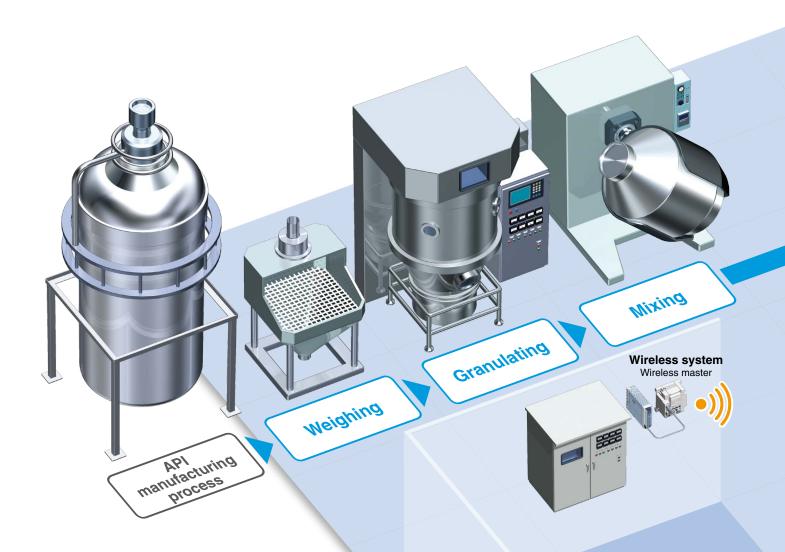
Equipment for Pharmaceutical Manufacturing

















Centralized



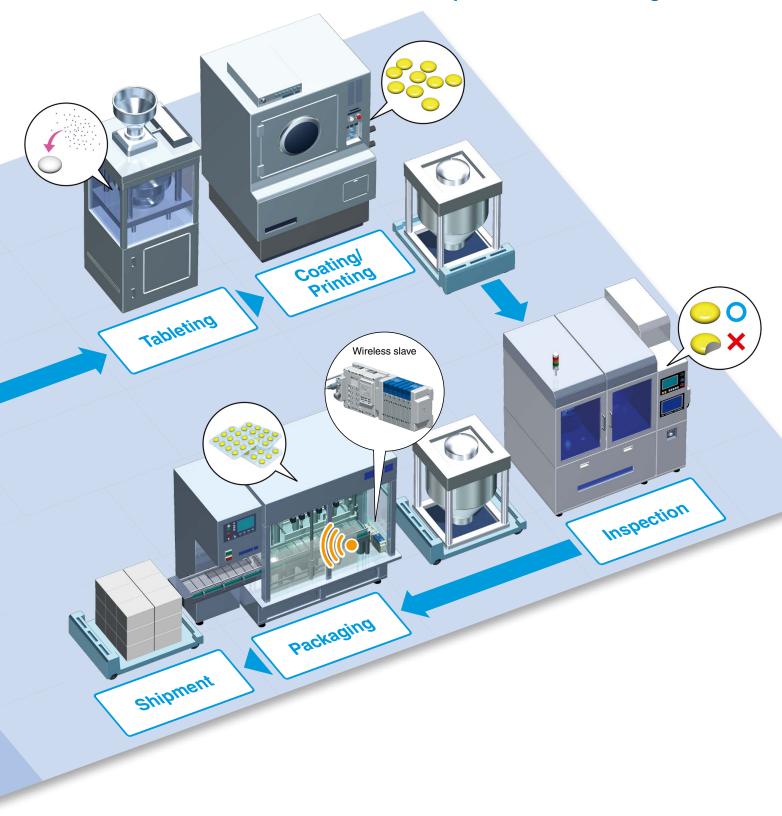
From

p. 49











p. 55

Control

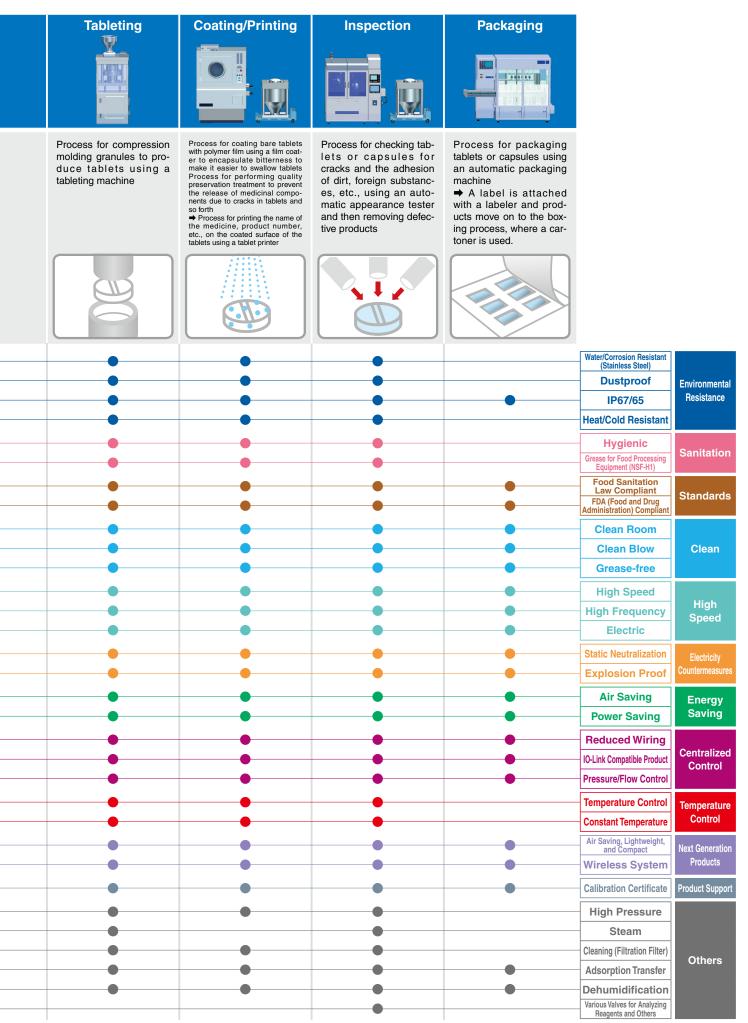


Support	p. 63
Others	From

Next Generation Products From p. 60

SMC

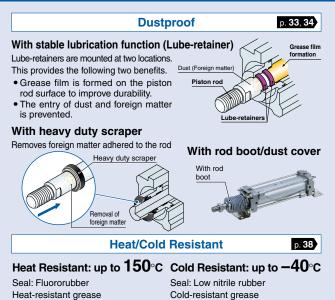
Solid Preparation Manufacturing Process Process for sieving pharmaceutical ingredients, implementing pretreatment (e.g. pulverization), and accurately weighing ingredients Process for granulating powder ingredients that have been pulverized and weighed Process for mixing granulated powder uniformly using a mixer Process for sieving pharmaceutical ingredients, implementing pretreatment (e.g. pulverized and weighed) Process for sieving pharmaceutical ingredients, implementing pretreatment (e.g. pulverized and weighed)	
Solid Preparation ceutical ingredients, imple- menting pretreatment (e.g. pul- verization), and accurately	
Water/Corrosion Resistant (Stainless Steel)	
Environmental Dustproof	
Resistance 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 Room •	
Clean Blow -	
Grease-free	
High Speed	
High Speed High Frequency	
Electric • •	
Electricity Static Neutralization	
Countermeasures Explosion Proof	
Energy Air Saving	
Saving Power Saving	
Reduced Wiring	
Control IO-Link Compatible Product	
Pressure/Flow Control	
Temperature Temperature Control	
Control Constant Temperature	
Next Generation Air Saving, Lightweight, and Compact	
Products Wireless System	
Product Support Calibration Certificate	
High Pressure	
Steam	
Cleaning (Filtration Filter)	
Others Adsorption Transfer	
Dehumidification • • •	
Various Valves for Analyzing Reagents and Others	



Environmental Resistance







Cold resistant cylinder

(-40 to 70°C):

-XB7



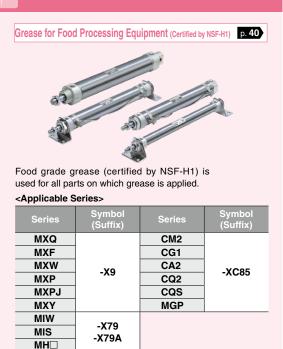
Heat resistant cylinder

(60

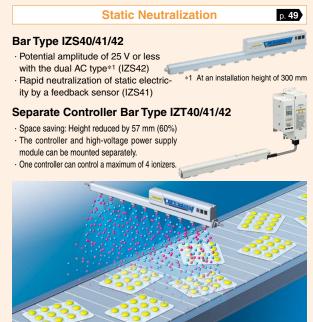
(-10 to 150°C):

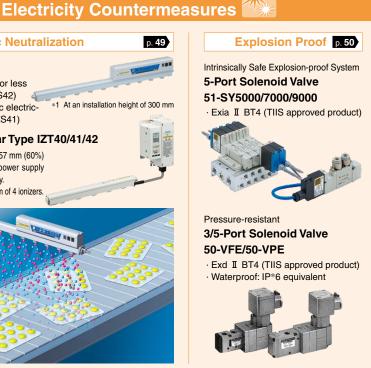
-XB6

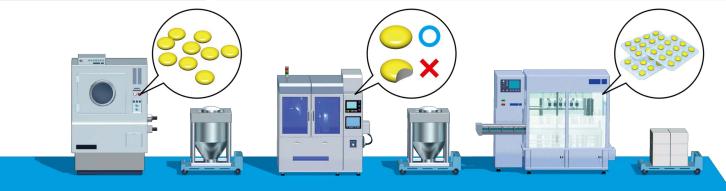














Inspection

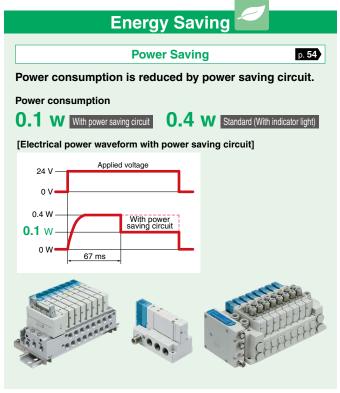
Packaging

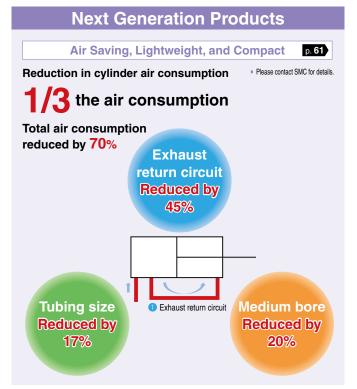


Shipment



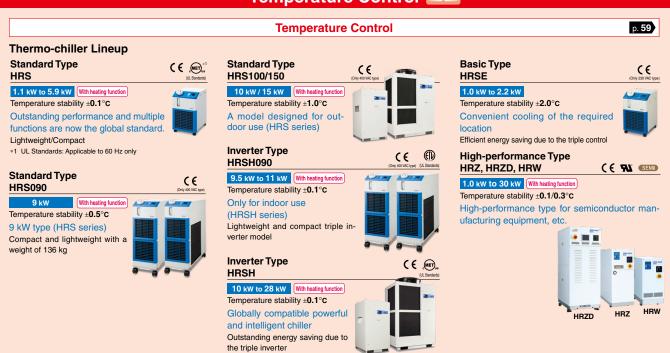




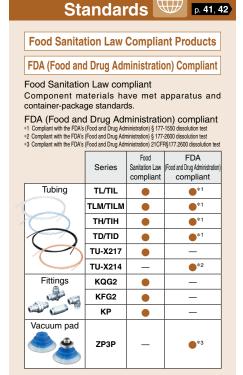


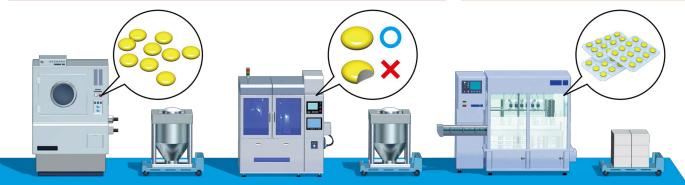












Coating/Printing



Inspection

p. **59**



Packaging



Shipment

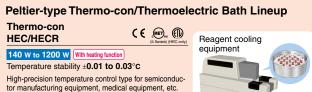
p. **69**

(€

Temperature Control

Constant Temperature











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

Temperature stability ±0.01°C

(€ .MET).

(E SEMI





Others





Stable supply of temperature and pressure controlled dry clean air



Moisture Control Tube IDK

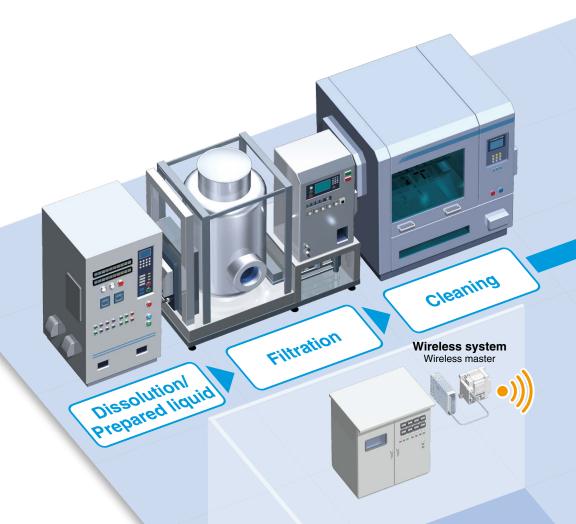
Prevents condensation in piping for small cylinders/air grippers

