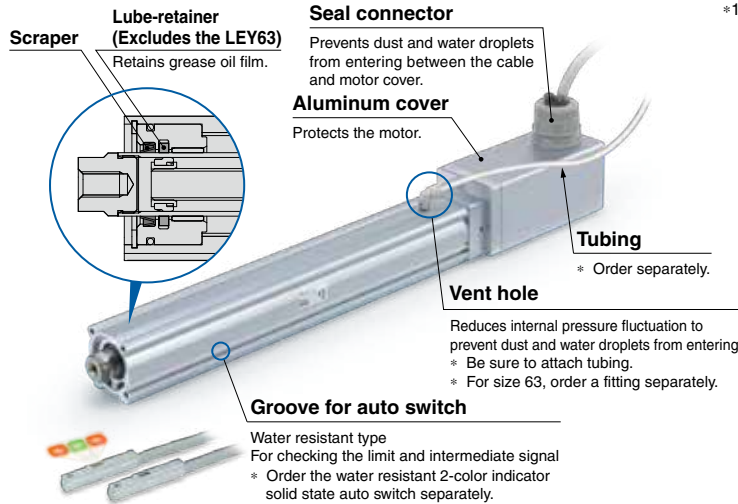
Enclosure: IP65*1

Electric Actuator/Rod Type Made to Order

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Size: 25, 32

LEY-X5



***1 IP65 equivalent**

IP65 enclosure: The protection structure against solid foreign objects is dust-tight type and the protection structure against water is water-jet-proof type.

Dust-tight means that no dust can enter the inside of the equipment.

Water-jet-proof means that the product is not adversely affected by direct water jets from any direction. That is, even when direct water jets are applied to the product for 3 minutes by means of the pre-determined method, there is no water entry that hinders correct operation inside the equipment. Be sure to take appropriate protection measures when the product is used in an environment where it is constantly exposed to water or fluids other than water splash. In particular, the product cannot be used in an environment with oil, such as cutting oil or cutting fluid.

Step Motor (Servo/24 VDC)

Servo Motor (24 VDC) Type

AC Servo Motor (100/200 W) Type

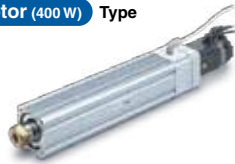


Electric Actuator/Rod Type Option

Size: 63

LEY63□□□□-□P

AC Servo Motor (400 W) Type



Enclosure

IP - □ □

First characteristic numeral Second characteristic numeral

● First characteristic: Degree of protection against solid foreign objects

0	Non-protected
1	Protected against solid foreign objects of 50 mm ø and greater
2	Protected against solid foreign objects of 12 mm ø and greater
3	Protected against solid foreign objects of 2.5 mm ø and greater
4	Protected against solid foreign objects of 1.0 mm ø and greater
5	Dust-protected
6	Dust-tight

● Second Characteristic: Degree of protection against water

0	Non-protected	—
1	Protected against vertically falling water drops	Dripproof type 1
2	Protected against vertically falling water drops when enclosure is tilted 15°	Dripproof type 2
3	Protected against rainfall when enclosure is tilted up to 60°	Rainproof type
4	Protected against splashing water	Splashproof type
5	Protected against water jets	Water-jet-proof type

6	Protected against powerful water jets	Powerful water-jet-proof type
7	Protected against the effects of temporary immersion in water	Immersion type
8	Protected against the effects of continuous immersion in water	Submersible type

Example) In the case of products stipulated as IP65, we can know the degree of protection is dust-tight and water-jet-proof on the grounds that the first characteristic numeral is 6 and the second characteristic numeral is 5. Therefore, we can assume it will not be adversely affected by direct water jets from any direction.

Environmental Resistance

Heat/Cold Resistant

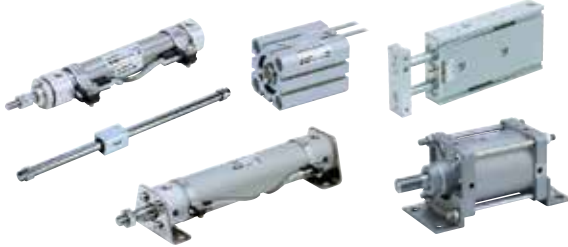
Heat Resistant

Cylinders, Air Grippers

Heat Resistant Cylinder (-10 to 150°C): -XB6

p. 90

Seal material and grease have been changed so that the product can be used at temperature up to 150°C.



Specifications

Seal material	Fluororubber
Grease	Heat-resistant grease

<Applicable Series>

CJP2/CJ2/CM2/CG1/MB/MB1/CA2/CUJ/CU/CQS/CG5/CS1/CS2/CQ2/MGP/MGQ/MGG/MGC/CXSJ/CXS/MK/CY3B

Heat Resistant Air Gripper (-10 to 100°C): -X4

p. 100

Seal material and grease have been changed so that the product can be used at temperatures between -10 up to 100°C.



Specifications

Ambient temperature range	-10°C to 100°C
Seal material	Fluororubber
Grease	Heat-resistant grease (GR-F)

<Applicable Series>

MHC/MHF2/MHK2/MHL2/MHS/MHT2/MHW2/MHY2/MHZ

Cylinder with Heat Resistant Auto Switch (Max. 150°C): -XB14

p. 90

Heat resistant compact cylinder which can mount heat resistant solid state switch (D-M9□J)



Specifications

Applicable cylinder	Compact cylinder/Standard type
Series	CQ2
Bore size [mm]	16, 20, 25, 32, 40, 50, 63

Heat Resistant 2-Color Indicator Solid State Auto Switch (Single Unit)

- Heat resistant type
- The optimum operating range can be determined by the color of the light. (Red → Green ← Red)



Fittings, Tubing

From p. 135

Metal One-touch KQB2



Max. operating temperature: 150°C

Brass Sleeve Insert KF



Max. operating temperature: 150°C

Stainless Steel One-touch KQG2



Max. operating temperature: 150°C

Stainless Steel Insert KFG2



Max. operating temperature: 260°C*1
*1 Swivel elbow and with sealant types: -5 to 150°C

S Couplers KKA



Max. operating temperature: 150°C

Fluoropolymer LQ1



Max. operating temperature: 150°C*2

Fluoropolymer LQ3



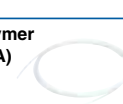
Max. operating temperature: 200°C*2

Bore Through Connector LQHB



Max. operating temperature: 200°C*2

Fluoropolymer (Super PFA) TL/TIL



Max. operating temperature: 200°C*2

Fluoropolymer (PFA) TLM/TILM



Max. operating temperature: 260°C*2

FEP TH/THH



Max. operating temperature: 200°C*2

Soft Fluoropolymer TD/TID



Max. operating temperature: 260°C*2

2-Layer Soft Fluoropolymer Tubing TQ



Max. operating temperature: 100°C*2 (Air, Inert gas)

*2 It varies depending on the operating pressure. Be sure to refer to the Web Catalog.

Regulators

p. 130, 132

Regulator/Filter Regulator for High Temperature AR/AW-B-X440



Max. operating temperature: 80°C

Precision Regulator for High Temperature IR-T



Max. operating temperature: 100°C

Flow Switches

p. 153

Digital Flow Switch for Deionized Water and Chemical Liquids PF2D



Max. fluid temperature: 90°C*3
*3 It varies depending on the fluid temperature.

Check Valves

p. 146

Check Valve XTO



Max. operating temperature: 80°C

Vacuum Pads

p. 119

Vacuum Pad ZP3P



Max. operating temperature: 200°C

Cold Resistant

Cylinders

Cold Resistant Cylinder (-40 to 70°C): -XB7

p. 90

Ambient temperature range: -40 to 70°C

<Applicable Series>

CJP2/CJ2/CM2/CG1/CU/CQS/CQ2



Regulators

p. 130

Regulator for Low Temperature AR25 to 60-B-X425



Ambient temperature: -5 to 60°C

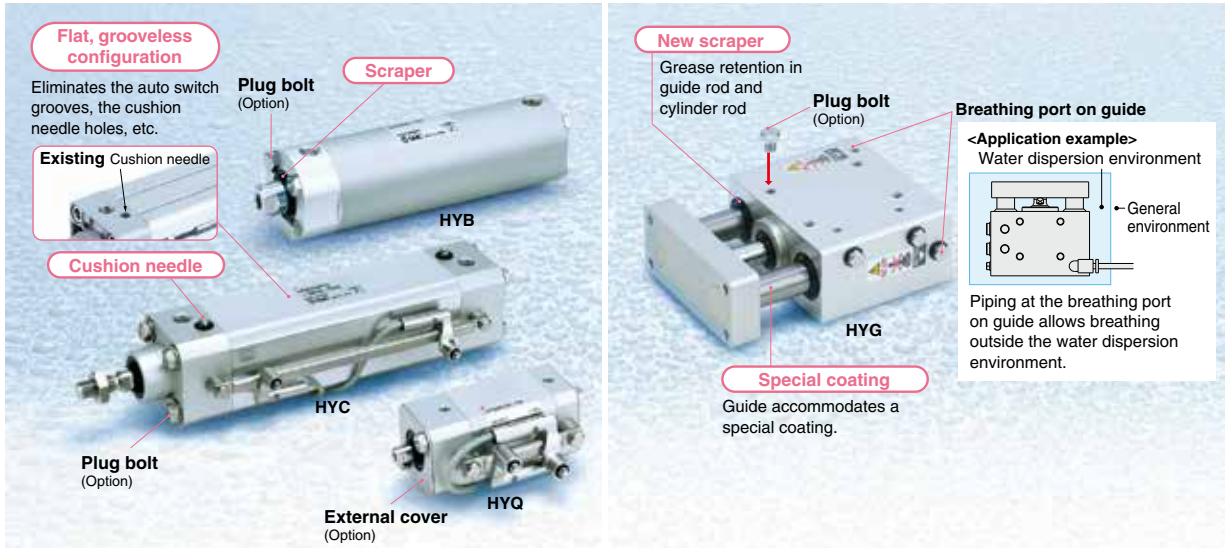
Filter Regulator for Low Temperature AW30 to 60-B-X430



Ambient temperature: -30 to 60°C

Sanitation Hygienic Grease for Food Processing Equipment

A hygienic design cylinder configured for easy cleaning



Hygienic Design Cylinder HY□

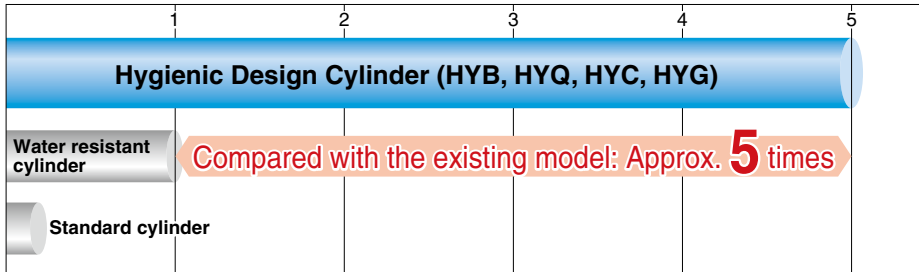
- Grease for food processing equipment (certified by NSF-H1) is available.



Type	Series	Action	Bore size [mm]
Round type	HYB	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Basic type	HYQ		20, 25, 32, 40, 50, 63
ISO standard type	HYC		32, 40, 50, 63
With guide	HYG		20, 25, 32, 40, 50, 63

Service life 5 times longer than the existing model (SMC ratio)

Waterproof examination result (Reference data)



Washing in water/Temperature: 30°C, Flow rate: 160 cc/min

Stainless Steel Cylinder C□5-S

- Exterior configuration reduces residual liquid
Electropolishing of mounting bracket surfaces makes them smoother to prevent build-up of liquids and foreign matter.
- With special water resistant scraper
- External metal parts: Stainless steel 304, Seal: Choose from NBR or FKM
- Grease for food processing equipment (certified by NSF-H1)

Series	Action	Bore size [mm]
CJ5-S	Double acting	10, 16
CG5-S		20, 25, 32, 40, 50, 63, 80, 100



Sanitation Grease for Food Processing Equipment

Made to Order

Grease for Food Processing Equipment

Food grade grease (certified by NSF-H1) is used for all parts on which grease is applied.

<Applicable Series>

Series	Symbol (Suffix)	Series	Symbol (Suffix)	Series	Symbol (Suffix)
MXQ	-X9	MIW	-X79	CQ2	-XC85
MXF		MIS		CQS	
MXW		MH□		MGP	
MPX		CM2	-XC85		
MPXJ		CG1			
MPXY		CA2			



Series other than shown on the left are also available. Please contact SMC for details.

Specifications

Seal material	Nitrile rubber
Grease	Grease for food
Auto switch	Mountable
Dimensions	Same as the standard type

Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

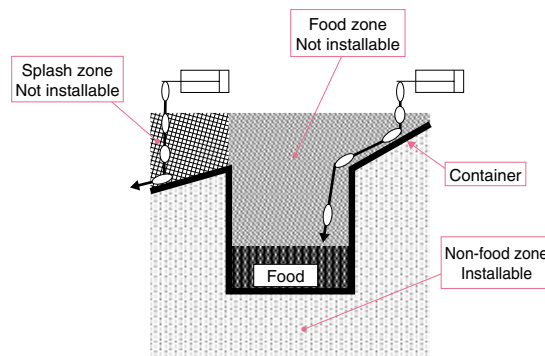
<Not installable>

Food zone.....An environment where food which will be sold as merchandise directly touches the cylinder's components

Splash zone.....An environment where food which will not be sold as merchandise directly touches the cylinder's components

<Installable>

Non-food zone ... An environment where there is no contact with food



- * Avoid using this product in the food zone. (Refer to the figure above.)
- * When the product is used in an area of liquid splash, or a water resistant function is required for the product, please consult with SMC.
- * Operate without lubrication from a pneumatic system lubricator.
- * Use the following grease pack for the maintenance work. GR-H-010 (Grease: 10 g)
- * Please contact SMC for details about the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Made to Order

5-Port Solenoid Valve SY5000-X500

Enclosure: IP69K



* Please contact SMC for details.






Standards **Food Sanitation Law Compliant Products** **FDA (Food and Drug Administration) Compliant**

Food Sanitation Law compliant
 Component materials have met apparatus and container-package standards.

FDA (Food and Drug Administration) compliant

*1 Compliant with the FDA's (Food and Drug Administration) § 177-1550 dissolution test
 *2 Compliant with the FDA's (Food and Drug Administration) § 177-2600 dissolution test
 *3 Compliant with the FDA's (Food and Drug Administration) 21CFR§177.2600 dissolution test


	Series	Food Sanitation Law compliant	FDA (Food and Drug Administration) compliant
 Tubing	TL/TIL	●	●*1
	TLM/TILM	●	●*1
	TH/TIH	●	●*1
	TD/TID	●	●*1
	TU-X217	●	—
	TU-X214	—	●*2
 Fittings	KQG2	●	—
	KFG2	●	—
	KP	●	—
 Vacuum pad	ZP3P	—	●*3

Fluoropolymer Tubing p. 140
TL/TIL **Food Sanitation Law Compliant**
FDA (Food and Drug Administration) Compliant

- Material: Super PFA
- Max. operating pressure: 1.0 MPa (at 20°C)*1
- Max. operating temperature: 260°C

*1 This may vary according to size.

Applicable tubing O.D.		Color
Metric	ø4, ø6, ø8, ø10, ø12, ø19	Translucent
Inch	ø1/8", ø3/16", ø1/4", ø3/8" ø1/2", ø3/4", ø1"	




Fluoropolymer Tubing (PFA) p. 140
TLM/TILM **Food Sanitation Law Compliant**
FDA (Food and Drug Administration) Compliant

- Material: PFA
- Max. operating pressure: 2.3 MPa (at 20°C)*1
- Max. operating temperature: 260°C

*1 This may vary according to size.

Applicable tubing O.D.		Color
Metric	ø2, ø3, ø4, ø6, ø8, ø10 ø12, ø16, ø19, ø25	Translucent, Black, Blue, Red
Inch	ø1/8", ø3/16", ø1/4", ø3/8" ø1/2", ø3/4", ø1", ø1 1/4"	




FEP Tubing (Fluoropolymer) p. 140
TH/TIH **Food Sanitation Law Compliant**
FDA (Food and Drug Administration) Compliant

- Material: FEP
- Max. operating pressure: 2.3 MPa (at 20°C)*1
- Max. operating temperature: 200°C

*1 This may vary according to size.

Applicable tubing O.D.		Color
Metric	ø4, ø6, ø8, ø10, ø12	Translucent, Black, Red, Blue
Inch	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2", ø3/4"	




Soft Fluoropolymer Tubing p. 141
TD/TID **Food Sanitation Law Compliant**
FDA (Food and Drug Administration) Compliant

- Material: Modified PTFE
- Max. operating pressure: 1.6 MPa (at 20°C)*1
- Max. operating temperature: 260°C

*1 This may vary according to size.

Applicable tubing O.D.		Color
Metric	ø4, ø6, ø8, ø10, ø12	Translucent
Inch	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	



Standards **Food Sanitation Law Compliant Products** **FDA (Food and Drug Administration) Compliant**


Compatible with Food Sanitation Law: p. 140
Polyurethane Tubing **Food Sanitation Law Compliant**
TU-X217

Applicable tubing O.D.		Color
Metric	ø4, ø6, ø8, ø10, ø12	Black, White, Blue, Clear



Polyurethane Tubing p. 139
TU-X214 **FDA (Food and Drug Administration) Compliant**


Applicable tubing O.D.		Color
	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green, Clear, Orange



Stainless Steel 316 One-touch Fittings p. 136
KQG2 **Food Sanitation Law Compliant**

- Materials: Metal parts stainless steel 316, seal parts special FKM
- Fluid temperature: -5 to 150°C
- Grease-free/Can be used with steam


Series	Size	Applicable tubing O.D.
KQG2	Metric	ø3.2, ø4, ø6, ø8, ø10, ø12, ø16
KQG2	Inch	ø1/8", ø5/32", ø1/4", ø5/16", ø3/8", ø1/2"



Stainless Steel 316 Insert Fittings p. 137
KFG2 **Food Sanitation Law Compliant**

- Material: Stainless steel 316
- Rubber materials are not used. (Excluding the swivel elbow)
- Fluid temperature: -65 to 260°C (Swivel elbow: -5 to 150°C)
- Grease-free/Can be used with steam


Series	Size	Tubing O.D. x I.D.
KFG2	Metric	ø4 x ø2.5, ø4 x ø3, ø6 x ø4, ø8 x ø6, ø10 x ø7.5, ø10 x ø8, ø12 x ø9, ø12 x ø10, ø16 x ø13
KFG2	Inch	ø1/8" x ø0.086", ø5/32" x 0.098", ø1/4" x ø5/32", ø5/16" x 0.236", ø3/8" x ø1/4", ø1/2" x ø3/8"



Clean One-touch Fittings for Blowing p. 137
KP **Food Sanitation Law Compliant**

- One-touch fittings for clean room blowing systems
- Completely oil-free (Fluoro-coated rubber portions)
- Wetted parts are non-metallic.
- Parts washed and assembled in a clean room, Packed in double packaging.
- Can be used in a vacuum (-100 kPa)


Series	Applicable tubing O.D.
KP	ø4, ø6, ø8, ø10, ø12



Vacuum Pad ZP3P p. 119
FDA (Food and Drug Administration) Compliant

- Good for film packaging applications where the shape of the workpiece changes easily from being lifted.
- Silicone rubber compliant with the FDA (USA Food and Drug Administration) 21CFR§177.2600 elution test is used.
- Blue colored pad
- Reduced leakage
- Reduction of wrinkles made on thin workpieces (film, vinyl, etc.) during adsorption

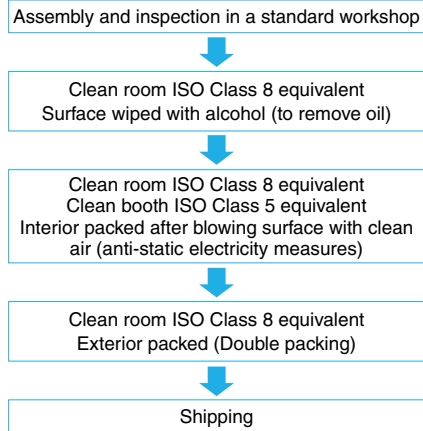
Pad diameter
ø20, ø25, ø35, ø50





Clean Series 10-/11-/12-/13-

Prevents particle generation in clean room



10 Series	11 Series	12 Series	13 Series
<ul style="list-style-type: none"> Double seal type/ release to atmosphere 	<ul style="list-style-type: none"> Single seal type/ vacuum suction 	<ul style="list-style-type: none"> Compact guide cylinder Dual rod cylinder Double seal type/release to atmosphere (10-series equivalent) and specially treated guide 	<ul style="list-style-type: none"> Rodless cylinder Specially treated cylinder tube exterior

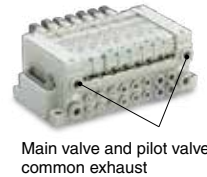
Air Cylinder

Directional Control Valve

Compressed Air Cleaning Filter Series Modular F.R.

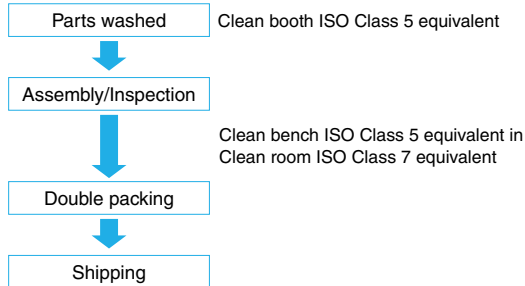


Fittings, speed controllers, pressure switches, etc., have the same structures as those of the standard products.



Special Clean Series

This series adheres to an even higher standard of cleanliness than the Clean Series. This line of products was developed, from structure and materials to assembly environment, for use in clean environments.

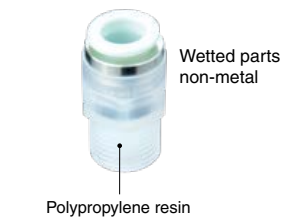


Clean Regulator

Wetted parts material: Stainless steel, FPM, PTFE



Clean One-touch Fittings (For blowing)



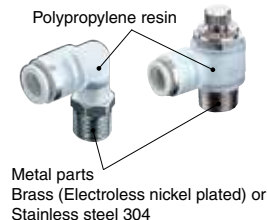
Clean Tubing*1

Polyolefin-based resin



*1 The tube, which is formed in a general environment, is finished by blowing highly clean air through its inside and over its outside in a clean room.

Clean One-touch Fittings/ Speed Controller



Exhaust Cleaner for Clean Room



Clean Exhaust Filter



Clean Gas Filter

PTFE membrane element



Clean Air Filter

Polyolefin hollow fiber membrane element



Digital Flow Switch

Low Particle Generation: PFM/PFMB-X300





Clean

p. 127

Clean Blow

Clean Air Filter

SFD

(Hollow fiber element)

- Filtration: 0.01 μm (Filtration efficiency: 99.99%)
- Initial pressure drop: 0.03 MPa (Inlet pressure 0.7 MPa, Max. flow rate)
- Max. operating pressure: 1.0 MPa (at 20°C)



Clean Gas Filter

SF

Cartridge Type/Disposable Type

- Integrated production in a clean environment
Under a clean environment, all components have undergone ultrasonic cleaning. Assembly, inspection and antistatic double packaging processes are conducted in an integrated production system.

- High precision filtration
0.01 μm filtration (filtering efficiency of 99.99%) is realized with the PTFE membrane cartridge element. (Clean gas strainer: Nominal filtration of 120 μm)

Assembly environment
Clean room: Class M5.5 (ISO class 7)*1
Clean booth: Class M3.5 (ISO class 5)*1

*1 Fed. Std. 209E (): based on ISO 14644-1

Disposable Type: Multiple Disc Type

SFC10□



Filtration	Flow rate [L/min(ANR)] (Inlet pressure 0.7 MPa, at pressure drop of 0.02 MPa)
0.01 μm (Filtration efficiency: 99.99%) (Membrane element)	240

Disposable Type: Straight Type

SFB30□



Filtration	Flow rate [L/min(ANR)] (Inlet pressure 0.7 MPa, at pressure drop of 0.02 MPa)
0.01 μm (Filtration efficiency: 99.99%) (Membrane element)	45

Cartridge Type: Disc Type

SFA10□, SFA20□, SFA30□



Series	Filtration	Flow rate [L/min(ANR)] (Inlet pressure 0.7 MPa, at pressure drop of 0.02 MPa)
SFA10□	0.01 μm (Filtration efficiency: 99.99%) (Membrane element)	26
SFA20□		70
SFA30□		140

Cartridge Type: Straight Type

SFB10□, SFB20□



Series	Filtration	Flow rate [L/min(ANR)] (Inlet pressure 0.7 MPa, at pressure drop of 0.02 MPa)
SFB10□	0.01 μm (Filtration efficiency: 99.99%) (Membrane element)	45
SFB20□ (Strainer)	Nominal 120 μm (Sintered metallic element)	400

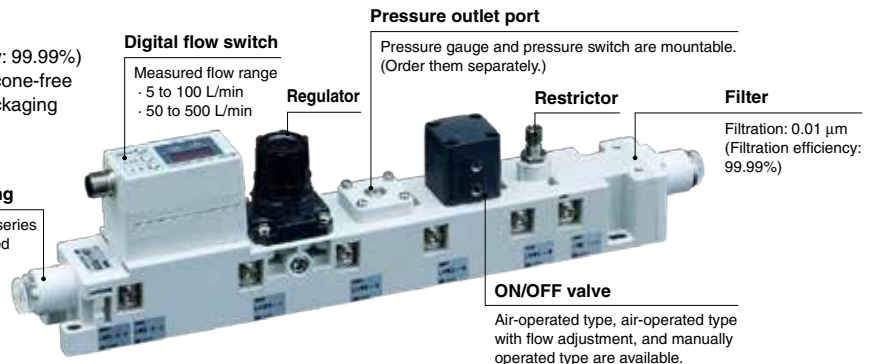
Clean Air Module

LLB

- Filtration: 0.01 μm (Filtration efficiency: 99.99%)
- Fluid contact space: Grease-free, Silicone-free
- Clean-room assembly and double-packaging

Built-in One-touch fitting

Clean One-touch fitting, KP series
Also compatible with threaded female connector





Clean

Grease-free

Air Preparation Filters

p. 126, 127

In-line Air Filter/**ZFC-X05**
 Clean Gas Filter/**SF**
 Clean Gas Strainer/**SFB200**
 Clean Air Filter/Hollow Fiber Element/**SFD**
 Clean Air Module/**LLB**



Pressure Control Equipment

p. 131, 133

Clean Regulator/**SRH**
 Clean Regulator/Fluororesin Type/**SRF**
 Compact Manifold Regulator/**ARM** (-3, -5, -6, -7)
 Grease-free Regulator/**AR-X2400** (Made to order)



Pressure Gauges

Pressure Gauge for General Purposes/**G36-X4**
 Oil-free/External Parts Copper-free Pressure Gauge/**G46E**
 Pressure Gauge for Clean Regulator/**G46-□-□-SRB**



Fittings

From p. 135

Metal One-touch Fittings/**KQB2**
 One-touch Fittings Manifold/**KM-X17**
 Insert Fittings/**KF**
 Miniature Fittings/**M*1** (ø2, ø3.2, ø4, ø6)
 Self-align Fittings/**H/DL/LL**
 Rectangular Multi-connector/**KDM-X17**
 Stainless Steel 316 One-touch Fittings/**KQG2**
 Stainless Steel One-touch Fittings/**KQ2-G-X17**
 Stainless Steel 316 Insert Fittings/**KFG2**
 Miniature Fittings/**MS*1**
 S Couplers Stainless Steel Type/**KKA**
 Clean One-touch Fittings/**KP**
 Fluoropolymer Fittings/**LQ1/LQ3**
 Fluoropolymer Bore Through Connector/**LQHB**



*1 Excludes some models

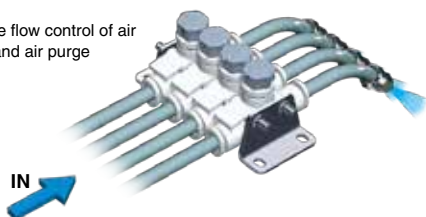
Restrictors

p. 146

Restrictor/**AS-X21**



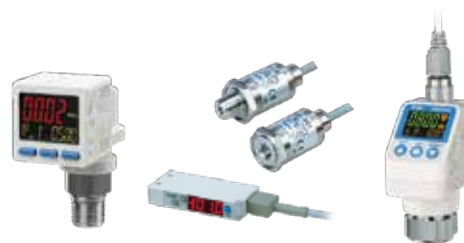
For the flow control of air blow and air purge



Pressure Switches

From p. 148

3-Screen Display High-Precision Digital Pressure Switch/**ZSE20□(F)/ISE20□-X2/ZSE20C(F)/ISE20C(H)**
 Compact Digital Pressure Switch/**ZSE10(F)/ISE10-X2**
 3-Screen Display High-Precision Digital Pressure Switch/**ISE70/71-X2**
 Pressure Sensor for General Fluids/**PSE56□**
 Compact Pneumatic Pressure Sensor/**PSE54□-X2**





Clean

Grease-free

Flow Switches

From p. 150

- 2-Color Display Digital Flow Switch/**PFM**
- 2-Color Display Digital Flow Switch/**PFMB**
- 2-Color Display Digital Flow Switch/Low Particle Generation/**PFM7/PFMB7-X300**
- 3-Color Display Digital Flow Switch/**PFMC**
- 3-Color Display Digital Flow Switch for Large Flow/**PF3A7□H**
- Flow Sensor/**PFMV**
- Digital Flow Switch for Air/**PF2A**
- 3-Color Display Digital Flow Switch for Water/**PF3W**



2/3-Port Solenoid Valves for Fluid Control

From p. 156

- Direct Operated 2-Port Solenoid Valve/**VX21/22/23** Oil-free (Option)
- Pilot Operated 2-Port Solenoid Valve/**VXD** Oil-free (Option)
- Zero Differential Pressure Type Pilot Operated 2-Port Solenoid Valve/**VXZ** Oil-free (Option)
- Compact Direct Operated 2-Port Solenoid Valve/**VDW** Oil-free (Option)
- Pilot Operated 2-Port Solenoid Valve for Dry Air/**VQ-X2**
- Normal Close High Vacuum Solenoid Valve/**XSA**
- Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids/**LVM**
- Direct Operated 2/3-Port Isolated Valve/**LVMK20/200**



Chemical Liquid Valves

p. 160, 161

- High Purity Chemical Liquid Valve/Air Operated, Integrated Fitting Type/**LVC**
- High Purity Chemical Liquid Valve/Air Operated, Threaded Type/**LVA**
- High Purity Chemical Liquid Valve/Manually Operated (Integrated Fitting Type/Threaded Type)/**L VH**
- Compact Type High Purity Air Operated Chemical Liquid Valve/**LVD**



Process Gas Equipment

p. 169, 170

- Regulator for Ultra High Purity/**AP**
- Regulator for Ultra High Purity/**SL**
- Regulator for Ultra High Purity/**AZ**
- Back Pressure Regulator for Ultra High Purity/**BP**
- Air Operated Regulator for Ultra High Purity/**AP□PA**
- Air Operated Regulator for Ultra High Purity/**AZ□PA**
- Regulator for General Applications/**AK**
- Back Pressure Regulator for General Applications/**BP**
- Air Operated Regulator for General Applications/**AK□PA**
- Regulator for General Applications/**AK1000T**
- For Ultra High Purity/Air Operated Type/**AP**
- For Ultra High Purity/Manually Operated Type/**AP**
- Process Gas Diaphragm Valve/**AZ**
- Diaphragm Valve for General Applications/**AK**
- Check Valve/**AP64**
- Vacuum Generator/**AP7/70/71/72**
- Flow Switch/**AP74/74B**



Sintered Metal Elements

p. 172

- Sintered Metal Element/**ES□**

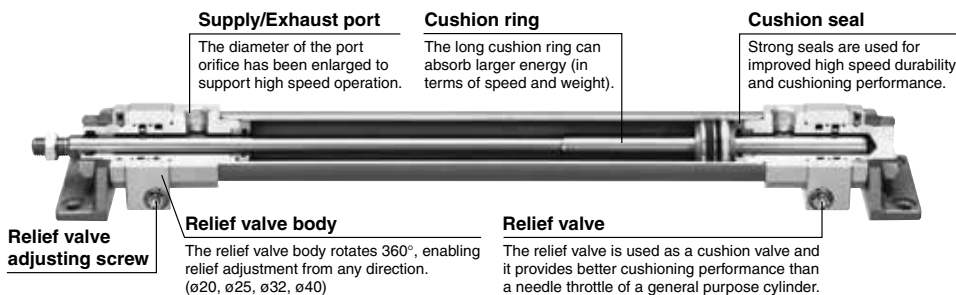


High Speed **High Speed** **High Frequency**

High Power Cylinder RHC

p. 96

- Smooth cushioning from high-speed operation (3000 mm/s) with light loads to low/ medium-speed operation with heavy loads
- Provides 10 to 20 times the energy absorption capacity of general purpose cylinders (CG1 series)
- XC93: With greater water resistance + a stable lubrication function



Large Flow Speed Controller AS3201F-01-□□SA-X778 **Made to Order**

- The orifice diameter has been enlarged to support the high-speed operation of cylinders.



Low Friction Cylinder/Metal Seal Type MQML□□H

p. 96

High speed, High frequency actuation

- H type achieves speeds up to 3,000 mm/s (without fixed orifice)
- Continuous actuation up to 50 cycles per second

Long service life

Long service life of 10,000 km or 100 million full cycles

Series	Bore size [mm]	Operating pressure range [MPa]	Driving speed [mm/s]
MQML Standard	6 (Standard only)	ø6: 0.02 to 0.7 ø10 to ø25: 0.005 to 0.7	0.5 to 1000
	10		
	16		
MQML□□H High speed/High frequency	20	0.01 to 0.7	5 to 3000
	25		

Variations



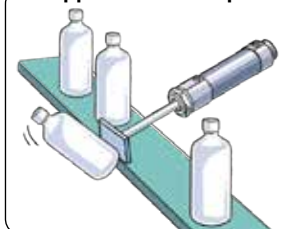
Compact Low Friction Cylinder MQQ



Low Friction Cylinder (Single Acting) MQP



Application Example



High Speed 2-Port Valve SX10

p. 157

- High-speed response ON: 0.45 ms, OFF: 0.4 ms (± 0.05 ms)
- Long service life: 5 billion cycles or more
- High frequency: 1200 Hz
- Width: 9 mm
- Low power consumption: 4 W



High Speed

From p. 102

Electric

**Electric Actuator/
Slider Type**
LEF



**Electric Actuator/
High Rigidity Slider Type**
LEJ



**Electric Actuator/
Guide Rod Slider**
LEL



**Electric Actuator/
Low Profile Slider Type**
LEM



**Electric Actuator/
Rod Type**
LEY



Electric Slide Table
LES



**Electric Actuator/
Miniature Rod Type/
Miniature Slide Table Type**
LEPY/LEPS



Electric Rotary Table
LER



Electric Gripper
LEH



Controllers/Drivers
<For Single Axis>
LECP6/LECA6/LECP1/LECP2/LECPA/LECPMJ/LEC-G
JXCE1/91/P1/D1/L1



<For Multiple Axes>
JXC73/83/93 (4 Axes) JXC92 (3 Axes)



Drivers
LECSA/LECSB/LECS/LECSS/LECSS-T
LECY□

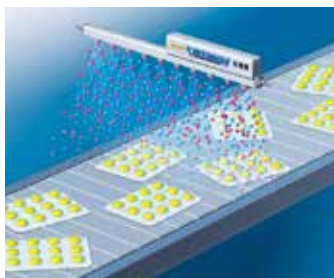
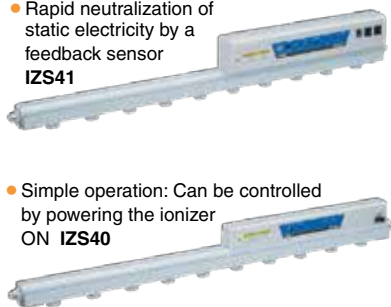




Ionizers

Bar Type

- Potential amplitude of the workpiece is reduced with Dual AC. **IZS42**
- Rapid neutralization of static electricity by a feedback sensor **IZS41**
- Simple operation: Can be controlled by powering the ionizer ON **IZS40**



Made to Order

Drop prevention cover

- Can even more reliably prevent emitter cartridges from dropping



Ionizer Vertical Stand

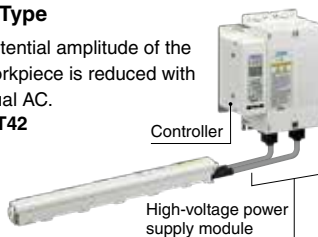
- Allows for the installation of a bar type ionizer on the table



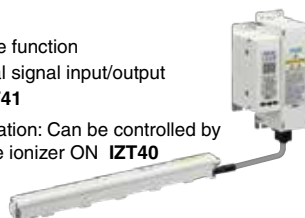
Separate Controller

Bar Type

- Potential amplitude of the workpiece is reduced with Dual AC. **IZT42**



- Auto-balance function With external signal input/output function **IZT41**
- Simple operation: Can be controlled by powering the ionizer ON **IZT40**



Made to Order

Drop prevention cover

- Can even more reliably prevent emitter cartridges from dropping



Nozzle Type

IZN10E

- Select either the energy saving static neutralization nozzle or the high flow static neutralization nozzle according to the application.
- The female threads for piping allow any type of nozzle to be installed to the ionizer.



For static neutralization and particle elimination on reagent bottles

Fan Type

IZF

- Can neutralize static electricity in a larger space with a built-in fan motor that requires no compressed air for blowing
- The variety of optional accessories, including louvers and automatic cleaning units, allow the product to be used in a wide range of applications.

Thickness: 40 mm



IZF21/31

Compact fan type with simple functions

Thickness: 39 mm



With flow rate adjustment function

IZF10/10R

Desktop Duster Box

ZVB

- Static neutralization, dust removal, and dust collection processes have been integrated into one box.



A4 size [ZVB20]

A3 size [ZVB40]

Electrostatic Sensor

IZD10/IZE11

- Potential measurement: ± 20 kV ± 0.4 kV



Electrostatic Sensor Monitor IZE11

Electrostatic Sensor IZD10

Handheld Electrostatic Meter

IZH10

- Potential measurement: ± 20.0 kV



Antistatic Equipment

Antistatic One-touch Fittings

KA



Conductive Vacuum Pad

ZP3/ZP2/ZP



Antistatic Tubing

TAS/TAU



Antistatic Speed Controller

AS-X260



Electricity Countermeasures **Explosion Proof**

Intrinsically Safe Explosion-proof System 5-Port Solenoid Valve
51-SY5000/7000/9000

p. 83

Rubber seal



- Exia II BT4 (TIIS approved product)
- 3 types of connectors are available: L plug connector, L plug connector with a cover, With IP65 compliant cable
- 3 types of barriers are available.

Explosion-proof 3/5-Port Solenoid Valve
50-VFE/50-VPE

p. 83

Rubber seal



- Exd II BT4 (TIIS approved product)
- Waterproof: IP*6 equivalent
- Exhausting equipment for the pilot valve is not required. (Common exhaust type for main and pilot valve [50-VFE3000])
- It is possible to be used in a manifold. (50-VFE)
- Can be used as a selector valve, divider valve, or for vacuum applications (50-VPE)

Electro-Pneumatic Positioner/Smart Positioner
IP8□00/IP8□01

p. 173



IP8001 (Lever type)



IP8101 (Rotary type)

- Explosion-proof construction
 - Electro-pneumatic positioner:
 - TIIS explosion-proof construction (Ex d IIB T5)
 - ATEX intrinsically safe explosion-proof construction (II2G Ex ib IIC T5/T6 Gb)
 - Smart positioner:
 - ATEX intrinsically safe explosion-proof construction (II1G Ex ia IIC T4/T5/T6 Ga)
- Enclosure: JISF8007 IP65 (Compliant with IEC 60529)
- Monitoring function
- HART transmission function (Smart positioner)

Description	Series	Type	Port size (Rc, NPT, G)	Supply air pressure [MPa]	Input current
Electro-pneumatic positioner	IP8000-X14	Lever type	1/4	0.14 to 0.7	4 to 20 mA DC
Electro-pneumatic positioner	IP8100-X14	Rotary type	1/4	0.14 to 0.7	4 to 20 mA DC
Smart positioner	52-IP8001	Lever type	1/4	0.14 to 0.7	4 to 20 mA DC
Smart positioner	52-IP8101	Rotary type	1/4	0.3 to 0.7	4 to 20 mA DC

Energy Saving

Air Saving

Vacuum Unit **ZK2**

p. 116

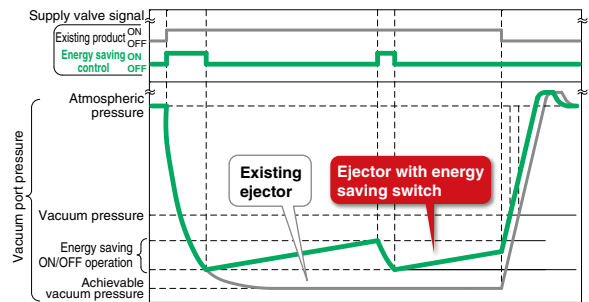
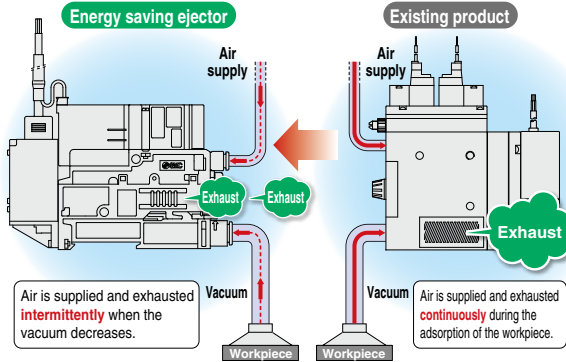
Energy Saving Ejector Vacuum Ejector Vacuum Pump System

The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum.

