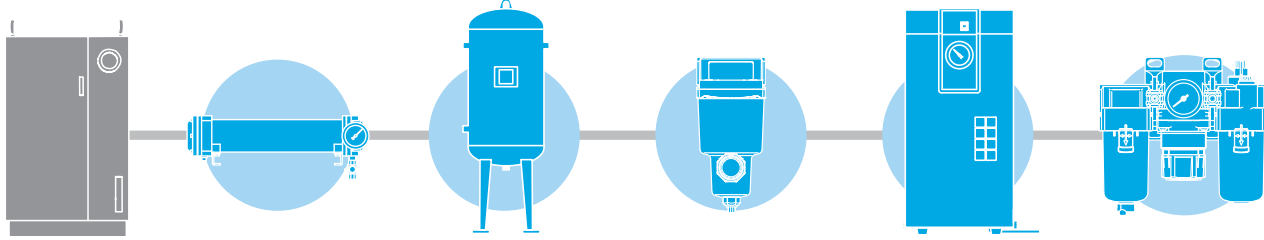




A•L•L• PRODUCTS

- Directional Control Valves
- Air Cylinders
- Rotary Actuators/
Air Grippers
- Electric Actuators/
Electric Cylinders
- Vacuum Equipment
- Air Preparation Equipment
- Modular F.R.L./
Pressure Control Equipment
- Lubrication Equipment
- Fittings and Tubing
- Flow Control Equipment
(Speed Controllers)
- Silencers/
Exhaust Cleaners/
Blow Guns/Pressure Gauges
- Switches/Sensors/
Controllers
- Static Neutralization
Equipment
- Process Valves
- Chemical Liquid Valves/
Fittings/Needle Valves/
Tubing
- Process Pumps
(Diaphragm Pumps)
- Temperature Control
Equipment
- Process Gas Equipment
- High Vacuum Equipment
- Industrial Filters/
Sintered Metal Elements
- Pneumatic Instrumentation
Equipment
- Hydraulic Equipment
- Other Derived Series

ALL PRODUCTS



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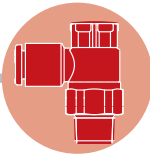
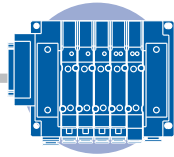
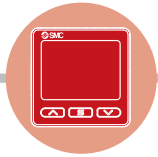
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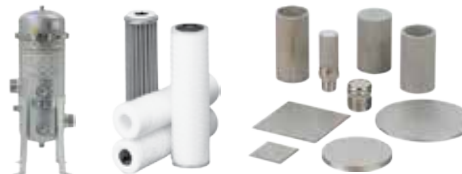
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Directional Control Valves

Air Cylinders

Rotary Actuators/
Air Grippers

Electric Actuators/
Electric Cylinders

Vacuum Equipment

Air Preparation Equipment

Modular F.R.L./
Pressure Control Equipment

Lubrication Equipment

Fittings and Tubing

Flow Control Equipment
(Speed Controllers)

Silencers/
Exhaust Cleaners/
Blow Guns/Pressure Gauges

Switches/Sensors/
Controllers

Static Neutralization
Equipment

Process Valves

Chemical Liquid Valves/
Fittings/Needle Valves/
Tubing

Process Pumps
(Diaphragm Pumps)

Temperature Control
Equipment

Process Gas Equipment

High Vacuum Equipment

Industrial Filters/
Sintered Metal Elements

Pneumatic Instrumentation
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Hydraulic Equipment

Other Derived Series

Directional Control Valves

Pilot Operated 4/5 Port Solenoid Valves



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Directional Control Valves

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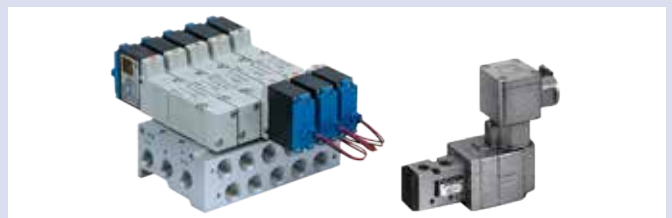
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Directional Control Valves

Pilot Operated 4/5 Port Solenoid Valves

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

Rubber seal



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

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

Vacuum Release Valve with Restrictor **SJ3A6**

Rubber seal



- 2 built-in spool valves
- Vacuum adsorption and release can be controlled with a single valve.
- Width 10 mm (Same size as the SJ3000 series)
- With a restrictor that can adjust the flow rate of the release air
- Built-in replaceable filter on both vacuum and release sides
- Can be combined with the 4 port solenoid valve SJ2000/3000. (Made to Order)
- Manifold type no.: SS3J3

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

Metal seal
Rubber seal



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

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

Vacuum Release Valve with Restrictor **SY³₅A□R**

Rubber seal



- Vacuum adsorption and release can be controlled with a single valve.
- With a restrictor that can adjust the flow rate of the release air
- Can be mounted on the same manifold valve with the standard valve
- * When the individual EXH spacer is used

Pilot Operated 4/5 Port Solenoid Valves

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

Rubber seal



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

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

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

Rubber seal

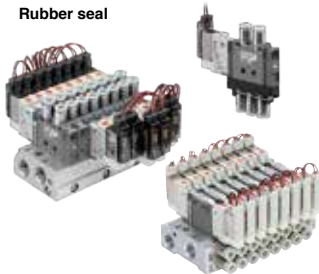


- A variety of common wiring methods are available.
- Slim, compact plug-in manifold: Required installation space reduced by 45%*, Height reduced by 20 mm*
- * Compared with plug-in manifold stacking base
- 4 position, dual 3 port valve
- Manifold type no.: SS0751, SS0750

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

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

Rubber seal



- Valve width: 7.4 mm
- Driveable cylinders: Up to ø32 (Body ported)
- Power consumption: 0.35 W
- Weight: 39 g (Body ported)

Series	Flow rate characteristics		Applicable cylinder size	Power consumption [W]
	1 → 4/2 (P → A/B)			
	C [dm ³ /(s·bar)]	Cv		
SS0752 Body ported	0.62	0.18	ø32	0.35
SS0755 Base mounted	0.39	0.11	ø25	0.35

5 Port Solenoid Valve **SV1000/2000/3000/4000**

Rubber seal



- It is possible to easily add stations to the manifold valve or change specifications.
- One side solenoid
- 4 position, dual 3 port specifications are available.
- Manifold type no.: SS5V1, SS5V2, SS5V3, SS5V4

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → E)				
	C [dm ³ /(s·bar)]	b	Cv		
SV1000	1.1	0.35	0.28	ø40	0.6
SV2000	2.4	0.18	0.48	ø63	0.6
SV3000	4.3	0.21	0.93	ø80	0.6
SV4000	7.0	0.18	1.6	ø100	0.6

Directional Control Valves

Pilot Operated 4/5 Port Solenoid Valves

4/5 Port Solenoid Valve SYJ3000/5000/7000

Rubber seal



- The combined mounting of a 3 port valve and a 5 port valve is possible.
- Power consumption: 0.1 W (With power saving circuit)
- Manifold type no.: SS5YJ3, SS5YJ5, SS5YJ7

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
SYJ3000	0.46	0.35	0.12	ø25	0.35 (Standard) 0.1 (With power saving circuit)
SYJ5000	0.83	0.32	0.21	ø40	
SYJ7000	2.9	0.35	0.74	ø50	

5 Port Solenoid Valve/Cassette Type Manifold SZ3000

Rubber seal



- The cassette type allows for easy valve exchange.
- Valve has an attached switch for safe maintenance.
- The low-profile cassette type with baseless structure takes up less space.
- Manifold type no.: SS5Z3

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 3 (A/B → R)				
	C [dm ³ /(s·bar)]	b	Cv		
SZ3000	0.77	0.19	0.19	ø32	0.6

5 Port Solenoid Valve SX3000/5000/7000

Rubber seal



- One side solenoid
- No exhaust mist, No exhaust noise of pilot valve (Common exhaust for main and pilot valve)
- Manifold type no.: SS5X3, SS5X5, SS5X7

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
SX3000	1.1	0.30	0.26	ø40	0.6
SX5000	2.8	0.29	0.66	ø63	0.6
SX7000	4.5	0.27	1.1	ø80	0.6

4/5 Port Solenoid Valve VZ1000/3000/5000

Rubber seal



- Rubber seal main valve construction
- Manifold type no.: VV5Z3, VV5Z5

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VZ1000	Effective area: 0.9 mm ²	Effective area: 0.9 mm ²	Effective area: 0.9 mm ²	ø20	1.8
VZ3000	0.83	0.32	0.21	ø40	1.8
VZ5000	2.9	0.35	0.94	ø63	1.8

Pilot Operated 4/5 Port Solenoid Valves

5 Port Solenoid Valve VF1000/3000/5000

Rubber seal



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

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VF1000	0.53	0.28	0.13	ø40	1.55 (Standard) 0.55 (With power saving circuit) 0.4 (Low wattage specification)
VF3000	3.1	0.32	0.75	ø80	1.55 (Standard) 0.55 (With power saving circuit)
VF5000	10.0	0.49	2.9	ø125	1.55 (Standard) 0.55 (With power saving circuit)

Large Size 5 Port Solenoid Valve VP4□50/4□70

Rubber seal



- For driving large cylinders
- Manifold type no.: VVP45, VVP46

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VP4□50	21	0.28	5.6	ø140	12
VP4□70	Effective area: 300 mm ²			ø300	12

5 Port Solenoid Valve VQ1000/2000

Metal seal
Rubber seal

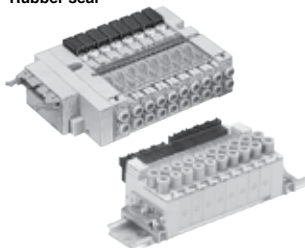


- Space-saving design with one side solenoid and fittings all positioned on one side, allowing free three-directional mounting
- No screws and one clamp structure for reduced recombination labor
- A variety of option parts (Back pressure check valve, Dual flow fitting, etc.) are available.
- A variety of common wiring methods are available.
- 4 position, dual 3 port valve
- Manifold type no.: VV5Q11, VV5Q21

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	2/4 → 3/5 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ1000	1.0	0.30	0.25	ø40	0.4 (Standard)
VQ2000	3.2	0.30	0.80	ø63	0.4 (Standard)

5 Port Solenoid Valve/Body Ported, Plug-in/Plug Lead VQ0000/1000/2000

Metal seal
Rubber seal



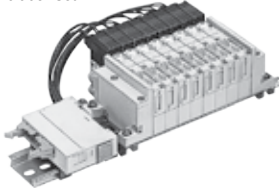
- One side solenoid
- A space-saving flip type and a cassette type which can increase or decrease stations are available.
- Valves can be changed without entirely disassembling the manifold.
- A variety of option parts (Individual SUP spacer, Block valve, etc.) are available.
- A variety of common wiring methods are available.
- Manifold type no.: VV5Q13, VV5Q04, VV5Q14, VV5Q24, VV5Q17

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ0000	0.59	0.19	0.14	ø25	1.0 0.5 (Low wattage type)
VQ1000	1.0	0.21	0.25	ø40	1.0 0.5 (Low wattage type)
VQ2000	2.7	0.25	0.62	ø63	1.0 0.5 (Low wattage type)

Pilot Operated 4/5 Port Solenoid Valves

5 Port Solenoid Valve/Base Mounted, Plug Lead VQ

Metal seal
Rubber seal



- Space-saving design with one side solenoid and fittings all positioned on one side, allowing free three-directional mounting
- No screws and one clamp structure for reduced recombination labor
- A variety of option parts (Back pressure check valve, Dual flow fitting, etc.) are available.
- A variety of common wiring methods are available.
- 4 position, dual 3 port valve
- Manifold type no.: VV5Q05, VV5Q12

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	2/4 → 3/5 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ0000	0.53	0.22	0.13	ø25	1.0 0.5 (Low wattage type)
VQ1000	1.0	0.30	0.25	ø40	1.0 0.5 (Low wattage type)

5 Port Solenoid Valve VQ4000/5000

Metal seal
Rubber seal



- Compact with a large flow capacity
Installation volume: 42% reduction, Installation area: 26% reduction
VQ4000: Can drive cylinders up to ø160
VQ5000: Can drive cylinders up to ø180
- Power saving: Power consumption of 0.4 W (Low wattage type)
- Long service life: 100 million cycles (According to SMC life test conditions)

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ4000	7.3	0.38	2.0	ø160	1.0 0.4 (Low wattage type)
VQ5000	17	0.31	4.7	ø180	1.0 0.4 (Low wattage type)

5 Port Solenoid Valve VQ4000

Metal seal
Rubber seal



- Compatible with dust-tight/water-jet-proof types (Equivalent to IP65)
- A variety of common wiring methods are available.
- Compatible with a wide variety of manifold options and control units
- Manifold type no.: VV5Q41, VV5Q45

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ4000	7.3	0.38	2.0	ø100	1.0 0.5 (Low wattage type)

5 Port Solenoid Valve VQ5000

Metal seal
Rubber seal



- Compatible with dust-tight/water-jet-proof types (Equivalent to IP65)
- A variety of common wiring methods are available.
- Manifold type no.: VV5Q51, VV5Q55

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	2/4 → 3/5 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ5000	17	0.31	4.7	ø160	1.0 0.5 (Low wattage type)

Pilot Operated 4/5 Port Solenoid Valves

5 Port Solenoid Valve **VQC1000/2000**

Metal seal
Rubber seal

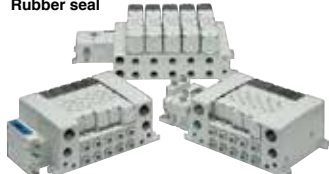


- Enclosure IP67 compliant
- Flexible adaptation, such as the adding of stations and changing of specifications, is made possible with the use of a multi-pin connector manifold.
- Space-saving design with one side solenoid and fittings all positioned on one side, allowing free mounting
- No screws and one clamp structure for reduced recombination labor
- A variety of common wiring methods are available.
- 4 position, dual 3 port valve
- Manifold type no.: VV5QC11, VV5QC21

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQC1000	1.0	0.30	0.25	ø40	0.4 W (Standard)
VQC2000	3.2	0.30	0.80	ø63	0.4 W (Standard)

5 Port Solenoid Valve **VQC4000/5000**

Metal seal
Rubber seal



- 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			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQC4000	7.3	0.38	2.0	ø160	1.0 0.4 (Low wattage type)
VQC5000	17	0.31	4.7	ø180	1.0 0.4 (Low wattage type)

5 Port Solenoid Valve **VQC4000**

Metal seal
Rubber seal



- Enclosure IP67 compliant
- Flexible adaptation, such as the adding of stations and changing of specifications, is made possible with the use of a multi-pin connector manifold.
- Space-saving design with one side solenoid and fittings all positioned on one side, allowing free mounting
- A variety of common wiring methods are available.
- Manifold type no.: VV5QC41

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	2/4 → 3/5 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VQC4000	7.3	0.38	2.0	ø100	1.0 0.5 (Low wattage type)

5 Port Solenoid Valve **VQZ1000/2000/3000**

Metal seal
Rubber seal



- The combined mounting of a 3 port valve and a 5 port valve on a manifold valve is possible.
- Can be mounted on an aluminum body manifold or a DIN rail
- Manifold type no.: VV5QZ12, VV5QZ15, VV5QZ22, VV5QZ25, VV5QZ32, VV5QZ35

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQZ1000	1.3	0.24	0.32	ø63	0.35 (Standard) 0.9 (High pressure type, High speed response type)
VQZ2000	2.3	0.29	0.53	ø80	
VQZ3000	4.6	0.26	1.2	ø100	

Pilot Operated 4/5 Port Solenoid Valves

5 Port Solenoid Valve **SQ1000/2000**

Metal seal
Rubber seal



- Power saving: Power consumption of 0.4 W (Standard)
- Easy to add or decrease the number of valve stations
- Easy valve maintenance, mountable with one screw
- Easy replacement of clip type One-touch fittings
- Connector entry direction can be changed with a single push.
- 4 position, dual 3 port valve
- Built-in back pressure check valve (Option)
- Manifold type no.: SS5Q13, SS5Q14, SS5Q23, SS5Q24

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
SQ1000	0.8	0.20	0.19	ø32	0.4 W (Standard)
SQ2000	3.1	0.18	0.71	ø63	0.95 W (High pressure type)

5 Port Solenoid Valve **VZS2000/3000**

Metal seal



- Metal seal main valve construction
- Flexible to increase and decrease manifold stations (Stacking type manifold base)
- A wide variety of connection variations are available.
- Manifold type no.: VV5ZS2, VV5ZS3

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VZS2000	1.4	0.19	0.33	ø40	1.8
VZS3000	2.4	0.09	0.53	ø63	1.8

5 Port Solenoid Valve **VFS1000/2000/3000/4000/5000/6000**

Metal seal



- Metal seal main valve construction
- Extensive size variations are available.
- For driving medium and large cylinders
- A wide variety of manifold options are available.
- Compatible with control units (VFS2000/3000/4000, Base mounted type)
- Manifold type no.: VV5FS1, VV5FS2, VV5FS3, VV5FS4, VV5FS5

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)				
	C [dm ³ /(s·bar)]	b	Cv		
VFS1000	1.8	0.19	0.40	ø50	1.8
VFS2000	3.5	0.32	0.85	ø63	1.8
VFS3000	6.8	0.12	1.6	ø80	1.8
VFS4000	12	0.22	3.1	ø140	1.8
VFS5000	20	0.13	4.7	ø160	1.8
VFS6000	38	0.10	9.0	ø200	1.8

Pilot Operated 4/5 Port Solenoid Valves

5 Port Solenoid Valve **VFR2000/3000/4000/5000/6000**

Rubber seal



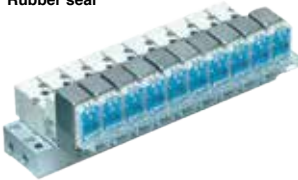
- Rubber seal main valve construction
- Extensive size variations are available.
- For driving medium and large cylinders
- Manifold type no.: VV5FR2, VV5FR3, VV5FR4, VV5FR5

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VFR2000	3.0	0.27	0.7	ø63	1.8
VFR3000	8.7	0.38	2.2	ø100	1.8
VFR4000	14	0.3	3.8	ø125	1.8
VFR5000	25	0.21	6.2	ø140	1.8
VFR6000	41	0.17	9.7	ø200	1.8

Pilot Operated 3 Port Solenoid Valves

3 Port Solenoid Valve **SYJ300/500/700**

Rubber seal



- Power consumption: 0.1 W (With power saving circuit)
- Manifold type no.: SS5YJ3, SS5YJ5, SS5YJ7

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
SYJ300	0.36	0.31	0.089	0.35 (Standard)	-14.5 psi [-100 kPa]
SYJ500	1.2	0.48	0.34	0.1 (With power saving circuit)	-14.5 psi [-100 kPa]
SYJ700	2.7	0.34	0.69		-14.5 psi [-100 kPa]

3 Port Solenoid Valve **VQZ100/200/300**

Metal seal
Rubber seal



- The external pilot specification can be used for vacuum applications.
- Can be mounted on an aluminum body manifold or a DIN rail
- Manifold type no.: VV3QZ12, VV3QZ15, VV3QZ22, VV3QZ25, VV3QZ32, VV3QZ35

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
VQZ100	0.56	0.30	0.14	0.35 (Standard)	-14.5 psi [-100 kPa]
VQZ200	1.7	0.36	0.45	0.9 (High pressure type, High speed response type)	-14.5 psi [-100 kPa]
VQZ300	3.0	0.33	0.72		-14.5 psi [-100 kPa]

3 Port Solenoid Valve **VZ100/300/500**

Rubber seal



- Can be used for vacuum applications (VZ100, VZ300R, VZ500R)
- Exhausting equipment for the pilot valve is not required. (Common exhaust type: VZ300M/500M)
- Can be used as either a selector or divider valve (External pilot type: VZ300R/500R)
- Manifold type no.: VV3Z1, VV4Z1, VV3Z3, VV3Z5

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → P)				
	C [dm ³ /(s·bar)]	b	Cv		
VZ100	0.19	0.071	0.042	1.8	-14.5 psi [-100 kPa]
VZ300	1.2	0.48	0.34	1.8	-14.5 psi [-100 kPa]
VZ500	2.7	0.34	0.69	1.8	-14.5 psi [-100 kPa]

Pilot Operated 3 Port Solenoid Valves

3 Port Solenoid Valve VZ200/400

Metal seal



- The plug connector allows for one-touch wiring.
- Can take measures against pilot exhaust (Common exhaust)
- Manifold type no.: VV3Z2, VV3Z4

Series	Flow rate characteristics			Power consumption [W]
	2 → 3 (A → R)			
	C [dm ³ /(s·bar)]	b	Cv	
VZ200	0.85	0.35	0.22	1.8
VZ400	2.2	0.11	0.49	1.8

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

Rubber seal



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

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications psi [MPa]
	2 → 3 (A → P)				
	C [dm ³ /(s·bar)]	b	Cv		
VP300	4.2	0.23	1.0	1.55 (Standard) 0.55 (With power saving circuit)	-14.5 [-100]
VP500	8.9	0.20	2.1	0.4 (Low wattage specification)	-14.5 [-100]
VP700	15.3	0.22	3.7	1.55 (Standard) 0.55 (With power saving circuit)	-14.5 [-100]

3 Port Solenoid Valve/Pilot Operated Poppet Type VG342

Rubber seal

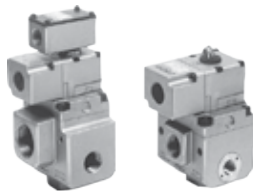


- Low power consumption
- No lubrication required
- Can be used under vacuum or low pressure
- Easy conversion to N.C., N.O., or external pilot
- Can be used as either a selector or divider valve (External pilot type)

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → P)				
	C [dm ³ /(s·bar)]	b	Cv		
VG342	38	0.32	9.8	4 (Standard) 1.8 (Energy-saving type) 1.8 (Continuous duty type)	-14.7 psi [-101.2 kPa]

Large Size 3 Port Solenoid Valve VP3145/3165/3185

Rubber seal



- Large flow capacity, small exhaust resistance
- Easy conversion to N.C. or N.O.

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (OUT → EXH)				
	C [dm ³ /(s·bar)]	b	Cv		
VP3145	26	0.35	7.0	12	-14.7 psi [-101.2 kPa]
VP3165	Effective area: 330 mm ²			12	-14.7 psi [-101.2 kPa]
VP3185	Effective area: 670 mm ²			12	-14.7 psi [-101.2 kPa]

Pilot Operated 3 Port Solenoid Valves

ISO13849-1 Certified: 3 Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position **VP/VG**

Rubber seal



- Safety standard ISO13849-1 certified (Corresponding to category 2 to 4)
- With detection of main valve position
- It is possible to construct a redundant system easily.
- Highly reliable construction
- Safety limit switch can be selected
- With soft start-up function (-X555)

Series	Category	Flow rate characteristics		
		2 → 3 (A → R)		
		C [dm ³ /(s·bar)]	b	Cv
Residual pressure release valve VP542-X536	2	8.9	0.20	2.1
Residual pressure release valve VP742-X536	2	15.3	0.22	3.7
Dual residual pressure release valve VP544-X538	3, 4	6.7	0.10	1.3
Dual residual pressure release valve VP744-X538	3, 4	9.7	0.08	2.1
Dual residual pressure release valve with soft start-up function VP544-X555	3, 4	6.7	0.10	1.3
Dual residual pressure release valve with soft start-up function VP744-X555	3, 4	9.7	0.08	2.1
Dual residual pressure release valve VG342-X87	3, 4	28.6	0.03	5.6

Direct Operated 3/4/5 Port Solenoid Valves

3 Port Solenoid Valve/Unit Manifold Valve **VV061**

Rubber seal



- Valve, base plate, base, and fitting in one compact unit
- Innovative unit manifold
- Equipped with a 6 mm wide valve, V060 series

Series	Type	Flow rate characteristics		Power consumption [W]	For use in vacuum applications
		2 → 3 (A → R)			
		C [dm ³ /(s·bar)]			
VV061	Standard	Effective area: 0.11 mm ²		0.55 (Standard) 0.23 (With power saving circuit)	-14.5 psi [-100 kPa]
	High flow	Effective area: 0.21 mm ²			

3 Port Solenoid Valve/Highly Integrated Unit Manifold **VV100**

Rubber seal



- Compact manifold with two 3-port valves on 1 station
- Connector (For plug-in connection)
- Individually wired valves can be added.

Series	Flow rate characteristics		Power consumption [W]	For use in vacuum applications
	2a/2b → 3 (E)			
	C [dm ³ /(s·bar)]	b		
VV100	0.05	0.29	0.4 (Standard) 0.15 (With power saving circuit)	-14.5 psi [-100 kPa]

Directional Control Valves

Direct Operated 3/4/5 Port Solenoid Valves

3 Port Solenoid Valve V100

Rubber seal

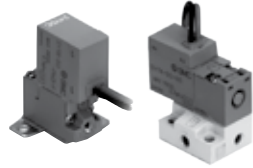


- Power consumption: 0.1 W (With power saving circuit)
- Manifold type no.: VV100-S41

Series	Type	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
		2 → 3				
		C [dm ³ /(s·bar)]	b	Cv		
V100	Standard	0.037	0.11	0.008	0.35 (Standard) 0.1 (With power saving circuit)	-14.5 psi [-100 kPa]
V100	High flow	0.076	0.07	0.016	1	-14.5 psi [-100 kPa]

3 Port Solenoid Valve SY100

Rubber seal



- Copper-free
- Manifold type no.: SS3Y1

Series	Type	Effective area	Power consumption [W]	For use in vacuum applications
SY100	Standard	0.14 mm ²	0.5	-14.5 psi [-100 kPa]
	High flow	0.22 mm ²		

3 Port Solenoid Valve S070

Rubber seal

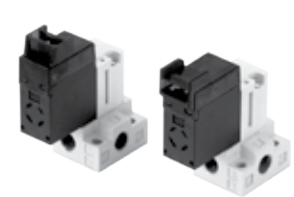


- 7 mm wide compact solenoid valve manifold
- Weight of valve alone: 5 g
- Single unit specifications, base mounted manifolds, and body ported manifolds can be selected.
- Manifold type no.: SS073

Series	Flow rate characteristics			Power consumption [W]	Max. operating pressure
	C [dm ³ /(s·bar)]	b	Cv		
S070	0.042	0.27	0.011	0.5	73 psi [0.5 MPa]
	0.060	0.28	0.016	0.5	44 psi [0.3 MPa]
	0.042	0.27	0.011	0.35	44 psi [0.3 MPa]
	0.060	0.28	0.016	0.35	15 psi [0.1 MPa]
	0.021	0.27	0.006	0.1 (With power saving circuit)	44 psi [0.3 MPa]
	0.042	0.28	0.011	0.1 (With power saving circuit)	15 psi [0.1 MPa]

3 Port Solenoid Valve VQ100

Metal seal



- High speed, stable response
- Copper-free
- A wide variety of wiring methods are available.
- Can be used for vacuum applications
- Manifold type no.: VV3Q11, VV3Q12

Series	Type	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
		2 → 3 (2 → 1)				
		C [dm ³ /(s·bar)]	b	Cv		
VQ100	Standard	0.083	0.28	0.021	1.0	-14.5 psi [-100 kPa]
	High flow	0.14	0.25	0.036	0.5 (Low wattage type)	

4 Port Solenoid Valve/Direct Operated Poppet Type VQD1000

Rubber seal



- Since the main valve has no sliding seals, a non-oil specification (Made to Order) is available. There is also no exhaust to the atmosphere.
- High speed, with stable response times
- Can be used for vacuum applications
- Manifold type no.: VV4QD12, VV4QD15

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQD1000	0.27	0.28	0.07	ø25	2.0

Direct Operated 3/4/5 Port Solenoid Valves

Vacuum/Release Unit **VQD1000-V**

Rubber seal



- Applicable to 0603 chips
- Response speed: 13 msec (at time of 500 mm²) / 18.5 msec (at time of 1000 mm²)
- Smooth workpiece removal, with no overshoot
- The timing adjustment of switchback between vacuum and positive pressure is not required.
- A throttle circuit for release air is not required.
- Suction filter: ZFC050 (Made to Order)

* Distance from the unit to the work area

3 Port Solenoid Valve/Direct Operated Poppet Type **VK300**

Rubber seal

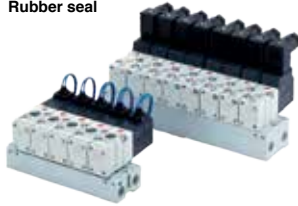


- Universal porting
- Can be combined on the VK3000 manifold
- Can be used for vacuum applications
- Manifold type no.: VV3K3

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
VK300	0.80	0.27	0.19	4	-14.7 psi [-101.2 kPa]

3 Port Solenoid Valve/Direct Operated Poppet Type **VKF300**

Rubber seal



- Universal porting
- Can be used for vacuum applications
- Manifold type no.: VV3KF3

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
VKF300	0.59	0.31	0.14	4.0	-14.7 psi [-101.2 kPa]

5 Port Solenoid Valve/Direct Operated Poppet Type **VK3000**

Rubber seal



- Low power consumption (2 W DC, Low wattage type)
- Can be used with a pressure of 0 MPa or more
- The combined mounting of the VK300 is possible.
- Manifold type no.: VV3K3

Series	Flow rate characteristics			Power consumption [W]
	4/2 → 5/3 (A/B → R1/R2)			
	C [dm ³ /(s·bar)]	b	Cv	
VK3000	0.54	0.12	0.12	4.0

3 Port Solenoid Valve/Direct Operated Poppet Type **VT307**

Rubber seal



- Energy-saving type: 1.8 W
- A single valve with various valve functions (Universal porting type)
- Low concentration ozone resistant
- Rubber seal material: HNBR for main valve
- Mounting dimensions are interchangeable with the current product.
- Manifold type no.: VV307

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
VT307	0.71	0.25	0.17	4 (Standard) 1.8 (Energy-saving type)	-14.7 psi [-101.2 kPa]

Directional Control Valves

Direct Operated 3/4/5 Port Solenoid Valves

3 Port Solenoid Valve/Direct Operated Poppet Type VT317/325

Rubber seal



- Direct operated solenoid valve
- Universal porting
- Can be used for vacuum applications
- Manifold type no.: VV317, VVT340, VVT341

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 3 (A → R)				
	C [dm ³ /(s·bar)]	b	Cv		
VT317	2.6	0.34	0.67	6.0	-14.7 psi [-101.2 kPa]
VT325	6.1	0.37	1.6	12	-14.7 psi [-101.2 kPa]

3 Port Solenoid Valve VT315

Rubber seal



- Universal porting
- Can be used for vacuum applications
- Manifold type no.: VVT320, VVT321

Series	Flow rate characteristics			Power consumption [W]	For use in vacuum applications
	2 → 1 (A → P)				
	C [dm ³ /(s·bar)]	b	Cv		
VT315	1.7	0.36	0.45	6 to 7	-14.5 psi [-100 kPa]

5 Port Direct Operated Solenoid Valve VS4□10

Metal seal



- Direct operated solenoid valve
- Can be used with a pressure of 0 MPa or more
- Metal seal main valve construction
- Manifold type no.: VVS410, VVS411

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	A/B → EA/EB				
	C [dm ³ /(s·bar)]	b	Cv		
VS4□10	3.9	0.35	1.0	ø80	5.5

3 Port Direct Operated Solenoid Valve VS3115/3110/3135/3145

Metal seal



- Direct operated solenoid valve
- Metal seal main valve construction
- Can be used with a pressure of 0 MPa or more
- Multiple pressure supply is possible.
- Manifold type no.: VVS310, VVS311

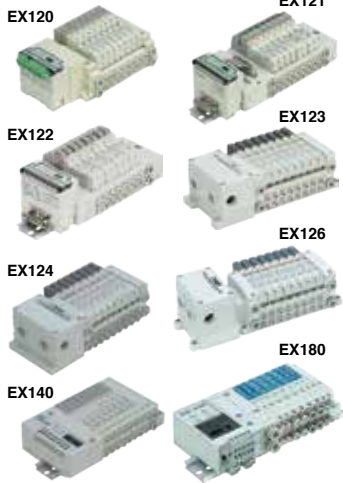
Series	Flow rate characteristics			Power consumption [W]
	A → E			
	C [dm ³ /(s·bar)]	b	Cv	
VS3115	3.6	0.34	0.88	5.5
VS3110	3.6	0.18	0.82	5.5
VS3135	9.0	0.3	2.4	13.2
VS3145	15	0.46	4.5	24.0

Reduced-wiring Fieldbus System (Serial Transmission System)

Serial Transmission System EX

For Output

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



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

Serial Transmission System EX260

For Output

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



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

Serial Transmission System EX250

For Input/Output

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



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

Reduced-wiring Fieldbus System (Serial Transmission System)

Serial Transmission System EX600



For Input/Output

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

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

Serial Transmission System EX500



For Input/Output, Gateway Type

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

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

Serial Transmission System EX510



For Input/Output, Gateway Type

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

Series	Enclosure	Communication protocol*	Applicable valve
EX510	IP20	DeviceNet™ PROFIBUS DP CC-Link	SJ2000, 3000 SY3000, 5000, 7000 (Plug-in) SY3000, 5000, 7000 SYJ3000, 5000, 7000 SQ1000, 2000 SZ3000 VQ1000, 2000 VQZ1000, 2000, 3000 S0700

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.