Linear shape Suitable for applica tions where cylinders do not rotate

Coil shape Reduces the tube buckling of moving parts













From p. 41



Centralized

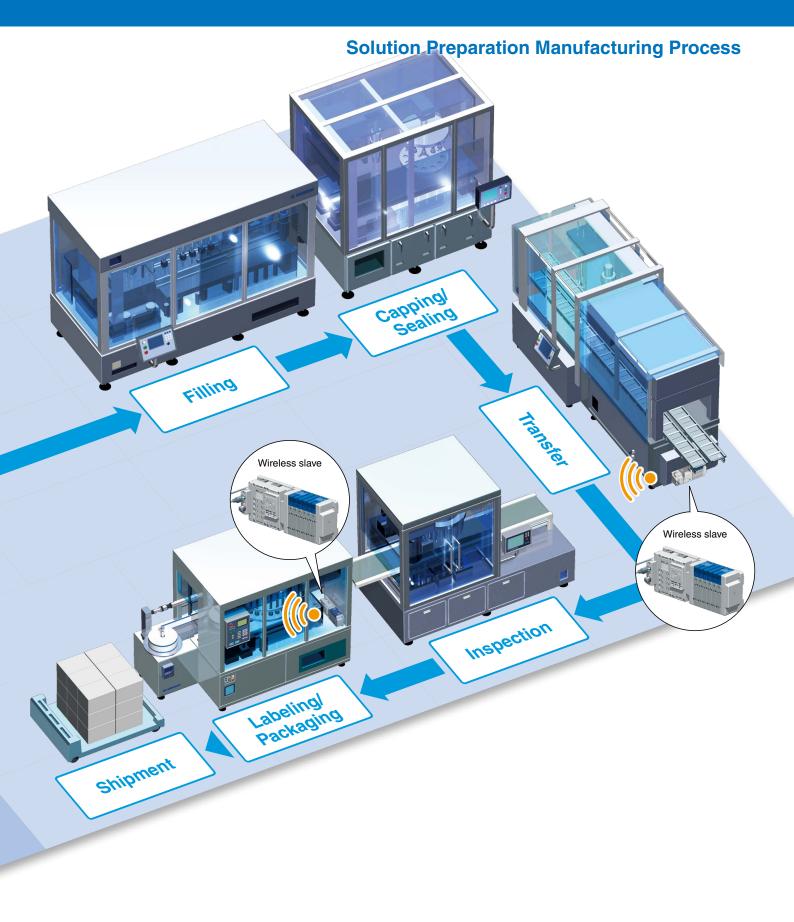
From p. 47

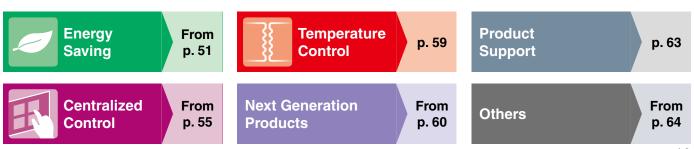


SMC



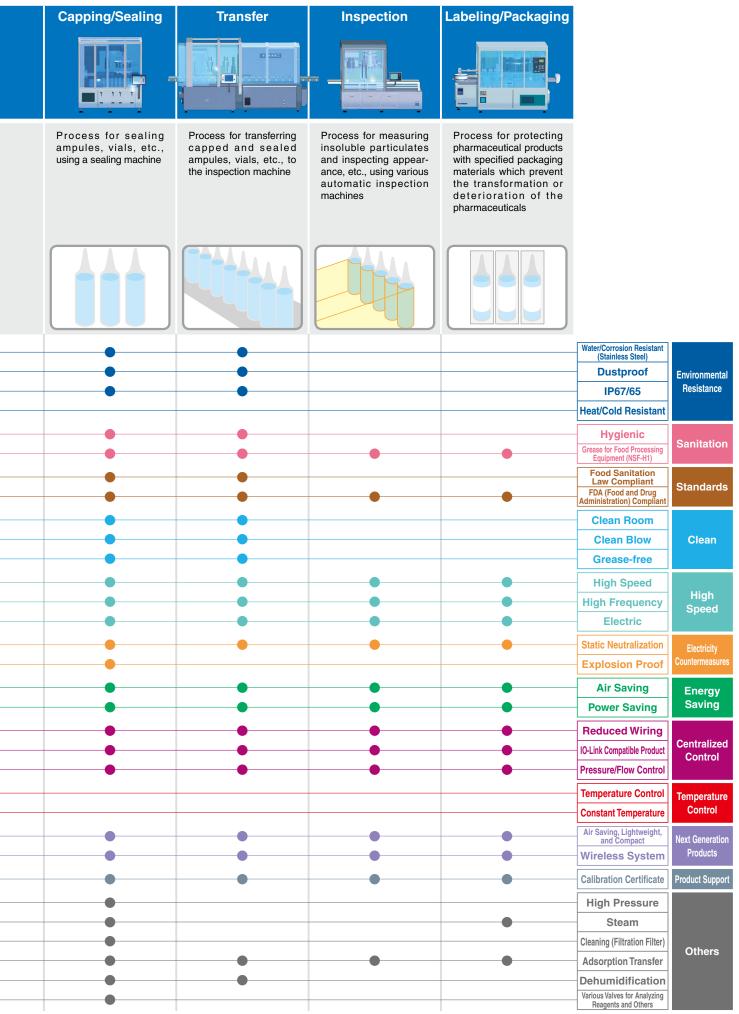






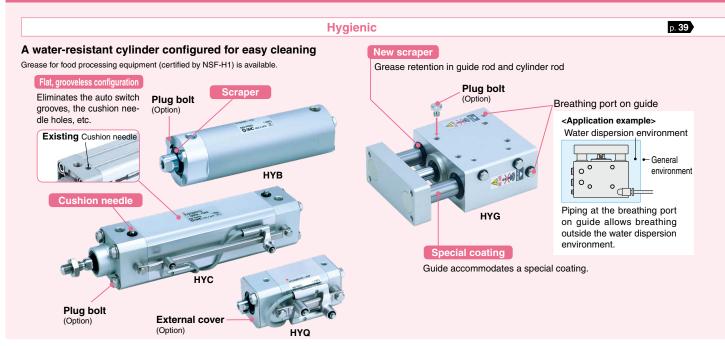
SMC

		Dissolution/ Prepared liquid	Filtration	Cleaning	Filling	
	n Preparation cturing Process	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 liq- uid	Process for aseptically drying vials, ampules, syringes, etc., after ultrasonic cleaning	Process for filling ampules, vials, etc., with the dissolved and filtered solution prep- arations using various filling machines	
	Water/Corrosion Resistant (Stainless Steel)	•	•	•	•	
Environmental	Dustproof			•	•	
Resistance	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 Room	•		•	•	
Clean	Clean Blow	•	•	•	•	
	Grease-free	•	•	•	•	
	High Speed				•	
High Speed	High Frequency				•	
	Electric				•	
Electricity	Static Neutralization				•	
Countermeasures	Explosion Proof	•	•	•	•	
Energy	Air Saving				•	
Saving	Power Saving				•	
	Reduced Wiring				•	
Centralized Control	IO-Link Compatible Product				•	
	Pressure/Flow Control	•	•	•	•	
Temperature	Temperature Control	•	•		•	
Control	Constant Temperature	•	•		•	
Next Generation	Air Saving, Lightweight, and Compact			•	•	
Products	Wireless System			•	•	
Product Support	Calibration Certificate	•	•	•	•	
	High Pressure	•		•	•	
	Steam	•	•	•	•	
Others	Cleaning (Filtration Filter)	•	•	•	•	
- Others	Adsorption Transfer				•	
	Dehumidification				•	
	Various Valves for Analyzing Reagents and Others	•	•	•	•	









Solution Preparation Manufacturing Process







Filtration



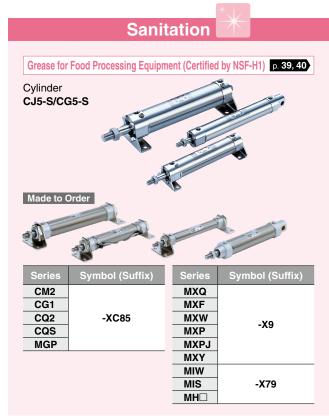
Cleaning

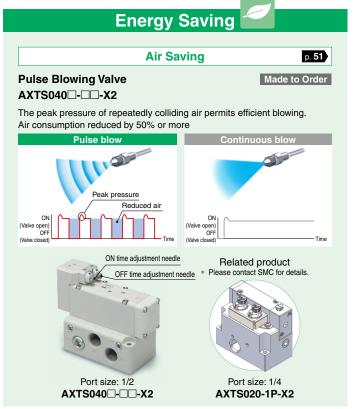


Filling



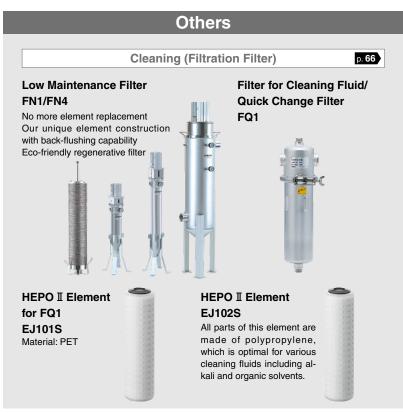
Capping/Sealing



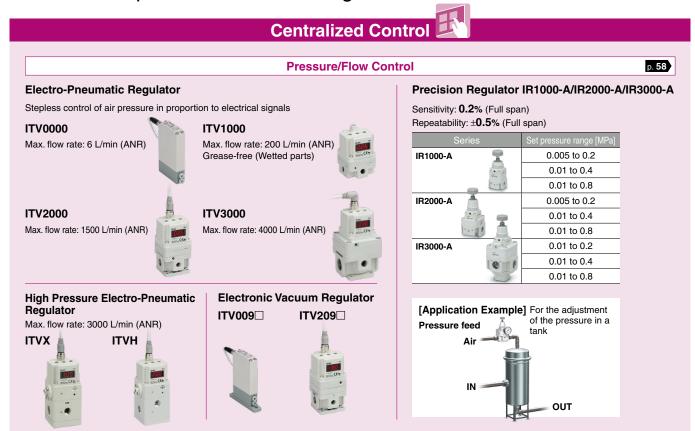












Solution Preparation Manufacturing Process



Dissolution/ Prepared liquid



Filtration



Cleaning

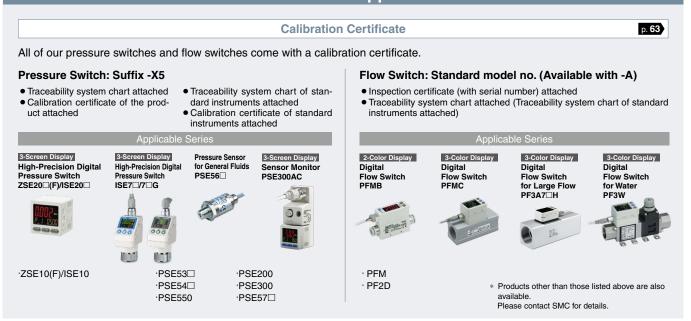


Filling



Capping/Sealing

Product Support





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



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





S Couplers **KKA**



Speed

Pressure Sensor for **General Fluids** PSE56□

All Stainless Steel Vacuum Ejector ZH□□-X267



Chemical **Liquid Valve** LVA



















Transfer



Inspection



Labeling/Packaging



Others

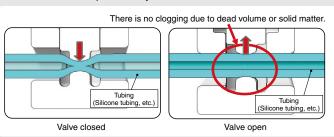
Various Valves for Analyzing Reagents and Others



Pinch Valve

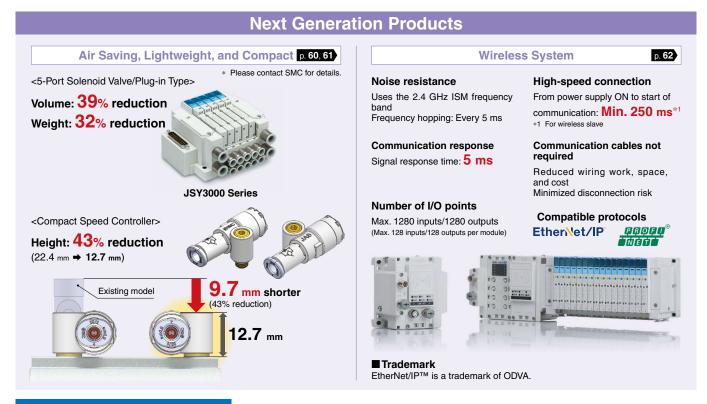
The flow volume of the fluid is controlled by directly clamping the tube so as to open or close it.

- 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.





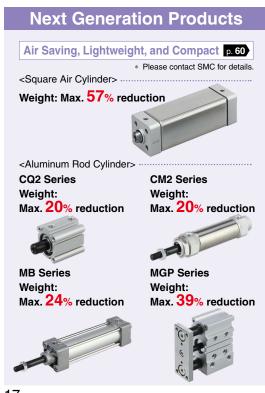


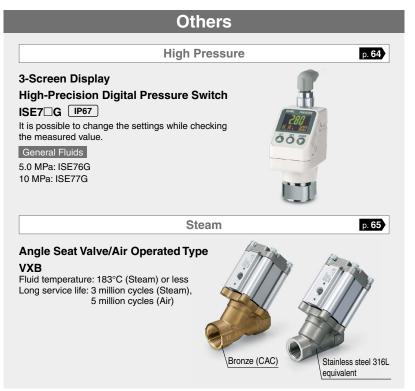


Solution Preparation Manufacturing Process

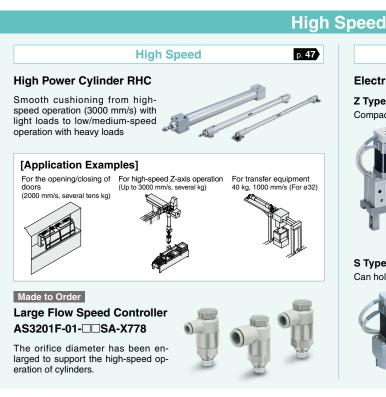


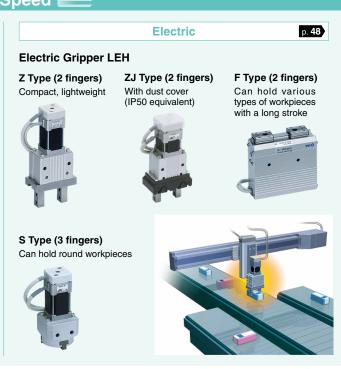


















Inspection



Labeling/Packaging



Shipment

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Electricity Countermeasures

Static Neutralization

Fan Type

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



Desktop Duster Box 7VB

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



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





nation on reagent bottles

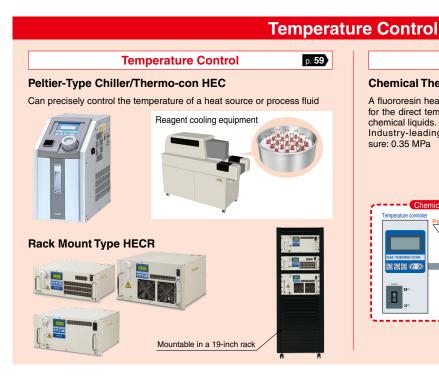
Electrostatic Sensor

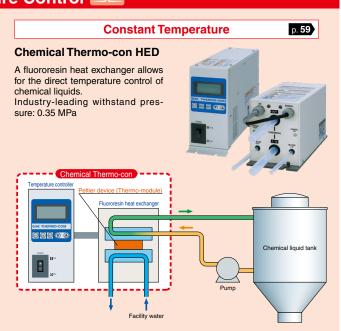


Handheld Electrostatic Meter IZH10





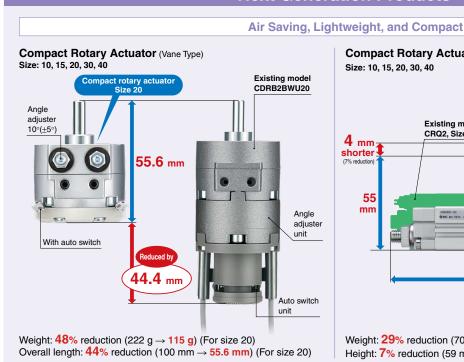




Solution Preparation Manufacturing Process



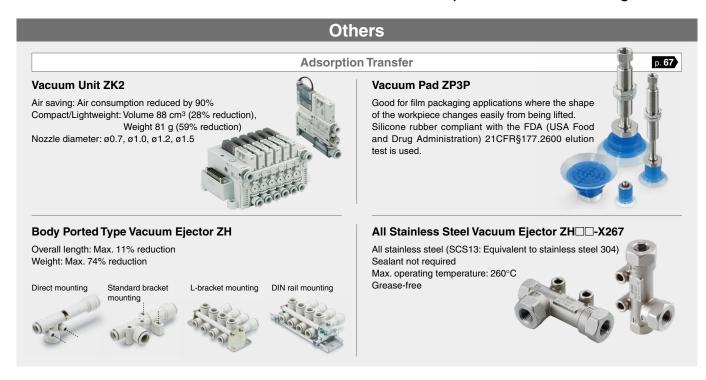
Next Generation Products



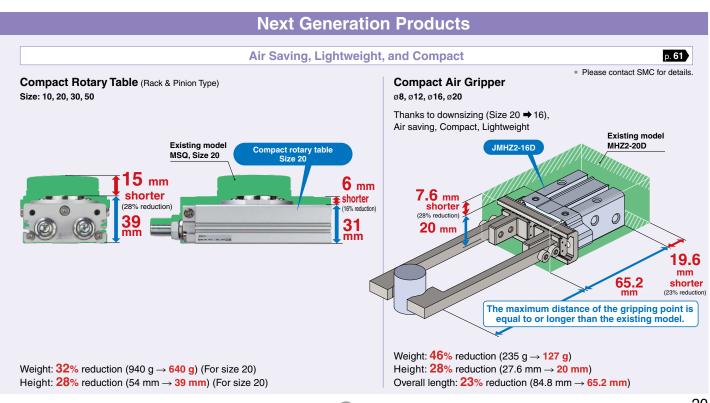
p. **60**, **61** * Please contact SMC for details. Compact Rotary Actuator (Rack & Pinion Type) Size: 10, 15, 20, 30, 40 ompact rotary actuator Size 20 Existing model CRQ2, Size 20 4 mm shorter 4 mm 55 shorter (14% reduction) mm 25 mm 136 mm 4.5 mm shorter (3% reduction) Weight: 29% reduction (700 g \rightarrow 500 g) (For size 20)

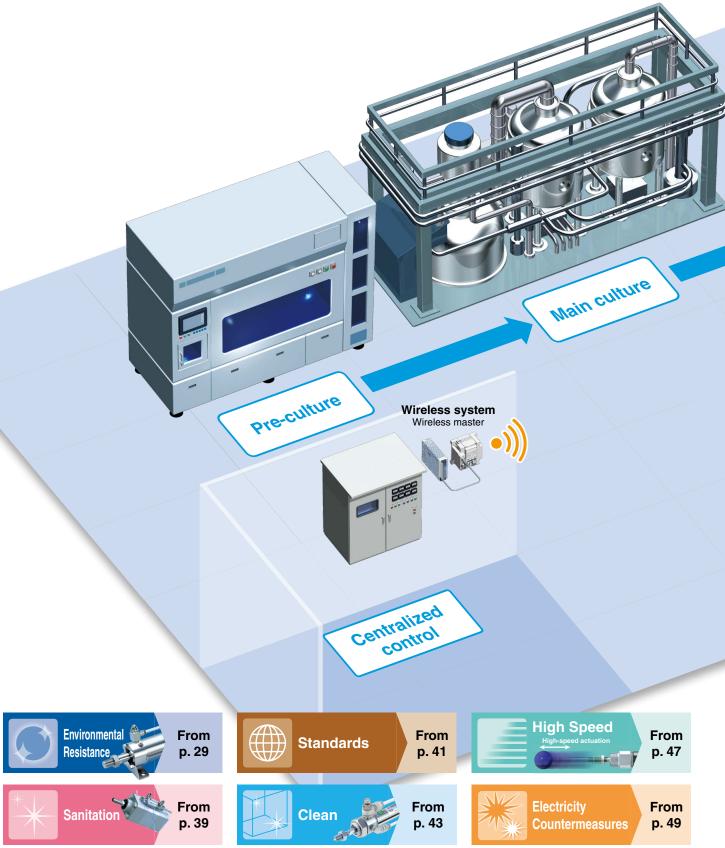
Height: 7% reduction (59 mm \rightarrow 55 mm) (For size 20)