Air consumption reduced by 90%*1

*1 Based on SMC's measuring conditions

While the suction signal is ON, the ON/OFF operation of the supply valve is also performed automatically within the set value.



Power consumption cost per year reduced by 70,594 JPY/year

The energy saving function shortens the exhaust time, which reduces the annual power consumption cost.

	Power consumption cost per year	Energizing time per year	Exhaust time	Compressor's consumption per unit time
ZK2/With energy saving function	5,344 JPY/year	1875 h/year	0.6 s	0.19 kWh
Existing product	75,938 JPY/year	18750 h/year	6 s	0.27 kWh

Cost conditions

- Electric power charge: 15 JPY/kWh, Operating hours: 10 hours/day, Operating days: 250 days/year, When 10 units are used
- Power consumption of the compressor is the theoretical value from the air consumption of each product at 0.35 MPa.

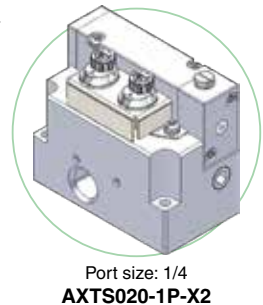
Pulse Blowing Valve AXTS040□-□□-X2 **Made to Order**

The peak pressure of repeatedly colliding air permits efficient blowing.

Air consumption reduced by 50% or more

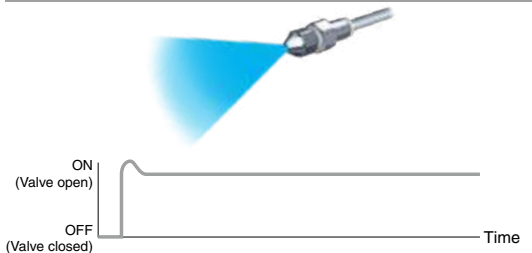
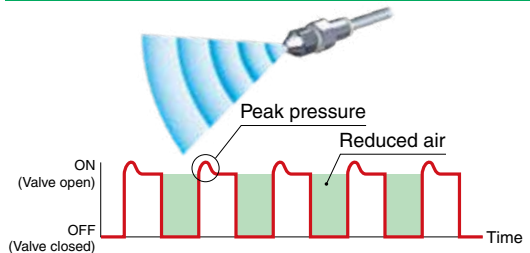


Related product
* Please contact SMC for details.



Pulse blow

Continuous blow



Energy Saving **Air Saving**

Pulse Valve **Valve for Dust Collectors** **JSXFA**

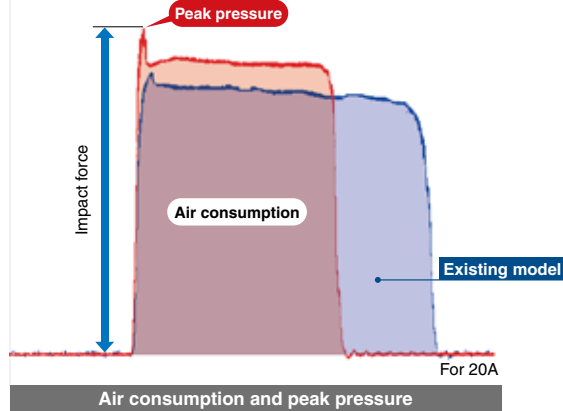
* Please contact SMC for details.

Life: More than 10 times longer/1000 million cycles*¹ or more

*¹ Based on SMC's specific testing conditions
When the orifice diameter of the pilot valve is $\phi 5$ mm or more

High peak pressure with low air consumption

Peak pressure: 15% increase
Air consumption: 35% reduction
Fluid temperature: -40 to 140°F (-40 to -60°C)



Size: 20A, 25A, 40A
Compression fitting type



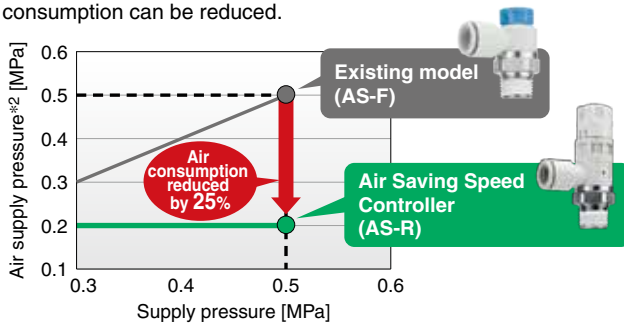
Direct piping type

Air Saving Speed Controller **AS-R/AS-Q**

p. 145

Air saving: 25*¹% reduction in air consumption

By reducing the pressure on the return stroke to 0.2 MPa, air consumption can be reduced.



*¹ The air consumption reduction rate indicates the rate for one cycle of the cylinder.
*² Cylinder pressure on the return stroke side



With pressure reduction function
AS-R



With rapid supply and exhaust function
AS-Q

When combined with an optimally-sized cylinder

Air consumption reduction ratio: 46%

For example, instead of using an $\phi 80$ bore cylinder in place of a $\phi 63$ bore cylinder that does not have enough force, it is possible to select an optimally-sized $\phi 67$ bore JMB series cylinder. In addition, an AS-R/AS-Q series combined with this cylinder can reduce air consumption by up to 46%.

Air Consumption (for one cycle)

Speed controller	Air Saving Speed Controller AS-R/AS-Q Series	Elbow type AS Series
Cylinder bore size [mm]	$\phi 67$ (Intermediary bore size)	$\phi 80$
Air consumption [L]	3.1	5.8

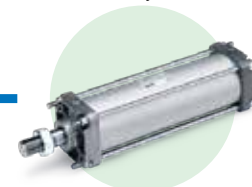
Conditions:
Working stroke pressure: 0.5 MPa
Return stroke pressure: 0.2 MPa
Stroke: 100 mm

* Utilizes the SMC sizing program

46% reduction

Air Saving Speed Controller

Air Cylinder JMB Series Intermediary bore size



		Intermediary bore size	
Bore size	$\phi 63$	$\phi 67$	$\phi 80$
Force	Not acceptable	Acceptable (Optimal)	Acceptable (Excessive)

Energy Saving **Power Saving**

**Thermo-chiller/
Inverter Type
HRSH090** p. 163



**Thermo-chiller/
Inverter Type
HRSH100 to 300** p. 164

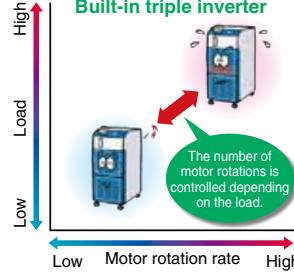


Triple inverter

The inverter respectively controls the number of motor rotations of the compressor, fan and pump depending on the load from the user's equipment. **Power consumption reduced by 53% compared with a non-inverter (HRSH090)**
With the inverter, it is possible to operate with the same performance even with the power supply of 50 Hz.

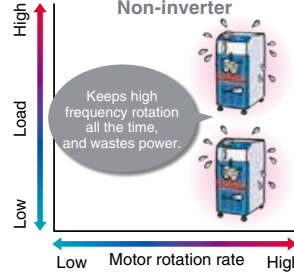
Chiller Type	Motor	Power Consumption (kW)	Total Power Consumption (kW)	Reduction
Non-inverter chiller	Pump	1.1	5.1	-
	Compressor + Fan + Others	4.0		
Double inverter chiller	Pump	1.1	3.1	Reduced by 39% with compressor and fan inverters
	Compressor + Fan + Others	2.0		
Triple inverter (HRSH090)	Pump	0.6	2.4	Reduced by 53% with the additional pump inverter
	Compressor + Fan + Others	1.8		

Built-in triple inverter



The number of motor rotations is controlled depending on the load.

Non-inverter



Keeps high frequency rotation all the time, and wastes power.

Operating ratio: Ratio of 9.5 kW (with heat load) to 0 kW (without heat load) Operating ratio: 50%, with heat load of 9.5 kW all the time

Conditions

Common conditions for non-inverter and triple inverter:	● Circulating fluid temperature: 20°C
● Ambient temperature: 32°C	● Heat load: 9.5 kW
● Circulating fluid flow rate: 35 L/min at 0.3 MPa (60 Hz)	

Conditions for non-inverter chiller: Continuous operation of the compressor which can cool down 9.5 kW at 60 Hz. The pump shall be same as that of the HRSH.


Refrigerated Air Dryer/Double Energy Saving Function Series p. 124

Double Energy Saving Function Series

Energy-saving effects of the double energy saving function series

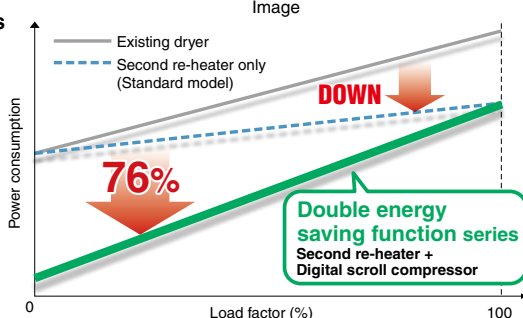
Second re-heater

Digital scroll compressor



Energy-saving design

The double energy saving function series reduces power consumption **by up to 76%!**



76%

DOWN

Double energy saving function series
Second re-heater + Digital scroll compressor

Operating conditions: The IDF125FS operated in the energy saving operation mode

● Ambient temperature 32°C	● Inlet air temperature 40°C	● Inlet air pressure 0.7 MPa	● Load factor
● Air flow rate = Rated flow x 0.4	● Power supply frequency 60 Hz	● Power supply voltage 200 V	● Operating conditions that increase load factor:
● Set dew point = 30°C			● High inlet air temperature and ambient temperature
			● A large amount of air to be processed
			● Low inlet air pressure

Effect example 1 year (Spring to Winter) Power consumption **DOWN**

Compared with the standard model (constant compressor operation), **the double energy saving function series reduces power consumption by 43%!!**


*1 The IDF125FS is used for this example.

per year	Double energy saving function series (IDF125FS)	Standard model (IDF125F)
----------	---	--------------------------

*1 [Trial calculation conditions] Days of operation per year = 240 days (60 days each in spring, summer, autumn, and winter), Operation hours per day = 12 hours, Electric power cost = ¥17/kWh
For details about the dryer operating conditions for each season, refer to the **Web Catalog** (IDF□FS series).

Energy Saving **Power Saving** **Air Saving**


5-Port Solenoid Valve
Plug-in SY p. 77



4-Port Solenoid Valve
SJ p. 77



5-Port Solenoid Valve
VF p. 78



3-Port Solenoid Valve
VP p. 79

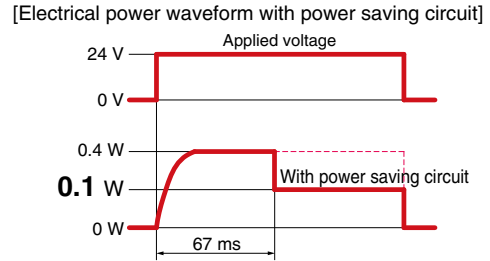


Reduces power consumption when energized

- Power consumption is reduced by power saving circuit.

Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 67 ms*1 at 24 VDC.) Refer to the electrical power waveform as shown below.

* Only products with the indicator light are equipped with the power saving circuit.



*1 For the SY plug-in series

Low Power Consumption Valve Energy-saving Product


Type	Model	Power consumption [W]*2	
		Standard	With power-saving circuit
4/5-port	SJ2000	0.55	0.23
	SJ3000	0.4	0.15
	Plug-in SY3000/5000/7000	0.4	0.1
	SY3000/5000/7000/9000	0.4	0.1
	SYJ3000/5000/7000	0.4	0.1
	VF1000/3000/5000	1.55	0.55
3-port	SYJ300/500/700	0.4	0.1
	VP300/500/700	1.55	0.55
	V100	0.4	0.1

*2 With DC light


Valve Mounted Compact Cylinder p. 96
CVQ/CVQM

- Approx. 50% reduction in air consumption between cylinder and valve

CVQ



CVQM




S Couplers p. 136
KK130

- Energy saving by pressure loss reduction



Blow Gun p. 147
VMG

- A 20% reduction in power consumption can be achieved with the SMC "Blow gun" + "S coupler" + "Coil tube."




* 10% reduction with the "Blow gun (VMG)" only

Precision Regulator p. 132
IR1000-A/IR2000-A/IR3000-A

- Air consumption: Reduced by up to approx. 90%*1

IR	Existing model	Series
1 L/min(ANR) or less	4.4 L/min(ANR)	IR1000-A/IR2000-A
1 L/min(ANR) or less	11.5 L/min(ANR)	IR3000-A

*1 Compared with the existing IR1000/2000/3000



Multistage Ejector p. 116
ZL112A

- Air consumption: 10% reduction [63 → 57 L/min(ANR)]





Centralized Control

From p. 80

Reduced Wiring

Fieldbus System

		IP67/65 specification models						
		Output type for solenoid valves		Gateway type	Integrated input-output type			
	Number of valve outputs	32						
		16		EX124				
	Number of inputs	16		EX123*1, EX126*1				
		32						
Applicable protocols	EtherNet/IP™		●		●	●		●
	PROFINET		●		●		●	
	Modbus®TCP		◆					◆
	Ethernet POWERLINK		●					
	EtherCAT		●					
	CC-Link IE Field					◆		◆
	PROFIBUS DP		●		●			●
	DeviceNet™		●		●			●
	CC-Link		●	●	●			●
	AS-Interface		◆					●
	CANopen		◆					●
	CompoNet™			◆				●
	INTERBUS						◆	
IO-Link		◆						

*1 For details, refer to the catalog of each product.

		IP20 specification models					
		Output type for solenoid valves			Gateway type	Integrated input-output type	
	Number of valve outputs	32					
		16					
	Number of inputs	16					
		32					
Applicable protocols	EtherNet/IP™					◆	
	PROFINET					◆	
	Modbus®TCP						
	Ethernet POWERLINK						
	EtherCAT				◆		
	CC-Link IE Field						
	PROFIBUS DP		●		●		●
	DeviceNet™		●		●		●
	CC-Link		●	●	●		●
	AS-Interface		●		●		●
	CANopen		●		●		●
	CompoNet™		●		●		●
	INTERBUS						
IO-Link							

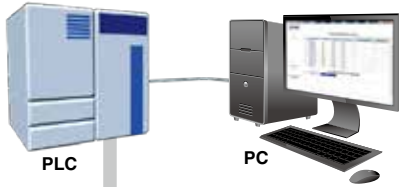
●: Standard product ◆: Made to order

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Centralized Control

IO-Link Compatible Product

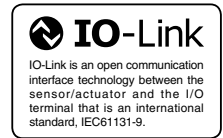


Configuration File (IODD File*)

- Manufacturer
- Product part no.
- Set value

***1 IODD File:**
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

For details on each device, refer to the **Web Catalog**.



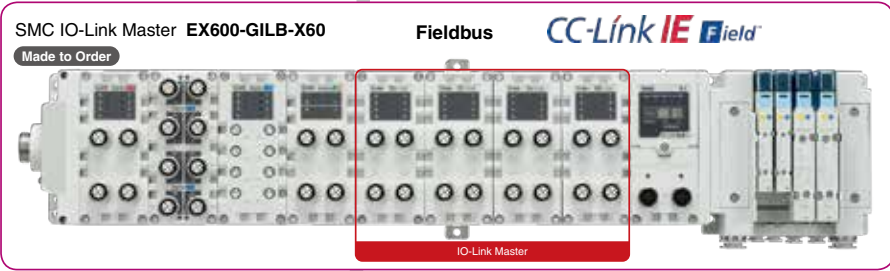
Various fieldbusses

Device settings can be set by the master.

- Threshold value
- Operation mode, etc.

Read the device data.

- Switch ON/OFF signal and analog value
- Device information: Manufacturer, Product part number, Serial number, etc.
- Normal or abnormal device status



<p>3-Screen Display High-Precision Digital Pressure Switch</p> <p>ZSE20B(F)-L / ISE20B-L</p>	<p>3-Screen Display High-Precision Digital Pressure Switch</p> <p>1.0 MPa 1.6 MPa</p> <p>For air ISE70/ISE71</p>	<p>3-Screen Display High-Precision Digital Pressure Switch</p> <p>1.0 MPa 2.0 MPa 5.0 MPa 10 MPa</p> <p>For general fluids ISE70G/ISE75G ISE76G/ISE77G</p>	<p>3-Color Display Digital Flow Switch for Water</p> <p>PF3W704-X445 PF3W720-X445 PF3W740-X445</p>
<p>Actuator Position Sensor</p> <p>Actuator position sensor</p> <p>D-MP025/D-MP050 D-MP100/D-MP200</p>	<p>Valve SI Unit</p> <p>EX260-SIL1-X207 EX260-SIL1-X210</p>	<p>Electro-Pneumatic Regulator</p> <p>ITV10□0-X395 ITV20□0-X395 ITV30□0-X395</p>	<p>Step Motor Controller</p> <p>JXCL1</p>



Centralized Control

Pressure/Flow Control

3-screen display applicable series Setting is possible while checking the measured value.

Main screen	Measured value (Current pressure value)	
Sub screen	Label (Display item), Set value (Threshold value)	
	Set value (Threshold value)	P_1
	Hysteresis value	H_1
	Delay time	dt_1
	Peak value	H_H_1
Visualization of settings	Bottom value	H_L_0



- Applicable Series**
- High-Precision Digital Pressure Switch
ZSE20□(F)/ISE20□ Series
ISE7□/7□G Series
 - Sensor Monitor
PSE300AC Series
 - Digital Flow Monitor
PFG300 Series

Pressure Switches/Sensors

3-Screen Display High-Precision Digital Pressure Switch p. 148
ZSE20□(F)/ISE20□

Compact Digital Pressure Switch p. 148
ZSE10(F)/ISE10

Compact Pneumatic Pressure Sensor p. 149
PSE53□/54□

Pressure Sensor for General Fluids p. 149
PSE56□/57□

3-Screen Display High-Precision Digital Pressure Switch p. 148
ISE7□/7□G

Variations

Flow Switches

3-Color Display Digital Flow Switch for Large Flow p. 151
PF3A7□H

2-Color Display Digital Flow Switch p. 151
PFMB

3-Color Display Digital Flow Switch p. 151
PFMC

3-Color Display Digital Flow Switch for Water p. 152
PF3W

3-Color Display Electromagnetic Type Digital Flow Switch p. 153
LFE

Variations



Centralized Control

Pressure/Flow Control

Regulators

Electro-Pneumatic Regulator **p. 134** ITV

- Stepless control of air pressure in proportion to electrical signals
- Sensitivity: 0.2% F.S. or less
- Linearity: $\pm 1\%$ F.S. or less
- Hysteresis: 0.5% F.S. or less
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C



5.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator **p. 134** ITVX

- Maximum supply pressure: 5.0 MPa
- Set pressure range: 0.01 to 3.0 MPa
- Max. flow rate: 3,000 L/min(ANR)



3.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator **p. 134** ITVH

- Maximum supply pressure: 3.0 MPa
- Set pressure range: 0.2 to 2.0 MPa
- Stability: $\pm 1\%$ F.S. or less
- Max. flow rate: 3,000 L/min(ANR)



Electronic Vacuum Regulator **p. 134** ITV

- Stepless control of vacuum pressure in proportion to electrical signals
- Sensitivity: 0.2% F.S. or less
- Linearity: $\pm 1\%$ F.S. or less
- Hysteresis: 0.5% F.S. or less
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C



Precision Regulator **p. 132** IR1000-A/2000-A/3000-A

- Air consumption: Reduced by up to approx. 90% (Compared to the existing SMC product)
- Sensitivity: 0.2% (Full span)
- Repeatability: $\pm 0.5\%$ (Full span)



Trademark
DeviceNet™ is a trademark of ODVA.

Others

Compact Proportional Solenoid Valve **p. 133** PVQ

- Stepless control of flow rate in proportion to current
- Repeatability: 3% or less
- Hysteresis: 10% or less



Flow Controller for Water **p. 153** FC2W-X110

- Automatically adjusts the flow rate
- Flow rate control accuracy: $\pm 5\%$ F.S.
- Response time: 10 s or less
- Grease-free







Temperature Control From p. 163 **Temperature Control** **Constant Temperature**

A chiller is used to control the temperature of circulating fluid and supply it to the heat source.

Refrigerated Thermo-chillers

<p>Thermo-chiller/Standard Type HRS Cooling capacity 1.1 kW to 5.9 kW</p> 	<p>Thermo-chiller/Standard Type HRS090 Cooling capacity 8.0 kW to 10.5 kW</p> 	<p>Thermo-chiller/Standard Type HRS100/150 Cooling capacity 9.0 kW to 16.5 kW</p> 
<p>Thermo-chiller/Inverter Type HRSH090 Cooling capacity 9.5 kW to 11 kW</p> 	<p>Thermo-chiller/Inverter Type HRSH Cooling capacity 10.5 kW to 28 kW</p> 	<p>Thermo-chiller/Basic Type HRSE Cooling capacity 1.0 kW to 2.2 kW</p> 
<p>Thermo-chiller/Rack Mount Type HRR Cooling capacity 1.2 kW to 3.0 kW</p> 	<p>Thermo-chiller/High-performance Type HRZ, HRZD, HRW Cooling capacity 1.0 kW to 30 kW</p> 	<p>Thermo-chiller/Environmentally Resistant Type HRS-R (IP54) Cooling capacity 1.9 kW to 5 kW</p> 

Peltier-Type Thermo-cons/Thermoelectric Baths

<p>Thermo-con HEC/HECR Cooling capacity 140 W to 1200 W</p> 	<p>Chemical Thermo-con HED Cooling capacity 300 W to 750 W</p> 
<p>Thermoelectric Bath (Round Type) HEB Cooling capacity 140 W to 280 W</p> 	<p>Thermoelectric Bath (Square Type) INR-244 Cooling capacity 140 W to 320 W</p> 

Next Generation Products

Air Saving, Lightweight, and Compact

* Please contact SMC for details.

Square Air Cylinder

Equivalent: $\phi 12$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$, $\phi 40$

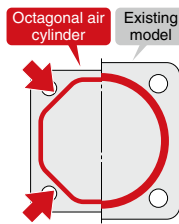
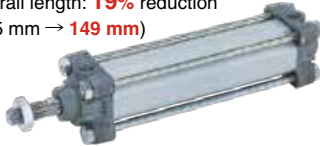
- Lightweight and compact due to its square piston shape
- Weight: **57%** reduction (150 g \rightarrow 64 g)
- Overall length: **30%** reduction (134 mm \rightarrow 93.5 mm)



Octagonal Air Cylinder

Bore size: $\phi 32$, $\phi 40$, $\phi 50$, $\phi 63$

- Lightweight and compact due to its octagonal piston shape
- Weight: **36%** reduction (480 g \rightarrow 306 g)
- Overall length: **19%** reduction (185 mm \rightarrow 149 mm)



Octagonal Compact Air Cylinder

Bore size: $\phi 20$, $\phi 25$, $\phi 32$, $\phi 40$

- Weight: **49%** reduction (179 g \rightarrow 92 g)
- Overall length: **13%** reduction (57.5 mm \rightarrow 50 mm)



Aluminum Rod Cylinder

- Special coating reduces sliding resistance and increases surface hardness
- Weight: **39%** reduction (2739 g \rightarrow 1704 g) (MGP $\phi 50$, 25 mm stroke)

MGP Series

Bore size: $\phi 25$, $\phi 32$, $\phi 40$, $\phi 50$

Aluminum rod + Special coating



CQ2 Series

Bore size: $\phi 25$, $\phi 32$, $\phi 40$, $\phi 50$, $\phi 63$



CM2 Series

Bore size: $\phi 20$, $\phi 25$, $\phi 32$, $\phi 40$



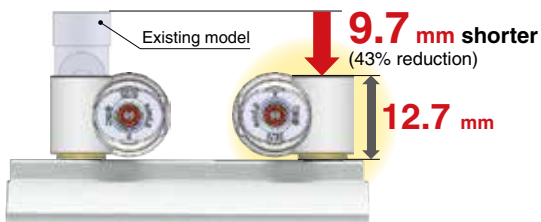
MB Series

Bore size: $\phi 32$, $\phi 40$, $\phi 50$, $\phi 63$



Compact Speed Controller

- Height: **43%** reduction (22.4 mm \rightarrow 12.7 mm)



Compact Rotary Actuator (Vane Type)

Size: 10, 15, 20, 30, 40

- Weight: **48%** reduction (222 g \rightarrow 115 g) (For size 20)
- Overall length: **44%** reduction (100 mm \rightarrow 55.6 mm) (For size 20)



Next Generation Products

Air Saving, Lightweight, and Compact

* Please contact SMC for details.

Compact Rotary Actuator (Rack & Pinion Type) Size: 10, 15, 20, 30, 40

- Weight: **29%** reduction (700 g → **500 g**) (For size 20)
- Height: **7%** reduction (59 mm → **55 mm**) (For size 20)



Compact Rotary Table (Rack & Pinion Type) Size: 10, 20, 30, 50

- Weight: **32%** reduction (940 g → **640 g**) (For size 20)
- Height: **28%** reduction (54 mm → **39 mm**) (For size 20)



Compact Air Gripper ø8, ø12, ø16, ø20

- Weight: **46%** reduction (235 g → **127 g**)
- Height: **28%** reduction (27.6 mm → **20 mm**)
- Overall length:
23% reduction (84.8 mm → **65.2 mm**)



Plug-in Type 5-Port Solenoid Valve

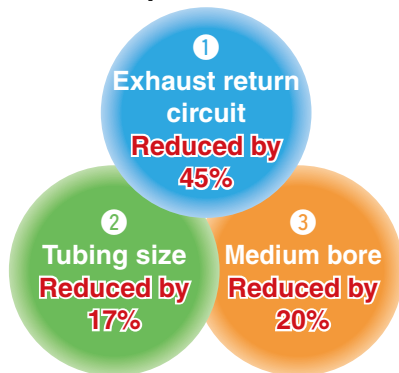
- Weight: **32%** reduction (1140 g → **770 g**) (JSY3000)
- Volume: **39%** reduction (1360 cm³ → **830 cm³**) (JSY3000)



Reduction in cylinder air consumption

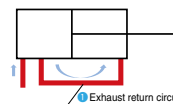
* Please contact SMC for details.

1/3 the air consumption



1 Exhaust return

Air is reused and consumption is **reduced by 45%**



2 Adjustment of combined tubing resistance

Tubing bore size ø6 → ø4
Air consumption **reduced by 17%**

3 Selection of medium bore size

Improved cylinder force (ø50 → ø45)
Air consumption **reduced by 20%**


Total air consumption reduced by 70%

Next Generation Products

Wireless System

Wireless System EX600-W

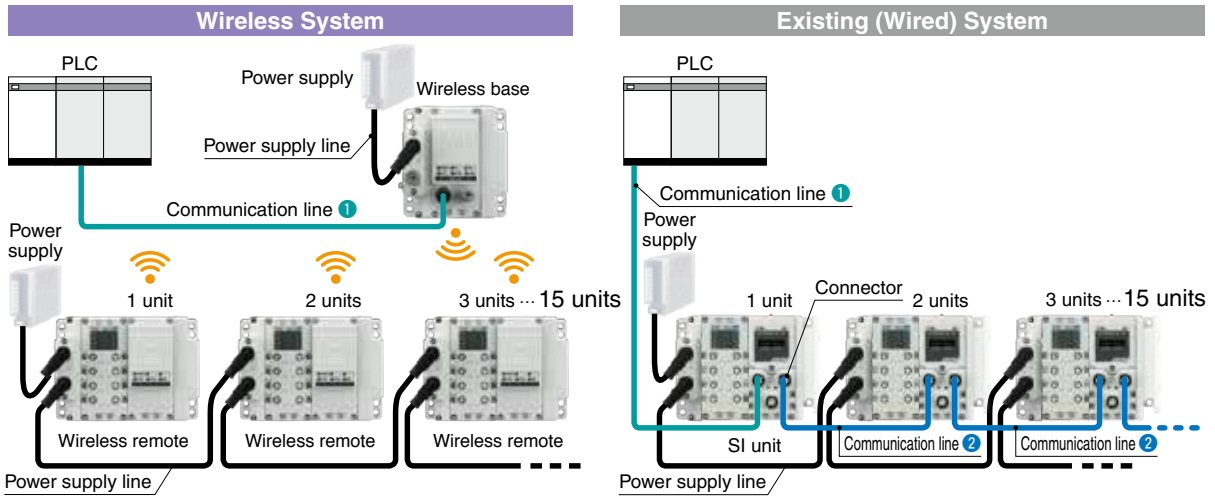
p. 82

- Noise resistance
Uses the 2.4 GHz ISM frequency band
Frequency hopping: Every 5 ms
- High-speed connection
From power supply ON to start of communication: Min. 250 ms*1
*1 For wireless slave
- Communication response
Signal response time: 5 ms
- Communication cables not required
Reduced wiring work, space, and cost
Minimized disconnection risk
- Number of I/O points
Max. 1280 inputs/1280 outputs
(Max. 128 inputs/128 outputs per module)
- Compatible protocols
EtherNet/IP 



■ Trademark
EtherNet/IP™ is a trademark of ODVA.

Wiring material cost and installation work-hours can be reduced.



SI unit: Comparison when 15 units are connected	Number of communication devices	Communication line		Communication connectors required
		①	②	
Wireless system	Wireless base: 1 unit Wireless remote: 15 units	1 line (Connector at one end)	—	1 place
Existing (Wired)	SI unit: 15 units	1 line (Connector at one end)	14 lines (Connector at both ends)	29 places

Product Support

Calibration Certificate

Pressure Switch: Suffix -X5

From p. 148

- Traceability system chart attached
 - Calibration certificate of the product attached
 - Traceability system chart of standard instruments attached
 - Calibration certificate of standard instruments attached
- * Models whose standard part number includes symbols "K" or "T", indicating that a calibration certificate is attached to the product, are not applicable.

Applicable Series

3-Screen Display High-Precision Digital Pressure Switch ZSE20□(F)/ISE20□



Compact Digital Pressure Switch ZSE10(F)/ISE10



3-Screen Display High-Precision Digital Pressure Switch ISE7□



3-Screen Display High-Precision Digital Pressure Switch ISE7□G



Compact Pneumatic Pressure Sensor PSE53□



Compact Pneumatic Pressure Sensor PSE54□



Low Differential Pressure Sensor PSE550



Pressure Sensor for General Fluids PSE56□



Pressure Sensor for General Fluids PSE57□



Multi-Channel Digital Pressure Sensor Controller PSE200



2-Color Display Digital Pressure Sensor Controller PSE300



3-Screen Display Sensor Monitor PSE300AC



Example of Calibration Certificate for Pressure Switch (-X5)

+

+

Calibration certificate/
Traceability system chart of
standard instruments

* The images shown are just examples.
The contents described may vary
depending on the product.

Flow Switch: Standard model no. (Available with -A)

From p. 150

- Inspection certificate (with serial number) attached
- Traceability system chart attached (Traceability system chart of standard instruments attached)

Applicable Series

2-Color Display Digital Flow Switch PFM



2-Color Display Digital Flow Switch PFMB



3-Color Display Digital Flow Switch PFMC



3-Color Display Digital Flow Switch for Large Flow PF3A7□H



3-Color Display Digital Flow Switch for Water PF3W



Digital Flow Switch for Deionized Water and Chemical Liquids PF2D



Products other than those listed above are also available. Please contact SMC for details.

Others

High Pressure

**Pilot Operated
2-Port Solenoid Valve
N.O. type
VCH42**

p. 159

- Max. operating pressure: 5.0 MPa
- Service life: 10 million cycles
- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet for valve parts
- Operating pressure differential: 0.5 to 5.0 MPa



**Pilot Operated
2-Port Solenoid Valve
N.C. type
VCH41**

p. 159

- Max. operating pressure: 5.0 MPa
- Service life: 10 million cycles
- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet for valve parts
- Operating pressure differential: 0.5 to 5.0 MPa



**Pilot Operated
3-Port Solenoid Valve
VCH410**

p. 159

- Max. operating pressure: 5.0 MPa
- Service life: 10 million cycles
- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet for valve parts
- Uses NSF-H1 approved grease on guide rings (Sliding parts)
- Operating pressure differential: 0.5 to 5.0 MPa



**Silencer
VCHN3/4**

p. 159

- Max. operating pressure: 5.0 MPa (Solenoid valve inlet pressure)
- Reduces clogging with its double-layer structure
- Noise reduction: 35 dB(A)



**Check Valve
VCHC40**

p. 159

- Operating pressure range: 0.05 to 5.0 MPa
- Service life: 10 million cycles
- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet for valve parts
- Cracking pressure: 0.05 MPa



**Direct Operated Regulator
(Relieving Type)
VCHR30/40**

p. 159

- Max. operating pressure: 6.0 MPa
- Service life: 10 million cycles
- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet
- Uses NSF-H1 approved grease on guide rings (Sliding parts)
- Set pressure range: 0.5 to 5.0 MPa



**3.0 MPa Maximum Supply
Pressure High Pressure
Electro-Pneumatic
Regulator
ITVH**

p. 134

- Max. supply pressure: 3.0 MPa



**Electro-Pneumatic Regulator
ITVX**

p. 134

- Max. supply pressure: 5.0 MPa
- Stepless control of air pressure proportional to electrical signals
- Set pressure range: 0.01 to 3.0 MPa



**Pressure Sensor for
General Fluids
PSE576/577**

p. 149

- Rated pressure range: 0 to 5 MPa (PSE576)
0 to 10 MPa (PSE577)



**Pressure Switch
ISE7□G**

p. 148

- Rated pressure range: 0 to 5 MPa (ISE76G)
0 to 10 MPa (ISE77G)



**Regulator: High Pressure
AR-B-X425**

p. 130

- Max. operating pressure: 2.0 MPa
- Strong materials are used in the manufacturing of regulators intended for high-pressure operation.
- Proof pressure: 3.0 MPa
- Set pressure range: 0.1 to 1.7 MPa



**Air Filter: High Pressure
AF-A-X425**

p. 128

- Max. operating pressure: 2.0 MPa
- Strong materials are used in the manufacturing of air filters intended for high-pressure operation.
- Proof pressure: 3.0 MPa

Others

p. 169, 170

High Pressure

For General Applications

High inlet pressure: Max. 24.1 MPa

Wetted parts material including diaphragm 316 SS (fluoropolymer seat)

Ni-Cr-Mo alloy internals available for corrosion resistance

**Regulator
AK**

For wide variety of applications from semiconductor to general



Gas supply unit for culture equipment



**Air Operated Regulator
AK□PA**



Others

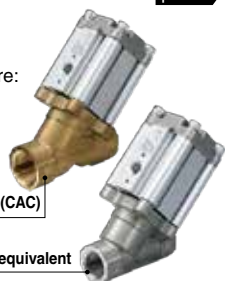
Steam

**Angle Seat Valve/Air Operated Type
VXB**

p. 156

- Fluid temperature: 183°C (Steam) or less

Body material: **Bronze (CAC)**
Body material: **Stainless steel 316L equivalent**



**Zero Differential Pressure Type Pilot Operated 2-Port Solenoid Valve
VXS**

p. 156

- Fluid temperature: 183°C (Steam) or less



**Direct Operated 2-Port Solenoid Valve
VX21/22/23**

p. 156

- Fluid temperature: 183°C (Steam) or less



**Stainless Steel 316 One-touch Fittings
KQG2**

p. 136

- Can be used with steam
- Fluid temperature: **-5 to 150°C**
- Grease-free
- Certified to meet current Food Sanitation Law standards (Component materials have met apparatus and container-package standards.)



**Stainless Steel 316 Insert Fittings
KFG2**

p. 137

- Can be used with steam
- Fluid temperature: **-65 to 260°C** (Swivel elbow: -5 to 150°C)
- Grease-free
- Certified to meet current Food Sanitation Law standards (Component materials have met apparatus and container-package standards.)



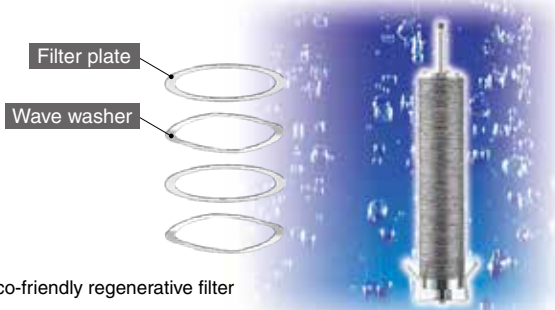
Others

p. 172

Cleaning (Filtration Filter)

Low Maintenance Filter
FN1/FN4

- Our unique element construction with back-flushing capability
The element of the filter is constructed of a series of grooved filter plates and wave washers placed one above the other.



- Eco-friendly regenerative filter
- A unique stainless steel element construction with back-flushing capability generates no industrial waste, thus requires no element replacement.



Flow rate
Max. **40** L/min Max. **80** L/min Max. **250** L/min
FN1 **FN4**

High Precision Filter for Liquids
FGH

- Filtration efficiency: 99% or more
- Prevents particle generation in the housing
Internal particle generation is eliminated by using stainless steel 316 and PTFE for the wetted material and adopting a clamp ring system.
- Integrity inspection conducted
100%-integrity inspection is conducted.
- Prevents residual liquid accumulation in the case
A simple structure prevents the residual liquid from accumulating in the case.



HEPO II Element

- Filtration accuracy: 2, 4, 6, 13 μm (Filtration efficiency: 99%)
- High precision filtration → 99% or more
High accuracy filtration is achieved by using a HEPO II element with filtration accuracy of 2, 4, 6 or 13 μm (Filtration efficiency 99%).
- No outflow of fibers or elution of components from the filter media
There is almost no outflow of fibers or elution of components from the filter media because it uses ultrafine and long polyester fiber nonwoven fabric with no binder.
- Applicable for a wide range of liquids
The element is applicable for a wide range of liquids because it adopts PTFE seals.



Quick Change Filter
FQ1

- Element can be replaced without using any tool.
· Replacing the element
· Air release
· Drainage of liquid

FQ1012
Element size
L500
(L250 x 2 pcs.)



FQ1010
Element size
L125

FQ1011
Element size
L250

HEPO II Element "EJ101S Series"

- Material: PET
- Optimal for high precision filtration (99% or more) of a wide range of fluids
- Dimensions: ø70 x L250 (EJ101S)

Recommended Flow Rate

Absolute filtration accuracy [μm]	Recommended flow rate [L/min]*1
2	20
4	
6	
13	

*1 Pressure loss: 0.01 to 0.02 MPa
• Operating temperature: 0 to 80°C • Differential pressure resistance: 0.5 MPa/25°C



HEPO II Element "EJ102S Series"

- All parts of this element are made of polypropylene, which is optimal for various cleaning fluids including alkali and organic solvents.
Nearly no fiber separation or release of chemicals, since fibers themselves are directly fused and no adhesives are used.
- Pressure loss is low and relatively long service life is provided due to a larger filtration area.
- Dimensions: ø70 x L250

Recommended Flow Rate

Absolute filtration accuracy [μm]	Recommended flow rate [L/min]
2	20
4	
6	
13	

• Operating temperature: 0 to 80°C • Differential pressure resistance: 0.5 MPa



Others

Adsorption Transfer

Vacuum Pad

From p. 119

ZP3P

- Silicone rubber compliant with the FDA (USA Food and Drug Administration) 21CFR§177.2600 elution test is used.



ZP3E

- Stable suction position
- Improved ease of removal
- Pad diameter: ø32 to ø125



ZP3

- Pad diameter: ø1.5 to ø16



ZP2



Unit Type Ejectors/Vacuum Pump Systems

Vacuum Unit

p. 116

ZK2

- The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum. Air consumption reduced by 90%
- Improved ejector efficiency: Suction flow increased by 50%
Air consumption reduced by 30%
(Compared with other SMC single-stage ejectors)



Individual wiring



D-sub connector



Flat ribbon cable

Ejectors

Multistage Ejector

p. 116

ZL112A

- Air consumption: 10% reduction
[63 → 57 L/min(ANR)]
- Lightweight: Max. 60% weight reduction
(450 g → 180 g)



Variations

With valve



With digital vacuum pressure switch



With vacuum pressure gauge



With vacuum port adapter



Port exhaust



Vacuum Ejector

p. 116

ZH

- Overall length: Max. 11% reduction
(6.7 mm shorter)
- Weight: Max. 74% reduction
(65.1 g lighter)
- Direct mounting, Standard bracket mounting, L-bracket mounting, DIN rail mounting



All Stainless Steel Vacuum Ejector

p. 117

ZH□□-X267

- All stainless steel (SCS13: Equivalent to stainless steel 304)

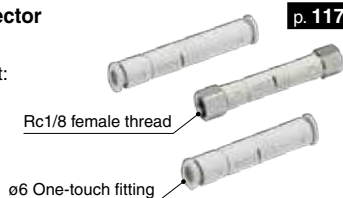


In-line Type Vacuum Ejector

p. 117

ZU□A

- Compact and lightweight:
O.D.: ø10.4
Weight: 3.9 g
Overall length: 52 mm



Vacuum Pad with Ejector

p. 117

ZHP

- Ejector and pad are integrated.
- Space saving with reduced piping labor
- Pad diameter: ø63, ø80



Others

Adsorption Transfer

Air Suction Filters

p. 118

ZFA

- Prevents problems related to vacuum circuits or airborne contaminants
- Provides a large filter element surface



ZFB

- Vacuum tubes can be connected and removed by a one-touch operation.