Air Operated Valves

5 Port Air Operated Valve **SYA3000/5000/7000**

Rubber seal



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

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

4/5 Port Air Operated Valve **SYJA3000/5000/7000**

Rubber seal



- Can be used with the same manifolds as the SYJ3000/5000/7000 series.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b	Cv	
SYJA3000	0.46	0.35	0.12	ø25
SYJA5000	0.83	0.32	0.21	ø40
SYJA7000	2.9	0.35	0.74	ø50

5 Port Air Operated Valve **VZA2000/4000**

Metal seal



- Can be used with the same manifolds as the VZ2000/4000 series.
- Can be mounted on VQZ2000/3000 manifolds.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b	Cv	
VZA2000	0.90	0.25	0.21	ø40
VZA4000	2.2	0.19	0.54	ø50

5 Port Air Operated Valve **VFA1000/3000/5000**

Rubber seal



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

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

5 Port Air Operated Valve **VFRA3000/4000**

Rubber seal



- Can be used with the same manifolds as the VFR3000/4000 series non plug-in type.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b	Cv	
VFRA3000	8.6	0.37	2.2	ø100
VFRA4000	14	0.30	3.7	ø125

Air Operated Valves

5 Port Air Operated Valve VPA4□50/4□70

Rubber seal



- Can be used with the same manifolds as the VP4□50 series.

Series	Flow rate characteristics			Applicable cylinder size
	4/2 → 5/3 (A/B → EA/EB)			
	C [dm ³ /(s·bar)]	b	Cv	
VPA4□50	21	0.28	5.6	ø140
VPA4□70	Effective area: 300 mm ²			ø300

4/5 Port Air Operated Valve VSA4□20/4□30/4□40

Metal seal



- Metal seal main valve construction

Series	Flow rate characteristics			Applicable cylinder size
	A/B → EA/EB			
	C [dm ³ /(s·bar)]	b	Cv	
VSA4□20	5.6	0.51	1.4	ø80
VSA4□30	9.6	0.17	2.4	ø100
VSA4□40	16	0.32	4.2	ø140

3 Port Air Operated Valve SYJA300/500/700

Rubber seal



- Can be used with the same manifolds as the SYJ300/500/700 series.
- Manual override is possible.

Series	Flow rate characteristics		
	2 → 3 (A → R)		
	C [dm ³ /(s·bar)]	b	Cv
SYJA300	0.36	0.31	0.089
SYJA500	1.2	0.48	0.34
SYJA700	2.7	0.34	0.69

3 Port Air Operated Valve VZA200/400

Metal seal



- Metal seal main valve construction

Series	Flow rate characteristics		
	4/2 → 5/3 (A/B → EA/EB)		
	C [dm ³ /(s·bar)]	b	Cv
VZA200	0.85	0.35	0.22
VZA400	2.2	0.17	0.53

3 Port Air Operated Valve VPA300/500/700

Rubber seal



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

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

Air Operated Valves

3 Port Air Operated Valve **VTA301/315**

Rubber seal



- Universal porting
- Can be used with a pressure of 0 MPa or more

Series	Flow rate characteristics		
	2 → 3 (A → R)		
	C [dm ³ /(s·bar)]	b	Cv
VTA301	0.60	0.29	0.15
VTA315	1.7	0.39	0.45

3 Port Air Operated Valve **VGA342**

Rubber seal



- Easy conversion to N.C. or N.O.

Series	Flow rate characteristics		
	2 → 3 (A → R)		
	C [dm ³ /(s·bar)]	b	Cv
VGA342	38	0.32	9.8

3 Port Air Operated Valve **VPA3145/3165/3185**

Rubber seal



- High flow capacity, small exhaust resistance

Series	Flow rate characteristics		
	2 → 3 (OUT → EXH)		
	C [dm ³ /(s·bar)]	b	Cv
VPA3145	42	0.39	10
VPA3165	Effective area: 330 mm ²		
VPA3185	Effective area: 670 mm ²		

Mechanical Valves/Hand Valves

Mechanical Valve **VM/VZM/VFM**



- A wide variety of valves are available for all types of air systems.
- Small mounting space with a compact body

Description	Series	Number of ports
Mechanical valve	VM1000	2/3 ports
	VM100, VM200	2/3 ports
	VM400	3 ports
	VZM500, VZM400	5 ports
	VFM300, VFM200	5 ports
	VM800	3 ports

Directional Control Valves

Mechanical Valves/Hand Valves

Blow Gun VMG



- A reduction of 2,000 m³ per annum is possible. (Energy saving)
- 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 psi [MPa]	Effective area [mm ²]	Nozzle port size
VMG	Rc, NPT, G 1/4, 3/8	0 to 145 [0 to 1.0]	30	Rc1/4

Transmitters VR



- Air transmitters used for a variety of All-Air Systems

Description	Series
Relay valve	VR4151, 4152
Shuttle valve	VR1210, 1220 VR1210F, VR1220F
AND valve	VR1211F
Time delay valve	VR2110
Pneumatic indicator	VR3100, 3110
Pneumatic-electric relay	VR3200, 3201

Two Hand Control Valve VR51



- Equipment featuring a safety circuit
- When starting an operation, accidents, such as fingers being caught, can be prevented by requiring both hands to start push button operated valves.
- An output requires synchronized two-handed operation. (within 0.5 s)

Series	Sonic conductance: C	Port size		Applicable tubing material
		Metric size	Inch size	
VR51	0.3 dm ³ /(s·bar)	ø6	ø1/4	Nylon Soft nylon Polyurethane FR soft nylon FR double layer FR double layer polyurethane

Finger Valve VHK



- The valve direction clearly indicates whether the valve is open or closed.
- Small knob operating force (0.03 to 0.10 lbf·ft [0.04 to 0.14 N·m])

Description	Series	Type	Port size
Finger valve	VHK2	2 port valve	ø4 to ø12 M5, 1/8 to 1/2
	VHK3	3 port valve	

Hand Valve VH200/300/400/600



- The direction of air flow can be confirmed at a glance by the orientation of the handle.

Description	Series	Max. operating pressure	Port size
Hand valve	VH200	145 psi [1.0 MPa]	1/4
	VH300		1/4, 3/8
	VH400		1/4, 3/8, 1/2, 3/4
	VH600	102 psi [0.7 MPa]	3/4, 1

Mechanical Valves/Hand Valves

Conforming to OSHA Standard: Pressure Relief 3 Port Valve with Locking Holes **VHS20/30/40/50**

For pressure relief



- Compliant with OSHA Standards (Occupational Safety and Health Administration Department of Labor)
- This manually operated valve can be used to prevent accidents caused by residual pressure in pneumatic lines.
- The supply and exhaust status of air flow can be confirmed at a glance.
- When in the exhaust position, the valve may be padlock secured. This can prevent accidental start-ups while personnel are cleaning or servicing equipment.
- Push the knob and then turn. This 2-step action can prevent malfunctions.

Series	Description	Knob operation	Port size
VHS20	Pressure relief 3 port valve with locking holes	Single action	1/8, 1/4
VHS30			1/4, 3/8
VHS40			1/4, 3/8, 1/2, 3/4
VHS50			3/4, 1
VHS2510		Double action	1/8, 1/4
VHS3510			1/4, 3/8
VHS4510			1/4, 3/8, 1/2, 3/4
VHS5510			3/4, 1

Residual Relief 3 Port Valve **VHS400/500**

For pressure relief



- Easy to operate
- The direction of air flow can be confirmed at a glance by the orientation of the knob.

Description	Series	Port size
Residual relief 3 port valve	VHS400	1/4, 3/8, 1/2
	VHS500	3/4

Power Valves

3 Port 3 Position Valve **VEX3**



- The intermediate stopping of cylinders up to $\phi 125$ is possible.
- Power consumption: 1 W
- 4 Manual override options:
 - Non-locking push type
 - Locking slotted type
 - Push-turn locking slotted type
 - Push-turn locking lever type

Description	Series	Function
3 port 3 position valve	VEX3	Directional control valve

Power Valve **VEX**



- Extensive size variations, port sizes 1/8 to 2
- VEX1: Large capacity exhaust regulator
- VEX3: 3 port, 3 position valve
- VEX5: 3 functions (pressure regulator, directional control valve, and speed controller) are provided by a single valve.

Description	Series	Function
Regulator valve	VEX1	Regulator + Directional control valve
3 position valve	VEX3	Directional control valve
Economy valve	VEX5	Reduced pressure supply + ON/OFF exhaust + Speed control

Directional Control Valves

ISO Valves

5 Port Solenoid Valve/ISO Standard **VQ7-6/7-8**

Metal seal
Rubber seal



- Compliant with ISO Standards
- Manifold type no.: VV71, VV72

Series	Flow rate characteristics			Applicable cylinder size	Power consumption [W]
	4/2 → 5/3 (A/B → EA/EB)				
	C [dm ³ /(s·bar)]	b	Cv		
VQ7-6	6.0	0.11	1.4	ø100	1.0
VQ7-8	13	0.27	3.3	ø140	1.0

Explosion Proof Valves

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

Rubber seal



- Exia II BT4 (TIIS approved product)
- Waterproof: Passed the IPX6 test
- 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-VEF)
- Can be used as a selector valve, divider valve, or for vacuum applications (50-VPE)
- Manifold type no.: 50-VV5FE3, 50-VV5FE5

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

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

Rubber seal



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

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

Air Cylinders

Standard Air Cylinders (Round Type)



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Standard Air Cylinders (Square Cover)



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Air Cylinders

Mechanically Jointed Rodless Cylinders



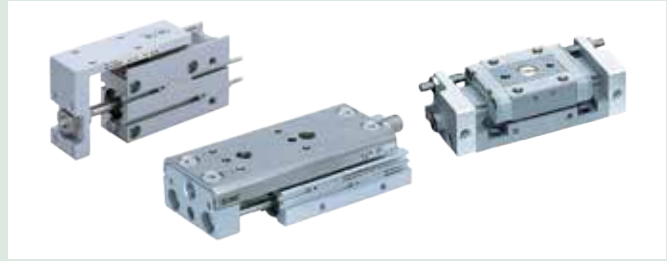
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Air Cylinders

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Air Cylinders

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Air Cylinders

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Standard Air Cylinders (Round Type)

Air Cylinder CJ1



- For the double acting type, the piping direction of the fitting on the rod cover side varies within a range of 90°.

Type	Series	Action	Bore size [mm]
Standard	CJ1	Double acting, Single rod	4
Standard	CJ1	Single acting (Spring return)	2.5, 4

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)

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

Air Cylinder CJ2/CDJ2



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

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

Air Cylinder JCM/JCDM



- Overall length shortened by up to 97 mm
- Weight reduced by up to 54% (0.69 kg → 0.32 kg)
- Various cover types are available.
- Port sizes: M5 and Rc1/8
- Male and female rod ends are available.
- With auto switch (JCDM series: JCDM)

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

Standard Air Cylinders (Round Type)

Air Cylinder **CM2/CDM2**



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

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

Air Cylinder/Short Type **CM3/CDM3**



- Up to 66 mm shorter, up to 21% lighter (Compared with the CM2 series)
- Female rod end is available as standard.
- With auto switch (CDM3 series: CDM3)

Type	Series	Action	Bore size [mm]
Standard	CM3	Double acting, Single rod	20, 25, 32, 40

Air Cylinder **CG1/CDG1**



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

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

Air Cylinder/Short Type **CG3/CDG3**



- Up to 51 mm shorter, up to 24% lighter (Compared with the CG1 series)
- Female rod end is available as standard.
- With auto switch (CDG3 series: CDG3)

Type	Series	Action	Bore size [mm]
Standard	CG3	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100

Air Cylinder **NCM** Standard non repairable round body



- Chrome plated carbon steel piston rod improves corrosion resistance. Stainless steel 304 is available for further protection.
- With auto switch (Series NCDM: NCDM, NCDMB, NCDMC, NCDME, NCDMR, NCDMW)

Type	Series	Action	Bore size [inch]
Standard	NCM	Double acting, single/double rod	7/16, 9/16, 3/4, 7/8, 1-1/16, 1-1/4, 1-1/2, 2
Standard	NCM	Single acting (Spring return/extend)	3/4, 7/8, 1-1/16, 1-1/4, 1-1/2
Non-rotating rod	NCMK	Double acting single/double rod	3/4, 7/8, 1-1/16, 1-1/4, 1-1/2
Non-rotating rod	NCMK	Single acting (Spring return)	3/4, 7/8, 1-1/16, 1-1/4, 1-1/2

Standard Air Cylinders (Square Cover)

Air Cylinder **JMB (JMDB)**



- Intermediary bore sizes: $\phi 45$, $\phi 56$, $\phi 67$, $\phi 85$
- Air saving, Space saving
- Overall length shortened by 27 mm
- Weight reduced by up to 30% (1.45 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)

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

Air Cylinder **MB/MDB**



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

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

Standard Air Cylinders (Square Cover)

Air Cylinder MB1/MDB1



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

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

Air Cylinder CA2/CDA2



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

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

Air Cylinder CS1/CDS1



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

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

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

Air Cylinder CS2/CDS2



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

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

Standard Air Cylinders (Square Cover)

Air Cylinder **NCA1/NCDA1**



- NFPA interchangeable air cylinder
- With auto switch (Series NCDA1: NCDA1, NCDA1K, NCDA1W, NCDA1M)

Type	Series	Action	Bore size [inch]
Standard	NCA1	Double acting Single rod	1.5, 2, 2.5, 3.25, 4
Standard	NCA1W	Double acting double rod	1.5, 2, 2.5, 3.25, 4
Non-rotating rod	NCA1K	Double acting single rod	1.5, 2, 2.5

Compact Air Cylinders

Mini Free Mount Cylinder **CUJ/CDUJ**



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

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

Free Mount Cylinder **CU/CDU**



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

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

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



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

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

Compact Air Cylinders

Compact Cylinder **JCQ/JCDQ**



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

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

Compact Cylinder **CQ2/CDQ2**



- Space-saving cylinder designed with a compact body
- Small auto switches can be mounted on 4 surfaces. (2 surfaces for ø12 to ø25)
- No projection of the auto switch
- Weight: Reduced by 5 to 13% (Compared with the current CQ2 series)
- Newly added compact type foot brackets and double clevis pivot bracket
- Part numbers with a rod end bracket and/or mounting bolt are available. (It is not necessary to order a bracket for the applicable cylinder separately.)
- With auto switch (CDQ2 series: CDQ2, CDQ2W, CDQ2K, CDQ2KW, CDQP2, CDQ2□S, CDBQ2)

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

Compact Cylinder with Air Cushion **RQ/RDQ**



- The air cushion mechanism has been added to the CQS and CQ2 series compact cylinders, extending the body length only + 2.5 mm to 13 mm.
- Absorbs nearly triple the amount of absorbable allowable kinetic energy (Compared to the rubber bumper of the CQS and CQ2 series)
- Newly added compact type foot brackets
- With auto switch (RDQ series: RDQ)

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

Compact Cylinder/Guide Rod Type **CQM/CDQM**



- Built-in guide rod in the CQS and CQ2 series compact cylinders
- Non-rotating accuracy: ±0.2° or less
- 2 to 4 times the lateral load resistance
 - * Compared to the CQ series compact cylinder
- Loads can be directly mounted.
- Mounting dimensions are compatible with the CQS and CQ2 series.
- With auto switch (CDQM series: CDQM)

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

Compact Air Cylinders

Compact Cylinder/Plate Type **CQU**



- The oval piston design reduces the width by a maximum of 40%. (Compared with the CQ2 series)
- Weight: Reduced by up to 36% (Compared with the MU series)
- A small type auto switch can be mounted from 4 directions.
- No protrusion of the auto switch from the mounting slot

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

Plate Cylinder **MU/MDU**



- The oval piston design saves space. Cylinders can be mounted from multiple directions.
- It is possible to mount small auto switches in 4 directions.
- No protrusion of the auto switch from the mounting slot
- Available with a stroke of up to 300 mm
- With auto switch (MDU series: MDU, MDUW)

Type	Series	Action	Bore size [mm]
Standard	MU-Z	Double acting, Single rod	25, 32, 40, 50, 63
Standard	MU-Z	Single acting (Spring return/extend)	25, 32, 40, 50, 63
Standard	MUW-Z	Double acting, Double rod	25, 32, 40, 50, 63

Compact Cylinder **NCQ8/NCDQ8**



- Square body allows close center to center mounting
- Visibility of auto switch is improved.
- Auto switch mountable on multiple-sides
- No protrusion from cylinder's exterior when mounting auto switches

Type	Series	Action	Bore size [inch]
Standard	NCQ8	Double acting single/double rod	9/16", 3/4", 1-1/16", 1-1/2", 2", 2-1/2", 3", 4"
Standard	NCQ8	Single acting single rod	9/16", 3/4", 1-1/16", 1-1/2", 2", 2-1/2"
Super compact	NCDQ8xZ	Double acting double rod	9/16", 3/4", 1-1/16", 1-1/2", 2", 2-1/2", 3", 4"
Super compact	NCDQ8xZ	Single acting single rod	9/16", 3/4", 1-1/16", 1-1/2", 2", 2-1/2"

Environment Resistant Cylinders

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



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

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

Hygienic Design Cylinder **HY□/HYD□**



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

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

Environment Resistant Cylinders

Water Resistant Cylinder (Pneumatic/Hydraulic)



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

Type	Series	Action	Bore size [mm]
Air cylinder	CM2-Z	Double acting	20, 25, 32, 40
Air cylinder	CG1-Z	Double acting	32, 40, 50, 63, 80, 100
Air cylinder	MB-Z	Double acting	32, 40, 50, 63, 80, 100
Square tube type air cylinder	MB1	Double acting	32, 40, 50, 63, 80, 100
Compact cylinder	CQ2-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Air cylinder	CA2-Z	Double acting	40, 50, 63, 80, 100
Compact guide cylinder	MGP-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Guide cylinder	MGG	Double acting	32, 40, 50, 63, 80, 100
Compact hydraulic cylinder compliant with JIS Standards (1450 psi [10 MPa])	CHKDB	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Hydraulic cylinder compliant with JIS Standards (1015 psi [7 MPa])	CH2F	Double acting	32, 40, 50, 63, 80, 100

Cylinder with Stable Lubrication Function (Lube-retainer)



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

Type	Series	Action	Bore size [mm]
Air cylinder	CM2-Z	Double acting	20, 25, 32, 40
Air cylinder	CG1-Z	Double acting	20, 25, 32, 40, 50, 63, 80, 100
Air cylinder	CA2-Z	Double acting	40, 50, 63, 80, 100
Compact cylinder	CQS	Double acting	20, 25
Compact cylinder	CQ2	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

Dust Resistant Cylinder



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

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

Floating Joints

Floating Joint J



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

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

Air-hydro Units

Air-hydro Unit CC



- By converting air pressure into hydraulic pressure, the same functions of a hydraulic unit can be obtained while using pneumatic equipment.

Type	Series	Nominal size [mm]
Air-hydro unit	CC	63, 100, 160
Converter	CCT	40, 63, 100, 160
Valve unit	CCV	—

Mechanically Jointed Rodless Cylinders

Mechanically Jointed Rodless Cylinder/Basic Type MY1B



- Remodeled to be made lighter
- Weight reduced by 17% (Compared to the current MY1B)
- Auto switches can be mounted from the front in any position on the mounting groove.
- The retention mechanism of the dust seal band has been changed to the magnet attraction method to improve retention ability.
- Mounting dimensions are interchangeable with the current model.

Type	Series	Action	Bore size [mm]
Basic	MY1B-Z	Double acting	25, 32, 40

Mechanically Jointed Rodless Cylinder/Linear Guide Type MY1H



- Piping can be connected from 4 directions on the head cover.
- Allows for on-site piping to suit the installation conditions
- Cushion needle can be easily adjusted. By changing the cushion needle adjustment from the side to the top, adjustment can be performed with ease.
- Auto switches can be mounted in any desired position. (D-M9□, D-A9□)
- The new dust seal band improves the product's life.
- The mounting and performance are the same as the previous model, but the weight has been reduced.

Type	Series	Action	Bore size [mm]
Linear guide type	MY1H-Z	Double acting	25, 32, 40

Mechanically Jointed Rodless Cylinders

Mechanically Jointed Rodless Cylinder MY1



- 4 standard models are available.
- A variety of applications are available based on the load mass and required accuracy.

Type	Series	Action	Bore size [mm]
Basic	MY1B	Double acting	10, 16, 20, 50, 63, 80, 100
Slide bearing	MY1M	Double acting	16, 20, 25, 32, 40, 50, 63
Cam follower guide	MY1C	Double acting	16, 20, 25, 32, 40, 50, 63
Linear guide type	MY1H	Double acting	10, 16
Linear guide type	MY1HT	Double acting	50, 63

Mechanically Jointed Rodless Cylinder with Protective Cover MY1□W



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

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

Mechanically Jointed Rodless Cylinder MY2



- Height has been reduced by a maximum of 30% compared to the mechanically jointed rodless cylinder, MY1H series. Furthermore, it is possible to replace the cylinder for the drive unit while the workpiece is mounted.

Type	Series	Action	Bore size [mm]
Cam follower guide	MY2C	Double acting	16, 25, 40
Linear guide	MY2H	Double acting	16, 25, 40
Linear guide	MY2HT	Double acting	16, 25, 40

Mechanically Jointed Rodless Cylinder MY3



- Space saving: Height has been reduced by a maximum of 36% and length by a maximum of 140 mm (Compared to the mechanically jointed rodless cylinder, MY1B series)

Type	Series	Action	Bore size [mm]
Basic, Short (Rubber bumper)	MY3A	Double acting	16, 20, 25, 32, 40, 50, 63
Basic, Standard (Air cushion)	MY3B	Double acting	16, 20, 25, 32, 40, 50, 63
Slide bearing guide (Air cushion)	MY3M	Double acting	16, 25, 40, 63

Magnetically Coupled Rodless Cylinders

Magnetically Coupled Rodless Cylinder CY3



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

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

Magnetically Coupled Rodless Cylinders

Magnetically Coupled Rodless Cylinder **CY1S**



- Weight: Max. 15% reduction (0.96 kg: Current model 1.13 kg)
- Overall length: Max. 15 mm shorter (240 mm: Current model 255 mm)
- Improved durability: Lube-retainers are mounted on the internal and external surfaces of the cylinder tube to maintain lubrication.
- The adjustment bolt improves stroke accuracy/repeatability.

Type	Series	Action	Bore size [mm]
Slider (Slide bearing)	CY1S-Z	Double acting	6, 10, 15, 20, 25, 32, 40

Magnetically Coupled Rodless Cylinder **CY1**



- This magnetically coupled, space-saving cylinder permits a wide range of applications.

Type	Series	Action	Bore size [mm]
Slider (Ball bushing bearing)	CY1L	Double acting	6, 10, 15, 20, 25, 32, 40
Linear guide	CY1H	Double acting	10, 15, 20, 25
Linear guide	CY1HT	Double acting	25, 32

Magnetically Coupled Rodless Cylinder/Low Profile Guide **CY1F**



- Low profile, short body, lightweight
- The cylinder and guide are integrated.

Type	Series	Action	Bore size [mm]
Standard	CY1F	Double acting	10, 15, 25

Clean Rodless Cylinder **CYP**



- Low particle generation transfer in clean environments

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

Table Cylinders

Compact Slide **MXH**



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

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

Table Cylinders

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 current cylinder through the adoption of the dual rod function

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

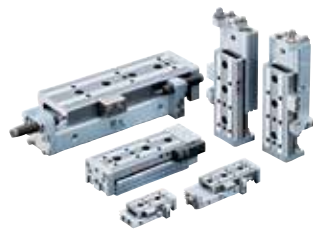
Air Slide Table **MXQ□**



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

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

Air Slide Table **MXQ**



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

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

Air Slide Table/Reversible Type **MXQR**



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

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

Low Profile Slide Table **MXF**



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

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

Table Cylinders

Air Slide Table **MXW**



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

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

Air Slide Table **MXJ**



- The integrated front mounting part and table results in a highly accurate and rigid top and front mounting surface.
- Traveling parallelism: 0.005 mm
- Height: 10 mm/Width: 20 mm/Length: 43 mm (MXJ4)

Type	Series	Action	Bore size [mm]
Standard	MXJ	Double acting	4, 6, 8

Air Slide Table **MXP**



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

Type	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

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

Precision Cylinder **MTS**



- Precision cylinder with internal guide function

Type	Series	Action	Bore size [mm]
Standard	MTS	Double acting	8, 12, 16, 20, 25, 32, 40

Guide Cylinders (MG Series)

Miniature Guide Rod Cylinder **MGJ**



- Overall length: 23 + Stroke mm/Width: 29 mm/Height: 14.5 mm (MGJ6)
- 2 auto switches can be mounted even for 5 strokes.
- Integral wiring/piping to one direction
- Non-rotating accuracy: $\pm 0.1^\circ$

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

Compact Guide Cylinder **JMGP**



- Compact: Overall length shortened by 30.5 mm, Height shortened by 16 mm
- 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.

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

Compact Guide Cylinder **MGP**



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

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

Compact Guide Cylinder/With Flange **MGP**



- Plate side flange type has been added.

Type	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing	MGPM-Z	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Basic type	Ball bushing	MGPL-Z	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100
Basic type	High-precision ball bushing	MGPA-Z	Double acting	12, 16, 20, 25, 32, 40, 50, 63, 80, 100

Guide Cylinders (MG Series)

Compact Guide Cylinder/Wide Type **MGPW**



- The guide pitch has been doubled.
- The allowable rotational torque of the plate has been improved. The non-rotating accuracy of the plate has been improved.
- Equivalent weight to the basic type

Type	Bearing	Series	Action	Bore size [mm]
Basic type	Slide bearing/ Ball bushing/ High-precision ball bushing	MGPW	Double acting	20, 25, 32, 40, 50, 63

Compact Guide Cylinder **MGQ**



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

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

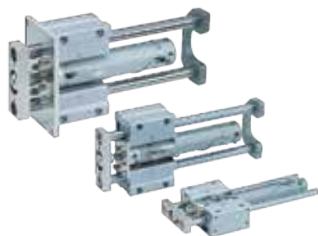
Guide Cylinder **MGG**



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

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

Guide Cylinder/Compact Type **MGC**



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

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

Guide Table **MGF**



- Low-profile compact cylinder
- Cylinder with a large concentric guiding sleeve that provides excellent eccentric load resistance

Type	Series	Action	Bore size [mm]
Standard	MGF	Double acting	40, 63, 100

Guide Cylinders (CX Series)

Non-rotating Double Power Cylinder/Double Power Cylinder **MGZ/MGZR**



- Doubles the output in the extending direction with its unique structure
- A built-in non-rotating mechanism using slide keys allows for loads to be mounted directly.

Type	Series	Action	Bore size [mm]
Standard	MGZ	Double acting	20, 25, 32, 40, 50, 63, 80
With end lock	MGZ	Double acting	40, 50, 63
Without non-rotating mechanism	MGZR	Double acting	20, 25, 32, 40, 50, 63, 80

Cylinder with Turntable **MGT**



- Integrated compact guide cylinder (MGP series) and manual turntable
- High-precision bearings for smooth turning return movement
- The table unit has positioning mechanisms for each 90° and 180° of rotation.

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing	MGTM	Double acting	63, 80, 100
Standard	Ball bushing bearing	MGTL	Double acting	63, 80, 100

Slide Unit **CX2/CDBX2/CDPX2**



- It is possible to install a shock absorber that absorbs impact and noise as desired.
- Ideal for workpiece transfers requiring positional accuracy
- With auto switch (CDBX2 series: CDBX2, CDPX2 series: CDPX2)

Type	Series	Action	Bore size [mm]
Standard	CX2	Double acting	10, 15, 25

Slide Unit **CXW/CDBXW/CDPXW**



- Built-in shock absorber that absorbs impact
- Can be mounted on the housing or on the plate
- Highly precise parallelism of cylinders and workpieces
- With auto switch (CDBXW series: CDBXWM, CDBXWL, CDPXW series: CDPXWM, CDPXWL)

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing	CXWM	Double acting	10, 16, 20, 25, 32
Standard	Ball bushing bearing	CXWL	Double acting	10, 16, 20, 25, 32

Platform Cylinder **CXT**



- Integrated worktable and actuator
- Highly rigid and accurate slide table

Type	Bearing	Series	Action	Bore size [mm]
Standard	Slide bearing	CXTM	Double acting	12, 16, 20, 25, 32, 40
Standard	Ball bushing bearing	CXTL	Double acting	12, 16, 20, 25, 32, 40

Guide Cylinders (CX Series)

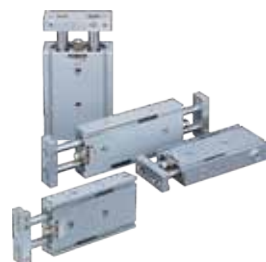
Dual Rod Cylinder **CXSJ**



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

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

Dual Rod Cylinder **CXS**



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

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

Fine Lock Cylinders

Fine Lock/Lock-up Cylinder **CL□/CDL□**



- Locking cylinder ideal for intermediate stops, emergency stops, and drop prevention (Bi-directional lock)
- * CL1: Single-directional lock
- With auto switch (CDL□ series: CDLJ2, CDLM2, CDLG1, CDL1)

Type	Series	Action	Bore size [mm]	Lock mechanism
Fine lock cylinder	CLJ2	Double acting, Single rod	16	Spring lock, Air pressure lock, Spring/Air pressure lock
Fine lock cylinder	CLM2	Double acting, Single rod	20, 25, 32, 40	
Fine lock cylinder	CLG1	Double acting, Single rod	20, 25, 32, 40	
Lock-up cylinder	CL1	Double acting, Single rod	40, 50, 63, 80, 100, 125, 140, 160	Spring lock

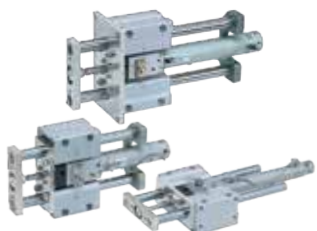
Fine Lock Cylinder **CLA2/CDLA2**



- 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 (CDLA2 series: CDLA2)

Type	Series	Action	Bore size [mm]	Lock mechanism
Fine lock cylinder	CLA2	Double acting, Single rod	40, 50, 63, 80, 100	Spring lock, Air pressure lock, Spring/Air pressure lock
Fine lock cylinder	CLA2W	Double acting, Double rod	40, 50, 63, 80, 100	

Guide Cylinder/Built-in Fine Lock Cylinder Compact Type **MLGC**



- This linear transfer unit integrates a locking cylinder (Ideal for intermediate stops, emergency stops, and drop prevention) and a guide. (Bi-directional lock)

Type	Bearing	Series	Action	Bore size [mm]	Lock mechanism
Standard	Slide bearing	MLGCM	Double acting, Single rod	20, 25, 32, 40	Spring lock, Spring/Air pressure lock, Air pressure lock
Standard	Ball bushing bearing	MLGCL	Double acting, Single rod	20, 25, 32, 40	

Lock Cylinders

Cylinder with Lock **CNG/CDNG**



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

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

Cylinder with Lock **MNB/MDNB**



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

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	MNB	Double acting, Single rod	32, 40, 50, 63, 80, 100	Spring lock
Standard	MNBW	Double acting, Double rod	32, 40, 50, 63, 80, 100	Spring lock

Cylinder with Lock **CNA2/CDNA2**



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

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

Cylinder with Lock **CNS/CDNS**



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

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	CNS	Double acting, Single rod	125, 140, 160	Spring lock

Cylinder with Lock **CLS/CDLS**



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

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	CLS	Double acting, Single rod	125, 140, 160, 180, 200, 250	Spring lock

Lock Cylinders

Compact Cylinder with Lock **CLQ/CDLQ**



- Locking cylinder ideal for drop prevention when the air supply is shut off (Single-directional lock)
- With auto switch (CDLQ series: CDLQ)

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	CLQ	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100	Spring lock

Compact Cylinder with Air Cushion and Lock **RLQ/RDLQ**



- Locking cylinder ideal for drop prevention when the air supply is shut off
- Compact cylinder with a built-in air cushion and lock unit (Single-directional lock)
- With auto switch (RDLQ series: RDLQ)

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	RLQ	Double acting, Single rod	32, 40, 50, 63	Spring lock

Plate Cylinder with Lock **MLU/MDLU**



- Locking cylinder ideal for drop prevention when the air supply is shut off (Single-directional lock)
- With auto switch (MDLU series: MDLU)

Type	Series	Action	Bore size [mm]	Lock mechanism
Standard	MLU	Double acting, Single rod	25, 32, 40, 50	Spring lock

Compact Guide Cylinder with Lock **MLGP**



- Compact guide cylinder with a built-in lock mechanism ideal for drop prevention when the air supply is shut off (Single-directional lock)

Type	Bearing	Series	Action	Bore size [mm]	Lock mechanism
Standard	Slide bearing	MLGPM	Double acting, Single rod	20, 25, 32, 40,	Spring lock
Standard	Ball bushing bearing	MLGPL	Double acting, Single rod	50, 63, 80, 100	Spring lock

Mechanically Jointed Hy-rodless Cylinder with Brake **ML1C**



- A brake mechanism has been compactly integrated into the slide table.
- Enables intermediate stops

Type	Series	Action	Bore size [mm]
Cam follower guide	ML1C	Double acting	25, 32, 40

Specialty Cylinders

Sine Rodless Cylinder **REA**



- Allows the high-speed transfer of a workpiece which must avoid shock/impact
- Maximum speed: 300 mm/s

Type	Series	Action	Bore size [mm]
Basic	REA	Double acting	25, 32, 40, 50, 63
Direct mount	REAR	Double acting	10, 15, 20, 25, 32, 40
Slider (Slide bearing)	REAS	Double acting	10, 15, 20, 25, 32, 40
Slider (Ball bushing bearing)	REAL	Double acting	10, 15, 20, 25, 32, 40
Linear guide (Single axis)	REAH	Double acting	10, 15, 20, 25
Linear guide (Double axis)	REATH	Double acting	25, 32

Sine Rodless Cylinder **REB**



- Allows the high-speed transfer of a workpiece which must avoid shock/impact
- Maximum speed: 600 mm/s

Type	Series	Action	Bore size [mm]
Direct mount	REBR	Double acting	15, 25, 32
Linear guide (Single axis)	REBH	Double acting	15, 25
Linear guide (Double axis)	REBHT	Double acting	25, 32

Sine Cylinder **REC**



- Allows the high-speed transfer of a workpiece which must avoid shock/impact

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

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



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

Type	Series	Action	Bore size [mm]	Min. operating pressure psi [MPa]
Air cylinder	CJ2Y-Z	Double acting	10, 16	4.4 [0.03]
Air cylinder	CM2Y-Z	Double acting	20, 25, 32, 40	2.9 [0.02]
Air cylinder	CG1Y-Z	Double acting	20, 25, 32, 40	2.9 [0.02]
Air cylinder	CG1Y-Z	Double acting	50, 63, 80, 100	1.5 [0.01]
Air cylinder	MBY-Z	Double acting	32, 40	2.9 [0.02]
Air cylinder	MBY-Z	Double acting	50, 63, 80, 100	1.5 [0.01]
Air cylinder	CA2Y-Z	Double acting	40	2.9 [0.02]
Air cylinder	CA2Y-Z	Double acting	50, 63, 80, 100	1.5 [0.01]
Air cylinder	CS2Y	Double acting	125, 140, 160	0.73 [0.005]
Compact cylinder	CQSY	Double acting	12, 16	4.4 [0.03]
Compact cylinder	CQSY	Double acting	20, 25	2.9 [0.02]
Compact cylinder	CQ2Y-Z	Double acting	32, 40	2.9 [0.02]
Compact cylinder	CQ2Y-Z	Double acting	50, 63, 80, 100	1.5 [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 $\phi 16$ 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, CDQ2X series: CDQ2X, CDUX series: CDUX)

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

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



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

Type	Series	Bore size [mm]	Operating pressure range psi [MPa]	Driving speed [mm/s]
Standard	MQQT	10, 16, 20, 25, 30, 40	0.73 to 73 [0.005 to 0.5]	0.3 to 300
Anti-lateral load	MQQL	10, 16, 20, 25, 30, 40	0.73 to 102 [0.005 to 0.7]	0.5 to 500
Anti-lateral load	MQML	6	2.9 to 102 [0.02 to 0.7]	0.5 to 1000
Anti-lateral load	MQML	10, 16, 20, 25	0.73 to 102 [0.005 to 0.7]	0.5 to 1000
High speed/High frequency	MQML□□H	10, 16, 20, 25	1.5 to 102 [0.01 to 0.7]	5 to 3000
Single acting	MQP	4, 6, 10, 16, 20	0.15 to 102 [0.001 to 0.7]	—

High Power Cylinder **RHC**



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

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

3 Position Cylinder **RZQ**



- Equipped with an intermediate stop mechanism
- Two-stage strokes are possible with just a minute extension.