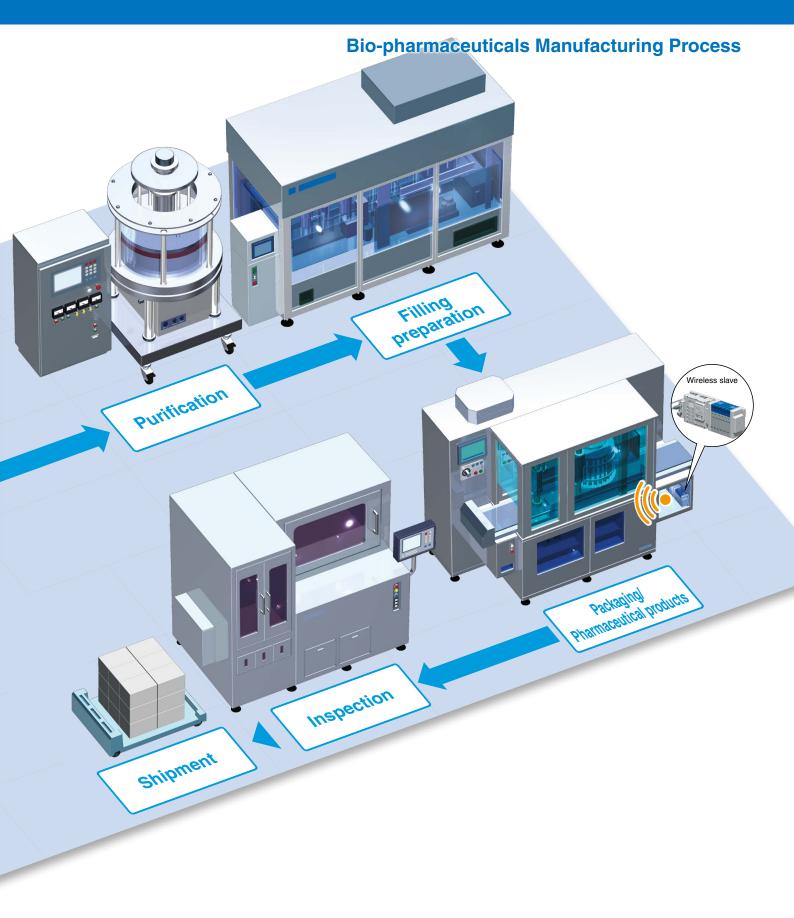


















Product

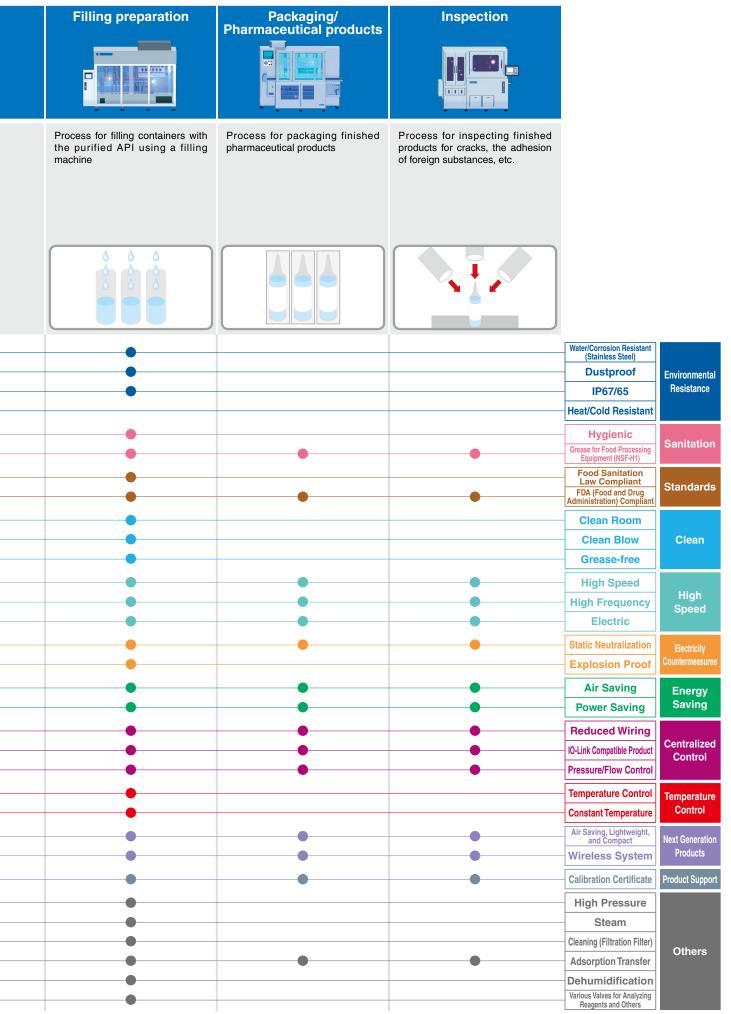
From

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Next Generation

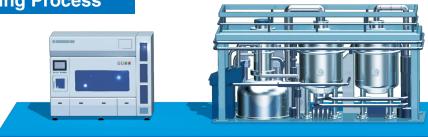
Products

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











Pre-culture

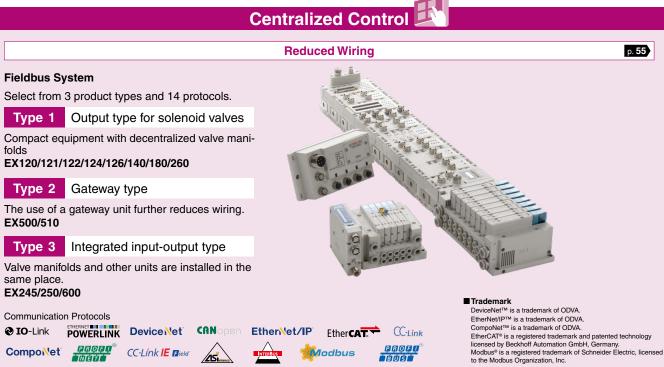


Main culture



Purification

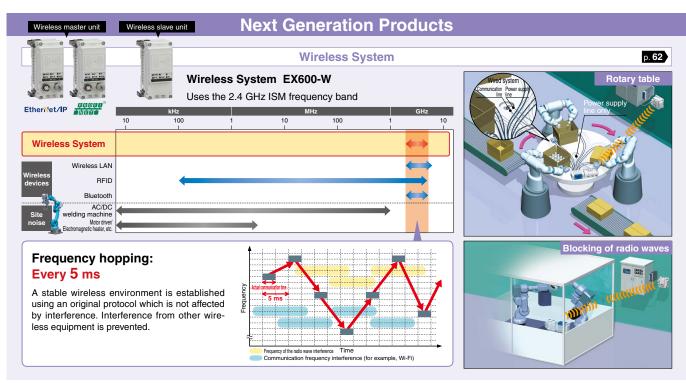


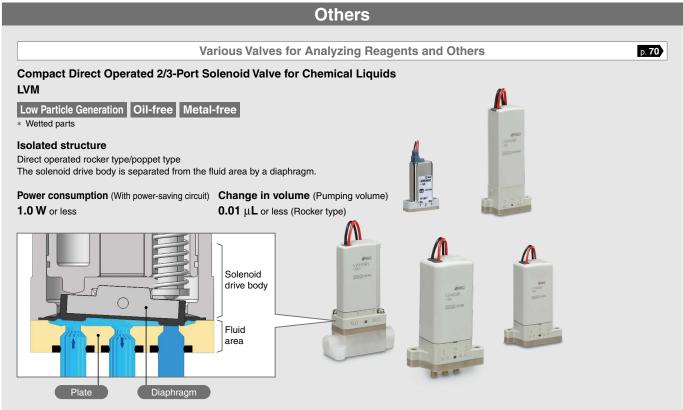


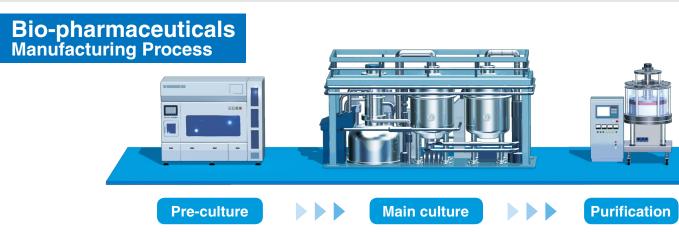


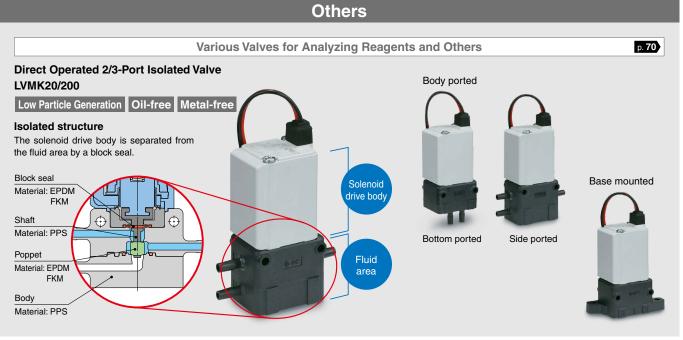






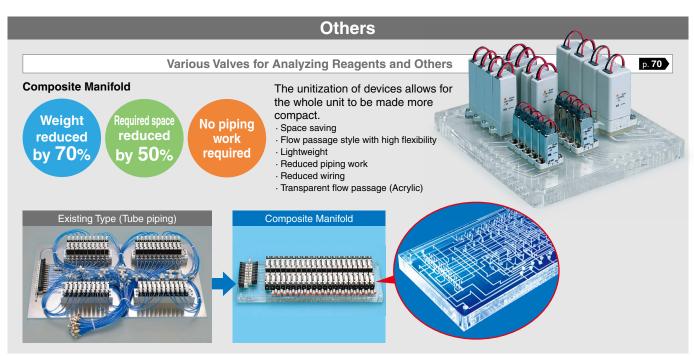














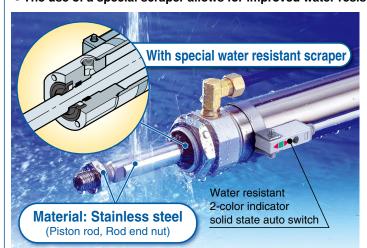
Water Resistant

Water Resistant Cylinders

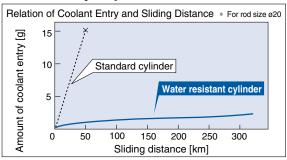
 Applicable for use in environments with water splashing CM2/CG1/CQ2/CA2/MB/MB1/MGPM/MGGM

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



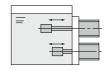


Dramatically improved water resistance



Conditions

Operating conditions	Air
Pressure ·····	0.5 MPa
Coolant	Water-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

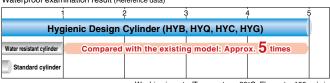
Hygienic Design Cylinder HY

 Service life 5 times longer than water resistant cylinders



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

Waterproof examination result (Reference data)



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

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

Stainless Steel Cylinder CJ5-S/CG5-S

- 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	Davible estine	10, 16
CG5-S	Double acting	20, 25, 32, 40, 50, 63, 80, 100





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High Power Cylinder RHC-XC93

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 Stainless Steel 316 SRH





Fittings

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



Stainless Steel One-touch **Fittings** KQ2-G



Miniature Fittings/Stainless Steel 316 MS



S Couplers

Stainless Steel Type **KKA**



Flow Control Equipment

Stainless Steel Speed Controller ASG



Check Valve Made to Order INA-14-□

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Pressure Switches

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





Pressure Switches

Pressure Sensor Stainless Steel 316 for General Fluids PSE56□



Flow Switches

3-Color Display Electromagnetic Type Digital Flow Switch LFE-X8



Ejectors

All Stainless Steel Vacuum Ejector ZH□□-X267





Process Gas Equipment

Regulator Diaphragm Valve Check Valve Vacuum Generator Flow Switch







Stainless Steel High Vacuum Angle/In-line Valve

p. 168



2-Port Valves for Fluid Control

High Purity Chemical







p. **156**



Direct Operated 2-Port Solenoid Valve VX2/VDW



XM/XY



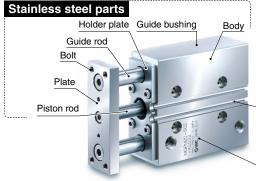
For details on this product,

refer to the Web Catalog.

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

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

 Stainless steel is used for all external metal parts.



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

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

Laser marking (Cylinder plate)

Improved durability

Can not be peeled off, even when wet

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





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 seting	10, 16
CG5-S	Double acting	20, 25, 32, 40, 50, 63, 80, 100



Floating Joint

Stainless Steel Type





Stainless Steel Foot Bracket, Flange Bracket,

Made to Order

Stainless steel parts improve corrosion resistance.

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Symbol

External Stainless Steel Cylinder: -XB12

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
	Air pulindor	CM2
CM2	Air cylinder	CM2W
	Non-rotating rod type	CM2K

Made of Stainless Steel: -XC6

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

<Applicable Series>

Series	Description	Model
	Air cylinder	CM2-Z
		CM2W-Z
	Non-rotating rod type	CM2K-Z
		CM2KW-Z
	Direct mount type	CM2R-Z
CM2	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
	Air cylinder	CG1-Z
CG1	Double rod type	CG1W-Z
CGI	Direct mount type	CG1R-Z
	Smooth cylinder	CG1Y-Z
MB*2	Air cylinder	MB-Z*3
IVID · -		MBW-Z*3
MB1*2	Air cylinder	MB1-Z*3
	End lock cylinder	CBA2*1
CA2*2	Air budro tuno	CA2H
	Air-hydro type	CA2W□H
	Air cylinder	CS1
CS1*2	All Cylinder	CS1W
	Air-hydro type	CS1H

Series	Description	Model
cos	Compact cylinder	CQS
		CQSW
Cus	Non-rotating rod type	CQSK
	Anti-lateral load type	CQS□S
	Compact cylinder	CQ2-Z
	Compact cylinder	CQ2W-Z
	Axial piping type (Centralized piping type)	CQP2
CQ2	Long stroke	CQ2-Z
	Anti-lateral load type	CQ2□S-Z
	Water-resistant compact cylinder	CQ2□ _V ^R -Z
	Water resistant, axial piping	CQP2□ ^R _V
MU	Plate cylinder	MU-Z
	Valve mounted air cylinder	CVM5
CV		CVM5K
CV		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



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

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
	Standard type	MB-Z
		MBW-Z
МВ	Non-rotating rod type	MBK-Z
IVID		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
	Non-rotating rod type	CA2KW
	End lock cylinder	CBA2
	Smooth cylinder	CA2Y-Z
cv		CV3
	Valve mounted air cylinder	CVS1
	valve mounted all Cylinder	CV3K
		CVS1K

Symbol

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

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
CGI	Non-rotating rod type	CG1K-Z
	Standard type	MB-Z
мв	Non-rotating rod type	MBK-Z
MB	With end lock	MBB
	Smooth cylinder	MBY-Z
MB1	Standard type	MB1-Z
IVIDI	Non-rotating rod type	MB1K-Z
	Standard type	CA2-Z
040	Non-rotating rod type	CA2K
CA2	End lock cylinder	CBA2
	Smooth cylinder	CA2Y-Z
CS1	Standard type	CS1
	Low friction	CS1Q

Series	Description	Model
CS2	Standard type	CS2
CSZ	Smooth cylinder	CS2Y
CV	Volve measurated air evilindes	CVS1
CV	Valve mounted air cylinder	CVS1K
	Standard type	CQS
cos	Long stroke	CQS
Cus	Anti-lateral load type	CQS□S
	Non-rotating rod type	CQSK
	Standard type	CQ2-Z
	Long stroke	CQ2-Z
CQ2	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

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

<Applicable Series>

Series	Description	Model
МВ	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

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

<Applicable Series>

Series	Description	Model
МВ	Standard type	MB-Z
		MBW-Z
	Smooth cylinder	MBY-Z
MB1	Standard type	MB1-Z
IVIDI		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



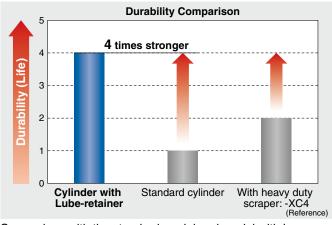
Dustproof

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

p. **89**

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



Comparison with the standard model and model with heavy duty scraper (-XC4) (Relative ratio of B₁₀)

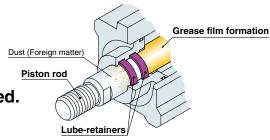
* The durability test is conducted in accordance with SMC test conditions.

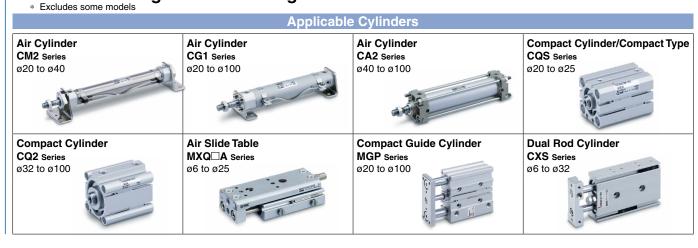
Lube-retainers are mounted at two locations. This provides the following two benefits.

- 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.

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





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.)





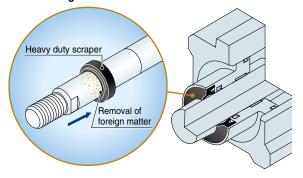
Dustproof

Environmental Resistance

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.

Removes foreign matter adhered to the rod







p. **90**

















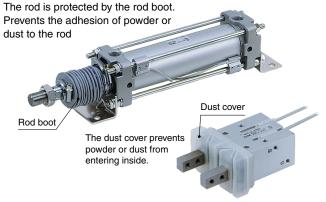








With Rod Boot/Dust Cover





























With dust cover



Wedge Cam Operation Slide Guide Air Gripper MHK2



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□)





IP65/67

Enclosure: IP67

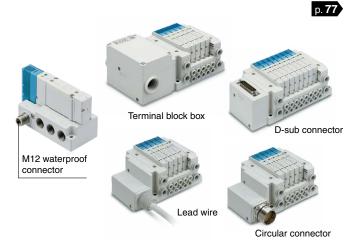
Plug-in Type

5-Port Solenoid Valve

SY Connector Connecting Base

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

Carias	Flow rate characteristics 4/2 → 5/3(A/B → EA/EB)		Applicable
Series	4/2 → 5/3(A/ C[dm³/(s·bar)]	b → EA/Eb)	cylinder size
SY3000	1.6	0.19	ø50
SY5000	3.6	0.17	ø63
SY7000	5.9	0.20	ø80



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



3-Color Display Digital Gap Checker

• 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.



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



p. **149**

20C Series

Pressure Sensor for General Fluids PSE56□

 Wetted parts: Stainless steel 316L



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)



3-Screen Display Sensor Monitor

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



Multi-Channel Digital Pressure Sensor Controller

PSE200





Front face: IP65 Others: IP40



p. 150

p. **149**

Environmental Resistance

IP65/67

Enclosure: IP65

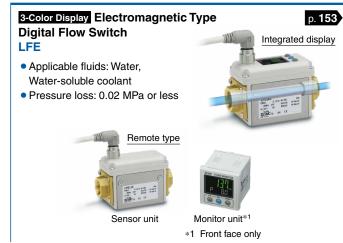


3-Color Display Digital Flow Switch for Large Flow p. 151 PF3A7□H

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











Monitor unit*1

*1 Front face only





Made to Order

5-Port Solenoid Valve SY5000-X500

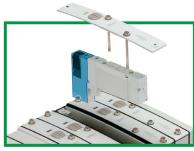
• Enclosure: IP69K



Sensor unit



* Please contact SMC for details.