ZFC

- Operating pressure range: -100 kPa to 1.0 MPa
Both positive pressure and vacuum pressure can be used with one unit.



ZFC050

- Small suction filter which can be installed directly



Vacuum Saving Valves/Vacuum Flow

p. 121

ZP2V

- Can restrict the reduction of vacuum pressure even when there is no workpiece
- A switching operation is not required when changing workpieces.
- Built-in filter (40 μm)



ZH□-□□-X185

- By supplying compressed air, large blow and vacuum flow rates are available.
- A blow flow rate 4 times the supply air
- A vacuum flow rate 3 times the supply air



Related Products

Adsorption Plate SP

p. 122



Free Mount Cylinder for Vacuum ZCUK

p. 122



Vacuum Filter AFJ

p. 118



Exhaust Cleaner for Vacuum Pump AMV

p. 122



Vacuum Regulator IRV

p. 121



Electronic Vacuum Regulator ITV

p. 122



Related Equipment for Vacuum Systems

p. 122

Pressure Switches/Flow Switches



Directional Control Valves



Vacuum Pressure Switches/Pressure Gauges



Flow Control Equipment



Refrigerated Air Dryer
IDF

- Can be used in high-temperature environments
- Ambient temperature: Max. 45°C
- Inlet air temperature: Max. 65°C
- Air flow capacity: 16.4 m³/min
(24% increase compared with the existing model)
- * IDF90-20, Dew point 10°C, 60 Hz
- For use in Southeast Asia (IDFC)
- For use in Europe, Asia, and Oceania (IDFA)
- For use in North, Central, and South America (IDFB)



Model	Rated inlet condition	Rated ambient temperature	Air flow capacity [m ³ /min]		Port size
			Dew point 10°C		
			50 Hz	60 Hz	
IDF60	35°C	32°C	5.6	6.5	R1
IDF70	0.7 MPa		8.0	9.1	R1 1/2
IDF80	40°C		11.6	13.6	R2
IDF90	0.7 MPa		14.3	16.4	

Refrigerated Air Dryer (Standard Inlet Air Temperature Type) IDF□E/F/D

- Air flow capacity
50 Hz: 0.11 to 11.7 m³/min
60 Hz: 0.13 to 13.2 m³/min
- Ambient temperature: Max. 40°C
- Inlet air temperature: Max. 50°C
- Air flow capacity
50 Hz: 17 to 57 m³/min
60 Hz: 20 to 69 m³/min
- Air-cooled type/water-cooled type lineup
- Can be used in high-temperature environments (IDF100F to 150F)
- Ambient temperature: Max. 45°C
- Inlet air temperature: Max. 60°C
- Energy-saving design (IDF100F to 150F)
The exhaust heat amount has been reduced by 25% to suppress rises in ambient temperature (air-cooled type) and reduce the facility water amount (water-cooled type).



IDF□E



Air-cooled type Water-cooled type
IDF□F



IDF□D

Refrigerated Air Dryer (High Inlet Air Temperature Type) IDU□E

- Air flow capacity
50 Hz: 0.34 to 11.7 m³/min
60 Hz: 0.39 to 13.3 m³/min
- Ambient temperature: Max. 40°C
- Inlet air temperature: Max. 80°C



IDU□E

Refrigerated Air Dryer Double Energy Saving Function Series

- IDF100FS/125FS/150FS
- Air flow capacity
50 Hz: 16.7 to 26 m³/min
60 Hz: 19.6 to 28.1 m³/min
 - Can be used in high-temperature environments
 - Ambient temperature: Max. 45°C
 - Inlet air temperature: Max. 60°C
 - ECO switch
Optimal operation by switching between the energy-saving operation mode and the normal operation mode depending on the season and operating environment



Thermo-dryer with Air Temperature Adjustment Function IDH□

- Stable supply of temperature and pressure controlled dry clean air
- It is possible to supply compressed air of the same condition and quality regardless of the season.



Membrane Air Dryer IDG□A/IDG

- Dry air can be easily supplied using the hollow fiber membrane.
- Non-fluorocarbon
- Power supply not required



Moisture Control Tube IDK

- Prevents condensation in piping for small cylinders/air grippers



Others

Various Valves for Analyzing Reagents and Others

Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids
LVM

p. 158

Low Particle Generation Oil-free Metal-free

* Wetted parts

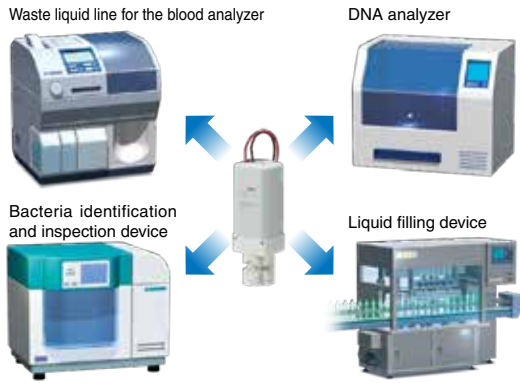
- Isolated structure
Direct operated rocker type/poppet type
The solenoid drive body is separated from the fluid area by a diaphragm.
- Power consumption (With power-saving circuit): 1.0 W or less (Holding)
- Change in volume (Pumping volume): 0.01 μ L or less (Rocker type)



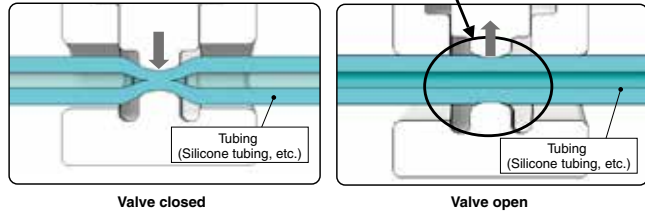
Pinch Valve
LPV

- The flow volume of the fluid is controlled by directly clamping the tube so as to open or close it.
- The fluid does not come into contact with the moving parts of the valve, so there is no inflow of contaminants.
- By discarding a tube after use, the need for a washing process is eliminated, thus ensuring good hygiene.
- Tubes can be set or replaced easily.

[Application Examples]



There is no clogging due to dead volume or solid matter.

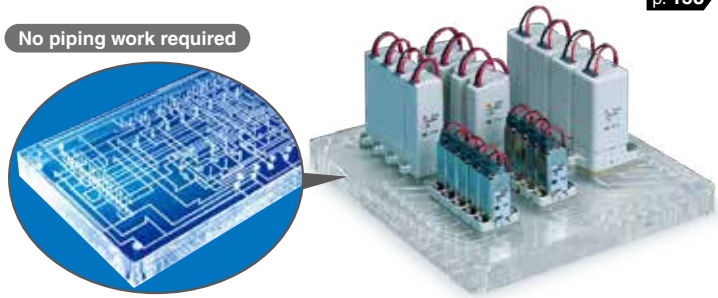


Composite Manifold

p. 158

Required space reduced by 50% Weight reduced by 70% No piping work required

- The unitization of devices allows for the whole unit to be made more compact.
- Space saving
- Flow passage style with high flexibility
- Lightweight
- Reduced piping work
- Reduced wiring
- Transparent flow passage (Acrylic)



Directional Control Valves

p. 77



Pilot Operated 4/5-Port Solenoid Valves

4-Port Solenoid Valve/Cassette Type Manifold/SJ2000/3000	p. 77
5-Port Solenoid Valve/Plug-in Type/SY3000/5000/7000	p. 77
5-Port Solenoid Valve/SY3000/5000/7000/9000	p. 77
5-Port Solenoid Valve/Plug-in Type/S0700	p. 77
5-Port Solenoid Valve/Plug Lead Type/S0700	p. 78
5-Port Solenoid Valve/VF1000/3000/5000	p. 78
5-Port Solenoid Valve/VQC4000/5000	p. 78

Pilot Operated 3-Port Solenoid Valves

3-Port Solenoid Valve/Pilot Operated Poppet Type/VP300/500/700	p. 79
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Direct Operated 3-Port Solenoid Valves

3-Port Solenoid Valve/V100	p. 79
3-Port Solenoid Valve/S070	p. 79

Reduced-wiring Fieldbus System (Serial Transmission System)

Serial Transmission System/EX	p. 80
Serial Transmission System/EX260	p. 80
Serial Transmission System/EX250	p. 80
Fieldbus System/EX245	p. 81
Serial Transmission System/EX600	p. 81
Serial Transmission System/EX500	p. 81
Serial Transmission System/EX510	p. 81
Wireless System/EX600-W	p. 82
M8/M12 Connector/PCA/EX9/EX500	p. 82

Air Operated Valves

5-Port Air Operated Valve/SYA3000/5000/7000	p. 82
5-Port Air Operated Valve/VFA1000/3000/5000	p. 82
3-Port Air Operated Valve/VPA300/500/700	p. 83

Explosion Proof Valves

Explosion-proof 3/5-Port Solenoid Valve/50-VFE/50-VPE	p. 83
Intrinsically Safe Explosion-proof System 5-Port Solenoid Valve/ 51-SY5000/7000/9000	p. 83

Air Cylinders

p. 84



Standard Air Cylinders (Round Type)

Pin Cylinder/CJP2/CDJP2/CJP	p. 84
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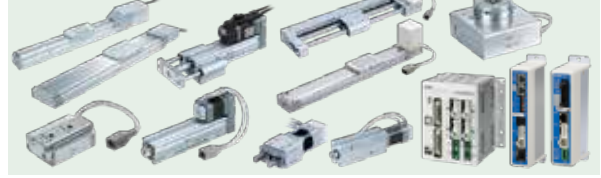


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Pilot Operated 4/5-Port Solenoid Valves

4-Port Solenoid Valve/Cassette Type Manifold SJ2000/3000

Rubber seal



- Low-profile cassette type with baseless structure
- Takes up minimal space with a body width of 7.5 mm (SJ2000) or 10 mm (SJ3000)
- The SJ2000 and the SJ3000 can be combined.
- The multi-pin connector makes it easy to add or subtract stations or to exchange valves.
- One side solenoid
- 4-position, dual 3-port specifications are available.
- Manifold type no.: SS5J2, SS5J3

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 3/5 (A/B → E)				
	C [dm ³ /(s·bar)]	b	Cv		
SJ2000	0.36	0.13	0.08	ø20	0.55 (Standard) 0.23 (With power saving circuit)
SJ3000	0.56	0.11	0.12	ø25	0.4 (Standard) 0.15 (With power saving circuit)

5-Port Solenoid Valve/Plug-in Type SY3000/5000/7000

Metal seal
Rubber seal



- Due to the flow increase, the valve size can be reduced!
Saves energy and space
- Power consumption: 0.1 W (With power saving circuit)/0.35 W (Standard)
- Service life: 200 million cycles (Metal seal)/70 million cycles (Rubber seal)
- Plug-in sub-plate has been newly added!
- Plug-in metal base (IP40)/Plug-in connector connecting base (IP67)
- Manifold type no.: SS5Y3, SS5Y5, SS5Y7

Series	Flow rate characteristics		Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b		
SY3000	1.6	0.19	ø50	0.35 (Standard) 0.1 (With power saving circuit)
SY5000	3.6	0.17	ø63	
SY7000	5.9	0.20	ø80	

5-Port Solenoid Valve SY3000/5000/7000/9000

Rubber seal



- The combined mounting of a 3-port valve and a 5-port valve is possible.
- Power consumption: 0.1 W (With power saving circuit)
- A wide variety of manifold options are available, such as the aluminum body manifold, DIN rail, and stacking type manifold.
- Manifold type no.: SS5Y3, SS5Y5, SS5Y7, SS5Y9

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
SY3000	1.1	0.30	0.26	ø40	0.35 (Standard) 0.1 (With power saving circuit)
SY5000	2.8	0.29	0.66	ø63	
SY7000	4.5	0.27	1.1	ø80	
SY9000	10	0.29	2.5	ø100	
SY300	1.1	0.3	0.26	ø40	
SY500	2.8	0.29	0.66	ø63	

5-Port Solenoid Valve/Plug-in Type S0700

Rubber seal



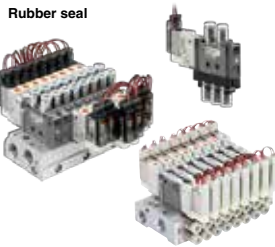
- A variety of common wiring methods are available.
- Slim, compact plug-in manifold: Required installation space reduced by 45%*1, Height reduced by 20 mm*1
*1 Compared with plug-in manifold stacking base
- 4-position, dual 3-port valve
- Manifold type no.: SS0751, SS0750

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	1 → 4/2 (P → A/B)				
	C [dm ³ /(s·bar)]	b	Cv		
S0700	0.39	0.39	0.11	ø25	0.35

Directional Control Valves

Pilot Operated 4/5-Port Solenoid Valves

5-Port Solenoid Valve/Plug Lead Type **S0700**



- Valve width: 7.4 mm
- Driveable cylinders: Up to $\phi 32$ (Body ported)
- Power consumption: 0.35 W
- Weight: 39 g (Body ported)
- Manifold type no.: SS0752, SS0755

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	1 → 4/2 (P → A/B)				
	C [dm ³ /(s·bar)]	b	Cv		
SS0752 Body ported	0.62		0.18	$\phi 32$	0.35
SS0755 Base mounted	0.39		0.11	$\phi 25$	0.35

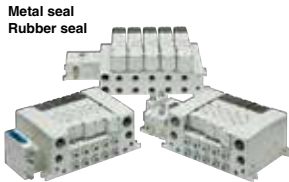
5-Port Solenoid Valve **VF1000/3000/5000**



- Built-in full-wave rectifier (AC)
- Built-in strainer in the pilot valve
- Manifold type no.: VV5F1, VV5F3, VV5F5

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VF1000	0.53	0.28	0.13	$\phi 40$	1.55 (Standard) 0.55 (With power saving circuit)
VF3000	3.1	0.32	0.75	$\phi 80$	0.4 (Low wattage specification)
VF5000	10.0	0.49	2.9	$\phi 125$	1.55 (Standard) 0.55 (With power saving circuit)

5-Port Solenoid Valve **VQC4000/5000**



- Compact with a large flow capacity
VQC4000: Can drive cylinders up to $\phi 160$
VQC5000: Can drive cylinders up to $\phi 180$
- An extensive range of protocols are available.
- Power saving: Power consumption of 0.4 W (Low wattage type)
- Long service life: 100 million cycles (According to SMC life test conditions)
- Enclosure IP67 compliant

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQC4000	7.3	0.38	2.0	$\phi 160$	1.0 0.4 (Low wattage type)
VQC5000	17	0.31	4.7	$\phi 180$	1.0 0.4 (Low wattage type)

Directional Control Valves

Pilot Operated 3-Port Solenoid Valves

3-Port Solenoid Valve/Pilot Operated Poppet Type **VP300/500/700**

Rubber seal



- Built-in full-wave rectifier (AC)
- Longer life expectancy: 50 million cycles or more
- Built-in strainer in the pilot valve
- The external pilot type can be used for vacuum applications.
- Manifold type no.: VV3P3, VV3P5, VV3P7

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → P)				
	C [dm ³ /(s·bar)]	b	Cv		
VP300	4.2	0.23	1.0	1.55 (Standard) 0.55 (With power saving circuit)	-100 kPa
VP500	8.9	0.20	2.1	0.4 (Low wattage specification)	-100 kPa
VP700	15.3	0.22	3.7	1.55 (Standard) 0.55 (With power saving circuit)	-100 kPa

Direct Operated 3-Port Solenoid Valves

3-Port Solenoid Valve **V100**

Rubber seal



- Power consumption: 0.1 W (With power saving circuit)
- Manifold type no.: VV100-S41

Series	Type	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
		2 → 3				
		C [dm ³ /(s·bar)]	b	Cv		
V100	Standard	0.037	0.11	0.008	0.35 (Standard) 0.1 (With power saving circuit)	-100 kPa
V100	High flow	0.076	0.07	0.016	1	-100 kPa

3-Port Solenoid Valve **S070**

Rubber seal



- 7 mm wide compact solenoid valve manifold
- Weight of valve alone: 5 g
- Single unit specifications, base mounted manifolds, and body ported manifolds can be selected.
- Manifold type no.: SS073

Series	Flow rate characteristics			Power consumption [W]	Max. operating pressure
	C [dm ³ /(s·bar)]	b	Cv		
S070	0.042	0.27	0.011	0.5	0.5 MPa
	0.060	0.28	0.016	0.5	0.3 MPa
	0.042	0.27	0.011	0.35	0.3 MPa
	0.060	0.28	0.016	0.35	0.1 MPa
	0.021	0.27	0.006	0.1 (With power saving circuit)	0.3 MPa
	0.042	0.28	0.011	0.1 (With power saving circuit)	0.1 MPa

Directional Control Valves

Reduced-wiring Fieldbus System (Serial Transmission System)

Serial Transmission System EX



For Output

*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX120	IP20	DeviceNet™ CC-Link CompoNet™	SY3000, 5000, 7000 (Plug-in) VQ1000, 2000 SV1000, 2000, 3000, 4000
EX121	IP20	CompoBus/S NKE (Wiring saving system)	SY3000, 5000
EX122	IP20	S-LINK V (Made to order)	SY3000, 5000
EX123	IP65	NKE (Wiring saving system)	VQ2000, 4000, 5000
EX124	IP65	CC-Link CompoBus/S DeviceNet™ (Made to order)	VQ2000, 4000, 5000
EX126	IP67	CC-Link	SY3000, 5000, 7000 (Plug-in) SV1000, 2000, 3000 VQC1000, 2000, 4000, 5000
EX140	IP20	DeviceNet™ CC-Link CompoBus/S NKE (Wiring saving system)	SZ3000 SQ1000, 2000
EX180	IP20	DeviceNet™ CC-Link EtherCAT (Made to order) AnyWireASLINK (Made to order)	SJ2000, 3000 S0700

Serial Transmission System EX260



For Output

*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX260	IP67	DeviceNet™ PROFIBUS DP CC-Link EtherCAT PROFINET EtherNet/IP™ Ethernet POWERLINK	SY3000, 5000, 7000 (Plug-in) VQC1000, 2000, 4000, 5000 SV1000, 2000, 3000 S0700 (IP40)

Serial Transmission System EX250



For Input/Output

*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX250	IP67	DeviceNet™ PROFIBUS DP CC-Link AS-Interface CANopen EtherNet/IP™	SY3000, 5000, 7000 (Plug-in) VQC1000, 2000, 4000, 5000 SV1000, 2000, 3000 S0700 (IP40)

■ Trademark

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- EtherNet/IP™ is a trademark of ODVA.
- CompoNet™ is a trademark of ODVA.
- EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Directional Control Valves

Reduced-wiring Fieldbus System (Serial Transmission System)

Fieldbus System EX245



- For Input/Output
- AIDA specifications compliant*1
- *1 Abbreviation of the Automation Initiative of German (Deutschland) Automobile Manufacturers
- Push Pull connectors
- One-touch installation and removal
- Reduced wiring time
- Modules can be combined flexibly.

Series	Enclosure	Communication protocol	Applicable valve
EX245	IP65	PROFINET INTERBUS (Made to order) PROFIBUS DP (Made to order)	SY3000, 5000, 7000 (Plug-in) VQC1000, 2000, 4000, 5000 SV1000, 2000, 3000

Serial Transmission System EX600

For Input/Output



*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX600	IP67	PROFIBUS DP DeviceNet™ CC-Link EtherNet/IP™ EtherCAT PROFINET Modbus/TCP (Made to order) POWERLINK (Made to order)	SY3000, 5000, 7000 (Plug-in) SV1000, 2000, 3000 VQC1000, 2000, 4000, 5000 S0700 (IP40)

Serial Transmission System EX500

For Input/Output, Gateway Type



*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX500	IP67	EtherNet/IP™ PROFINET DeviceNet™ PROFIBUS DP	SY3000, 5000, 7000 (Plug-in) VQC1000, 2000, 4000, 5000 SV1000, 2000, 3000 S0700 (IP40)

Serial Transmission System EX510

For Input/Output, Gateway Type



*1 The applicable protocols differ depending on the series. For details, refer to the catalog of each series.

Series	Enclosure	Communication protocol*1	Applicable valve
EX510	IP20	CC-Link DeviceNet™ PROFIBUS DP EtherNet/IP™ (Made to order) PROFINET (Made to order)	SJ2000, 3000 SY3000, 5000, 7000 (Plug-in) SY3000, 5000, 7000, 9000 SYJ3000, 5000, 7000 SQ1000, 2000 SZ3000 VQ1000, 2000 VQZ1000, 2000, 3000 S0700

■ Trademark

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Directional Control Valves

Reduced-wiring Fieldbus System (Serial Transmission System)

Wireless System EX600-W



- Usable even in welding environments
- Noise resistance
- Uses the 2.4 GHz ISM frequency band
- Frequency hopping: Every 5 ms
- High-speed connection: From power supply ON to start of communication: Min. 250 ms
- Communication response (Signal response time): 5 ms
- Communication cables not required
- Number of I/O points: Max. 1280 inputs/1280 outputs (Max. 128 inputs/128 outputs per module)

Series	Enclosure	Communication protocol	Applicable valve
EX600-W	IP67 equivalent	EtherNet/IP™ PROFINET	SY3000, 5000, 7000 (Plug-in) SV1000, 2000, 3000 S0700 (IP40) VQC1000, 2000, 4000, 5000

M8/M12 Connector PCA/EX9/EX500



- Communication cable/connector: CC-Link, DeviceNet™, PROFIBUS DP
- Compliant with IEC61076-2-101 and IEC60947-5-2 Standards
- IP67 (IEC60529)
- Field-wireable connectors: No exclusive tools required, Reduction in wiring time
- SPEEDCON: Just insert the connector and make a 1/2 rotation.

■ Trademark
 • DeviceNet™ is a trademark of ODVA.
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Air Operated Valves

5-Port Air Operated Valve SYA3000/5000/7000



- Can be used with the same manifolds as the SY3000/5000/7000 series non plug-in type.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm³/(s·bar)]	b	Cv	
SYA3000	1.1	0.30	0.26	ø40
SYA5000	2.8	0.29	0.66	ø63
SYA7000	4.5	0.27	1.1	ø80

5-Port Air Operated Valve VFA1000/3000/5000



- Can be used with the same manifolds as the VF1000/3000/5000 series.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm³/(s·bar)]	b	Cv	
VFA1000	0.53	0.28	0.13	ø40
VFA3000	3.1	0.32	0.75	ø80
VFA5000	10.0	0.49	2.9	ø125

Directional Control Valves

Air Operated Valves

3-Port Air Operated Valve **VPA300/500/700**

Rubber seal



- Can be used with the same manifolds as the VP300/500/700 series internal pilot type.
- Easy conversion to N.C. or N.O.

Series	Flow rate characteristics		
	2 → 3 (A → R)		
	C [dm ³ /(s·bar)]	b	Cv
VPA300	4.2	0.26	1.0
VPA500	8.9	0.20	2.1
VPA700	15.3	0.22	3.7

Explosion Proof Valves

Explosion-proof 3/5-Port Solenoid Valve **50-VFE/50-VPE**

Rubber seal



- Exd II BT4 (TIIS approved product)
- Waterproof: IP*6 equivalent
- Exhausting equipment for the pilot valve is not required. (Common exhaust type for main and pilot valve [50-VFE3000])
- It is possible to be used in a manifold. (50-VFE)
- Can be used as a selector valve, divider valve, or for vacuum applications (50-VPE)
- Manifold type no.: 50-VV5FE3, 50-VV5FE5

Series	No. of ports	Effective area mm ² (Cv)	Power consumption [W]
50-VFE3000	5-port	18 (1.0)	3.5
50-VFE5000	5-port	45 (2.5)	3.5
50-VPE500	3-port	41.4 (2.3)	3.5
50-VPE700	3-port	72 (4)	3.5

Intrinsically Safe Explosion-proof System 5-Port Solenoid Valve **51-SY5000/7000/9000**

Rubber seal



- Exia II BT4 (TIIS approved product)
- 3 types of connectors are available: L plug connector, L plug connector with a cover, With IP65 compliant cable
- 3 types of barriers are available.
- Manifold type no.: 51-SS5Y5, 51-SS5Y7

Series	Flow rate characteristics			Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b	Cv	
51-SY5000	2.8	0.29	0.66	0.52
51-SY7000	4.1	0.29	1.0	0.52
51-SY9000	9.6	0.43	2.6	0.52

Air Cylinders

Standard Air Cylinders (Round Type)

Pin Cylinder CJP2/CDJP2/CJP



- Two auto switches can be mounted even on the $\phi 4$, 5 st.
- A $\phi 2$ One-touch fitting and a speed controller can be connected.
- With auto switch (CDJP2 series: CDJP2)

Type	Series	Action	Bore size [mm]
Standard	CJP2	Double acting, Single rod	4, 6, 10, 16
Standard	CJPB	Single acting (Panel mount)	4, 6, 10, 15
Standard	CJPS	Single acting (Plug mount)	4, 6, 10, 15

Air Cylinder CJ2/CDJ2



- Double foot and head flange have been added to the available mounting types.
- Easy fine adjustment of auto switch position
- The auto switch mounting type, band, or rail can be selected with the model number.
- Part numbers with a rod end bracket and/or pivot bracket are available.
(It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDJ2-Z series: CDJ2, CDJ2W, CDJ2K, CDJ2Z, CDJ2ZW, CDJ2RA, CDJ2RK)

Type	Series	Action	Bore size [mm]
Standard	CJ2-Z	Double acting, Single rod	6, 10, 16
Standard	CJ2-Z	Single acting (Spring return/extend)	6, 10, 16
Standard	CJ2W-Z	Double acting, Double rod	6, 10, 16
Non-rotating rod	CJ2K-Z	Double acting, Single rod	10, 16
Non-rotating rod	CJ2K-Z	Single acting (Spring return/extend)	10, 16
Built-in speed controller	CJ2Z-Z	Double acting, Single rod	10, 16
Built-in speed controller	CJ2ZW-Z	Double acting, Double rod	10, 16
Direct mount	CJ2RA-Z	Double acting, Single rod	10, 16
Direct mount	CJ2RA-Z	Single acting (Spring return/extend)	10, 16
Non-rotating rod/ Direct mount	CJ2RK-Z	Double acting, Single rod	10, 16
Non-rotating rod/ Direct mount	CJ2RK-Z	Single acting (Spring return/extend)	10, 16
With end lock	CBJ2	Double acting, Single rod	16

Air Cylinder JCM/JCDM



- Overall length shortened by up to 97 mm
- Weight reduced by up to 54% (0.69 kg \rightarrow 0.32 kg)
- Various cover types are available.
- Port sizes: M5, Rc, NPT1/8
- Male and female rod ends are available.
- With auto switch (JCDM series: JCDM)

Type	Series	Action	Bore size [mm]
Standard	JCM	Double acting, Single rod	20, 25, 32, 40

Air Cylinders

Standard Air Cylinders (Round Type)

Air Cylinder CM2/CDM2



- Female rod end is available as standard.
- Easy fine adjustment of auto switch position
- Single clevis and trunnion pivot brackets are available.
- Part numbers with a rod end bracket and/or pivot bracket are available.
(It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDM2-Z series: CDM2, CDM2W, CDM2K, CDM2KW, CDM2R, CDM2RK, CDM2□P, CDBM2)

Type	Series	Action	Bore size [mm]
Standard	CM2-Z	Double acting, Single rod	20, 25, 32, 40
Standard	CM2-Z	Single acting (Spring return/extend)	20, 25, 32, 40
Standard	CM2W-Z	Double acting, Double rod	20, 25, 32, 40
Non-rotating rod	CM2K-Z	Double acting, Single rod	20, 25, 32, 40
Non-rotating rod	CM2K-Z	Single acting (Spring return/extend)	20, 25, 32, 40
Non-rotating rod	CM2KW-Z	Double acting, Double rod	20, 25, 32, 40
Direct mount	CM2R-Z	Double acting, Single rod	20, 25, 32, 40
Non-rotating rod/ Direct mount	CM2RK-Z	Double acting, Single rod	20, 25, 32, 40
Centralized piping	CM2□P	Double acting, Single rod	20, 25, 32, 40
With end lock	CBM2	Double acting, Single rod	20, 25, 32, 40
Low friction	CM2Q	Double acting, Single rod	20, 25, 32, 40

Air Cylinder CG1/CDG1



- Female rod end is available as standard.
- Easy fine adjustment of auto switch position
- No trunnion mounting female thread has been added to the basic type.
- Part numbers with a rod end bracket and/or pivot bracket are available.
(It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDG1-Z series: CDG1, CDG1W, CDG1K, CDG1KW, CDG1R, CDG1KR, CDBG1)

Type	Series	Action	Bore size [mm]
Standard	CG1-Z	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100
Standard	CG1-Z	Single acting (Spring return/extend)	20, 25, 32, 40
Standard	CG1W-Z	Double acting, Double rod	20, 25, 32, 40, 50, 63, 80, 100
Non-rotating rod	CG1K-Z	Double acting, Single rod	20, 25, 32, 40, 50, 63
Non-rotating rod	CG1KW-Z	Double acting, Double rod	20, 25, 32, 40, 50, 63
Direct mount	CG1R-Z	Double acting, Single rod	20, 25, 32, 40, 50, 63
Direct mount, Non-rotating rod	CG1KR-Z	Double acting, Single rod	20, 25, 32, 40, 50, 63
With end lock	CBG1	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100
Low friction	CG1□G	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100

Standard Air Cylinders (Square Cover)

Air Cylinder JMB/JMDB



- Intermediary bore sizes: ø45, ø56, ø67, ø85
Air saving, Space saving
- Overall length shortened by 27 mm
- Weight reduced by up to 30% (1.43 kg → 1.00 kg)
- Air saving: Reduced by up to 29%
Air consumption can be reduced by optimal size selection.
- Reduces labor time
Air cushion adjustment is not required due to the non-adjustable air cushion.
- With auto switch (JMDB series: JMDB)

Type	Series	Action	Bore size [mm]
Standard	JMDB	Double acting, Single rod	32, 40, 45, 50, 56, 63, 67, 80, 85, 100

Air Cylinders

Standard Air Cylinders (Square Cover)

Air Cylinder MB/MDB



- Weight has been reduced by changing the shape of the rod cover and head cover. Max. 10% lighter
- Part numbers with a rod end bracket and/or pivot bracket are available.
(It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (MDB-Z series: MDB, MDBW, MDBK, MDBKW, MDBB, MDB□Q)

Type	Series	Action	Bore size [mm]
Standard	MB-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100, 125
Standard	MBW-Z	Double acting, Double rod	32, 40, 50, 63, 80, 100, 125
Non-rotating rod	MBK-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100
Non-rotating rod	MBKW-Z	Double acting, Double rod	32, 40, 50, 63, 80, 100
With end lock	MBB	Double acting, Single rod	32, 40, 50, 63, 80, 100
Low friction	MB□Q	Double acting, Single rod	32, 40, 50, 63, 80, 100

Air Cylinder MB1/MDB1



- Weight: 10% lighter (ø50-100 stroke)
Weight has been reduced by changing the shape of the rod cover and head cover.
- Small auto switches can be mounted on 4 surfaces.
- Fastener on auto switch mounting groove for dust-prevention (Option)
- With auto switch (MDB1 series: MDB1, MDB1W, MDB1K)

Type	Series	Action	Bore size [mm]
Standard	MB1-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100, 125
Standard	MB1W-Z	Double acting, Double rod	32, 40, 50, 63, 80, 100, 125
Non-rotating rod	MB1K-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100

Air Cylinder CA2/CDA2



- Weight reduced by up to 15%
- Easy air cushion control
- Various switches, such as compact auto switches and magnetic field resistant auto switches, can be mounted.
- Part numbers with a rod end bracket and/or pivot bracket are available.
(It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDA2 series: CDA2, CDA2W, CDA2K, CDA2KW, CDBA2, CDA2□H, CDA2W□H, CDA2□Q)

Type	Series	Action	Bore size [mm]
Standard	CA2-Z	Double acting, Single rod	40, 50, 63, 80, 100
Standard	CA2W-Z	Double acting, Double rod	40, 50, 63, 80, 100
Non-rotating rod	CA2K	Double acting, Single rod	40, 50, 63
Non-rotating rod	CA2KW	Double acting, Double rod	40, 50, 63
With end lock	CBA2	Double acting, Single rod	40, 50, 63, 80, 100
Air-hydro	CA2□H	Double acting, Single rod	40, 50, 63, 80, 100
Air-hydro	CA2W□H	Double acting, Double rod	40, 50, 63, 80, 100
Low friction	CA2□Q	Double acting, Single rod	40, 50, 63, 80, 100

Air Cylinder CS1/CDS1



- Large bore air cylinder with square cover, tie-rod type
- With auto switch (CDS1 series: CDS1, CDS1W, CDS1□Q)

* The air-hydro type is only available in ø125, ø140, and ø160.

Type	Series	Action	Bore size [mm]
Standard	CS1	Double acting, Single rod	125, 140, 160, 180, 200, 250, 300
Standard	CS1W	Double acting, Double rod	125, 140, 160, 180, 200, 250, 300
Low friction	CS1□Q	Double acting, Single rod	125, 140, 160

Air Cylinders

Standard Air Cylinders (Square Cover)

Air Cylinder **CS2/CDS2**



- Weight has been reduced by a maximum of 58% compared to the CS1 series.
- With auto switch (CDS2 series: CDS2)

Type	Series	Action	Bore size [mm]
Standard	CS2	Double acting, Single rod	125, 140, 160
Standard	CS2W	Double acting, Double rod	125, 140, 160

Compact Air Cylinders

Mini Free Mount Cylinder **CUJ/CDUJ**



- Space saving: Total length reduced by 64% and capacity by 70% (Compared to the CU series)
- With auto switch (CDUJ series: CDUJ)

Type	Series	Action	Bore size [mm]
Standard	CUJ	Double acting, Single rod	4, 6, 8, 10, 12, 16, 20
Standard	CUJ	Single acting (Spring return)	4, 6, 8, 10, 12, 16, 20

Free Mount Cylinder **CU/CDU**



- Space-saving cylinder that enables the direct mounting of cylinders on multiple sides
- With auto switch (CDU series: CDU, CDUW, CDUK, CDUKW, CDU-A, ZCDUK)

Type	Series	Action	Bore size [mm]
Standard	CU	Double acting, Single rod	6, 10, 16, 20, 25, 32
Standard	CU	Single acting (Spring return/extend)	6, 10, 16, 20, 25, 32
Standard	CUW	Double acting, Double rod	6, 10, 16, 20, 25, 32
Non-rotating rod	CUK	Double acting, Single rod	6, 10, 16, 20, 25, 32
Non-rotating rod	CUK	Single acting (Spring return/extend)	6, 10, 16, 20, 25, 32
Non-rotating rod	CUKW	Double acting, Double rod	6, 10, 16, 20, 25, 32
Long stroke/Standard	CU	Double acting, Single rod	6, 10, 16, 20, 25, 32
Long stroke/ Non-rotating rod	CUK	Double acting, Single rod	6, 10, 16, 20, 25, 32
With air cushion	CU-A	Double acting, Single rod	20, 25, 32
For vacuum	ZCUK	Double acting, Single rod	10, 16, 20, 25, 32

Compact Cylinder/Compact Type **CQS/CDQS**



- With this compact square type cylinder, auto switch mounting on 3 or 4 sides is possible.
This compact cylinder does not protrude from the body when mounting an auto switch.
- Newly added compact type foot brackets and double clevis pivot bracket
- With auto switch (CDQS series: CDQS, CDQSW, CDQSK, CDQSKW, CDQS□S)

Type	Series	Action	Bore size [mm]
Standard	CQS	Double acting, Single rod	12, 16, 20, 25
Standard	CQS	Single acting (Spring return/extend)	12, 16, 20, 25
Standard	CQSW	Double acting, Double rod	12, 16, 20, 25
Non-rotating rod	CQSK	Double acting, Single rod	12, 16, 20, 25
Non-rotating rod	CQSKW	Double acting, Double rod	12, 16, 20, 25
Anti-lateral load	CQS□S	Double acting, Single rod	12, 16, 20, 25

Air Cylinders

Compact Air Cylinders

Compact Cylinder **JCQ/JCDQ**



- Compact: Overall length shortened by 6.5 mm, Width shortened by 6 mm, Height shortened by 4 mm
- Weight reduced by up to 45% (150 g → 82 g)
- Volume reduced by up to 40%
- With auto switch (JCDQ series: JCDQ)

Type	Series	Action	Bore size [mm]
Standard	JCQ	Double acting, Single rod	12, 16, 20, 25, 32, 40, 50, 63, 80, 100

Compact Cylinder **CQ2/CDQ2**



- Space-saving cylinder designed with a compact body
- Small auto switches can be mounted on 4 surfaces. (2 surfaces for $\phi 12$ to $\phi 25$)
- No projection of the auto switch
- Weight: Reduced by 5 to 13% (Compared with the existing CQ2 series)
- Newly added compact type foot brackets and double clevis pivot bracket
- Part numbers with a rod end bracket and/or mounting bolt are available. (It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDQ2 series: CDQ2, CDQ2W, CDQ2K, CDQ2KW, CDQP2, CDQ2□S, CDBQ2)

Type	Series	Action	Bore size [mm]
Standard	CQ2-Z	Double acting, Single rod	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Standard	CQ2W-Z	Double acting, Double rod	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Standard	CQ2-Z	Single acting (Spring return/extend)	12, 16, 20, 25, 32, 40, 50
Large bore size	CQ2-Z	Double acting, Single rod	125, 140, 160, 180, 200
Large bore size	CQ2W-Z	Double acting, Double rod	125, 140, 160, 180, 200
Long stroke	CQ2-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100
Non-rotating rod	CQ2K-Z	Double acting, Single rod	12, 16, 20, 25, 32, 40, 50, 63
Non-rotating rod	CQ2KW-Z	Double acting, Double rod	12, 16, 20, 25, 32, 40, 50, 63
Axial piping (Centralized piping type)	CQP2	Double acting, Single rod	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Axial piping (Centralized piping type)	CQP2	Single acting (Spring return/extend)	12, 16, 20, 25, 32, 40, 50
Anti-lateral load	CQ2□S-Z	Double acting, Single rod	32, 40, 50, 63, 80, 100
With end lock	CBQ2	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100

Environment Resistant Cylinders

Stainless Steel Cylinder **CJ5-S/CDJ5-S/CG5-S/CDG5-S**



- Applicable for use in an environment with water splashing
- With auto switch (CDJ5-S series: CDJ5-S, CDG5-S series: CDG5-S)

Type	Series	Action	Bore size [mm]
Standard	CJ5-S	Double acting	10, 16
Standard	CG5-S	Double acting	20, 25, 32, 40, 50, 63, 80, 100

Stainless Steel Foot Bracket, Flange Bracket, Single Knuckle Joint, Double Knuckle Joint **CJ2, CM2, CG1, CQ2**



- External dimensions and mounting dimensions are interchangeable with the standard type.
- Post-mounting is possible.
- Bracket applicable cylinders
CJ2, CM2, CG1, CQ2

Air Cylinders

Environment Resistant Cylinders

Stainless Steel: Made to Order

- Parts changed to stainless steel

Model	Description
-XB12	External stainless steel cylinder
-XC6	Made of stainless steel
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC65	Made of stainless steel (Combination of XC7 and XC68)
-XC68	Made of stainless steel (With hard chrome plated piston rod)

Hygienic Design Cylinder HY□/HYD□



- Improved water resistant air cylinder with an easily washable configuration
- 5 times the lifespan of the improved water resistant cylinder (SMC comparison)
- With auto switch (HYDB series: HYDB, HYDQB series: HYDQB, HYDC series: HYDC, HYDG series: HYDG)

Type	Series	Action	Bore size [mm]
Basic	HYB	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Basic	HYQ	Double acting	20, 25, 32, 40, 50, 63
ISO Standard	HYC	Double acting	32, 40, 50, 63
With guide	HYG	Double acting	20, 25, 32, 40, 50, 63

Water Resistant Cylinder (Pneumatic/Hydraulic)



- Can be used in environments where contact with water or coolant occurs
- With water resistant 2-color indicator auto switch
- Suitable for factory machinery, food manufacturing machinery, car washers, etc.

Type	Series	Action	Bore size [mm]
Air cylinder	CM2-Z	Double acting	20, 25, 32, 40
Air cylinder	CG1-Z	Double acting	32, 40, 50, 63, 80, 100
Air cylinder	MB-Z	Double acting	32, 40, 50, 63, 80, 100
Square tube type air cylinder	MB1	Double acting	32, 40, 50, 63, 80, 100
Compact cylinder	CQ2-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Air cylinder	CA2-Z	Double acting	40, 50, 63, 80, 100
Compact guide cylinder	MGP-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Guide cylinder	MGG	Double acting	32, 40, 50, 63, 80, 100
Compact hydraulic cylinder compliant with JIS Standards (10 MPa)	CHKDB	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Hydraulic cylinder compliant with JIS Standards (7 MPa)	CH2F	Double acting	32, 40, 50, 63, 80, 100

Cylinder with Stable Lubrication Function (Lube-retainer)



- Applicable to operation in micro-powder (10 to 100 μm) / general environments
- Durability is 4 times stronger than the standard model in micro-powder environments.
- The overall length and mounting are the same as those of the standard model. (Except for some models)
- Grease film is formed on the piston rod surface to improve durability.
- Prevents the entry of dust and foreign matter
- The number of operating cycles can be improved even in general environments.