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

Clamp Cylinders

Rotary Clamp Cylinder **MK**



- The allowable moment of inertia is 3 times higher. (The same as the heavy-duty MK2 series)
- It is possible to mount small auto switches on 4 surfaces.
- Mounting dimensions are interchangeable with the MK series.
- Consolidated to the new MK series and renewed

Type	Series	Action	Bore size [mm]
Standard	MK	Double acting	12, 16, 20, 25, 32, 40, 50, 63

Rotary Clamp Cylinder **MK2T**



- The double guide type features improved non-rotating accuracy by using a guide roller in the rotating mechanism.
- Can be used as a spatter resistant cylinder for arc welding (-XC89/-XC91)

Type	Series	Action	Bore size [mm]
Double guide type	MK2T	Double acting	20, 25, 32, 40, 50, 63

Clamp Cylinder **CK□1**



- Total tube length reduced by 7 mm (for CKP1□40)
- Easy fine speed adjustment with screw adjustment construction
- Speed controller valve has no projection from the tube's external surface
- It is possible to mount magnetic field resistant auto switches from 3 directions.
D-P3DW type, D-P4DW type (CKG1), D-P79WSE type, D-P74L/Z type
- Can be used as a spatter resistant cylinder for arc welding (-XC88/-XC89/-XC91) (CKG1 only)

Type	Series	Action	Clevis width [mm]	Bore size [mm]
Standard	CK1	Double acting	16.5, 19.5	40, 50, 63
Built-in standard magnet type (With magnetic field resistant auto switch)	CKG1	Double acting	16.5, 19.5	40, 50, 63
Built-in strong magnet type (With magnetic field resistant auto switch)	CKP1	Double acting	16.5, 19.5	40, 50, 63

Clamp Cylinder with Lock **CLK2**



- The clamp cylinder makes it possible to maintain a clamped or unclamped state even when the air supply pressure drops or residual pressure is released. (Single-directional lock)
- Increases operation efficiency by eliminating the overhang from the tube cover with built-in cushion valve and plug

Type	Series	Action	Clevis width [mm]	Bore size [mm]
Built-in standard magnet	CLK2G	Double acting	12, 16.5, 19.5	32, 40, 50, 63
Built-in strong magnet	CLK2P	Double acting	16.5, 19.5	40, 50, 63

Clamp Cylinders

Clamp Cylinder/Slim Type **C (L) KG/C (L) KP-X2095**



- The smallest class of clamp cylinder in the world.
- $\phi 25$ is available.
Weight: 380 g, Length: 186.7 mm
($\phi 25$ -50 stroke without speed controller or auto switch)
- Weight reduced by up to 48%, total length reduced by 18%

Type	Series	Action	Clevis width [mm]	Bore size [mm]
Standard (Built-in standard magnet)	CKG-X2095	Double acting	9, 12	25, 32, 40
Standard (Built-in strong magnet)	CKP-X2095	Double acting	9, 12	25, 32, 40
With lock (Built-in standard magnet)	CLKG-X2095	Double acting	9, 12	25, 32, 40
With lock (Built-in strong magnet)	CLKP-X2095	Double acting	9, 12	25, 32, 40

Pin Clamp Cylinder **C (L) KQG/C (L) KQP**



- Simultaneous positioning and clamping
- Compatible with a broad range of workpiece configurations (55 types of guide pins)
- 4 body types for a broad range of installation conditions
- The height of the clamping position can be selected according to the workpiece.

Type	Series	Guide pin shape	Bore size [mm]
Standard (Built-in standard magnet)	CKQG	Round/Diamond	50
Standard (Built-in strong magnet)	CKQP	Round/Diamond	50
With lock (Built-in standard magnet)	CLKQG	Round/Diamond	50
With lock (Built-in strong magnet)	CLKQP	Round/Diamond	50

Pin Clamp Cylinder **C (L) KQG32/C (L) KU32**



- 2 types of clamping heights can be selected: 30 mm, 100 mm
- Plate cylinder type: Width 29 mm
- All types come equipped with a lock.
- Plate cylinder type with small auto switch
- Newly added guide pins and a diamond shape option (Available for $\phi 10$ or more) for workpieces with $\phi 9$, $\phi 11$, and $\phi 13$ hole diameters

Type	Series	Guide pin shape	Bore size [mm]
Compact cylinder: Magnetic field resistant auto switch mounting type	CKQG32-X2081/X2082	Round/Diamond	32
Compact cylinder with lock: Magnetic field resistant auto switch mounting type	CLKQG32-X2081/X2082	Round/Diamond	32
Plate cylinder: Magnetic field resistant auto switch, Small auto switch mounting type	CKU32-X2321/X2322	Round/Diamond	32
Plate cylinder with lock: Magnetic field resistant auto switch, Small auto switch mounting type	CLKU32-X2321/X2322	Round/Diamond	32
Plate cylinder: Magnetic field resistant auto switch mounting type	CKU32-X2091/X2092	Round/Diamond	32
Plate cylinder with lock: Magnetic field resistant auto switch mounting type	CLKU32-X2091/X2092	Round/Diamond	32

Clamp Cylinders

Pin Plate Cylinder C (L) KU32-X2359



- Reduction of spare parts, short lead times, and a drastic reduction of the need for special orders
- Guide pin is separated from the reference support block.
- The reference support block can be machined by the customer.
(The block can be changed to any desired shape.)

Type	Series	Guide pin shape	Bore size [mm]
Pin plate cylinder: Magnetic field resistant auto switch mounting type	CKU32-X2359	Round/Diamond	32
Pin plate cylinder with lock: Magnetic field resistant auto switch mounting type	CLKU32-X2359	Round/Diamond	32

Micro Clamp Cylinder CKZM16



- Compact: Width 20 mm, Lightweight: 250 g
- Maximum clamping force: 45 lbf [200 N], Maximum holding force: 67 lbf [300 N]
- Flat clamping characteristics
- Outputs constant clamping force for workpiece thicknesses up to 3.5 mm
- Reduction of design/assembly labor by unitization
Arm assembly and mounting assembly have been added to the clamp cylinder.

Type	Series	Action	Bore size [mm]
Base type	CKZM16-X2800	Double acting	16
Tandem type	CKZM16-X2900	Double acting	16

For North America/Europe: Power Clamp Cylinder CKZ3



- Weight reduced by up to 39% with aluminum body
- Standardized unclamp opening to 15°
- Complies with NAAMS Standards (CKZ3N)
- 75 types of arm variations (CKZ3N), 12 types for each size (CKZ3T)

Type	Series	Arm opening angle	Switch	Bore size [mm]
For North America	CKZ3N	15°, 30°, 45°, 60°, 75° 90°, 105°, 120°, 135°	TURCK/P&F	50, 63
For Europe	CKZ3T	15°, 30°, 45°, 60°, 75° 90°, 105°, 120°, 135°	TURCK/P&F	50, 63

Power Clamp Cylinder CKZ3T-X2734



- Simple switch adjustment greatly reduces work-hours
Switch can be adjusted easily when changing the arm opening angle.
- With metal switch cassette cover
- Weight reduced by up to 39%
- High clamping force: 900 lbf [4000 N]
- Spatter proof construction
- Select from 2 types of top cover

Series	Arm opening angle	Switch	Bore size [mm]
CKZ3T-X2734	15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°	TURCK/P&F	50, 63

For North America: Power Clamp Cylinder CKZ2N



- Complies with the new NAAMS Standards (North America Automotive Metric Standard)
- 138 types of arm variations
- Spatter resistant and water resistant structure

Series	Arm opening angle	Switch	Bore size [mm]
CKZ2N	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°	TURCK/P&F	50, 63, 80

Clamp Cylinders

For Europe: Power Clamp Cylinder **CKZT**



- 3 types of arm variations for each size
- Spatter resistant and water resistant structure

Series	Arm opening angle	Switch	Bore size [mm]
CKZT	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°	TURCK/P&F	40, 50, 63, 80

For France: Power Clamp Cylinder **CLKZ1R**



- Complies with CNOMO Standards
- Constant clamping force irrespective of workpiece thickness
- End lock on unclamp side
- Rubber cushion on unclamp side

Series	Arm opening angle	Bore size [mm]
CLKZ1R	15°, 30°, 45°, 60°, 75°, 90°, 105°	40, 50, 57

Slim-line Power Clamp Cylinder **CKZ2N-X2346**



- The distance accuracy from the reference hole to the lower surface of the clamp arm is ± 0.1 mm.
- Easy setup with a scale
The guide of the appropriate position can be checked visually when adjusting the shim.
- Reduced width
Easy torch entry for spot welding, arc welding, etc.

Series	Arm opening angle	Bore size [mm]
CKZ2N-X2346	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°	50, 63, 80

Frame Clamp Cylinder **WRF100**



- High output: 4496 lbf [20,000 N] (at 73psi [0.5 MPa])

Series	Bore size [mm]	Stroke [mm]
WRF100	100	48

Pallet Lock Cylinder **W-R1/W-R3**

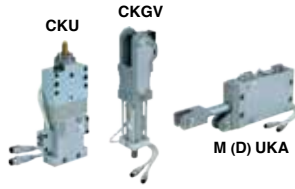


- Centering applied to correct positional deviation of up to ± 50 mm
- Through the toggle mechanism, max. clamping force of 996 lbf [4430 N]
- Arm opening angle: Approx. 70°
- The integration of the clamping unit and cylinder unit reduces design and assembly labor.

Series	Mass of transferred object	Clamping force lbf [N]	Bore size [mm]
W-R1	1000 kg or less	996 [4430]	100
W-R3	3000 kg or less	915 [4070]	100

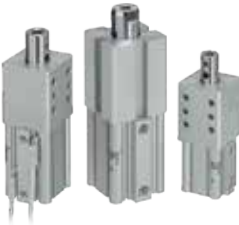
Clamp Cylinders

Other Clamp Cylinders



Description	Series
Plate Clamp Cylinder	M (D) UKA
Clamp Cylinder	CKGV
Pin Clamp Cylinder (Compact body type)	CKU

For High Precision Positioning: Pin Shift Cylinder **CKQG-X2370/CKQP-X2371**



- High Precision: Rod end deflection of ± 0.1 mm or less
- Position reproducibility
- Pins for positioning the workpiece provided by the customer can be directly mounted.
- Built-in coil scraper
- Reduces labor time by integrating the cylinder and guide
- Magnetic field resistant auto switches are mountable.

Type	Series	Bore size [mm]	Stroke [mm]
Built-in standard magnet	CKQG-X2370	32, 40, 50	25, 30, 40, 50
Built-in strong magnet	CKQP-X2371	50	30, 50

Locating Pin Cylinder **MGPL50-X2616**



- Ideal for pin positioning and locating workpieces
- Highly accurate mounting positions
Highly accurate positioning is possible even after the cylinder is replaced.
- D-P3DWA magnetic field resistant auto switch is available.
- Coil scraper is equipped as standard.

Type	Bearing	Series	Action	Bore size [mm]
Locating pin cylinder	Ball bushing	MGPL50-X2616	Double acting	25, 40, 65

Pin Shift Cylinders

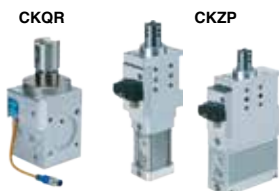
Center Lock Unit **MA331-X441**



- The workpiece contact portion of the locating pin can switch from center lock (for locating) to free (for releasing workpieces).
- Even if the workpiece is distorted after welding, if the locating pin is set to free, the workpiece can be removed easily from the locating pin.
- Locating pin swing angle and rotation angle: $3^\circ \pm 1^\circ$

Series	Action	Handling air pressure
MA331-X441	Double acting	29 to 102 psi [0.2 to 0.7 MPa]

Other Pin Shift Cylinders



Description	Series
Pin Shift Cylinder	CKQR
Pin Shift Cylinder	CKZP

Stopper Cylinders

Stopper Cylinder **RSQ/RSDQ/RSG/RSDG**



- A wide range of models are available, so it is possible to select a cylinder that meets your needs.
Realizes the labor saving and automation of conveyor lines
- With auto switch (RSDQ series: RSDQ, RSDG series: RSDG)

Type	Series	Action	Bore size [mm]
Fixed mounting height	RSQ	Double acting Double acting with spring Single acting, spring extend	12, 16, 20, 32, 40, 50
Adjustable mounting height	RSG	Double acting Double acting with spring Single acting, spring extend	40, 50

Heavy Duty Stopper Cylinder **RS2H**



- Weight: Reduced by up to 22% (Compared with the current RS1H series)
- Cylinder tube: Shortened by up to 9 mm (RS2H63-30 stroke)
- Capable of stopping pallets softly
- Stopper cylinder with shock absorber

Type	Series	Action	Bore size [mm]
Flange	RS2H	Double acting Double acting with spring Single acting, spring extend	50, 63, 80

Heavy Duty Stopper Cylinder **RSH**



- Capable of stopping pallets softly
- Stopper cylinder with shock absorber

Type	Series	Action	Bore size [mm]
Flange	RSR	Double acting Double acting with spring Single acting, spring extend	20, 32

Escapements **MIW/MIS**



- Ideal for separating workpieces continuously moving on conveyors, etc.

Type	Series	Action	Bore size [mm]
2-finger type	MIW	Double acting	8, 12, 20, 25, 32
1-finger type	MIS	Double acting	8, 12, 20, 25, 32

Stroke Reading Cylinders

High Precision Stroke Reading Cylinder **CEP1**



- Movable scale cylinder

Series	Action	Bore size [mm]	Applicable counter
CEP1	Double acting	12, 20	CEU5/CEU1

Stroke Reading Cylinders

Stroke Reading Cylinder **CE1**



- Movable scale cylinder

Series	Action	Bore size [mm]	Applicable counter
CE1	Double acting	12, 20, 30, 40, 50, 63	CEU5/CEU1

Counter for Stroke Reading Cylinder **CEU5**



Type	Series	Applicable cylinder (Stroke reading cylinder)
Multi-counter	CEU5	CEP1/CE1 CE2/ML2B

Stroke Reading Cylinder with Brake **CE2**



- A brake mechanism has been added to a movable scale cylinder.

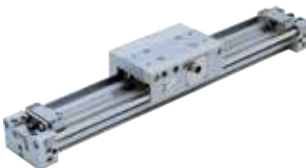
Series	Action	Bore size [mm]	Applicable counter/controller
CE2	Double acting	40, 50, 63, 80, 100	CEU5/CEU1 CEU2

Controller for Stroke Reading Cylinder **CEU2**



Type	Series	Applicable counter
Controller	CEU2	CE2/ML2B

Stroke Reading Rodless Cylinder with Brake **ML2B**



- Mechanically jointed rodless cylinder incorporated with a brake mechanism and stroke sensor

Type	Series	Action	Bore size [mm]
Standard	ML2B	Double acting (Cylinder)	25, 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

Compact Cylinder with Solenoid Valve/Guide Rod Type **CVQM**



- A guide rod and solenoid valve have been integrated in the CQ2 series compact cylinder.
- Non-rotating accuracy: $\pm 0.2^\circ$ or less
- Lateral load resistance 2 to 4 times that of the CDQ2 series compact cylinder
- Loads can be directly mounted.
- Mounting pitch is interchangeable with the CQ2 series.
- Saves manpower, space, and energy

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

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	CA1	V3□08
Standard	CVS1	Double acting	40, 50, 63, 80, 100	CS1	VS4□24
Non-rotating rod	CVM5K	Double acting	20, 25, 32, 40	CM2K	VZ3□90
Non-rotating rod	CVM3K	Single acting (Spring return/extend)	20, 25, 32, 40	CM2K	VZ319
Non-rotating rod	CV3K	Double acting	40, 50, 63	CA1K	V3□08
Non-rotating rod	CVS1K	Double acting	40, 50, 63	CS1K	VS4□24

Valve Mounted Guide Cylinder **MVGQ**

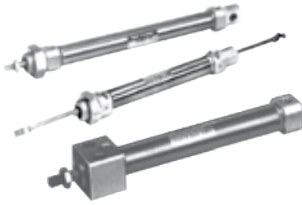


- A valve, speed controller, and cylinder are combined in one unit.

Type	Series	Bore size [mm]	Applicable valve
Slide bearing	MVGQM	12, 16, 20	SYJ3000
Slide bearing	MVGQM	25, 32, 40, 50, 63	VZ3000
Ball bushing bearing	MVGQL	25, 32, 40, 50, 63	VZ5000
Ball bushing bearing	MVGQL	80, 100	VF3000

ISO Cylinders

ISO Standard Air Cylinder **C85/CD85**



- Compliant with ISO Standards (6432)
- With auto switch (CD85 series: CD85, CD85W, CD85K, CD85R)

Type	Series	Action	Bore size [mm]
Standard	C85	Double acting, Single rod	8, 10, 12, 16, 20, 25
Standard	C85W	Double acting, Double rod	8, 10, 12, 16, 20, 25
Standard	C85	Single acting (Spring return/extend)	8, 10, 12, 16, 20, 25
Non-rotating rod	C85K	Double acting, Single rod	8, 10, 12, 16, 20, 25
Non-rotating rod	C85K	Single acting (Spring return/extend)	8, 10, 12, 16, 20, 25
Direct mount	C85R	Double acting, Single rod	8, 10, 12, 16, 20, 25

ISO Cylinder **CP96/CP96SD**



- Compliant with ISO Standards (15552)
- Lightweight: Max. 15% reduction
- Cycle time shortened by adopting a new cushion method (Air cushion + Bumper cushion)
- The bumper cushion reduces the metal noise that occurs when the piston stops.

Type	Series	Action	Bore size [mm]
Standard	CP96	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100
Non-rotating rod	CP96K	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100

ISO Standard Air Cylinder **CP96/CP96SD**



- Compliant with ISO Standards (15552)
- Cushion valve can easily be adjusted.
- Grooves arranged on 4 surfaces for CNOMO, D-M9□, and A9□
- With auto switch (CP96SD series: CP96SD, CP96KD)

Type	Series	Action	Bore size [mm]
Standard	CP96	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100, 125
Non-rotating rod	CP96K	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100

ISO Cylinder **C96/C96SD**



- Compliant with ISO Standards (15552)
- Lightweight: Max. 17% reduction
- Cycle time shortened by adopting a new cushion method (Air cushion + Bumper cushion)
- The bumper cushion reduces the metal noise that occurs when the piston stops.

Type	Series	Action	Bore size [mm]
Standard	C96	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100
Non-rotating rod	C96K	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100
Smooth cylinder	C96Y	Double acting, Single rod	32, 40, 50, 63, 80, 100

ISO Cylinders

ISO Standard Air Cylinder **C96/C96SD**



- Compliant with ISO Standards (15552)
- Cushion valve can easily be adjusted.
- With auto switch (C96SD series: C96SD, C96KD, C96YD)

Type	Series	Action	Bore size [mm]
Standard	C96	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100, 125
Non-rotating rod	C96K	Double acting, Single rod Double acting, Double rod	32, 40, 50, 63, 80, 100
Smooth cylinder	C96Y	Double acting, Single rod	32, 40, 50, 63, 80, 100, 125

ISO Standard Compact Cylinder **C55/CD55**



- Compliant with ISO Standards (21287)
- It is possible to mount small auto switches on 4 surfaces.
- With auto switch (CD55 series: CD55)

Type	Series	Action	Bore size [mm]
Standard	C55	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100

Hygienic Design Cylinder/ISO Standard Type **HYC**



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

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

Shock Absorbers

Shock Absorber **RJ**



- Max. operating cycles: 10 million cycles
- Stops transferred objects gently
- Lineup features from M6 to M27
- Compatible with the RB series in terms of mounting
- Applicable models can be selected depending on the operating speed.
L type: 0.05 to 1 m/s
H type: 0.05 to 2 m/s
Short stroke type: 0.05 to 1 m/s

Type	Series	Absorbed energy lbf-ft [J]	Absorption stroke [mm]	O.D. thread
Soft type	RJ	0.37 to 51.6 [0.5 to 70]	4 to 25	M6 to M27
Short stroke type	RJ	0.37 to 2.7 [0.5 to 3.7]	5 to 10	M6 to M14

Shock Absorber **RB**



- Automatic adjustment and suitable energy absorption performance

Type	Series	Absorbed energy lbf-ft [J]	Absorption stroke [mm]	O.D. thread
Standard	RB	0.37 to 108 [0.5 to 147]	4 to 25	M6 to M27
Coolant resistant	RBL	2.89 to 108 [3.92 to 147]	6 to 25	M10 to M27
Short	RBQ	1.45 to 36.1 [1.96 to 49]	4 to 13	M16 to M32

Auto Switches

Auto Switch D



Series	Type	Features
D Series	Solid state auto switch	General purpose type 2-color indicator 2-color indicator with diagnostic output Water resistant 2-color indicator Hygienic With timer Magnetic field resistant 2-color indicator Heat resistant 2-color indicator Wide range detection type
D Series	Reed auto switch	General purpose type 2-color indicator Magnetic field resistant 2-color indicator Heat resistant

Trimmer Auto Switch D



- Easily distinguish workpieces with a single auto switch
- Minimum detectable adjustment width: 0.5 mm
- Applicable to the short stroke cylinder
 The detection of the extended and retracted end positions can be made by a single auto switch. This switch can be used when two auto switches cannot be mounted due to a short stroke.

Series	Type	Mounting
D-M9K	Sensor unit	Direct mounting (Round groove)
D-Y7K	Sensor unit	Direct mounting (Square groove)
D-F7K	Sensor unit	Rail mounting
D-R□K	Amplifier unit	—

Cylinder Speed Checkers

Cylinder Speed Checker IN574



- Increases efficiency with the visualization of air cylinder operations
 Quantification of cycle time improvements
 For reducing the amount of numerical management/adjustment required when starting up equipment
 For reducing the amount of numerical confirmation/inspection required during periodic maintenance
- 3 measurement modes
 Speed (mm/s), Time required for stroke (s), Operation count (Times)

Series	Rated measurement range: Speed	Rated measurement range: Time required for stroke	Rated measurement range: Operation count
IN574	-1999 to 1999 mm/s	-999.9 to 999.9 s	0 to 999 times

Rotary Actuators/Air Grippers

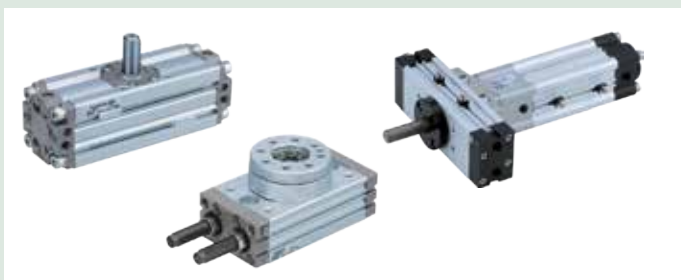
Rotary Actuators

Rotary Actuators/Vane Type



Rotary Actuator/Vane Type/ CRB2	P.64
Free Mount Type Rotary Actuator Vane Type/ CRBU2	P.64
Rotary Actuator/Vane Type/ CRB1	P.64
Rotary Table/Vane Type/ MSU	P.64

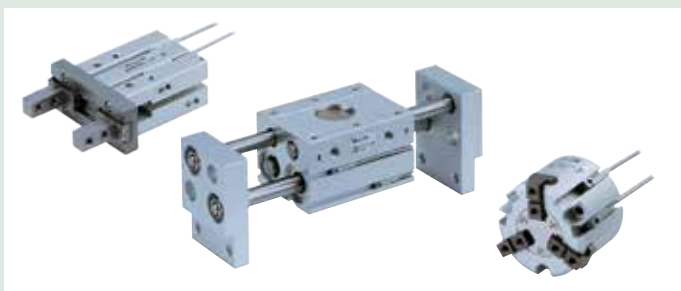
Rotary Actuators/ Rack & Pinion Type



Mini Rotary Actuator/Rack & Pinion Type/ CRJ	P.65
Rotary Actuator/Rack & Pinion Type/ CRA1	P.65
Compact Rotary Actuator/Rack & Pinion Type/ CRQ2	P.65
Rotary Table/Rack & Pinion Type/ MSQ	P.65
3-Position Rotary Table/ MSZ	P.66
Low Speed Rotary Actuator/ CRQ2X/MSQX	P.66
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Air Grippers

Parallel Type Air Grippers



Linear Guide Parallel Type Air Gripper/ MHZ	P.67
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Slide Guide Round Body Air Gripper 2-Finger Type/ MHS2	P.68
Slide Guide Round Body Air Gripper 3-Finger Type/ MHS3	P.68
Slide Guide Round Body Air Gripper 4-Finger Type/ MHS4	P.68

Angular Type Air Grippers



Angular Type Air Gripper/Compact Type/ MHC2/MHCA2/MHCM2	P.69
Angular Type Air Gripper/Standard Type/ MHC2	P.69
Toggle Type Air Gripper/ MHT2	P.69
180° Angular Type Air Gripper/Cam Type/ MHY2	P.69
180° Angular Type Air Gripper/Rack & Pinion Type/ MHW2	P.69
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Auto Switches

Auto Switches



◆ Solid State Auto Switches

General Purpose Type	P.70
2-Color Indicator	P.70
2-Color Indicator with Diagnostic Output	P.70
Water Resistant 2-Color Indicator	P.70
With Timer	P.70
Trimmer Auto Switch	P.70

◆ Reed Auto Switches

General Purpose Type	P.70
2-Color Indicator	P.70
Cylinder Speed Checker/ IN574	P.70

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: 29 psi [0.2 MPa] (Size 10), 22 psi [0.15 MPa] (Sizes 15 to 40)
- It is possible to adjust the angle as desired.
- With auto switch (CDRB2 series: CDRB2□W, CDRB2□WU)

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

Rotary Actuator/Free Mount Type **CRBU2/CDRBU2**



- It is possible to change the starting position freely according to the installation conditions.
- Lightweight: Weight reduced by 12%
- Can be directly installed in 6 different ways
- It is possible to adjust the angle as desired.
- It is possible to set the auto switch mounting position freely.
- With auto switch (CDRBU2 series: CDRBU2, CDRBU2WU)

Type	Series	Vane type	Size	Rotating angle Single	Rotating angle Double
Standard	CRBU2	Single	10, 15, 20,	90°, 180°, 270°	90°, 100°
With angle adjuster	CRBU2WU	Double	30, 40	90°, 180°, 270°	90°, 100°

Rotary Actuator **CRB1/CDRB1**



- It is possible to move the auto switch mounting position as desired.
- Direct mounting
- Connection port position: Select from side ported or axial ported
- Low-pressure operation: 22 psi [0.15 MPa] (Sizes 50 to 100)
- With auto switch (CDRB1 series: CDRB1, CDVRB1)

Type	Series	Vane type	Size	Rotating angle Single	Rotating angle Double
Standard	CRB1	Single	50, 63, 80,	90°, 100°, 180°, 190°,	90°, 100°
With solenoid valve	CVRB1	Double	100	270°, 280°	90°, 100°

Rotary Table **MSU/MDSU**



- Integrated table and rotary actuator
- Angle adjustable, $\pm 5^\circ$ at each rotation end (Double: $\pm 2.5^\circ$)
- Table deflection accuracy: 0.03 mm or less (MSUA)
- Connection port position: Select from side ported or axial ported (When a switch is installed, only the side ported is selectable.)
- It is possible to move the auto switch mounting position as desired.
- With auto switch (MDSU series: MDSUA, MDSUB)

Type	Series	Vane type	Size	Rotating angle Single	Rotating angle Double
High precision	MSUA	Single	1, 3, 7, 20	90°, 180°	—
Basic type	MDSUB	Double	1, 3, 7, 20	90°, 180°	90°

Rotary Actuators/Rack & Pinion Type

Mini Rotary Actuator **CRJ**



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

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

Rotary Actuator **CRA1/CDRA1**



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

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

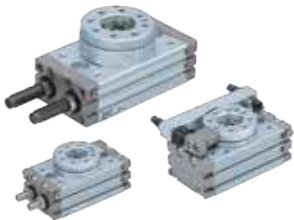
Compact Rotary Actuator **CRQ2/CDRQ2**



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

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

Rotary Table **MSQ**



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

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

Rotary Actuators/Rack & Pinion Type

3-Position Rotary Table **MSZ**



- 3-point-stopping is possible.
- Suitable for applications such as distributing workpieces to the left, right, and center
- Can be operated with one valve

Type	Series	Rack type	Size	Stop position adjustment range
High precision type	MSZA	Double	10, 20, 30, 50	Intermediate position: $\pm 10^\circ$ Rotating end: Left/right, both 0 to 95° using the intermediate position as a basis
Basic type	MSZB	Double	10, 20, 30, 50	Intermediate position: $\pm 10^\circ$ Rotating end: Left/right, both 0 to 95° using the intermediate position as a basis

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°

Rotary Cylinder **MRQ**



- Rectilinear rotation unit that integrates a slim cylinder and a rotary actuator
- It is possible to select types with an air cushion on the linear motion parts.
- Angle adjustable

Series	Size	Rotating angle	Linear motion parts standard stroke
MRQ	32, 40	90° , 180°	5, 10, 15, 20, 25, 30, 40, 50, 75, 100

Parallel Type Air Grippers

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



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

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

Cross Roller Guide Parallel Type Air Gripper **MHQ□2**



Type	Series	Cylinder bore size [mm]
High rigidity type	MHQG2	32, 40
With dust cover	MHQJ2	10, 16, 20, 25

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 Air Gripper **MHL2**



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

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

Rotary Actuated Air Gripper 2-Finger Type **MHR2/MDHR2**



- A vertically compact configuration has been achieved through the use of a rotary actuator as the drive force source.
- Repeatability: ± 0.01 mm
- Supports class 10 clean rooms
- With auto switch (MDHR2 series: MDHR2)

Series	Cylinder bore size [mm]
MHR2	Nominal size: 10, 15, 20, 30
MDHR2	Nominal size: 10, 15, 20, 30

Parallel Type Air Grippers

Rotary Actuated Air Gripper 3-Finger Type **MHR3/MDHR3**



- A vertically compact configuration has been achieved through the use of a rotary actuator as the drive force source.
- Repeatability: ± 0.01 mm
- Supports class 10 clean rooms
- With auto switch (MDHR3 series: MDHR3)

Series	Cylinder bore size [mm]
MHR3	Nominal size: 10, 15
MDHR3	Nominal size: 10, 15

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

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



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

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

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



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

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

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



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

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

Angular Type Air Grippers

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



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

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

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



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

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

Toggle Type Air Gripper **MHT2**



- The new cylinder body allows small auto switches to be mounted on 4 surfaces.
- A strong and stable gripping force can be obtained through the toggle mechanism.
- Holds workpiece even when the air is shut down (Safety measure)

Series	Cylinder bore size [mm]
MHT2	32, 40, 50, 63

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

Air Grippers

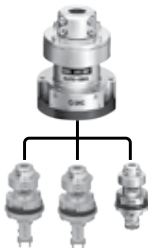
Rotary Gripper MRHQ



- The gripper function and the rotation function have been integrated in a compact package.
- It is possible to grip and reverse workpieces in conveyor lines with a single unit.
- Rotation range and angle are adjustable.