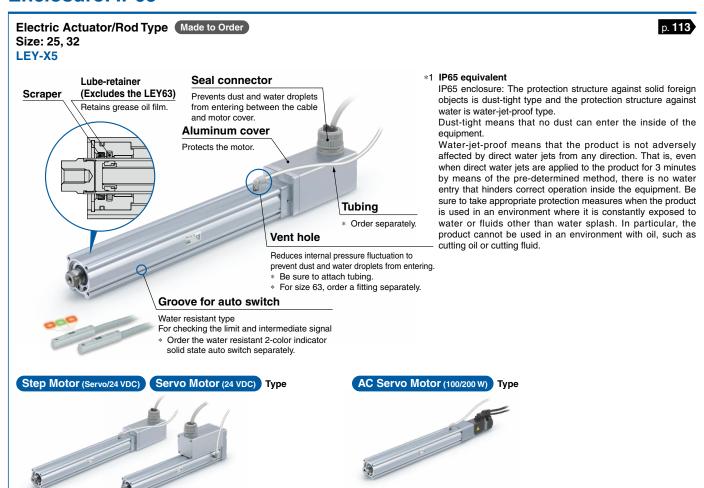




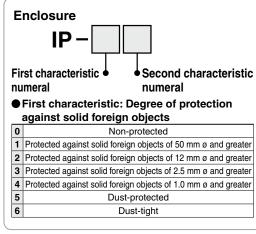
Environmental Resistance

IP65/67

Enclosure: IP65*1







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	Immersible 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.



Heat/Cold Resistant

Heat Resistant

Cylinders, Air Grippers

Symbol 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.



S	pecification	าร
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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

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

p. **90**

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

Heat resistant compact cylinder which can mount heat resistant solid state switch (D-M9DJ)

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)



• The optimum operating range can be determined



by the color of the light. (Red \rightarrow Green \leftarrow Red)



Fittings, Tubing From p. 135



Max. operating temperature: $150^{\circ}C$



Max. operating temperature: 150°C

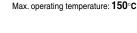


Max. operating temperature: 150°C

Stainless Steel Insert KFG2

Max. operating temperature: 260°C*1 *1 Swivel elbow and with sealant

types: -5 to 150°C



S Couplers

KKA

Fluoropolymer (Super PFA) TL/TIL

Max. operating temperature: $200^{\circ}C^{*2}$



Max. operating temperature: 260°C*2

Fluoropolymer LQ1

Max. operating temperature: 150°C*2





Max. operating temperature: 200°C*2

Fluoropolymer LQ3



Max. operating temperature: 200°C*2

Max. operating temperature: 260°C*2

Connector I OHR Max. operating temperature: 200 $^{\circ}\text{C}^{*2}$

Bore Through

2-Layer Soft Fluoropolymer Tubing

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







Max. operating temperature: 80°C

*2 It varies depending on the operating pressure.

Be sure to refer to the **Web Catalog**.

Vacuum Pads p. 119 Vacuum Pad



Max. operating temperature: 200°C

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

Cold Resistant

Cylinders

Cold Resistant Cylinder (-40 to 70°c): -XB7 Ambient temperature range: -40 to 70°C

<Applicable Series> CJP2/CJ2/CM2/CG1/CU/CQS/CQ2





Regulator for Low Temperature AR25 to 60-B-X425



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



Ambient temperature: -5 to 60°C

Ambient temperature: -30 to 60°C





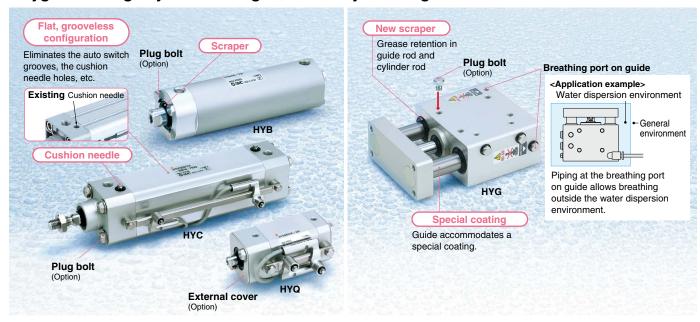
p. **90**



Sanitation Hygienic

Hygienic Grease for Food Processing Equipment

A hygienic design cylinder configured for easy cleaning



Hygienic Design Cylinder HY

p. **89**

p. 88

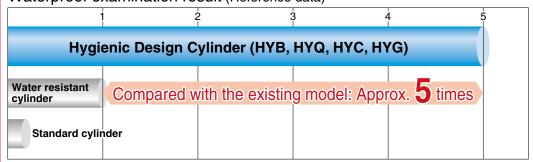
• Grease for food processing equipment (certified by NSF-H1) is available.



Туре	Series	Action	Bore size [mm]	
Round type HYB			20, 25, 32, 40, 50, 63, 80, 100	
Basic type	HYQ	Double acting	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		MIW		CQ2	
MXF		MIS	-X79	CQS	-XC85
MXW	-X9	MH□		MGP	
MXP		CM2	-XC85		
MXPJ		CG1			
MXY		CA2			



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

Food zone

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

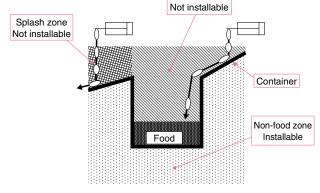
components

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





40



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.

	Color	
Metric	ø4, ø6, ø8, ø10, ø12, ø19	
Inch	ø1/8", ø3/16", ø1/4", ø3/8" ø1/2", ø3/4", ø1"	Translucent



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.

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



FEP Tubing (Fluoropolymer)

TH/TIH

p. 140 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.

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



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.

	Color	
Metric	ø4, ø6, ø8, ø10, ø12	
Inch	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Translucent







Standards

Food Sanitation Law Compliant Products

FDA (Food and Drug Administration) Compliant

FDA (Food and Drug Administration) Compliant

Color Black, White, Red, Blue, Yellow,

Green, Clear, Orange

Compatible with Food Sanitation Law: **Polyurethane Tubing**

Food Sanitation Law Compliant TU-X217

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



Stainless Steel 316 One-touch Fittings

p. **136**

- 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

p. **139**

Polyurethane Tubing

Applicable tubing O.D.

ø4, ø6, ø8, ø10, ø12

TU-X214

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**

Food Sanitation Law Compliant

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





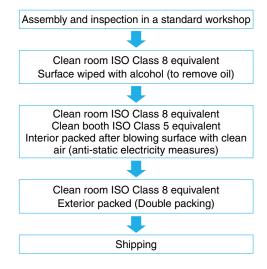
p. **173**

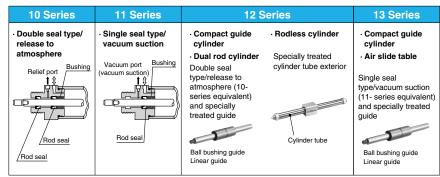
Clean Room

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

Prevents particle generation in clean room







Air Cylinder

Relief port

Directional Control Valve

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



Main valve and pilot valve common exhaust

Compressed Air Cleaning Filter Series Modular F.R.



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.

Stainless steel 304 Clean Air Filter

Metal parts

Polyolefin hollow fiber membrane element

Brass (Electroless nickel plated) or

Clean One-touch Fittings/

Speed Controller

Polypropylene resin



Exhaust Cleaner for

Clean Room



Clean Exhaust Filter



Clean Gas Filter

PTFE membrane element



Digital Flow Switch

Low Particle Generation: PFM/PFMB-X300







PFMB-X300



p. **127**

Clean Blow

Clean Air Filter

(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.

Assembly environment

 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)

Clean room: Class M5.5 (ISO class 7)*1

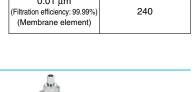
Clean booth: Class M3.5 (ISO class 5)*1

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

Disposable Type: Multiple Disc Type



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	





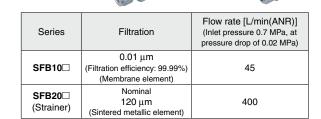
Series	Filtration	Flow rate [L/min(ANR)] (Inlet pressure 0.7 MPa, at pressure drop of 0.02 MPa)
SFA10□	0.01 µm	26
SFA20□	(Filtration efficiency: 99.99%)	70
SFA30□ (Membrane element)		140

Disposable Type: Straight Type



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	





operated type are available.

Clean Air Module Pressure outlet port LLB Digital flow switch Pressure gauge and pressure switch are mountable. • Filtration: 0.01 μm (Filtration efficiency: 99.99%) (Order them separately.) Measured flow range Fluid contact space: Grease-free, Silicone-free · 5 to 100 L/min Regulator Restrictor Filter Clean-room assembly and double-packaging · 50 to 500 L/min Filtration: 0.01 µm (Filtration efficiency: 99.99%) **Built-in One-touch fitting** Clean One-touch fitting, KP series Also compatible with threaded female connector ON/OFF valve Air-operated type, air-operated type with flow adjustment, and manually



Grease-free

Air Preparation Filters

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

p. **126**, **127**

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

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/L/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







Pressure Switches



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



Grease-free

Flow Switches

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

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

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)/LVH

Compact Type High Purity Air Operated Chemical Liquid Valve/LVD



Process Gas Equipment

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/ $\mathbf{AP} \square \mathbf{PA}$

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/ $\mathbf{AK} \square \mathbf{PA}$

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

Sintered Metal Element/ES





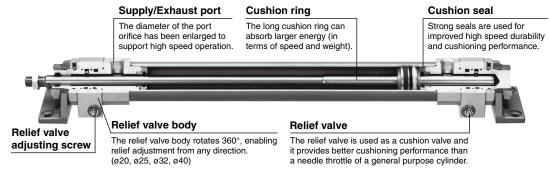
High Speed

High Speed | High Frequency

High Power Cylinder RHC

- 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 highspeed operation of cylinders.

Variations



Low Friction Cylinder/Metal Seal Type MQML H

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

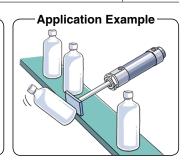
Series	Bore size [mm]	Operating pressure range [MPa]	Driving speed [mm/s]
MQML	6 (Standard only)	ø6: 0.02 to 0.7	0.5 to 1000
Standard	10	ø10 to ø25: 0.005 to 0.7	
MQML□□H	16		
High speed/High	20	0.01 to 0.7	5 to 3000
frequency	25		





Low Friction Cylinder (Single Acting) MQP





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High Speed 2-Port Valve SX10

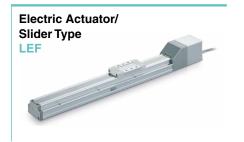
- High-speed response ON: 0.45 ms, OFF: 0.4 ms (± 0.05 ms)
- Long service life: 5 billion cycles or more
- High frequency: 1200 Hz
- Width: 9 mm
- Low power consumption: 4 W



High Speed

From p. **102**

Electric



























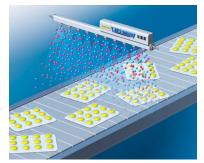
Electricity Countermeasures **D. 154, 155** Static Neutralization

lonizers

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



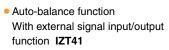
Ionizer Vertical Stand

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



Bar Type

 Potential amplitude of the workpiece is reduced with Dual AC. IZT42 Controller High-voltage power supply module



 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

Static neutralization, dust removal, and dust

collection processes have been

Desktop Duster Box

integrated into one box.

A4 size [ZVB20]

Fan Type

- Can neutralize static electricity in a larger space with a builtin 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.



IZF21/31



Electrostatic Sensor

IZD10/IZE11

 Potential measurement: ± 20 kV $\pm\,0.4\;kV$



Handheld Electrostatic Meter

Potential measurement: ± 20.0 kV



Antistatic Equipment

A3 size [ZVB40]



Conductive Vacuum Pad ZP3/ZP2/ZP



Antistatic Tubing



Antistatic Speed Controller

AS-X260



Electricity Countermeasures

Explosion Proof

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.

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)

Electro-Pneumatic Positioner/Smart Positioner

IP8 00/IP8 01



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	Туре	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
		,			



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Energy Saving

Air Saving

p. 116



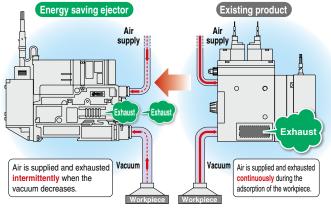
Energy Saving Ejector Vacuum Ejector Vacuum Pump System

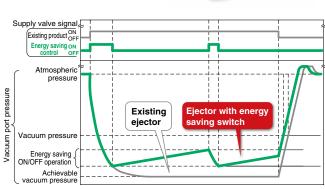
The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum.

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.

Energizing time Power consumption **Exhaust** Compressor's consumption cost per year per year time 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.

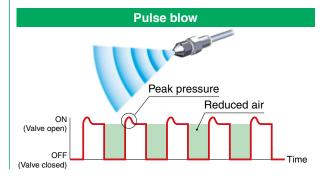
Air consumption reduced by 50% or more

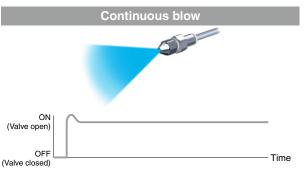




With energy saving function

AXTS020-1P-X2







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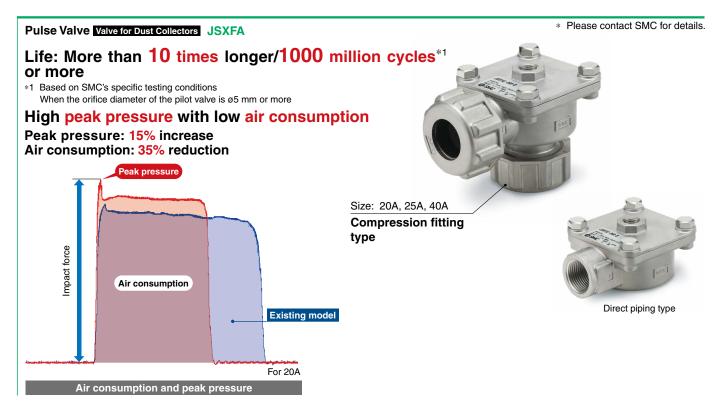
With rapid supply and

exhaust function

AS-Q

Energy Saving

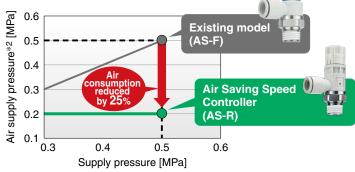
Air Saving



Air Saving Speed Controller AS-R/AS-Q

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.



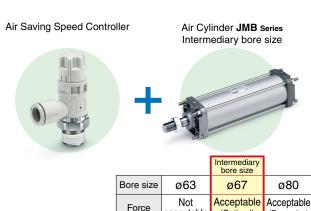
- *1 The air consumption reduction rate indicates the rate for one cycle of the cylinder.
- *2 Cylinder pressure on the return stroke side

When combined with an optimally-sized cylinder Air consumption reduction ratio: 46%

For example, instead of using an ø80 bore cylinder in place of a ø63 bore cylinder that does not have enough force, it is possible to select an optimally-sized ø67 bore JMB series cylinder. In addition, an AS-R/AS-Q series combined with this cylinder can reduce air consumption by up to 46%.

* Utilizes the SMC sizing program

Air Consumption (for one	e cycle)		
Speed controller	Air Saving Speed Controller AS-R/AS-Q Series	Elbow type AS Series	
Cylinder bore size [mm]	Ø 67 (Intermediary bore size)	ø80	
Air consumption [L]	3.1	5.8	
Conditions: Working stroke pressure: 0.5 I Return stroke pressure: 0.2 M Stroke: 100 mm	IPa 🚜 🦰	eduction	



acceptable

(Optimal)

With pressure

reduction function

AS-R

(Excessive)



Energy Saving

Power Saving

Thermo-chiller/ **Inverter Type HRSH090**



Thermo-chiller/ **Inverter Type** HRSH100 to 300

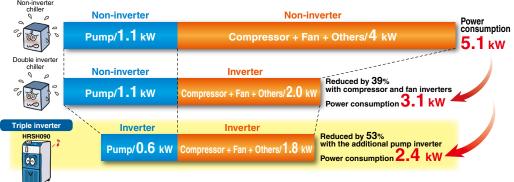


Triple inverter



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 (HRS090)

With the inverter, it is possible to operate with the same performance even with the power supply of 50 Hz.



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

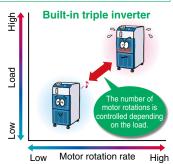
Common conditions for non-inverter and triple inverter:

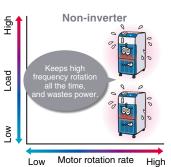
Ambient temperature: 32°C

Second re-heater

- Circulating fluid flow rate: 35 L/min at 0.3 MPa (60 Hz)
- Circulating fluid temperature: 20°C
- Heat load: 9.5 kW

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 **IDF** FS

p. **124**

Double Energy Saving Function Series

Energy-saving effects of the double energy saving function series



Digital scroll compressor

series reduces power consumption by up to

Existing dryer Second re-heater only (Standard model) DOWN consumption 76% Power **Double energy** saving function series Second re-heater + Digital scroll compressor Load factor (%)

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

Load factor Operating conditions that increase load factor: 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 Inwi

Compared with the standard model (constant compressor operation),

the double energy saving function series

*1 The IDF125FS is used for this example. *∤reduces power* consumption by



*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).