Type	Series	Action	Bore size [mm]
Air cylinder	CM2-Z	Double acting	20, 25, 32, 40
Air cylinder	CG1-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Air cylinder	CA2-Z	Double acting	40, 50, 63, 80, 100
Compact cylinder	CQS	Double acting	20, 25
Compact cylinder	CQ2-Z	Double acting	32, 40, 50, 63, 80, 100
Air slide table	MXQ□A	Double acting	6, 8, 12, 16, 20, 25
Compact guide cylinder	MGP-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Dual rod cylinder	CXS	Double acting	6, 8, 12, 16, 20, 25, 32

Air Cylinders

Environment Resistant Cylinders

Dust Resistant Cylinder



- Applicable for environments with flying micro-powder such as ceramic powder, toner powder, paper powder, and metallic powder (Excludes weld spatter)
- 4 times stronger than the standard model
- 2 Lube-retainers on the rod cover prevent micro-powder of 30 μm or smaller from entering.
- The Lube-retainers create a coat of grease on the piston rod for improved durability.

Type	Series	Action	Bore size [mm]
Air cylinder	CM2-XC92	Double acting	20, 25, 32, 40
Compact cylinder	CQS-XC92	Double acting	12, 16, 20, 25
Compact cylinder	CQ2-XC92	Double acting	32, 40, 50, 63, 80, 100
Compact guide cylinder	MGP-XC92	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100

Measures Against Dust: Made to Order -XC4

- Cylinders with a heavy duty scraper on the wiper ring are suitable for use in extremely dusty environments and those where they will be exposed to earth or sand, such as in die-casted equipment, construction machinery, and industrial vehicles.

Model	Description
-XC4	With heavy duty scraper
-XC35	With coil scraper

Heat Resistant/Cold Resistant: Made to Order -XB6, XB7

- Air cylinder for use in low-temperature and high-temperature environments

Model	Description
-XB6	Heat resistant cylinder (-10 to 150°C)
-XB7	Heat resistant cylinder (-40 to 70°C)
-XB14	Cylinder with heat resistant auto switch
-XC5	Heat resistant cylinder (-10 to 110°C)

Floating Joints

Floating Joint J



- The floating joint can absorb any off-centering or loss of parallel accuracy of the double acting cylinder, making centering unnecessary.

Type	Series	Applicable cylinder bore size [mm]
Lightweight and compact type	JT	20, 25, 32, 40
Light weight type for light load	JC	20, 25, 32, 40, 50, 63
Standard	JA, JAF, JAL	6, 10, 15, 20, 25, 30, 40, 50, 63, 80, 100, 125, 140, 160
Standard	JA-X530, JAF-X530, JAL-X530	180, 200
Heavy load	JAH, JAHF, JAHL	40, 50, 63, 80, 100
For compact cylinders	JB	12, 16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 140, 160
Stainless steel type	JS	10, 15, 16, 20, 25, 32, 40, 50, 63

Mechanically Jointed Rodless Cylinders

Mechanically Jointed Rodless Cylinder with Protective Cover MY1□W



- Improves dustproof and water resistance with a protective cover, Features a side seal that prevents dust and water from entering from the side

Type	Series	Action	Bore size [mm]
Slide bearing	MY1MW	Double acting	16, 20, 25, 32, 40, 50, 63
Cam follower guide	MY1CW	Double acting	16, 20, 25, 32, 40, 50, 63

Magnetically Coupled Rodless Cylinders

Magnetically Coupled Rodless Cylinder **CY3**



- Further improvements have been made on the CY1 series.
- The mounting dimensions are the same as those of the CY1 series.
Upgraded bearing performance and reduced sliding resistance
- NPT thread and G thread are available as standard.

Type	Series	Action	Bore size [mm]
Basic	CY3B	Double acting	6, 10, 15, 20, 25, 32, 40, 50, 63
Direct mount	CY3R	Double acting	6, 10, 15, 20, 25, 32, 40, 50, 63

Clean Rodless Cylinder **CYP**

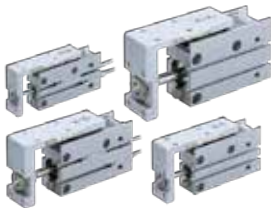


- Low particle generation transfer in clean environments

Type	Series	Action	Bore size [mm]
Standard	CYP	Double acting	15, 32

Table Cylinders

Compact Slide **MXH**



- Allowable moment improved by up to 240%
- With new high rigidity linear guide
Allowable moment improved
- The weight has been reduced by incorporating a new high rigidity linear guide and piston.
Weight: 19% reduction (ø20-10 stroke)
- Piping is possible in 3 directions.

Type	Series	Action	Bore size [mm]
Standard	MXH	Double acting	6, 10, 16, 20

Compact Cylinder with Linear Guide **MXZ**



- Compact: Overall length: 49.5 mm, Width: 30 mm
- The integration of the linear guide and the cylinder allows for reduced design and assembly time.
- Lightweight workpieces such as electronic boards can be stopped, positioned, and clamped.
- Port location selectable
- Auto switch mountable on 3 surfaces

Type	Series	Action	Bore size [mm]
Standard	MXZ	Double acting	12, 16, 20, 25

Air Slide Table **MXS**



- Integrated with a worktable in a compact manner
- An air slide table that is ideal for precision assembly work
- High rigidity and high accuracy
- Smooth movement without looseness has been achieved through the adoption of a cross roller guide.
- Compact and lightweight
- Provides twice the output of the existing cylinder through the adoption of the dual rod function

Type	Series	Action	Bore size [mm]
Standard	MXS	Double acting	6, 8, 12, 16, 20, 25
Symmetric	MXS□L	Double acting	6, 8, 12, 16, 20, 25

Air Cylinders

Table Cylinders

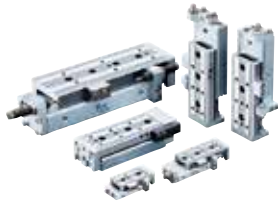
Air Slide Table MXQ□



- Height: 10% reduction (27 mm: Existing model 30 mm)
- Product weight: 22% reduction (298 g: Existing model 380 g)
- Allowable kinetic energy: 64% improvement (0.09 J: Existing model 0.055 J)

Type	Series	Action	Bore size [mm]
Double ported type	MXQ□A	Double acting	6, 8, 12, 16, 20, 25
Low thrust with high rigidity type	MXQ□B	Double acting	6, 8, 12, 16, 20
Single side ported type	MXQ□C	Double acting	8, 12
Height interchangeable type	MXQ	Double acting	6, 8, 12, 16, 20, 25

Air Slide Table MXQ



- Integrated guide rail and table
- High rigidity and high accuracy has been achieved through the adoption of the recirculating linear guide.

Type	Series	Action	Bore size [mm]
Standard	MXQ	Double acting	6, 8, 12, 16, 20, 25
Symmetric	MXQ□L	Double acting	6, 8, 12, 16, 20, 25

Air Slide Table/Reversible Type MXQR



- Integrated guide rail and table
- High rigidity and high accuracy has been achieved through the adoption of the recirculating linear guide.
- Position of the piping and adjusters can be changed on site according to the installation conditions.
- Features installation compatibility with the MXQ series
- Shock absorber also available for ø6
- Soft type/short stroke type shock absorbers (RJ) can be mounted.

Type	Series	Action	Bore size [mm]
Reversible	MXQR	Double acting	6, 8, 12, 16, 20, 25

Low Profile Slide Table MXF



- The parallel design of the guide and cylinder creates a slim and compact slide.

Type	Series	Action	Bore size [mm]
Standard	MXF	Double acting	8, 12, 16, 20

Air Slide Table MXW



- This table unit is compatible with a long stroke using a linear guide.
- Table rigidity is constant throughout the entire stroke.

Type	Series	Action	Bore size [mm]
Standard	MXW	Double acting	8, 12, 16, 20, 25

Air Cylinders

Table Cylinders

Air Slide Table **MPX**



- Cylinder with built-in linear guide, Compact air slide table

Type	Series	Action	Bore size [mm]
Standard	MPXJ	Double acting	6
Standard	MPX	Double acting	6, 8, 10, 12, 16

Air Slide Table/Long Stroke Type **MXY**



- High rigidity and high accuracy, Maximum of 400 strokes

Type	Series	Action	Bore size [mm]
Standard	MXY	Double acting	6, 10, 12

Guide Cylinders (MG Series)

Compact Guide Cylinder **JMGP**



- Compact: Overall length shortened by 30.5 mm, Height shortened by 16 mm
- Weight: Max. 69% lighter (0.32 kg → 0.1 kg)
- 3 mounting options: Top mounting, Bottom mounting, Rear mounting
- Piping is possible in 4 directions.
- The solid state auto switch D-M9□ is mountable.
- Suitable for pushing, lifting, or clamping in a transport line.

Type	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing	JMGPM	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100

Compact Guide Cylinder **MGP**



- Weight reduced by up to 24% with a shorter guide rod and thinner plate.
- The space required between the bottom of the cylinder body and your equipment is reduced because of the shortening of the guide rod by a max. of 22 mm.
- Round type and magnetic field resistant auto switches can be mounted directly without a spacer.
- With flange: MGP□F

Type	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing	MGPM-Z	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Basic type	Ball bushing	MGPL-Z	Double acting	
Basic type	High-precision ball bushing	MGPA-Z	Double acting	
With air cushion	Slide bearing	MGPM-AZ	Double acting	16, 20, 25, 32, 40, 50, 63, 80, 100
	Ball bushing	MGPL-AZ	Double acting	
Water resistant	High-precision ball bushing	MGPA-AZ	Double acting	20, 25, 32, 40, 50, 63, 80, 100
	Slide bearing	MGPMR-Z	Double acting	
With end lock	Slide bearing/ Ball bushing bearing	MGP	Double acting	20, 25, 32, 40, 50, 63, 80, 100
	Slide bearing	MGPS	Double acting	

Air Cylinders

Guide Cylinders (MG Series)

Compact Guide Cylinder **MGQ**



- Air cylinder with an integrated guide that achieves lateral load resistance and high non-rotating accuracy
- Suitable for stoppers and lifters in the conveyor line

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing	MGQM	Double acting	12, 16, 20, 25, 32,
Standard	Ball bushing bearing	MGQL	Double acting	40, 50, 63, 80, 100

Guide Cylinder **MGG**



- Basic cylinder with integrated guide rods in a compact configuration
- A linear transfer unit that achieves lateral load resistance and high non-rotating accuracy

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing/	MGG	Double acting	20, 25, 32, 40, 50, 63, 80, 100
With end lock	Ball bushing bearing	MGG	Double acting	

Guide Cylinder/Compact Type **MGC**



- Linear transfer unit with compact guide body and front plate
- Compact, lightweight, and space saving

Type	Series	Action	Bore size [mm]
Standard	MGC	Double acting	20, 25, 32, 40, 50

Guide Cylinders (CX Series)

Dual Rod Cylinder **CXSJ**



- Features a more compact body compared to the CXS series dual rod cylinder
- Auto switches can be confirmed from 4 directions.
- Axial piping is also available. (Bore size: 6 and 10)

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing	CXSJM	Double acting	6, 10, 15, 20, 25, 32
Standard	Ball bushing bearing	CXSJL	Double acting	6, 10, 15, 20, 25, 32

Dual Rod Cylinder **CXS**



- Compact cylinder with a high-precision guide function for pick & place applications

Type	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing/ Ball bushing bearing	CXS	Double acting	6, 10, 15, 20, 25, 32
With air cushion		CXS	Double acting	20, 25, 32
With end lock		CXS	Double acting	6, 10, 15, 20, 25, 32
Double rod type		CXSW	Double acting	6, 10, 15, 20, 25, 32

Air Cylinders

Lock Cylinders

Cylinder with Lock **CNG/CDNG**



- Locking cylinder ideal for intermediate stops, emergency stops, and drop prevention (Bi-directional lock)
- With auto switch (CDNG series: CDNG)

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	CNG	Double acting, Single rod	20, 25, 32, 40	Spring lock

Cylinder with Lock **CNA2/CDNA2**



- Locking cylinder ideal for intermediate stops, emergency stops, and drop prevention (Bi-directional lock)
- Magnetic field resistant 2-color indicator solid state auto switch D-P3DW□ series mountable
- With auto switch (CDNA2 series: CDNA2, CDNA2W)

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	CNA2	Double acting, Single rod	40, 50, 63, 80, 100	Spring lock
Standard	CNA2W	Double acting, Double rod	40, 50, 63, 80, 100	Spring lock

Specialty Cylinders

Smooth Cylinder **CJ2Y/CM2Y/CG1Y/MBY/CA2Y/CS2Y/CQSY/CQ2Y**



- Reduces stick-slip in a low-speed range
- Stable operation is possible even at a low speed of 5 mm/s. (Measurement based on JIS B 8377)
- Low sliding is possible even in bi-directional operations.
- Lightweight/Improved functions (The new structure is equivalent to the standard models.)
- Interchangeable with the standard models
- With auto switch (CDJ2Y-Z series: CDJ2Y, CDM2Y-Z series: CDM2Y-Z, CDG1Y-Z series: CDG1Y, MDBY-Z series: MDBY, CDA2Y-Z series: CDA2Y, CDS2Y series: CDS2Y, CDQSY series: CDQSY, CDQ2Y-Z series: CDQ2Y)

Type	Series	Action	Bore size [mm]	Min. operating pressure [MPa]
Air cylinder	CJ2Y-Z	Double acting	10, 16	0.03
Air cylinder	CM2Y-Z	Double acting	20, 25, 32, 40	0.02
Air cylinder	CG1Y-Z	Double acting	20, 25, 32, 40	0.02
Air cylinder	CG1Y-Z	Double acting	50, 63, 80, 100	0.01
Air cylinder	MBY-Z	Double acting	32, 40	0.02
Air cylinder	MBY-Z	Double acting	50, 63, 80, 100	0.01
Air cylinder	CA2Y-Z	Double acting	40	0.02
Air cylinder	CA2Y-Z	Double acting	50, 63, 80, 100	0.01
Air cylinder	CS2Y	Double acting	125, 140, 160	0.005
Compact cylinder	CQSY	Double acting	12, 16	0.03
Compact cylinder	CQSY	Double acting	20, 25	0.02
Compact cylinder	CQ2Y-Z	Double acting	32, 40	0.02
Compact cylinder	CQ2Y-Z	Double acting	50, 63, 80, 100	0.01

Air Cylinders

Specialty Cylinders

Low Speed Cylinder **CJ2X/CM2X/CQSX/CQ2X/CUX**



- Reduces adhesion/quick extension
- Smooth operation is possible even at 0.5 mm/s. (1 mm/s for ø16 or smaller)
- The minimum operating pressure has been reduced by half. (Compared to the previous version)
- Improved functions (The new structure is equivalent to the standard models.)
- Interchangeable with the standard models
- With auto switch (CDJ2X-Z series: CDJ2X-Z, CDM2X-Z series: CDM2X, CDQSX series: CDQSX, CDQ2X series: CDQ2X, CDUX series: CDUX)

Type	Series	Action	Bore size [mm]	Min. piston speed [mm/s]
Air cylinder	CJ2X-Z	Double acting	10, 16	1
Air cylinder	CM2X-Z	Double acting	20, 25, 32, 40	0.5
Compact cylinder	CQSX	Double acting	12, 16	1
Compact cylinder	CQSX	Double acting	20, 25	0.5
Compact cylinder	CQ2X	Double acting	32, 40, 50, 63, 80, 100	0.5
Free mount cylinder	CUX	Double acting	10, 16	1
Free mount cylinder	CUX	Double acting	20, 25, 32	0.5

Low Friction Cylinder/Metal Seal **MQQ/MQM/MQP**



- Covers a range of driving speeds and output controls not possible with standard cylinders thanks to its metal seal structure with minimal sliding resistance

Type	Series	Bore size [mm]	Operating pressure range [MPa]	Driving speed [mm/s]
Standard	MQQT	10, 16, 20, 25, 30, 40	0.005 to 0.5	0.3 to 300
Anti-lateral load	MQQL	10, 16, 20, 25, 30, 40	0.005 to 0.7	0.5 to 500
Anti-lateral load	MQML	6	0.02 to 0.7	0.5 to 1000
Anti-lateral load	MQML	10, 16, 20, 25	0.005 to 0.7	0.5 to 1000
High speed/High frequency	MQML□□H	10, 16, 20, 25	0.01 to 0.7	5 to 3000
Single acting	MQP	4, 6, 10, 16, 20	0.001 to 0.7	—

High Power Cylinder **RHC**



- Provides 10 to 20 times the energy absorption capacity of general purpose cylinders (CG1 series)
- Smooth cushioning from high-speed operation (3000 mm/s) with light loads to low/medium-speed operation with heavy loads
- XC93: With greater water resistance + a stable lubrication function 5 times stronger against water (liquids) than the standard model (RHC series)

Type	Series	Action	Bore size [mm]
Standard	RHC	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Standard	RHC-XC93	Double acting	32, 40

Valve Mounted Air Cylinders

Valve Mounted Compact Cylinder **CVQ**



- Integrated valve and compact cylinder
- Saves manpower, space, and energy

Type	Series	Action	Bore size [mm]	Component: Cylinder	Component: Valve
Standard	CVQ	Double acting	32, 40, 50, 63	CQ2	SY3000

Air Cylinders/Rotary Actuators

Valve Mounted Air Cylinders

Valve Mounted Air Cylinder CV□/CDV□



- Valve is mounted on a round cylinder.
- Built-in speed controller for some models
- A cylinder with a valve makes it easy to adjust the speed.
- With auto switch (CDVJ series: CDVJ5, CDVJ3, CDVM series: CDVM5, CDVM5K, CDVM3, CDVM3K, CDV3 series: CDV3, CDV3K, CDVS1 series: CDVS1, CDVS1K)

Type	Series	Action	Bore size [mm]	Component: Cylinder	Component: Valve
Standard	CVJ5	Double acting	10, 16	CJ2	SYJ3190
Standard	CVJ3	Single acting (Spring return/extend)	10, 16	CJ2	SYJ319
Standard	CVM5	Double acting	20, 25, 32, 40	CM2	VZ3□90
Standard	CVM3	Single acting (Spring return/extend)	20, 25, 32, 40	CM2	VZ319
Standard	CV3	Double acting	40, 50, 63, 80, 100	CA2-Z	V3□08
Standard	CVS1	Double acting	40, 50, 63, 80, 100	CA2-Z	VS4□24
Non-rotating rod	CVM5K	Double acting	20, 25, 32, 40	CM2K	VZ3□90
Non-rotating rod	CVM3K	Single acting (Spring return/extend)	20, 25, 32, 40	CM2K	VZ319
Non-rotating rod	CV3K	Double acting	40, 50, 63	CA1K	V3□08
Non-rotating rod	CVS1K	Double acting	40, 50, 63	CA1K	VS4□24

ISO Cylinders

Hygienic Design Cylinder/ISO Standard Type HYC



- Compliant with ISO Standards (VDMA)
- Easily washable configuration, Improved water resistant air cylinder
- 5 times the lifespan of the improved water resistant cylinder (SMC comparison)
- With auto switch (HYDC series: HYDC)

Type	Series	Action	Bore size [mm]
ISO Standard type	HYC	Double acting	32, 40, 50, 63

Rotary Actuators/Vane Type

Rotary Actuator CRB2/CDRB2



- It is possible to move the auto switch mounting position as desired.
- Direct mounting
- Connection port position: Select from side ported or axial ported (When a switch and angle adjuster are installed, only the side ported is selectable.)
- Low-pressure operation: 0.2 MPa (Size 10), 0.15 MPa (Sizes 15 to 40)
- It is possible to adjust the angle as desired.
- With auto switch (CDRB2 series: CDRB2□W, CDRB2□WU)

Type	Series	Vane type	Size	Rotating angle Single	Rotating angle Double
Standard	CRB2	Single	10, 15, 20,	90°, 180°, 270°	90°, 100°
With angle adjuster	CRB2□WU	Double	30, 40	90°, 180°, 270°	90°, 100°

Rotary Actuators

Rotary Actuators/Rack & Pinion Type

Mini Rotary Actuator CRJ



- Compact, lightweight
- Flexible mounting: Top, bottom, or side mounting is possible.
- Front or side ported is selectable.

Series	Rack type	Size	Rotating angle Basic type	Rotating angle With external stopper
CRJ	Single	05, 1	90°, 100°, 180°, 190°	90°, 180°

Rotary Actuator CRA1/CDRA1



- Compact auto switches (D-M9□ type) are mountable on 2 surfaces. Auto switch can be mounted from the front.
- Weight reduced by up to 14%
- With air cushion, Easy adjustment of cushion valve
- With auto switch (CRA1 series: CDRA1, CDRA1□□U, CDVRA1)

Type	Series	Rack type	Size	Rotating angle
Standard	CRA1	Single	30, 50, 63, 80, 100	30: 90°, 180° 50 to 100: 90°, 100°, 180°, 190°
Angle adjustable	CRA1□□U	Single	50, 63, 80, 100	90°, 100°, 180°, 190°
With solenoid valve	CVRA1	Single	50, 63, 80, 100	90°, 100°, 180°, 190°

Compact Rotary Actuator CRQ2/CDRQ2



- With cushion
- Equipped with an angle adjustment mechanism
- Single or double axis is selectable.
- With auto switch (CDRQ2 series: CDRQ2)

Series	Rack type	Size	Rotating angle
CRQ2	Double	10, 15, 20, 30, 40	90°, 180°, 360°

Rotary Table MSQ



- Integrated table and rotary actuator
- Equipped with an angle adjustment mechanism
- Easy alignment when mounting the load and the body
- Built-in shock absorber type and external absorber type are selectable.

Type	Series	Rack type	Size	Rotating angle
High precision type	MSQA	Double	1, 2, 3, 7, 10, 20, 30, 50	0 to 190°
Basic type	MSQB	Double	1, 2, 3, 7, 10, 20, 30, 50, 70, 100, 200	0 to 190°
With external absorber	MSQ□□L	Double	10, 20, 30, 50	90°, 180°
With external absorber	MSQ□□H	Double	10, 20, 30, 50	90°, 180°

Low Speed Rotary Actuator CRQ2X/CDRQ2X/MSQX



- It is possible to transfer workpieces at lower speeds. (5 s/90°)
- With auto switch (CDRQ2X series: CDRQ2X)

Series	Rack type	Size	Rotating angle
CRQ2X	Double	10, 15, 20, 30, 40	80° to 100°, 170° to 190°
MSQX	Double	10, 20, 30, 50	0° to 190°

Air Grippers

Parallel Type Air Grippers

Linear Guide Parallel Type Air Gripper **MHZ□2**



- The linear guide improves rigidity and accuracy.
- Dustproof and drip proof construction
- Dust cover material is selectable.

Type	Series	Cylinder bore size [mm]
Compact	MHZA2-6	6
Compact, with dust cover	MHZAJ2-6	6
Standard	MHZ2	6, 10, 16, 20, 25, 32, 40
Long stroke	MHZL2	10, 16, 20, 25
Long stroke, with dust cover	MHZL2	10, 16, 20
With dust cover	MHZJ2	6, 10, 16, 20, 25, 32, 40

Low Profile Air Gripper **MHF2**



- Reduced height of approx. 1/3 of that of the standard gripper
- Low profile design that reduces moment generation
- Short, middle, and long strokes are available.
- Compact, but the double piston mechanism provides it with a strong gripping force.

Series	Cylinder bore size [mm]
MHF2	8, 12, 16, 20

Wide Type Parallel Style Air Gripper **MHL2**



- Lightweight: Max. 10% lighter: 585 g → 525 g
Weight reduced by changing the body shape and internal construction
- Built-in dust protection mechanism (Standard)
Dust-resistant option (Made to order: -X85, -X86□)
- Long stroke: One unit can handle workpieces of various diameters.
- A large amount of gripping force is provided, through the use of a double piston mechanism, while maintaining a compact design.
- Small auto switches can be directly mounted.

Series	Bore size [mm]
MHL2-Z	10, 16, 20, 25

Wide Type Air Gripper **MHL2**



- Long strokes
- Ideal for holding large-size workpieces that have dimensional variances
- The double pistons provide a large amount of gripping force.
- Built-in dust protection mechanism

Series	Cylinder bore size [mm]
MHL2	10, 16, 20, 25, 32, 40

Wedge Cam Operation Slide Guide Air Gripper **MHK2**



- Wedge shaped cam driving mechanism
- High rigidity with a slide type guide
- A dustproof, drip proof, external force resistant, and environmental resistant type that can be used for a variety of applications
- To suit the environment, a selection of dust cover materials (chloroprene rubber, fluororubber, silicone rubber) and stainless steel (SUS304) fingers are available.
- Long stroke option is selectable.

Series	Cylinder bore size [mm]
MHK2	12, 16, 20, 25
MHKL2	12, 16, 20, 25

Air Grippers

Parallel Type Air Grippers

Slide Guide Round Body Air Gripper 2-Finger Type **MHS2**



- Vertically compact and lightweight due to the wedge shaped cam construction
- Ideal for operations in which external force is applied, such as press fitting operations
- Repeatability: ± 0.01 mm

Series	Cylinder bore size [mm]
MHS2	16, 20, 25, 32, 40, 50, 63

Slide Guide Round Body Air Gripper 3-Finger Type **MHS3**



- Vertically compact and lightweight due to the wedge shaped cam construction
- Ideal for operations in which external force is applied, such as press fitting operations
- Repeatability: ± 0.01 mm
- Long stroke type: Strokes 2 times longer than the standard type
- Gripping of cylindrical workpieces
- Reliable removal of the workpiece with through-holes and a center pusher

Type	Series	Cylinder bore size [mm]
Double acting	MHS3	16, 20, 25, 32, 40, 50, 63, 80, 100, 125
Single acting	MHS3-X84	16, 20, 25, 32, 40, 50, 63
With dust cover	MHSJ3	16, 20, 25, 32, 40, 50, 63, 80
Through-hole	MHSH3	16, 20, 25, 32, 40, 50, 63, 80
With dust cover + Through-hole	MHSHJ	16, 20, 25, 32, 40, 50, 63, 80
Long stroke	MHSL3	16, 20, 25, 32, 40, 50, 63, 80, 100, 125

Slide Guide Round Body Air Gripper 4-Finger Type **MHS4**



- Vertically compact due to its wedge shaped cam construction
- Optimally holds rectangular workpieces for positioning operations
- Repeatability: ± 0.01 mm
- Positioning of rectangular workpieces

Series	Cylinder bore size [mm]
MHS4	16, 20, 25, 32, 40, 50, 63

Environment Resistant: Made to Order

- Seal material and grease have been changed so that the product can be used at temperatures between -10 up to 100°C .
- Dustproof and dripproof (-X77, -X78)
- Anti-corrosive measures (-X81)

Model	Description
-X4	Heat resistant (-10 to 100°C)
-X77A, -X77B	Dust cover adhesion (Powerful adhesive used)
-X78A, -X78B	Dust cover caulking (Silicone caulking agent used)
-X81A, -X81B	Anti-corrosive treatment of finger

Angular Type Air Grippers

Angular Type Air Gripper/Compact Type **MHC2**



- MHC2-6: Auto switch mountable
- MHCA2-6: Short body
- MHCM2-7: Compact, lightweight

Series	Cylinder bore size [mm]
MHC2-6	6
MHCA2-6	6
MHCM2-7	7

Air Grippers

Angular Type Air Grippers

Angular Type Air Gripper/Standard Type **MHC2**



- A large holding moment is achieved through a double piston construction.
- Integral variable throttle

Series	Cylinder bore size [mm]
MHC2	10, 16, 20, 25

180° Angular Type Air Gripper/Cam Type **MHY2**



- Lightweight and compact through the use of a cam mechanism

Series	Cylinder bore size [mm]
MHY2	10, 16, 20, 25

180° Angular Type Air Gripper/Rack & Pinion Type **MHW2**



- Features a unique seal construction with a shortened overall length and dust proofing countermeasures that allow it to be used for removing workpieces from machine tools or for holding workpieces

Series	Cylinder bore size [mm]
MHW2	20, 25, 32, 40, 50

Environment Resistant: Made to Order

- Seal material and grease have been changed so that the product can be used at temperatures between -10 up to 100°C.
- Anti-corrosive measures (-X81)

Model	Description
-X4	Heat resistant (-10 to 100°C)
-X81A, -X81B	Anti-corrosive treatment of finger

Electric Actuators

Card Motor

Card Motor LAT3



- The transportation, pushing, and length measurement systems have been miniaturized through the use of a linear motor.
- Thickness 9 mm, Weight 130 g (At a stroke of 10 mm)
- Max. pushing force: 6 N
- Positioning repeatability: $\pm 5 \mu\text{m}$
- Pushing measurement accuracy: $\pm 10 \mu\text{m}$
- Max. operating frequency: 500 cpm

Model	Stroke [mm]	Sensor (Optical linear encoder) Resolution	Pushing Max. instantaneous thrust	Positioning repeatability	Pushing measurement accuracy	Max. speed
LAT3F	10, 20, 30, 50	1.25 μm	Up to 6 N	$\pm 5 \mu\text{m}$	$\pm 10 \mu\text{m}$	400 mm/s
LAT3M	50	5 μm	Up to 6 N	$\pm 20 \mu\text{m}$	$\pm 40 \mu\text{m}$	400 mm/s
LAT3	10, 20, 30	30 μm	Up to 6 N	$\pm 90 \mu\text{m}$	$\pm 100 \mu\text{m}$	400 mm/s

Card Motor Controller LATCA



- Easy programming (Cycle time entry)
Just input 3 parameters: Positioning time, Target position, Load mass

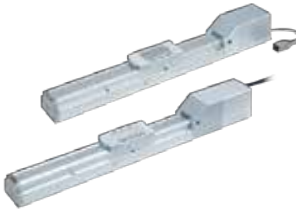
Type	Series	Power supply voltage	Parallel I/O	
			Input	Output
Step data input type/ Pulse input type	LATCA	24 VDC $\pm 10\%$	6 inputs (Optically isolated)	4 outputs (Optically isolated, open collector output)

Slider Type

Electric Actuator/Slider Type, Ball Screw Drive LEFS

Motorless Type

Clean Room Specification



LEFS Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

- Max. work load: 65 kg
- Positioning repeatability: $\pm 0.015 \text{ mm}$ (High precision type)
- Clean specification: Complies with ISO Class 4 (ISO14644-1) (11-LEFS)

LEFS Series AC Servo Motor

- High output motor (100/200/400 W)
- Improved high speed transfer ability
- High acceleration/deceleration (20,000 mm/s^2)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: $\pm 0.01 \text{ mm}$ (High precision type)
- Clean specification: Complies with ISO Class 4 (ISO14644-1) (11-LEFS)
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEFS16	50 to 500	Max. 15	Max. 700	5, 10
	LEFS25	50 to 800	Max. 30	Max. 1100	6, 12, 20
	LEFS32	50 to 1000	Max. 50	Max. 1200	8, 16, 24
	LEFS40	150 to 1200	Max. 65	Max. 1200	10, 20, 30
Servo motor (24 VDC)	LEFS16A	50 to 500	Max. 10	Max. 500	5, 10
	LEFS25A	50 to 800	Max. 18	Max. 800	6, 12, 20
AC servo motor (100/200/400 W)	LEFS25S	50 to 800	Max. 20	Max. 1500	6, 12, 20
	LEFS32S	50 to 1000	Max. 45	Max. 1500	8, 16, 24
	LEFS40S	150 to 1200	Max. 60	Max. 1500	10, 20, 30

Electric Actuators

Slider Type

Electric Actuator/Slider Type, Belt Drive **LEFB**

Motorless Type



LEFB Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

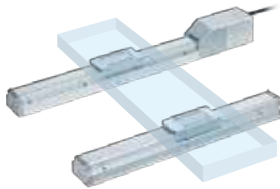
- Max. stroke: 2000 mm
- Max. speed: 2000 mm/s
- Positioning repeatability: ± 0.08 mm

LEFB Series AC Servo Motor

- Max. speed: 2000 mm/s
- Max. stroke: 3000 mm
- Max. acceleration/deceleration: 20000 mm/s²
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ± 0.06 mm
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Equivalent lead [mm]
Step motor (Servo/24 VDC)	LEFB16	300 to 1000	1	48 to 1100	48
	LEFB25	300 to 2000	10	48 to 1400	48
	LEFB32	300 to 2000	19	48 to 1500	48
Servo motor (24 VDC)	LEFB16A	300 to 1000	1	5 to 2000	48
	LEFB25A	300 to 2000	2	5 to 2000	48
AC servo motor	LEFB25S	300 to 2000	5	Max. 2000	54
	LEFB32S	300 to 2500	15	Max. 2000	54
	LEFB40S	300 to 3000	25	Max. 2000	54

Electric Actuator/LEF Series Support Guide **LEFG**



- A support guide that is designed to support workpieces with significant overhang
- Easy installation with the same outer dimensions as the LEF series body, Contributes to the reduction of design and assembly labor
- The standardly equipped sealing band prevents the scattering of grease and the entry of foreign matter from outside.

Drive method	Model	Stroke [mm]
Ball screw drive/S	LEFG16-S	50 to 500
Ball screw drive/S	LEFG25-S	50 to 800
Ball screw drive/S	LEFG32-S	50 to 1000
Ball screw drive/S	LEFG40-S	150 to 1200
Belt drive/BT	LEFG16-BT	300 to 1000
Belt drive/BT	LEFG25-BT	300 to 2000
Belt drive/BT	LEFG32-BT	300 to 2000
Belt drive/BS	LEFG25-BS	300 to 2000
Belt drive/BS	LEFG32-BS	300 to 2500
Belt drive/BS	LEFG40-BS	300 to 3000

Electric Actuator/High Rigidity Slider Type, Ball Screw Drive **LEJS**

Motorless Type

Clean Room Specification



- Low profile/Low center of gravity: Height reduced by approx. 36% (Reduced by 32 mm)
- Max. work load: 85 kg
- Positioning repeatability: ± 0.02 mm
- Max. acceleration/deceleration: 20000 mm/s²
- Clean specification: Complies with ISO Class 4 (Class 10) (11-LEJS)
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
AC servo motor	LEJS40	200 to 1200	Max. 55	Max. 1800	8, 16, 24
	LEJS63	300 to 1500	Max. 85	Max. 1800	10, 20, 30

Electric Actuators

Slider Type

Electric Actuator/High Rigidity Slider Type, Belt Drive **LEJB**



- Max. stroke: 3000 mm
- Max. speed: 3000 mm/s
- Max. acceleration/deceleration: 20000 mm/s²
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
AC servo motor	LEJB40	200 to 2000	Max. 20	Max. 2000	27
	LEJB63	300 to 3000	Max. 30	Max. 3000	42

Electric Actuator/Compact Slider Type **LEM**



- Low-profile, Low center of gravity
Table height: 28 mm
(In the case of LEMC/H/HT, size 25)
- Can be combined with various guides
- High maintainability
- Motor mounting position: Select from above or below, right or left
- Solid state auto switches can be mounted for limit confirmation and intermediate signal confirmation.
- Selectable controllability (Controller)
Complete control like an air cylinder (Allows for a 12 point intermediate stop)
Easy position setting by value input

Guide type	Model	Stroke [mm]	Work load [kg]	Speed [mm/s]	Equivalent lead [mm]
Basic	LEMB	50 to 2000	6, 11	Max. 1000	48
Cam follower guide	LEMC	50 to 2000	10, 20	Max. 1000	48
Linear guide (Single axis)	LEMH	50 to 1500	10, 20	Max. 2000	48
Linear guide (Double axis)	LEMHT	100 to 1500	10, 20	Max. 2000	48

Electric Actuator/Guide Rod Slider, Belt Drive **LEL**



- Low profile/Flat: Height 48 mm
- Profile reduced by the side mounting of the motor.
No interference with the motor, even with large workpieces.
- Auto switch mountable (Made to order)
- Max. stroke: 1000 mm
- Transfer speed: 1000 mm/s
- Positioning repeatability: ±0.1 mm

Specification	Model	Bearing	Stroke [mm]	Work load [kg]	Speed [mm/s]
Step motor (Servo/24 VDC)	LEL25M	Sliding bearing	100 to 1000	3	Max. 500
	LEL25L	Ball bushing bearing	100 to 1000	5	Max. 1000

Electric Actuators

Rod Type/Guide Rod Type

Electric Actuator/Rod Type, Motor Top/Parallel Type LEY

Motorless Type

Dust-tight/Water-jet-proof



LEY Series

Step Motor (Servo/24 VDC) Servo Motor (24 VDC)

- Long stroke: Max. 500 mm
- Direct mounting: 3 directions
Bracket mounting: 3 types
- Auto switch can be mounted.
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
- It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less
- Dust-tight/Water-jet-proof (IP65)

LEY Series

AC Servo Motor

- High output motor (100/200/400 W)
- Improved high speed transfer ability
- High acceleration compatible (5000 mm/s^2)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ± 0.02 mm or less
- Dust-tight/Water-jet-proof (IP65 equivalent)
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY16	30 to 300	Max. 141	Max. 500	2.5, 5, 10
	LEY25	30 to 400	Max. 452	Max. 500	3, 6, 12
	LEY32	30 to 500	Max. 707	Max. 500	4, 8, 16
	LEY40	30 to 500	Max. 1058	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEY16A	30 to 300	Max. 111	Max. 500	2.5, 5, 10
	LEY25A	30 to 400	Max. 130	Max. 500	3, 6, 12
AC servo motor	LEY25□S	30 to 400	Max. 485	Max. 900	3, 6, 12
	LEY32□S	30 to 500	Max. 588	Max. 1200	5, 10, 20
	LEY63□S	100 to 800	Max. 3343	Max. 1000	5 (2.86), 5, 10, 20

Electric Actuator/Rod Type, In-line Motor Type LEY□D

Motorless Type

Dust-tight/Water-jet-proof



LEY Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

- Long stroke: Max. 500 mm
- Direct mounting: 3 directions, Bracket mounting: 3 types
- Auto switch can be mounted.
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
- It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less

LEY Series AC Servo Motor

- High output motor (100/200/400 W)
- Improved high speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s^2)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ± 0.02 mm or less
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY16D	30 to 300	Max. 141	Max. 500	2.5, 5, 10
	LEY25D	30 to 300	Max. 141	Max. 500	2.5, 5, 10
	LEY32D	30 to 500	Max. 707	Max. 500	4, 8, 16
	LEY40D	30 to 500	Max. 1058	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEY16DA	50 to 300	Max. 111	Max. 500	2.5, 5, 10
	LEY25DA	50 to 400	Max. 130	Max. 500	3, 6, 12
AC servo motor	LEY25DS	30 to 400	Max. 485	Max. 900	3, 6, 12
	LEY32DS	30 to 500	Max. 736	Max. 1000	4, 8, 16
	LEY63DS	100 to 800	Max. 1910	Max. 1000	5, 10, 20

Electric Actuators

Rod Type/Guide Rod Type

Electric Actuator/Guide Rod Type, Motor Top Mounting Type **LEYG**

Motorless Type



LEYG Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

- Compact integration of guide rods
- Achieves lateral load resistance and high non-rotating accuracy
- Lateral end load: 5 times more (Compared with a rod type, size 25, 100 stroke)
- Compatible with sliding bearings and ball bushing bearings
- Compatible with moment load and stopper (sliding bearings)
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
- It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less

LEY Series AC Servo Motor

- High output motor (100/200 W)
- Improved high speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s²)
- Pulse input type
- With internal absolute encoder
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEYG16	30 to 200	Max. 141	Max. 500	2.5, 5, 10
	LEYG25	30 to 300	Max. 452	Max. 500	3, 6, 12
	LEYG32	30 to 300	Max. 707	Max. 500	4, 8, 16
	LEYG40	30 to 300	Max. 1058	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEYG16A	30 to 200	Max. 111	Max. 500	2.5, 5, 10
	LEYG25A	30 to 300	Max. 130	Max. 500	3, 6, 12
AC servo motor	LEYG25□S	30 to 300	Max. 485	Max. 900	3, 6, 12
	LEYG32□S	30 to 300	Max. 588	Max. 1200	5, 10, 20

Electric Actuator/Guide Rod Type, In-line Motor Type

LEYG□D

Motorless Type



LEYG Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

- Compact integration of guide rods
- Achieves lateral load resistance and high non-rotating accuracy
- Lateral end load: 5 times more (Compared with a rod type, size 25, 100 stroke)
- Compatible with sliding bearings and ball bushing bearings
- Compatible with moment load and stopper (sliding bearings)
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
- It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less

LEY Series AC Servo Motor

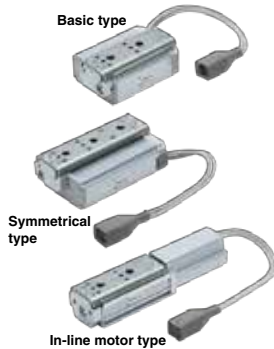
- High output motor (100/200 W)
- Improved high speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s²)
- Pulse input type
- With internal absolute encoder
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEYG16D	30 to 200	Max. 141	Max. 500	2.5, 5, 10
	LEYG25D	30 to 200	Max. 452	Max. 500	3, 6, 12
	LEYG32D	30 to 200	Max. 707	Max. 500	4, 8, 16
	LEYG40D	30 to 200	Max. 1058	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEYG16DA	30 to 200	Max. 111	Max. 500	2.5, 5, 10
	LEYG25DA	30 to 300	Max. 130	Max. 500	3, 6, 12
AC servo motor	LEYG25DS	30 to 300	Max. 485	Max. 900	3, 6, 12
	LEYG32DS	30 to 300	Max. 736	Max. 1000	4, 8, 16

Electric Actuators

Slide Tables

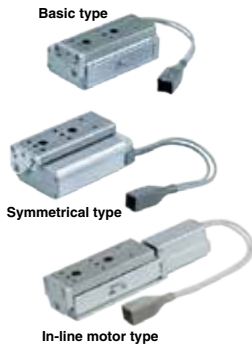
Electric Slide Table/Compact Type **LES**