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

AHC System/Auto Hand Changing System MA



- The robot hand tools change automatically to accommodate workpieces of different shapes, thus making it possible to adopt an FMS (flexible manufacturing system) in the assembly line.

Series	Positioning	Action
MA210	Ball coupling	Single acting
MA310	Ball coupling	Single acting
MA311	Ball coupling	Double acting
MA320	Curved coupling	Single acting
MA321	Curved coupling	Double acting

Auto Switches

Auto Switch D



Series	Type	Features	Series	Type	Features
D Series	Solid state auto switch	General purpose type	D Series	Reed auto switch	General purpose type
		2-color indicator			
		2-color indicator with diagnostic output			2-color indicator
		Water resistant 2-color indicator			
		With timer			

Trimmer Auto Switch D



- Easily distinguish workpieces with a single auto switch
- Minimum detectable adjustment width: 0.5 mm
- Applicable to the short stroke cylinder
The detection of the extended and retracted end positions can be made by a single auto switch. This switch can be used when two auto switches cannot be mounted due to a short stroke.

Series	Type	Mounting
D-M9K	Sensor unit	Direct mounting (Round groove)
D-Y7K	Sensor unit	Direct mounting (Square groove)
D-F7K	Sensor unit	Rail mounting
D-R□K	Amplifier unit	—

Cylinder Speed Checker IN574



- Increases efficiency with the visualization of air cylinder operation
- Quantification of cycle time improvements
- For reducing the amount of numerical management/adjustment required when starting up equipment
- For reducing the amount of numerical confirmation/inspection required during periodic maintenance
- 3 measurement modes
Speed (mm/s), Time required for stroke (s), Operation count (Times)

Series	Rated measurement range: Speed	Rated measurement range: Time required for stroke	Rated measurement range: Operation count
IN574	-1999 to 1999 mm/s	-999.9 to 999.9 s	0 to 999 times

Electric Actuators/Electric Cylinders

■ Card Motor



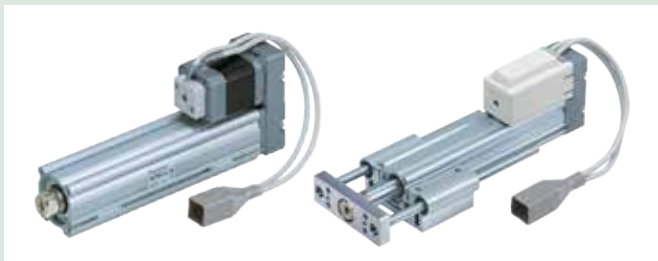
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■ Slider Type



Electric Actuator/Slider Type/**LEF**□ P.73, 74
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■ Rod Type/Guide Rod Type



Electric Actuator/Rod Type/Guide Rod Type/
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Electric Actuators/Electric Cylinders

Environment



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

Electric Actuator/Rod Type/**LEY-X5** P.84

Clean Room Specification

Electric Actuator/Slider Type/**11-LEFS** P.84

Electric Actuator/LEF Series Support Guide/**11-LEFG** P.85

Electric Actuator/High Rigidity Slider Type/**11-LEJS** P.85

Secondary Battery Compatible

Electric Actuator/Slider Type/**25A-LEFS** P.85

Electric Actuator/High Rigidity Slider Type/**25A-LEJS** P.85

Electric Actuator/Rod Type/**25A-LEY** P.85

Motorless Type



Electric Actuator/Slider Type/**LEF□** P.86

Electric Actuator/High Rigidity Slider Type/**LEJS** P.86

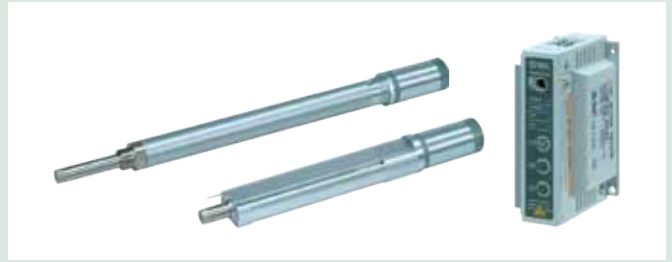
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Made to Order



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Electric Cylinders



Electric Cylinder/**LZB/LZC** P.88

Directional Control Driver for Electric Cylinder/**LC3F** P.88

Moving Coil Actuators



Moving Coil Actuator/**LA** P.88

Electric Actuators/Electric Cylinders

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)
- Linear motor type: Moving magnet type linear motor
- Max. pushing force: 1.35 lbf [6 N]
- Positioning repeatability: $\pm 5 \mu\text{m}$
- Pushing measurement accuracy: $\pm 10 \mu\text{m}$
- Max. operating frequency: 500 cpm

Model	Stroke [mm]	Sensor (Optical linear encoder) Resolution	Pushing Max. instantaneous thrust	Positioning repeatability	Pushing measurement accuracy	Max. speed
LAT3F	10, 20, 30, 50	1.25 μm	Up to 1.35 lbf [6 N]	$\pm 5 \mu\text{m}$	$\pm 10 \mu\text{m}$	400 mm/s
LAT3M	50	5 μm	Up to 1.35 lbf [6 N]	$\pm 20 \mu\text{m}$	$\pm 40 \mu\text{m}$	400 mm/s
LAT3	10, 20, 30	30 μm	Up to 1.35 lbf [6 N]	$\pm 90 \mu\text{m}$	$\pm 100 \mu\text{m}$	400 mm/s

Card Motor Controller LATCA



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

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

Slider Type

Electric Actuator/Slider Type, Ball Screw Drive LEFS

Motorless Type

Clean Room Specification



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

- Max. work load: 65 kg
- Positioning repeatability: $\pm 0.015 \text{ mm}$ (High precision type)
- Clean specification: Complies with ISO Class 4 (ISO14644-1) (11-LEFS)
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

LEFS Series AC Servo Motor

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

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

Slider Type

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

Motorless Type



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

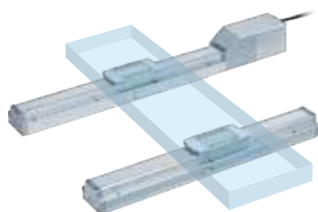
- Max. stroke: 2000 mm
- Max. speed: 2000 mm/s
- Positioning repeatability: ±0.08 mm
- Compatible controllers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

LEFB Series AC Servo Motor

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

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

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



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

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

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

Motorless Type

Clean Room Specification



- Low profile/Low center of gravity: Height reduced by approx. 36% (Reduced by 32 mm)
- Max. work load: 85 kg
- Positioning repeatability: ±0.01 mm
- Max. acceleration/deceleration: 20000 mm/s²
- Clean specification: Complies with ISO Class 4 (Class 10) (11-LEJS)
- Compatible drivers: LECSA, LECSB, LECSA, LECSA, LECSA-T, LECSA□
- Motorless specification is available.

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

Slider Type

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



- Max. stroke: 3000 mm
- Max. speed: 3000 mm/s
- Max. acceleration/deceleration: 20000 mm/s²
- Compatible drivers: LECSA, LECSB, LECSC, LECSS
- Motorless specification is available.

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

Electric Actuator/Compact Slider Type **LEM**



- Low-profile, Low center of gravity
Table height: 28 mm
(In the case of LEMC/H/HT, size 25)
- Can be combined with various guides
- High maintainability
- Motor mounting position: Select from above or below, right or left
- Solid state auto switches can be mounted for limit confirmation and intermediate signal confirmation.
- Selectable controllability (Controller)
Complete control like an air cylinder (Allows for a 12 point intermediate stop)
Easy position setting by value input
- Compatible controllers: LECP2, LECP6, LEC1, LECPMJ, JXC91

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
- Compatible controllers: LECP6, LEC1, LECPMJ, JXC91

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

Motorless Type

Dust-tight/Water-jet-proof



LEY Series

Step Motor (Servo/24 VDC)

Servo Motor (24 VDC)

- Long stroke: Max. 500 mm
- Direct mounting: 3 directions, Bracket mounting: 3 types
- Auto switch can be mounted.
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.

It is possible to hold the actuator with the rod pushing on a workpiece, etc.

- Positioning repeatability: ± 0.02 mm or less
- Dust-tight/Water-jet-proof (IP65)
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

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: LECSA, LECSB, LECSC, LECSS, LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force lbf [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY16	30 to 300	Max. 32 [141]	Max. 500	2.5, 5, 10
	LEY25	30 to 400	Max. 102 [452]	Max. 500	3, 6, 12
	LEY32	30 to 500	Max. 159 [707]	Max. 500	4, 8, 16
	LEY40	30 to 500	Max. 238 [1058]	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEY16A	30 to 300	Max. 25 [111]	Max. 500	2.5, 5, 10
	LEY25A	30 to 400	Max. 29 [130]	Max. 500	3, 6, 12
AC servo motor	LEY25□S	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
	LEY32□S	30 to 500	Max. 132 [588]	Max. 1200	5, 10, 20
	LEY63□S	100 to 800	Max. 752 [3343]	Max. 1000	5 (2.86), 5, 10, 20

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

Motorless Type

Dust-tight/Water-jet-proof



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

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

- Positioning repeatability: ± 0.02 mm or less
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

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: LECSA, LECSB, LECSC, LECSS, LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force lbf [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY16D	30 to 300	Max. 32 [141]	Max. 500	2.5, 5, 10
	LEY25D	30 to 300	Max. 32 [141]	Max. 500	2.5, 5, 10
	LEY32D	30 to 500	Max. 159 [707]	Max. 500	4, 8, 16
	LEY40D	30 to 500	Max. 238 [1058]	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEY16DA	50 to 300	Max. 25 [111]	Max. 500	2.5, 5, 10
	LEY25DA	50 to 400	Max. 29 [130]	Max. 500	3, 6, 12
AC servo motor	LEY25DS	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
	LEY32DS	30 to 500	Max. 165 [736]	Max. 1200	4, 8, 16
	LEY63DS	100 to 800	Max. 429 [1910]	Max. 1000	5, 10, 20

Rod Type/Guide Rod Type

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

Motorless Type



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

- Compact integration of guide rods
Achieves lateral load resistance and high non-rotating accuracy
- Lateral end load: 5 times more (Compared with a rod type, size 25, 100 stroke)
- Compatible with sliding bearings and ball bushing bearings
Compatible with moment load and stopper (sliding bearings)
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

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: LECSA, LECSB, LECS, LECS, LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force lbf [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEYG16	30 to 200	Max. 32 [141]	Max. 500	2.5, 5, 10
	LEYG25	30 to 300	Max. 102 [452]	Max. 500	3, 6, 12
	LEYG32	30 to 300	Max. 159 [707]	Max. 500	4, 8, 16
	LEYG40	30 to 300	Max. 238 [1058]	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEYG16A	30 to 200	Max. 25 [111]	Max. 500	2.5, 5, 10
	LEYG25A	30 to 300	Max. 29 [130]	Max. 500	3, 6, 12
AC servo motor	LEYG25□S	30 to 300	Max. 109 [485]	Max. 900	3, 6, 12
	LEYG32□S	30 to 300	Max. 132 [588]	Max. 1200	5, 10, 20

Electric Actuator/Guide Rod Type, In-line Motor Type **LEYG□D**

Motorless Type



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

- Compact integration of guide rods
Achieves lateral load resistance and high non-rotating accuracy
- Lateral end load: 5 times more (Compared with a rod type, size 25, 100 stroke)
- Compatible with sliding bearings and ball bushing bearings
Compatible with moment load and stopper (sliding bearings)
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
It is possible to hold the actuator with the rod pushing on a workpiece, etc.
- Positioning repeatability: ± 0.02 mm or less
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

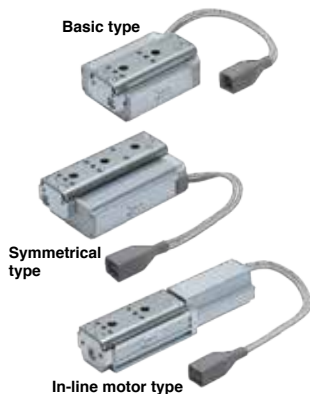
LEY Series AC Servo Motor

- 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: LECSA, LECSB, LECS, LECS, LECSS-T, LECY□
- Motorless specification is available.

Specification	Model	Stroke [mm]	Pushing force lbf [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEYG16D	30 to 200	Max. 32 [141]	Max. 500	2.5, 5, 10
	LEYG25D	30 to 200	Max. 102 [452]	Max. 500	3, 6, 12
	LEYG32D	30 to 200	Max. 159 [707]	Max. 500	4, 8, 16
	LEYG40D	30 to 200	Max. 238 [1058]	Max. 300	4, 8, 16
Servo motor (24 VDC)	LEYG16DA	30 to 200	Max. 25 [111]	Max. 500	2.5, 5, 10
	LEYG25DA	30 to 300	Max. 29 [130]	Max. 500	3, 6, 12
AC servo motor	LEYG25DS	30 to 300	Max. 109 [485]	Max. 900	3, 6, 12
	LEYG32DS	30 to 300	Max. 165 [736]	Max. 1000	4, 8, 16

Slide Tables

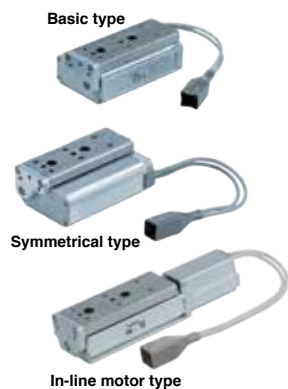
Electric Slide Table/Compact Type **LES**



- 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: 40 lbf [180 N]
- Positioning repeatability: ± 0.05 mm
- Cycle time can be reduced.
Max. acceleration/deceleration: 5,000 mm/s²
Max. speed: 400 mm/s
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Work load [kg] Vertical	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LES8□	30, 50, 75	Max. 1	Max. 0.5	Max. 400	4, 8
	LES16□	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
	LES25□	30, 50, 75, 100, 125, 150	Max. 5	Max. 5	Max. 400	8, 16
Servo motor (24 VDC)	LES8□A	30, 50, 75	Max. 1	Max. 1	Max. 400	4, 8
	LES16□A	30, 50, 75, 100	Max. 3	Max. 3	Max. 400	5, 10
	LES25□A	30, 50, 75, 100, 125, 150	Max. 5	Max. 4	Max. 400	8, 16

Electric Slide Table/High Rigidity Type **LESH**



- Easy setting: Data can be set with only 2 items, position and speed.
The controller is already set with the data of the actuator. (The actuator and controller are provided as a set.)
- Integrated guide rail and table
Uses a recirculating linear guide for high rigidity and high precision
- Reduced cycle time
Max. acceleration/deceleration: 5000 mm/s² Max. speed: 400 mm/s
- Max. pushing force: 40 lbf [180 N]
- Positioning repeatability: ± 0.05 mm
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Work load [kg] Vertical	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LESH8□	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
	LESH16□	50, 100	Max. 8	Max. 2	Max. 400	5, 10
	LESH25□	50, 100, 150	Max. 12	Max. 4	Max. 400	8, 16
Servo motor (24 VDC)	LESH8□A	50, 75	Max. 2	Max. 0.5	Max. 400	4, 8
	LESH16□A	50, 100	Max. 5	Max. 2	Max. 400	5, 10
	LESH25□A	50, 100, 150	Max. 6	Max. 2.5	Max. 400	8, 16

Miniature

Electric Actuator/Miniature Rod Type **LEPY**



- Compact and lightweight
W 20.5 mm x H 30 mm x L 125.6 mm, Weight 240 g
- Max. pushing force: 11 lbf [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
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Specification	Model	Stroke [mm]	Pushing force lbf [N]		Max. work load [kg] (Horizontal)		Screw lead
			Basic	Compact	Basic	Compact	
Step motor (Servo/24 VDC)	LEPY6	25, 50, 75	Max. 4.5 [20]	—	Max. 2.0	—	4.8
	LEPY10	25, 50, 75	Max. 11 [50]	Max. 9 [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: 1.1 [5 N]
- Positioning repeatability: ± 0.05 mm
- It is possible to set the position, speed, and force. (64 points)
- Max. speed (Horizontal): 350 mm/s
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Specification	Model	Stroke [mm]	Pushing force lbf [N]		Max. work load [kg] (Horizontal)		Screw lead
			Basic	Compact	Basic	Compact	
Step motor (Servo/24 VDC)	LEPS6	25, 50	Max. 4.5 [20]	—	Max. 1.0	—	4.8
	LEPS10	25, 50	Max. 11 [50]	Max. 9 [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.)
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

* Value when an external stopper is mounted

Model	Rotating torque lbf ft [N·m]		Max. speed [°/s]		Positioning repeatability [°]	
	Basic	High torque	Basic	High torque	Basic type	High precision type
LER10	0.22	0.24 [0.32]	420	280	± 0.05	
LER30	0.8	0.89 [1.2]	420	280	± 0.05	± 0.03
LER50	6.6	7.38 [10]	420	280	± 0.05	± 0.03

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)
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force lbf [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHZ	10	4	1.3 to 3.1 [6 to 14]	0.4 to 1.3 [2 to 6]	5 to 80
	16	6	1.3 to 3.1 [6 to 14]	0.7 to 1.8 [3 to 8]	5 to 80
	20	10	3.6 to 9.0 [16 to 40]	2.5 to 6.3 [11 to 28]	5 to 100
	25	14	3.6 to 9.0 [16 to 40]	2.5 to 6.3 [11 to 28]	5 to 100
	32	22	12 to 29 [52 to 130]	—	5 to 120
	40	30	19 to 47 [84 to 210]	—	5 to 120

Grippers

Electric Gripper 2-Finger Type/With Dust Cover (Z 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)
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force lbf [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHZJ	10	4	1.3 to 3.1 [6 to 14]	0.67 to 3.1 [3 to 6]	5 to 80
	16	6	1.3 to 3.1 [6 to 14]	0.90 to 1.8 [4 to 8]	5 to 80
	20	10	3.6 to 9.0 [16 to 40]	2.5 to 6.3 [11 to 28]	5 to 100
	25	14	3.6 to 9.0 [16 to 40]	2.5 to 6.3 [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)
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Note) (): For long strokes

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force lbf [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHF	10	16 (32) ^{Note)}	0.7 to 1.6 [3 to 7]	0.7 to 1.6 [3 to 7]	5 to 80
	20	24 (48) ^{Note)}	2.5 to 6.3 [11 to 28]	2.5 to 6.3 [11 to 28]	5 to 100
	32	32 (64) ^{Note)}	11 to 27 [48 to 120]	11 to 27 [48 to 120]	5 to 100
	40	40 (80) ^{Note)}	16 to 40 [72 to 180]	16 to 40 [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)
- Compatible controllers/drivers: LECP6, LECP1, LECPA, LECPMJ, JXC91, JXC73/83/93

Series	Body size	Open and close stroke/ both sides [mm]	Gripping force lbf [N]		Opening and closing speed [mm/s]
			Basic	Compact	
LEHS	10	4	0.5 to 1.2 [2.2 to 5.5]	0.3 to 0.8 [1.4 to 3.5]	5 to 70
	20	6	2.0 to 4.9 [9 to 22]	1.6 to 3.8 [7 to 17]	5 to 80
	32	8	8.1 to 20 [36 to 90]	—	5 to 100
	40	12	12 to 29 [52 to 130]	—	5 to 120

Controllers/Drivers

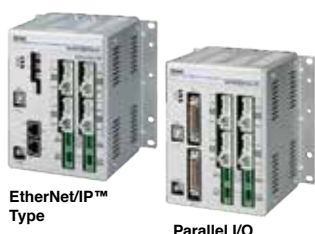
Controller/Step Data Input Type **LECP6/LECA6**



- 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

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

4 Axis Step Motor Controller/(Parallel I/O/EtherNet/IP™ Type) **JXC73/83/93**



- 4-axis synchronous control
- Linear/circular interpolation
- Positioning/pushing operation
- Absolute/relative position coordinate instructions
- Step data input (Max. 2048 points)
- Space saving, reduced wiring

Type	Series	I/O type	Compatible motor	Power supply voltage	Number of axes
Step data input type	JXC73	NPN	Step motor (Servo/24 VDC)	24 VDC ±10%	Max. 4 axes
	JXC83	PNP	Step motor (Servo/24 VDC)	24 VDC ±10%	Max. 4 axes
	JXC93	EtherNet/IP™	Step motor (Servo/24 VDC)	24 VDC ±10%	Max. 4 axes

Programless Controller **LECP1**



- No programming required
Capable of setting up an electric actuator operation without using a PC or teaching box
- Speed/acceleration 16-level adjustment
- Compatible with actuators with locks
- 3-level pushing force settings

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Programless type	LECP1	Step motor (Servo/24 VDC)	24 VDC ±10%	6 (Photo-coupler isolation)	6 (Photo-coupler isolation)	14 points

Programless Controller (With Stroke Study) **LECP2**



- End to end operation similar to an air cylinder
- Positioning of 2 stroke end points + 12 intermediate points

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Programless type (With stroke study)	LECP2	Step motor (Servo/24 VDC)	24 VDC ±10%	6 (Photo-coupler isolation)	6 (Photo-coupler isolation)	2 stroke end points, 12 intermediate points

Controllers/Drivers

Step Motor Driver (Pulse Input Type) **LECPA**



- A driver that uses pulse signals to allow positioning at any position
The actuator can be controlled from the customers' positioning unit.
- Return-to-origin command signal
- With force limit function (Pushing force/Gripping force operations are available.)

Type	Series	Compatible motor	Power supply voltage	Parallel I/O		Number of step data
				Input	Output	
Pulse input type	LECPA	Step motor (Servo/24 VDC)	24 VDC ±10%	5 (Photo-coupler isolation)	9 (Photo-coupler isolation)	—

Step Motor Controller/CC-Link Direct Input Type **LECPMJ**



- CC-Link Ver. 1.10 compatible
- External data import function
- Position and speed can be monitored by the PLC touch panel (display).
- Step data can be edited from the PLC touch panel (display).

Type	Series	Compatible motor	Power supply voltage	Fieldbus
CC-Link direct input type	LECPMJ	Step motor (Servo/24 VDC)	24 VDC ±10%	CC-Link Ver. 1.10

Step Motor Controller/EtherNet/IP™ Direct Input Type **JXC91**



- EtherNet/IP™ compatible
- 10/100 Mbps high-speed communication
- Dual port connection
Transition wiring of communication cable
- Recovery is possible during a disconnection of the device level ring (DLR)!

Type	Series	Compatible motor	Power supply voltage	Fieldbus
EtherNet/IP™ direct input type	JXC91	Step motor (Servo/24 VDC)	24 VDC ±10%	EtherNet/IP™

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

Controllers/Drivers

AC Servo Motor Controller (Pulse Input Type) **LECS**



- Pulse input type motor driver
- Compatible motor capacity: 100 W, 200 W, 400 W
- Compatible encoders:
 - Incremental type
 - Absolute type
- Servo adjustment using auto gain tuning
- With display setting function

Type	Series	Compatible motor	Power supply voltage	Parallel I/O	
				Input	Output
Pulse input type (For incremental encoder)	LECSA	AC servo motor (100/200/400 W)	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	6	4
Pulse input type (For absolute encoder)	LECSB			10	6
CC-Link direct input type (For absolute encoder)	LECSA			—	—
SSCNET III type (For absolute encoder)	LECSA			—	—
SSCNET III/H type (For absolute encoder)	LECSA-T		200 to 240 VAC (50/60 Hz)	—	—

AC Servo Motor Driver (MECHATROLINK Compatible) **LECYM/LECYU**



- Position control, speed control, and torque control can be used.
- Control encoder: Absolute 20-bit encoder
(Resolution: 1048576 p/rev)
- Applicable Fieldbus protocol: MECHATROLINK- II , MECHATROLINK- III

Type	Series	Compatible motor	Power supply voltage	Parallel I/O	
				Input	Output
MECHATROLINK- II type (For absolute encoder)	LECYM	AC servo motor (100/200/400 W)	200 to 230 VAC (50/60 Hz)	7 (Number of optional allocations)	1 (Number of fixed allocations) 3 (Number of optional allocations)
MECHATROLINK- III type (For absolute encoder)	LECYU	AC servo motor (100/200/400 W)	200 to 230 VAC (50/60 Hz)	7 (Number of optional allocations)	1 (Number of fixed allocations) 3 (Number of optional allocations)

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

Electric Actuator/Rod Type LEY-X5



- Enclosure: IP65 equivalent
- Max. stroke: 500 mm

Specification	Model	Stroke [mm]	Pushing force lbf [N]	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	LEY25-X5	30 to 400	Max. 102 [452]	Max. 400	3, 6, 12
Step motor (Servo/24 VDC)	LEY32-X5	30 to 500	Max. 159 [707]	Max. 400	4, 8, 16
Servo motor (24 VDC)	LEY25A-X5	30 to 400	Max. 29 [130]	Max. 400	3, 6, 12
AC servo motor	LEY25S-X5	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
AC servo motor	LEY32S-X5	30 to 500	Max. 132 [588]	Max. 1200	5, 10, 20
AC servo motor	LEY63□□□-□P	100 to 800	Max. 429 [1910]	Max. 1000	5, 10, 20
AC servo motor (In-line motor type)	LEY25DS-X5	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
AC servo motor (In-line motor type)	LEY32DS-X5	30 to 500	Max. 165 [736]	Max. 1000	4, 8, 16
AC servo motor (In-line motor type)	LEY63D□□□-□P	100 to 800	Max. 429 [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
- Compatible controllers/drivers: LECP6, LECA6, LECP1, LECPA, LECPMJ

LEFS Series AC Servo Motor

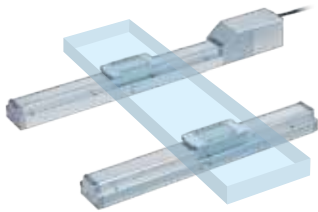
- High output motor (100/200/400 W)
- Improved high speed transfer ability
- High acceleration/deceleration (20000 mm/s²)
- Pulse input type
- With internal absolute encoder
- Positioning repeatability: ±0.02 mm
- Compatible drivers: LECSA, LECSB, LECSA, LECSB, LECSA, LECSB, LECSA, LECSB
- Motorless specification is available.

Specification	Model	Stroke [mm]	Work load [kg] Horizontal	Speed [mm/s]	Screw lead [mm]
Step motor (Servo/24 VDC)	11-LEFS16	50 to 500	Max. 14	Max. 500	5, 10
Step motor (Servo/24 VDC)	11-LEFS25	50 to 600	Max. 25	Max. 500	6, 12
Step motor (Servo/24 VDC)	11-LEFS32	50 to 800	Max. 45	Max. 500	8, 16
Step motor (Servo/24 VDC)	11-LEFS40	150 to 1000	Max. 55	Max. 500	10, 20
Servo motor (24 VDC)	11-LEFS16A	50 to 500	Max. 10	Max. 500	5, 10
Servo motor (24 VDC)	11-LEFS25A	50 to 600	Max. 18	Max. 500	6, 12
AC servo motor (100/200/400 W)	11-LEFS25S	50 to 600	Max. 20	Max. 900	6, 12
AC servo motor (100/200/400 W)	11-LEFS32S	50 to 800	Max. 45	Max. 1000	8, 16
AC servo motor (100/200/400 W)	11-LEFS40S	150 to 1000	Max. 60	Max. 1000	10, 20

Electric Actuators/Electric Cylinders

Environment: Clean Room Specification

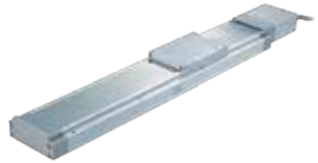
Electric Actuator/LEF Series Support Guide 11-LEFG



- 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
- Compatible drivers: LECSA, LECSB, LECS, LECS
- 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

Environment: Secondary Battery Compatible

Electric Actuator 25A-



- Copper (Cu) and Zinc (Zn) free*
- * Excludes motors, cables, and controllers/drivers
- Compatible with a low dew point -94°F [-70°C]

Type	Motor type	Model
Slider type/Ball screw drive	Step motor	25A-LEFS
	Servo motor	
Slider type/Ball screw drive	AC servo motor	25A-LEFS
High rigidity slider type/Ball screw drive	AC servo motor	25A-LEJS
Rod type	Step motor	25A-LEY
	Servo motor	
Rod type	AC servo motor	25A-LEY

Motorless Type

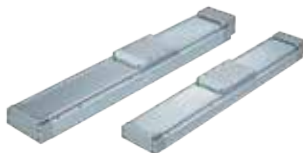
Electric Actuator/Slider Type **LEF**



- Various servo motors can be mounted due to the addition of the motorless type.
- Compatible motors:
Mitsubishi Electric Corporation, YASKAWA Electric Corporation, SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation, FANUC CORPORATION, NIDEC SANKYO CORPORATION, KEYENCE CORPORATION, FUJI ELECTRIC CO., LTD., ORIENTAL MOTOR Co., Ltd., FASTECH Co., Ltd., Rockwell Automation, Inc. (Allen-Bradley), Beckhoff Automation GmbH, Siemens AG, Delta Electronics, Inc.

Specification	Model	Stroke [mm]	Work load [kg]	Speed [mm/s]	Screw lead [mm]
Motorless Ball screw drive	LEFS25	50 to 800	Max. 20	Max. 900	6, 12, 20
Motorless Ball screw drive	LEFS32	50 to 1000	Max. 45	Max. 1000	8, 16, 24
Motorless Ball screw drive	LEFS40	150 to 1200	Max. 60	Max. 1000	10, 20, 30
Motorless Belt drive	LEFB25	300 to 2000	5	Max. 2000	Equivalent to 54
Motorless Belt drive	LEFB32	300 to 2500	15	Max. 2000	Equivalent to 54
Motorless Belt drive	LEFB40	300 to 3000	25	Max. 2000	Equivalent to 54

Electric 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 lbf [N]	Speed [mm/s]	Screw lead [mm]
Motorless Top/Parallel	LEY25	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
Motorless In-line	LEY25D	30 to 400	Max. 109 [485]	Max. 900	3, 6, 12
Motorless Top/Parallel	LEY32	30 to 500	Max. 132 [588]	Max. 1200	4, 8, 16
Motorless In-line	LEY32D	30 to 500	Max. 165 [736]	Max. 1000	4, 8, 16
Motorless Top/Parallel	LEY63	100 to 800	Max. 752 [3343]	Max. 1000	5, 10, 20
Motorless In-line	LEY63D	100 to 800	Max. 429 [1910]	Max. 1000	5, 10, 20

Motorless Type

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 lbf [N]	Speed [mm/s]	Screw lead [mm]
Motorless Top mounting	LEYG25	30 to 300	Max. 109 [485]	Max. 900	3, 6, 12
Motorless In-line	LEYG25D	30 to 300	Max. 109 [485]	Max. 900	3, 6, 12
Motorless Top mounting	LEYG32	30 to 300	Max. 132 [588]	Max. 1200	4, 8, 16
Motorless In-line	LEYG32D	30 to 300	Max. 165 [736]	Max. 1000	4, 8, 16

Made to Order

Electric Stopper Cylinder (Made to Order) **LEBQ**



- Suitable for conveyor lines without an air supply
- Available rod end shapes:
Chamfered type, roller type, and lever type
- Energy saving
The power consumption at rod stoppage is reduced by 60%.
- Height and mounting methods are compatible with the stopper cylinder RSQ series.
- Easy setting
Easy adjustment on site with a programless controller
Applicable to the controller LEC series which allows detailed settings
- Compatible controllers: LECP6, LECP1

Model	Stroke [mm]	Force lbf [N]	Speed [mm/s]	Screw lead [mm]
LEBQ32	20	6.7 [30]	80	5
LEBQ50	30	34 [150]	135	8

Electric Cylinders

Electric Cylinder **LZB/LDZB/LZC/LDZC**



- It can be operated like an air cylinder.
- With auto switch (LDZB series: LDZB, LDZC series: LDZC)

Series	Max. thrust	Max. speed	Lead screw type	Stroke [mm]
LZB	44 lbf [196 N] or more	200 mm/s or more	Slide screw: ø8, ø12	25, 40, 50, 100, 200
LZC	44 lbf [196 N] or more	200 mm/s or more	Lead: 2 mm, 6 mm, 12 mm	25, 40, 50, 100, 200

Directional Control Driver for Electric Cylinder **LC3F**



- Directional control driver like a solenoid valve
- Command for transfer with ON/OFF signal, Thrust can be set
- Driver and motor burnout protection with current control

Series	Applicable model
LC3F2	LZB, LZC

Moving Coil Actuators

Moving Coil Actuator **LA**



- Refer to the SMAC Japan website for the product information.