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Energy Saving

Power Saving

Air Saving









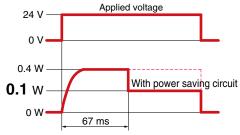
Reduces power consumption when energized

 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

[Electrical power waveform with power saving circuit]



*1 For the SY plug-in series

Low Power Consumption Valve Energy-saving Product

Tuno	Model	Power consumption [W]*2		
Type	Wodei	Standard	With power-saving circuit	
	SJ2000	0.55	0.23	
	SJ3000	0.4	0.15	
4/5-port	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	
	SYJ300/500/700	0.4	0.1	
3-port	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



S Couplers KK130

Energy saving by pressure loss reduction

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Blow Gun

VMG

• A 20% reduction in power consumption can be achieved with the SMC "Blow gun"



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

Precision Regulator 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 IR1000/2000/300					



Multistage Ejector

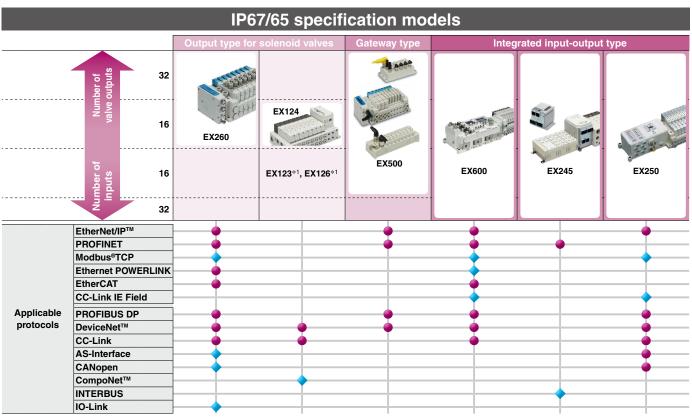
ZL112A

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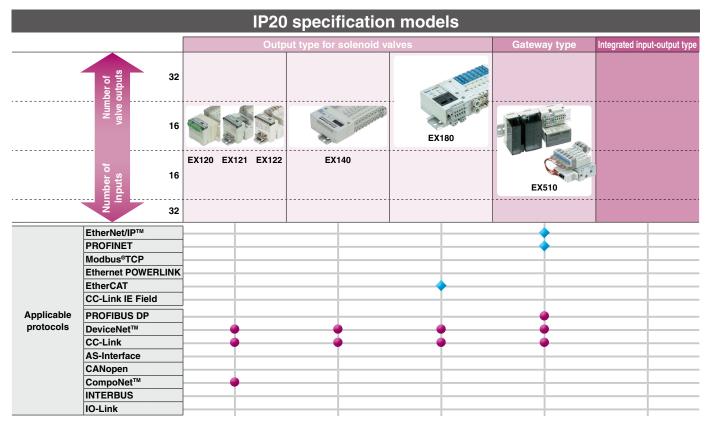
• Air consumption: 10% reduction [63 \rightarrow 57 L/min(ANR)]

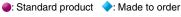


Fieldbus System



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





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Trademark

EtherNet/IP™ is a trademark of ODVA

CompoNet™ is a trademark of ODVA.

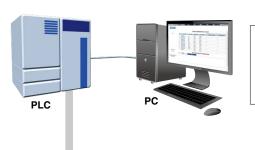
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. Modbus® is a registered trademark of Schneider Electric, licensed to the Modbus Organization, Inc.



Electricity

Centralized Control

IO-Link Compatible Product



Configuration File (IODD File*1)

- · 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**.



interface technology between the sensor/actuator and the I/O terminal that is an international standard, IEC61131-9.

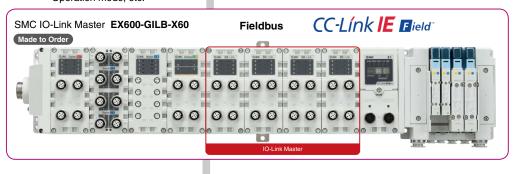
Various fieldbusses

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



IO-Link Master (Commercially available)





ZSE20B(F)-L /ISE20B-L

3-Screen Display High-Precision Digital Pressure Switch



ISE70/ISE71

3-Screen Display High-Precision Digital Pressure Switch



ISE70G/ISE75G ISE76G/ISE77G



3-Color Display Digital Flow Switch

for Water

PF3W704-X445 PF3W720-X445 PF3W740-X445

Actuator Position Sensor



D-MP025/D-MP050 D-MP100/D-MP200

Valve SI Unit



EX260-SIL1-X207 EX260-SIL1-X210

Electro-Pneumatic Regulator



ITV10□0-X395 ITV20□0-X395 ITV30□0-X395

Step Motor Controller



JXCL1

SMC

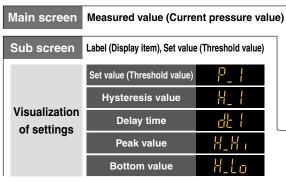


Centralized Control

Pressure/Flow Control

3-screen display applicable series

Setting is possible while checking the measured value.





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













Flow Switches













p. 134

Centralized Control

Pressure/Flow Control

Regulators

Electro-Pneumatic Regulator p. 134

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



5.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator

- TVX
- 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 ITVH

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



Electronic Vacuum Regulator p. 134

- Stepless control of vacuum pressure in proportion to electrical signals
- Sensitivity: 0.2% F.S. or less
- Linearity: ± 1% F.S. or less
- Hysteresis: 0.5% F.S. or less
- Communication:

CC-Link, DeviceNet™, PROFIBUS DP, RS-232C



Precision Regulator

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: ± 0.5% (Full span)



Trademark DeviceNet™ is a trademark of ODVA.

Others

Compact Proportional Solenoid Valve

p. **133**

DVO

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



Flow Controller for Water

р. **153**

p. **132**

FC2W-X110

- Automatically adjusts the flow rate
- Flow rate control accuracy: ± 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











Cooling capacity

9.5 kW to 11 kW



Thermo-chiller/Inverter Type **HRSH**



Thermo-chiller/Basic Type **HRSE**

Cooling capacity 1.0 kW to 2.2 kW



Thermo-chiller/Rack Mount Type

Cooling capacity 1.2 kW to 3.0 kW



Thermo-chiller/High-performance Type HRZ, HRZD, HRW

Cooling capacity 1.0 kW to 30 kW



Peltier-Type Thermo-cons/Thermoelectric Baths



Chemical Thermo-con

Cooling capacity 300 W to 750 W



Thermoelectric Bath (Round Type)

Cooling capacity 140 W to 280 W



Thermoelectric Bath (Square Type)

Cooling capacity 140 W to 320 W



Next Generation Products

Air Saving, Lightweight, and Compact

* Please contact SMC for details.

Square Air Cylinder

Equivalent: Ø12, Ø16, Ø20, Ø25, Ø32, Ø40

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

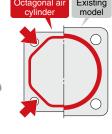


Octagonal Air Cylinder

Bore size: Ø32, Ø40, Ø50, Ø63

- Lightweight and compact due to its octagonal piston shape
- Weight: 36% reduction (480 g → 306 g)





Octagonal Compact Air Cylinder

Bore size: Ø20, Ø25, Ø32, Ø40

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



Aluminum Rod Cylinder

- Special coating reduces sliding resistance and increases surface hardness
- Weight: 39% reduction (2739 g → 1704 g) (MGP ø50, 25 mm stroke)

MGP Series

Bore size: Ø25, Ø32, Ø40, Ø50

Aluminum rod + Special coating



CQ2 Series

Bore size: Ø25, Ø32, Ø40, Ø50, Ø63



CM2 Series

Bore size: Ø20, Ø25, Ø32, Ø40



MB Series

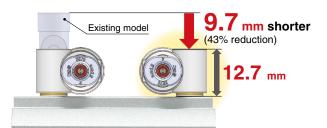
Bore size: Ø32, Ø40, Ø50, Ø63



Compact Speed Controller

Height: 43% reduction $(22.4 \text{ mm} \rightarrow 12.7 \text{ mm})$





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)



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 \rightarrow 55 mm) (For size 20)



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

- Weight: 32% reduction (940 g \rightarrow 640 g) (For size 20)
- Height: 28% reduction (54 mm \rightarrow 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

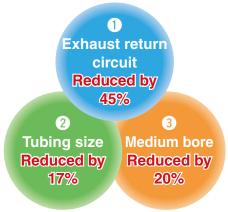
- Weight: 32% reduction (1140 g → 770 g) (JSY3000)
- Volume: 39% reduction (1360 cm³ → 830 cm³) (JSY3000)



Reduction in cylinder air consumption

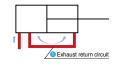
* Please contact SMC for details.

1/3 the air consumption



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%

Selection of medium bore size

Improved cylinder force (\emptyset 50 $\rightarrow \emptyset$ 45)

Air consumption reduced by 20%

Total air consumption reduced by 70%

p. **82**

Clean

Next Generation Products

Wireless System

Wireless System EX600-W

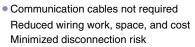
Noise resistance
 Uses the 2.4 GHz ISM frequency band

- 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



Number of I/O points

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

Compatible protocols

EtherNet/IP

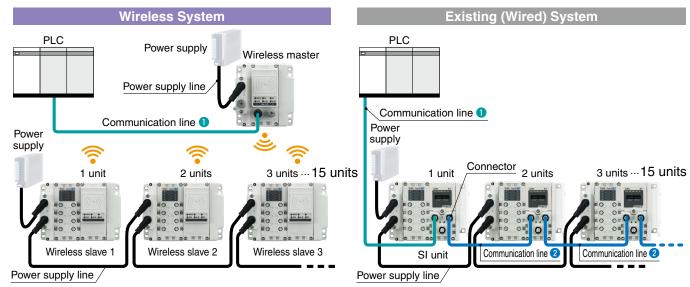






■ Trademark
EtherNet/IP™ is a trademark of ODVA.

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



SI unit: Comparison when	Number of communication devices	Communi	Communication	
15 units are connected	Number of communication devices	0	2	connectors required
Wireless system	Wireless master: 1 unit Wireless slave: 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

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□

















3-Screen Display High-Precision **Digital Pressure Switch** ISF7□G



From p. 148

Compact Pneumatic Pressure



Compact Pneumatic Pressure Sensor PSE54□





Pressure Sensor for General Fluids PSE56□



Pressure Sensor for General



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)

CONTRACTOR MESSES				SMC CORPORATION 1-7-14 ACVACA SCICA-SHLSAITAMA-KINLMAN	
	ORDER No.			TEL 048 (905) 5771	
	SERIAL No. WQ-Assessed			DATE:	
高名 デジタルE力 TITLE Digital pressus	スイッチ 品番 re-switch NODELNs ISE#	数量 +-+-+ QUANTITY 1			
				CHIEF OF INSPECTOR	
株変項目 INSPECTION ITEM	権 変 方 故 INSPECTION METHOD	利定基準 CHITERIA	AS AS RESULT	指 考 NOTE	
HIII PPEARANCE			GOOD	高序器 Standard pressure gauge 名称 Title: プジタル(E力計 Digital pressure gauge	
HE IMENSION			GOOD	製化 Model No.:***** 計算費 D Instrument No.:******	
LIE IRTIGHT	** 35% ** 500	** [al/min] (ANR) DESS THAN	GOOD	校正書No. Calibration Certificate No.: ************************************	
押しボタン	回路の開閉線器 DC24±0.1[V]	表示されるメニュー、設定被等が変化すること	goop	1	
PUSH BUTTON	Check opening and closing of the circuit.	Displayed menus, setting vales, etc. should change.		16-91/19-08-808	
の発电池	DC24±0.1[V] 出力ON抗糖		goop		
CURRENT CONSUMPTION	24V DC±0.1V Output ON	es (ad)		200.00	
	负荷電流:無负荷 用回温度:20[C]	LESS THAN		-	
8	Load current: No load. Ambient temperature: 25°C 32.6~6.06.1. LEDBATORES DC34+0.05°C	REA-ONLEDGET REA-OFF LEDGET		7V9AE5B	
Aryfilith SWITCH OUTPUT			goop		
	well (with 26±0.1VDC power supply)	Output is ON: LED display lights on. Output is OFF: LED display lights off.	6000	97/24/E2/20/d	
イッチ以力遊覧減保護	DC24±0.1[V] 投为ON状態				
ATTCH OUTPUT OVER CURRENT	24V DC 2 8.1V Output ON	SATEHOFF / LEDWIN			
	负责电区:DC28V(NPN時) 负责电流:***ssA	SW output OFF / LED OFF			
	Load current:28VDC Load current:***ns\				
· 不精皮	DC24±0.1 (V)				
SPLAY ACCURACY	*,*±*,*** [MPb]	*** **** (W/*) TD4	GOOD		
_		WITHIN **		-	
IIE INCTION		"-M" ML: NEMEX.AN" S.F. N-MC Without "-M" When the product in turned on, "S.F. should be			
LINE HEAVY	DC24[V]	indicated.	0000		
	24 V DC	"-M"有9:電源較入後"5, J "を表示	5500		
		With "-M": When the product is turned on, "S, J " should be indicated.			
				ESTree, 200 ESTher, 726	

品番: Model No	ISE*-*-*-			判定:合格 Judgment: GOOD	
WWIE CONFIL	MATERIAN Imperting presspe	アナップ放力機能 Animogi output incomes			
Imperios pressure	ORACHONIA Orbeiro	OMMONVI Orbation			
0.000	****~****	****~****			
0.500	8444~8444	8888~8888			
1,111	1111~1111	8888~8888			
	MATERIAN Inspection pressure	アナロデ出力機度 Anaroga output accountry		Mattheway Inspection pressure	アナロア社の報告 Assense extext soo
Social No.	RESERVATION OF THE PROPERTY OF	ROUNDS SOURCE BOOMEN Solve	Serial No.	RUEMONN Collection value	REMEVI Collection value
	0.000	1,000			
WQ-A*****	0.494	2,998			
	1,010	1,000			
				+	

Calibration certificate/ Traceability system chart of standard instruments

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

> > From p. **150**

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





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

- 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



p. **159**

p. 159

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

VCH41

- 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



p. 1**59**

p. 1**59**

Pilot Operated 3-Port Solenoid Valve

VCH410

- 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



p. 1**59**

p. 1**59**

Silencer

VCHN3/4

- 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

- 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

- 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



p. **149**

p. 128

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

ITVH

• Max. supply pressure: 3.0 MPa



Electro-Pneumatic Regulator 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



p. 130

Pressure Sensor for General Fluids

PSE576/577

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



Pressure Switch

ISE7□G

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



p. 148

Regulator: High Pressure

AR-B-X425

- 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

- 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



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



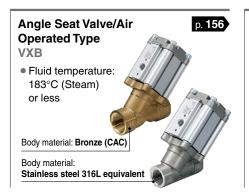
AK1000/AK1500



Gas supply unit for culture equipment 11111111111



Others Steam



Zero Differential Pressure Type Pilot Operated 2-Port Solenoid Valve

Fluid temperature: 183°C (Steam) or less

p. **136**



p. **156**

Direct Operated 2-Port Solenoid Valve

VX21/22/23

Fluid temperature: 183°C (Steam) or less



p. **156**

p. **137**

Stainless Steel 316 One-touch Fittings

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 containerpackage standards.)



Stainless Steel 316 Insert Fittings

- 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 containerpackage standards.)





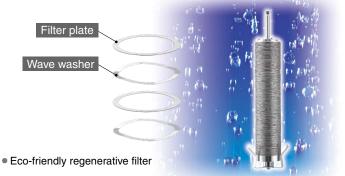


Cleaning (Filtration Filter

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.



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



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

 Element can be replaced without using any tool.

FQ1010

L125

- · Replacing the element
- · Air release
- · Drainage of liquid





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

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

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

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



Adsorption Transfer

Vacuum Pad From p. 119



ZP3E • Stable suction position Improved ease of removal • Pad diameter: ø32 to ø125





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%

p. 116

 \bullet Improved ejector efficiency: Suction flow increased by 50%

Air consumption reduced by 30%







Flat ribbon cable

Ejectors

Multistage Ejector

ZL112A

• Air consumption: 10% reduction

[63 → 57 L/min(ANR)]

• Lightweight: Max. 60% weight

reduction $(450 \text{ g} \rightarrow 180 \text{ g})$

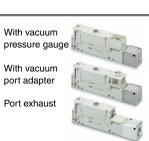




With valve

With digital vacuum pressure switch





Vacuum Ejector

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

ZH□□-X267

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



In-line Type Vacuum Ejector

ZU□A

Compact and lightweight: O.D.: ø10.4

Weight: 3.9 g Overall length: 52 mm



Vacuum Pad with Ejector

ZHF

Ejector and pad are integrated.
 Space saving with reduced piping labor

Pad diameter: ø63, ø80



p. 118

Clean

Adsorption Transfer Others

Air Suction Filters

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



p. **121**

p. **122**

Vacuum Saving Valves/Vacuum Flow

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



Free Mount Cylinder for Vacuum ZCUK





Vacuum Filter AFJ



Exhaust Cleaner for Vacuum Pump AMV





Related Equipment for Vacuum Systems p. 122

Pressure Switches/





Directional Control Valves



Vacuum Pressure Switches/ **Pressure Gauges**





Flow Control Equipment







p. **123**, **124**

Dehumidification

Refrigerated Air Dryer

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 [m³/min] Dew point 10°C 50 Hz 60 Hz		Port size
IDF60	35°C		5.6	6.5	R1
IDF70	0.7 MPa	32°C	8.0	9.1	R1 1/2
IDF80	40°C		11.6	13.6	R2
IDF90	0.7 MPa		14.3	16.4	ΠΖ

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).



Air-cooled type Water-cooled type IDF□F



IDF□D

Refrigerated Air Dryer (High Inlet Air Temperature Type)

IDF□E

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



Membrane Air Dryer

IDG□A/IDG

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



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.



Moisture Control Tube

 Prevents condensation in piping for small cylinders/air grippers





Various Valves for Analyzing Reagents and Others

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

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 μL or less (Rocker type)

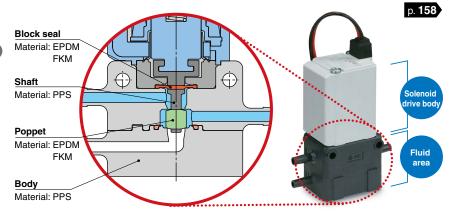


Direct Operated 2/3-Port Isolated Valve

Low Particle Generation Oil-free Metal-free

Isolated structure

The solenoid drive body is separated from the fluid area by a block seal.