- Compact: Workpiece mounting surface height reduced by up to 12% compared with the LESH
 - Vertical work load: Increased by up to 50%
 - Lightweight: Reduced by up to 29%
 - Max. pushing force: 180 N
 - Positioning repeatability: ± 0.05 mm
 - Cycle time can be reduced.
- Max. acceleration/deceleration: 5,000 mm/s²
Max. speed: 400 mm/s

Specification	Model	Stroke [mm]	Work load [kg]		Speed [mm/s]	Screw lead [mm]
			Horizontal	Vertical		
Step motor (Servo/24 VDC)	LES8□	30, 50, 75	Max. 1	Max. 0.5	Max. 400	4, 8
	LES16□	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
	LES25□	30, 50, 75, 100, 125, 150	Max. 5	Max. 5	Max. 400	8, 16
Servo motor (24 VDC)	LES8□A	30, 50, 75	Max. 1	Max. 1	Max. 400	4, 8
	LES16□A	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
	LES25□A	30, 50, 75, 100, 125, 150	Max. 5	Max. 4	Max. 400	8, 16

Electric Slide Table/High Rigidity Type **LESH**



- Easy setting: Data can be set with only 2 items, position and speed. The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Integrated guide rail and table
Uses a recirculating linear guide for high rigidity and high precision
- Reduced cycle time
Max. acceleration/deceleration: 5000 mm/s² Max. speed: 400 mm/s
- Max. pushing force: 180 N
- Positioning repeatability: ± 0.05 mm

Specification	Model	Stroke [mm]	Work load [kg]		Speed [mm/s]	Screw lead [mm]
			Horizontal	Vertical		
Step motor (Servo/24 VDC)	LESH8□	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
	LESH16□	50, 100	Max. 8	Max. 2	Max. 400	5, 10
	LESH25□	50, 100, 150	Max. 12	Max. 4	Max. 400	8, 16
Servo motor (24 VDC)	LESH8□A	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
	LESH16□A	50, 100	Max. 5	Max. 2	Max. 400	5, 10
	LESH25□A	50, 100, 150	Max. 6	Max. 2.5	Max. 400	8, 16

Miniature

Electric Actuator/Miniature Rod Type **LEPY**



- Compact and lightweight
W 20.5 mm x H 30 mm x L 125.6 mm, Weight 240 g
- Max. pushing force: 50 N
- Positioning repeatability: ± 0.05 mm
- It is possible to set the position, speed, and force. (64 points)
- Max. speed (Horizontal): 350 mm/s

Specification	Model	Stroke [mm]	Pushing force [N]		Max. work load [kg] (Horizontal)		Screw lead
			Basic	Compact	Basic	Compact	
Step motor (Servo/24 VDC)	LEPY6	25, 50, 75	Max. 20	—	Max. 2.0	—	4.8
	LEPY10	25, 50, 75	Max. 50	Max. 40	Max. 6.0	Max. 4.0	5, 10

Electric Actuators

Miniature

Electric Actuator/Miniature Slide Table Type **LEPS**



- Compact and lightweight
W 21 mm x H 41 mm x L 138.6 mm, Weight 290 g
- Max. pushing force: 50 N
- Positioning repeatability: ± 0.05 mm
- It is possible to set the position, speed, and force. (64 points)
- Max. speed (Horizontal): 350 mm/s

Specification	Model	Stroke [mm]	Pushing force [N]		Max. work load [kg] (Horizontal)		Screw lead
			Basic	Compact	Basic	Compact	
Step motor (Servo/24 VDC)	LEPS6	25, 50	Max. 20	—	Max. 1.0	—	4.8
	LEPS10	25, 50	Max. 50	Max. 40	Max. 2.0	Max. 2.0	5, 10

Rotary Tables

Electric Rotary Table **LER**



- Rotation angle: 360°, 320° (310°), 180°, 90°
() The value indicated in brackets shows the value for the LER10.
- Low profile: Height 42 mm (LER10)
- Space saving: Built-in step motor
- Shock-less/high speed actuation
Max. speed: 420°/sec (7.33 rad/sec)
Max. acceleration/deceleration: 3000°/sec² (52.36 rad/sec²)
- It is possible to set the speed, acceleration/deceleration, and position. Max. 64 points
- Energy saving: Automatic 40% power reduction after the table has stopped
- Easy setting: Data can be set with only 2 items, position and speed.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)

*1 Value when an external stopper is mounted

Model	Rotating torque [N·m]		Max. speed [°/s]		Positioning repeatability [°]	
	Basic	High torque	Basic	High torque	Basic	High torque
LER10	0.22	0.32	420	280	± 0.05 (At the end: ± 0.01)*1	± 0.05 (At the end: ± 0.01)*1
LER30	0.8	1.2	420	280		
LER50	6.6	10	420	280		

Grippers

Electric Gripper 2-Finger Type (Z Type) **LEHZ**



- Easy setting: Data can be set with only 2 items, position and force.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Equipped with a drop prevention function (All series come equipped with a self-lock mechanism.)
- The self-lock mechanism reduces power consumption.
- Equipped with a gripping check function
- It is possible to set the position, speed, and force. (64 points)

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHZ	10	4	6 to 14	2 to 6	5 to 80
	16	6	6 to 14	3 to 8	5 to 80
	20	10	16 to 40	11 to 28	5 to 100
	25	14	16 to 40	11 to 28	5 to 100
	32	22	52 to 130	—	5 to 120
	40	30	84 to 210	—	5 to 120

Electric Actuators

Grippers

Electric Gripper 2-Finger Type/With Dust Cover (ZJ Type) LEHZJ



- Easy setting: Data can be set with only 2 items, position and force.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Equipped with a drop prevention function (All series come equipped with a self-lock mechanism.)
- The self-lock mechanism reduces power consumption.
- Equipped with a gripping check function
- It is possible to set the position, speed, and force. (64 points)

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHZJ	10	4	6 to 14	3 to 6	5 to 80
	16	6	6 to 14	4 to 8	5 to 80
	20	10	16 to 40	11 to 28	5 to 100
	25	14	16 to 40	11 to 28	5 to 100

Electric Gripper 2-Finger Type (F Type) LEHF



- Easy setting: Data can be set with only 2 items, position and force.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Equipped with a drop prevention function (All series come equipped with a self-lock mechanism.)
- The self-lock mechanism reduces power consumption.
- Equipped with a gripping check function
- It is possible to set the position, speed, and force. (64 points)

*1 (): For long strokes

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHF	10	16 (32)*1	3 to 7	3 to 7	5 to 80
	20	24 (48)*1	11 to 28	11 to 28	5 to 100
	32	32 (64)*1	48 to 120	48 to 120	5 to 100
	40	40 (80)*1	72 to 180	72 to 180	5 to 100

Electric Gripper 3-Finger Type (S Type) LEHS



- Easy setting: Data can be set with only 2 items, position and force.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Equipped with a drop prevention function (All series come equipped with a self-lock mechanism.)
- The self-lock mechanism reduces power consumption.
- Equipped with a gripping check function
- It is possible to set the position, speed, and force. (64 points)

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHS	10	4	2.2 to 5.5	1.4 to 3.5	5 to 70
	20	6	9 to 22	7 to 17	5 to 80
	32	8	36 to 90	—	5 to 100
	40	12	52 to 130	—	5 to 120

Electric Actuators

Controllers/Drivers

Controller/Step Data Input Type **LECP6/LECA6**



- The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Easy operation and simple setting: Easy mode, Detail setting: Normal mode
- Teaching box, controller setting software

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Step data input type	LECP6	Step motor (Servo/24 VDC)	24 VDC ±10%	11 (Photo-coupler isolation)	13 (Photo-coupler isolation)	64 points
	LECA6	Servo motor (24 VDC)	24 VDC ±10%			64 points

Multi-Axis Step Motor Controller **JXC73/83/92/93**



- Speed tuning control
- Linear/circular interpolation
- Positioning/pushing operation
- Absolute/relative position coordinate instructions
- Step data input (Max. 2048 points)
- Space saving, reduced wiring

■ **Trademark**
• EtherNet/IP™ is a trademark of ODVA.

Type	Series	I/O type	Compatible motor	Power supply voltage	Number of axes
Step data input type	JXC73	NPN	Step motor (Servo/24 VDC)	24 VDC ±10%	Max. 4 axes
	JXC83	PNP			Max. 4 axes
	JXC92	EtherNet/IP™			Max. 3 axes
	JXC93	EtherNet/IP™			Max. 4 axes

Programless Controller **LECP1**



- No programming required
Capable of setting up an electric actuator operation without using a PC or teaching box
- Speed/acceleration 16-level adjustment
- Compatible with actuators with locks
- 3-level pushing force settings

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Programless type	LECP1	Step motor (Servo/24 VDC)	24 VDC ±10%	6 (Photo-coupler isolation)	6 (Photo-coupler isolation)	14 points

Programless Controller (With Stroke Study) **LECP2**



- End to end operation similar to an air cylinder
- Positioning of 2 stroke end points + 12 intermediate points

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Programless type (With stroke study)	LECP2	Step motor (Servo/24 VDC)	24 VDC ±10%	6 (Photo-coupler isolation)	6 (Photo-coupler isolation)	2 stroke end points, 12 intermediate points

Electric Actuators

Controllers/Drivers

Step Motor Driver (Pulse Input Type) **LECPA**



- A driver that uses pulse signals to allow positioning at any position
The actuator can be controlled from the customers' positioning unit.
- Return-to-origin command signal
- With force limit function (Pushing force/Gripping force operations are available.)

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Pulse input type	LECPA	Step motor (Servo/24 VDC)	24 VDC ±10%	5 (Photo-coupler isolation)	9 (Photo-coupler isolation)	—

Step Motor Controller/CC-Link Direct Input Type **LECPMJ**



- CC-Link Ver. 1.10 compatible
- External data import function
- Position and speed can be monitored by the PLC touch panel (display).
- Step data can be edited from the PLC touch panel (display).

Type	Series	Compatible motor	Power supply voltage	Fieldbus
CC-Link direct input type	LECPMJ	Step motor (Servo/24 VDC)	24 VDC ±10%	CC-Link Ver. 1.10

Step Motor Controller **JXCE1/91/P1/D1/L1**



- EtherCAT, EtherNet/IP™, PROFINET, DeviceNet™, and IO-Link compatible
- Two types of operation command:
Step no. defined operation, Numerical data defined operation
- Transition wiring of communication cables
- Numerical monitoring available
- IO-Link communication can be performed.

Series	Compatible motor	Power supply voltage	Fieldbus
JXCE1	Step motor (Servo/24 VDC)	24 VDC ±10%	EtherCAT
JXC91			EtherNet/IP™
JXCP1			PROFINET
JXCD1			DeviceNet™
JXCL1			IO-Link

Fieldbus-compatible Gateway (GW) Unit **LEC-G**



- The LE□ series electric actuators are applicable to Fieldbus protocols.
- Conversion unit for Fieldbus network and LEC serial communication
- 2 methods of operation:
Step data input, numerical data input
- Position, speed, and other values can be checked on the PLC.

Series	Applicable fieldbus	Power supply voltage	Applicable controllers
LEC-G	CC-Link DeviceNet™ PROFIBUS DP EtherNet/IP™	24 VDC ±10%	LECP6 series LECA6 series

■ Trademark

- DeviceNet™ is a trademark of ODVA.
- EtherNet/IP™ is a trademark of ODVA.
- EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Electric Actuators

Controllers/Drivers

AC Servo Motor Driver (Pulse Input Type) **LECS**



- Pulse input type motor driver
- Compatible motor capacity: 100 W, 200 W, 400 W
- Compatible encoders:
 - Incremental type
 - Absolute type
- Servo adjustment using auto gain tuning
- With display setting function

Type	Series	Compatible motor	Power supply voltage	Parallel I/O	
				Input	Output
Pulse input type (For incremental encoder)	LECSA	AC servo motor (100/200/400 W)	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	6	4
Pulse input type (For absolute encoder)	LECSB			10	6
CC-Link direct input type (For absolute encoder)	LECSC			—	—
SSCNET III type (For absolute encoder)	LECSS			—	—
SSCNET III/H type (For absolute encoder)	LECSS-T		200 to 240 VAC (50/60 Hz)	—	—

AC Servo Motor Driver (MECHATROLINK Compatible) **LECYM/LECYU**



- Position control, speed control, and torque control can be used.
- Control encoder: Absolute 20-bit encoder
(Resolution: 1048576 p/rev)
- Applicable Fieldbus protocol: MECHATROLINK- II , MECHATROLINK- III

Type	Series	Compatible motor	Power supply voltage	Parallel I/O	
				Input	Output
MECHATROLINK-II type (For absolute encoder)	LECYM	AC servo motor (100/200/400 W)	200 to 230 VAC (50/60 Hz)	7 (Number of optional allocations)	1 (Number of fixed allocations) 3 (Number of optional allocations)
MECHATROLINK-III type (For absolute encoder)	LECYU	AC servo motor (100/200/400 W)	200 to 230 VAC (50/60 Hz)	7 (Number of optional allocations)	1 (Number of fixed allocations) 3 (Number of optional allocations)

Electric Actuators

Environment: Dust-tight/Water-jet-proof (IP65 Equivalent)

Electric Actuator/Rod Type LEY-X5



- Enclosure: IP65 equivalent
- Max. stroke: 500 mm

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY25-X5	30 to 400	Max. 452	Max. 400	3, 6, 12
Step motor (Servo/24 VDC)	LEY32-X5	30 to 500	Max. 707	Max. 400	4, 8, 16
Servo motor (24 VDC)	LEY25A-X5	30 to 400	Max. 130	Max. 400	3, 6, 12
AC servo motor	LEY25S-X5	30 to 400	Max. 485	Max. 900	3, 6, 12
AC servo motor	LEY32S-X5	30 to 500	Max. 588	Max. 1200	5, 10, 20
AC servo motor	LEY63□□□-□P	100 to 800	Max. 1910	Max. 1000	5, 10, 20
AC servo motor (In-line motor type)	LEY25DS-X5	30 to 400	Max. 485	Max. 900	3, 6, 12
AC servo motor (In-line motor type)	LEY32DS-X5	30 to 500	Max. 736	Max. 1000	4, 8, 16
AC servo motor (In-line motor type)	LEY63D□□□-□P	100 to 800	Max. 1910	Max. 1000	5, 10, 20

Environment: Clean Room Specification

Electric Actuator/Slider Type, Ball Screw Drive 11-LEFS



LEFS Series Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

- Max. work load: 60 kg
- Positioning repeatability: ± 0.02 mm

LEFS Series AC Servo Motor

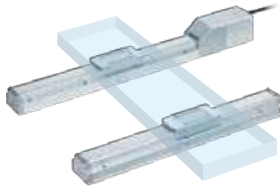
- High output motor (100/200/400 W)
- Improved high speed transfer ability
- High acceleration/deceleration (20000 mm/s^2)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ± 0.02 mm
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	11-LEFS16	50 to 500	Max. 14	Max. 500	5, 10
Step motor (Servo/24 VDC)	11-LEFS25	50 to 600	Max. 25	Max. 500	6, 12
Step motor (Servo/24 VDC)	11-LEFS32	50 to 800	Max. 45	Max. 500	8, 16
Step motor (Servo/24 VDC)	11-LEFS40	150 to 1000	Max. 55	Max. 500	10, 20
Servo motor (24 VDC)	11-LEFS16A	50 to 500	Max. 10	Max. 500	5, 10
Servo motor (24 VDC)	11-LEFS25A	50 to 600	Max. 18	Max. 500	6, 12
AC servo motor (100/200/400 W)	11-LEFS25S	50 to 600	Max. 20	Max. 900	6, 12
AC servo motor (100/200/400 W)	11-LEFS32S	50 to 800	Max. 45	Max. 1000	8, 16
AC servo motor (100/200/400 W)	11-LEFS40S	150 to 1000	Max. 60	Max. 1000	10, 20

Electric Actuators

Environment: Clean Room Specification

Electric Actuator/LEF Series Support Guide 11-LEFG



- A support guide that is designed to support work pieces with significant overhang
- Easy installation with the same outer dimensions as the LEF series body, Contributes to the reduction of design and assembly labor
- The standardly equipped sealing band prevents the scattering of grease and the entry of foreign matter from outside.

Drive method	Model	Stroke [mm]
Ball screw drive/S	11-LEFG16-S	50 to 500
Ball screw drive/S	11-LEFG25-S	50 to 600
Ball screw drive/S	11-LEFG32-S	50 to 800
Ball screw drive/S	11-LEFG40-S	150 to 1000

Electric Actuator/High Rigidity Slider Type, Ball Screw Drive 11-LEJS



- Low profile/Low center of gravity: Height reduced by approx. 36% (Reduced by 32 mm)
- Max. work load: 85 kg
- Positioning repeatability: ± 0.02 mm
- Max. acceleration/deceleration: 20000 mm/s²
- Clean room specification
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
AC servo motor	11-LEJS40	200 to 1200	Max. 55	Max. 1200	8, 16
AC servo motor	11-LEJS63	300 to 1500	Max. 85	Max. 1200	10, 20

Motorless Type

Electric Actuator/Slider Type LEF



- Various servo motors can be mounted due to the addition of the motorless type.
- Compatible motors:
Mitsubishi Electric Corporation, YASKAWA Electric Corporation, SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation, FANUC CORPORATION, NIDEC SANKYO CORPORATION, KEYENCE CORPORATION, FUJI ELECTRIC CO., LTD., ORIENTAL MOTOR Co., Ltd., FASTECH Co., Ltd., Rockwell Automation, Inc. (Allen-Bradley), Beckhoff Automation GmbH, Siemens AG, Delta Electronics, Inc.

Specification	Model	Stroke [mm]	Work load [kg]	Speed [mm/s]	Screw lead [mm]
Motorless Ball screw drive	LEFS25	50 to 800	Max. 20	Max. 900	6, 12
Motorless Ball screw drive	LEFS32	50 to 1000	Max. 45	Max. 1000	8, 16
Motorless Ball screw drive	LEFS40	150 to 1200	Max. 60	Max. 1000	10, 20
Motorless Belt drive	LEFB25	300 to 2000	5	Max. 2000	Equivalent to 54
Motorless Belt drive	LEFB32	300 to 2500	15	Max. 2000	Equivalent to 54
Motorless Belt drive	LEFB40	300 to 3000	25	Max. 2000	Equivalent to 54

Electric Actuators

Motorless Type

Electric Actuator/High Rigidity Slider Type **LEJ**



- Various servo motors can be mounted due to the addition of the motorless type.
- Compatible motors:
Mitsubishi Electric Corporation, YASKAWA Electric Corporation, SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation, FANUC CORPORATION, NIDEC SANKYO CORPORATION, KEYENCE CORPORATION, FUJI ELECTRIC CO., LTD., Rockwell Automation, Inc. (Allen-Bradley), Beckhoff Automation GmbH, Siemens AG, Delta Electronics, Inc.

Specification	Model	Stroke [mm]	Work load [kg]	Speed [mm/s]	Screw lead [mm]
Motorless Ball screw drive	LEJS40	200 to 1200	Max. 55	Max. 1800	8, 16, 24
Motorless Ball screw drive	LEJS63	300 to 1500	Max. 85	Max. 1800	10, 20, 30

Electric Actuator/Rod Type **LEY**



- Various servo motors can be mounted due to the addition of the motorless type.
- Compatible motors:
Mitsubishi Electric Corporation, YASKAWA Electric Corporation, SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation, FANUC CORPORATION, NIDEC SANKYO CORPORATION, KEYENCE CORPORATION, FUJI ELECTRIC CO., LTD., ORIENTAL MOTOR Co., Ltd., FASTECH Co., Ltd., Rockwell Automation, Inc. (Allen-Bradley), Beckhoff Automation GmbH, Siemens AG, Delta Electronics, Inc.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Motorless Top/Parallel	LEY25	30 to 400	Max. 485	Max. 900	3, 6, 12
Motorless In-line	LEY25D	30 to 400	Max. 485	Max. 900	3, 6, 12
Motorless Top/Parallel	LEY32	30 to 500	Max. 588	Max. 1200	4, 8, 16
Motorless In-line	LEY32D	30 to 500	Max. 736	Max. 1000	4, 8, 16
Motorless In-line	LEY63D	100 to 800	Max. 1910	Max. 1000	5, 10, 20

Electric Actuator/Guide Rod Type **LEYG**



- Various servo motors can be mounted due to the addition of the motorless type.
- Compatible motors:
Mitsubishi Electric Corporation, YASKAWA Electric Corporation, SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation, FANUC CORPORATION, NIDEC SANKYO CORPORATION, KEYENCE CORPORATION, FUJI ELECTRIC CO., LTD., ORIENTAL MOTOR Co., Ltd., FASTECH Co., Ltd., Rockwell Automation, Inc. (Allen-Bradley), Beckhoff Automation GmbH, Siemens AG, Delta Electronics, Inc.

Specification	Model	Stroke [mm]	Pushing force [N]	Speed [mm/s]	Screw lead [mm]
Motorless Top mounting	LEYG25	30 to 300	Max. 485	Max. 900	3, 6, 12
Motorless In-line	LEYG25D	30 to 300	Max. 485	Max. 900	3, 6, 12
Motorless Top mounting	LEYG32	30 to 300	Max. 588	Max. 1200	4, 8, 16
Motorless In-line	LEYG32D	30 to 300	Max. 736	Max. 1000	4, 8, 16

Vacuum Equipment

Vacuum Ejectors/Vacuum Pump Systems

Vacuum Unit ZK2



- Compatible with ejector systems and vacuum pump systems
- The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum. Air consumption: 90% reduction
- Improved ejector efficiency: Suction flow increased by 50%, Air consumption reduced by 30%
 - * Compared to other SMC single-stage ejectors
- Compact/Lightweight: Volume 88 cm³ (28% reduction), Weight 81 g (59% reduction)

Ejector series	Nozzle diameter [mm]	Max. suction flow [L/min (ANR)]	Air consumption [L/min (ANR)]	Guidelines for applicable pad [mm]	Vacuum pump system series
ZK2□07	0.7	29	24	2 to 40	ZK2□00
ZK2□10	1.0	44	40	2 to 50	
ZK2□12	1.2	61	58	2 to 125	
ZK2□15	1.5	67	90	2 to 150	

Multistage Ejector ZL112A



- Energy saving: Air consumption reduced by 10%
- Weight reduced by up to 60%
 - ZL112A: 180 g ← Existing model (ZL112): 450 g
- 3 stage diffuser construction
 - Suction flow rate increased by 250%
- 3 types of vacuum pressure sensors
- No tools are required! Maintenance labor can be reduced.

Series	Nozzle diameter [mm]	Max. suction flow [L/min (ANR)]	Air consumption [L/min (ANR)]	Guidelines for applicable pad [mm]
ZL112A	1.2	100	57	2 to 250

Vacuum Ejectors

Vacuum Ejector ZH



Vacuum Ejector/Box Type (Built-in Silencer) ZH



- Compact and lightweight
 - Overall length: Max. 11% reduction (6.7 mm shorter)
 - Port height: Max. 25% reduction (9.1 mm shorter)
 - Weight: Max. 74% reduction (65.1 g lighter)
- 4 mounting types:
 - Direct mounting, Standard bracket mounting, L-bracket mounting, DIN rail mounting

Series	Nozzle diameter [mm]	Max. suction flow [L/min (ANR)]	Air consumption [L/min (ANR)]	Guidelines for applicable pad [mm]
ZH05DSA	0.5	6	13	2 to 13
ZH07DSA	0.7	12	27	2 to 20
ZH10DSA	1.0	26	52	2 to 32
ZH13DSA	1.3	40	84	2 to 50
ZH15DSA	1.5	58	113	2 to 100
ZH18DSA	1.8	76	162	2 to 125
ZH20DSA	2.0	90	196	2 to 150

Vacuum Equipment

Vacuum Ejectors

All Stainless Steel Vacuum Ejector ZH□□-X267



- All stainless steel (SCS13: Equivalent to stainless steel 304)
- Sealant not required
- Max. operating temperature: 260°C
- Grease-free

Series	Nozzle diameter [mm]	Max. suction flow [L/min (ANR)]	Air consumption [L/min (ANR)]	Guidelines for applicable pad [mm]
ZH05-X267	0.5	5	13	2 to 13
ZH07-X267	0.7	12	23	2 to 20
ZH10-X267	1.0	24	46	2 to 32

In-line Type Vacuum Ejector ZU□A



- Compact and Lightweight
O.D.: ø10.4, Weight: 3.9 g, Overall length: 52 mm
- Port size:
ø6 One-touch fitting, Rc1/8 female thread
- Vacuum pressure reached [kPa]
Type S: -90
Type L: -48

Series	Nozzle diameter [mm]	Max. suction flow [L/min (ANR)]		Air consumption [L/min (ANR)]	Guidelines for applicable pad [mm]
		Type S	Type L		
ZU05□A	0.5	7	13	14	2 to 13
ZU07□A	0.7	11	16	28	2 to 20

Vacuum Pad with Ejector ZHP



- Ejector and pad are integrated. Space saving with reduced piping labor!
- 2-stage ejector
Suction flow rate increased by 50%, Air consumption reduced by 30%
- Easier maintenance
Mounting with the lock plate reduces the steps required for pad replacement!
- Pad diameter: ø63, ø80

Series	Pad diameter	Pad form	Nozzle nominal size
ZHP	ø63, ø80	Bellows type with groove, Flat type with groove	ø0.7, ø1.0, ø1.2, ø1.5

Vacuum Equipment

Air Suction Filters

Air Suction Filter ZFA



- Prevents problems related to vacuum circuits or airborne contaminants
- Provides a large filter element surface

Series	Port size	Flow rate [L/min (ANR)]	Filtration [μm]
ZFA10	1/8	50	30
ZFA20	1/4	200	30

Air Suction Filter with One-touch Fittings ZFB



- Prevents problems related to vacuum circuits or airborne contaminants
- Vacuum tubes can be connected and removed by a one-touch operation.

Series	Applicable tubing O.D.		Flow rate [L/min (ANR)]	Filtration [μm]
	Metric	Inch		
ZFB10	$\phi 4, \phi 6$	$\phi 3/16, \phi 1/4$	10 to 20	30
ZFB20	$\phi 6, \phi 8$	$\phi 1/4$	30 to 50	30
ZFB30	$\phi 8, \phi 10$	$\phi 3/8$	75	30
ZFB40	—	$\phi 1/2$	100	30

In-line Air Filter ZFC



- Operating pressure range: -100 kPa to 1.0 MPa
- Both positive pressure and vacuum pressure can be used with one unit.
- With lock mechanism
- During positive pressure, it prevents components from being scattered when they are loosened.

- 2 types of transparent case materials are available: Polycarbonate (Standard), Nylon (Made to order)

*1 Supply pressure 0.1 MPa , Differential pressure 30 kPa
 *2 Made to order

Series	Applicable tubing O.D.		Flow rate [L/min (ANR)]* ¹ Positive pressure	Flow rate [L/min (ANR)] Vacuum pressure	Filtration [μm]
	Metric	Inch			
ZFC1□	$\phi 2, \phi 3.2$	$\phi 1/8"$	15/45	2/5	$5, 10^{*2}$
ZFC3□	$\phi 3.2, \phi 4$	$\phi 1/8", \phi 5/32"$	50/80	7/10	$5, 10^{*2}$
ZFC5□	$\phi 4, \phi 6$	$\phi 5/32", \phi 1/4"$	100/200	10/20	$5, 10^{*2}$
ZFC7□	$\phi 6, \phi 8, \phi 10, \phi 12$	$\phi 1/4", \phi 5/16", \phi 3/8"$	250/450/550/650	30/70/80/100	$5, 10^{*2}$

Vacuum Filter AFJ



- Prevents problems with vacuum equipment!
- Nominal filtration rating: 5, 40, 80 μm
- Large flow capacity: Max. 660 L/min (ANR)
- Elements can be reused by washing them.
- Water droplets can be removed.
- The bowl is covered with a transparent bowl guard.

Series	Port size	Recommended flow rate [L/min (ANR)]	Filtration
AFJ	1/8, 1/4, 3/8, 1/2	180, 380, 660	5, 40, 80

Suction Filter ZFC050



- Small suction filter which can be installed directly

Series	Port size IN side	Port size OUT side	Filtration [μm]
ZFC050	M5 x 0.8, $\phi 6$ barb	M5 x 0.8	3 μm , 20 μm (Nominal)

Vacuum Equipment

Vacuum Pads

Vacuum Pad ZP3

- Pad diameter: $\phi 1.5$ to $\phi 16$
- Compact/Space saving: Overall length shortened
- One-touch fittings and barb fittings are available for $\phi 2$.



Series	Type
ZP3	Flat
ZP3	Flat with groove
ZP3	Bellows

Thin Flat/Flat Pad ZP2

- For sheets or vinyl
- Pad diameter: $\phi 5$ to $\phi 30$



Series	Type
ZP2	Thin flat
ZP2	Flat

Vacuum Pad ZP3E

- Stable suction position, Improved ease of removal
- The dents and bumps on the adsorption surface expand the area which is in contact with the workpiece. The ribs reduce inclinations during the transport of workpieces.

- Reduced number of mounting screws (4 pcs. \rightarrow 1 pc.)
- Pad and metal parts can be disposed of separately.
- Pad diameter: $\phi 32$ to $\phi 125$



Series	Type
ZP3E	Flat type with groove
ZP3E	Bellows type with groove

Bellows Pad ZP2

- For spherical workpieces or workpieces with inclined surfaces
- Pad diameter: $\phi 2$ to $\phi 46$



Vacuum Pad ZP3P

- Good for film packaging applications where the shape of the workpiece changes easily when lifted
- Uses silicone rubber compliant with the FDA (USA Food and Drug Administration) 21CFR \S 177.2600 elution test

- Blue colored pad
- Reduced leakage
- Reduction of wrinkles made on thin workpieces (film, vinyl, etc.) during adsorption



Series	Type
ZP3P	Flat type with groove

4.5-Stage Bellows Pad ZP2

- For adsorbing workpieces moving at high speeds
- Follows various shapes of workpieces
- Pad material: Silicone rubber (Rubber hardness: A40, A50, A60)
- Pad diameter: $\phi 15$, $\phi 20$, $\phi 30$, $\phi 40$, $\phi 46$



Compact/Short-type/Nozzle Pad ZP2

- Compact/Space saving
- Pad diameter: $\phi 0.8$ to $\phi 15$



Series	Type
ZP2	Compact
ZP2	Short-type
ZP2	Nozzle

Oval Pad ZP2

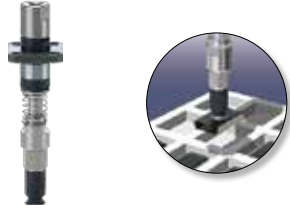
- For rectangular workpieces
- Pad diameter: 3.5 x 7 to 8 x 30



Vacuum Pads

Ball Spline Buffer Pad ZP2

- The ball spline guide is used for buffers.
- Pad diameter: $\phi 2$ to $\phi 8$



Special Configuration Pad ZP2

- For stage setting of disks (CD, DVD) or glass substrates



Series	Type
ZP2	For transferring disks
ZP2	For fixing panels

Mark-free Pad ZP2

- For use where adsorption marks must not be left on workpieces
- Pad diameter: $\phi 4$ to $\phi 125$



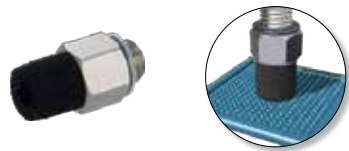
Vacuum Pad ZP

- The wide variety of available models can accommodate a wide range of applications.
- Pad shapes: Flat, Flat with ribs, Thin flat, Thin flat with ribs, Deep, and Bellows shape
- Pad diameter: $\phi 2$ to $\phi 50$



Sponge Pad ZP2

- For workpieces with bumps
- Pad diameter: $\phi 4$ to $\phi 15$



Vacuum Pad/Large/Heavy Duty Type ZPT/ZPX

- Ideal for heavy or large workpieces such as CRT tubes and automobile bodies
- Pad diameter: $\phi 40$ to $\phi 125$



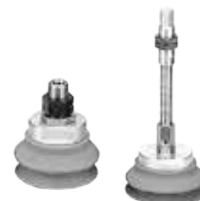
Heavy-duty Pad ZP2

- For heavy or large workpieces
- Pad diameter: $\phi 32$ to $\phi 340$



Vacuum Pad/Large Size Bellows Type ZPT/ZPX

- Ideal for workpieces with a curved adsorption surface, heavy mass, or those that are large in size
- Pad diameter: $\phi 40$ to $\phi 125$



Vacuum Equipment

Vacuum Pads

Vacuum Pad/Ball Joint Type ZPT/ZPR

- Ideal for adsorption on slanted work surfaces
- Pad diameter: $\phi 10$ to $\phi 50$



Special Pads

Non-contact Gripper XT661

- Assists in non-contact workpiece transfer
- Max. workpiece suction distance: 10 mm
- 2 types are available:
 - Cyclone type: High lift: Max. 44 N
 - Bernoulli type: Amplitude of the workpiece during gripping: ± 0.01 mm or less



Special Pads

Magnet Gripper MHM-X6400

- Steel plates can be transferred without a vacuum. Can support workpieces with holes and uneven surfaces when a vacuum pad cannot be used
- Holds workpieces even when the air is shut off
- High holding force: 80 N (Workpiece plate thickness: 0.6 mm), 120 N (Workpiece plate thickness: 1.4 mm)
- Residual holding force: 0.3 N or less (Reduces workpiece release time)



Series	Holding force (Workpiece plate thickness: 0.6 mm)
MHM-32D1-X6400	80 N
MHM-32D2-X6400	50 N
MHM-32D3-X6400	30 N

Vacuum Saving Valves

Vacuum Saving Valve ZP2V

- Can restrict the reduction of vacuum pressure even when there is no workpiece
- A switching operation is not required when changing workpieces.
- Built-in filter (40 μm)
- With One-touch fittings



Vacuum Flow

Vacuum Flow ZH□-□□-X185

- By supplying compressed air, large blow and vacuum flow rates are available.
- A blow flow rate 4 times the supply air
- A vacuum flow rate 3 times the supply air
- Large passage diameter available for the suction of machining chips, particles, etc.
- Maintenance-free
- Mounting brackets are available.
- Application examples:
 - Blow: Blowing away water droplets and machining chips
 - Vacuum: Vacuuming smoke during soldering, Transferring materials such as pellets or fine particles



Vacuum Regulators

Vacuum Regulator IRV

- Allows for the adjustment of vacuum line pressure
- Single-sided connection series
- Weight reduced by 20% (Compared with the existing IRV2000 with IRV20 fitting)
- Built-in One-touch fittings
- The pressure gauge and digital pressure switch can be easily attached/detached due to being attached by a clip.
- Mounting direction of the pressure gauge and digital pressure switch can be changed. (Standard connections only)
- Mounting angle of the pressure gauge and digital pressure switch can be changed easily (in 60 degree increments)



Series	Port size	Set pressure range [kPa]
IRV10	$\phi 6$, $\phi 8$, $\phi 1/4$, $\phi 5/16$	-100 to -1.3
IRV20	$\phi 6$, $\phi 8$, $\phi 10$, $\phi 1/4$, $\phi 5/16$, $\phi 3/8$	-100 to -1.3

Vacuum Equipment

Vacuum Regulators

Electronic Vacuum Regulator **ITV**



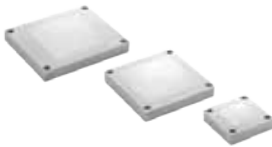
- Stepless control of vacuum pressure in proportion to electrical signals
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C

Series	Port size	Set pressure range [kPa]
ITV009□	ø4, ø5/32" One-touch fittings	-1 to -100
ITV209□	1/4	-1.3 to -80

■ **Trademark**
 • DeviceNet™ is a trademark of ODVA.

Related Equipment for Vacuum Systems

Adsorption Plate **SP**



- Ideal for the adsorption and fixing in place of thin sheets, glass panels, and soft workpieces
 Workpieces will not be deformed since they are adsorbed with multiple micro air vents on the adsorption surface.
- A high level of machining accuracy
- Strong adsorption force

Series	Shape	Adsorption surface size	Sintered metallic element particle dia.	Suction port
SP	Rectangular, Square	□50 x 50 mm, □100 x 100 mm, □150 x 150 mm, □200 x 200 mm, □250 x 250 mm, □300 x 300 mm	ø0.3 (Sphere)	1/8

Free Mount Cylinder for Vacuum **ZCUK**



- In the rectangular compact cylinder CU series, which has a high level of mounting precision, a vacuum passage is provided in the rod to facilitate the mounting of a vacuum pad and to save space.
- Standard vacuum pads (ø2 to ø50) can be mounted.

Series	Bore size [mm]	Vacuum pad diameter	Stroke [mm]
ZCUK	10, 16, 20, 25, 30	ø2 to ø50	5 to 50

Exhaust Cleaner for Vacuum Pump **AMV**



- Captures 99.5% of the greasy fumes exhausted from the vacuum pump
- Creates a comfortable working environment without oil mist
- Captures and separates 99.5% of even low-flow and highly concentrated greasy fumes
- Exhaust ducts from the vacuum pump are not required.

Series	Port size	Max. air flow [L/min (ANR)]	Oil mist removal	Filtration [μm]
AMV	1, 1 1/2, 2, 3BJIS 10K FF flange 4BJIS 10K FF flange	360 to 16000	99.5% or more	0.3 (Filtration efficiency: 95%)

Related Equipment for Vacuum Systems



- Directional Control Valves
- Vacuum Pressure Switches
- Vacuum Pressure Gauges
- Flow Control Equipment
- Made to Order

Air Preparation Equipment

Air Dryers

Refrigerated Air Dryer IDF



- Can be used in high-temperature environments
Ambient temperature: Max. 45°C
Inlet air temperature: Max. 65°C
- Increased air flow capacity
- For Use in Southeast Asia (IDFC)
- For Use in Europe, Asia, and Oceania (IDFA)
- For Use in North, Central, and South America (IDFB)

Series	Rated inlet condition	Air flow capacity [m ³ /min (ANR)]		Refrigerant	Port size
		50 Hz	60 Hz		
IDF60	35°C 0.7 MPa	5.6	6.5	R410A (HFC) GWP: 2088	R1
IDF70		8	9.1		R1 1/2
IDF80	40°C 0.7 MPa	11.6	13.6		R2
IDF90		14.3	16.4		R2

Refrigerated Air Dryer IDF□E/F/D



Series	Rated inlet condition	Air flow capacity [m ³ /min (ANR)]		Applicable air compressor [kW]	Refrigerant	Port size
		50 Hz	60 Hz			
IDF1E	35°C 0.7 MPa	0.1	0.12	0.75	R134a (HFC)	Rc3/8
IDF2E		0.2	0.235	1.5		Rc3/8
IDF3E		0.32	0.37	2.2		Rc3/8
IDF4E		0.52	0.57	3.7		Rc1/2
IDF6E		0.75	0.82	5.5		Rc3/4
IDF8E		1.22	1.32	7.5		Rc3/4
IDF11E		1.65	1.82	11		Rc3/4
IDF15E1		2.8	3.1	15		Rc1
IDF22E		3.9	4.3	22		R1
IDF37E		5.7	6.1	37		R1 1/2
IDF55E	40°C 0.7 MPa	8.4	9.8	55	R407C (HFC)	R2
IDF75E		11.0	12.4	75		R2
IDF100F		16.0	18.8	100		R2
IDF125F		20.1	23.7	125		65 (2 1/2B) flange
IDF150F		25.0	30.0	150		80 (3B) flange
IDF190D		32.0	38.0	190		80 (3B) flange
IDF240D	43.0	50.0	240	100 (4B) flange		
IDF370D	35°C 0.7 MPa	54.0	65.0	370	150 (6B) flange	

Refrigerated Air Dryer IDU□E



Series	Rated inlet condition	Air flow capacity [m ³ /min (ANR)]		Applicable air compressor [kW]	Refrigerant	Port size
		50 Hz	60 Hz			
IDU3E	55°C 0.7 MPa	0.32	0.37	2.2	R134a (HFC)	Rc3/8
IDU4E		0.52	0.57	3.7		Rc1/2
IDU6E		0.75	0.82	5.5		Rc3/4
IDU8E		1.1	1.2	7.5		Rc3/4
IDU11E		1.5	1.7	11		Rc3/4
IDU15E1		2.6	2.8	15		Rc1
IDU22E		3.9	4.3	22		R1
IDU37E		5.7	6.1	37		R1 1/2
IDU55E		8.4	9.8	55		R2
IDU75E		11.0	12.5	75		R2

Air Preparation Equipment

Air Dryers

Refrigerated Air Dryer/Double Energy Saving Function Series IDF100FS/125FS/150FS



- Energy-saving design (Second re-heater + Digital scroll compressor)
- Power consumption: Reduced by up to 76%
- Exhaust heat: Reduced by up to 25%
- Tolerant of high temperature environments!
- Ambient temperature: Up to 45°C, Inlet air temperature: Up to 60°C

Series	Applicable compressor [kW]	Air flow capacity [m ³ /min (ANR)]	
		50 Hz	60 Hz
IDF100FS	100	16	18.8
IDF125FS	125	20.1	23.7
IDF150FS	150	25	27

Thermo-dryer with Air Temperature Adjustment Function IDH□



- Stable supply of temperature and pressure controlled dry clean air
It is possible to supply compressed air with the same conditions and quality regardless of the season.
- Application example: Supplying compressed air with constant conditions to the air bearings mounted on a tool
- Built-in filter
Nominal filtration: 0.01 μm (99.9% filtration efficiency)
Outlet oil mist concentration: Max. 0.01 mg/m³ (ANR)
Outlet cleanliness: Particles of 0.3 μm or more: 3.5 particles/L (ANR) or less
- Compatible with power supplies all over the world
Single-phase 100, 200, 230 VAC (50/60 Hz)

Series	Air flow capacity [L/min (ANR)]	Outlet air temperature adjustment range	Outlet air set pressure range	Outlet air temperature stability	Temperature control method
IDH□4	100 to 500	15 to 30°C	0.15 to 0.85 MPa	±0.1	Heater operation, PID control
IDH□6	200 to 800	15 to 30°C	0.15 to 0.85 MPa	±0.1	Heater operation, PID control

Membrane Air Dryer IDG□A/IDG



- It is possible to easily supply dry air using the hollow fiber membrane.
- Non-fluorocarbon
- Power supply not required
- Compatible with low dew points (–60°C)
- No vibration or heat discharge
- With a dew point indicator

Series	Outlet flow [L/min (ANR)]	Standard dew point [°C]
IDG□A/IDG	10 to 1000	–15, –20, –40, –60

Moisture Control Tube IDK



- Prevents condensation in piping for small cylinders/air grippers
- Diffuses water vapor in the piping to the outside
- All you have to do is install the moisture control tube. Additional power supplies and works are not necessary.