Vacuum Equipment

Vacuum Ejectors/ Vacuum Pump Systems



Vacuum Unit/ ZK2	P.91
Space Saving Vacuum Ejector/Pump System/ ZQ ..	P.91
Large Size Vacuum Module/ ZR	P.91
Compact Vacuum Unit/ ZB	P.91
Compact Vacuum Ejector/ ZA	P.92
Vacuum Module/ ZX	P.92
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Multistage Ejector/ ZL	P.92

Vacuum Ejectors



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Vacuum Release Valve Units



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Air Suction Filters



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Vacuum Pads



Vacuum Pad/ ZP3	P.96
Vacuum Pad/ ZP3E	P.96
Compact/Short-type/Nozzle Pad/ ZP2	P.96
Thin Flat/Flat Pad/ ZP2	P.96
Bellows Pad/ ZP2	P.96
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Vacuum Pad/Ball Joint Type/ ZPT/ZPR	P.97
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Vacuum Equipment

Special Pads



- Non-contact Gripper/**XT661** P.98
- Magnet Gripper/**MHM-X6400** P.98

Vacuum Saving Valves



- Vacuum Saving Valve/**ZP2V** P.98

Vacuum Flow



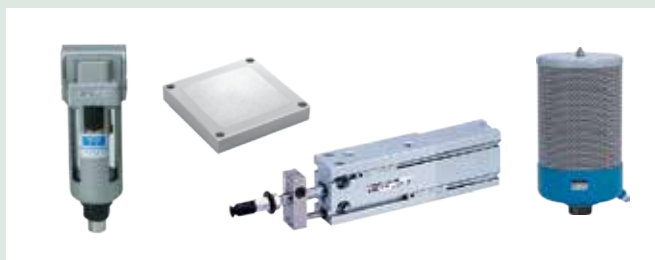
- Vacuum Flow/**ZH□-□□-X185** P.99

Vacuum Regulators



- Vacuum Regulator/**IRV** P.99
- Electronic Vacuum Regulator/**ITV** P.99

Related Equipment for Vacuum Systems



- Adsorption Plate/**SP** P.99
- Free Mount Cylinder for Vacuum/**ZCUK** P.100
- Drain Separator for Vacuum/**AMJ** P.100
- Vacuum Filter/**AFJ** P.100
- Exhaust Cleaner for Vacuum Pump/**AMV** P.100
- Related Equipment for Vacuum Systems P.100

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 scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]	Vacuum pump system series
ZK2□07	0.7	1.02 [29]	0.85 [24]	2 to 40	ZK2□00
ZK2□10	1.0	1.55 [44]	1.41 [40]	2 to 50	
ZK2□12	1.2	2.15 [61]	2.05 [58]	2 to 125	
ZK2□15	1.5	2.37 [67]	3.18 [90]	2 to 150	

Space Saving Vacuum Ejector/Pump System ZQ



- Compatible with ejector systems and vacuum pump systems
- Width: 10 mm, Weight: 109 g (Single unit, with vacuum pressure switch and suction filter)
- Digital vacuum pressure switch
- With LED display function
- Adaptable to manifold applications

Ejector series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]	Vacuum pump system series
ZQ105	0.5	0.18 [5]	0.49 [14]	2 to 13	ZQ1000
ZQ107	0.7	0.35 [10]	0.81 [23]	2 to 20	
ZQ110	1.0	0.78 [22]	1.62 [46]	2 to 32	

Large Size Vacuum Module ZR



- Compatible with ejector systems and vacuum pump systems
- Necessary functions can be combined through a modular design.
- Double solenoids provide a self-holding function.
- Adaptable to manifold applications
- Functions such as a digital vacuum switch or a solenoid valve can be selected.

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]	Vacuum pump system series
ZR110	1.0	0.78 [22]	1.62 [46]	2 to 32	ZR100
ZR113	1.3	1.34 [38]	2.75 [78]	2 to 50	
ZR115	1.5	1.91 [54]	3.35 [95]	2 to 100	
ZR118	1.8	2.19 [62]	5.30 [150]	2 to 125	
ZR120	2.0	2.97 [84]	6.53 [185]	2 to 150	

Compact Vacuum Unit ZB



With vacuum pressure switch

- Compatible with ejector systems and vacuum pump systems
- Quick response: Response time of the valve 5 ms, vacuum response time 28 ms
- Energy saving: Air consumption reduced by 17%, Vacuum pressure reached increased by 21%
- Compact/Lightweight: 46 g
- With vacuum pressure switch
- Can copy to up to 10 switches simultaneously

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
ZB03	0.3	0.07 [2]	0.12 [3.5]	2 to 8	ZB00
ZB04	0.4	0.12 [3.5]	0.23 [6.5]	2 to 10	
ZB05	0.5	0.16 [4.5]	0.35 [10]	2 to 13	
ZB06	0.6	0.25 [7]	0.64 [18]	2 to 20	

Vacuum Ejectors/Vacuum Pump Systems

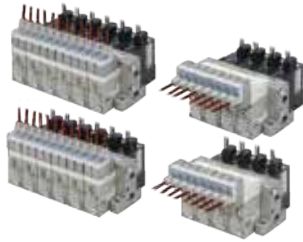
Compact Vacuum Ejector ZA



- Total width: 9.9 mm, Total length: 72.9 mm, Total height: 52.5 mm, Weight: 50 g
- Can be installed on moving parts
- Improved response through the shortening of the length of the tube to the pad
- Adaptable to manifold applications

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZA105	0.5	0.14 [4]	0.42 [12]	2 to 13
ZA107	0.7	0.28 [8]	0.99 [28]	2 to 20

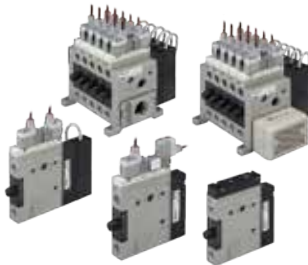
Vacuum Module ZX



- Compatible with ejector systems and vacuum pump systems
- Necessary functions can be combined through a modular design.
- Ideal for electronic parts or small precision parts weighing up to 100 g
- Adaptable to manifold applications

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]	Vacuum pump system series
ZX105	0.5	0.18 [5]	0.46 [13]	2 to 13	ZX100
ZX107	0.7	0.35 [10]	0.81 [23]	2 to 20	
ZX110	1.0	0.78 [22]	1.62 [46]	2 to 25	

Vacuum Ejector ZM



- Valves and switches are unitized.
- Adaptable to manifold applications
- Maximum absorption flow rate has been increased by 40%.
- Max. vacuum pressure: -12 psi [-84 kPa]

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZM05	0.5	0.53 [15]	0.60 [17]	2 to 16
ZM07	0.7	0.81 [23]	1.17 [33]	2 to 25
ZM10	1.0	1.34 [38]	2.12 [60]	2 to 32
ZM13	1.3	1.55 [44]	3.00 [85]	2 to 40
ZM15	1.5	1.59 [45]	3.88 [110]	2 to 50

Multistage Ejector ZL



- Suction flow rate increased by the 3-stage diffuser construction
- Functions such as a digital vacuum switch or a vacuum pressure gauge can be selected.

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZL112	1.2	3.53 [100]	2.22 [63]	2 to 250
ZL212	1.2 x 2	7.06 [200]	4.45 [126]	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 scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZH05DSA	0.5	0.21 [6]	0.46 [13]	2 to 13
ZH07DSA	0.7	0.42 [12]	0.95 [27]	2 to 20
ZH10DSA	1.0	0.92 [26]	1.84 [52]	2 to 32
ZH13DSA	1.3	1.41 [40]	2.97 [84]	2 to 50
ZH15DSA	1.5	2.05 [58]	3.99 [113]	2 to 100
ZH18DSA	1.8	2.68 [76]	5.72 [162]	2 to 125
ZH20DSA	2.0	3.18 [90]	6.92 [196]	2 to 150

Vacuum Ejector ZH



- Nozzle diameter: ϕ 0.5, ϕ 0.7, ϕ 1.0, ϕ 1.3, ϕ 1.5, ϕ 1.8, ϕ 2.0
- Integrally molded resin nozzle and body
- Available in series of 2 types: Box type (built-in silencer), Body ported type

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZH05	0.5	0.18 [5]	0.46 [13]	2 to 13
ZH07	0.7	0.42 [12]	0.81 [23]	2 to 20
ZH10	1.0	0.85 [24]	1.62 [46]	2 to 32
ZH13	1.3	1.41 [40]	2.75 [78]	2 to 50
ZH15	1.5	1.94 [55]	3.35 [95]	2 to 100
ZH18	1.8	2.30 [65]	5.30 [150]	2 to 125
ZH20	2.0	3.00 [85]	6.53 [185]	2 to 150

All Stainless Steel Vacuum Ejector ZH□□-X267



- All stainless steel (SCS13: Equivalent to stainless steel 304)
- Sealant not required
- Max. operating temperature: 500°F [260°C]
- Grease-free

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZH05-X267	0.5	0.18 [5]	0.46 [13]	2 to 13
ZH07-X267	0.7	0.42 [12]	0.81 [23]	2 to 20
ZH10-X267	1.0	0.85 [24]	1.62 [46]	2 to 32

Vacuum Ejector/In-line Type ZU



- Vacuum port and supply port are located collinearly to facilitate piping.
- A lightweight construction is achieved through the use of a resin body.
- Nozzle diameter
 ϕ 0.5: 6.5 g
 ϕ 0.7: 7.0 g
- Built-in One-touch fittings (Copper-free countermeasures taken)

Series	Nozzle diameter [mm]	Max. suction flow scfm [L/min (ANR)]	Air consumption scfm [L/min (ANR)]	Guidelines for applicable pad [mm]
ZU05	0.5	0.25, 0.42 [7, 12]	0.49 [14]	2 to 13
ZU07	0.7	0.35, 0.56 [10, 16]	1.02 [29]	2 to 20

Vacuum Ejectors

Vacuum Pad with Ejector ZHP



- Ejector and pad are integrated. Space saving with reduced piping labor!
- 2-stage ejector
Suction flow rate increased by 50%, Air consumption reduced by 30%
- Easier maintenance
Mounting with the lock plate reduces the steps required for pad replacement!
- Pad diameter: $\phi 63$, $\phi 80$

Series	Pad diameter	Pad form	Nozzle nominal size
ZHP	$\phi 63$, $\phi 80$	Bellows type with groove, Flat type with groove	$\phi 0.7$, $\phi 1.0$, $\phi 1.2$, $\phi 1.5$

Ejector Valve Unit ZYY/ZYX



- Ejector valve unit suitable for vacuum adsorption systems
- Can be combined with a valve for cylinder drive

Vacuum Release Valve Units

Vacuum/Release Unit VQD1000-V

Rubber seal

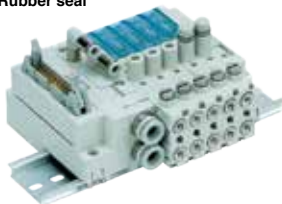


- Applicable to 0603 chips
- Response speed: 13 msec (at the time of 500 mm^{*})/18.5 msec (at the time of 1000 mm^{*})
- Smooth workpiece removal with no overshoot
- There is no need for timing adjustment of switchback between vacuum and positive pressure.
- A throttle circuit is not required for release air.
- Suction filter: ZFC050 (Made to order)

* Distance from the unit to the work area

Vacuum Release Valve with Restrictor SJ3A6

Rubber seal



- 2 built-in spool valves
- It is possible to control vacuum adsorption and release with a single valve unit.
- Width 10 mm (Same size as the SJ3000 series)
- With a restrictor that can adjust the flow rate of the release air
- Built-in replacement filter on both vacuum and release sides
- Can be combined with the 4 port solenoid valve SJ2000/3000 (Made to order)
- Manifold model: SS3J3

Vacuum Release Valve with Restrictor SY³A□R

Rubber seal



- Vacuum suction and release can be controlled with a single valve.
- With a restrictor that can adjust the flow rate of the release air
- Can be mounted on the same manifold as the standard valve
- * When the individual EXH spacer is used

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 scfm [L/min (ANR)]	Filtration [μm]
ZFA10	1/8	1.77 [50]	30
ZFA20	1/4	7.06 [200]	30

Air Suction Filters

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 scfm [L/min (ANR)]	Filtration [μm]
	Metric	Inch		
ZFB10	$\phi 4, \phi 6$	$\phi 3/16, \phi 1/4$	0.35 to 0.71 [10 to 20]	30
ZFB20	$\phi 6, \phi 8$	$\phi 1/4$	1.06 to 1.77 [30 to 50]	30
ZFB30	$\phi 8, \phi 10$	$\phi 3/8$	2.65 [75]	30
ZFB40	—	$\phi 1/2$	3.53 [100]	30

In-line Air Filter **ZFC**



- Operating pressure range: -14.5 to 145 psi [-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)
- Note 1) Supply pressure 14.5 psi [0.1 MPa], Differential pressure 4.4 psi [30 kPa]
Note 2) Made to order

Series	Applicable tubing O.D.		Flow rate ^{Note 1)} scfm [L/min (ANR)]	Flow rate scfm [L/min (ANR)]	Filtration [μm]
	Metric	Inch	Positive pressure	Vacuum pressure	
ZFC1□	$\phi 2, \phi 3.2$	$\phi 1/8"$	0.53/1.59 [15/45]	0.07/0.18 [2/5]	5, 10 ^{Note 2)}
ZFC3□	$\phi 3.2, \phi 4$	$\phi 1/8", \phi 5/32"$	1.77/2.82 [50/80]	0.25/0.35 [7/10]	5, 10 ^{Note 2)}
ZFC5□	$\phi 4, \phi 6$	$\phi 5/32", \phi 1/4"$	3.53/7.06 [100/200]	0.35/0.71 [10/20]	5, 10 ^{Note 2)}
ZFC7□	$\phi 6, \phi 8, \phi 10, \phi 12$	$\phi 1/4", \phi 5/16", \phi 3/8"$	8.83/15.9/19.4/22.9 [250/450/550/650]	1.06/2.47/2.82/3.53 [30/70/80/100]	5, 10 ^{Note 2)}

Air Suction Filter with One-touch Fittings/In-line Type **ZFC**



- IN/OUT straight piping
- Easy installation and removal with One-touch fittings
- Light and compact molded resin parts
- Cartridge type allows for element replacement

Series	Applicable tubing O.D.		Flow rate scfm [L/min (ANR)]	Filtration [μm]
	Metric	Inch		
ZFC050	$\phi 2, \phi 3.2, \phi 4$	$\phi 1/8, \phi 5/32$	0.07 to 0.35 [2 to 10]	10
ZFC100	$\phi 4, \phi 6$	$\phi 5/32, \phi 1/4$	0.35 to 0.71 [10 to 20]	10
ZFC200	$\phi 6, \phi 8$	$\phi 1/4, \phi 5/16$	1.06 to 1.77 [30 to 50]	10

Vacuum Filter **AFJ**



- Prevents problems with vacuum equipment!
- Nominal filtration rating: 5, 40, 80 μm
- Large flow capacity: Max. 23.3 scfm [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 scfm [L/min (ANR)]	Filtration
AFJ	1/8, 1/4, 3/8, 1/2	6.36, 13.4, 23.3 [180, 380, 660]	5, 40, 80

Suction Filter **ZFC050**



- Small suction filter which can be installed directly

Series	Port size IN side	Port size OUT side	Filtration [μm]
ZFC050	M5 x 0.8, $\phi 6$ barb	M5 x 0.8	3 μm , 20 μm (Nominal)

Vacuum Pads

Vacuum Pad ZP3

- Pad diameter: $\phi 1.5$ to $\phi 16$
- Compact/Space saving: Overall length shortened
- One-touch fittings and barb fittings are available for $\phi 2$.



Series	Type
ZP3	Flat
ZP3	Flat with groove
ZP3	Bellows

Bellows Pad ZP2

- For spherical workpieces or workpieces with inclined surfaces
- Pad diameter: $\phi 2$ to $\phi 46$



Vacuum Pad ZP3E

- Stable suction position, Improved ease of removal
- The dents and bumps on the adsorption surface expand the area which is in contact with the workpiece. The ribs reduce inclinations during the transport of workpieces.

- Reduced number of mounting screws (4 pcs. \rightarrow 1 pc.)
- Pad and metal parts can be disposed of separately.
- Pad diameter: $\phi 32$ to $\phi 125$



Series	Type
ZP3E	Flat type with groove
ZP3E	Bellows type with groove

4.5-Stage Bellows Pad ZP2

- For adsorbing workpieces moving at high speeds
- Follows various shapes of workpieces
- Pad material: Silicone rubber (Rubber hardness: A40, A50, A60)
- Pad diameter: $\phi 15$, $\phi 20$, $\phi 30$, $\phi 40$, $\phi 46$



Compact/Short-type/Nozzle Pad ZP2

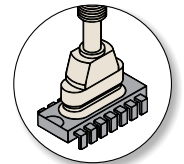
- Compact/Space saving
- Pad diameter: $\phi 0.8$ to $\phi 15$



Series	Type
ZP2	Compact
ZP2	Short-type
ZP2	Nozzle

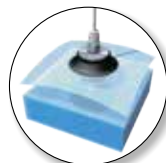
Oval Pad ZP2

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



Thin Flat/Flat Pad ZP2

- For sheets or vinyl
- Pad diameter: $\phi 5$ to $\phi 30$



Series	Type
ZP2	Thin flat
ZP2	Flat

Ball Spline Buffer Pad ZP2

- The ball spline guide is used for buffers.
- Pad diameter: $\phi 2$ to $\phi 8$



Vacuum Pads

Mark-free Pad ZP2

- For use where adsorption marks must not be left on workpieces
- Pad diameter: $\phi 4$ to $\phi 125$



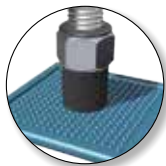
Vacuum Pad ZP

- The wide variety of available models can accommodate a wide range of applications.
- Pad shapes: Flat, Flat with ribs, Thin flat, Thin flat with ribs, Deep, and Bellows shape
- Pad diameter: $\phi 2$ to $\phi 50$



Sponge Pad ZP2

- For workpieces with bumps
- Pad diameter: $\phi 4$ to $\phi 15$



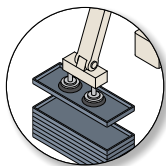
Vacuum Pad/Large/Heavy Duty Type ZPT/ZPX

- Ideal for heavy or large workpieces such as CRT tubes and automobile bodies
- Pad diameter: $\phi 40$ to $\phi 125$



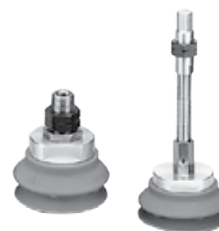
Heavy-duty Pad ZP2

- For heavy or large workpieces
- Pad diameter: $\phi 32$ to $\phi 340$



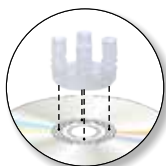
Vacuum Pad/Large Size Bellows Type ZPT/ZPX

- Ideal for workpieces with a curved adsorption surface, heavy mass, or those that are large in size
- Pad diameter: $\phi 40$ to $\phi 125$



Special Configuration Pad ZP2

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



Series	Type
ZP2	For transferring disks
ZP2	For fixing panels

Vacuum Pad/Ball Joint Type ZPT/ZPR

- Ideal for adsorption on slanted work surfaces
- Pad diameter: $\phi 10$ to $\phi 50$



Vacuum Pads

Vacuum Pad with Ejector ZHP



- Ejector and pad are integrated. Space saving with reduced piping labor!
- 2-stage ejector
Suction flow rate increased by 50%, Air consumption reduced by 30%
- Easier maintenance
Mounting with the lock plate reduces the steps required for pad replacement!
- Pad diameter: ø63, ø80

Series	Pad diameter	Pad form	Nozzle nominal size
ZHP	ø63, ø80	Bellows type with groove, Flat type with groove	ø0.7, ø1.0, ø1.2, ø1.5

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. 9.9 lbf [44 N]
Bernoulli type: Amplitude of the workpiece during gripping:
±0.01 mm or less

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: 18.0 lbf [80 N] (Workpiece plate thickness: 0.6 mm), 27.0 lbf [120 N] (Workpiece plate thickness: 1.4 mm)
- Residual holding force: 0.07 lbf [0.3 N] or less (Reduces workpiece release time)

Series	Holding force (Workpiece plate thickness: 0.6 mm)
MHM-32D1-X6400	18.0 lbf [80 N]
MHM-32D2-X6400	11.2 lbf [50 N]
MHM-32D3-X6400	6.7 lbf [30 N]

Vacuum Saving Valves

Vacuum Saving Valve ZP2V



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

Vacuum Flow

Vacuum Flow ZH□-□□-X185



- By supplying compressed air, large blow and vacuum flow rates are available.
- A blow flow rate 4 times the supply air
- A vacuum flow rate 3 times the supply air
- Large passage diameter available for the suction of machining chips, particles, etc.
- Maintenance-free
- Mounting brackets are available.
- Application examples:
Blow: Blowing away water droplets and machining chips
Vacuum: Vacuuming smoke during soldering, Transferring materials such as pellets or fine particles

Vacuum Regulators

Vacuum Regulator IRV



- Allows for the adjustment of vacuum line pressure
- Single-sided connection series
- Weight reduced by 20% (Compared with the current 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 psi [kPa]
IRV10	ø6, ø8, ø1/4, ø5/16	-14.5 to -0.19 [-100 to -1.3]
IRV20	ø6, ø8, ø10, ø1/4, ø5/16, ø3/8	-14.5 to -0.19 [-100 to -1.3]

Electronic Vacuum Regulator ITV

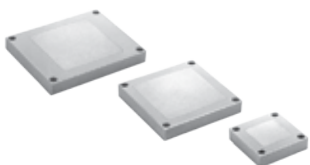


- Stepless control of vacuum pressure in proportion to electrical signals
- Communication: CC-Link, DeviceNet™, PROFIBUS DP, RS-232C

Series	Port size	Set pressure psi [kPa]
ITV009□	ø4, ø5/32 One-touch fittings	-0.145 to -14.5 [-1 to -100]
ITV209□	1/4	-0.19 to -11.6 [-1.3 to -80]

Related Equipment for Vacuum Systems

Adsorption Plate SP



- Ideal for the adsorption and fixing in place of thin sheets, glass panels, and soft workpieces
Workpieces will not be deformed since they are adsorbed with multiple micro air vents on the adsorption surface.
- A high level of machining accuracy
- Strong adsorption force

Series	Shape	Adsorption surface size	Sintered metallic element particle dia.	Suction port
SP	Rectangular, Square	□50 x 50 mm, □100 x 100 mm, □150 x 150 mm, □200 x 200 mm, □250 x 250 mm, □300 x 300 mm	ø0.3 (Sphere)	1/8

Related Equipment for Vacuum Systems

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

Drain Separator for Vacuum **AMJ**



- Remove water droplets from the air by simply installing it in vacuum equipment connection lines.
- Effective for removing water droplets from the air sucked into vacuum pumps, ejectors, etc.

Series	Port size	Recommended flow rate scfm [L/min (ANR)]	Max. operating pressure psi [MPa]	Water droplet removal ratio
AMJ	1/4, 3/8, 1/2, 3/4, 1	7.06, 10.6, 17.7 [200, 300, 500]	145 [1.0]	90%

Vacuum Filter **AFJ**



- Prevents problems with vacuum equipment!
- Nominal filtration rating: 5, 40, 80 µm
- Large flow capacity: Max. 23.3 scfm [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 scfm [L/min (ANR)]	Filtration
AFJ	1/8, 1/4, 3/8, 1/2	6.36, 13.4, 23.3 [180, 380, 660]	5, 40, 80

Exhaust Cleaner for Vacuum Pump **AMV**



- Captures 99.5% of the greasy fumes exhausted from the vacuum pump
- Creates a comfortable working environment without oil mist
- Captures and separates 99.5% of even low-flow and highly concentrated greasy fumes
- Exhaust ducts from the vacuum pump are not required.

Series	Port size	Max. air flow [L/min (ANR)]	Oil mist removal	Filtration [µm]
AMV	1, 1 1/2, 2, 3BJIS 10K FF flange, 4BJIS 10K FF flange	12.7 to 565 scfm [360 to 16000 L/min (ANR)]	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

Aftercoolers/Air Tanks



Air Cooled Aftercooler/ HAA	P.102
Water Cooled Aftercooler/ HAW	P.102
Air Tank/ AT	P.102
Air Tank/ VBAT	P.102

Air Dryers



Refrigerated Air Dryer/ IDF/IDU	P.103
Refrigerated Air Dryer/ IDF100FS/125FS/150FS	P.103
Refrigerated Air Dryer/For Use in Europe, Asia, and Oceania/ IDFA□E/F	P.104
Refrigerated Air Dryer/For Use in North, Central, and South America/ IDFB□E	P.104
Thermo-dryer with Air Temperature Adjustment Function/ IDH	P.105
Heatless Air Dryer/ ID	P.105
Membrane Air Dryer/ IDG□A/IDG	P.105
Moisture Control Tube/ IDK	P.105

Air Preparation Filters



Water Separator/ AMG	P.106
Main Line Filter/ AFF	P.106
Mist Separator/ AM	P.106
Micro Mist Separator/ AMD	P.106
Micro Mist Separator with Pre-filter/ AMH	P.106
Super Mist Separator/ AME	P.107
Odor Removal Filter/ AMF	P.107
In-line Air Filter/ ZFC	P.107
Clean Gas Filter/ SF	P.107
Clean Gas Strainer/ SFB200	P.107
Clean Air Filter/Hollow Fiber Element/ SFD	P.108
Clean Air Module/ LLB	P.108
Air-blow Module/ LLB1	P.108

Auto Drains/Differential Pressure Gauges



Auto Drain Valve/ AD402/600	P.108
Motor Operated Auto Drain/ ADM	P.108
Heavy Duty Auto Drain/ ADH	P.108
Differential Pressure Gauge/ GD40	P.108

Aftercoolers/Air Tanks

Air Cooled Aftercooler HAA



- Can cool high-temperature compressed air from compressors down to 40°C or less and efficiently remove moisture from the air
- Cooling equipment is not required for this air-cooled type.
- Easy maintenance and reasonable running costs, No need to worry about freezing or running out of water supply.

Series	Applicable compressor [kW]	Air flow capacity scfm [L/min (ANR)]
HAA	7.5 to 37	35.3 to 201 [1000 to 5700]

Water Cooled Aftercooler HAW



- Can cool high-temperature compressed air from compressors down to 40°C or less and efficiently remove moisture from the air
- Stable operation for this water-cooled type is possible even in an environment with a high temperature, high moisture, and heavy foreign particles.

Series	Applicable compressor [kW]	Air flow capacity scfm [L/min (ANR)]
HAW	2.2 to 110	10.6 to 636 [300 to 18000]

Air Tank AT



- This air tank accumulates the compressed air from compressors, prevents it from being pulsated, and cools it.

Series	Port size	Tank capacity gal [L]
AT	1/2 to 4 ^B flange	26.4 to 793 [100 to 3000]

Air Tank VBAT



- Compact air tank that can be directly connected to a regulator
- Can be used as an independent tank
- With a safety valve port (Option)
- Overseas standards compliant products:
CE certified product (-Q)
Product not applicable to ASME Standards (-X11)
Chinese pressure vessel regulations compliant product (-X104)
Industrial Safety and Health Act compliant product (-X101)

Series	Port size	Tank capacity gal [L]
VBAT	3/8, 1/2, 3/4	1.3, 2.6, 5.3, 10 [5, 10, 20, 38]

Air Dryers

Refrigerated Air Dryer **IDF□E/F/D**



Series	Rated inlet condition	Air flow capacity scfm [m³/min (ANR)]		Applicable air compressor [kW]	Refrigerant	Port size
		50 Hz	60 Hz			
IDF1E	95°F [35°C] 102 psi 0.7 MPa	3.5 [0.1]	4.2 [0.12]	0.75	R134a (HFC)	Rc3/8
IDF2E		7.1 [0.2]	8.3 [0.235]	1.5		Rc3/8
IDF3E		11.3 [0.32]	13.1 [0.37]	2.2		Rc3/8
IDF4E		18.4 [0.52]	20.1 [0.57]	3.7		Rc1/2
IDF6E		26.5 [0.75]	28.9 [0.82]	5.5		Rc3/4
IDF8E		43.1 [1.22]	46.6 [1.32]	7.5		Rc3/4
IDF11E		58.3 [1.65]	64.3 [1.82]	11		Rc3/4
IDF15E1		98.9 [2.8]	109 [3.1]	15		Rc1
IDF22E		138 [3.9]	152 [4.3]	22		R1
IDF37E		201 [5.7]	215 [6.1]	37		R1 1/2
IDF55E	104°F [40°C] 102 psi [0.7MPa]	297 [8.4]	346 [9.8]	55	R407C (HFC)	R2
IDF75E		388 [11.0]	438 [12.4]	75		R2
IDF100F		565 [16.0]	664 [18.8]	100		R2
IDF125F		710 [20.1]	837 [23.7]	125		65 (2 1/2B) flange
IDF150F		883 [25.0]	1059 [30.0]	150		80 (3B) flange
IDF190D		1130 [32.0]	1342 [38.0]	190		80 (3B) flange
IDF240D		1518 [43.0]	1766 [50.0]	240		100 (4B) flange
IDF370D		95°F [35°C] 102 psi 0.7 MPa	1907 [54.0]	2295 [65.0]		370

Refrigerated Air Dryer **IDU□E**



Series	Rated inlet condition	Air flow capacity scfm [m³/min (ANR)]		Applicable air compressor [kW]	Refrigerant	Port size
		50 Hz	60 Hz			
IDU3E	95°F [35°C] 102 psi 0.7 MPa	11.3 [0.32]	13.1 [0.37]	2.2	R134a (HFC)	Rc3/8
IDU4E		18.4 [0.52]	20.1 [0.57]	3.7		Rc1/2
IDU6E		26.5 [0.75]	29.0 [0.82]	5.5		Rc3/4
IDU8E		38.8 [1.1]	42.4 [1.2]	7.5		Rc3/4
IDU11E		53.0 [1.5]	60.0 [1.7]	11		Rc3/4
IDU15E1		91.8 [2.6]	99.0 [2.8]	15		Rc1
IDU22E		138 [3.9]	152 [4.3]	22		R1
IDU37E		201 [5.7]	215 [6.1]	37		R1 1/2
IDU55E		297 [8.4]	346 [9.8]	55		R2
IDU75E		388 [11.0]	441 [12.5]	75		R2

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 113°F [45°C], Inlet air temperature: Up to 140°F [60°C]

Series	Applicable compressor [kW]	Air flow capacity scfm [m³/min (ANR)]	
		50 Hz	60 Hz
IDF100FS	100	565 [16]	664 [18.8]
IDF125FS	125	710 [20.1]	837 [23.7]
IDF150FS	150	883 [25]	953 [27]

Air Dryers

Refrigerated Air Dryer/For Use in Europe, Asia, and Oceania IDFA□E/F

- EC Directive compliant product (With CE mark)
- Power supply voltage: Single-phase 230 VAC (50 Hz)



Series	Rated inlet condition	Air flow capacity [m³/h (ANR)]			Refrigerant	Port size
		Outlet air pressure dew point				
		37.4 °F [3°C]	44.6 [7°C]	50°F [10°C]		
IDFA3E	95°F [35°C] 102 psi 0.7 MPa]	12	15	17	R134a (HFC)	Rc3/8
IDFA4E		24	31	34		Rc1/2
IDFA6E		36	46	50		Rc3/4
IDFA8E		65	83	91		Rc3/4
IDFA11E		80	101	112		Rc3/4
IDFA15E		120	152	168		Rc1
IDFA22E		182	231	254		R1
IDFA37E		273	347	382		R1 1/2
IDFA55E		390	432	510		R2
IDFA75E		660	720	822		R2
IDFA100F-38	104°F [40°C]	—	—	960	R407C (HFC)	R2
IDFA125F-38	102 psi [0.7MPa]	—	—	1210		R2 1/2
IDFA150F-38		—	—	1500		DIN flange 80
IDFA100F-40	95°F [35°C]	860	—	—		R2
IDFA125F-40	102 psi 0.7 MPa]	1100	—	—		R2 1/2
IDFA150F-40		1340	—	—		DIN flange 80

Refrigerated Air Dryer/For Use in North, Central, and South America IDFB□E

- UL, CSA certified product
- Power supply voltage: Single-phase 115 VAC (60 Hz), 230 VAC (60 Hz)
3-phase 460 VAC (60 Hz)



Note) The air flow capacity for each dew point is indicated.