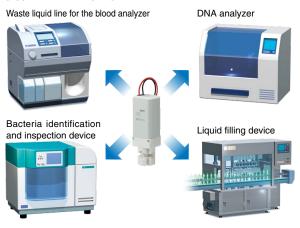


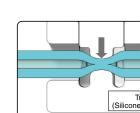
Pinch Valve

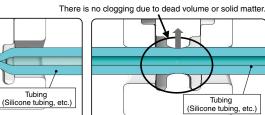
LPV

- 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]





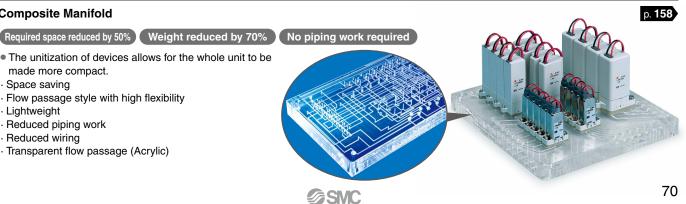


Valve closed

Valve open

Composite Manifold

- 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

Equipment for Pharmaceutical Manufacturing CONTENTS

Directional Control Valves p.77
Pilot Operated 4/5-Port Solenoid Valves
4-Port Solenoid Valve/Cassette Type Manifold/SJ2000/3000p. 77
5-Port Solenoid Valve/Plug-in Type/ SY3000/5000/7000 p. 77 5-Port Solenoid Valve/ SY3000/5000/7000/9000 p. 77
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Pilot Operated 3-Port Solenoid Valves
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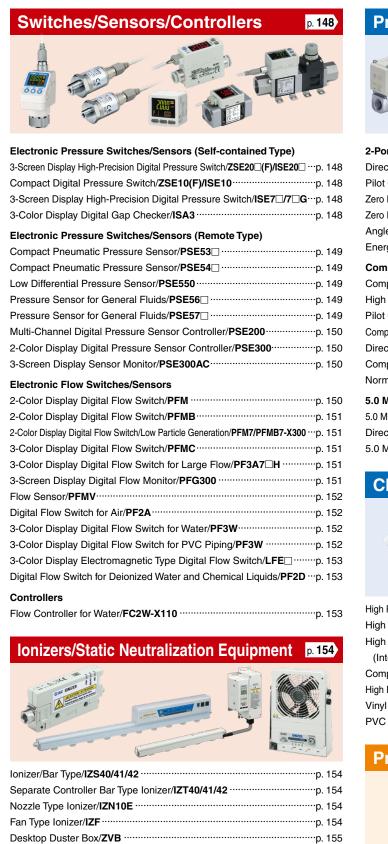
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Pilot Operated 4/5-Port Solenoid Valves

4-Port Solenoid Valve/Cassette Type Manifold \$\frac{\text{SJ2000/3000}}{\text{SJ2000/3000}}



- 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

	Flow rate characteristics			A		
Series	4/2	→ 3/5 (A/B →	E)	Applicable cylinder size	Power consumption [W]	
	C [dm³/(s·bar)]	b	Cv	Cylinaer Size	[]	
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





- 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 cha 4/2 → 5/3 (A/		Applicable cylinder size	Power consumption	
	C [dm³/(s·bar)]	b		[W]	
SY3000	1.6	0.19	ø50		
SY5000	3.6	0.17	ø63	0.35 (Standard) 0.1 (With power saving circuit)	
SY7000	5.9	0.20	ø80	o. i (with power saving circul	

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



- 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

	Flow	rate characteri	stics			
Series	4/2 -	→ 5/3 (A/B → EA	/EB)	Applicable cylinder size	Power consumption [W]	
	C [dm³/(s·bar)]	b		[**]		
SY3000	1.1	0.30	0.26	ø40		
SY5000	2.8	0.29	0.66	ø63		
SY7000	4.5	0.27	1.1	ø80	0.35 (Standard)	
SY9000	10	0.29	2.5	ø100	0.1 (With power saving circuit)	
SY300	1.1	0.3	0.26	ø40	,	
SY500	2.8	0.29	0.66	ø63		

5-Port Solenoid Valve/Plug-in Type \$0700

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		rate characteris		Applicable Power consumption	
	C [dm³/(s·bar)]	b	Cv	Cylinder Size	[]
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 \$0700



- Valve width: 7.4 mm
- Driveable cylinders: Up to ø32 (Body ported)
- Power consumption: 0.35 W
- Weight: 39 g (Body ported)
- Manifold type no.: SS0752, SS0755

Series		aracteristics P → A/B)	Applicable cylinder size	Power consumption [W]	
	C [dm³/(s·bar)]	Cv	Cyllinder Size	[11]	
SS0752 Body ported	0.62	0.18	ø32	0.35	
SS0755 Base mounted	0.39	0.11	ø25	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			low rate characteristics //2 → 5/3 (A/B → EA/EB) Application cylinder		Power consumption
	C [dm³/(s·bar)]	b	Cv	Cyllinder Size	[**]
VF1000	0.53	0.28	0.13	ø40	1.55 (Standard) 0.55 (With power saving circuit)
VF3000	3.1	0.32	0.75	ø80	0.4 (Low wattage specification)
VF5000	10.0	0.49	2.9	ø125	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 ø160 VQC5000: Can drive cylinders up to ø180
- 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 4/2 → 5/3 (A/B → EA/EB)			Applicable cylinder size	Power consumption [W]	
	C [dm³/(s·bar)]	b	Cv	Cyllider Size	[w]	
VQC4000	7.3	0.38	2.0	ø160	1.0 0.4 (Low wattage type)	
VQC5000	17	0.31	4.7	ø180	1.0 0.4 (Low wattage type)	



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 $2 \rightarrow 3 (A \rightarrow P)$		Power consumption [W]	For use in vacuum	
	C [dm³/(s·bar)]	b	Cv	["]	applications
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

Ruhher seal



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

		Flow rate characteristics				For use
Series	Туре	2 → 3		Power consumption [W]	in vacuum	
		C [dm³/(s·bar)]	b	Cv	[]	applications
V100	Standard	0.037	0.11	0.008	0.35 (Standard) 0.1 (With power saving circuit)	-100 kPa
V100	High flow	0.076	0.076 0.07 0.016		1	-100 kPa

3-Port Solenoid Valve S070

Rubber sea



- 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 ra	ate characteri	stics	Power consumption	Max. operating
	C [dm³/(s·bar)]	b	Cv	[W]	pressure
	0.042	0.27	0.011	0.5	0.5 MPa
	0.060	0.28	0.016	0.5	0.3 MPa
S070	0.042	0.27	0.011	0.35	0.3 MPa
3070	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 TM CC-Link EtherCAT (Made to order) AnyWireASLINK (Made to order)	SJ2000, 3000 S0700

Serial Transmission System EX260





*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

- DeviceNet™ is a trademark of ODVA.
- 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.



Reduced-wiring Fieldbus System (Serial Transmission System)

Fieldbus System **EX245**



- AIDA specifications compliant*1
 - *1 Abbreviation of the Automation Initiative of German Reduced wiring time (Deutschland) Automobile Manufacturers
- Push Pull connectors One-touch installation and removal

 - 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

- 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.



Directional Control Valves

Reduced-wiring Fieldbus System (Serial Transmission System)

Wireless System EX600-W



- Noise resistance Uses the 2.4 GHz ISM frequency band • Communication cables not required
- Usable even in welding environments High-speed connection: From power supply ON to start of communication: Min. 250 ms
 - Communication response (Signal response time): 5 ms

 - Frequency hopping: Every 5 ms Number of I/O points: Max. 1280 inputs/1280 outputs (Max. 128 inputs/128 outputs per module)

Series	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.
- EtherNet/IP™ is a trademark of ODVA.

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	F	low rate characteristic	S	
	4	Applicable cylinder size		
	C [dm³/(s⋅bar)]	b	Cv	Cylinder Size
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

Rubber seal



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

	Flow rate characteristics			A 1: 1-1-	
Series	4	Applicable cylinder size			
	C [dm³/(s⋅bar)]	b	Cv	Oyimaci Size	
VFA1000	0.53	0.28	0.13	ø40	
VFA3000	3.1	0.32	0.75	ø80	
VFA5000	10.0	0.49	2.9	ø125	



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.

	Flow rate characteristics				
Series	2 → 3 (A → R)				
	C [dm³/(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



- 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 mm² (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



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- 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

	Flow	rate characteris	stics	
Series	4/2 -	→ 5/3 (A/B → EA	/EB)	Power consumption [W]
	C [dm³/(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

Standard Air Cylinders (Round Type)

Pin Cylinder CJP2/CDJP2/CJP



- Two auto switches can be mounted even on the ø4, 5 st.
- A ø2 One-touch fitting and a speed controller can be connected.
- With auto switch (CDJP2 series: CDJP2)

Туре	Series	Action	Bore size [mm]
Standard	CJP2	Double acting, Single rod	4, 6, 10, 16
Standard	СЈРВ	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)

Туре	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)

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



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)

Туре	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)

Туре	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 \rightarrow 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)

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



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)

Туре	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)

Туре	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)

Туре	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
- \bullet With auto switch (CDS1 series: CDS1, CDS1W, CDS1 \square Q)
- * The air-hydro type is only available in ø125, ø140, and ø160.

Туре	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	



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)

Туре	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)

Туре	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



- \bullet 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)

Туре	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	сик	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)

Туре	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



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 \rightarrow 82 g)
- Volume reduced by up to 40%
- With auto switch (JCDQ series: JCDQ)

Туре	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 ø12 to ø25)
- 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)

Туре	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)

Туре	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



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)

Туре	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 Suitable for factory machinery, food manufacturing
- With water resistant 2-color indicator auto switch
- machinery, car washers, etc.

Туре	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)



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

Туре	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



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
- ullet 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.

Туре	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.

Туре	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

Туре	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.

Туре	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

Туре	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.

Туре	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

Туре	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

Туре	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



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)

Туре	Series	Action	Bore size [mm]
Double ported type	$MXQ\square A$	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.

Туре	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.

Туре	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.

Туре	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.

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



Table Cylinders

Air Slide Table MXP



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

Туре	Series	Action	Bore size [mm]
Standard	MXPJ	Double acting	6
Standard	MXP	Double acting	6, 8, 10, 12, 16

Air Slide Table/Long Stroke Type MXY



• High rigidity and high accuracy, Maximum of 400 strokes

Туре	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
- \bullet Weight: Max. 69% lighter (0.32 kg \rightarrow 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.

Туре	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

Туре	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing	MGPM-Z	Double acting	
Basic type	Ball bushing	MGPL-Z	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Basic type	High-precision ball bushing	MGPA-Z	Double acting	30, 00, 00, 100
	Slide bearing	MGPM-AZ	Double acting	
With air cushion	Ball bushing	MGPL-AZ	Double acting	16, 20, 25, 32, 40, 50, 63, 80, 100
	High-precision ball bushing	MGPA-AZ	Double acting	00, 00, 100
Water resistant	Slide bearing	MGPMR-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
With end lock	Slide bearing/ Ball bushing bearing	MGP	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Heavy duty guide rod	Slide bearing	MGPS	Double acting	50, 80



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

Туре	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

Туре	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	20, 25, 32, 40, 50, 63, 80, 100

Guide Cylinder/Compact Type MGC



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

Туре	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)
- TypeBearingSeriesActionBore size [mm]StandardSlide bearingCXSJMDouble acting6, 10, 15, 20, 25, 32StandardBall bushing bearingCXSJLDouble acting6, 10, 15, 20, 25, 32

Dual Rod Cylinder CXS



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

Туре	Bearing	Series	Action	Bore size [mm]
Basic type	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



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)

Туре	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)

Туре	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)

Туре	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





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)

Туре	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

Туре	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	$MQML \square \square H$	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)

Туре	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□



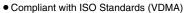
- Valve is mounted on a round cylinder.
- Built-in speed controller for some models
- A cylinder with a valve makes it easy to adjust the speed.
- With auto switch (CDVJ series: CDVJ5, CDVJ3, CDVM series: CDVM5, CDVM5K, CDVM3, CDVM3K, CDV3 series: CDV3, CDV3K, CDVS1 series: CDVS1, CDVS1K)



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	ard CVS1 Double acting		40, 50, 63, 80, 100	CA2-Z	VS4□24
Non-rotating rod	ting 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



- 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)

Туре	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/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)

Туре	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.

Туре	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°



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.

Туре	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
- \bullet 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

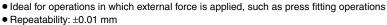


Parallel Type Air Grippers

Slide Guide Round Body Air Gripper 2-Finger Type MHS2

• Vertically compact and lightweight due to the wedge shaped cam construction









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 Long stroke type: Strokes 2 times longer than the shaped cam construction
- Ideal for operations in which external force is applied, Gripping of cylindrical workpieces such as press fitting operations
- Repeatability: ±0.01 mm

- standard type
- Reliable removal of the workpiece with through-holes and a center pusher

Туре	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

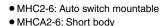
Environment Resistant: Made to Order

- 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



• MHCM2-7: Compact, lightweight

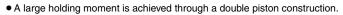


Series	Cylinder bore size [mm]
MHC2-6	6
MHCA2-6	6
MHCM2-7	7



Angular Type Air Grippers

Angular Type Air Gripper/Standard Type MHC2







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



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: ±5 μm
- Pushing measurement accuracy: ±10 μm
- 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	±5 μm	±10 μm	400 mm/s
LAT3M	50	5 μm	Up to 6 N	±20 μm	±40 μm	400 mm/s
LAT3	10, 20, 30	30 μm	Up to 6 N	±90 μm	±100 μm	400 mm/s

Card Motor Controller LATCA



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

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

Slider Type

Electric Actuator/Slider Type, Ball Screw Drive LEFS





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

- Max. work load: 65 kg
- Positioning repeatability: ±0.015 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/s²)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ±0.01 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]
	LEFS16	50 to 500	Max. 15	Max. 700	5, 10
Step motor	LEFS25	50 to 800	Max. 30	Max. 1100	6, 12, 20
(Servo/24 VDC)	LEFS32	50 to 1000	Max. 50	Max. 1200	8, 16, 24
	LEFS40	150 to 1200	Max. 65	Max. 1200	10, 20, 30
Servo motor	LEFS16A	50 to 500	Max. 10	Max. 500	5, 10
(24 VDC)	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



Slider Type

Electric Actuator/Slider Type, Belt Drive LEFB





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

 \bullet Compatible drivers: LECSS-T, LECY \square

• Motorless specification is available.

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

Electric Actuator/LEF Series Support Guide LEFG



- \bullet 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



- 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			
AC Servo motor	LEJS63	300 to 1500	Max. 85	Max. 1800	10, 20, 30			





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
- ullet 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

• Selectable controllability (Controller)

Easy position setting by value input

point intermediate stop)

Complete control like an air cylinder (Allows for a 12

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.

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



Rod Type/Guide Rod Type

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







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/s²)
- 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 Pushing force [Mm] [N]		Speed [mm/s]	Screw lead [mm]	
	LEY16	30 to 300	Max. 141	Max. 500	2.5, 5, 10	
Step motor	LEY25	30 to 400	Max. 452	Max. 500	3, 6, 12	
(Servo/24 VDC)	LEY32	30 to 500	Max. 707	Max. 500	4, 8, 16	
	LEY40	30 to 500	Max. 1058	Max. 300	4, 8, 16	
Servo motor	LEY16A	30 to 300	Max. 111	Max. 500	2.5, 5, 10	
(24 VDC)	LEY25A	30 to 400	Max. 130	Max. 500	3, 6, 12	
	LEY25□S	30 to 400	Max. 485	Max. 900	3, 6, 12	
AC servo motor	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





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/s²)
- 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]
	LEY16D	30 to 300	Max. 141	Max. 500	2.5, 5, 10
Step motor	LEY25D	30 to 300	Max. 141	Max. 500	2.5, 5, 10
(Servo/24 VDC)	LEY32D	30 to 500	Max. 707	Max. 500	4, 8, 16
	LEY40D	30 to 500	Max. 1058	Max. 300	4, 8, 16
Servo motor	LEY16DA	50 to 300	Max. 111	Max. 500	2.5, 5, 10
(24 VDC)	LEY25DA	50 to 400	Max. 130	Max. 500	3, 6, 12
	LEY25DS	30 to 400	Max. 485	Max. 900	3, 6, 12
AC servo motor	LEY32DS	30 to 500	Max. 736	Max. 1000	4, 8, 16
	LEY63DS	100 to 800	Max. 1910	Max. 1000	5, 10, 20



Rod Type/Guide Rod Type

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





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
- ullet Compatible drivers: LECSS-T, LECY \square
- Motorless specification is available.