Series	O.D./I.D. [mm]	Effective length [mm]	Applicable fittings
IDK02 Linear shape	2/1.2	100 200	KQ2
IDK04 Linear shape	4/2.5	100 200	KQ2
IDK06 Linear shape	6/4	100 200	KQ2
IDK04-100-C1 Coil shape	4/2.5	100	KQ2

Air Preparation Filters

Water Separator **AMG**



- Compressed air without water can be obtained.
- Water droplet removal ratio: 99%
- Easily connects to the air line to remove moisture!

Series	Air flow capacity [L/min (ANR)]	Port size
AMG	300 to 12000	1/8 to 2

Main Line Filter **AFF**

Mist Separator **AM**

Micro Mist Separator **AMD**



- Compressed air purity class: ISO 8573
- Increased air flow capacity due to lower pressure drop which contributes to energy saving
Flow capacity: 14.5 m³/min (ANR) (Increased by up to 20% compared with the existing model)
Pressure drop: 5 kPa or less

- Lightweight: Max. 52% lighter (10.5 kg → 5.0 kg)
Lighter body weight due to thinner stainless steel bowl
- Space-saving design, Reduced piping labor!

The AFF series main line filter removes both water droplets and solid particles.

A separate filter for removing water droplets (water separator, AMG series) is not necessary any more. Space and piping work are reduced.

- Easier replacement of the element
The stopper function prevents the bowl from falling.

Type	Series	Filtration [μm]	Air flow [m ³ /min (ANR)]	Port size
Main line filter	AFF	1.0 (Filtration efficiency: 99%)	7 to 14.5	1, 1 1/2, 2
Mist separator	AM	0.1 (Filtration efficiency: 99.9%)	7 to 14.5	1, 1 1/2, 2
Micro mist separator	AMD	0.01 (Filtration efficiency: 99.9%)	7 to 14.5	1, 1 1/2, 2

Main Line Filter **AFF**



- Can remove impurities, such as oil, water, and foreign matter, in compressed air, improve the function of a downstream dryer, extend the life of precision filters, and prevent problems with the equipment

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AFF	3 (Filtration efficiency: 99%)	300 to 42000	1/8 to 4 ^B flange

Mist Separator **AM**



- Can separate and remove oil mist and remove solid particles, such as rust or carbon, of 0.3 μm or larger

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AM	0.3 (Filtration efficiency: 99.9%)	300 to 12000	1/8 to 2

Air Preparation Filters

Micro Mist Separator **AMD**



- Can separate and remove aerosol state oil mist and remove carbon or dust of 0.01 μm or larger
- Should be used as a pre-filter for compressed air for precision instruments or clean rooms requiring high levels of clean air

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AMD	0.01 (Filtration efficiency: 99.9%)	200 to 12000	1/8 to 2

Micro Mist Separator with Pre-filter **AMH**



- The integration of the AM series and AMD series achieves a reduction in installation space and reduced piping installation labor and costs.
- Can separate and remove aerosol state oil mist and remove carbon or dust of 0.01 μm or larger
- Should be used as a pre-filter for compressed air for precision instruments or clean rooms requiring high levels of clean air

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AMH	0.01 (Filtration efficiency: 99.9%)	200 to 12000	1/8 to 2

Super Mist Separator **AME**



- Can separate and absorb aerosol state fine oil particles and change oil-lubricated compressed air to the equivalent of oilless air
- Should be applied for the filtration of compressed air that requires high-degree cleanliness, such as the compressed air used for coating lines, clean rooms, and equipment that must remain oil free

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AME	0.01 (Filtration efficiency: 99.9%)	200 to 12000	1/8 to 2

Odor Removal Filter **AMF**



- Efficiently removes odors in compressed air with an activated carbon element
This unit is designed for removing odors from places, such as clean rooms, which must remain odorless
- Activated carbon element with large filtration area
- Easy element replacement and installation

Series	Filtration [μm]	Air flow [L/min (ANR)]	Port size
AMF	0.01 (Filtration efficiency: 99.9%)	200 to 12000	1/8 to 2

In-line Air Filter **ZFC**



- Operating pressure range: -100 kPa to 1.0 MPa
Both positive pressure and vacuum pressure can be used with one unit.
- With lock mechanism
During positive pressure, it prevents components from being scattered when they are loosened.
- 2 types of transparent case materials are available:
Polycarbonate (Standard), Nylon (Made to order)

*1 Supply pressure: 0.1 MPa, Differential pressure: 30 kPa

*2 Made to order

Series	Applicable tubing O.D.		Flow rate [L/min (ANR)]*1		Filtration [μm]
	Metric	Inch	Positive pressure	Vacuum pressure	
ZFC1□	ø2, ø3.2	ø1/8"	15/45	2/5	5, 10*2
ZFC3□	ø3.2, ø4	ø1/8", ø5/32"	50/80	7/10	
ZFC5□	ø4, ø6	ø5/32", ø1/4"	100/200	10/20	
ZFC7□	ø6, ø8, ø10, ø12	ø1/4", ø5/16", ø3/8"	250/450/550/650	30/70/80/100	

Air Preparation Filters

Clean Gas Filter SF



- Cartridge type allows for element replacement (SFA100/200/300, SFB100)
- Compact, disposable type for the semiconductor industry (SFB300, SFC100)

Type	Series	Operating pressure	Filtration [μm]
Cartridge type disc	SFA100/200/300	Max. 0.99 MPa (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency: 99.99%)
Cartridge type straight	SFB100	Max. 0.99 MPa (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency: 99.99%)
Disposable type straight	SFB300	Max. 0.99 MPa (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency: 99.99%)
Disposable type multiple disc	SFC100	Max. 0.99 MPa (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency: 99.99%)

Clean Gas Strainer SFB200



Type	Series	Operating pressure	Filtration [μm]
Cartridge type straight	SFB200	Max. 0.99 MPa (Vacuum: 1.3×10^{-6} kPa)	120

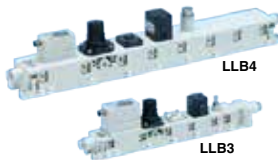
Clean Air Filter/Hollow Fiber Element SFD



- Built-in hollow fiber element
- Pressure drop: 0.03 MPa (Inlet pressure 0.7 MPa, Max. flow rate)
- Compliant with the RoHS Directives regulations regarding the reduction of environmentally detrimental chemicals

Series	Type	Operating pressure	Filtration [μm]
SFD100	Disposable type (Irreplaceable element)	Max. 1.0 MPa	0.01 (Filtration efficiency: 99.99%)
SFD200	Cartridge type (Replaceable element)	Max. 1.0 MPa	0.01 (Filtration efficiency: 99.99%)

Clean Air Module LLB



- Modularized clean equipment (Reduced piping labor/Space saving)
Makes clean air easily available
- Nominal filtration rating: 0.01 μm (Filtration efficiency: 99.99%)
- Wetted parts: Grease-free, Silicone-free
- Assembled in a clean room, Shipped and packed in double packaging
- 24 combinations are available.

*1 Inlet air conditions ISO 8573-1 Quality grade: Equivalent to 1.4.1 to 1.6.1

Series	Fluid	Set pressure	Flow range [L/min (ANR)]
LLB3	Clean air, N ₂ gas*1	0.05 to 0.4 MPa	5 to 100
LLB4	Clean air, N ₂ gas*1	0.05 to 0.4 MPa	50 to 500

Modular F.R.L./Pressure Control Equipment

Modular F.R.L.

Modular F.R.L. Units AC-A



- Easy element replacement
The element and the bowl are integrated. Replacement can be done in hand.
- Energy-saving regulator Pressure drop: Max. 50% improvement
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.
- Attachments:
Spacer: Y200-A, Y300-A, Y400-A, Y500-A
Spacer with bracket: Y200T-A, Y300T-A, Y400T-A, Y500T-A

Combination equipment	Series	Port size	Set pressure [MPa]
Air filter, Regulator, Lubricator	AC10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	0.05 to 0.7, 0.02 to 0.2
Filter regulator, Lubricator	AC10A to 40A-A		
Air filter, Regulator	AC10B to 40B-A		
Air filter, Mist separator, Regulator	AC20C to 40C-A	1/8, 1/4, 3/8, 1/2, 3/4	
Filter regulator, Mist separator	AC20D to 40D-A		

Air Filter AF-A



- Easy element replacement
The element and the bowl are integrated. Replacement can be done in hand.
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Filtration [μ m]
AF10 to 60-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1	5

Mist Separator AFM-A



- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Filtration [μ m]
AFM20 to 40-A	1/8, 1/4, 3/8, 1/2, 3/4	0.3

Micro Mist Separator AFD-A



- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Filtration [μ m]
AFD20 to 40-A	1/8, 1/4, 3/8, 1/2, 3/4	0.01

Regulator AR-A



- Energy-saving regulator Pressure drop: Max. 50% improvement

Series	Port size	Set pressure [MPa]
AR10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	0.05 to 0.7, 0.02 to 0.2

Modular F.R.L./Pressure Control Equipment

Modular F.R.L.

Lubricator AL-A



- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.
- Semi-standard specifications: 1000 cm³ tank (AL30 to AL60)

Series	Port size	Bowl capacity [cm ³]
AL10 to 60-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1	7 to 135

Filter Regulator AW-A



- Easy element replacement
The element and the bowl are integrated.
Replacement can be done in hand.
- Energy-saving regulator Pressure drop: Max. 50% improvement
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Set pressure [MPa]	Filtration [μm]
AW10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	0.05 to 0.7, 0.02 to 0.2	5

Modular F.R.L. Units AC-B



- Better visibility and environmental resistance
- Easy element replacement
The element and the bowl are integrated.
Replacement can be done in hand.
- Reduced required maintenance space: Max. 46% reduction
- Regulator: Set pressure 0.05 to 0.85 MPa, 0.02 to 0.2 MPa
- Choose from a selection of pressure gauges:
Square embedded type pressure gauge, Round type pressure gauge, Digital pressure switch

Combination equipment	Series	Port size	Set pressure [MPa]
Air filter, Regulator, Lubricator	AC20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2
Filter regulator, Lubricator	AC20A to 60A-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2
Air filter, Regulator	AC20B to 60B-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2
Air filter, Mist separator, Regulator	AC20C to 40C-B	1/8, 1/4, 3/8, 1/2, 3/4	0.05 to 0.85 0.02 to 0.2
Filter regulator, Mist separator	AC20D to 40D-B	1/8, 1/4, 3/8, 1/2, 3/4	0.05 to 0.85 0.02 to 0.2

Regulator AR-B



Series	Port size	Set pressure [MPa]
AR20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2

Regulator with Backflow Function AR□K-B



- The regulator with backflow function incorporates a mechanism that exhausts the air pressure in the outlet side quickly.

Series	Port size	Set pressure [MPa]
AR20K to 60K-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2

Modular F.R.L./Pressure Control Equipment

Modular F.R.L.

High Pressure: Made to Order **AR20 to 60-B-X425**



Stronger materials are used for the manufacturing of regulators intended for high-pressure operation. The modified construction also allows for a wider set pressure range. Refer to the AR series made to order specifications in the AC series catalog for details.

Series	Proof pressure [MPa]	Max. operating pressure [MPa]	Set pressure range [MPa]	Ambient and fluid temperatures [°C]
AR20 to 60-B-X425	3.0	2.0	0.1 to 1.7	-5 to 60 (No freezing)

Filter Regulator **AW-B**



Series	Port size	Set pressure [MPa]	Filtration [μm]
AW20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2	5

Filter Regulator with Backflow Function **AW□K-B**



- Integrated filter and regulator units save space and require less piping.
- The filter regulator with backflow function incorporates a mechanism that exhausts the air pressure in the outlet side quickly.

Series	Port size	Set pressure [MPa]	Filtration [μm]
AW20K to 60K-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	0.05 to 0.85 0.02 to 0.2	5

Filter Regulator **AW30/40-X2622**



- Stainless steel 316 and special temperature environment (-40°C) specifications
- Material of external parts: Stainless steel 316
- Ambient and fluid temperatures: -40 to 80°C
- NACE International Standards compliant

Series	Port size	Set pressure [MPa]	Filtration [μm]
AW30/40-X2622	1/4, 3/8, 1/2, 3/4	0.05 to 0.85	5

Filter Regulator: Made to Order **AW30-B to AW60-B-X430/X440**



- Special temperature environment:
Special materials are used in the manufacturing of seals and resin parts to allow them to withstand various temperature conditions in cold or tropical (hot) climates.

Series	Environment	Port size	Set pressure [MPa]	Filtration [μm]
AW30-B to AW60-B-X430	Low temperature -30 to 60°C	1/4 to 1	0.05 to 0.85 0.02 to 0.2	5
AW30-B to AW60-B-X440	High temperature -5 to 80°C			

Modular F.R.L./Pressure Control Equipment

Modular F.R.L.

Mist Separator Regulator **AWM**



Series	Port size	Set pressure [MPa]	Filtration [μm]
AWM20 to 40	1/8, 1/4, 3/8, 1/2	0.05 to 0.85	0.3

Micro Mist Separator Regulator **AWD**



Series	Port size	Set pressure [MPa]	Filtration [μm]
AWD20 to 40	1/8, 1/4, 3/8, 1/2	0.05 to 0.85	0.01

Regulators

Compact Manifold Regulator **ARM5**



- Width: 14 mm
- Select from 2 kinds of mounting methods: Direct mounting and DIN rail mounting
- Standard model comes equipped with backflow function.
- Select from a variety of One-touch fitting sizes.

Series	Model	Features	Applicable tubing bore size		Set pressure [MPa]
			Metric size	Inch size	
ARM5A	Manifold specifications	Common air supply	$\phi 4, \phi 6, \phi 8$	$\phi 5/32, \phi 1/4, \phi 5/16$	0.05 to 0.7
ARM5B	Manifold specifications	Individual air supply	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.05 to 0.7
ARM5S	Single unit specifications	Individual air supply	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.05 to 0.7

Compact Manifold Regulator **ARM10/11**



- Free selection in response to positioning conditions
Knob positions: Top/Front/Bottom
Piping directions: Up/Down
One-touch fitting types: Straight/Elbow
- Types and sizes of One-touch fittings can be changed.
- Standard model comes equipped with backflow function.
- Compatible with digital pressure switches

Series	Model	Features	Applicable tubing bore size		Set pressure [MPa]
			Metric size	Inch size	
ARM11A	Manifold specifications	Common air supply	$\phi 4$ to $\phi 10$	$\phi 5/32$ to $\phi 3/8$	0.05 to 0.7
ARM11B	Manifold specifications	Individual air supply	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.05 to 0.7
ARM10	Single unit specifications	Standard	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.05 to 0.7
ARM10F	Single unit specifications	Knob front face	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.05 to 0.7

Modular F.R.L./Pressure Control Equipment

Regulators

Regulator IR1200-A/2200-A/3200-A



- Air consumption: Bleed air "0"
- High flow rate: Up to approx. twice that of the existing SMC product
- Lightweight: Reduced by up to approx. 27% (Compared to the existing SMC product)
- Repeatability: $\pm 1\%$ (Full span)

Series	Port size	Set pressure [MPa]
IR1200-A	1/8	0.02 to 0.2
		0.02 to 0.4
		0.02 to 0.8
IR2200-A	1/4	0.02 to 0.2
		0.02 to 0.4
		0.02 to 0.8
IR3200-A	1/4, 3/8, 1/2	0.02 to 0.2
		0.02 to 0.4
		0.02 to 0.8

Precision Regulator IR1000-A/2000-A/3000-A



- Air consumption: Reduced by up to approx. 90% (Compared to the existing SMC product)
- High flow rate: Up to approx. twice that of the existing SMC product
- Lightweight: Reduced by up to approx. 27% (Compared to the existing SMC product)
- Sensitivity: 0.2% (Full span)
- Repeatability: $\pm 0.5\%$ (Full span)

Series	Port size	Set pressure [MPa]
IR1000-A	1/8	0.005 to 0.2
		0.01 to 0.4
		0.01 to 0.8
IR2000-A	1/4	0.005 to 0.2
		0.01 to 0.4
		0.01 to 0.8
IR3000-A	1/4, 3/8, 1/2	0.01 to 0.2
		0.01 to 0.4
		0.01 to 0.8

Precision Regulator IR



- Tension control
- Contact pressure control
- Setting sensitivity: Within 0.2% F.S.
- Repeatability: Within $\pm 0.5\%$ F.S.

Series	Port size	Set pressure [MPa]
IR1000	1/8	0.005 to 0.2
IR2000		0.01 to 0.4
IR3000	1/4, 3/8, 1/2	0.01 to 0.8
		0.01 to 0.2
		0.01 to 0.4
		0.01 to 0.8

Vacuum Regulator IRV



- Allows for the adjustment of vacuum line pressure
- Single-sided connection series
- Weight reduced by 20% (Compared with the existing IRV2000 with IRV20 fitting)
- Built-in One-touch fittings
- The pressure gauge and digital pressure switch can be easily attached/detached due to being attached by a clip.
- Mounting direction of the pressure gauge and digital pressure switch can be changed. (Standard connections only)
- Mounting angle of the pressure gauge and digital pressure switch can be changed easily (in 60 degree increments).

Series	Port size	Set pressure range [kPa]
IRV10	$\phi 6, \phi 8, \phi 1/4, \phi 5/16$	-100 to -1.3
IRV20	$\phi 6, \phi 8, \phi 10, \phi 1/4, \phi 5/16, \phi 3/8$	-100 to -1.3

Modular F.R.L./Pressure Control Equipment

Regulators

Clean Regulator **SRH**



- Contamination-controlled stainless steel regulator
- Oil-free
- 2 types of diaphragm materials: PTFE, Fluororubber

Series	Relief mechanism	Port size	Set pressure [MPa]
SRH	Non-relief	Rc1/8, 1/4, 3/8, 1/2 9/16-18UNF, 7/8-14UNF	Low pressure type: 0.02 to 0.2 High pressure type: 0.05 to 0.7
SRH	Relief	Rc1/8, 1/4, 3/8, 1/2	

Precision Clean Regulator **SRP**



- High-precision low flow consumption stainless steel regulator
- Bleed air flow of 0.5 L/min (ANR) or less (0.2 MPa at outlet pressure)
- Setting sensitivity: 0.3% F.S.
- Repeatability: 1% F.S.

Series	Port size	Set pressure [MPa]
SRP	M5, 1/8	Low pressure type: 0.005 to 0.2 High pressure type: 0.01 to 0.4

Clean Regulator/Fluororesin Type **SRF**



- Wetted parts Body: New PFA, Diaphragm: PTFE
- Recommended maximum flow rate: 20 L/min (SRF50), (Inlet pressure: 0.3 MPa, Fluid: Water)

Series	Type	Applicable tubing O.D.		Set pressure [MPa]
		Metric size	Inch size	
SRF	Integrated with fitting	ø4 to ø19	ø1/8 to ø3/4	0.02 to 0.4
SRF	With nut	Fitting size: 2 to 6	Fitting size: 2 to 6	0.02 to 0.4
SRF	Tube extension	—	Tubing O.D.: ø1/4 to ø3/4	0.02 to 0.4

Direct Operated Regulator for 6.0 MPa (Relieving Type) **VCHR**



- Service life: 10 million times
Improved durability in high-pressure environments using a polyurethane elastomer poppet
- Uses NSF-H1 approved grease on guide rings (sliding parts)
- Improved durability using a metal seal type relief valve
- Uses special fluororesin seals for sliding parts
Stable unattached response, Not easily affected by pressure

Series	Model	Type	Port size	Set pressure [MPa]
VCHR	VCHR30/40	Direct operated regulator (Relieving type)	G3/4, 1, 1 1/2	0.5 to 5.0 (Max. operating pressure: 6.0)

Proportional Valves

Compact Proportional Solenoid Valve **PVQ**



- Stepless control of flow rate in proportion to current
- Repeatability: 3% or less
- Hysteresis: 10% or less

Series	Flow control range [L/min]	Fluid
PVQ	0 to 5 0 to 6 0 to 75 0 to 100	Air, inert gas

Modular F.R.L./Pressure Control Equipment

Electro-Pneumatic Regulators

Electro-Pneumatic Regulator **ITV**



- Stepless control of air pressure in proportion to electrical signals
- Sensitivity: 0.2 kPa (100 kPa specification)
- Linearity: $\pm 1\%$ or less (F.S.)
- Hysteresis: 0.5% or less (F.S.)
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C

Series	Port size	Set pressure [MPa]
ITV0000	Built-in One-touch fitting $\phi 4, \phi 5/32$	0.001 to 0.1
		0.001 to 0.5 0.001 to 0.9 -1 to -100 kPa
ITV1000	1/8, 1/4	0.005 to 0.1
ITV2000	1/4, 3/8	0.005 to 0.5
ITV3000	1/4, 3/8, 1/2	0.005 to 0.9

Electronic Vacuum Regulator **ITV**



- Stepless control of vacuum pressure in proportion to electrical signals
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C

Series	Port size	Set pressure [MPa]
ITV009□	$\phi 4, \phi 5/32$ One-touch fitting	-1 to -100
ITV209□	1/4	-1.3 to -80

5.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator **ITVX**



- Stepless control of air pressure proportional to electrical signals
- Maximum supply pressure: 5.0 MPa
- Set pressure range: 0.01 to 3.0 MPa
- Maximum flow rate: 3000 L/min (ANR)
- Fluid: Air, N₂, O₂, Ar
- Wetted parts: Fluorine grease

Series	Port size	Set pressure [MPa]
ITVX	3/8	0.01 to 3.0

3.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator **ITVH**



- Maximum supply pressure: 3.0 MPa
- Set pressure range: 0.2 to 2.0 MPa
Stepless control of air pressure up to 2.0 MPa
- Stability: $\pm 1\%$ F.S. or less
- Power consumption: 3 W or less
- Maximum flow rate: 3,000 L/min (ANR)
- Wetted parts: Fluorine grease

Series	Port size	Set pressure [MPa]
ITVH	1/4, 3/8	0.2 to 2.0

■ **Trademark**
• DeviceNet™ is a trademark of ODVA.

Fittings for General Purposes

One-touch Fittings **KQ2**

Applicable tubing: Metric size



Applicable tubing: Inch size



- Can be used in vacuum to -100 kPa
- Body types: Total of 51 models
- Thread material/Surface treatment (Treated or Non-treated): 2 types
- Selectable surface treatments: Brass (No plating), Brass + Electroless nickel plating
- Applicable tubing O.D.
 - Round Type
 - Metric: $\phi 2$, $\phi 3.2$, $\phi 4$, $\phi 6$, $\phi 8$, $\phi 10$, $\phi 12$, $\phi 16$
 - Inch: $\phi 1/8"$, $\phi 5/32"$, $\phi 3/16"$, $\phi 1/4"$, $\phi 5/16"$, $\phi 3/8"$, $\phi 1/2"$
 - Oval Type
 - Metric: $\phi 3.2$, $\phi 4$, $\phi 6$
 - Inch: $\phi 1/8"$, $\phi 5/32"$, $\phi 3/16"$
- Connection thread
 - Metric: M3, M5, M6
 - R, Rc: 1/8, 1/4, 3/8, 1/2
 - G: 1/8, 1/4, 3/8, 1/2
 - NPT: 10-32UNF, 1/16, 1/8, 1/4, 3/8, 1/2
 - Uni: 1/8, 1/4, 3/8, 1/2
- Seal method
 - Sealant/Gasket seal
 - Face seal
 - Gasket seal (Uni thread)

Series	Release button shape	Size	Connection thread
KQ2	Oval type	Metric, Inch	M, R, Rc, G, NPT, Uni
KQ2	Round type	Metric, Inch	M, R, Rc, G, NPT, Uni

Metal One-touch Fittings **KQB2**



- Compact and lightweight
- Fluid temperature: -5 to 150°C
- Brass parts: Electroless nickel-plated
- Grease-free

Series	Size	Applicable tubing O.D.	Connection thread
KQB2	Metric	$\phi 3.2$, $\phi 4$, $\phi 6$, $\phi 8$, $\phi 10$, $\phi 12$, $\phi 16$	M5 R, Rc, G 1/8, 1/4, 3/8, 1/2
KQB2	Inch	$\phi 1/8"$, $\phi 5/32"$, $\phi 1/4"$, $\phi 5/16"$, $\phi 3/8"$, $\phi 1/2"$	UNF10-32 NPT1/8, 1/4, 3/8, 1/2

Insert Fittings **KF**



- Vacuum -101.3 kPa applicable
- Piping can be done without removing the nut.
- Fluid temperature: -5 to 150°C (Brass sleeve)
-5 to 60°C (Resin sleeve)
- Steam can be used.
- Grease-free

Series	Applicable tubing O.D.	Connection thread
KF	$\phi 4$, $\phi 6$, $\phi 8$, $\phi 10$, $\phi 12$	1/8, 1/4, 3/8, 1/2

Miniature Fittings **M**



- Compact and doesn't require tools for connection
- Compact piping space
- Hose nipple, Hose elbow, Barb

Series	Applicable tubing O.D.	Connection thread
M-□□-2	$\phi 2$	M3, M5
M	$\phi 3.2$, $\phi 4$, $\phi 6$	M3, M5, 1/8

Fittings and Tubing

Fittings for General Purposes

Self-align Fittings H/DL/L/LL



- Applicable for use on soft copper steel pipes
- Flared ridge metal ferrule

Series	Applicable tubing O.D.	Connection thread
H	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
DL	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
L	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
LL	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2

Fittings for General Purposes (S Couplers)

S Couplers KK130



- Cv factor: Increased by 34%*1
 - Plug insertion force: Reduced by 22% (20 N)*1
 - Lightweight: Weight reduced by 14% (12 g)*1
- *1 Compared to the existing model

Series	Applicable tubing O.D.	Connection thread [R, NPT]
KK130	ø6, ø8, ø10, ø12 ø1/4", ø5/16", ø3/8", ø1/2"	1/8, 1/4, 3/8, 1/2

Fittings for Special Environments

Stainless Steel 316 One-touch Fittings KQG2



- Compact and lightweight
 - Fluid temperature: -5 to 150°C
 - Materials: Metal parts stainless steel 316, seal parts special FKM
 - Grease-free/Can be used with steam
- Certified to meet current Food Sanitation Law standards

Series	Size	Applicable tubing O.D.	Connection thread
KQG2	Metric	ø3.2, ø4, ø6, ø8, ø10, ø12, ø16	M5 R, Rc 1/8, 1/4, 3/8, 1/2
KQG2	Inch	ø1/8", ø5/32", ø1/4", ø5/16", ø3/8", ø1/2"	UNF10-32 NPT1/8, 1/4, 3/8, 1/2

Stainless Steel One-touch Fittings KQ2-G



- Metal material: Stainless steel 303
- Improved tube insertion/removal: Insertion force reduced by up to 30%, Removal force reduced by up to 20%
- Compact and lightweight
- Dimensions: Height 24% shorter, Length 23% shorter, Weight 57% lighter
- Body types: Total of 27 models

Series	Size	Applicable tubing O.D.	Connection thread
KQ2-G	Metric	ø4, ø6, ø8, ø10, ø12, ø16	M5 R, Rc 1/8, 1/4, 3/8, 1/2

Stainless Steel One-touch Fittings KG



- Can be used in corrosive conditions
- Metal parts: Stainless steel 303

Series	Applicable tubing O.D.	Connection thread
KG	ø4, ø6, ø8, ø10, ø12, ø16	M5 x 0.8, M6 x 1.0 1/8, 1/4, 3/8, 1/2

Fittings and Tubing

Fittings for Special Environments

Stainless Steel 316 Insert Fittings **KFG2**



- Compact and lightweight
- Fluid temperature: -65 to 260°C (Swivel elbow: -5 to 150°C)
- Material: Stainless steel 316
Rubber materials are not used. (Excluding the swivel elbow)
- Grease-free/Can be used with steam
Certified to meet current Food Sanitation Law standards

Series	Size	Applicable tubing O.D.	Connection thread
KFG2	Metric	ø4, ø6, ø8, ø10, ø12, ø16	R, Rc 1/8, 1/4, 3/8, 1/2
KFG2	Inch	ø1/8", ø5/32", ø1/4", ø5/16" ø3/8", ø1/2"	NPT1/8, 1/4, 3/8, 1/2

Miniature Fittings Stainless Steel 316 **MS**



- Can be used in corrosive conditions
- Compact piping space
- Hose nipple, Hose elbow, Barb

Series	Applicable tubing O.D.	Connection thread
MS	ø3.2, ø4, ø6	M5

S Couplers Stainless Steel Type **KKA**



- Body material: Stainless steel 304
- Seal material: Fluoropolymer (Special FKM) is employed.
- Grease-free
- Check valve built in to both plug and socket

Series	Connection thread
KKA	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2

Fittings for Special Environments (Clean/Fluoropolymer)

Clean One-touch Fittings for Blowing **KP**



- One-touch fittings for clean room blowing systems
- Completely oil-free (Fluoro-coated rubber portions)
- Wetted parts are non-metallic.
- Parts washed and assembled in a clean room, Packed in double packaging.
- Can be used in a vacuum (-100 kPa)

Series	Applicable tubing O.D.	Connection thread
KP	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2

Clean One-touch Fittings for Driving Air Piping **KPQ/KPG**



- One-touch fittings suitable for driveline systems in clean room environments
- Resin parts: Polypropylene
- All metal portions: Brass (Electroless nickel-plated) KPQ
Stainless steel (Stainless steel 304) KPG

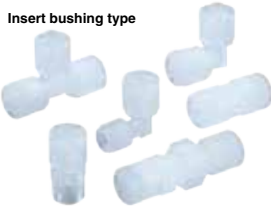
Series	Applicable tubing O.D.	Connection thread
KPQ	ø4, ø6, ø8, ø10, ø12	M5, 1/8, 1/4, 3/8, 1/2
KPG	ø4, ø6, ø8, ø10, ø12	M5, 1/8, 1/4, 3/8, 1/2

Fittings and Tubing

Fittings for Special Environments (Clean/Fluoropolymer)

Fluoropolymer Fittings Hyper Fittings LQ1

Insert bushing type



- Material: New PFA
- Quadruple-seal construction
- The reducer method allows for tubing size changes without replacing the body

Series	Max. operating pressure	Operating temperature
LQ1	1.0 MPa	0 to 200°C

Fluoropolymer Fittings Hyper Fittings LQ3

Flare type



- Material: New PFA
- Triple-seal construction
- Easy installation

Series	Max. operating pressure	Operating temperature
LQ3	1.0 MPa	Nut material PVDF: 0 to 150°C Nut material PFA: 0 to 200°C

Fluoropolymer Bore Through Connector LQHB



- It is possible to freely choose the tube positioning. As the tube runs through the fitting itself, a setting is available for any desired position.
- Can be used in the pressure feed of chemicals, etc., during the production process of semiconductors
- Applicable to chemicals such as acid, alkali, and deionized water
- Materials: New PFA (Body, nut), PTFE (Collet)

Series	Applicable tubing O.D.		Operating temperature [°C]
	Metric size	Inch size	
LQHB	ø3 to ø25	ø1/8" to ø1"	0 to 200

Tubing

Nylon Tubing T



- General pneumatic tubing
- Max. operating pressure: 3.0 MPa (T0604, at 20°C)

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
T/TIA	ø4, ø6, ø8, ø10 ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green	Air, Water

Soft Nylon Tubing TS



- Max. operating pressure: 1.0 MPa (at 20°C)

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
TS/TISA	ø4, ø6, ø8, ø10 ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green	Air, Water

Tubing

Polyurethane Tubing TU



- Max. operating pressure: 0.8 MPa (at 20°C)

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
TU/TIUB	ø2, ø4, ø6, ø8 ø10, ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green, Clear, Orange, and more (Total 29 colors)	Air, Water

Soft Polyurethane Tubing TUS



- Max. operating pressure: 0.6 MPa (at 20°C)

Series	Tubing O.D.	Color	Fluid
TUS	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green, Translucent, Yellow-brown	Air

Hard Polyurethane Tubing TUH



- Superior restoring force compared to the nylon tubing

Series	Type	Max. operating pressure	Tubing O.D.	Color	Fluid
TUH	Standard type	0.8 MPa (at 20°C)	ø4, ø6, ø8	Black, White, Blue, Translucent	Air
TUH	High-pressure type	1.0 MPa (at 20°C)	ø10, ø12	Black, White, Blue, Translucent	Air

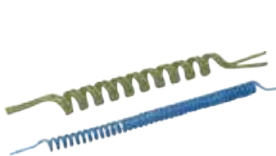
Wear Resistant Tubing TUZ



- Abrasion: Approx. 1/3 (Compared with SMC's TU series polyurethane tubing)

Series	Tubing O.D.		Color	Fluid
	Metric size			
TUZ	ø2, ø3.2, ø4, ø6, ø8 ø10, ø12, ø16		Black, White, Red, Blue, Yellow, Green	Air, Water

Polyurethane Coil Tubing TCU



- Flexible
 - Max. operating pressure: 0.8 MPa (at 20°C)
 - For moving applications
- * Colors other than black are available as made-to-order specifications.

Series	Tubing O.D.	Color	Number of cores	Fluid
TCU	ø4, ø6, ø8	Black	1, 2, 3	Air

Fittings and Tubing

Tubing

Polyurethane Flat Tubing **TFU**



- Max. operating pressure: 0.8 MPa (at 20°C)
- Compact piping

Series	Tubing O.D.	Color	Number of cores	Fluid
TFU	ø4, ø6, ø8	Black	2, 3	Air

Compatible with Food Sanitation Law: Polyurethane Tubing **TU-X217**



- In compliance with the Food Sanitation Law
Testing in compliance with Japan's Food Sanitation Law based on the 370th notice given by the Ministry of Health and Welfare in 1959

Series	Tubing O.D.	Color	Fluid
TU-X217	ø4, ø6, ø8, ø10, ø12	Black, White, Blue, Clear	Air, Water

Tubing (Fluoropolymer/Clean)

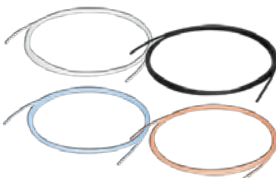
Fluoropolymer Tubing **TL/TIL**



- Max. operating pressure: 1.0 MPa (at 20°C)
- Max. operating temperature: 260°C (This may vary according to operating pressure.)

Series	Tubing O.D.		Color
	Metric size	Inch size	
TL/TIL	ø4, ø6, ø8, ø10 ø12, ø19	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2", ø3/4", ø1"	Translucent

Fluoropolymer Tubing (PFA) **TLM/TILM**



- Max. operating temperature: 260°C (This may vary according to operating pressure.)
- Food Sanitation Law compliant
- Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test

Series	Tubing O.D.		Color
	Metric size	Inch size	
TLM/TILM	ø2, ø3, ø4, ø6, ø8, ø10 ø12, ø16, ø19, ø25	ø1/8", ø3/16", ø1/4", ø3/8" ø1/2", ø3/4", ø1", ø1 1/4"	Translucent, Black, Red, Blue

FEP Tubing (Fluoropolymer) **TH/THI**



- Max. operating pressure: 2.3 MPa (at 20°C)*1
 - Food Sanitation Law compliant
 - Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test
 - Max. operating temperature: 200°C (This may vary according to operating pressure.)
- *1 This may vary according to size.

Series	Tubing O.D.		Color
	Metric size	Inch size	
TH/THI	ø4, ø6, ø8, ø10, ø12	ø1/8", ø3/16", ø1/4", ø3/8", ø1/2", ø3/4"	Translucent, Black, Red, Blue

Fittings and Tubing

Tubing (Fluoropolymer/Clean)

Soft Fluoropolymer Tubing TD/TID



- Max. operating pressure: 1.6 MPa (at 20°C)*1
 - Food Sanitation Law compliant
 - Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test
 - Max. operating temperature: 260°C (This may vary according to operating pressure.)
- *1 This may vary according to size.

Series	Tubing O.D.		Color
	Metric size	Inch size	
TD/TID	ø4, ø6, ø8, ø10, ø12	ø1/8", ø3/16", ø1/4", ø3/8", ø1/2"	Translucent

Clean Series Tubing 10-T□

Polyurethane Tubing 10-TU



- Flexible tubing 0.8 MPa max. (at 20°C)
- *1 Only black and blue are available for the inch size.

Series	Tubing O.D.		Color*1
	Metric size	Inch size	
10-TU	ø4, ø6, ø8, ø10, ø12	ø1/8"	Black, White, Red, Blue, Yellow, Green, Clear, Orange

Polyurethane Coil Tubing 10-TCU



- Flexible for moving applications

Series	Tubing O.D.	Color	Number of cores
10-TCU	ø4, ø6, ø8	Black	1, 2, 3

Polyurethane Flat Tubing 10-TFU



- Flexible multi-core tubing

Series	Tubing O.D.	Color	Number of cores
10-TFU	ø4, ø6, ø8	Black	2, 3

Polyolefin Tubing TPH



- Max. operating pressure (at 20°C): 1.0 MPa (ø4, ø6), 0.7 MPa (ø8, ø10, ø12)

Series	Applicable tubing O.D.	Color	Fluid
TPH	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	Air, Water, etc.

Soft Polyolefin Tubing TPS



- Max. operating pressure (at 20°C): 0.7 MPa (ø4 to ø12)

Series	Applicable tubing O.D.	Color	Fluid
TPS	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	Air, Water, etc.