Series	Rated inlet condition	Air flow capacity SCFM [m³/h (ANR)]			Refrigerant	Port size	
		Outlet air pressure dew point ^{Note}					
		37°F (2.8°C)	45°F (7.2°C)	50°F (1.0°C)			
IDFB3E	100°F (37.8°C) 100 psi (0.7 MPa)	10 (17)	11 (19)	12 (20)	R134a (HFC)	NPT3/8	
IDFB4E		15 (25)	16 (27)	17 (28)		NPT1/2	
IDFB6E		25 (43)	26 (45)	28 (47)		NPT3/4	
IDFB8E		41 (70)	43 (74)	45 (77)		NPT3/4	
IDFB11E		59 (100)	62 (106)	65 (110)		NPT3/4	
IDFB15E		71 (120)	80 (136)	86 (147)		NPT1	
IDFB22E		107 (182)	120 (205)	130 (221)		NPT1	
IDFB37E		161 (273)	173 (294)	181 (308)		NPT1 1/2	
IDFB55E		226 (384)	258 (438)	297 (504)		R407C (HFC)	NPT2
IDFB75E		300 (510)	353 (600)	406 (690)			NPT2

Air Dryers

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 scfm [L/min (ANR)]	Outlet air temperature adjustment range	Outlet air set pressure range	Outlet air temperature stability	Temperature control method
IDH□4	3.5 to 17.7 [100 to 500]	59 to 86°F [15 to 30°C]	22 to 123 psi [0.15 to 0.85 MPa]	±0.18°F [±0.1°C]	Heater operation, PID control
IDH□6	7.1 to 28.2 [200 to 800]	59 to 86°F [15 to 30°C]	22 to 123 psi [0.15 to 0.85 MPa]	±0.18°F [±0.1°C]	Heater operation, PID control

Heatless Air Dryer ID



- Can supply dry air with a low dew point below -22°F [-30°C]
- Compact and lightweight without a heater or an electric control board
- It is possible to check the outlet dew point with the indicator.
(Self-regenerative type allows for easy maintenance)

Series	Outlet flow scfm [L/min (ANR)]	Inlet flow scfm [L/min (ANR)]
ID	2.8 to 27.5 [80 to 780]	3.5 to 34.4 [100 to 975]

Membrane Air Dryer IDG□A/IDG



- It is possible to easily supply dry air using the hollow fiber membrane.
- Non-fluorocarbon
- Power supply not required
- Compatible with low dew points (-76°F [-60°C])
- No vibration or heat discharge
- With a dew point indicator

Series	Outlet flow scfm [L/min (ANR)]	Standard dew point °F [°C]
IDG□A/IDG	0.35 to 35.3 [10 to 1000]	5, -4, -40, -76 [-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%

Series	Air flow capacity scfm [L/min (ANR)]	Port size
AMG	10.6 to 424 [300 to 12000]	1/8 to 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 scfm [L/min (ANR)]	Port size
AFF	3 (Filtration efficiency 99%)	10.6 to 1483 [300 to 42000]	1/8 to 4 ⁵ 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 scfm [L/min (ANR)]	Port size
AM	0.3 (Filtration efficiency 99.9%)	10.6 to 424 [300 to 12000]	1/8 to 2

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 scfm [L/min (ANR)]	Port size
AMD	0.01 (Filtration efficiency 99.9%)	7.1 to 424 [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 scfm [L/min (ANR)]	Port size
AMH	0.01 (Filtration efficiency 99.9%)	7.1 to 424 [200 to 12000]	1/8 to 2

Air Preparation Filters

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 scfm [L/min (ANR)]	Port size
AME	0.01 (Filtration efficiency 99.9%)	7.1 to 424 [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 scfm [L/min (ANR)]	Port size
AMF	0.01 (Filtration efficiency 99.9%)	7.1 to 424 [200 to 12000]	1/8 to 2

In-line Air Filter **ZFC**



- Operating pressure range: -14.5 to 145 psi [-100 kPa to 1.0 MPa]
Both positive pressure and vacuum pressure can be used with one unit.
- Filtration: 5 μm , 10 μm (Made to order)
- 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)

Series	Applicable tubing O.D.		Air flow capacity scfm[L/min (ANR)]	
	Metric	Inch	Positive pressure	Vacuum pressure
ZFC5	$\phi 4, \phi 6$	$\phi 5/32", \phi 1/4"$	1.6 to 3.5 [45 to 100]	0.35 to 0.71 [10 to 20]
ZFC7	$\phi 6, \phi 8, \phi 10, \phi 12$	$\phi 1/4", \phi 5/16", \phi 3/8"$	4.2 to 12.4 [120 to 350]	1.1 to 3.5 [30 to 100]

Clean Gas Filter **SF**



- Cartridge type allows for element replacement (SFA100/200/300, SFB100)
- Compact, disposable type for the semiconductor industry (SFB300, SFC100)

Type	Series	Operating pressure	Filtration [μm]
Cartridge type disc	SFA100/200/300	Max. 144 psi [0.99 MPa] (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency 99.99%)
Cartridge type straight	SFB100	Max. 144 psi [0.99 MPa] (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency 99.99%)
Disposable type straight	SFB300	Max. 144 psi [0.99 MPa] (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency 99.99%)
Disposable type multiple disc	SFC100	Max. 144 psi [0.99 MPa] (Vacuum: 1.3×10^{-6} kPa)	0.01 (Filtration efficiency 99.99%)

Clean Gas Strainer **SFB200**



Type	Series	Operating pressure	Filtration [μm]
Cartridge type straight	SFB200	Max. 144 psi [0.99 MPa] (Vacuum: 1.3×10^{-6} kPa)	120

Air Preparation Filters

Clean Air Filter/Hollow Fiber Element SFD



- Built-in hollow fiber element
- Pressure drop: 4.4 psi [0.03 MPa] (Inlet pressure 102 psi [0.7 MPa], Max. flow rate)
- Compliant with the RoHS Directives regulations regarding the reduction of environmentally detrimental chemicals

Series	Type	Operating pressure	Filtration [μm]
SFD100	Disposable type (Irreplaceable element)	Max. 145 psi [1.0 MPa]	0.01 (Filtration efficiency: 99.99%)
SFD200	Cartridge type (Replaceable element)	Max. 145 psi [1.0 MPa]	0.01 (Filtration efficiency: 99.99%)

Clean Air Module LLB



- Modularized clean equipment (Reduced piping labor/Space saving)
Makes clean air easily available
- Nominal filtration rating: 0.01 μm (Filtration efficiency 99.99%)
- Wetted parts: Grease-free, Silicone-free
- Assembled in a clean room, Shipped and packed in double packaging
- 24 combinations are available.

Note) Inlet air conditions ISO 8573-1 Quality grade: Equivalent to 1.4.1 to 1.6.1

Series	Fluid	Set pressure	Flow range scfm [L/min (ANR)]
LLB3	Clean air, N ₂ gas <small>Note)</small>	7.3 to 58 psi [0.05 to 0.4 MPa]	0.2 to 3.5 [5 to 100]
LLB4	Clean air, N ₂ gas <small>Note)</small>	7.3 to 58 psi [0.05 to 0.4 MPa]	1.8 to 17.7 [50 to 500]

Air-blow Module LLB1



- Reduced piping labor/Space saving
- Compact integration of devices
- Short-pitch mounting is possible.
Compact centralized pressure control
- Parts in contact with fluid: Grease-free

Series	Fluid	Set pressure	Flow range scfm [L/min (ANR)]
LLB1	Air, N ₂ gas	7.3 to 87 psi [0.05 to 0.6 MPa] 7.3 to 51 psi [0.05 to 0.35 MPa]	Up to 3.5 [Up to 100]

Auto Drains/Differential Pressure Gauges

Auto Drain Valve AD



- Drainage is automatically discharged.

Series	Port size	Drain discharge port size
AD402	1/4, 3/8, 1/2	3/8
AD600	3/4, 1	3/4, 1

Heavy Duty Auto Drain ADH



- Easy maintenance
Easy to maintain without removing pipes
- Electric power is not required, and the wasting of air can be prevented.
Float type drain allows for automatic draining without electric power

Series	Port size	Auto drain
ADH4000	1/2	Float type

Motor Operated Auto Drain ADM



- Reliably discharges even highly viscous drainage

Series	Power consumption [W]	Port size
ADM200	4	IN 3/8, 1/2 OUT 3/8

Differential Pressure Gauge GD40



- The differential pressure at the inlet and the outlet of compressed air equipment can be viewed at a glance on the differential pressure gauge.
It is ideal for the maintenance control of filters.
- Can be easily installed by merely providing a bypass circuit
- Provided with a protective cover to prevent hazards

Series	Accuracy	Scale range
GD40	± 0.87 psi [± 0.006 MPa]	0 to 29 psi [0 to 0.2 MPa]

Modular F.R.L./Pressure Control Equipment

Modular F.R.L.

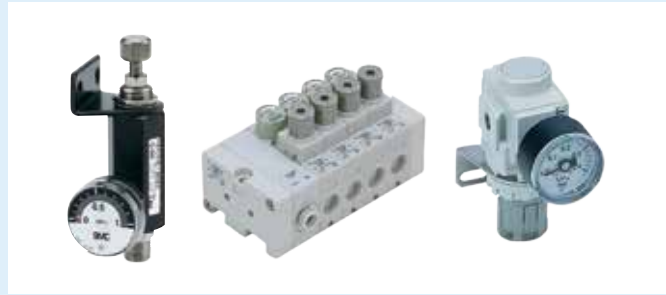
Modular F.R.L.



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Pressure Control Equipment

Regulators



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Modular F.R.L./Pressure Control Equipment

Electro-Pneumatic Regulators



- Electro-Pneumatic Regulator/
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- 5.0 MPa Maximum Supply Pressure High Pressure
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Proportional Valves



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Booster Regulators



- Booster Regulator/**VBA** P.123
- Air Tank/**VBAT** P.123

Modular F.R.L.

Modular F.R.L. Units AC-A



- Easy element replacement
The element and the bowl are integrated. Replacement can be done in hand.
- Energy-saving regulator Pressure drop: Max. 50% improvement
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.
- Attachments:
Spacer: Y200-A, Y300-A, Y400-A, Y500-A
Spacer with bracket: Y200T-A, Y300T-A, Y400T-A, Y500T-A

Combination equipment	Series	Port size	Set pressure psi [MPa]
Air filter, Regulator, Lubricator	AC10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	7.3 to 102 [0.05 to 0.7] 2.9 to 29 [0.02 to 0.2]
Filter regulator, Lubricator	AC10A to 40A-A		
Air filter, Regulator	AC10B to 40B-A		
Air filter, Mist separator, Regulator	AC20C to 40C-A	1/8, 1/4, 3/8, 1/2, 3/4	
Filter regulator, Mist separator	AC20D to 40D-A		

Air Filter AF-A



- Easy element replacement
The element and the bowl are integrated. Replacement can be done in hand.
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Filtration [μm]
AF10 to 60-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1	5

Mist Separator AFM-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]
AFM20 to 40-A	1/8, 1/4, 3/8, 1/2, 3/4	0.3

Micro Mist Separator AFD-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]
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 psi [MPa]
AR10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	7.3 to 102 [0.05 to 0.7] 2.9 to 29 [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 [cm ³]
AL10 to 60-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1	7 to 135

Filter Regulator AW-A



- Easy element replacement
The element and the bowl are integrated.
Replacement can be done in hand.
- Energy-saving regulator Pressure drop: Max. 50% improvement
- Reduced required maintenance space: Max. 46% reduction
- Better visibility & increased safety
The bowl is covered with a transparent bowl guard.

Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AW10 to 40-A	M5, 1/8, 1/4, 3/8, 1/2, 3/4	7.3 to 102 [0.05 to 0.7] 2.9 to 29 [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 7.3 to 102 psi [0.05 to 0.85 MPa], 2.9 to 29 psi [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 psi [MPa]
Air filter, Regulator, Lubricator	AC20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]
Filter regulator, Lubricator	AC20A to 60A-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]
Air filter, Regulator	AC20B to 60B-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]
Air filter, Mist separator, Regulator	AC20C to 40C-B	1/8, 1/4, 3/8, 1/2, 3/4	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]
Filter regulator, Mist separator	AC20D to 40D-B	1/8, 1/4, 3/8, 1/2, 3/4	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]

Regulator AR-B



Series	Port size	Set pressure psi [MPa]
AR20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [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 psi [MPa]
AR20K to 60K-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]

Modular F.R.L.

Filter Regulator **AW-B**



Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AW20 to 60-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [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 psi [MPa]	Filtration [μm]
AW20K to 60K-B	1/8, 1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85] 2.9 to 29 [0.02 to 0.2]	5

Filter Regulator **AW30/40-X2622**



- Stainless steel 316 and special temperature environment (-40°F [-40°C]) specifications
- Material of external parts: Stainless steel 316
- Ambient and fluid temperature: -40 to 176°F [-40 to 80°C]
- NACE International Standards compliant

Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AW30/40-X2622	1/4, 3/8, 1/2, 3/4	7.3 to 123 [0.05 to 0.85]	5

Mist Separator Regulator **AWM**



Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AWM20 to 40	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]	0.3

Micro Mist Separator Regulator **AWD**



Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AWD20 to 40	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]	0.01

Modular F.R.L.

Modular Type F.R.L. Unit **ACG**



- Improves the visibility of pressure gauges located in various locations

Combination equipment	Series	Port size	Set pressure psi [MPa]
Air filter, Regulator with built-in pressure gauge, Lubricator	ACG20 to 40	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]
Filter regulator with built-in pressure gauge, Lubricator	ACG20A to 40A	1/8, 1/4, 3/8, 1/2	
Air filter, Regulator with built-in pressure gauge	ACG20B to 40B	1/8, 1/4, 3/8, 1/2	
Air filter, Mist separator, Regulator with built-in pressure gauge	ACG20C to 40C	1/8, 1/4, 3/8, 1/2	
Filter regulator with built-in pressure gauge, Mist separator	ACG20D to 40D	1/8, 1/4, 3/8, 1/2	

Regulator with Built-in Pressure Gauge **ARG**



- Improves the visibility of pressure gauges located in various locations

Series	Port size	Set pressure psi [MPa]
ARG20 to 40	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]

Regulator with Built-in Pressure Gauge with Backflow Function **ARG□K**



- Improves the visibility of pressure gauges located in various locations

Series	Port size	Set pressure psi [MPa]
ARG20K to 40K	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]

Filter Regulator with Built-in Pressure Gauge **AWG**



- Improves the visibility of pressure gauges located in various locations

Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AWG20 to 40	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]	5

Filter Regulator with Built-in Pressure Gauge with Backflow Function **AWG□K**

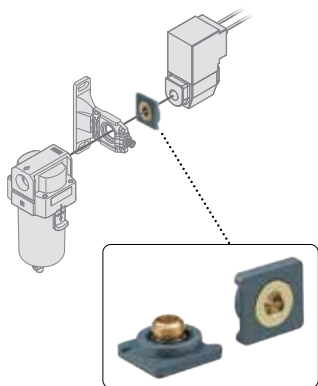


- Improves the visibility of pressure gauges located in various locations

Series	Port size	Set pressure psi [MPa]	Filtration [μm]
AWG20K to 40K	1/8, 1/4, 3/8, 1/2	7.3 to 123 [0.05 to 0.85]	5

Modular F.R.L.

Modular Adapter E210/310/410



- Can be easily connected to current products
- Can be freely rotated, thus allowing a wide selection of mounting directions
- Can be connected to current products of different sizes
- Reduced required space/piping maintenance costs

Series	Port size	Applicable products
E210	1/8, 1/4	Modular F.R.L. equipment (Filters, regulators, lubricators, etc.) 2 port solenoid valve 3 port solenoid valve
E310	1/4, 3/8	
E410	1/4, 3/8, 1/2	

Conforming to OSHA Standard: Pressure Relief 3 Port Valve with Locking Holes VHS20/30/40/50

For pressure relief



- Compliant with OSHA Standards (Occupational Safety and Health Administration Department of Labor)
- Manually operated valve that can be used to prevent accidents caused by residual pressure in pneumatic lines
- It is possible to verify the supply and exhaust status of air flow at a glance.
- When in the exhaust position, the valve can be padlock secured. This prevents accidental start-ups while personnel are cleaning or servicing equipment.
- Push the knob and then turn. This 2-step action prevents malfunctions.

Series	Description	Knob operation	Port size
VHS20	Pressure relief 3 port valve with locking holes	Single action	1/8, 1/4
VHS30			1/4, 3/8
VHS40			1/4, 3/8, 1/2, 3/4
VHS50		Double action	3/4, 1
VHS2510		1/8, 1/4	
VHS3510		1/4, 3/8	
VHS4510		1/4, 3/8, 1/2, 3/4	
VHS5510		3/4, 1	

Soft Start-up Valve AV



- A starting valve that can supply air at a low speed and exhaust it at a high speed by blocking the air supply

Series	Port size	Operating pressure psi [MPa]
AV2000 to 5000	1/4, 3/8, 1/2	14.5 to 145 psi [0.1 to 1]

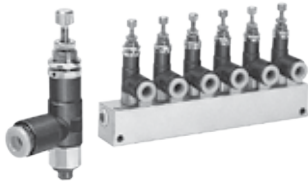
Large Flow Air Filter AF



Series	Port size	Filtration [μm]
AF800/900	1 1/4, 1 1/2, 2	5

Regulators

Miniature Regulator **ARJ1020F**



- Compact and lightweight (16 g)
- Low cracking pressure: 2.9 psi [0.02 MPa]
- Standard model comes equipped with backflow function.
- Manifold base (Option)

Series	Features	Port size	Set pressure
ARJ1020F	Direct operated relieving type with backflow function	M5	15 to 102 psi [0.1 to 0.7 MPa]

Miniature Regulator **ARJ210**



- Lightweight with an aluminum body (60g)

Series	Features	Port size	Set pressure
ARJ210	Direct operated relieving type	Male thread: 1/8 Female thread: M5 x 0.8	29 to 102 psi [0.2 to 0.7 MPa]

Miniature Regulator **ARJ310**



- Compact and lightweight (Body 65 g)
- Short-pitch mounting is possible: Mounting pitch 18.5 mm
- Series with One-touch fittings

Series	Features	Port size	Set pressure
ARJ310	Direct operated relieving type	IN: 1/8 (Male thread), M5 x 0.8 (Female thread) OUT: 1/8 (Female thread)	29 to 102 psi [0.2 to 0.7 MPa]

Pilot Operated Regulator **AR**



- Internal pilot-operated relieving type

Series	Port size	Set pressure psi [MPa]
AR425 to 925	1/4, 3/8, 1/2, 3/4, 1 1/4, 1 1/2, 2	7.3 to 120 [0.05 to 0.83]
AR435 to 935	1/4, 3/8, 1/2, 3/4, 1 1/4, 1 1/2, 2	2.9 to 29 [0.02 to 0.2]

Compact Regulator **ARX**



- Compatible with inlet supply pressures of 290 psi [2.0 MPa]
- Ideal for discharge pressure adjustment on small compressors
- Piston type
- Ideal for the pressure adjustment of air blowing applications

Series	Port size	Set pressure psi [MPa]
ARX20	1/4, 1/8	7.3 to 123 [0.05 to 0.85]

Regulators

MR Unit (Regulator with Mist Separator) **AMR**



- Integrated mist separator and regulator
- Filtration: 0.3 μm.

Series	Port size	Set pressure psi [MPa]
AMR	1/4, 3/8, 1/2, 3/4, 1	7.3 to 123 [0.05 to 0.85]

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 psi [MPa]
			Metric size	Inch size	
ARM5A	Manifold specifications	Common air supply	ø4, ø6, ø8	ø5/32, ø1/4, ø5/16	7.3 to 102 psi [0.05 to 0.7]
ARM5B	Manifold specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	
ARM5S	Single unit specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	

Compact Manifold Regulator **ARM10/11**



- Free selection in response to positioning conditions
Knob positions: Top/Front/Bottom
Piping directions: Up/Down
One-touch fitting types: Straight/Elbow
- Types and sizes of One-touch fittings can be changed.
- Standard model comes equipped with backflow function.
- Compatible with digital pressure switches

Series	Model	Features	Applicable tubing bore size		Set pressure psi [MPa]
			Metric size	Inch size	
ARM11A	Manifold specifications	Common air supply	ø4 to ø10	ø5/32 to ø3/8	7.3 to 102 psi [0.05 to 0.7]
ARM11B	Manifold specifications	Individual air supply	ø4, ø6	ø5/32, ø1/4	
ARM10	Single unit specifications	Standard	ø4, ø6	ø5/32, ø1/4	
ARM10F	Single unit specifications	Knob front face	ø4, ø6	ø5/32, ø1/4	

Manifold Regulator **ARM1000/2000**



- With a ø15 compact pressure gauge (Option)
- Standard model comes equipped with backflow function.

Series	Features	Port size	Set pressure psi [MPa]
ARM1000, 2000	Manifold (Common IN, Individual IN) Direct operated relieving type With backflow function	1/8	7.3 to 102 [0.05 to 0.7]

Manifold Regulator **ARM2500/3000**



- A modular type that can be freely mounted on a manifold station
- Optimal for central pressure control
- Uses a One-touch lock handle

Series	Features	Port size	Set pressure [MPa]
ARM2500, 3000	Manifold (Common IN, Individual IN) Modular type	1/4, 3/8	7.3 to 123 [0.05 to 0.85]

Regulators

Direct Operated Precision Regulator **ARP**



- Setting sensitivity: Within 0.2% F.S.
- Energy saving: Reduces air consumption by 80% (SMC comparison)
- Repeatability: Within $\pm 1\%$ F.S. (or within ± 0.44 psi [± 3 kPa])
- With backflow function (ARP20K/30K/40K)
Can be mounted between a solenoid valve and a cylinder

Series	Port size	Set pressure range
ARP20 (K)	1/8, 1/4	0.73 to 58 psi [0.005 to 0.4 MPa]
ARP30 (K)	1/4, 3/8	0.73 to 29 psi [0.005 to 0.2 MPa]
ARP40 (K)	1/4, 3/8, 1/2	0.73 to 87 psi [0.005 to 0.6 MPa]

Regulator **IR1200-A/2200-A/3200-A**



- Air consumption: Bleed air "0"
- High flow rate: Up to approx. twice that of the current SMC product
- Lightweight: Reduced by up to approx. 27% (Compared to the current SMC product)
- Repeatability: $\pm 1\%$ (Full span)

Series	Port size	Set pressure psi [MPa]
IR1200-A	1/8	2.9 to 29 [0.02 to 0.2]
		2.9 to 58 [0.02 to 0.4]
		2.9 to 116 [0.02 to 0.8]
IR2200-A	1/4	2.9 to 29 [0.02 to 0.2]
		2.9 to 58 [0.02 to 0.4]
		2.9 to 116 [0.02 to 0.8]
IR3200-A	1/4, 3/8, 1/2	2.9 to 29 [0.02 to 0.2]
		2.9 to 58 [0.02 to 0.4]
		2.9 to 116 [0.02 to 0.8]

Precision Regulator **IR1000-A/2000-A/3000-A**



- Air consumption: Reduced by up to approx. 90% (Compared to the current SMC product)
- High flow rate: Up to approx. twice that of the current SMC product
- Lightweight: Reduced by up to approx. 27% (Compared to the current SMC product)
- Sensitivity: 0.2% (Full span)
- Repeatability: $\pm 0.5\%$ (Full span)

Series	Port size	Set pressure psi [MPa]
IR1000-A	1/8	0.73 to 29 [0.005 to 0.2]
		1.45 to 58 [0.01 to 0.4]
		1.45 to 116 [0.01 to 0.8]
IR2000-A	1/4	0.73 to 29 [0.005 to 0.2]
		1.45 to 58 [0.01 to 0.4]
		1.45 to 116 [0.01 to 0.8]
IR3000-A	1/4, 3/8, 1/2	1.45 to 29 [0.01 to 0.2]
		1.45 to 58 [0.01 to 0.4]
		1.45 to 116 [0.01 to 0.8]

Precision Regulator **IR**



- Tension control
- Contact pressure control
- Setting sensitivity: Within 0.2% F.S.
- Repeatability: Within $\pm 0.5\%$ F.S.

Series	Port size	Set pressure psi [MPa]
IR1000	1/8	0.73 to 29 [0.005 to 0.2]
IR2000	1/4	1.45 to 58 [0.01 to 0.4]
		1.45 to 116 [0.01 to 0.8]
IR3000	1/4, 3/8, 1/2	1.45 to 29 [0.01 to 0.2]
		1.45 to 58 [0.01 to 0.4]
		1.45 to 116 [0.01 to 0.8]

Regulators

Vacuum Regulator IRV



- Allows for the adjustment of vacuum line pressure
- Single-sided connection series
- Weight reduced by 20% (Compared with the current 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 psi [kPa]
IRV10	ø6, ø8, ø1/4, ø5/16	-14.5 to 0.19 [-100 to -1.3]
IRV20	ø6, ø8, ø10, ø1/4, ø5/16, ø3/8	-14.5 to 0.19 [-100 to -1.3]

Power Valve/Precision Regulator VEX



- Large-capacity exhaust regulator
- Sensitivity: Within 0.2% F.S.
- Repeatability: Within ±0.5% F.S.

Series	Port size	Set pressure range psi [MPa]
VEX1A33, 1B33	M5, 1/8	14.5 to 102 [0.01 to 0.7]
VEX1□30, 1□33	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2	7.3 to 102 [0.05 to 0.7]

Clean Regulator SRH



- Contamination-controlled stainless steel regulator
- Oil-free
- 2 types of diaphragm materials: PTFE, Fluororubber

Series	Relief mechanism	Port size	Set pressure psi [MPa]
SRH	Non-relief	Rc1/8, 1/4, 3/8, 1/2 9/16-18UNF, 7/8-14UNF	Low pressure type: 2.9 to 29 [0.02 to 0.2]
SRH	Relief	Rc1/8, 1/4, 3/8, 1/2	High pressure type: 7.3 to 102 [0.05 to 0.7]

Precision Clean Regulator SRP



- High-precision low flow consumption stainless steel regulator
- Bleed air flow of 0.02 scfm [0.5 L/min] (ANR) or less (29 psi [0.2 MPa] at outlet pressure)
- Setting sensitivity: 0.3% F.S.
- Repeatability: 1% F.S.

Series	Port size	Set pressure psi [MPa]
SRP	M5, 1/8	Low pressure type: 0.7 to 29 [0.005 to 0.2] High pressure type: 15 to 58 [0.01 to 0.4]

Clean Regulator/Fluororesin Type SRF



- Wetted parts Body: New PFA, Diaphragm: PTFE
- Recommended maximum flow rate: 5.3 gal/min [20 L/min] (SRF50), (44 psi [0.3 MPa] at inlet pressure, fluidization)

Series	Type	Applicable tubing O.D.		Set pressure psi [MPa]
		Metric size	Inch size	
SRF	Integrated with fitting	ø4 to ø19	ø1/8 to ø3/4	2.9 to 58 [0.02 to 0.4]
SRF	With nut	Fitting size: 2 to 6	Fitting size: 2 to 6	2.9 to 58 [0.02 to 0.4]
SRF	Tube extension	—	Tubing O.D.: ø1/4 to ø3/4	2.9 to 58 [0.02 to 0.4]

Regulators

Direct Operated Regulator for 870 psi [6.0 MPa] (Relieving Type)



- Service life: 10 million times
Improved durability in high-pressure environments using a polyurethane elastomer poppet
- Uses NSF-H1 approved grease on guide rings (sliding parts)
- Improved durability using a metal seal type relief valve
- Uses special fluororesin seals for sliding parts
Stable unattached response, Not easily affected by pressure

Series	Model	Type	Port size	Set pressure psi [MPa]
VCHR	VCHR30/40	Direct operated regulator (Relieving type)	G3/4, 1, 1 1/2	73 to 725 [0.5 to 5.0] (Max. operating pressure: 870 [6.0])

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
- Multiple port types are available.
Select from compression, NPT female, or Rc thread.

Series	Type	Body material	Connection type	Connection size
AK1000T	Manually operated type	316 SS	Compression Rc, NPT	1/4", 3/8"

Water Regulator WR110



- Pressure adjustment for water lines

Series	Port size	Set pressure psi [MPa]
WR110-□-X224	Rc1/8, 1/4	11.6 to 56.5 [0.08 to 0.39]
WR110-□-X215	Rc1/8, 1/4, NPT1/8, 1/4	7.3 to 100 [0.05 to 0.69]

Water Strainer WF300



- Removes foreign matter from water lines

Series	Port size	Mesh
WF300	Rc1/4, 3/8, 1/2	100/70/50/25 mesh

Pressure Control Valve (Relief Valve) AP100



- Releases pressure over the set range into the atmosphere and constantly maintains the pressure in a pipe

Series	Port size	Set pressure psi [MPa]
AP100	1/8, 1/4	7.3 to 100 [0.05 to 0.69]

Electro-Pneumatic Regulators

Electro-Pneumatic Regulator **ITV**



- Stepless control of air pressure in proportion to electrical signals
- Sensitivity: 0.029 psi [0.2 kPa] (15 psi [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 psi [MPa]
ITV0000	Built-in One-touch fitting ø4, ø5/32	0.15 to 15 [0.001 to 0.1]
		0.15 to 73 [0.001 to 0.5]
		0.15 to 131 [0.001 to 0.9]
		-0.15 to -15 [-1 to -100 kPa]
ITV1000	1/8, 1/4	0.73 to 15 [0.005 to 0.1]
ITV2000	1/4, 3/8	0.73 to 73 [0.005 to 0.5]
ITV3000	1/4, 3/8, 1/2	0.73 to 131 [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 psi [MPa]
ITV009□	ø4, ø5/32 One-touch fitting	-145 to -14503 [-1 to -100]
ITV209□	1/4	-189 to -11603 [-1.3 to -80]

Controller for Electro-Pneumatic Regulator **IC**



- Is mainly used integrated with the ITV0000 series which is not equipped with a display function
- Converts digital input signals into analog output signals
- 10 bit parallel input signal (maximum)
Possible pressure setting of $2^{10} = 1024$ points
- 4-point preset output
Applicable to programming functions with up to 20 steps

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



- Stepless control of air pressure proportional to electrical signals
- Maximum supply pressure: 73 psi [5.0 MPa]
- Set pressure range: 1.45 to 435 psi [0.01 to 3.0 MPa]
- Maximum flow rate: 106 scfm [3000 L/min (ANR)]
- Fluid: Air, N₂, O₂, Ar
- Wetted parts: Fluorine grease

Series	Port size	Set pressure psi [MPa]
ITVX	3/8	1.45 to 435 [0.01 to 3.0]

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



- Maximum supply pressure: 435 psi [3.0 MPa]
- Set pressure range: 29 to 290 psi [0.2 to 2.0 MPa]
Stepless control of air pressure up to 290 psi [2.0 MPa]
- Stability: ±1% F.S. or less
- Power consumption: 3 W or less
- Maximum flow rate: 106 scfm [3,000 L/min (ANR)]
- Wetted parts: Fluorine grease

Series	Port size	Set pressure psi [MPa]
ITVH	1/4, 3/8	29 to 290 [0.2 to 2.0]

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 cfm [L/min]	Fluid
PVQ	0 to 0.18 [0 to 5]	Air, inert gas
	0 to 0.21 [0 to 6]	
	0 to 2.65 [0 to 75]	
	0 to 3.53 [0 to 100]	

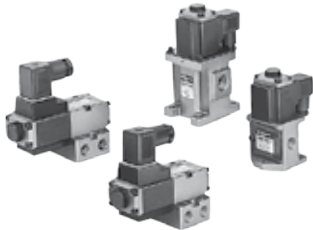
E-P HYREG® **VY1**



- Stepless control of pressure by use of electrical signals
- Thrust control of cylinders
- Flow control of nozzles
- Pressure control of tanks

Series	Port size	Set pressure psi [MPa]
VY1	M5 x 8	7.3 [0.05] to supply pressure
	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2	

Electro-Pneumatic Proportional Valve **VEF/VEP**



- Stepless control of air flow or pressure by use of electrical signals
- Press-die cushions
- Pressure control of welding machines and low-pressure casting
- Multi-stage speed control of air cylinders and rotation control of air motors

Series	Port size
VEF/VEP	1/4, 3/8, 1/2

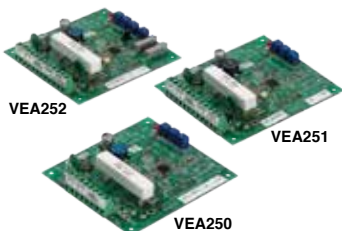
5 Port Electro-Pneumatic Proportional Valve **VER**



- Stepless control of cylinders and applied pressure
- Applicable cylinders: ø25 to ø125
- Available for exhaust throttle and B port pressure regulation

Series	Port size	Set pressure psi [MPa]
VER2000/4000	1/4, 3/8, 1/2	15 to 131 [0.1 to 0.9]

Power Amplifier for Electro-Pneumatic Proportional Valve **VEA**



- Dedicated amplifier for driving an electro-pneumatic proportional valve
- Low-current command signal
- High dither effect
- Stabilizes the performance of the electro-pneumatic proportional valve

Series
VEA250
VEA251
VEA252

Booster Regulators

Booster Regulator **VBA**



- Can increase factory air by a maximum of 200%, Power supply not required
It is possible to get a maximum of double the existing pressure by connecting the air to a factory line.
(VBA11A: maximum 4 times)
- Space-saving type that directly connects air tanks and booster regulators

Series	Port size	Set pressure psi [MPa]
VBA	1/4, 3/8, 1/2	VBA1□A: 29 to 290 [0.2 to 2.0] VBA2□A: 29 to 145 [0.2 to 1.0] VBA4□A: 29 to 145 [0.2 to 1.0] VBA43A: 29 to 232 [0.2 to 1.6]

Air Tank **VBAT**



- Compact air tank that can be directly connected to a regulator
- Can be used as an independent tank
- With a safety valve port (Option)
- Overseas standards compliant products:
 - CE certified product (-Q)
 - Product not applicable to ASME Standards (-X11)
 - Chinese pressure vessel regulations compliant product (-X104)
 - Industrial Safety and Health Act compliant product (-X101)

Series	Port size	Tank capacity [L]
VBAT	3/8, 1/2, 3/4	5, 10, 20, 38

Lubrication Equipment



Large Flow Lubricator/ AL800/900	P.125
Auto Feed Lube, Auto Feed Tank/ ALF400 to 900/ALT-5, -9	P.125
Related Product: Oil Distributor/ VA, VB , Nylon Tubing ·	P.125
D.P. Lube/ ALD600/900	P.125
Booster Lube/ ALB900	P.125
Mist Spray Unit/ LMU100/200	P.125
Related Product: Mixing Valve/ LMV	P.125
Related Product: Magnet Holder/ LMH	P.125
Related Product: Branch Pipe/ LMD	P.125
Impulse Lubricator/ ALIP1000/1100	P.126
<Liquid Collectors>	
Liquid Collector/Exhaust Pressure Type/ AEP100 ·	P.126
Liquid Collector/Ejector Type/ HEP500	P.126

Lubrication Equipment

Large Flow Lubricator **AL**



- Individual lubrication
- Large capacity type

Series	Port size	Bowl capacity [cm ³]
AL800/900	1 1/4, 1 1/2, 2	440, 1000

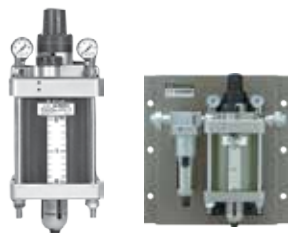
Auto Feed Lube, Auto Feed Tank **ALF/ALT**



- Reduces maintenance labor with an auto-lubrication function

Series	Type	Port size	Bowl capacity [cm ³]
ALF400 to 900	—	1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2	5000, 9000
ALT	Tank	Air: 1/4 Oil: 3/8	5000, 9000
VA, VB	Oil distributor	ø6	Number of distribution ports: 4, 6, 8, 10, 16

D.P. Lube **ALD**



- Centralized control of multi-point lubrication
- Less lubricant consumption
- Simplified oil feeding volume setting in which only the pressure differential is adjusted
- Oil can be replenished by merely opening and closing the oil filler plug without stopping the air line.
- Micromist generation can be checked from the oil filler port.