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





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

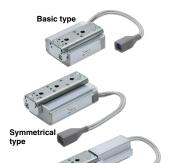
- High output motor (100/200 W)
- Improved high speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s²)
- Pulse input type
- With internal absolute encoder
- Compatible drivers: LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Model Stroke Pushing force [mm] [N]		Speed [mm/s]	Screw lead [mm]	
	LEYG16D	30 to 200	Max. 141	Max. 500	2.5, 5, 10	
Step motor	LEYG25D	30 to 200	Max. 452	Max. 500	3, 6, 12	
(Servo/24 VDC)	LEYG32D	30 to 200	Max. 707	Max. 500	4, 8, 16	
	LEYG40D	30 to 200	Max. 1058	Max. 300	4, 8, 16	
Servo motor	LEYG16DA	30 to 200	Max. 111	Max. 500	2.5, 5, 10	
(24 VDC)	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	



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] Horizontal	Work load [kg] Vertical	Speed [mm/s]	Screw lead [mm]
	LES8□	30, 50, 75	Max. 1	Max. 0.5	Max. 400	4, 8
Step motor	LES16□	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
(Servo/24 VDC)	LES25□	30, 50, 75, 100, 125, 150	Max. 5	Max. 5	Max. 400	8, 16
	LES8□A	30, 50, 75	Max. 1	Max. 1	Max. 400	4, 8
Servo motor	LES16□A	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
(24 VDC)	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] Horizontal	Work load [kg] Vertical	Speed [mm/s]	Screw lead [mm]
	LESH8□	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
Step motor (Servo/24 VDC)	LESH16□	50, 100	Max. 8	Max. 2	Max. 400	5, 10
(00110/24120)	LESH25□	50, 100, 150	Max. 12	Max. 4	Max. 400	8, 16
	LESH8□A	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
Servo motor (24 VDC)	LESH16□A	50, 100	Max. 5	Max. 2	Max. 400	5, 10
(2.750)	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
		[111111]	Basic	Compact	Basic	Compact	ieau
Step motor	LEPY6	25, 50, 75	Max. 20	_	Max. 2.0	_	4.8
(Servo/24 VDC)	LEPY10	25, 50, 75	Max. 50	Max. 40	Max. 6.0	Max. 4.0	5, 10



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 (Horiz	load [kg] contal)	Screw lead
		[]	Basic Compact	Basic	Compact	ieau	
Step motor	LEPS6	25, 50	Max. 20	_	Max. 1.0	_	4.8
(Servo/24 VDC)	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

Mode	Model -		torque [N·m]	ue [N·m] Max. speed [°/s]		Positioning repeatability [°]		
WOUE			High torque	Basic	High torque	Basic	High torque	
LER1	0	0.22	0.32	420	280			
LER3	0	0.8	1.2	420	280	± 0.05 (At the end: ± 0.01)*1	± 0.05 (At the end: ± 0.01)*1	
LER5	0	6.6	10	420	280	(At the cha. ±0.01)	(At the cha. ±0.01)	

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)

	Body	Open and close stroke/	Gripping	force [N]	Opening and	
Series	size	both sides [mm]	Basic	Compact	closing speed [mm/s]	
	10	4	6 to 14	2 to 6	5 to 80	
	16	6	6 to 14	3 to 8	5 to 80	
LEHZ	20	10	16 to 40	11 to 28	5 to 100	
LENZ	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	



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)

	Body	Open and close stroke/	Gripping	force [N]	Opening and	
Series	size	both sides [mm]	Basic Compac		closing speed [mm/s]	
	10	4	6 to 14	3 to 6	5 to 80	
LEHZJ	16	6	6 to 14	4 to 8	5 to 80	
LENZJ	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

	Body	Open and close stroke/	Gripping	force [N]	Opening and
Series	size	both sides [mm]	Basic	Compact	closing speed [mm/s]
	10	16 (32)*1	3 to 7	3 to 7	5 to 80
LEHF	20	24 (48)*1	11 to 28	11 to 28	5 to 100
LENF	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)

	Body	Open and close stroke/	Gripping	Opening and	
Series	size	both sides [mm]	Basic	Compact	closing speed [mm/s]
	10	4	2.2 to 5.5	1.4 to 3.5	5 to 70
LEHS	20	6	9 to 22	7 to 17	5 to 80
LENS	32	8	36 to 90	_	5 to 100
	40	12	52 to 130	_	5 to 120



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

		Compatible	Power	Paral	lel I/O	Number
Туре	Series	motor	supply voltage	Input	Output	of step data
Step data	LECP6	Step motor (Servo/24 VDC)	24 VDC ±10%	11	13	64 points
input type	LECA6	Servo motor (24 VDC)	24 VDC ±10%	(Photo-coupler isolation)	(Photo-coupler isolation)	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.

Туре	Series	I/O type	Compatible motor	Power supply voltage	Number of axes
	JXC73	NPN			Max. 4 axes
Step data	JXC83	PNP	Step motor (Servo/24 VDC)	24 VDC ±10%	Max. 4 axes
input type	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

		Compatible	Power	Paral	Number	
Туре	Series	motor	SUDDIV		Output	of step data
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

		. Compatible		Paral	lel I/O	Number
Туре	Series	motor	supply voltage Input		Output	of step data
Programles type (With stroke stud	LECP2	Step motor (Servo/24 VDC)	24 VDC ±10%	6 (Photo-coupler isolation)	6 (Photo-coupler isolation)	2 stroke end points, 12 intermediate points



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.)

		Compatible	Power	Paral	lel I/O	Number
Туре	Series	motor	supply voltage	Input	Output	of step data
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).

Туре	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)		EtherCAT
JXC91		041/100	EtherNet/IP™
JXCP1		24 VDC ±10%	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.



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

Tuno	Series	Compatible	Power supply	Paral	Parallel I/O	
Туре	Series	motor	voltage	Input	Output	
Pulse input type (For incremental encoder)	LECSA		100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	6	4	
Pulse input type (For absolute encoder)	LECSB	AC servo motor (100/200/400 W)		10	6	
CC-Link direct input type (For absolute encoder)	LECSC			_	_	
SSCNETII type (For absolute encoder)	LECSS			_	_	
SSCNETII/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)
- \bullet Applicable Fieldbus protocol: MECHATROLINK- ${\rm I\hspace{-.1em}I}$, MECHATROLINK- ${\rm I\hspace{-.1em}I}$

Tuno	Series Compatible	Power supply	Parallel I/O		
Туре	Series	motor	voltage	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)



Environment: Dust-tight/Water-jet-proof (IP65 Equivalent)

Electric Actuator/Rod Type LEY-X5



Enclosure: IP65 equivalentMax. 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/s²)
- 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

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



- \bullet 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



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□10	1.0	44	40	2 to 50	ZK2□00
ZK2□12	1.2	61	58	2 to 125	ZKZ_UU
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







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 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	Max. suction flow [L/min (ANR)]		Air consumption	Guidelines for applicable pad [mm]	
	[,,,,,,,	Type S	Type L	[L/IIIII (ANN)]	applicable pau [IIIII]	
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!
- 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	Filtration
Series	Metric	Inch	[L/min (ANR)]	[μ m]
ZFB10	ø4, ø6	ø3/16, ø1/4	10 to 20	30
ZFB20	ø6, ø8	ø1/4	30 to 50	30
ZFB30	ø8, ø10	ø3/8	75	30
ZFB40	_	ø1/2	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

	Applicable tubing O.D.		Flow rate [L/min (ANR)]*1	Flow rate	Filtration	
Series	Metric	Metric Inch		[L/min (ANR)] Vacuum pressure	[µ m]	
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	5, 10* ²	
ZFC5	ø4, ø6	ø5/32", ø1/4"	100/200	10/20	5, 10* ²	
ZFC7	ø6, ø8 , ø10, ø12	ø1/4", ø5/16", ø3/8"	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, ø6 barb	M5 x 0.8	3 μm, 20 μm (Nominal)



Vacuum Pads

Vacuum Pad ZP3

- Pad diameter: ø1.5 to ø16
- Compact/Space saving: Overall length shortened
- One-touch fittings and barb fittings are available for ø2.



Series	Туре	
ZP3	Flat	
ZP3	Flat with groove	
ZP3	Bellows	

Thin Flat/Flat Pad ZP2

For sheets or vinyl

• Pad diameter: ø5 to ø30





Series	Туре
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. → 1 pc.)
- Pad and metal parts can be disposed of separately.
- Pad diameter: ø32 to ø125



Series	Туре	
ZP3E	Flat type with groove	
ZP3E	Bellows type with groove	

Blue colored pad

Reduced leakage

Bellows Pad ZP2

- For spherical workpieces or workpieces with inclined surfaces
- Pad diameter: ø2 to ø46





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 § 177.2600 elution test



Series	Туре
ZP3P	Flat type with
ZF JF	groove

Reduction of wrinkles made on thin workpieces

(film, vinyl, etc.) during adsorption

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: ø15, ø20, ø30, ø40, ø46



Compact/Short-type/Nozzle Pad

ZP2

- Compact/Space saving
- Pad diameter: ø0.8 to ø15





Series	Туре	
ZP2	Compact	
ZP2	Short-type	
ZP2	Nozzle	

Oval Pad ZP2

- For rectangular workpieces
- Pad diameter: 3.5 x 7 to 8 x 30







Vacuum Equipment

Vacuum Pads

Ball Spline Buffer Pad

- The ball spline guide is used for buffers.
- Pad diameter: ø2 to ø8





Special Configuration Pad ZP2

 For stage setting of disks (CD, DVD) or glass substrates





Series	Туре	
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: ø4 to ø125





Vacuum Pad ZP

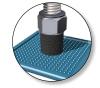
- The wide variety of available models can accommodate a wide range of applications.
- Pad shapes: Flat, Flat with ribs, Thin flat, Thin flat with ribs, Deep, and Bellows shape
- Pad diameter: ø2 to ø50



Sponge Pad ZP2

- For workpieces with bumps
- Pad diameter: ø4 to ø15





Vacuum Pad/Large/Heavy Duty Type ZPT/ZPX

- Ideal for heavy or large workpieces such as CRT tubes and automobile bodies
- Pad diameter: ø40 to ø125



Heavy-duty Pad ZP2

- For heavy or large workpieces
- Pad diameter: ø32 to ø340



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: ø40 to ø125





Vacuum Pads

Vacuum Pad/Ball Joint Type ZPT/ZPR

- Ideal for adsorption on slanted work surfaces
- Pad diameter: ø10 to ø50



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 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
- \bullet 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



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



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 Regulators

Vacuum Regulator

IR\

- 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	eries Port size Set pressur	
IRV10	ø6, ø8, ø1/4, ø5/16	-100 to -1.3
IRV20	ø6, ø8, ø10, ø1/4, ø5/16, ø3/8	-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
- A high level of machining accuracy
- Strong adsorption force

Series	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
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, 11/2, 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 environ- For Use in Southeast Asia (IDFC)
 - For Use in Europe, Asia, and Oceania (IDFA)
 - Ambient temperature: Max. 45°C Inlet air temperature: Max. 65°C
- For Use in North, Central, and South America (IDFB)
- Increased air flow capacity

Series	Rated inlet Air flow capacity [m³/min (ANR)]		Port size			
Series	condition	50 Hz	60 Hz	Refrigerant	POIT SIZE	
IDF60	35°C	5.6	6.5		R1	
IDF70	0.7 MPa	8	9.1	R410A (HFC)	R1 1/2	
IDF80	40°C	11.6	13.6	GWP: 2088	R2	
IDF90	0.7 MPa	14.3	16.4		R2	

Refrigerated Air Dryer IDF E/F/D



Series	Rated inlet	Air flow capacity	y [m³/min (ANR)]	Applicable air	Defrieserent	Port size
Series	condition	50 Hz	60 Hz	compressor [kW]	Refrigerant	
IDF1E		0.1	0.12	0.75		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	R134a	Rc1/2
IDF6E	35°C	0.75	0.82	5.5	(HFC)	Rc3/4
IDF8E	0.7 MPa	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		8.4	9.8	55		R2
IDF75E		11.0	12.4	75		R2
IDF100F		16.0	18.8	100	R407C	R2
IDF125F	40°C 0.7 MPa	20.1	23.7	125	(HFC)	65 (2 1/2B) flange
IDF150F] ۱۷11 α	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	Air flow capacity [m³/min (ANR)]		Applicable air	Refrigerant	Port size
Series	condition	50 Hz	60 Hz	compressor [kW]	neirigerani	Port Size
IDU3E		0.32	0.37	2.2		Rc3/8
IDU4E		0.52	0.57	3.7		Rc1/2
IDU6E		0.75	0.82	5.5	R134a	Rc3/4
IDU8E	1	1.1	1.2	7.5	(HFC)	Rc3/4
IDU11E	55°C	1.5	1.7	11		Rc3/4
IDU15E1	0.7 MPa	2.6	2.8	15		Rc1
IDU22E		3.9	4.3	22		R1
IDU37E		5.7	6.1	37	R407C	R1 1/2
IDU55E		8.4	9.8	55	(HFC)	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 A	Applicable compressor [kW]	Air flow capacity [m³/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



- \bullet 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.

Туре	Series	Filtration [μm]	Air flow [m³/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 Equipment

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
Series	Metric	Inch	Positive pressure	Vacuum pressure	[µ m]
ZFC1□	ø2, ø3.2	ø1/8"	15/45	2/5	
ZFC3□	ø3.2, ø4	ø1/8", ø5/32"	50/80	7/10	5. 10* ²
ZFC5□	ø4, ø6	ø5/32", ø1/4"	100/200	10/20	3, 10 -
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)

Туре	Series	Operating pressure	Filtration [μm]
Cartridge type disc	SFA100/200/300	Max. 0.99 MPa (Vacuum: 1.3 x 10-6 kPa)	0.01 (Filtration efficiency: 99.99%)
Cartridge type straight	SFB100	Max. 0.99 MPa (Vacuum: 1.3 x 10 ⁻⁶ kPa)	0.01 (Filtration efficiency: 99.99%)
Disposable type straight	SFB300	Max. 0.99 MPa (Vacuum: 1.3 x 10 ⁻⁶ kPa)	0.01 (Filtration efficiency: 99.99%)
Disposable type multiple disc	SFC100	Max. 0.99 MPa (Vacuum: 1.3 x 10-6 kPa)	0.01 (Filtration efficiency: 99.99%)

Clean Gas Strainer SFB200



Туре	Series	Operating pressure	Filtration [μm]
Cartridge type straight	SFB200	Max. 0.99 MPa (Vacuum: 1.3 x 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	Туре	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
- \bullet 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, N₂ 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.

Modular F.R.L. Units AC-A





- 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 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		0.02 10 0.2
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 [μm]
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 [μm]
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 [μm]
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.

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 [cm³]
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.

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





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	E
AW30-B to AW60-B-X440	High temperature -5 to 80°C		0.02 to 0.2	5



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



ı	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]
Series		reatures	Metric size	Inch size	Set pressure [wra]
ARM5A	Manifold specifications	Common air supply	ø4, ø6, ø8	ø5/32, ø1/4, ø5/16	0.05 to 0.7
ARM5B	Manifold specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	0.05 to 0.7
ARM5S	Single unit specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	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.
- \bullet Standard model comes equipped with backflow function.
- Compatible with digital pressure switches

Series	Model	Features	Applicable tubing bore size		Set pressure [MPa]
Series			Metric size	Inch size	Set pressure [MFa]
ARM11A	Manifold specifications	Common air supply	ø4 to ø10	ø5/32 to ø3/8	0.05 to 0.7
ARM11B	Manifold specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	0.05 to 0.7
ARM10	Single unit specifications	Standard	ø4, ø6	ø5/32, ø1/4	0.05 to 0.7
ARM10F	Single unit specifications	Knob front face	ø4, ø6	ø5/32, ø1/4	0.05 to 0.7



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: ±1% (Full span)

Series	Port size	Set pressure [MPa]
		0.02 to 0.2
IR1200-A	1/8	0.02 to 0.4
		0.02 to 0.8
		0.02 to 0.2
IR2200-A	1/4	0.02 to 0.4
		0.02 to 0.8
		0.02 to 0.2
IR3200-A	1/4, 3/8, 1/2	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: ±0.5% (Full span)

Series	Port size	Set pressure [MPa]
		0.005 to 0.2
IR1000-A	1/8	0.01 to 0.4
		0.01 to 0.8
		0.005 to 0.2
IR2000-A	1/4	0.01 to 0.4
		0.01 to 0.8
		0.01 to 0.2
IR3000-A	1/4, 3/8, 1/2	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 ±0.5% F.S.

Series	Port size	Set pressure [MPa]
IR1000	1/8	0.005 to 0.2 0.01 to 0.4
IR2000	1/4	0.01 to 0.8
IR3000	1/4, 3/8, 1/2	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	ø6, ø8, ø1/4, ø5/16	−100 to −1.3
IRV20	ø6, ø8, ø10, ø1/4, ø5/16, ø3/8	−100 to −1.3



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
SRH	Relief	Rc1/8, 1/4, 3/8, 1/2	High pressure type: 0.05 to 0.7

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	Tymo	Applic	Cet pressure [MDe]	
Series	Туре	Metric size	Inch size	Set pressure [MPa]
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	Туре	Port size	Set pressure [MPa]
VCHR	VCHR30/40	Direct operated regulator (Relieving type)	(4'3//) 1 1 1/')	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



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: ±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 ø4, ø5/32	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□	ø4, ø5/32 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: ±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: ø2, ø3.2, ø4, ø6, ø8, ø10, ø12, ø16

Inch: $\emptyset1/8"$, $\emptyset5/32"$, $\emptyset3/16"$, $\emptyset1/4"$, $\emptyset5/16"$, $\emptyset3/8"$, $\emptyset1/2"$ Oval Type

Metric: ø3.2, ø4, ø6 Inch: ø1/8", ø5/32", ø3/16" 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	ø3.2, ø4, ø6, ø8, ø10, ø12, ø16	M5 R, Rc, G 1/8, 1/4, 3/8, 1/2
KQB2	Inch	ø1/8", ø5/32", ø1/4", ø5/16", ø3/8", ø1/2"	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	ø4, ø6, ø8, ø10, ø12	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	ø2	M3, M5
М	ø3.2, ø4, ø6	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
Н	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
 Cartified to most current Food Sanitat

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 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 air 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)

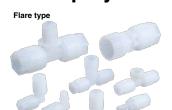
Fluoropolymer Fittings Hyper Fittings LQ1



- 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



- 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]
Series	Metric size	Inch size	Operating temperature [°C]
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	Color	Fiula	
	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	Color	Fluid
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	Color	Fiuld
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

S	Series	Туре	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		
Series	Metric size	Coloi	Fiuld	
TUZ	ø2, ø3.2, ø4, ø6, ø8 ø10, ø12, ø16	Black, White, Red, Blue, Yellow, Green	Air, Water	

Polyurethane Coil Tubing TCU





For moving applications

* Colors other than black are available as made-to-order specifications.





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	Tubin	g O.D.	Color
	Metric size	Inch size	Color
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	Tubin	g O.D.	Color
	Metric size	Inch size	Coloi
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/TIH



- 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.