Flow Control Equipment

Speed Controllers for General Purposes

Elbow Type/Universal Type/Push-lock Type AS



- Easy to lock push-lock type
 - Larger knob
 - Improved tube insertion/removal
Insertion force: Max. 30% (8 N) reduction
Removal force: Max. 20% (5 N) reduction*1
 - Electroless nickel plated type is standard.
 - 360° swivel piping is possible. (Universal type)
 - Available with a restrictor (Made to order: -X214, -X21)
- *1 Tube removal strength is ensured to be equivalent to the previous model.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type	AS12□1F to 42□1F	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to ø1/2"
Universal type	AS13□1F to 43□1F	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controller with Indicator AS-FS



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Improved reproducibility of flow rate
- Easier to insert and remove tubes
- Electroless nickel plated type is standard.
- Available with a restrictor (Made to order: -X214, -X21)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type	AS12□1FS to 42□1FS	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to 1/2"
Universal type	AS13□1FS to 43□1FS	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to 1/2"

In-line Type AS



- Reduces labor time
Easy to use push-lock type
Knob O.D.: Almost doubled
- Improved reproducibility of flow rate
- Lightweight: Weight reduced by approx. 27%
- Electroless nickel plated type is standard.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AS2002F to AS4002F	—	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controller with Indicator/In-line Type AS-FS



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. Flow rate can be controlled numerically with the indicator window.
4 indicator window directions are available.
- Larger push-lock type knob
- Improved reproducibility of flow rate
- Electroless nickel plated type is standard.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AS1002FS to AS4002FS	—	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controllers for General Purposes

Uni Elbow Type/Universal Type/Push-lock Type **AS**



- Easy to lock push-lock type
 - Larger knob
 - Improved tube insertion/removal
Insertion force: Max. 30% (8 N) reduction
Removal force: Max. 20% (5 N) reduction*1
 - Electroless nickel plated type is standard.
 - 360° swivel piping is possible. (Universal type)
- *1 Tube removal strength is ensured to be equivalent to the previous model.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Uni thread	AS22□1F to 42□1F	Uni 1/8 to 1/2	ø3.2 to ø16	ø1/8" to ø1/2"
Universal type Uni thread	AS23□1F to 43□1F	Uni 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controller with Indicator/Uni Thread Type **AS-FS**



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Improved reproducibility of flow rate
- Easier to insert and remove tubes
- Electroless nickel plated type is standard.
- Larger push-lock type knob

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Uni thread	AS22□1FS to 42□1FS	Uni 1/8 to 1/2	ø3.2 to ø16	ø1/8" to 1/2"

Dual Speed Controller **ASD**



- Enables bi-directional flow control with a speed controller (Meter-in and meter-out)
- Prevents cylinders from lurching
- Speed control of single acting cylinders

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Dual speed controller	ASD	M5 to 1/2	ø4 to ø12	ø1/8" to ø3/8"

Speed Controllers for Special Environments

Stainless Steel: Elbow Type/Universal Type/Push-lock Type

AS-FG



- Stainless steel type
 - Easy to lock push-lock type
 - Larger knob
 - Improved tube insertion/removal
Insertion force: Max. 30% (8 N) reduction
Removal force: Max. 20% (5 N) reduction*1
 - 360° swivel piping is possible. (Universal type)
 - Available with a restrictor (Made to order: -X214, -X21)
- *1 Tube removal strength is ensured to be equivalent to the previous model.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Stainless steel type	AS12□1FG to 42□1FG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to ø1/2"
Universal type Stainless steel type	AS13□1FG to 43□1FG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Stainless Steel Type Speed Controller with Indicator AS-FSG



- Stainless steel type
- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Larger push-lock type knob
- Improved reproducibility of flow rate
- Easier to insert and remove tubes
- Available with a restrictor (Made to order: -X214, -X21)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Stainless steel type	AS12□1FSG to 42□1FSG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to 1/2"
Universal type Stainless steel type	AS13□1FSG to 43□1FSG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to 1/2"

Stainless Steel Type/In-line Type AS-FG



- Stainless steel type
- Reduces flow setting time
Easy to use push-lock type
Knob O.D.: Almost doubled
- Improved reproducibility of flow rate
- Lightweight: Weight reduced by approx. 27%

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type Stainless steel type	AS2002FG to AS4002FG	—	ø3.2 to ø12	ø1/8" to ø1/2"

Stainless Steel Type Speed Controller with Indicator/In-line Type

AS-FSG



- Stainless steel type
- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. Flow rate can be controlled numerically with the indicator window. 4 indicator window directions are available.
- Larger push-lock type knob
- Improved reproducibility of flow rate

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type Stainless steel type	AS1002FSG to AS4002FSG	—	ø3.2 to ø12	ø1/8" to ø1/2"

Flow Control Equipment

Speed Controllers for Special Environments

Stainless Steel Speed Controller (Elbow Type) **ASG**



- Material: Stainless steel 316
- Seal: Special FKM
- Seat ring: Stainless steel 303
- Applicable tubing materials: FEP, PFA, Nylon, Soft nylon, Polyurethane, Polyolefin

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	ASG	M5 to 1/2	ø4 to ø12

Clean Speed Controller with One-touch Fitting **AS-FPQ/FPG**



- Low particle generation type speed controller suitable for use in clean rooms
- AS-FPQ: Electroless nickel-plated brass
- AS-FPG: Stainless steel 304
- AS-FPQ, AS-FPG: Polypropylene resin (Resin parts)

Series	Port size	Applicable tubing O.D.
AS-FPQ	M5 x 0.8, R1/8, 1/4, 3/8, 1/2	ø4 to ø12
AS-FPG	M5 x 0.8, R1/8, 1/4, 3/8, 1/2	ø4 to ø12

Speed Controllers with Special Functions

Speed Controller with Pilot Check Valve **ASP**



- Integrated pilot check valve and speed controller
- Realizes momentary intermediate stoppage of a cylinder and is able to adjust its speed

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Speed controller with pilot check valve	ASP	1/8 to 1/2	ø6 to ø12	ø1/4" to ø1/2"

Air Saving Speed Controllers

Air Saving Speed Controller **AS-R/AS-Q**



- Reduce air consumption just by mounting to an air cylinder.
- Air consumption reduced by 25%
- Mounting and operation are the same as regular speed controller.
- Equal response time
- Compact: 85% reduction
- No delay of response time with 2-pressure control
- The functions of the regulator and speed controller have been integrated.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type With pressure reduction function	AS22R to AS42R	R, NPT, G 1/8 to 1/2	ø6 to ø12	ø1/4" to ø1/2"
Elbow type With rapid supply and exhaust function	AS22Q to AS42Q	R, NPT, G 1/4 to 1/2	ø6 to ø12	ø1/4" to ø1/2"

Flow Control Equipment/Silencers

Related Equipment

Restrictor **AS-X214/AS-X21**



- Restrictor (Without check valve): -X214
- Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve): -X21
- Speed controller without check valve specifications
External dimensions, specifications, etc., are the same as those of each respective speed controller.

Check Valve **AK**



Type	Series	Port size	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AK2000/AK4000 AK6000	1/8 to 1	—	—
Straight type	AKH	—	ø4 to ø12	ø5/32" to ø1/2"
Male connector type	AKH	M5 to 1/2	ø4 to ø12	ø5/32" to ø1/2"
Bushing type	AKB	1/8 to 1/2	—	—
Made to order for air/water	<ul style="list-style-type: none"> · Body materials: Brass, Stainless steel · Rubber materials: NBR, FKM, CR · High temperature, low temperature · Low cracking 	1/8 to 1/2	—	—

725 psi (5.0 MPa) Check Valve **VCHC40**



- Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet

Type	Series	Port size	Operating pressure
725 psi (5.0 MPa)	VCHC40	3/4, 1	7.25 to 725 psi (0.05 to 5.0 MPa)

Silencers

Silencers

AN



Series	Features
AN05 to 40	<ul style="list-style-type: none"> • Compact and lightweight • Noise reduction: 30 dB (A)
AN10 to 30-C	<ul style="list-style-type: none"> • Can connect with One-touch fitting directly • Noise reduction: 30 dB (A)

Silencer/BC Sintered Body Type

AN



Series	Features
AN	<ul style="list-style-type: none"> • BC sintered body type • Noise reduction: 13, 16, 18, 21 dB (A)

5.0 MPa Silencer

VCHN



- Reduces clogging with its double-layer structure
- Noise reduction: 35 dB (A)

Exhaust Cleaners/Blow Guns

Exhaust Cleaners

Exhaust Cleaner for Clean Room **AMP**



- An exhaust cleaner that can be used inside a clean room

Series	Filtration [μm]	Maximum flow capacity [L/min (ANR)]	Port size
AMP	0.01 (Filtration efficiency: 95%)	200 to 1000	1/4, 3/8, 1/2, 3/4

Clean Exhaust Filter **SFE**



- This filter enables the direct exhaust of air in a clean room. (Cleanliness class 4: ISO14644-1)
Air can be directly exhausted in a clean room by simply mounting this product to the pneumatic equipment in the clean room.
- Piping for exhaust air and relief air is not required. Reduces piping installation work and space
- Noise reduction: 30 dB (A) or more
- One-touch fitting type is available.

Series	Filtration [μm]	Maximum flow capacity [L/min (ANR)]	Port size
SFE	0.01 (Filtration efficiency: 99.99%)	3, 30, 65, 130, 200	M5 x 0.8, R1/8, R1/4 $\phi 4, \phi 6, \phi 8, \phi 10$

Blow Guns

Blow Gun **VMG**



- A 20% reduction in power consumption can be achieved with the SMC "Blow gun" + "S coupler" + "Coil tube."
- Pressure loss: 1% or less (Nozzle size: $\phi 2.5$)
- Available nozzles:
Male thread nozzle, High efficiency nozzle with male thread, Low noise nozzle with male thread, Copper extension nozzle

Series	Port size	Operating pressure range [MPa]	Effective area [mm^2]	Nozzle port size
VMG	Rc, NPT, G 1/4, 3/8	0 to 1.0	30	Rc1/4

Nozzles for Blowing **KN**



Series	Type	Nozzle size
KN	Nozzle with male thread	$\phi 1$ to $\phi 8$
	High efficiency nozzle	$\phi 1$ to $\phi 2$
	Low noise nozzle with male thread	$\phi 0.75 \times 4$ to $\phi 1.1 \times 8$
	Copper extension nozzle	$\phi 1.5$ to $\phi 3$
	Pivoting nozzle	$\phi 4, \phi 6$
	Nozzle with self-align fitting	$\phi 1$ to $\phi 6$
	Nozzle for One-touch fitting	$\phi 1$ to $\phi 3$

Electronic Pressure Switches/Sensors (Self-contained Type)

3-Screen Display High-Precision Digital Pressure Switch ZSE20□(F)/ISE20□



- Visualization of setting items
 - Simple 3-step setting
 - Easy screen switching
 - Delay time: Fastest 1.5 ms or less
 - Current consumption: 25 mA or less (ZSE20/ISE20), 35 mA or less (Others)
- Setting is possible while checking the measured value.

Series	Output type	Type	Rated pressure range	Enclosure	Applicable fluid
ZSE20(F) ISE20	1 output	Compound pressure Vacuum pressure Positive pressure	-100.0 to 100.0 kPa 0.0 to -101.0 kPa -0.100 to 1.000 MPa	IP40	Air
ZSE20A(F) ISE20A	2 outputs Analog output (Voltage/Current)	Compound pressure Vacuum pressure Positive pressure	-100.0 to 100.0 kPa 0.0 to -101.0 kPa -0.100 to 1.000 MPa	IP40	Air
ZSE20B(F) ISE20B	2 outputs Analog output (Voltage/Current)	Compound pressure Vacuum pressure Positive pressure	-100.0 to 100.0 kPa 0.0 to -101.0 kPa -0.100 to 1.000 MPa	IP65	Air
ZSE20C(F) ISE20C(H)	2 outputs Analog output (Voltage/Current)	Compound pressure Vacuum pressure Positive pressure	-100.0 to 100.0 kPa 0.0 to -101.0 kPa -0.100 to 1.000 MPa -0.100 to 2.000 MPa	IP65	General fluids

Compact Digital Pressure Switch ZSE10(F)/ISE10



- Low profile: 9.8 mm
- Vertical mounting space reduced to approx. 1/2 (Compared to the ZSE/ISE30A series)
- Simultaneous copying is possible for a maximum of 10 units.
- 3-step setting

Series	Type	Rated pressure range
ZSE10F	Compound pressure	-100.0 to 100 kPa
ZSE10	Vacuum pressure	0.0 to -101.0 kPa
ISE10	Positive pressure	-0.100 to 1.000 MPa

3-Screen Display High-Precision Digital Pressure Switch ISE7□/7□G



- It is possible to change the settings while checking the measured value.
- IO-Link
- Angled display
Good visibility from various mounting positions
- Rotating display
Display rotates 336 degrees after installation.
- Applicable fluids: Air, Non-corrosive gas, Non-flammable gas

Series	Type	Rated pressure range
ISE70	Positive pressure (For air)	0 to 1 MPa
ISE71	Positive pressure (For air)	0 to 1.6 MPa
ISE70G	Positive pressure (For general fluids)	0 to 1 MPa
ISE75G	Positive pressure (For general fluids)	0 to 2 MPa
ISE76G	Positive pressure (For general fluids)	0 to 5 MPa
ISE77G	Positive pressure (For general fluids)	0 to 10 MPa

3-Color Display Digital Gap Checker ISA3



- Check at a glance to see if a workpiece is placed or not.
- The clearance distance between the detection surface and the workpiece can be found intuitively.
- Simple setting: Change the settings while checking the displayed value.
- Energy saving: Air consumption reduced by 60%
- Improved drainage resistance: 10 times or more

Series	Rated distance range	Piping specifications: Supply side	Piping specifications: Detection side
ISA3-F	0.01 to 0.03 mm	Rc, G 1/8	ø4, ø6 One-touch fitting, G 1/8
ISA3-G	0.02 to 0.15 mm	Rc, G 1/8	ø4, ø6 One-touch fitting, G 1/8
ISA3-H	0.05 to 0.30 mm	Rc, G 1/8	ø4, ø6 One-touch fitting, G 1/8

Electronic Pressure Switches/Sensors (Remote Type)

Compact Pneumatic Pressure Sensor PSE53□



- Connector type
- Analog output (Voltage)

Series	Type	Rated pressure range
PSE531	Vacuum pressure	0 to -101 kPa
PSE533	Compound pressure	-101 to 101 kPa
PSE532	Positive pressure	0 to 101 kPa
PSE530	Positive pressure	0 to 1 MPa

Compact Pneumatic Pressure Sensor PSE54□



- Analog output (Voltage)

Series	Type	Rated pressure range
PSE541	Vacuum pressure	0 to -101 kPa
PSE543	Compound pressure	-100 to 100 kPa
PSE540	Positive pressure	0 to 1 MPa

Low Differential Pressure Sensor PSE550



- Suitable for applications such as air current volume maintenance, filter blockage, and liquid surface detection.
- Analog output (Voltage/Current)

Series	Type	Rated differential pressure range
PSE550	Vacuum pressure	0 to 2 kPa

Pressure Sensor for General Fluids PSE56□



- Wetted parts: Stainless steel 316L
- IP65
- Suitable for a wide variety of fluids
- Analog output (Voltage/Current)
- Low leakage
- Select from a face seal or compression fitting.

Series	Type	Rated pressure range
PSE561	Vacuum pressure	0 to -101 kPa
PSE563	Compound pressure	-100 to 100 kPa
PSE564	Positive pressure	0 to 500 kPa
PSE560	Positive pressure	0 to 1 MPa

Pressure Sensor for General Fluids PSE57□



- Withstand voltage: 500 VAC
- Enclosure: IP65
- Materials of parts in contact with fluid
Piping port: C3604 + Nickel plating
Pressure sensor: Al₂O₃ (Alumina 96%)
O-ring: FKM + Grease (PSE570/573/574)
Square ring: FKM (PSE575/576/577)

Series	Type	Rated pressure range	Proof pressure
PSE570	Positive pressure	0 to 1 MPa	3.0 MPa
PSE573	Compound pressure	-100 to 100 kPa	600 kPa
PSE574	Positive pressure	0 to 500 kPa	1.5 MPa
PSE575	Positive pressure	0 to 2 MPa	5.0 MPa
PSE576	Positive pressure	0 to 5 MPa	12.5 MPa
PSE577	Positive pressure	0 to 10 MPa	30 MPa

Electronic Pressure Switches/Sensors (Remote Type)

Multi-Channel Digital Pressure Sensor Controller **PSE200**



- 4 sensors can be connected.
- Applicable sensors: PSE53□, 54□, 56□, 570, 573
- A single controller can be used to monitor various applications.
- 4 inputs, 5 outputs

Series	Set pressure range
PSE200	-101 to 101 kPa
	10 to -101 kPa
	-10 to 101 kPa
	-0.1 to 1 MPa

2-Color Display Digital Pressure Sensor Controller **PSE300**



- Applicable sensors: PSE53□, 54□, 550, 56□, 570, 573, 574
- Compatible with voltage input and current input
- Response time: 1 ms
- Space saving, Capable of vertical and horizontal contact mounting
- Panel mounting, Bracket mounting, DIN rail mounting

Series	Set pressure range
PSE300	-101 to 101 kPa
	10 to -101 kPa
	-10 to 100 kPa
	-0.1 to 1 MPa
	-50 to 500 kPa
	-0.2 to 2 kPa

3-Screen Display Sensor Monitor **PSE300AC**



- It is possible to change the settings while checking the measured value.
- Visualization of settings
- NPN/PNP switch function
- Input range selection (for pressure/flow rate)
- Simple 3-step setting

Series	Set pressure range	Applicable pressure sensor
PSE300AC	-0.2 to 2.1 kPa	PSE550
	10 to -105 kPa	PSE531/PSE541/PSE561
	-105 to 105 kPa	PSE533/PSE543/PSE563/PSE573
	-10 to 105 kPa	PSE532
	-50 to 525 kPa	PSE564/PSE574
	-0.105 to 1.05 MPa	PSE530/PSE540/PSE560/PSE570
	-0.105 to 2.1 MPa	PSE575
	-0.1 to 5.25 MPa	PSE576
	-0.1 to 10.5 MPa	PSE577

Electronic Flow Switches/Sensors

2-Color Display Digital Flow Switch **PFM**



- Dry air, N₂, Ar, CO₂
- Grease-free
- Integrated flow adjustment valve
- Compact, Lightweight, Space saving

Series	Rated flow range [L/min]
PFM	0.2 to 10 (0.2 to 5)
	0.5 to 25 (0.5 to 12.5)
	1 to 50 (1 to 25)
	2 to 100 (2 to 50)
	(): For CO ₂

Electronic Flow Switches/Sensors

2-Color Display Digital Flow Switch **PFMB**



- Dry air, N₂
- Grease-free
- Integrated flow adjustment valve
- Compact, Space saving

Series	Rated flow range [L/min]
PFMB	2 to 200
	5 to 500
	10 to 1000
	20 to 2000

2-Color Display Digital Flow Switch/Low Particle Generation **PFM7/PFMB7-X300**



- Low particle generation
Flow control of a clean air blow in clean room environments
- Metal material of parts in contact with fluid: Stainless steel 304

Series	Rated flow range [L/min]
PFM7-X300	0.2 to 10 (0.2 to 5)
	0.5 to 25 (0.5 to 12.5)
	1 to 50 (1 to 25)
	2 to 100 (2 to 50)
(): For CO ₂	
PFMB7-X300	2 to 200

3-Color Display Digital Flow Switch **PFMC**



- Dry air, N₂
- 3-color/2-screen display
- Expanded flow range: Wide range of flow measurement with one product
- Compact, Space saving

Series	Rated flow range [L/min]
PFMC	5 to 500
	10 to 1000
	20 to 2000

3-Color Display Digital Flow Switch for Large Flow **PF3A7□H**



- Applicable fluid: Air, N₂
- Flow range: Max. 12000 L/min
- Flow ratio 100:1
Wide range of flow measurement with one product
- Improved drainage and resistance to foreign matter
- Pressure loss: 75% reduction (20 kPa → 5 kPa)
- Through bore construction

Series	Rated flow range [L/min]
PF3A7□H	30 to 3000
	60 to 6000
	120 to 12000

3-Screen Display Digital Flow Monitor **PFG300**



- Can measure up to 12,000 L/min
- While checking the measured value, settings are possible.
- Current consumption: 25 mA or less
- NPN/PNP switch function
- Input range selection (for pressure/flow rate)
- Simple 3-step setting

Series	Applicable flow switch
PFG300	PFMB, PFMC, PF3A7□H

Electronic Flow Switches/Sensors

Flow Sensor PFMV



- Suction verification of very small workpieces
- Repeatability: $\pm 2\%$ F.S.
- Response speed: 5 ms or less, Withstand pressure: 500 kPa
- Grease-free, RoHS compliant
- Only 1 voltage monitor is required to cover the complete range.
- Related equipment: Suction filter ZFC050 series

Series	Rated flow range [L/min]
PFMV	0 to 0.5
	0 to 1
	0 to 3
	-0.5 to 0.5
	-1 to 1
	-3 to 3

Digital Flow Switch for Air PF2A



- An integrated type and a separate monitor type are available.
- Switch output, Accumulated pulse output, Analog output
- Capable of switching back and forth between cumulative and instantaneous flow
- IP65
- 4-channel flow monitor
- 4 different flow ranges can be connected to 1 controller.

Series	Rated flow range [L/min]
PF2A	1 to 10
	5 to 50
	10 to 100
	20 to 200
	50 to 500

3-Color Display Digital Flow Switch for Water PF3W



- 3-color/2-screen display
- Integrated temperature sensor
- 40% smaller than the existing product
- IP65 compliant, Non-grease type
- Fluid temperature: 0 to 90°C

Series	Rated flow range [L/min]
PF3W	0.5 to 4
	2 to 16
	5 to 40
	10 to 100
	50 to 250
PF3W Manifold	up to 10 stations

3-Color Display Digital Flow Switch for PVC Piping PF3W



- Applicable fluids: Deionized water, chemical liquids, etc.
- 3-color/2-screen display
- IP65 compliant, Non-grease type
- Fluid temperature: 0 to 70°C
- PVC pipe O.D.: 25A, 30A

Series	Rated flow range [L/min]
PF3W	10 to 100
	30 to 250

Electronic Flow Switches/Sensors

3-Color Display Electromagnetic Type Digital Flow Switch LFE□



- Applicable fluids: Water, Water-soluble coolant
- Compact, Lightweight
56 mm x 40 mm x 90 mm (H x W x D)
Weight: 340 g (LFE1□3)
- Pressure loss: 0.02 MPa or less
- Close proximity setting allows for space saving.
- Reverse flow can be detected.
- Operating fluid temperature: 0 to 85°C
- Current consumption: 45 mA

Series	Rated flow range [L/min]
LFE□	0.5 to 20
	2.5 to 100
	5 to 200

Digital Flow Switch for Deionized Water and Chemical Liquids PF2D



- Body sensor: New PFA, Tube: Super PFA
- Low particle generation, Excellent flow-through characteristics
- 4-channel flow monitor
4 different flow ranges can be connected to 1 controller.

Series	Rated flow range [L/min]
PF2D	0.4 to 4
	1.8 to 20
	4.0 to 40

Controllers

Flow Controller for Water FC2W-X110



- Automatically adjusts the flow rate
- Flow rate control accuracy: $\pm 5\%$ F.S.
- Response time: 10 s or less
- Grease-free

Series	Flow rate control range [L/min]	Set flow rate range [L/min]
FC2W-X110	0.5 to 4.0	0.4 to 4.2
	2.0 to 16.0	1.6 to 16.8

Ionizers/Static Neutralization Equipment

Ionizers/Static Neutralization Equipment

Ionizer/Bar Type IZS40/41/42



- Potential amplitude of 25 V or less with the dual AC type (At an installation height of 300 mm)
- Rapid neutralization of static electricity by a feedback sensor
- Reduction of adjustment and maintenance labor by an auto balance sensor
- Simple operation: Can be controlled by powering the ionizer ON (Standard type)
- Setting ionizer with remote controller
- Transition wiring may be used.
- High speed static neutralization cartridges and energy saving static neutralization cartridges are available.

Series	Type	Ion generation method	Offset voltage (Ion balance)
IZS42	Dual AC type	Corona discharge type	±30 V
IZS41	Feedback sensor type	Corona discharge type	±30 V
IZS40	Standard type	Corona discharge type	±30 V

Separate Controller Bar Type Ionizer IZT40/41/42



- The controller and high-voltage power supply module can be mounted separately.
- Space saving: Height 37 mm x Width 30 mm
- One controller can control a maximum of 4 ionizers.
- Potential amplitude: 25 V or less
- Rapid neutralization of static electricity: Max. speed of 0.1 s

Series	Type	Ion generation method	Offset voltage (Ion balance)
IZT42	Dual AC type	Corona discharge type	Within ±30 V
IZT41	AC type	Corona discharge type	Within ±30 V
IZT40	Standard type	Corona discharge type	Within ±30 V

Nozzle Type Ionizer IZN10E



- Slim: 16 mm (Thickness) x 100 mm (Width) x 46 mm (Height)
- Lightweight: 33% reduction (120 g → 80 g)
- Offset voltage: ±10 V
- Nozzle type can be selected according to the application.
Energy-saving static neutralization nozzle (Short range static neutralization)
High flow rate nozzle (Long range static neutralization)

Series	Ion generation method	Offset voltage (Ion balance)
IZN10E	Corona discharge type	Energy saving static neutralization nozzle: Within ±10 V High flow rate nozzle: Within ±15 V

Fan Type Ionizer IZF



- Thinnest: 40 mm thick
- Fastest: Rapid static neutralization 0.5 seconds
- Offset voltage (Ion balance): ±5 V
- Stable static neutralization performance, Easier maintenance

Series	Maximum air flow	Ion generation method	Offset voltage (Ion balance)
IZF10	0.46 m ³ /min, 0.66 m ³ /min, 0.80 m ³ /min	Corona discharge type	±13 V
IZF21	1.8 m ³ /min	Corona discharge type	±5 V
IZF31	4.4 m ³ /min	Corona discharge type	±5 V

Ionizers/Static Neutralization Equipment

Ionizers/Static Neutralization Equipment

Desktop Duster Box ZVB



- Static neutralization, dust removal, and dust collection processes have been integrated into one box.
- Supports workpieces of various sizes:
Electronic components, lenses, smartphones, lamp covers, cosmetic cases, parts for home appliances
- Static neutralization and dust removal efficiency have been improved by separation from the ion blow and air blow structure.

Series	Size	Ion generation method	Offset voltage
ZVB20	A4	Corona discharge type	Within ± 10 V (Static neutralization distance: 100 mm from the nozzle)
ZVB40	A3	Corona discharge type	Within ± 10 V (Static neutralization distance: 100 mm from the nozzle)

Electrostatic Sensor IZD10



- Detects the electrostatic potential and outputs in an analog voltage

Series	Potential measurement	Output voltage	Effective detection distance
IZD10-110	± 0.4 kV (Detected at a 25 mm distance)	1 to 5 V	10 to 50 mm
IZD10-510	± 20 kV (Detected at a 50 mm distance)	(Output impedance: Approx. 100 Ω)	25 to 75 mm

Electrostatic Sensor Monitor IZE11



- Displays the electrostatic potential with the connected electrostatic sensor (IZD10), and is capable of switch output, analog output, or output of current

Series	Rated measurement range	Minimum unit setting	Output
IZE11	-0.4 kV to +0.4 kV -20 kV to +20 kV	0.001 kV (at ± 0.4 kV) 0.1 kV (at ± 20 kV)	Switch output x 2 + Analog output (1 to 5 V, 4 to 20 mA)

Handheld Electrostatic Meter IZH10



- Easy-to-use handheld electrostatic meter

Series	Rated charge amount range	Minimum display unit
IZH10	± 20.0 kV	0.1 kV (± 1.0 to ± 20.0 kV) 0.01 kV (0 to ± 0.99 kV)

2-Port Solenoid Valves/Air Operated Valves

Direct Operated 2-Port Solenoid Valve **VX2**



- For air, medium vacuum, water, oil, steam (Can be used with heated water)
- Flow rate: 20% more flow*¹
- Height: 10% smaller*¹
- Weight: 30% lighter*¹
- Body materials: Aluminum, Resin, C37, Stainless steel
- Available with One-touch fittings (Resin body)
- *¹ Comparison made with SMC's existing model
- Manifold type no.: VVX21, VVX22, VVX23

Series	Valve type	Port size	Orifice diameter [mmø]
VX21/22/23	N.C./N.O.	1/8 to 1/2 ø6 to ø12	2 to 10

Pilot Operated 2-Port Solenoid Valve **VXD**



- For air, water, oil, heated water, high-temperature oil
- Body materials: Aluminum, Resin, C37, Stainless steel, CAC408
- A type with One-touch fittings (Resin body) is available.
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXD	N.C./N.O.	ø10, ø12, ø3/8" 1/4 to 1 32A to 50A	10 to 50

Zero Differential Pressure Type Pilot Operated 2-Port Solenoid Valve **VXZ**



- For air, water, oil, heated water, high-temperature oil
- Body materials: Aluminum, Resin, C37, Stainless steel
- A type with One-touch fittings (Resin body) is available.
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXZ	N.C./N.O.	ø10, ø12, ø3/8" 1/4 to 1	10 to 25

Zero Differential Pressure Type Pilot Operated 2-Port Solenoid Valve **VXS**



- For steam
- Long service life: 3 million cycles (Based on SMC's test conditions)
- Improved air filtration
- Reduced apparent power: 18 VA → 12 VA, 20 VA → 15 VA
- Reduced coil temperature rise: 120°C → 100°C
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXS	N.C.	1/4 to 1	10 to 25

Angle Seat Valve/Air Operated Type **VXB**



- For steam (Can be used with air and water)
- Low pressure loss due to angle seat structure
- Reduced leakage with rubber seal
- Long service life: 3 million cycles (Steam), 5 million cycles (Air)
- Low leakage: 10 cm³/min or less
- Space saving: Height 100 mm
- Body materials: Stainless steel 316L equivalent, Bronze (CAC)

Series	Valve type	Port size	Orifice diameter [mmø]
VXB	N.C.	3/8, 1/2, 3/4 10A, 15A, 20A	11, 14, 18

Process Valves

2-Port Solenoid Valves/Air Operated Valves

Energy Saving Type 2-Port Solenoid Valve **VXE**



- Power consumption reduced by 1/3 (SMC comparison)
- For air, water, oil

Series	Valve type	Port size	Orifice diameter [mmø]
VXE2	N.C.	1/8 to 1/2	2 to 10
VXED2	N.C.	1/4 to 1 32A to 50A	10 to 50
VXEZ2	N.C.	1/4 to 1	10 to 25

Compact 2/3-Port Solenoid Valves

Compact Direct Operated 2-Port Solenoid Valve **VDW**



- For air, medium vacuum, water
- Body materials: Aluminum, Resin (PPS), Brass, Stainless steel
- With One-touch fittings (Resin body)
- IP65

Series	Valve type	Port size	Orifice diameter
VDW10/20	N.C.	ø3.2, ø4, ø6, M5, 1/8	ø1 to ø3.2

High Speed 2-Port Valve **SX10**



- High-speed response ON: 0.45 ms
OFF: 0.4 ms (±0.05 ms)
- Long service life: 5 billion cycles or more
- High frequency: 1200 Hz
- Width: 9 mm
- Low power consumption: 4 W

Series	Flow rate (l/min)	Power consumption [W]	Max. operating frequency [Hz]
SX10	50	80	1200
		40	1000
		10	550
		4	350
SX10	100	80	650
		40	550
		10	300
		4	200
SX10	150	80	600
		40	500
		10	250
		4	150

Pilot Operated 2-Port Solenoid Valve for Dry Air **VQ**



- High-frequency operation is possible: High-speed response 7 ms or less (VQ20), 20 ms or less (VQ30)
- Easy piping with One-touch fittings
- The dust-tight, water-jet-proof enclosure (IP65) is compatible with the DIN terminal type.
- Applications: Air-blow, Blow-off of workpieces, etc.
- Manifold type no.: VV2Q22, VV2Q32

Series	Valve type	Port size	Orifice diameter [mmø]
VQ20	N.C.	ø6 to ø12	3.4
VQ30	N.C.	ø6 to ø12	4.8

Compact 2/3-Port Solenoid Valves

Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids **LVM**



- Materials of wetted parts Body/plate: PEEK
Diaphragm: Choice of EPDM, FKM, Kalrez®
- Service life: 10 million cycles or more (Based on SMC's test conditions)

Series	Valve structure	Valve type	Orifice diameter [mm ϕ]
LVM09/090	Diaphragm type direct operated poppet (Rocker type)	N.C./N.O./Universal	1.1
LVM11	Diaphragm type direct operated poppet	N.C.	1.5
LVM10/100	Diaphragm type direct operated poppet (Rocker type)	N.C./N.O./Universal	1.4
LVM15/150			1.6
LVM20/200			2

Composite Manifold



- The unitization of devices allows for the whole unit to be made more compact. Expansion into a wide range of industries is now possible!
- Space saving
- Lightweight
- Reduced wiring

Normal Close High Vacuum Solenoid Valve **XSA**



- Minimum operating pressure: 1×10^{-6} Pa (abs)
- Leakage: Internal 1.3×10^{-9} Pa·m³/s, External 1.3×10^{-11} Pa·m³/s
- 2 types of fittings and female threads are available.
- Power consumption: Max. 25% reduction
- Weight: Max. 18% lighter (0.5 kg \rightarrow 0.41 kg)

Series	Valve type	Fluid	Piping	Port size
XSA	Normally closed	Air, Inert gas	Face seal fitting Compression fitting	1/4, 3/8
XSA	Normally closed	Air, Inert gas	Rc, NPT female thread	1/8, 1/4, 3/8

■ Trademark

- Kalrez® is a registered trademark of E. I. du Pont de Nemours and Company or its affiliates.

5.0 MPa 2/3-Port Solenoid Valves

5.0 MPa Pilot Operated 2/3-Port Solenoid Valve & Check Valve VCH/VCHC



- Service life: 10 million cycles
- Uses a polyurethane elastomer poppet for valve parts
- Improves durability at high pressures

Series	Type	Port size	Orifice diameter [mmø]
VCH41	2-port valve, N.C.	G3/4, 1	ø16
VCH42	2-port valve, N.O.	G3/4, 1	ø17.5
VCH410	3-port valve	G1/2 to 1	ø18
VCHC40	Check valve	G3/4, 1	ø16

Direct Operated Regulator for 6.0 MPa (Relieving Type) VCHR



- Service life: 10 million cycles
Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet
- Uses NSF-H1 approved grease on guide rings (Sliding parts)
- Improved durability through the use of a metal seal type relief valve
- Uses a special fluororesin seal for sliding parts
Stable unattached response, Not easily affected by pressure

Series	Model	Type	Port size	Set pressure [MPa]
VCHR	VCHR30/40	Direct operated regulator (Relieving type)	G3/4, 1, 1 1/2	0.5 to 5.0 (Max. operating pressure: 6.0)

725 psi (5.0 MPa) Silencer VCHN



- Reduces clogging with its double-layer structure
- Noise reduction: 35 dB (A)

Chemical Liquid Valves

Chemical Liquid Valves

High Purity Chemical Liquid Valve/Air Operated, Integrated Fitting Type **LVC**



- Body material: New PFA
- N.C./N.O./Double acting all feature the same configuration.
- Compatible with fluid temperatures of 100°C
- Manifold type no.: LLC2, LLC3, LLC4, LLC5

Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVC	Air operated Integrated fitting	N.C./N.O./Double acting	Metric: 3 to 25 Inch: 1/8 to 1	4 to 22

High Purity Chemical Liquid Valve/Air Operated, Threaded Type **LVA**



- Body materials: New PFA/Stainless steel/PPS
- Diaphragm materials: PTFE, EPR, or NBR can be selected.
- Manifold type no.: LLA2, LLA3, LLA4, LLA5

Series	Type	Valve type	Port size	Orifice diameter [mmø]
LVA	Air operated Threaded type	N.C./N.O./Double acting	1/8 to 1	2 to 22

Organic Solvents Compatible

- Body material: Stainless steel
- Actuator material: ADC
- Buffer materials: FKM/EPDM

Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVA	Air operated Organic solvents compatible	N.C./N.O./Double acting	Metric: 6 to 19 Inch: 1/4 to 1	4 to 22

High Purity Chemical Liquid Valve/Manually Operated (Integrated Fitting Type/Threaded Type) **LVH**



- Body materials: New PFA/Stainless steel/PPS
- Compatible with locking and non-locking types
- Manifold type no.: LLH2, LLH3, LLH4

Series	Type	Valve type	Port size (Applicable tubing O.D.)	Orifice diameter [mmø]
LVH	Manually operated (Integrated fitting/ Threaded type)	N.C.	Threaded type: 1/8 to 1/2 Integrated fitting: Metric: ø3 to ø12 Inch: 1/8 to 1/2	4 to 12

Organic Solvents Compatible

- Body material: Stainless steel
- Actuator material: ADC
- Buffer materials: FKM/EPDM

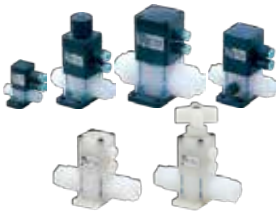
Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVH	Manually operated Organic solvents compatible	N.C.	Metric: 6 to 19 Inch: 1/4 to 1	4 to 22



Chemical Liquid Valves

Chemical Liquid Valves

Compact Type High Purity Air Operated Chemical Liquid Valve **LVD**



- Space saving, compact model is available. Dimension across inlet/outlet ports: Reduced by up to 29%
- Body material: New PFA
- Diaphragm material: PTFE
- Actuator materials: PPS, PVDF (LVD-F/FN)

*1 Tubing O.D. for the tube extension type

Series	Type	Valve type	Applicable tubing O.D.*1		Orifice diameter [mmø]
			Metric	Inch	
LVD	Integrated fittings	N.C./N.O./Double acting	3 to 19	1/8 to 3/4	2 to 16
LVD	Tube extensions	N.C./N.O./Double acting	6 to 19	1/4 to 3/4	4 to 16
LVD-F/FN	LQ1 Integrated fittings	N.C./N.O./Double acting	3 to 25	1/8 to 1	4 to 22
LVD-F/FN	LQ3 Integrated fittings	N.C./N.O./Double acting	6 to 25	1/4 to 1	4 to 22
LVD-F/FN	Tube extensions	N.C./N.O./Double acting	6 to 25	1/4 to 1	4 to 22

High Purity Chemical Liquid Valve/Air Operated, Non-Metallic Exterior **LVQ**



- Screwless construction, Non-metallic construction doesn't use metal screws to secure the body of the actuator
- Body material: New PFA
- Diaphragm material: PTFE
- Actuator material: PVDF

*1 Tubing size

Series	Type	Valve type	Applicable tubing O.D.		Orifice diameter [mmø]
			Metric	Inch	
LVQ	Integrated fitting type	N.C./N.O./Double acting	3 to 25	1/8 to 1	4 to 22
LVQ	Space saving type	N.C./N.O./Double acting	Fitting size: 2 to 6	Fitting size: 2 to 6	4 to 22
LVQ	Tube extension type	N.C./N.O./Double acting	6 to 25*1	1/4 to 1*1	4 to 22

Vinyl Chloride Air Operated Valve **LVP**



- Applicable to rigid vinyl chloride tubes: Union type with PVC unfixed union
- Body material: CPVC, Diaphragm material: PTFE
- O-ring materials: FKM, EPDM (Selectable)
- Applicable fluids: Deionized water, Chemical liquids

Series	Applicable tubing O.D.	Orifice diameter [mmø]	Valve type	Option
LVP5□	O.D. ø22 (Nominal dia. 16A)	16	N.C./N.O./Double acting	With flow rate adjustment
LVP6□	O.D. ø26 (Nominal dia. 20A)	22	N.C./N.O./Double acting	With flow rate adjustment
LVP6□	O.D. ø32 (Nominal dia. 25A)	22	N.C./N.O./Double acting	With flow rate adjustment

PVC Quick Drain Valve **LVW**



- Compliant with JIS Standards for polyvinyl chloride piping (JIS K 6742)
- Applicable fluids: Deionized water, Chemical liquids
- Materials of wetted parts: PVC (Body)
PTFE (Poppet)
FKM (O-ring: Standard)
EPDM (O-ring: Option)
- Flow rate characteristics: Cv factor 10 to 198
- Easy piping with union connection

Series	Applicable tubing O.D.	Orifice diameter	Valve type
LVW60	ø32 (Nominal dia. 25A)	ø25	Double acting
LVW80	ø38 (Nominal dia. 32A)	ø40	Double acting
LVW80	ø48 (Nominal dia. 40A)	ø40	Double acting
LVW90	ø60 (Nominal dia. 50A)	ø65	Double acting
LVW90	ø75 (Nominal dia. 65A)	ø65	Double acting
LVW90	ø89 (Nominal dia. 80A)	ø80	Double acting

Process Pumps

Process Pump/Double Acting Pump PA/PAP/PAX



Series	Actuation	Discharge rate [L/min]	Wetted parts material
PA3□□0	Automatically operated type	1 to 20	ADC12 (Aluminum) SCS14 (Stainless steel)
PA3□13	Air operated type	0.1 to 12	ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□□0	Automatically operated type	5 to 45	ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□13	Air operated type	1 to 24	ADC12 (Aluminum) SCS14 (Stainless steel)
PAP3310	Automatically operated type	1 to 13	New PFA (Fluororesin)
PAP3313	Air operated type	0.1 to 9	New PFA (Fluororesin)
PAX1□12	Automatically operated type, Built-in pulsation attenuator	0.5 to 10	ADC12 (Aluminum) SCS14 (Stainless steel)

Process Pump/Single Acting Pump PB



Series	Actuation	Discharge rate [mL/min]	Wetted parts material
PB1011A	Built-in solenoid valve	8 to 2000	Polypropylene Stainless steel 316
PB1013A	Air operated type	8 to 1000	Polypropylene Stainless steel 316
PB1313A	Air operated type	8 to 1000	New PFA (Fluororesin)

Non-Metallic Pump/Double Acting Pump PAF



Series	Actuation	Discharge rate [L/min]	Wetted parts material
PAF3410	Automatically operated type	1 to 20	New PFA (Fluororesin)
PAF3413	Air operated type	1 to 15	New PFA (Fluororesin)
PAF3410-X68*1	Automatically operated type	1 to 20	New PFA (Fluororesin)
PAF5410	Automatically operated type	5 to 45	New PFA (Fluororesin)
PAF5413	Air operated type	5 to 38	New PFA (Fluororesin)

*1 Tightening bolt, Air switching valve: Stainless steel

Use the PAF series standard products when a metal-free pump is necessary for hydrofluoric acid, etc.