Series	Type	Port size	Bowl capacity [cm ³]
ALD600/900	Single product	3/4, 1, 1 1/4, 1 1/2, 2	2000, 5000
ALDU600/900	Unit	3/4, 1, 1 1/4, 1 1/2, 2	2000, 5000

Booster Lube **ALB**



- Centralized control of multi-point lubrication
- Stable oil feeding with a micromist
- Through the use of a booster, a pressure that is higher than that of the main air passage can be supplied. This difference is used as the mist generating pressure differential. Thus, the pressure drop in the main air passage can be minimized.
- Micromist can be constantly supplied by merely adjusting the mist generating pressure differential.
- Oil can be replenished by merely opening and closing the oil filler plug without stopping the air line.
- Micromist generation can be checked from the oil filler port.

Series	Type	Port size	Bowl capacity [cm ³]
ALB900	Booster lube	1, 2, 3	5000
ALBA90	Bypass lubrication adapter	1/4, 1/2	—

Mist Spray Unit **LMU**



Series	Type
LMU	Mist spray unit
LMV	Mixing valve
LMH	Magnet holder
LMD	Branch pipe

Lubrication Equipment

Impulse Lubricator **ALIP**



- Supplies a set volume of oil just before the supply point
It is possible to supply a constant volume of lubricating oil to circuits that are difficult for oil to reach, or to places with little air consumption.

Series	Type	Port size	Feeding volume/cycle [cm ³]
ALIP	Pressure type	1/8	0 to 0.04
ALT10	Oil tank	Air: 1/8 Oil: 1/4	Tank capacity: 160 cm ³
ALT20	Oil tank		Tank capacity: 1000 cm ³

Liquid Collector/Exhaust Pressure Type **AEP100**



- Collect and reuse the leaked lubricating oil or hydraulic fluid using exhaust pressure.
- Collect the liquids using only the exhausted air released from the switching valve, Realizes energy saving
- Efficient operation that eliminates the need for collection and wiping by hand.

Liquid Collector/Ejector Type **HEP500**



- Collects the leakage of expensive cutting and grinding oil
- Eliminates the need to collect the leaked liquids by hand
- It is possible to use the equipped pump. A special driving force is not required.

Fittings and Tubing

■ Fittings for General Purposes



One-touch Fittings/ KQ2	P.129
Uni One-touch Fittings/ KQ2 Uni	P.129
Metal One-touch Fittings/ KQB2	P.129
Rotary One-touch Fittings/ KS/KX	P.129
One-touch Fittings Manifold/ KM	P.130
Insert Fittings/ KF	P.130
Miniature Fittings/ M (ø2, ø3.2, ø4, ø6).....	P.130
Self-align Fittings/ H/DL/L/LL	P.130
Self-seal Fittings/ KC	P.131

■ Fittings for General Purposes (S Couplers/Multi-connectors)



S Couplers/ KK/KKH	P.131
S Couplers/ KK130	P.131
Multi-connector/ DM	P.131
Multi-connector with One-touch Fittings/ DMK	P.131
Rectangular Multi-connector/ KDM	P.132
Piping Module/ KB	P.132

■ Fittings for Special Environments



FR One-touch Fittings/ KR-W2	P.132
FR One-touch Fittings Manifold/ KRM	P.132
Antistatic One-touch Fittings/ KA	P.133
Stainless Steel 316 One-touch Fittings/ KQG2	P.133
Stainless Steel One-touch Fittings/ KQ2-G	P.133
One-touch Fittings/ KG	P.133
Stainless Steel 316 Insert Fittings/ KFG2	P.133
Miniature Fittings/ MS	P.134
S Couplers Stainless Steel Type/ KKA	P.134
Low Torque Rotary Joint/ MQR	P.134
Rubber Seal Rotary Joint/ MQR-X229	P.134

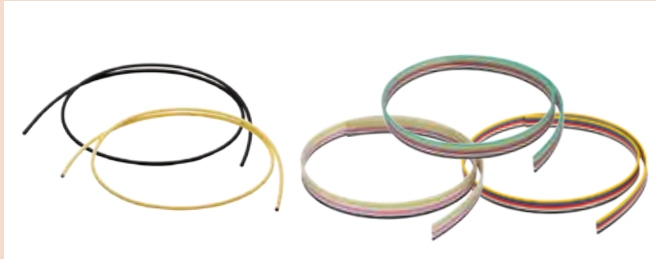
■ Fittings for Special Environments (Clean/Fluoropolymer)



Clean One-touch Fittings/ KP	P.135
Clean One-touch Fittings/ KPQ/KPG	P.135
Fluoropolymer Fittings/ LQ1	P.135
Fluoropolymer Fittings/ LQ3	P.135
Fluoropolymer Bore Through Connector/ LQHB	P.135

Fittings and Tubing

Tubing



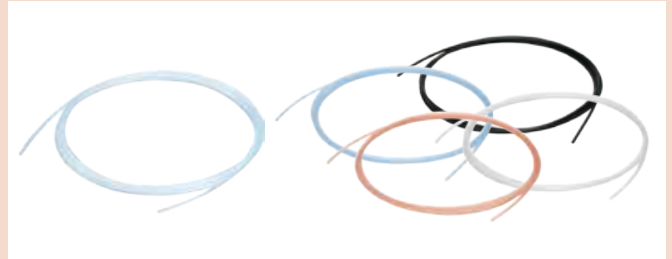
Nylon Tubing/ T	P.136
Soft Nylon Tubing/ TS	P.136
Polyurethane Tubing/ TU	P.136
Polyurethane Flat Tubing/ Multi-core, Multi-color/ TU	P.136
Soft Polyurethane Tubing/ TUS	P.136
Soft Polyurethane Flat Tubing/ Multi-core, Multi-color/ TUS	P.137
Hard Polyurethane Tubing/ TUH	P.137
Wear Resistant Tubing/ TUZ	P.137
Wear Resistant Flat Tubing/ Multi-core, Multi-color/ TUZ	P.137
Polyurethane Coil Tubing/ TCU	P.137
Polyurethane Flat Tubing/ TFU	P.138
Compatible with Food Sanitation Law: Polyurethane Tubing/ TU-X217	P.138

Tubing (Tubing for Special Environments)



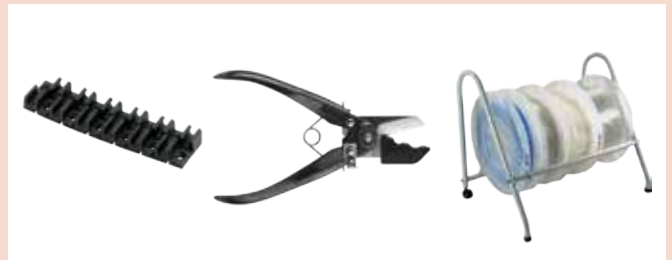
FR Soft Nylon Tubing/ TRS	P.138
FR Double Layer Tubing/ TRB	P.138
FR Double Layer Polyurethane Tubing/ TRBU	P.138
Double Layer Tube Stripper/ TKS	P.139
FR Three-layer Polyurethane Tubing/ TRTU	P.139
2-Layer Soft Fluoropolymer Tubing/ TQ	P.139
Antistatic Tubing/ TA	P.139

Tubing (Fluoropolymer/Clean)



Fluoropolymer Tubing/ TL	P.140
Fluoropolymer Tubing (PFA)/ TLM	P.140
FEP Tubing (Fluoropolymer)/ TH	P.140
Soft Fluoropolymer Tubing (Modified PTFE)/ TD	P.140
Clean Series Tubing/ 10-T	P.141
Polyolefin Tubing/ TPH	P.141
Soft Polyolefin/ TPS	P.141
Moisture Control Tube/ IDK	P.142

Related Products



Multi-tube Holder/ TM	P.142
Multi-holder/ TMA	P.142
Tube Cutter/ TK	P.142
Tube Releasing Tool/ TG	P.142
Tube Stand & Tube Reel/ TB/TBR	P.142

Fittings for General Purposes

One-touch Fittings **KQ2**

Applicable tubing: Metric size



Applicable tubing: Inch size



- Can be used in vacuum to -14.5 psi [-100 kPa]
- 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 51 models
- Thread material/Surface treatment (Treated or Non-treated): 2 types
- Selectable surface treatments: Brass (No plating), Electroless nickel-plated brass

Series	Seal method	Size	Applicable tubing O.D.	Connection thread
KQ2	Sealant/ Gasket seal	Metric	$\phi 2, \phi 3.2, \phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	M3 x 0.5, M5 x 0.8, M6 x 1.0 R, Rc 1/8, 1/4, 3/8, 1/2
KQ2	Sealant/ Gasket seal	Inch	$\phi 1/8", \phi 5/32", \phi 3/16", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	10-32UNF NPT 1/16, 1/8, 1/4, 3/8, 1/2
KQ2	Sealant/ Gasket seal	Inch	$\phi 1/8", \phi 3/16", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	M5 x 0.8 R, Rc 1/8, 1/4, 3/8, 1/2
KQ2	Face seal	Metric	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	G1/8, 1/4, 3/8, 1/2
KQ2	Face seal	Metric	$\phi 3.2, \phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	R, Rc 1/8, 1/4, 3/8, 1/2
KQ2	Face seal	Inch	$\phi 1/8", \phi 5/32", \phi 3/16", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	NPT 1/16, 1/8, 1/4, 3/8, 1/2
KQ2	Face seal	Inch	$\phi 1/8", \phi 5/32", \phi 3/16", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	R1/8, 1/4, 3/8, 1/2
KQ2	Gasket seal	Metric	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	Uni 1/8, 1/4, 3/8, 1/2
KQ2	Gasket seal	Inch	$\phi 1/8", \phi 5/32", \phi 3/16", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	Uni 1/8, 1/4, 3/8, 1/2

Metal One-touch Fittings **KQB2**



- Compact and lightweight
- Fluid temperature: 23 to 302°F [-5 to 150°C]
- Brass parts: Electroless nickel-plated
- Grease-free

Series	Size	Applicable tubing O.D.	Connection thread
KQB2	Metric	$\phi 3.2, \phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	M5 R, Rc, G 1/8, 1/4, 3/8, 1/2
KQB2	Inch	$\phi 1/8", \phi 5/32", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	UNF10-32 NPT1/8, 1/4, 3/8, 1/2

Rotary One-touch Fittings **KS/KX**

Applicable tubing: Metric size



- Applicable to use for oscillating and rotating sections in robots
- Low torque rotation type rotary One-touch fittings
- Copper-free (Electroless nickel-plated)

Series	Size	Applicable tubing O.D.	Connection thread
KS	Metric	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12$	M5 x 0.8, M6 x 1.0 1/8, 1/4, 3/8, 1/2
KX (High speed type)	Metric	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12$	M5 x 0.8, M6 x 1.0 1/8, 1/4, 3/8, 1/2

Rotary One-touch Fittings **KS**

Applicable tubing: Inch size



- Applicable to use for oscillating and rotating sections in robots
- Low torque rotation type rotary One-touch fittings
- Copper-free (Electroless nickel-plated)

Series	Size	Applicable tubing O.D.	Connection thread
KS	Inch	$\phi 5/32, \phi 1/4, \phi 5/16, \phi 3/8$	10-32UNF, 1/8, 1/4, 3/8

Fittings for General Purposes

One-touch Fittings Manifold **KM**

Applicable tubing: Metric size



Applicable tubing: Inch size



- Compact manifold piping is possible.

Series	Size	Applicable tubing O.D.	Connection thread
KM	Metric	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
KM	Inch	ø5/32", ø1/4", ø5/16", ø3/8", ø1/2"	1/4, 3/8

Insert Fittings **KF**



- Vacuum 1.3×10^{-2} kPa applicable
- Piping can be done without removing the nut.
- Fluid temperature: 23 to 302°F [-5 to 150°C] (Brass sleeve)
23 to 140°F [-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
M	ø3.2, ø4, ø6	M3, M5, 1/8

Self-align Fittings **H/DL/L/LL**



- Applicable for use on soft copper steel pipes
- Flared ridge metal ferrule

Series	Applicable tubing O.D.	Connection thread
H	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
DL	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
L	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2
LL	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2

Fittings for General Purposes

Self-seal Fittings **KC**



- One-touch installation and removal
- Built-in self-sealing mechanism
- Air does not exhaust after the removal of tubing.
- Copper-free (Electroless nickel-plated)

Series	Applicable tubing O.D.	Connection thread
KC	ø4, ø6, ø8, ø10, ø12	M5 x 0.8, 1/8, 1/4, 3/8, 1/2

Fittings for General Purposes (S Couplers/Multi-connectors)

S Couplers **KK/KKH**



- One-touch fitting type standardized (KK)
- Uses ultra high-impact PBT resin (KKH)

Series	Applicable tubing O.D.	Connection thread
KK	ø3.2, ø4, ø6, ø8, ø10, ø12, ø16	M5 x 0.8, 1/8, 1/4, 3/8, 1/2, 3/4
KKH	—	1/8, 1/4, 3/8, 1/2

S Couplers **KK130**



- Cv factor: Increased by 34%*
 - Plug insertion force: Reduced by 22% (4.5 lbf [20 N])*
 - Lightweight: Weight reduced by 14% (12 g)*
- * Compared to the current 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

Multi-connector **DM**



- One-touch installation and removal of multi-tubes
- Prevents installation mistakes

Series	No. of connecting tubes	Applicable tubing O.D.
DM	6, 12	ø4, ø6

Multi-connector with One-touch Fittings **DMK**



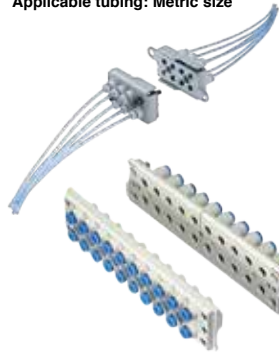
- One-touch installation and removal of multi-tubes
- Prevents installation mistakes

Series	No. of connecting tubes	Applicable tubing O.D.
DMK	6, 12	ø3.2, ø4

Fittings for General Purposes (S Couplers/Multi-connectors)

Rectangular Multi-connector **KDM**

Applicable tubing: Metric size



- One-touch installation and removal of multi-tubes
- Prevents installation mistakes
- Built-in One-touch fittings

Series	No. of connecting tubes	Size	Applicable tubing O.D.
KDM6 (-X955)	6	Metric	ø2
KDM	10, 20	Metric	ø3.2, ø4, ø6, ø8
KDM	10, 20	Inch	ø1/8, ø5/32, ø1/4, ø5/16
KDM (-X1053)	6, 10, 20	Metric	ø10, ø12

Applicable tubing: Inch size



Piping Module **KB**



- Centralized distribution of supply air
- One-touch installation and removal without the use of tools
- 360° air output is possible.

Series	Applicable tubing O.D.	Connection thread
KB	ø4, ø6, ø8, ø10, ø12, ø16	1/8, 1/4, 3/8, 1/2

Fittings for Special Environments

FR One-touch Fittings **KR-W2**



- For use where weld spatter is generated/Flame resistant (Equivalent to UL-94 Standard V-0)

Series	Applicable tubing O.D.	Connection thread
KR-W2	ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2

FR One-touch Fittings Manifold **KRM**



- For use where weld spatter is generated/Flame resistant (Equivalent to UL-94 Standard V-0)

Series	Applicable tubing O.D.	Connection thread
KRM	ø6, ø8, ø10, ø12	1/4, 3/8

Fittings for Special Environments

Antistatic One-touch Fittings **KA**



- Surface resistance: $10^4\Omega$ to $10^7\Omega$
- For preventing static electricity
- Body: Conductive resin used for seal parts
- Copper-free (Electroless nickel-plated)
- Uni-thread

Series	Applicable tubing O.D.	Connection thread
KA	$\phi 3.2, \phi 4, \phi 6, \phi 8, \phi 10, \phi 12$	M5 x 0.8, M6 x 1.0, Standard Uni thread 1/8, 1/4, 3/8, 1/2

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



- Compact and lightweight
 - Fluid temperature: 23 to 302°F [-5 to 150°C]
 - Materials: Metal parts stainless steel 316, seal parts special FKM
 - Grease-free/Can be used with steam
- Certified to meet current Food Sanitation Law standards

Series	Size	Applicable tubing O.D.	Connection thread
KQG2	Metric	$\phi 3.2, \phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	M5 R, Rc 1/8, 1/4, 3/8, 1/2
KQG2	Inch	$\phi 1/8", \phi 5/32", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	UNF10-32 NPT1/8, 1/4, 3/8, 1/2

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	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	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	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	M5 x 0.8, M6 x 1.0 1/8, 1/4, 3/8, 1/2

Stainless Steel 316 Insert Fittings **KFG2**



- Compact and lightweight
 - Fluid temperature: -85 to 500°F [-65 to 260°C] (Swivel elbow: 23 to 302°F [-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 Act standards

Series	Size	Applicable tubing O.D.	Connection thread
KFG2	Metric	$\phi 4, \phi 6, \phi 8, \phi 10, \phi 12, \phi 16$	R, Rc 1/8, 1/4, 3/8, 1/2
KFG2	Inch	$\phi 1/8", \phi 5/32", \phi 1/4", \phi 5/16", \phi 3/8", \phi 1/2"$	NPT1/8, 1/4, 3/8, 1/2

Fittings for Special Environments

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

Low Torque Rotary Joint MQR



- Metal seal type
- Supplies air to the rotary/pivot shafts of turntables and robot arms
- Low rotational torque: 0.002 to .037 lbf-ft [0.003 to 0.50 N·m] or less
- Operating temperature: 14 to 176°F [-10 to 80°C]
- Allowable rpm: 200 to 3000 min⁻¹ (rpm)

Series	Number of circuits	Port size	Operating pressure
MQR	1, 2, 4, 8, 12, 16	M5 x 0.8	-14.5 to 145 psi [-100 kPa to 1 MPa]

Rubber Seal Rotary Joint MQR-X229



- Rubber seal
 - Oldham coupling
 - Operating pressure range: -14.5 to 102 psi [-100 kPa to 0.7 MPa]
 - Allowable rpm: 200 min⁻¹ (rpm)*1
 - Max. start-up rotation torque: 0.37 lbf-ft [0.50 N·m]*2 or less
 - Service life: 10 million rotations*3
 - Number of circuits: 8 circuits
- *1 Reference value
*2 When no pressure is applied
*3 Under SMC's life test conditions

Series	Number of circuits	Port size	Operating pressure
MQR-X229	8	M5 x 0.8	-14.5 to 102 psi [-100 kPa to 0.7 MPa]

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 (-14.5 psi [-100 kPa])

Series	Applicable tubing O.D.	Connection thread
KP	ø4, ø6, ø8, ø10, ø12	1/8, 1/4, 3/8, 1/2

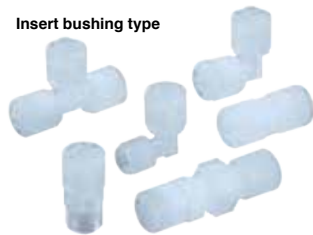
Clean One-touch Fittings for Driving Air Piping **KPQ/KPG**



- 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

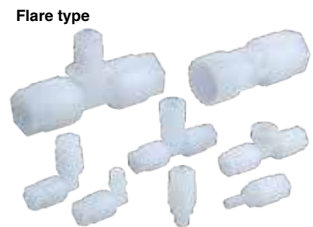
Fluoropolymer Fittings Hyper Fittings **LQ1**



- 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	145 psi [1.0 MPa]	32 to 392°F [0 to 200°C]

Fluoropolymer Fittings Hyper Fittings **LQ3**



- Material: New PFA
- Triple-seal construction
- Easy installation

Series	Max. operating pressure	Operating temperature
LQ3	145 psi [1.0 MPa]	Nut material PVDF: 32 to 302°F [0 to 150°C] Nut material PFA: 32 to 392°F [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
	Metric size	Inch size	
LQHB	ø3 to ø25	ø1/8" to ø1"	32 to 392°F [0 to 200°C]

Tubing

Nylon Tubing T



- General pneumatic tubing
- Max. operating pressure: 435 psi [3.0 MPa] (T0604, at 68°F [20°C])

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
T/TIA	ø4, ø6, ø8, ø10 ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green	Air, Water

Soft Nylon Tubing TS



- Max. operating pressure: 145 psi [1.0 MPa] (at 68°F [20°C])

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
TS/TISA	ø4, ø6, ø8, ø10 ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green	Air, Water

Polyurethane Tubing TU



- Max. operating pressure: 116 psi [0.8 MPa] (at 68°F [20°C])
- Food Sanitation Law compliant (-X217)

Series	Tubing O.D.		Color	Fluid
	Metric size	Inch size		
TU/TIUB	ø2, ø4, ø6, ø8 ø10, ø12, ø16	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2"	Black, White, Red, Blue, Yellow, Green, Clear, Orange, and more (Total 29 colors)	Air, Water
TU (-X217)	ø4, ø6, ø8, ø10, ø12	—	Black, White, Blue, Clear	

Polyurethane Flat Tubing/Multi-core, Multi-color TU



- Multi-core, multi-color specification
- Compact piping is possible.
- 8 color variations

Series	Tubing O.D.	Color	Number of cores	Fluid
TU	ø2, ø4, ø6, ø8 ø10, ø12	Black, White, Red, Blue, Yellow, Green, Clear, Orange	2, 3, 4, 5, 6	Air

Soft Polyurethane Tubing TUS



- Max. operating pressure: 87 psi [0.6 MPa] (at 68°F [20°C])

Series	Tubing O.D.	Color	Fluid
TUS	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green, Translucent, Yellow-brown	Air

Tubing

Soft Polyurethane Flat Tubing/Multi-core, Multi-color TUS



- Multi-core, multi-color specification
- Compact piping is possible.
- 8 color variations

Series	Tubing O.D.	Color	Number of cores	Fluid
TUS	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green, Translucent, Yellow-brown	2, 3, 4, 5	Air

Hard Polyurethane Tubing TUH



- Superior restoring force compared to the nylon tubing

Series	Type	Max. operating pressure	Tubing O.D.	Color	Fluid
TUH	Standard type	116 psi [0.8 MPa] (at 68°F [20°C])	ø4, ø6, ø8	Black, White, Blue, Translucent	Air
TUH	High-pressure type	145 psi [1.0 MPa] (at 68°F [20°C])	ø10, ø12	Black, White, Blue, Translucent	Air

Wear Resistant Tubing TUZ



- Abrasion: Approx. 1/3 (Compared with SMC's TU series polyurethane tubing)

Series	Tubing O.D.	Color	Fluid
	Metric size		
TUZ	ø2, ø3.2, ø4, ø6, ø8 ø10, ø12, ø16	Black, White, Red, Blue, Yellow, Green	Air, Water

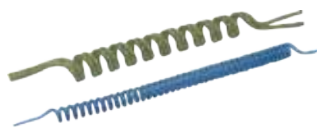
Wear Resistant Flat Tubing/Multi-core, Multi-color TUZ



- Multi-core, multi-color specification
- Compact piping is possible.
- 8 color variations
- Abrasion: Approx. 1/3

Series	Tubing O.D.	Color	Number of cores	Fluid
TUZ	ø4, ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	2, 3, 4, 5, 6	Air

Polyurethane Coil Tubing TCU



- Flexible
- Max. operating pressure: 0.8 MPa (at 20°C)
- For moving applications

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

Series	Tubing O.D.	Color	Number of cores	Fluid
TCU	ø4, ø6, ø8	Black	1, 2, 3	Air

Tubing

Polyurethane Flat Tubing **TFU**



- Max. operating pressure: 116 psi [0.8 MPa] (at [68°F [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 (Tubing for Special Environments)

FR Soft Nylon Tubing **TRS**



- Max. operating pressure: 174 psi [1.2 MPa] (at 68°F [20°C])
- For use in spatter-generating atmospheres/Flame resistant (Equivalent to UL-94 Standard V-0)

Series	Tubing O.D.	Color	Fluid
TRS	ø6, ø8, ø10, ø12	Black, White, Red, Blue, Green	Air, Water

FR Double Layer Tubing **TRB**



- Max. operating pressure: 145 psi [1.0 MPa] (at 68°F [20°])
- For use in spatter-generating atmospheres/Flame resistant (Equivalent to UL-94 Standard V-0)

Series	Tubing O.D.	Color	Fluid
TRB	ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	Air, Water

FR Double Layer Polyurethane Tubing **TRBU**



- Max. operating pressure: 116 psi [0.8 MPa] (at 68°F [20°C])
- Superior restoring force compared to the nylon tubing

Series	Tubing O.D.	Color	Fluid
TRBU	ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	Air, Water

Tubing (Tubing for Special Environments)

Double Layer Tube Stripper **TKS**



- Easily strips the outer layer from double layer tubes

Series	Tubing O.D.	Color
TKS	ø6, ø8, ø10, ø12	Orange, Yellow, Blue, Green

FR Three-layer Polyurethane Tubing **TRTU**



- Spatter resistance has been improved by installing an aluminum layer between the outer layer and the inner tube. (It is twice that of the TRBU series FR double layer polyurethane tubing.)
- For general pneumatic and water piping in environments exposed to sparks from arc welding, etc.

Series	Tubing O.D.	Color	Fluid
TRTU	ø6, ø8, ø10, ø12	Black, White, Red, Blue, Yellow, Green	Air, Water

2-Layer Soft Fluoropolymer Tubing **TQ**



- Carry fluids, such as solvent, with this soft and abrasion-resistant tube
- 2-layer structure
Outer layer: Special nylon resin, Inner layer: Special fluoropolymer
- Internal smoothness: Equivalent to Ra 0.02 μm

Series	Tubing O.D.	Color	Fluid
	Metric size		
TQ	ø4, ø6, ø8, ø10, ø12	Translucent (Material color)	Air, Water, Inert gas, Solvent

Antistatic Soft Nylon Tubing **TAS**



- Max. operating pressure: 174 psi [1.2 MPa] (at 68°F [20°])
- For preventing static electricity

Series	Tubing O.D.	Color	Fluid
	Metric size		
TAS	ø3.2, ø4, ø6, ø8, ø10, ø12	Black	Air

Antistatic Polyurethane Tubing **TAU**



- Max. operating pressure: 131 psi [0.9 MPa] (at 68°F [20°C])
- For preventing static electricity

Series	Tubing O.D.	Color	Fluid
	Metric size		
TAU	ø3.2, ø4, ø6, ø8, ø10, ø12	Black	Air

Tubing (Fluoropolymer/Clean)

Fluoropolymer Tubing **TL/TIL**



- Max. operating pressure: 145 psi [1.0 MPa] (at 68°F [20°C])
- Max. operating temperature: 500°F [260°C] (This may vary according to operating pressure.)

Series	Tubing O.D.		Color
	Metric size	Inch size	
TL/TIL	ø4, ø6, ø8, ø10 ø12, ø19	ø1/8", ø3/16", ø1/4" ø3/8", ø1/2", ø3/4", ø1"	Translucent

Fluoropolymer Tubing (PFA) **TLM/TILM**



- Max. operating temperature: 500°F [260°C] (This may vary according to operating pressure.)
- Food Sanitation Law compliant
- Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test

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

FEP Tubing (Fluoropolymer) **TH/TH**



- Max. operating pressure: 334 psi [2.3 MPa] (at 68°F [20°C])*
- Food Sanitation Law compliant
- Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test
- Max. operating temperature: 392°F [200°C] (This may vary according to operating pressure.)
- * This may vary according to size.

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

Soft Fluoropolymer Tubing **TD/TID**



- Max. operating pressure: 232 psi [1.6 MPa] (at 20°C)*
- Food Sanitation Law compliant
- Complies with the FDA (Food and Drug Administration) § 177-1550 dissolution test
- Max. operating temperature: 500°F [260°C] (This may vary according to operating pressure.)
- * This may vary according to size.

Series	Tubing O.D.		Color
	Metric size	Inch size	
TD/TID	ø4, ø6, ø8, ø10, ø12	ø1/8", ø3/16", ø1/4", ø3/8", ø1/2"	Translucent

Tubing (Fluoropolymer/Clean)

Clean Series Tubing 10-T□

Polyurethane Tubing 10-TU



- Flexible tubing 116 psi [0.8 MPa] max. (at 68°F [20°C])
- * Only black and blue are available for the inch size.

Series	Tubing O.D.		Color*
	Metric size	Inch size	
10-TU	ø4, ø6, ø8, ø10, ø12	ø1/8	Black, White, Red, Blue, Yellow, Green, Clear, Orange

Polyurethane Coil Tubing 10-TCU



- Flexible for moving applications

Series	Tubing O.D.	Color	Number of cores
10-TCU	ø4, ø6, ø8	Black	1, 2, 3

Polyurethane Flat Tubing 10-TFU



- Flexible multi-core tubing

Series	Tubing O.D.	Color	Number of cores
10-TFU	ø4, ø6, ø8	Black	2, 3

Polyolefin Tubing TPH



- Max. operating pressure (at 68°F [20°C]): 145 psi [1.0 MPa] (ø4, ø6), 102 psi [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 68°F [20°C]): 102 psi [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.

Tubing (Fluoropolymer/Clean)

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		KQ2
IDK06 Linear shape	6/4		KQ2
IDK04-100-C1 Coil shape	4/2.5	100	KQ2

Related Products

Multi-tube Holder **TM**

- Easily arranges tubing

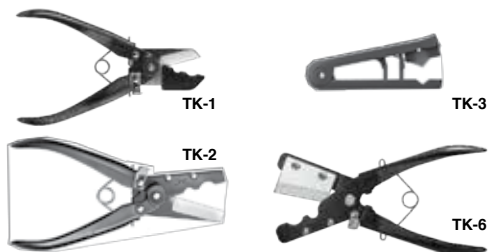


Multi-holder **TMA**

- It is possible to secure both an exhaust valve with a One-touch fitting and One-touch fittings.



Tube Cutter **TK**



Series	Applicable tubing O.D.	Applicable tubing material
TK-1	13 mm or less	Nylon, Soft nylon, Polyurethane, and other soft plastic tubing
TK-2	18 mm or less	
TK-3	12 mm or less	
TK-6	16 mm or less	

Tube Releasing Tool **TG**



Series	Applicable tubing size	Applicable tubing material
TG-1	Metric size: $\phi 4$, $\phi 6$	Nylon, Soft nylon, Polyurethane
TG-2	Inch size: $\phi 1/8''$, $\phi 1/4''$	Nylon, Soft nylon, Polyurethane

Tube Stand & Tube Reel **TB/TBR**



- Compact size doesn't take up space
- Installation is easy. Just place the tube reel in the stand.