Corios	Saving O.D.		Color
Series	Metric size	Inch size	Color
TH/TIH	ø4, ø6, ø8, ø10, ø12	ø1/8", ø3/16", ø1/4", ø3/8", ø1/2", ø3/4"	Translucent, Black, Red, Blue



Tubing (Fluoropolymer/Clean)

Soft Fluoropolymer Tubing TD/TID



- 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	Color
	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 (D.D.	Color*1
Series	Metric size	Inch size	Color
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
- *1 Tube removal strength is ensured to be equivalent to the previous model.
- Electroless nickel plated type is standard.
- 360° swivel piping is possible. (Universal type)
- Available with a restrictor (Made to order: -X214, -X21)

Type	Series	Port size on the Applicable	tubing O.D.	
Type	Series	cylinder side 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 Improved reproducibility of flow rate reduces flow setting time and setting errors. The value • Easier to insert and remove tubes can be controlled with the indicator window.
- Larger push-lock type knob

- - Electroless nickel plated type is standard.
 - Available with a restrictor (Made to order: -X214, -X21)

Tyme	Series Port s	Port size on the	Applicable	tubing O.D.	
	Туре	Series	cylinder side 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	Applicable tubing O.D. Metric size Inch size	tubing O.D.
туре	Series	cylinder side		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 Serie		Port size on the Applicable tubing O.D.	
Type Serie	cylinder side	Metric size	Inch size
In-line type AS1002FS to	AS4002FS —	ø3.2 to ø12	ø1/8" to ø1/2"



Flow Control Equipment

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
- *1 Tube removal strength is ensured to be equivalent to the previous model.

 Electroless nickel plated type is standard
--

• 360° swivel piping is possible. (Universal type)

Туре	Series	cylinder side Metric size		e tubing O.D.	
	Series			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
 Improved reproducibility of flow rate
 reduces flow setting time and setting errors. The value
 Easier to insert and remove tubes
 can be controlled with the indicator window.
 Electroless nickel plated type is standard.
- Larger push-lock type knob

Type	Series	1 011 0120 011 1110	tubing O.D.	
Туре	Series	cylinder side	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	Applicable	tubing O.D.
туре	Series	cylinder side	cylinder side Metric size	Inch size
Dual speed controller	ASD	M5 to 1/2	ø4 to ø12	ø1/8" to ø3/8"



Flow Control Equipment

Speed Controllers for Special Environments

Stainless Steel: Elbow Type/Universal Type/Push-lock Type



- 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
 - *1 Tube removal strength is ensured to be equivalent to the previous model.
- 360° swivel piping is possible. (Universal type)
- Available with a restrictor (Made to order: -X214, -X21)

Type	Series	Port size on the	Applicable tubing O.D.		
туре	Series	cylinder side	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 Improved reproducibility of flow rate reduces flow setting time and setting errors. The value • Easier to insert and remove tubes can be controlled with the indicator window.
- Larger push-lock type knob
- - Available with a restrictor (Made to order: -X214, -X21)

Type	Series	Port size on the	Applicable tubing O.D.		
Type	Series	cylinder side	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	Applicable tubing O.D.	
туре	Series	cylinder side	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

- Larger push-lock type knob
- The numerical indication of knob rotations for flow rate
 Improved reproducibility of 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.

Tyme	Series	Port size on the	Applicable tubing O.D.		
Туре	Series	cylinder side	Metric size	Inch size	
In-line type Stainless steel type	AS1002FSG to AS4002FSG	_	ø3.2 to ø12	ø1/8" to ø1/2"	



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

Туре	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

Tuno	Series	Port size on the	Applicable tubing O.D.		
Туре	Series	cylinder side	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

No delay of response time with 2-pressure control

Compact: 85% reduction
 The functions of the regulator and speed controller have been integrated.

Type	Series	Port size on the	Applicable tubing O.D.	
туре	Series	cylinder side	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



Tune	Series	Port size	Applicable tubing O.D.	
Туре	Series	Port Size	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	Body materials: Brass, Stainless steel Rubber materials: NBR, FKM, CR High temperature, low temperature Low cracking	1/8 to 1/2	_	_

5.0 MPa Check Valve VCHC40



• Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet

Туре	Series	Port size	Operating pressure
5.0 MPa	VCHC40	3/4, 1	0.05 to 5.0 MPa

Silencers

AN

Silencers



Series		Features
ANG	05 to 40	Compact and lightweightNoise reduction: 30 dB (A)
AN1	0 to 30-C	Can connect with One-touch fitting directly Noise reduction: 30 dB (A)

Silencer/BC Sintered Body Type AN







Series	Features
AN	BC sintered body typeNoise 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

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 ø4, ø6, ø8, ø10

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: ø2.5)
- 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 [mm²]	Nozzle port size
VMG	Rc, NPT, G 1/4, 3/8	0 to 1.0	30	Rc1/4

Nozzles for Blowing KN



Series	Туре	Nozzle size
	Nozzle with male thread	ø1 to ø8
	High efficiency nozzle	ø1 to ø2
	Low noise nozzle with male thread	ø0.75 x 4 to ø1.1 x 8
KN	Copper extension nozzle	ø1.5 to ø3
	Pivoting nozzle	ø4, ø6
	Nozzle with self-align fitting	ø1 to ø6
	Nozzle for One-touch fitting	ø1 to ø3



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 Setting is possible while checking the measured value.
- Delay time: Fastest 1.5 ms or less
- Current consumption: 25 mA or less (ZSE20/ISE20), 35 mA or less (Others)

Series	Output type	Туре	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	Туре	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 check- Rotating display
 - ing the measured value. Display rotates 336 degrees after installation.
- IO-Link · Applicable fluids: Air, Non-corrosive gas, Angled display Non-flammable gas
- Good visibility from various mounting positions

Series	Туре	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	Туре	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	Туре	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	Туре	Rated differential pressure range
PSE550	Vacuum pressure	0 to 2 kPa

Pressure Sensor for General Fluids PSE56



- Wetted parts: Stainless steel 316L Analog output (Voltage/Current)
- IP65
- Low leakage
- Suitable for a wide variety of fluids Select from a face seal or compression fitting.

Series	Туре	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	Туре	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



Switches/Sensors/Controllers

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
	-101 to 101 kPa
	10 to -101 kPa
PSE300	-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
	-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
PSE300AC	-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]
	0.2 to 10 (0.2 to 5)
	0.5 to 25 (0.5 to 12.5)
PFM	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]
	5 to 500
PFMC	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]
	30 to 3000
PF3A7□H	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



Switches/Sensors/Controllers

Electronic Flow Switches/Sensors

Flow Sensor PFMV



- Suction verification of very small workpieces
- Repeatability: ± 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]
	1 to 10
	5 to 50
PF2A	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]	
	0.5 to 4	
	2 to 16	
PF3W	5 to 40	
	10 to 100	
	50 to 250	

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]	
	0.5 to 20	
LFE□	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]
	0.4 to 4
PF2D	1.8 to 20
	4.0 to 40

Controllers

Flow Controller for Water FC2W-X110



- Automatically adjusts the flow rate
- Flow rate control accuracy: ±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	Туре	lon generation method	Offset voltage (lon 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	Туре	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 m³/min, 0.66 m³/min, 0.80 m³/min	Corona discharge type	±13 V
IZF21	1.8 m³/min	Corona discharge type	±5 V
IZF31	4.4 m³/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	А3	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.

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.

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



- Long service life: 3 million cycles (Based on SMC's test conditions)
- Improved air filtration
- ullet Reduced apparent power: 18 VA ightarrow 12 VA, 20 VA ightarrow 15 VA
- ullet Reduced coil temperature rise: 120°C ightarrow 100°C

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



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 (\pm 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	Power consumption [W]	Max. operating frequency [Hz]
		80	1200
SX10	50	40	1000
3710	50	10	550
		4	350
	100	80	650
SX10		40	550
5810		10	300
		4	200
SX10	450	80	600
		40	500
3/10	150	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 [mmø]
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

Direct Operated 2/3-Port Isolated Valve LVMK20/200



- Low particle generation, Oil-free, Metal-free
- Fluids: Air, Water, Deionized water, Diluent, Cleaning fluid
- Isolated structure: The solenoid drive body is separated from the fluid area by a block seal.
- Easy piping
- Minimal dead space
- Flow adjustment is not required.

Series	Valve type	Piping direction	Fluid contact material
LVMK	N.C.	Bottom ported	Body: PPS
	Universal	Side ported	Seal: EPDM, FKM

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 x 10⁻⁶ Pa (abs)
- Leakage: Internal 1.3 x 10⁻⁹ Pa⋅m³/s, External 1.3 x 10⁻¹¹ Pa⋅m³/s
- 2 types of fittings and female threads are available.
- Power consumption: Max. 25% reduction
- \bullet 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

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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	Туре	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	Туре	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)

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	Туре	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	Туре	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	Туре	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	Туре	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	Туре	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

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	Tyma	Valve type	Applicable tubing O.D.*1		Orifice diameter
Series	es Type	vaive type	Metric	Inch	[mmø]
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
Series	Туре	vaive type	Metric	Inch	[mmø]
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	eries Actuation		Wetted parts material
PA 3□□0	PA3□□0 Automatically operated type		ADC12 (Aluminum) SCS14 (Stainless steel)
PA3□13	PA3□13 Air operated type		ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□□0 Automatically operated type		5 to 45	ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□13	PA5□13 Air operated type 1 to 24		ADC12 (Aluminum) SCS14 (Stainless steel)
PAP3310	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	Series Actuation		Wetted parts material
PB1011A	PB1011A Built-in solenoid valve		Polypropylene Stainless steel 316
PB1013A Air operated type		8 to 1000	Polypropylene Stainless steel 316
PB1313A	PB1313A Air operated type		New PFA (Fluororesin)

Non-Metallic Pump/Double Acting Pump PAF



Series	Series Actuation		Wetted parts material
PAF3410	410 Automatically operated type		New PFA (Fluororesin)
PAF3413	Air operated type 1		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: ±0.1°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	±0.1°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)	+2 0°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 Cooling capacity: 1.2/1.8/2.4/3.0 kW (60 Hz) the rack
 - Front access: Simple to control, service and main- Global power supply: Single-phase 200 to 230 VAC tain with all filters and drainage via the front panel
- Space saving Multiple chillers can be mounted to a 19-inch rack.
- Temperature stability: ±0.1°C



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	+0.1%:	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	±0.1°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	±0.1°C	Water-cooled refrigeration	Fluorinated fluid, Tap water, Deionized water, Ethylene glycol aqueous solution (60%)



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
- \bullet High-precision, refrigerant-free temperature control equipment that uses a Peltier device
- Simple structure and high reliability
- \bullet 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	
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	Tap water
INR-244-747	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	Ethylene glycol aqueous
INR-244-736	0 to 60°C	320 W	320 W ±0.03°C Peltier-type water-coole		solution Fluorinated fluid
INR-244-746	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	(Square type can only be
INR-244-734	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	used at room
INR-244-749	0 to 60°C	320 W	±0.03°C	Peltier-type water-cooled	temperature.)
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
IDH□6	200 to 800	15 to 30°C	0.15 to 0.85 MPa	±0.1	PID control



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		Bellows seal	Single acting (N.C.)		16 to 80*1
XMC/XYC	Air	Bellows seal	Double acting	Body: SCS13 (Equivalent to	16 to 80*1
XMD/XYD	operated	Bellows seal O-ring seal	Single acting (N.C.)	stainless steel 304) Bellows: Stainless steel 316L	25 to 80
XMH/XYH	Manual	Bellows seal	Manual		16 to 50*1

Normal Close High Vacuum Solenoid Valve XSA



- Minimum operating pressure: 1 x 10⁻⁶ Pa (abs)
- Leakage: Internal 1.3 x 10⁻⁹ Pa·m³/s, External 1.3 x 10⁻¹¹ Pa·m³/s
- 2 types of fittings and female threads are available.
- Power consumption: Max. 25% reduction
- \bullet 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



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	Туре	Application	Body material	Connection type	Connection size
AP/SL	Single stage	Distribution (Compact)	316L SS		1/4", 3/8"
AP/SL	Single stage	Distribution	secondary remelt		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			1/4", 3/8", 1/2", 3/4"
AP/SL	Single stage	Sub-atmospheric pressure	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8", 1/2", 3/4"
AP	Two stage	Source	Scoondary remen		1/4", 3/8"
AZ	Single stage	Distribution			1/4", 3/8", 1/2"
AZ	Single stage	Source	316L SS		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	Туре	Application	Body material	Connection type	Connection size
AK	Single stage	Distribution			1/4", 3/8", 1/2"
AK	Single stage	Source			1/4", 3/8", 1/2"
AK	Single stage	Sub-atmospheric pressure	316 SS or Brass	NPT female, Compression	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	Туре	Body material	Connection type	Connection size
AP	Air operated type	316L SS	Face seal	1/4", 3/8", 1/2", 3/4"
AP	Manually operated type	secondary remelt	Tube weld	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	Туре	Body material	Connection type	Connection size
AZ	Air operated type	316L SS	Face seal	1/4", 3/8", 1/2
AZ	Manually operated type	3102 33	Tube weld	1/4", 3/8", 1/2



Process Gas Equipment

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	Туре	Body material	Connection type	Connection size
AP	Check valve	316L SS secondary remelt		1/4", 3/8"
AP	Vacuum generator	316L SS	Face seal	1/4", 3/8"
АР	AP Flow switch secondary re	316L SS secondary remelt, 316L SS	Tube weld	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	Туре	Body material	Connection type	Connection size
AK	Air operated type	316 SS	Compression Rc, R, NPT	1/4", 3/8"
AK	Manually operated type	310 33		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	Туре	Body material	Connection type	Connection size
AK1000T	Manually operated type	316 SS	Compression Rc, NPT	1/4", 3/8"



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)

15 to 21			
F(4(:	5 (1/2B to 1B) S 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
- $\bullet \ \text{Mechanical process, caulking, brazing, soldering, welding, and simultaneous sintering are possible. }$
- Can be cleaned and reused

Series	Material	Nominal filtration accuracy
ЕВ	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: TIIS explosion-proof construction (Ex d II B T5)

ATEX intrinsically safe explosion-proof construction ($\mathbb{I}\, 2G$ Ex ib $\, \mathbb{I}\, C\, T5/T6$ Gb)

 \cdot 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	Туре	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-	on the cleanlinese class of the clean room	
Copper, Fluorine, Silicone-free, Low particle generation	21-/22-	 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.) 	

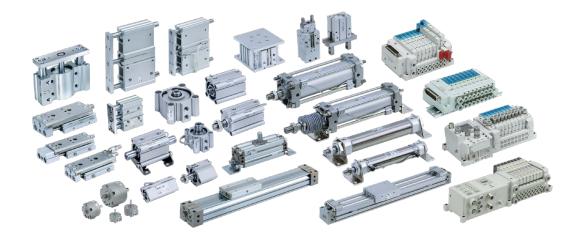


SMC:

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 stand-point, 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

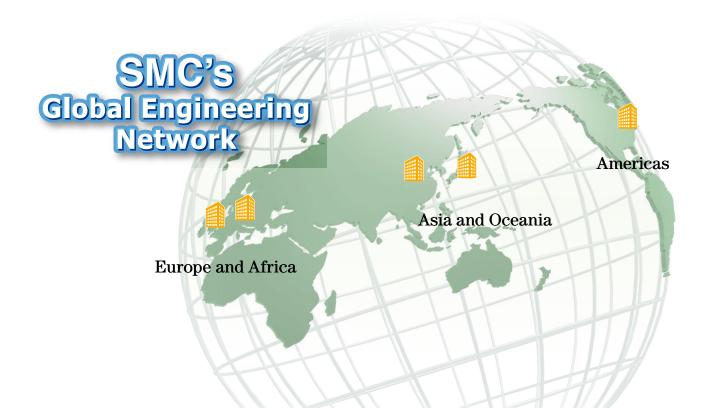
The JTC is staffed with 1,100 employees and is the center of SMC research and development. It produces new products for the global market based on customers' current and future needs.



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.













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)





Kamaishi Factory (Iwate Pref.)





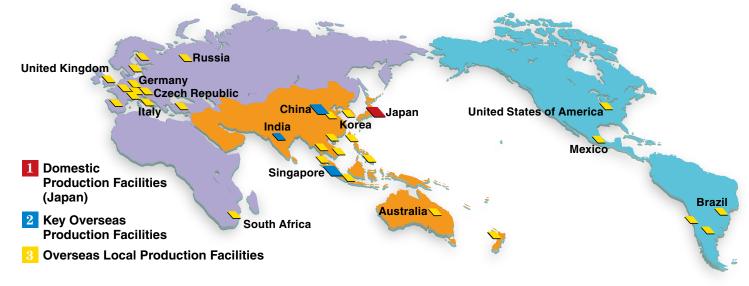






Yamatsuri Factory (Fukushima Pref.)





Key Overseas Production Facilities







China Factory

Singapore Factory

India Factory

Overseas Local Production Facilities

Americas



United States of America



Brazil



Mexico

Europe and Africa



Germany



United Kingdom



Italy

Austria Finland France South Africa Spain Sweden Switzerland Turkey

Argentina Chile



Russia



Czech Republic



Australia



China (Guangzhou) Singapore **Hong Kong** Malaysia New Zealand **Philippines**

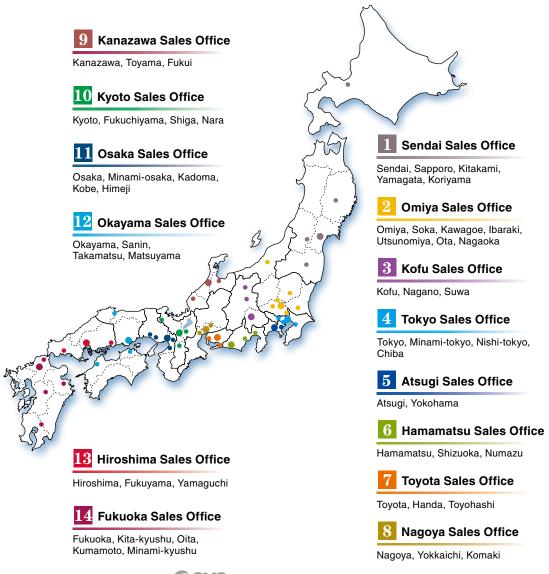
Taiwan **Thailand** Vietnam



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 54 branch offices and 94 distributors with 591 offices





Equipment for Pharmaceutical Manufacturing



SMC Corporation

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