Temperature Control Equipment

Thermo-chillers (Circulating Fluid Temperature Controllers)

Thermo-chiller/Standard Type HRS



- With this chiller, cooling water can be obtained anywhere it is necessary because of easy installation and easy operation.
- For a wide range of applications, such as laser machine tools, analytical equipment, LCD manufacturing equipment, mold temperature control, etc.
- Compact: W 377 x H 615 x D 500 mm, 40 kg (HRS012/018/024)
- Timer function, Low liquid level protection, Power failure auto-restart, Anti-freezing function, etc.
- Self diagnosis function
- Ideal for overseas models (Single-phase 200 to 230 VAC, Single-phase 100, 115 VAC)
- Compliant with UL Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRS012 to 060	5 to 40°C	1.3 kW, 1.9 kW 2.4 kW, 3.2 kW 5.1 kW, 5.9 kW (60 Hz)	±0.1°C	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

Thermo-chiller/Standard Type HRS090



- Lightweight and compact
- Cooling capacity: 9 kW
- Temperature stability: ±0.5°C
- Set temperature range: 5 to 35°C
- Max. ambient temperature: 45°C
- Power supply: 3-phase 200 to 230 VAC, 380 to 415 VAC

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRS090	5 to 35°C	9 kW (60 Hz)	±0.5°C	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

Thermo-chiller/Standard Type HRS100/150



- No heater is required, as the circulating fluid is heated using only the heat exhausted by the refrigerating circuit.
- Compatible with power supplies in Europe, Asia, Oceania, North, Central, and South America
- Low-noise design: 70 dB (A)
- Outdoor installation: IPX4
- Compact, Space saving

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRS100 HRS150	5 to 35°C	9.5 kW, 14.5 kW (60 Hz)	±1.0°C	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

Thermo-chiller/Inverter Type HRSH090



- Power consumption reduced by 53%
Complete with energy-saving triple inverter!
- Cooling capacity: 9.5 kW (Air-cooled), 11.0 kW (Water-cooled)
- Temperature stability: ±0.1°C
- Set temperature range: 5°C to 40°C

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRSH090	5 to 40°C	9.5 kW	±0.1°C	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

Temperature Control Equipment

Thermo-chillers (Circulating Fluid Temperature Controllers)

Thermo-chiller/Inverter Type HRSH



- Complete with energy-saving triple inverter!
- Outdoor installation, Splashproof type (IPX4)
- Max. ambient temperature: 45°C
- Min. ambient temperature: -20°C (For the air-cooled type)
- Temperature stability: $\pm 0.1^{\circ}\text{C}$ (When a load is stable)
- Space saving and lightweight: 280 kg (25 kW type)
- Compliant with UL Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRSH	5 to 35°C	10 kW, 15 kW 20 kW, 25 kW 28 kW	$\pm 0.1^{\circ}\text{C}$	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

Thermo-chiller/Basic Type HRSE



- Complete with energy-saving triple control!
Reduces power consumption by 33%
- Compact and lightweight: 32 kg (100 VAC)
- Maintenance-free: Magnet pump
- Low-noise design: 55 dB (A)

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRSE	10 to 30°C	1.2 kW, 1.6 kW 2.2 kW (60 Hz)	$\pm 2.0^{\circ}\text{C}$	Air-cooled refrigeration	Tap water Ethylene glycol aqueous solution (15%)

Thermo-chiller/Rack Mount Type HRR



- Operable without the need to remove the unit from the rack
Front access: Simple to control, service and maintain with all filters and drainage via the front panel
- Space saving
Multiple chillers can be mounted to a 19-inch rack.
- Cooling capacity: 1.2/1.8/2.4/3.0 kW (60 Hz)
- Temperature stability: $\pm 0.1^{\circ}\text{C}$
- Global power supply: Single-phase 200 to 230 VAC (50/60 Hz)

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRR	10 to 35°C	1.2 kW, 1.8 kW 2.4 kW, 3.0 kW	$\pm 0.1^{\circ}\text{C}$	Air-cooled refrigeration Water-cooled refrigeration	Tap water Ethylene glycol aqueous solution (15%)

Thermo-chiller/High-performance Type HRZ



- Suitable for semiconductor processing equipment with a wide variety of features, such as high-temperature stability, a wide temperature range, failure diagnosis, external communication, etc.
- Compliant with various safety standards
- Compliant with UL Standards, SEMI Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZ	-20 to 40°C 20 to 90°C -20 to 90°C	1 kW, 2 kW 4 kW, 8 kW	$\pm 0.1^{\circ}\text{C}$	Water-cooled refrigeration	Fluorinated fluid Tap water Deionized water Ethylene glycol aqueous solution (60%)

Thermo-chiller/High-performance Inverter Type HRZ



- In addition to the state-of-the-art functions of the HRZ series, these models employ a DC inverter compressor to achieve better energy efficiency.
- A wide temperature range and cooling capacity range are covered by one unit.
- Suited to the short innovation cycle of semiconductor equipment, Capable of responding flexibly to changes in the process conditions
- Compliant with UL Standards, SEMI Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZ	-20 to 90°C 10 to 60°C	10 kW	$\pm 0.1^{\circ}\text{C}$	Water-cooled refrigeration	Fluorinated fluid, Tap water, Deionized water, Ethylene glycol aqueous solution (60%)

Temperature Control Equipment

Thermo-chillers (Circulating Fluid Temperature Controllers)

Dual Thermo-chiller/High-performance Inverter Type **HRZD**



- Temperatures for 2 systems can be controlled separately by one chiller.
- Double inverter type: Substantially more energy is saved by using a DC inverter refrigerator and inverter pump.
- Space saving: Footprint reduced by 23%
- Reduced wiring, piping, and labor: Single power cable, Single facility-water piping system
- Compliant with SEMI Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZD	-30 to 90°C	9.5 kW x 2	±0.1°C	Water-cooled refrigeration	Fluorinated fluid Ethylene glycol aqueous solution (60%)

Water-cooled Thermo-chiller/High-performance Type **HRW**



- Direct heat exchanger for in-plant circulating fluid
- Can control the temperature over a wide range since a compressor is not required.
- Suitable for semiconductor processing equipment with a wide variety of features, such as high-temperature stability, a wide temperature range, failure diagnosis, external communication, etc.
- Compliant with UL Standards, SEMI Standards, CE-marking
- It is possible to select the inverter type.

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRW	20 to 90°C	2 kW, 8 kW 15 kW, 30 kW	±0.3°C	Water-cooled type (Without compressor)	Fluorinated fluid, Tap water, Deionized water, Ethylene glycol aqueous solution (60%)

Thermo-cons/Thermoelectric Baths (Peltier-Type Temperature Control Equipment)

Peltier-Type Thermo-con/Rack Mount Type **HECR**



- Good space utilization: Mountable in a 19-inch rack
Saves space by allowing multiple pieces of equipment to be mounted together in a rack.
- Temperature stability: ±0.01°C to 0.03°C
- Set temperature range: 10°C to 60°C
- Cooling capacity: 200 W, 400 W, 510 W, 800 W, 1 kW, 1.2 kW
- Power consumption: 200 W, 300 W, 400 W

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method
HECR002-A	10 to 60°C	200 W	±0.01 to 0.03°C	Peltier-type air-cooled
HECR004-A	10 to 60°C	400 W	±0.01 to 0.03°C	Peltier-type air-cooled
HECR006-A	10 to 60°C	510 W	±0.01 to 0.03°C	Peltier-type air-cooled
HECR008-A	10 to 60°C	800 W	±0.01 to 0.03°C	Peltier-type air-cooled
HECR010-A	10 to 60°C	1 kW	±0.01 to 0.03°C	Peltier-type air-cooled
HECR008-W	10 to 60°C	800 W	±0.01 to 0.03°C	Peltier-type water-cooled
HECR012-W	10 to 60°C	1.2 kW	±0.01 to 0.03°C	Peltier-type water-cooled

Peltier-Type Thermo-con **HEC**

High-precision chiller



- For applications requiring high-precision temperature control
- High-precision, refrigerant-free temperature control equipment that uses a Peltier device
- Simple structure and high reliability
- Can easily be built into equipment due to its compact and low-vibration design
- Compatible with a wide range of power supply voltages
- Compliant with UL Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HEC	10 to 60°C	230 W 600 W	±0.01 to 0.03°C	Peltier-type air-cooled	Tap water
HEC	10 to 60°C	140 W 320 W	±0.01 to 0.03°C	Peltier-type water-cooled	Tap water Ethylene glycol aqueous solution (20%)
HEC	10 to 60°C	600 W 1200 W	±0.01 to 0.03°C	Peltier-type water-cooled	Tap water Fluorinated fluid

Temperature Control Equipment

Thermo-cons/Thermoelectric Baths (Peltier-Type Temperature Control Equipment)

Peltier-Type Thermoelectric Bath **HEB**

High-precision thermoelectric bath



- High-precision temperature control bath that uses a Peltier device
- Compact and low noise
- Minimal up-down temperature distribution by a unique agitation method

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HEB	-15 to 60°C	140 W 280 W	0.01°C	Round type Peltier-type water-cooled	Tap water, Fluorinated fluid

Peltier-Type Thermoelectric Bath (Made to Order) **INR**



- High-precision temperature control bath that uses a Peltier device
- Compact and low noise
- Minimal up-down temperature distribution by a unique agitation method

Series	Set temperature range	Max. cooling capacity	Temperature stability	Cooling method	Circulating fluid
INR-244-696A	-15 to 60°C	280 W	±0.02°C	Peltier-type water-cooled	Tap water Ethylene glycol aqueous solution Fluorinated fluid (Square type can only be used at room temperature.)
INR-244-745	0 to 60°C	140 W	±0.03°C	Peltier-type water-cooled	
INR-244-733	0 to 60°C	140 W	±0.03°C	Peltier-type water-cooled	
INR-244-747	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-736	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-746	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-734	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-749	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-748	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	
INR-244-757	0 to 60°C	220 W	±0.03°C	Peltier-type air-cooled	

Peltier-Type Chemical Thermo-con **HED**

Fluoropolymer temperature control equipment for chemical liquids



- Heat exchanger for direct temperature control that uses a Peltier device
- Compatible with a wide range of chemical liquids through the use of a fluororesin heat exchanger
- Compliant with UL Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HED	10 to 60°C	300 W 500 W 750 W	±0.1°C	Peltier-type water-cooled	Deionized water, Fluorinated fluid, Ammonia hydrogen peroxide solution, etc.

Temperature Control Equipment

Air Temperature Controllers

Peltier-Type Air-Thermo HEA



- High-precision, compact temperature control equipment that uses a Peltier device
- Compatible with localized and small-volume temperature control

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Fluid
HEA	0 to 50°C	22 W	±0.1°C	Peltier-type air-cooled	Air

Thermo-dryer with Air Temperature Adjustment Function IDH□



- Stable supply of temperature and pressure controlled dry clean air
Can supply compressed air with the same conditions and quality regardless of the season
- Application example:
Supplying compressed air with constant conditions to air bearings mounted on a tool
- Built-in filter
Nominal filtration: 0.01 μm (99.9% filtration efficiency)
Outlet oil mist concentration: Max. 0.01 mg/m³ (ANR)
Outlet cleanliness: Particles of 0.3 μm or more: 3.5 particles/L (ANR) or less
- Compatible with power supplies from around the world
Single-phase 100, 200, 230 VAC (50/60 Hz)

Series	Air flow capacity [L/min (ANR)]	Outlet air temperature adjustment range	Outlet air set pressure range	Outlet air temperature stability	Cooling method
IDH□4	100 to 500	15 to 30°C	0.15 to 0.85 MPa	±0.1	Heater operation PID control
IDH□6	200 to 800	15 to 30°C	0.15 to 0.85 MPa	±0.1	

Circulating Fluid Temperature Controller HRS-R



- Resistant to dust and water splashing
- IP54 Protection of electrical unit
- Self diagnosis function and check display
- Exterior surface is metal/stainless panel optional
- 5 L tank capacity/12L tank capacity optional
- Compatible with power supplies in Europe, Asia, Oceania, and North, Central, and South America

Series	Set Temperature Range	Cooling Capacity (50/60 Hz)	Heating Capacity (50/60 Hz)	Temperature Stability	Cooling Method	Circulating Fluid
HRS018-A□-R	5 to 40°C	1.7kW/1.9kW	430W/540kW	±0.1°C	Air Cooled Refrigeration	Tap water, 14% ethylene glycol aqueous solution
HRS030-A□-R		2.5kW/2.9kW				
HRS050-A□-R		4.5kW/5.0kW	830W/1.2kW			

High Vacuum Equipment

High Vacuum Valves

Stainless Steel High Vacuum Angle/In-line Valve **XM/XY**



- The precision casting, unified composition prevents the accumulation of gas.
- The XM series is interchangeable with the XL series aluminum high vacuum angle valve.

*1 Size 16 is not available for the in-line type.

Series	Actuation	Shaft seal type	Valve type	Material	Flange size
XMA/XYA	Air operated	Bellows seal	Single acting (N.C.)	Body: SCS13 (Equivalent to stainless steel 304) Bellows: Stainless steel 316L	16 to 80*1
XMC/XYC		Bellows seal	Double acting		16 to 80*1
XMD/XYD		Bellows seal O-ring seal	Single acting (N.C.)		25 to 80
XMH/XYH	Manual	Bellows seal	Manual		16 to 50*1

Normal Close High Vacuum Solenoid Valve **XSA**



- Minimum operating pressure: 1×10^{-9} Pa (abs)
- Leakage: Internal 1.3×10^{-9} Pa·m³/s, External 1.3×10^{-11} Pa·m³/s
- 2 types of fittings and female threads are available.
- Power consumption: Max. 25% reduction
- Weight: Max. 18% lighter (0.5 kg → 0.41 kg)

Series	Valve type	Fluid	Piping	Port size
XSA	Normally closed	Air, Inert gas	Face seal fitting Compression fitting	1/4, 3/8
XSA	Normally closed	Air, Inert gas	Rc, NPT female thread	1/8, 1/4, 3/8

Process Gas Equipment

Regulators for Ultra High Purity (UHP) AP/SL/AP/AZ



- For UHP gas delivery in semiconductor and other clean industries
- Body material: 316L SS secondary remelt or 316L SS
- Electropolished wetted parts
- External metal seal construction

Series	Type	Application	Body material	Connection type	Connection size
AP/SL	Single stage	Distribution (Compact)	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8"
AP/SL	Single stage	Distribution			1/4", 3/8", 1/2", 3/4"
AP/SL	Single stage	Bulk gas	316L SS		1/2", 3/4", 1"
AP/SL	Single stage	Source	316L SS secondary remelt		1/4", 3/8", 1/2", 3/4"
AP/SL	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2", 3/4"
AP	Two stage	Source			1/4", 3/8"
AZ	Single stage	Distribution	316L SS		1/4", 3/8", 1/2"
AZ	Single stage	Source			1/4", 3/8", 1/2"
AZ	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2"

Regulator/Back Pressure Regulator for General Applications AK/BP



- For a wide variety of applications from semiconductor to general
- Body material of 316 SS or brass is available depending on the gas.

Series	Type	Application	Body material	Connection type	Connection size
AK	Single stage	Distribution	316 SS or Brass	NPT female, Compression	1/4", 3/8", 1/2"
AK	Single stage	Source			1/4", 3/8", 1/2"
AK	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2"
AK	Two stage	Source			1/4"
BP	Back pressure regulator	—			1/4"

Diaphragm Valve for Ultra High Purity AP



- For UHP gas delivery in semiconductor and other clean industries
- Used as a gas shutoff valve
- No spring is used for the wetted parts and the drive part is also separated from the diaphragm. Dead space in the flow path is small in order to suppress particle generation.

Series	Type	Body material	Connection type	Connection size
AP	Air operated type	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8", 1/2", 3/4"
AP	Manually operated type			1/4", 3/8", 1/2", 3/4"

Diaphragm Valve for Ultra High Purity AZ

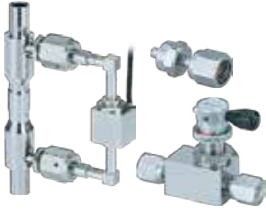


- Cleaned for high-purity semiconductor applications and clean room assembled
- Helium leak tested
- SEMI Standards-compliant
- User-friendly forged body

Series	Type	Body material	Connection type	Connection size
AZ	Air operated type	316L SS	Face seal Tube weld	1/4", 3/8", 1/2"
AZ	Manually operated type			1/4", 3/8", 1/2"

Process Gas Equipment

Check Valve/Vacuum Generator/Flow Switch **AP**



[Check valve]

- Fluid backflow is prevented by back pressure.
- Unique design with only one moving part in the gas stream, an O-ring
- Springless structure suppresses particle generation by vibration or chattering and pressure fluctuations on the downstream side

[Vacuum generator]

- Vacuum generation equipment
- Applicable to the exhaustion of unnecessary gas remaining inside the piping during gas cylinder replacement

[Flow switch]

- Detects excess flow above a given flow rate caused by pipe breakage, etc.

Series	Type	Body material	Connection type	Connection size
AP	Check valve	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8"
AP	Vacuum generator	316L SS		1/4", 3/8"
AP	Flow switch	316L SS secondary remelt, 316L SS		1/2", 3/4"

Diaphragm Valve for General Applications **AK**



- Rc, R, and NPT connections have been added to the series.
- For a wide variety of applications from semiconductor to general
- Cleaned for O₂ service
- Compact and lightweight due to the shortening of the actuator (AK3542/4542)
- M5 actuation port (AK3542/4542)
- Compact and lightweight due to the modifying of the knob design (AK3652/4652)
- The knob features a unique design that combines a scalloped round knob with a raised rectangular section to provide two choices of gripping. (AK3652/4652)

Series	Type	Body material	Connection type	Connection size
AK	Air operated type	316 SS	Compression Rc, R, NPT	1/4", 3/8"
AK	Manually operated type			1/4", 3/8"

Regulator for General Applications **AK1000T**



- For a wide variety of applications from semiconductor to general
- Compact and lightweight:
Weight: 0.52 kg, Height: 97.5 mm
- Minimum dead leg construction
- Various piping configurations are available:
Select from compression, NPT female, or Rc thread.

Series	Type	Body material	Connection type	Connection size
AK1000T	Manually operated type	316 SS	Compression Rc, NPT	1/4", 3/8"

Industrial Filters/Sintered Metal Elements

Industrial Filters

Industrial Filter/Vessel Series FGD



- Ideal for low-flow filtration (Max. 60 L/min)
- It is possible to select the antistatic specification (FGDE, FGDF).

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGD	Rc3/8, 1/2, 3/4	0.7, 1 MPa	Max. 80

Industrial Filter/Vessel Series FGE



- Ideal for medium flow rate filtration (Max. 230 L/min)
- Easy element replacement for the V-band type (With cover anti-scattering mechanism)

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGE	R1, 2	0.7 MPa	Max. 80

Industrial Filter/Vessel Series FGG



- Ideal for high-flow filtration (Max. 350 L/min)
- Easy element replacement for the V-band type (With cover anti-scattering mechanism)

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGG	Rc2	0.7 MPa	Max. 80

Industrial Filter/Vessel Series FGA



- Ideal for high-flow filtration (Max. 3200 L/min)

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGA	25 to 150 (1B to 6B) JIS 10KFF	1 MPa	Max. 80

Industrial Filter/Vessel Series FGC



- Ideal for low-flow filtration (Max. 80 L/min)

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGC	15 to 25 (1/2B to 1B) JIS 10KFF	1, 2, 4 MPa	Max. 80

Industrial Filters/Sintered Metal Elements

Industrial Filters

Bag Filter FGF



- Highly effective for the filtration of high-temperature and high-viscosity fluids
- Ideal for high-flow filtration (Max. 2000 L/min)
- Easy handling of filtered impurities

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGF	100 (4B), 150 (6B) JIS 10KFF	0.5 MPa	Max. 80

High Precision Filter for Liquids FGH



- Filtration efficiency: 99% or more

Series	Port size	Max. operating pressure	Operating temperature [°C]
FGH	Rc3/8 to 1	1 MPa	Max. 80

Filter for Cleaning Fluid/Quick Change Filter FQ1



- Ideal for low-flow filtration (Max. 30 L/min)
- No tools are required.
- Takes only 60 seconds for element replacement

Series	Port size	Max. operating pressure	Operating temperature [°C]
FQ1	Rc1/2, 3/4, 1	1 MPa	Max. 80

Low Maintenance Filter FN



- Element replacement is not required.
- System circuit allows for the automatic cleaning of the element when clogged

Series	Port size	Max. operating pressure	Operating temperature [°C]
FN1	Rc1	1 MPa	Max. 80
FN4	Rc2	1 MPa	Max. 80

Sintered Metal Elements

Sintered Metal Element EB/ES



- Large mechanical strength and withstand pressure, Anti-corrosive
- Mechanical process, caulking, brazing, soldering, welding, and simultaneous sintering are possible.
- Can be cleaned and reused

Series	Material	Nominal filtration accuracy
EB	Bronze	(1) 2, 5, 10, 20, 40, 70, 100, 120 μm () : Semi-standard
ES	Stainless steel	(1) 2, 5, 10, 20, 40, 70, 100, 120 μm () : Semi-standard

Pneumatic Instrumentation Equipment

Positioners

Electro-Pneumatic Positioner/Smart Positioner IP8□00/IP8□01



- Enclosure: JISF8007 IP65 (Compliant with IEC 60529)
- Monitoring function
- Explosion-proof construction
 - Electro-pneumatic positioner: TIS explosion-proof construction (Ex d IIB T5)
 - ATEX intrinsically safe explosion-proof construction (II 2G Ex ib II C T5/T6 Gb)
 - Smart positioner: ATEX intrinsically safe explosion-proof construction (II 1G Ex ia II C T4/T5/T6 Ga)
- HART transmission function (Smart positioner)

Description	Series	Type	Port size [Rc, NPT, G]	Supply air pressure [MPa]	Input current
Electro-pneumatic positioner	IP8000	Lever type	1/4	0.14 to 0.7	4 to 20 mA DC
Electro-pneumatic positioner	IP8100	Rotary type	1/4	0.14 to 0.7	4 to 20 mA DC
Smart positioner	IP8001	Lever type	1/4	0.14 to 0.7	4 to 20 mA DC
Smart positioner	IP8101	Rotary type	1/4	0.3 to 0.7	4 to 20 mA DC

Other Derived Series

Clean/Low Particle Generation 10-/11-/12-/13-/21-/22-



Description	Model	Features/Specifications
Clean series	10-/11-12-/13-	<ul style="list-style-type: none"> • Prevents particle generation in a clean room • Particle generation from the equipment is classified by ISO cleanliness class (ISO Class 3 to 6). Select based on the cleanliness class of the clean room. • Fluorine grease is used. • Products are sealed and shipped in anti-static double bags.
Copper, Fluorine, Silicone-free, Low particle generation	21-/22-	<ul style="list-style-type: none"> • Suitable for environments where the presence of copper, fluorine, or silicone materials is restricted. • Lithium soap-based grease is used. • Construction is the same as the clean series. • Standard packaging (Double packaging is not used.)

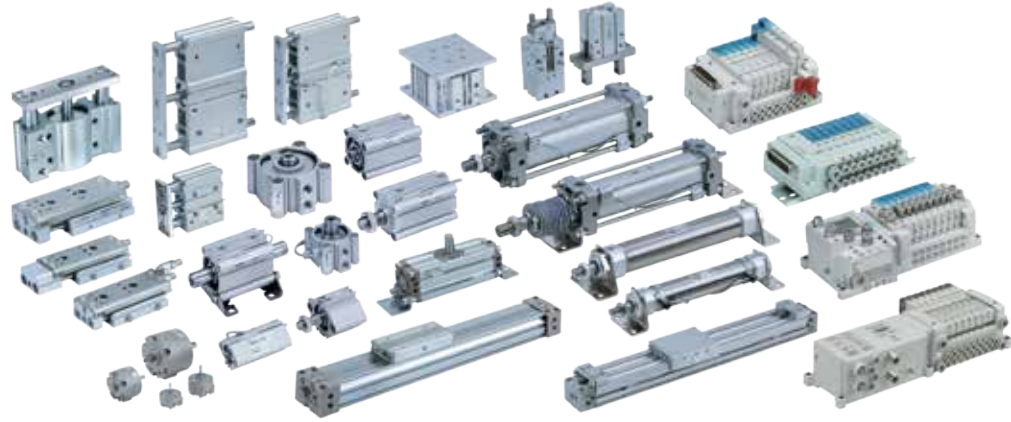
UNIT CONVERSIONS

	unit	conversion	result
length	m	x 3.28	ft
	mm	x 0.04	in
mass	g	x 0.04	oz
volume	cm ³	÷ 16.387	in ³
	L	x 61.024	in ³
speed	mm/s	÷ 25.4	in/s
pressure	MPa	x 145	psi
	kPa	÷ 6.895	psi
temperature	°C	x1.8 then add 32	°F
torque	N·m	x 0.738	ft·lb
force	N	÷ 4.448	lbf
flow	L/min	÷ 28.317	cfm



SMC:
Continuing to pursue worldwide customer satisfaction and support automation with the latest pneumatic technologies

The 21st century—with increased globalization and the rapid evolution of information technology—has seen great changes in the way business is conducted. In these quickly developing, ever-changing times, customer satisfaction can only be achieved with a clear understanding of customer goals and objectives. This is the reason for SMC's dedication to building an organization that listens carefully to customers and responds quickly and specifically to their needs. SMC has established a wide-spread global network of locations in all major countries in the Americas, Europe, Asia, and Oceania as well as in emerging countries, showing our active commitment to the world market. SMC supports this global network with a stable supply chain of products, advanced technical services, and a solid communication network. It is our number one goal to meet the needs and expectations of all our customers.



Technical Development

We have over 1,500 engineers spread out over numerous technical centers in Japan, the U.S., Europe, and China.

Quick, clear, and detailed responses to customer requests are communicated through our sales group. And with ongoing information exchange between our technical centers, our engineers are constantly working together to find new industry trends that may lead to product improvement.

Production and Supply

Our product line offers 12,000 basic models with over 700,000 variations. With both domestic and overseas production facilities, we are able to provide a stable supply of products to customers around the world.

We are proud to offer a vast array of products that satisfy the needs of a wide range of applications. Our unique production system allows us to quickly deliver high-quality products at competitive prices, and by maximizing our local production capabilities, a stable supply of product is guaranteed.

Sales & Communication Network

With 500 sales offices in 83 countries and regions worldwide, our sales force of over 8,300 maintains close communication with our customers.

It is by establishing a strong base in each country and region with a large experienced sales force that SMC is able to provide the best possible service in the industry. Maintaining close communication with our customers throughout the world ensures our engineering teams and our products stay at the leading edge of the industry.



SMC's global engineering network: Featuring technical centers in the U.S., Europe, China, and Japan

Following the basic concept of developing products from the customer's standpoint, SMC dedicates a great deal of staff and financial resources to research and development. This is undertaken to promote research on basic technology with future potential and to produce products that meet the needs of the marketplace in a timely manner. To provide speedy solutions to all our customers' problems, technical centers have been established in the U.S., Europe, and China, creating a powerful global engineering network with Japan as its nucleus. All of our technical centers keep in close contact, constantly exchanging information in order to quickly respond to local demands and offer the same standard of technical service quality throughout the world.

The Japan Technical Center has been expanded, moving to a new twin-tower building from where it will oversee worldwide technical development.



JTC (Japan Technical Center) Japan

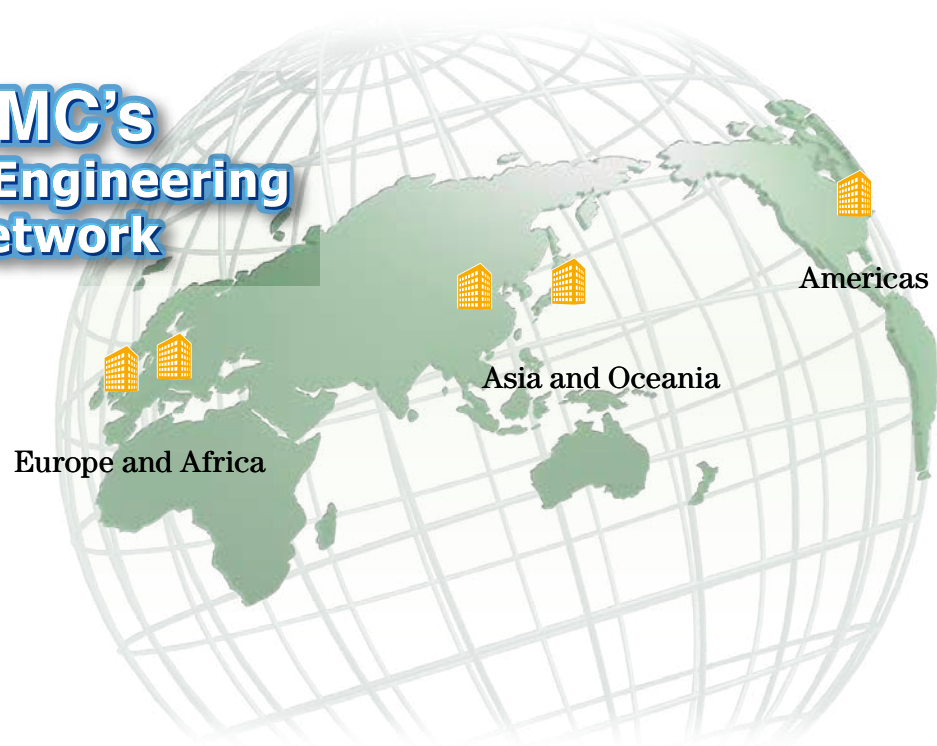
The JTC is staffed with 1,100 employees and is the center of SMC research and development. It produces new products for the global market based on customers' current and future needs.



CTC (China Technical Center) China

The CTC's 120 employees are reinforcing the system through product development and technical services in order to quickly respond to the Chinese market's wide range of needs and requirements.

SMC's Global Engineering Network



UTC (U.S. Technical Center) **United States of America**

The UTC is enhancing engineering capabilities in order to more quickly respond to the needs of the North American market through product development and technical services. At present, there are approximately 140 employees tasked with dealing with the various needs of customers in the region.



ETC (European Technical Centre) **United Kingdom**

The ETC was established in the existing SMC UK factory site in Milton Keynes. Here, approximately 60 experienced staff members from a number of SMC European subsidiaries work together to handle projects from their respective countries. This has enabled improved communication, faster and more accurate information exchange, and a higher level of customer satisfaction in the region.



GTC (German Technical Centre) **Germany**

Situated in Germany, the industrial center of Europe, the GTC and its 80 employees develop products and provide technical services by quickly responding to the needs of the region's customers.



A global production network providing the world with a stable and continuous supply of high-quality products

SMC provides products to world markets from six domestic production facilities, including our Soka (Saitama Pref.) and Tsukuba (Ibaraki Pref.) factories, as well as from other key overseas production facilities in China, Singapore, and India. Additionally, in order to respond quickly and flexibly to the demands of local markets outside of Japan, overseas production facilities have been established in SMC subsidiaries around the world.

1 Domestic Production Facilities (Japan)



Soka Factory
(Saitama Pref.)



Kamaishi Factory
(Iwate Pref.)



Tsukuba Factory
(Ibaraki Pref.)



Tono Factory
(Iwate Pref.)



Shimotsuma Factory
(Ibaraki Pref.)



Yamatsuri Factory
(Fukushima Pref.)





2 Key Overseas Production Facilities



China Factory



Singapore Factory



India Factory

3 Overseas Local Production Facilities

Americas



United States of America



Brazil



Mexico

Argentina
Chile

Europe and Africa



Germany



United Kingdom



Italy

Austria
Finland
France
South Africa
Spain
Sweden
Switzerland
Turkey



Russia



Czech Republic

Asia and Oceania



Australia



Korea

China (Guangzhou) Singapore
Hong Kong Taiwan
Malaysia Thailand
New Zealand Vietnam
Philippines



Sales & Communication Network

One-to-one communication facilitated through a highly extensive network sharply focusing on SMC customers and an experienced sales support organization

In order to satisfy each individual customer, SMC believes it is essential to promote sales activities that emphasize personal contact. The function of our sales staff is not simply to take the customers' orders but to accurately gauge the customers' needs and desires. They play an important role in the development of new products and services by providing vital feedback to the technical and production departments. For this reason, we invest a great deal in our support network and sales organization with the aim of developing closer relationships with our customers and becoming more familiar with their needs. SMC's sales force of 1,200 in Japan and 7,100 internationally is continually striving to cultivate closer communication with our customers.

SMC's extensive domestic sales network 53 branch offices

West Region	Central Region	East Region	SMC Automation Canada, Ltd.
<ul style="list-style-type: none"> Austin Branch 9233 Waterford Centre, Suite 200, Austin, TX 78758 Phone: (800) 762-7621 Dallas Branch 520 E. Corporate Drive, Suite 600 Lewisville, TX 75057 Phone: (800) 762-7621 Los Angeles Branch 1590 Metro Drive, Suite 118 Costa Mesa, CA 92626 Phone: (714) 669-1701 Phoenix Branch 4050 E Cotton Center Blvd., Suite 74 Phoenix, AZ 85040 Phone: (800) 762-7621 Portland Branch 15055 Southwest Sacupia Parkway Suite 180 Portland, OR 97224 Phone: (800) 762-7621 San Jose Branch 2841 Junction Avenue, Suite 110 San Jose, CA 95134 Phone: (408) 943-9600 	<ul style="list-style-type: none"> Chicago Branch 858 Meridian Lake Drive, Suite F Aurora, IL 63034 Phone: (630) 449-0600 Cincinnati Branch 4900 Parkway Drive, Suite 130 Mason, OH 45040 Phone: (513) 445-6957 Cleveland Branch 4160 Highlander Parkway, Suite 200 Richfield, OH 44286 Phone: (330) 659-2006 Des Moines Branch 11384 Aurora Avenue Urbandale, IA 50322 Phone: +1-515-805-2300 Detroit Branch 3895 West Hamlin Road Rochester Hills, MI 48309 Phone: (800) 762-7621 Grand Rapids Branch 3940 Broadmoor Avenue SE Grand Rapids, MI 49512 Phone: +1-616-552-1000 Indianapolis Branch 10100 SMC Boulevard Noblesville, IN 46060 Phone: (317) 859-4440 Kansas City Branch 13261 W. 98th Street Lenexa, KS 66215 Phone: +1-913-643-1798 Milwaukee Branch W177 N9886 Rivercrest Road, Suite 109 Germantown, WI 53022 Phone: (800) 762-7621 Minneapolis Branch 6541 City West Parkway Eden Prairie, MN 55344 Phone: (800) 762-7621 St. Louis Branch 11489 Page Service Center Drive, Saint Louis, MO 63146 Phone: (800) 762-7621 	<ul style="list-style-type: none"> Albany Branch 286 Washington Avenue Extension Suite 101 Albany, NY 12203 Phone: (518) 668-7200 Atlanta Branch 3090 Premiere Parkway Suite 350, Duluth, GA 30097 Phone: (800) 762-7621 Birmingham Branch 177 Cahaba Valley Parkway Pelham, AL 35124 Phone: (800) 762-7621 Boston Branch 99 Rosewood Drive, Suite 180 Danvers, MA 01923 Phone: (978) 767-2328 Charlotte Branch 9801 W Kincay Avenue, Suite 150 Huntersville, NC 28078 Phone: (800) 762-7621 Knoxville Branch 1703 Schaeffer Road Knoxville, TN 37932 Phone: (800) 762-7621 Nashville Branch 318 Seaboard Lane, Suite 401 Franklin, TN 37067 Phone: (800) 762-7621 Philadelphia Branch 2463 Baglyos Circle Bethlehem, PA 18020 Phone: (800) 762-7621 Rochester Branch 7625 Ormitech Place, Suite 7 Victor, NY 14561 Phone: (800) 762-7621 Tampa Branch 13958 Lynnmar Blvd. Tampa, FL 33626 Phone: (800) 762-7621 	<ul style="list-style-type: none"> Toronto Branch 6700 Millcreek Drive, Unit #3 Mississauga, Ontario L5N 8B3 Phone: (905) 267-9700 Vancouver Branch 4300 N. Fraser Way, Unit 206 Burnaby, B.C. V5J 0S3 Phone: (604) 412-2100 Quebec City Branch 2800 Saint-Jean-Baptiste Avenue Suite 100, Quebec City, QC G2E 6J5 Phone: (418) 478-4278 Montreal Branch 755 Saint-Jean Boulevard, Suite 120 Pointe-Claire, QC H9R 5M9 Phone: (514) 733-9595 Windsor Branch 3100 Temple Drive, Unit 500, Windsor, ON N8W 5E6 Phone: (519) 944-0555



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SMC North American Headquarters, Manufacturing and Central Distribution Facility



Global Products / Local Support

The North American Manufacturing and Central Warehouse expansion has positioned SMC to support sales and growth in the U.S. and Canada.

- 2 million sq. ft. total manufacturing and warehouse space
- Additional investment in warehouse space to increase inventory levels
- Incorporating FTZ area within the expanded warehouse reducing overseas delivery time



Global Manufacturing, Distribution and Service Network

Worldwide Subsidiaries

EUROPE

AUSTRIA
SMC Pneumatik GmbH (Austria)

BELGIUM
SMC Pneumatics N.V./S.A.

BULGARIA
SMC Industrial Automation Bulgaria EOOD

CROATIA
SMC Industrijska Automatika d.o.o.

CZECH REPUBLIC
SMC Industrial Automation CZ s.r.o.

DENMARK
SMC Pneumatik A/S

ESTONIA
SMC Pneumatics Estonia

FINLAND
SMC Pneumatics Finland OY

FRANCE
SMC Pneumatique S.A.

GERMANY
SMC Pneumatik GmbH

GREECE
SMC Hellas EPE

HUNGARY
SMC Hungary Ipari Automatizálási Kft.

IRELAND
SMC Pneumatics (Ireland) Ltd.

ITALY
SMC Italia S.p.A.

KAZAKHSTAN
LLP "SMC Kazakhstan"

LATVIA
SMC Pneumatics Latvia SIA

LITHUANIA
UAB "SMC Pneumatics"

NETHERLANDS
SMC Pneumatics B.V.

NORWAY
SMC Pneumatics Norway AS

POLAND
SMC Industrial Automation Polska Sp. z o.o.

ROMANIA
SMC Romania S.r.l.

RUSSIA
SMC Pneumatik LLC.

SLOVAKIA
SMC Priemyselná Automatizácia, Spol s.r.o.

SLOVENIA
SMC Industrijska Avtomatika d.o.o.

SPAIN / PORTUGAL
SMC España, S.A.

SWEDEN
SMC Pneumatics Sweden AB

SWITZERLAND
SMC Pneumatik AG

TURKEY
SMC Pnömatik Sanayi Ticaret ve Servis A.Ş.

UK
SMC Pneumatics (U.K.) Ltd.

ASIA / OCEANIA

AUSTRALIA
SMC Pneumatics (Australia) Pty. Ltd.

CHINA
SMC (China) Co., Ltd.
SMC Pneumatics (Guangzhou) Ltd.

HONG KONG
SMC Pneumatics (Hong kong) Ltd.

INDIA
SMC Pneumatics (India) Pvt. Ltd.

INDONESIA
PT. SMC Pneumatics Indonesia

JAPAN
SMC Corporation

MALAYSIA
SMC Pneumatics (S.E.A.) Sdn. Bhd.

NEW ZEALAND
SMC Pneumatics (N.Z.) Ltd.

PHILIPPINES
Shoketsu SMC Corporation

SINGAPORE
SMC Pneumatics (S.E.A.) Pte. Ltd.

SOUTH KOREA
SMC Pneumatics Korea Co., Ltd.

TAIWAN
SMC Pneumatics (Taiwan) Co., Ltd.

THAILAND
SMC (Thailand) Ltd.

UNITED ARAB EMIRATES
SMC Pneumatics Middle East FZE

VIETNAM
SMC Pneumatics (VN) Co., Ltd

AFRICA

SOUTH AFRICA
SMC Pneumatics (South Africa) Pty Ltd

NORTH, CENTRAL & SOUTH AMERICA

ARGENTINA
SMC Argentina S.A.

BOLIVIA
SMC Pneumatics Bolivia S.R.L.

BRAZIL
SMC Pneumáticos do Brasil Ltda.

CANADA
SMC Pneumatics (Canada) Ltd.

CHILE
SMC Pneumatics (Chile) S.A.

COLOMBIA
SMC Colombia Sucursal de SMC Chile, S.A.

MEXICO
SMC Corporation (Mexico) S.A. de C.V.

PERU
SMC Corporation Peru S.A.C.

USA
SMC Corporation of America

VENEZUELA
SMC Neumatica Venezuela S.A.

U.S. & Canadian Sales Offices

WEST

Austin
Dallas
Los Angeles
Phoenix
Portland
San Jose

CENTRAL

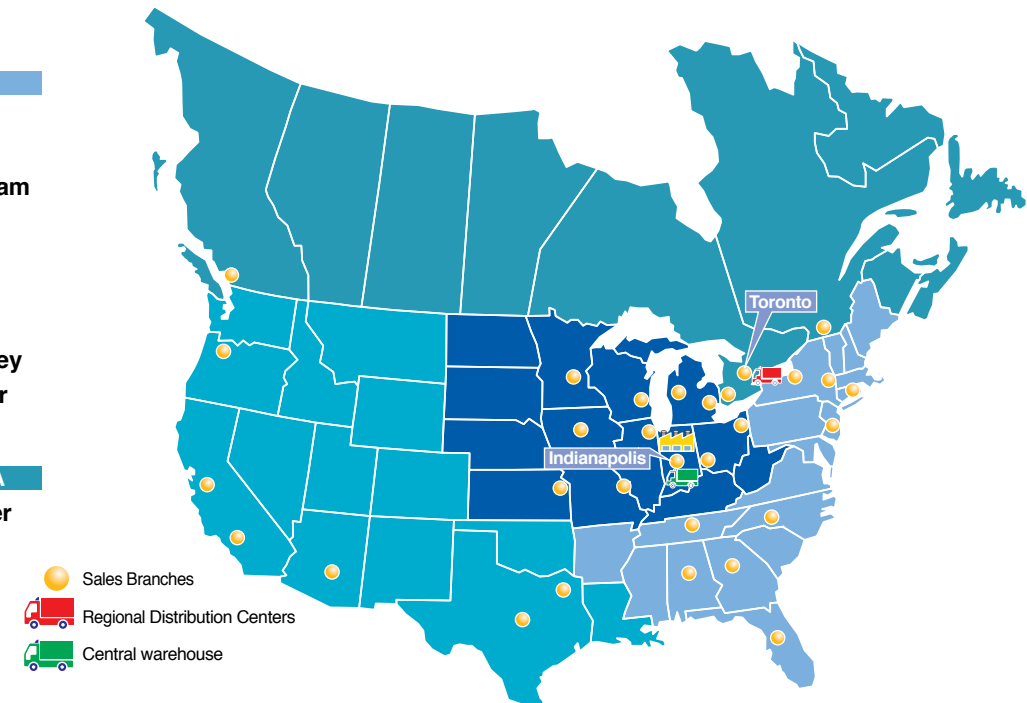
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Cincinnati
Cleveland
Detroit
Des Moines
Grand Rapids
Indianapolis
Kansas City
Milwaukee
Minneapolis
St. Louis

EAST

Albany
Atlanta
Birmingham
Boston
Charlotte
Knoxville
Nashville
New Jersey
Rochester
Tampa

CANADA

Vancouver
Toronto
Windsor
Montreal



S E S C S C O C O S C O C O