Flow Control Equipment

Speed Controllers for General Purposes



Elbow Type/Universal Type (Push-lock Type)/ AS	P. 145
Speed Controller with Indicator/ AS-FS	P. 145
Elbow Type/Universal Type/ AS	P. 145
Plug-in Type/ AS	P. 145
In-line Type (Push-lock Type)/ AS	P. 146
In-line Type/ AS	P. 146
Speed Controller with Indicator (In-line Type)/ AS-FS	P. 146
In-line Panel Mount Type/ AS	P. 146
Uni Elbow Type/Universal Type (Push-lock Type)/ AS	P. 146
Speed Controller with Indicator/ Uni Thread Type/ AS-FS	P. 147
Speed Controller with Uni One-touch Fittings/ AS	P. 147
Dual Speed Controller/ ASD	P. 147
Elbow Type (Metal Body)/ AS12□0 to 42□0	P. 147
In-line Type/ AS1000 to 5000	P. 147
Large Flow In-line Type/ AS420 to 900	P. 148
In-line Push Locking Type/ AS3500	P. 148

Speed Controllers for Low Speed Control



With One-touch Fitting (Resin Body)/ AS-FM	P. 148
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Standard Type (Metal Body)/ AS-M	P. 148

Speed Controllers for Special Environments



Elbow Type/Universal Type (Push-lock Type)/ AS-FG	P. 148
Speed Controller with Indicator/ AS-FSG	P. 149
Flame Resistant (Equivalent to UL94 Standard V-0)/ Elbow Type/ AS	P. 149
Flame Resistant Flat Head Screwdriver Adjustable/ Elbow Type/ AS□2□1F-W2D	P. 149
Elbow Type (Metal Body)/ AS	P. 149
All Metal Exterior/Elbow Type/ AS-X737	P. 149
Stainless Steel Speed Controller (Elbow Type)/ ASG	P. 150
In-line Type (Push-lock Type)/ AS	P. 150
Speed Controller with Indicator (In-line Type)/ AS-FS	P. 150
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Clean Speed Controller with One-touch Fitting/ AS-FPQ/FPG	P. 150

Speed Controllers with Special Functions



Elbow Type/Universal Type/ AS□□□1FE	P. 151
Metal body, In-line type/ AS□000E	P. 151
Speed Controller with Pilot Check Valve/ ASP	P. 151
Speed Exhaust Controller/ ASV	P. 151

■ Tool Operation Type Speed Controllers



Elbow Type/Universal Type/ AS□□□1F-D	P.151
In-line Type/ AS□1F-D	P.151
Dual Speed Controller/ ASD□□□F-D	P.151
Elbow Type (Metal Body)/ AS□2□0-D	P.151
Elbow Type/Universal Type/ AS□□□1F-T	P.152
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Dual Speed Controller/ ASD□□□F-T	P.152
Elbow Type (Metal Body)/ AS□2□0-T	P.152
Flame Resistant Flat Head Screwdriver Adjustable (Elbow Type)/ AS□2□1F-W2D	P.152

■ Air Saving Speed Controllers/ Air Saving Valves



Air Saving Speed Controller/ AS-R/AS-Q	P.152
Air Saving Valve/Pressure Valve/ ASR	P.152
Air Saving Valve/Flow Valve/ ASQ	P.152

■ Related Equipment



Holder for Speed Controller/ TMH	P.153
Residual Pressure Release Valve with One-touch Fittings/ KE□	P.153
Metering Valve with Silencer/ ASN2	P.153
Quick Exhaust Valve/ AQ	P.153
Quick Exhaust Valve with One-touch Fittings/ AQ240F/340F	P.153
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Bushing Type Check Valve with One-touch Fittings/ AKH/AKB	P.154
5.0 MPa Check Valve/ VCHC40	P.154
Extension Prevention System/ ASS	P.154

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% (1.8 lbf [8 N]) reduction
Removal force: Max. 20% (1.1 lbf [5 N]) reduction*
 - Electroless nickel plated type is standard.
 - 360° swivel piping is possible. (Universal type)
- * Tube removal strength is ensured to be equivalent to the previous model.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type	AS12□1F to 42□1F	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to ø1/2"
Universal type	AS13□1F to 43□1F	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controller with Indicator AS-FS



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Improved reproducibility of flow rate
- Easier to insert and remove tubes
- Electroless nickel plated type is standard.
- Larger push-lock type knob

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type	AS12□1FS to 42□1FS	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to 1/2"
Universal type	AS13□1FS to 43□1FS	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to 1/2"

Elbow Type/Universal Type AS



Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type	AS12□1F to 42□1F	M3 to 1/2	ø2 to ø12	ø1/8" to ø1/2"
Universal type	AS13□1F to 43□1F	M3 to 1/2	ø2 to ø12	ø1/8" to ø1/2"
Fixed throttle type	AS1201F to 22□1F-X250	M3 to 1/4	ø4, ø6	—

Plug-in Type AS



- Can be mounted directly to One-touch fittings
- Since there is no need for tools, mounting time can be reduced.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	AS10□0P to AS30□0P	ø4 to ø10	ø4 to ø10

Speed Controllers for General Purposes

In-line Type AS



- Reduces labor time
Easy to use push-lock type
Knob O.D.: Almost doubled
- Improved reproducibility of flow rate
- Lightweight: Weight reduced by approx. 27%
- Electroless nickel plated type is standard.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AS2002F to AS4002F	—	ø3.2 to ø12	ø1/8" to ø1/2"

In-line Type AS



- 4 types of mounting variations: Direct mounting, L-bracket mounting, DIN rail mounting, Holder mounting
- With index plate
- Lightweight: Weight reduced by 30% compared with the current product (AS2002F-04)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AS1002F to AS4002F	—	ø2 to ø12	ø1/8" to ø1/2"

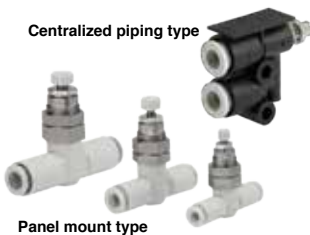
Speed Controller with Indicator/In-line Type AS-FS



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors.
Flow rate can be controlled numerically with the indicator window.
4 indicator window directions are available.
- Larger push-lock type knob
- Improved reproducibility of flow rate
- Electroless nickel plated type is standard.

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

In-line Panel Mount Type AS



- Panel mount thickness: 35 mm at the maximum

Type	Series	Applicable tubing O.D.	
		Metric size	Inch size
Panel mount type	AS□□□1F-3	ø3.2 to ø12	ø1/8" to ø1/2"
Centralized piping type	AS-DPP00092/00093	ø4, ø6	—

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% (1.8 lbf [8 N]) reduction
Removal force: Max. 20% (1.1 lbf [5 N]) reduction*
 - Electroless nickel plated type is standard.
 - 360° swivel piping is possible. (Universal type)
- * Tube removal strength is ensured to be equivalent to the previous model.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Uni thread	AS22□1F to 42□1F	Uni 1/8 to 1/2	ø3.2 to ø16	ø1/8" to ø1/2"
Universal type Uni thread	AS23□1F to 43□1F	Uni 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controllers for General Purposes

Speed Controller with Indicator/Uni Thread Type **AS-FS**



- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Larger push-lock type knob
- Improved reproducibility of flow rate
- Easier to insert and remove tubes
- Electroless nickel plated type is standard.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Uni thread	AS22□1FS to 42□1FS	Uni 1/8 to 1/2	ø3.2 to ø16	ø1/8" to 1/2"

Speed Controller with Uni One-touch Fittings **AS**



- New thread for piping that reduces screw-in time by 1/3 with a gasket seal
- Compatible with Rc, G, NPT, and NPTF

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
With Uni One-touch fitting	AS□□□1F-U□	1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Dual Speed Controller **ASD**



- Enables bi-directional flow control with a speed controller (Meter-in and meter-out)
- Prevents cylinders from lurching
- Speed control of single acting cylinders

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Dual speed controller	ASD	M5 to 1/2	ø4 to ø12	ø1/8" to ø3/8"

Elbow Type (Metal Body) **AS**



Type	Series	Port size on the cylinder side
Elbow type (Metal body)	AS12□0 to AS42□0	M3 to 1/2

In-line Type **AS**



Type	Series	Port size on the cylinder side
In-line type	AS1000 to 5000	M3 to 1/2

Speed Controllers for General Purposes

Large Flow In-line Type AS



Type	Series	Port size on the cylinder side
Large flow in-line type	AS420 to 900	1/4 to 1/2

In-line Push Locking Type AS



- One-touch needle locking

Type	Series	Port size on the cylinder side
In-line push locking type	AS3500	1/4, 3/8

Speed Controllers for Low Speed Control

Speed Controller for Low Speed Control AS



- Ideal for low-speed control (from 10 to 50 mm/sec)
- Number of needle rotations: 10 turns

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
With One-touch fittings Elbow/Universal type	AS□□□1FM	M5 to 1/4	ø3.2 to ø10	ø1/8" to ø3/8"
With One-touch fittings In-line type	AS□001FM	—	ø3.2 to ø10	ø1/8" to ø3/8"
With One-touch fittings Dual speed controller	ASD□30FM	M5 to 1/4	ø3.2 to ø10	ø1/8" to ø3/8"
Standard type (Metal body)	AS□□□0M	M5 to 1/4	ø3.2 to ø10	ø1/8" to ø3/8"

Speed Controllers for Special Environments

Elbow Type/Universal Type/Push-lock Type AS



- Stainless steel type
 - Easy to lock push-lock type
 - Larger knob
 - Improved tube insertion/removal
- Insertion force: Max. 30% (1.8 lbf [8 N]) reduction
 Removal force: Max. 20% (1.1 lbf [5 N]) reduction*
- * Tube removal strength is ensured to be equivalent to the previous model.
- 360° swivel piping is possible. (Universal type)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Stainless steel type	AS12□1FG to 42□1FG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to ø1/2"
Universal type Stainless steel type	AS13□1FG to 43□1FG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controllers for Special Environments

Speed Controller with Indicator AS-FS



- Stainless steel type
- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. The value can be controlled with the indicator window.
- Larger push-lock type knob
- Improved reproducibility of flow rate
- Easier to insert and remove tubes

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type Stainless steel type	AS12□1FSG to 42□1FSG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø2 to ø16	ø1/8" to 1/2"
Universal type Stainless steel type	AS13□1FSG to 43□1FSG	M5 x 0.8 10-32UNF R, NPT, G 1/8 to 1/2	ø3.2 to ø12	ø1/8" to 1/2"

Flame Resistant Elbow Type AS



- Flame resistant (Equivalent to UL94 Standard V-0)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	AS22□1F-W2 to AS42□1F-W2	1/8 to 1/2	ø6 to ø12

Flame Resistant Flat Head Screwdriver Adjustable Speed Controller (Elbow Type) AS□2□1F-W2D



- Flame resistant resin (Equivalent to UL-94 Standard V-0)
- Flat head screwdriver adjustable
Prevent accidental manual operation by making adjustments with a flat head screwdriver.
- Thread type: G thread

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	AS22□1F to AS42□1F	G1/8 to 1/2	ø6 to ø12

Elbow Type (Metal Body) AS



- Uses flame resistant resin as standard. (Equivalent to UL-94 Standard V-0)

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type (Metal body)	AS12□1 to 42□1F	M5 to 1/2	ø4 to ø12	—

All Metal Exterior Speed Controller with One-touch Fitting AS-X737



- Improved environmental resistance with an all metal exterior*
* Excluding the sealant
- Comes with a spatter cover
Also available for the KQB2/KQG2 series

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
All metal exterior	AS-X737	R1/8 to 3/8	ø6 to ø10

Speed Controllers for Special Environments

Stainless Steel Speed Controller (Elbow Type) **ASG**



- Material: Stainless steel 316
- Seal: Special FKM
- Seat ring: Stainless steel 303

- Applicable tubing materials: FEP, PFA, Nylon, Soft nylon, Polyurethane, Polyolefin

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	ASG	M5 to 1/2	ø4 to ø12

In-line Type **AS**



- Stainless steel type
- 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%

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
In-line type Stainless steel type	AS2002FG to AS4002FG	—	ø3.2 to ø12	ø1/8" to ø1/2"

Speed Controller with Indicator/In-line Type **AS-FS**



- Stainless steel type
- The numerical indication of knob rotations for flow rate reduces flow setting time and setting errors. Flow rate can be controlled numerically with the indicator window. 4 indicator window directions are available.
- Larger push-lock type knob
- Improved reproducibility of flow rate

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

Speed Controller Stainless Steel Series **AS**



- Stainless specifications for use in corrosive environments
- Stainless steel 303 is used for metal parts.

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
With One-touch fittings, Elbow/Universal type	AS□□□1FG Elbow/Universal type	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, In-line type	AS□□□1FG In-line type	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, Dual speed controller	ASD□□□FG Dual speed controller	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Clean Speed Controller with One-touch Fitting **AS-FPQ/FPG**



AS-FPQ

AS-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 Residual Pressure Release Valve **AS**



- Integrated speed controller and residual pressure release valve
- Residual pressure can be easily released with the push of a button.
- Eye-catching red release button

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
With One-touch fittings, Elbow/Universal type	AS□□□1FE	1/8 to 1/2	ø4 to ø12
Metal body, In-line type	AS□000E	1/8 to 1/2	—

Speed Controller with Pilot Check Valve **ASP**



- Integrated pilot check valve and speed controller
- Realizes momentary intermediate stoppage of a cylinder and is able to adjust its speed

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Speed controller with pilot check valve	ASP	1/8 to 1/2	ø6 to ø12	ø1/4" to ø1/2"

Speed Exhaust Controller **ASV**

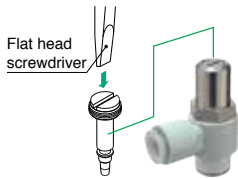


- Integrated quick exhaust valve and exhaust throttle valve
- Supports the high speed operation of cylinders

Type	Series	Port size
Speed exhaust controller	ASV120F/220F	M3, M5
	ASV310F/410F/510F	1/8 to 1/2

Tool Operation Type Speed Controllers

Speed Controller Adjustable by Flat Head Screwdriver **AS**

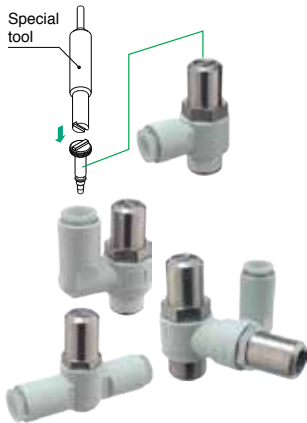


- Flow adjustable by a flat head screwdriver
- Prevents unnecessary manual operation

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
With One-touch fittings, Elbow/Universal type	AS□□□1F-D	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, In-line type	AS□1F-D	—	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, Dual speed controller	ASD□□□F-D	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
Metal body	AS□2□0-D	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Tool Operation Type Speed Controllers

Tamper Proof Speed Controller AS



- Flow can be adjusted with a special tool.
- Prevents unnecessary manual operation

Type	Series	Port size on the cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
With One-touch fittings, Elbow/Universal type	AS□□□1F-T	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, In-line type	AS□1F-T	—	ø3.2 to ø12	ø1/8" to ø1/2"
With One-touch fittings, Dual speed controller	ASD□□□F-T	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"
Metal body	AS□2□0-T	M5 to 1/2	ø3.2 to ø12	ø1/8" to ø1/2"

Flame Resistant Flat Head Screwdriver Adjustable Speed Controller (Elbow Type) AS□2□1F-W2D



- Flame resistant resin (Equivalent to UL-94 Standard V-0)
- Flat head screwdriver adjustable
Prevent accidental manual operation by making adjustments with a flat head screwdriver.
- Thread type: G thread

Type	Series	Port size on the cylinder side	Applicable tubing O.D.
Elbow type	AS22□1F to AS42□1F	G1/8 to 1/2	ø6 to ø12

Air Saving Speed Controllers/Air Saving Valves

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 cylinder side	Applicable tubing O.D.	
			Metric size	Inch size
Elbow type With pressure reduction function	AS22R to AS42R	R, NPT, G 1/8 to 1/2	ø6 to ø12	ø1/4" to ø1/2"
Elbow type With rapid supply and exhaust function	AS22Q to AS42Q	R, NPT, G 1/8 to 1/2	ø6 to ø12	ø1/4" to ø1/2"

Air Saving Valve ASR/ASQ



- 40% reduction in air consumption
- Cuts air consumption by operating the return stroke at a reduced pressure

Type	Series	Port size	Applicable tubing O.D.
Pressure valve	ASR	1/4 to 1/2	ø6 to ø12
Flow valve	ASQ	1/4 to 1/2	ø6 to ø12

Related Equipment

Holder for Speed Controller **TMH**



- A holder for securing a speed controller (In-line type) with One-touch fittings
- Universal mounting

Type	Series
Holder	TMH

Residual Pressure Release Valve with One-touch Fittings **KE□**



- Residual pressure in the cylinder can be easily released with the push of a button.

Type	Series	Applicable tubing O.D.
With One-touch fittings without a push button guard	KEA	ø6 to ø12
With One-touch fittings with a push button guard	KEB	ø6 to ø12
Rc thread with a push button guard	KEC	Connection thread: Rc1/4, 3/8

Metering Valve with Silencer **ASN2**



- Superior sound reducing performance (Over 20 dB at max. flow rate)
- Can be directly mounted on the exhaust port of a solenoid valve

Type	Series	Port size
Metering valve with silencer	ASN2	M5 to 1/2

Quick Exhaust Valve **AQ**



- A wide selection of models are available.

Type	Series	Port size	Applicable tubing O.D.
Lip	AQ1500 AQ1510	M5, 1/8	—
Diaphragm	AQ2000 to AQ5000	1/8 to 3/4	—
Built-in One-touch fittings	AQ240F AQ340F	—	ø4 to ø6, ø1/4"

Related Equipment

Check Valve **AK**



Type	Series	Port size	Applicable tubing O.D.	
			Metric size	Inch size
In-line type	AK2000/AK4000 AK6000	1/8 to 1	—	—
Straight type	AKH	—	ø4 to ø12	ø5/32" to ø1/2"
Male connector type	AKH	M5 to 1/2	ø4 to ø12	ø5/32" to ø1/2"
Bushing type	AKB	1/8 to 1/2	—	—
Made to order for air/water	· 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

Type	Series	Port size	Operating pressure
5.0 MPa	VCHC40	3/4, 1	7.3 to 725 psi [0.05 to 5.0 MPa]

Extension Prevention System **ASS**



- Prevents accidents caused by sudden cylinder rod extensions

Type	Series	Port size
Meter-out control	ASS100 to ASS600	1/8 to 1
Meter-in control	ASS110 to ASS310	1/8 to 3/8

Silencers/Exhaust Cleaners/Blow Guns/Pressure Gauges

■ Silencers



- Silencer/**AN** P.156
- 5.0 MPa Silencer/**VCHN** P.156

■ Exhaust Cleaners



- Exhaust Cleaner/**AMC** P.156
- Exhaust Cleaner for Vacuum Pump/**AMV** P.156
- Exhaust Cleaner for Clean Room/**AMP** P.156
- Clean Exhaust Filter/**SFE** P.156

■ Blow Guns



- Blow Gun/**VMG** P.157
- Nozzles for Blowing/**KN** P.157

■ Pressure Gauges



- Pressure Gauge for General Purposes/**G□** P.157
- Oil-free/External Parts Copper-free Pressure Gauge/**G46E** P.157
- Pressure Gauge for Clean Series (10- Series)/**G49** P.158
- Pressure Gauge for Clean Regulator/**G46-□-□-SRA, B** P.158
- Pressure Gauge with Switch/**GP46** P.158
- Pressure Gauge for Vacuum/**GZ46** P.158
- ◆ Related Products
- Digital Pressure Sensor/**GS40** P.158
- Compact Manometer/**PPA** P.158

Silencers

Silencer/Compact Resin Type AN



Series	Features
AN05 to 40	<ul style="list-style-type: none"> • Compact and lightweight • Noise reduction: 30 dB (A)
AN10 to 30-C	<ul style="list-style-type: none"> • Can connect with One-touch fitting directly • Noise reduction: 30 dB (A)

Silencer/BC Sintered Body Type AN



Series	Features
AN	<ul style="list-style-type: none"> • BC sintered body type • Noise reduction: 13, 16, 18, 21 dB (A)

Silencers AN



Series	Features
AN□00	<ul style="list-style-type: none"> • Metal body type • Noise reduction: 30 dB (A)
25□□	<ul style="list-style-type: none"> • Metal case type • Noise reduction: 19 dB (A)
AN□02 AN□1	<ul style="list-style-type: none"> • High noise reduction type • Noise reduction: 35, 38, 40 dB (A)

5.0 MPa Silencer VCHN



- Reduces clogging with its double-layer structure
- Noise reduction: 35 dB (A)

Exhaust Cleaners

Exhaust Cleaner AMC



- Noise reduction: 35 dB (A)
- Oil mist removal: 99.9% or more

Exhaust Cleaner for Vacuum Pump AMV



- Captures 99.5% of greasy fumes exhausted from the vacuum pump
- Realizes a comfortable working environment without greasy fumes
- Captures and cuts off 99.5% of even low-flow and highly concentrated greasy fumes
- Exhaust ducts from the vacuum pump are not necessary.

Exhaust Cleaner for Clean Room AMP



- An exhaust cleaner that can be used inside a clean room

Series	Filtration [μm]	Maximum flow capacity	Port size
AMP	0.01 (Filtration efficiency 95%)	7.1 to 35.3 scfm [200 to 1000 L/min (ANR)]	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	Port size
SFE	0.01 (Filtration efficiency 99.99%)	0.11, 1.1, 2.3, 4.6, 7.1 scfm [3, 30, 65, 130, 200 L/min (ANR)]	M5 x 0.8, R1/8, R1/4 ø4, ø6, ø8, ø10

Blow Guns

Blow Gun VMG



- Reduction of 2000 m³ per annum is possible. (Energy saving)
- Pressure loss: 1% or less (Nozzle size: $\phi 2.5$)
- Available nozzles:
Male thread nozzle, High efficiency nozzle with male thread, Low noise nozzle with male thread, Copper extension nozzle. OSHA conforming nozzle available.

Series	Port size	Operating pressure range psi [MPa]	Effective area [mm ²]	Nozzle port size
VMG	Rc, NPT, G 1/4, 3/8	0 to 145 [0 to 1.0]	30	Rc1/4

Nozzles for Blowing KN



Series	Type	Nozzle size
KN	Nozzle with male thread	$\phi 1$ to $\phi 8$
	High efficiency nozzle	$\phi 1$ to $\phi 2$
	Low noise nozzle with male thread	$\phi 0.75 \times 4$ to $\phi 1.1 \times 8$
	Copper extension nozzle	$\phi 1.5$ to $\phi 3$
	Pivoting nozzle	$\phi 4$, $\phi 6$
	Nozzle with self-align fitting	$\phi 1$ to $\phi 6$
	Nozzle for One-touch fitting	$\phi 1$ to $\phi 3$

Pressure Gauges

Pressure Gauge for General Purposes G□



- Available with a limit indicator and color zones

Series	Size (O.D.)	Connection thread
G15	$\phi 15$	R1/8, M5 (Female thread)
G27	$\phi 27$	R1/8, 1/16
G36	$\phi 37.5$	R1/8, M5 (Female thread)
GA36	$\phi 37.5$	R1/8
G46	$\phi 42.5$	R1/8, 1/4, M5 (Female thread)
GA46	$\phi 42.5$	R1/8, 1/4
G33	$\phi 30$	R1/8
GA33	$\phi 30$	R1/8
G43	$\phi 43$	R1/8, 1/4
G36-L	$\phi 37.5$	R1/8
G46-L	$\phi 42.5$	R1/8, 1/4

Oil-free/External Parts Copper-free Pressure Gauge G46E



- Oil-free, external parts copper-free
- With limit indicator

Series	Size (O.D.)	Connection thread
G46E	$\phi 42.5$	R1/8, 1/4

Pressure Gauges

Pressure Gauge for Clean Series (10- Series) **G49**



- For clean series (10- series)

Series	Size (O.D.)	Connection thread
G49	ø44	R1/4

Pressure Gauge for Clean Regulator **G46-□-□-SRA, B**



- For clean regulators
- With limit indicator

Series	Size (O.D.)	Connection thread
G46-□-□-SRA, B	ø42.5	R1/8, 1/4

Pressure Gauge with Switch **GP46**



- A pressure switch function has been added to the gauge.

Series	Size (O.D.)	Connection thread
GP46	ø42.5	R1/8, 1/4

Pressure Gauge for Vacuum **GZ46**



- Pressure gauge for vacuum
- Pressure range: -14.5 to 29 psi [-100 to 200 kPa]

Series	Size (O.D.)	Connection thread
GZ46	ø42.5	R1/8, 1/4

Digital Pressure Sensor **GS40**



- A pressure switch function has been added to the gauge with a digital display.

Series	Set pressure psi [MPa]
GS40	0 to 142 [0 to 0.98]

Compact Manometer **PPA**



- Pressure measurements can easily be taken anytime, anywhere.

Series	Set pressure	Applicable tubing size	Type
PPA100	-14.5 to 145 psi [-0.1 to 1 MPa]	ø4, ø6	For high pressure
PPA101	-14.6 to 1.45 psi [-101 to 10 kPa]	ø4, ø6	For vacuum
PPA102	-1.45 to 14.5 psi [-10 to 100 kPa]	ø4, ø6	For low pressure

Switches/Sensors/Controllers

Pressure Switches

Electronic Pressure Switches/Sensors (Self-contained Type)



3-Screen Display High-Precision Digital Pressure Switch/ ZSE20(F)/ISE20	P.160
2-Color Display High-Precision Digital Pressure Switch/ ZSE30A(F)/ISE30A	P.160
2-Color Display High-Precision Digital Pressure Switch/ ZSE40A(F)/ISE40A	P.160
Compact Digital Pressure Switch/ ZSE10(F)/ISE10	P.160
2-Color Display Digital Pressure Switch/ ISE70/75/75H	P.160
2-Color Display Digital Pressure Switch/ ZSE80(F)/ISE80(H)	P.161
Air Checker/Electronic Pressure Switch/ PS1000/PS1100/PS1200	P.161
LCD Readout Digital Pressure Switch/ ZSE3/ISE3	P.161
Compact Pressure Switch/ ZSE1/ISE1	P.161
Compact Pressure Switch/ ZSE2/ISE2	P.161
3-Color Display Digital Gap Checker/ ISA3	P.162
Air Catch Sensor/ ISA2	P.162
Digital Pressure Switch (Built-in Regulator Type)/ ISE35	P.162
Digital Pressure Sensor/ GS40	P.162

Electronic Pressure Switches/Sensors (Remote Type)



Compact Pneumatic Pressure Sensor/ PSE53 □	P.163
Compact Pneumatic Pressure Sensor/ PSE54 □	P.163
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Multi-Channel Digital Pressure Sensor Controller/ PSE200	P.164
2-Color Display Digital Pressure Sensor Controller/ PSE300	P.164

Mechanical Pressure Switches



Pressure Switch/Reed Switch Type/ IS10	P.164
Pressure Switch/Micro Switch Type/ IS3000	P.164
General Purpose Pressure Switch/Snap Switch Type/ ISG	P.165
Vacuum Switch/Reed Switch Type/ ZSM1	P.165
Pressure Gauge with Switch/ GP46	P.165

Flow Switches

Electronic Flow Switches/Sensors



2-Color Display Digital Flow Switch/ PFM	P.165
2-Color Display Digital Flow Switch/ PFMB	P.165
3-Color Display Digital Flow Switch/ PFMC	P.166
Flow Sensor/ PFMV	P.166
Digital Flow Switch for Air/ PF2A	P.166
3-Color Display Digital Flow Switch for Water/ PF3W	P.166
3-Color Display Electromagnetic Type Digital Flow Switch/ LFE □	P.167
Digital Flow Switch for Water/ PF2W	P.167
Digital Flow Switch for Deionized Water and Chemical Liquids/ PF2D	P.167
4-Channel Flow Monitor/ PF2 □200	P.167

Mechanical Flow Switches



Flow Switch/Diaphragm Type/ IFW5	P.168
Flow Switch/Paddle Type/ IF3	P.168

Controllers



Flow Controller for Water/ FC2W-X110	P.168
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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

Series	Type	Rated pressure range
ZSE20F	Compound pressure	-14.5 to 14.5 psi [-100.0 to 100.0 kPa]
ZSE20	Vacuum pressure	0. to -14.6 psi [0.0 to -101.0 kPa]
ISE20	Positive pressure	-14.5 to 145 psi [-0.100 to 1.000 MPa]

2-Color Display High-Precision Digital Pressure Switch ZSE30A(F)/ISE30A



- With One-touch fitting (Straight, Elbow)
- Space saving, Capable of vertical and horizontal contact mounting
- With display calibration function
- Simultaneous copying is possible for a maximum of 10 units.

Series	Type	Rated pressure range
ZSE30AF	Compound pressure	-14.5 to 14.5 psi [-100.0 to 100.0 kPa]
ZSE30A	Vacuum pressure	0. to -14.6 psi [0.0 to -101.0 kPa]
ISE30A	Positive pressure	-14.5 to 145 psi [-0.100 to 1.000 MPa]

2-Color Display High-Precision Digital Pressure Switch ZSE40A(F)/ISE40A



- IP65
- Applicable fluids: Air, Non-corrosive gas, Non-flammable gas
- Simultaneous copying is possible for a maximum of 10 units.
- 3-step setting
- With One-touch fitting

Series	Type	Rated pressure range
ZSE40AF	Compound pressure	-14.5 to 14.5 psi [-100.0 to 100.0 kPa]
ZSE40A	Vacuum pressure	0. to -14.7 psi [0.0 to -101.3 kPa]
ISE40A	Positive pressure	-14.5 to 145 psi [-0.100 to 1.000 MPa]

Compact Digital Pressure Switch ZSE10(F)/ISE10



- Low profile: 9.8 mm
- Vertical mounting space reduced to approx. 1/2 (Compared to the ZSE/ISE30A series)
- Simultaneous copying is possible for a maximum of 10 units.
- 3-step setting

Series	Type	Rated pressure range
ZSE10F	Compound pressure	-14.5 to 14.5 psi [-100.0 to 100 kPa]
ZSE10	Vacuum pressure	0. to -14.6 psi [0.0 to -101.0 kPa]
ISE10	Positive pressure	-14.5 to 145 psi [-0.100 to 1.000 MPa]

2-Color Display Digital Pressure Switch ISE70/75(H)



- Metal body type (Aluminum die-casted)
- IP67
- With M12 connector

Series	Type	Rated pressure range
ISE70	Positive pressure (for air)	0 to 145 psi [0 to 1 MPa]
ISE75	Positive pressure (for general fluids)	0 to 1450 psi [0 to 10 MPa]
ISE75H	Positive pressure (for general fluids)	0 to 2176 psi [0 to 15 MPa]

Electronic Pressure Switches/Sensors (Self-contained Type)

2-Color Display Digital Pressure Switch ZSE80(F)/ISE80(H)



- Suitable for a wide variety of fluids due to its stainless diaphragm
- IP65
- RoHS compliant
- Low leakage
- VCR®, Swagelok® compatible fittings can be selected.
- Back piping, underside piping

Series	Type	Rated pressure range
ZSE80F	Compound pressure	-14.5 to 14.5 [-100.0 to 100.0 kPa]
ZSE80	Vacuum pressure	0.0 to -14.6 ps [0.0 to -101.0 kPa]
ISE80	Positive pressure	-14.5 to 145 psi [-0.100 to 1.000 MPa]
ISE80H	Positive pressure	-14.5 to 290 psi [-0.100 to 2.000 MPa]

Air Checker/Electronic Pressure Switch PS1000/1100/1200



- Plug-in port for One-touch fittings
- With LED light

Series	Type	Set pressure range
PS1000	Positive pressure	-14.6 to 65 psi [-0.1 to 0.45 MPa]
PS1100	For vacuum/residual pressure	-14.5 to 58 psi [-0.1 to 0.4 MPa]
PS1200	For vacuum	-14.5 to 0 psi [-100 to 0 kPa]

LCD Readout Digital Pressure Switch ZSE3/ISE3



- Built-in failure prediction output function
- Can be integrated with a vacuum unit, ZX series
- Comes equipped with a suction filter as standard

Series	Type	Set pressure range
ZSE3	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
ISE3L	Positive pressure	0 to 14.2 psi [0 to 98 kPa]
ISE3	Positive pressure	0 to 142 psi [0 to 0.98 MPa]

Compact Pressure Switch ZSE1/ISE1



- Can be integrated with a ZM ejector system

Series	Type	Set pressure range
ZSE1	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
ISE1L	Positive pressure	0 to 14.5 psi [0 to 100 kPa]
ISE1	Positive pressure	0 to 145 psi [0 to 1 MPa]

Compact Pressure Switch ZSE2/ISE2



- Can be integrated with a ZX or ZR ejector system
- Comes equipped with a suction filter as standard

Series	Type	Set pressure range
ZSE2	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
ISE2L	Positive pressure	0 to 14.5 psi [0 to 100 kPa]
ISE2	Positive pressure	0 to 145 psi [0 to 1 MPa]

Electronic Pressure Switches/Sensors (Self-contained Type)

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

Non-Contact Sensor for Workpiece Placement Verification/Air Catch Sensor **ISA2**



- Gap detection
- Can be configured with a regulator and a 2 port solenoid valve
- With LED level meter
- Plug connector, Easy to add and remove manifold stations

Series	Detection range	Recommended nozzle dia.
ISA2	0.01 to 0.25 mm	ø1.5
ISA2	0.03 to 0.50 mm	ø2.0

Digital Pressure Switch (Built-in Regulator Type) **ISE35**



- Modular type mountable
- ARM10/11 series mountable
- Selectable pressure unit
- With anti-chattering function
- Power-saving mode

Series	Type	Rated pressure range
ISE35	Positive pressure	-14.5 to 145 psi [-0.1 to 1 MPa]

Digital Pressure Sensor **GS40**



- A pressure switch function has been added to the gauge with a digital display.

Series	Set pressure
GS40	0 to 142 psi [0 to 0.98 MPa]

Electronic Pressure Switches/Sensors (Remote Type)

Compact Pneumatic Pressure Sensor PSE53□



- Connector type
- Analog output (Voltage)

Series	Type	Rated pressure range
PSE531	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
PSE533	Compound pressure	-14.6 to 14.6 psi [-101 to 101 kPa]
PSE532	Positive pressure	0 to 14.6 psi [0 to 101 kPa]
PSE530	Positive pressure	0 to 145 psi [0 to 1 MPa]

Compact Pneumatic Pressure Sensor PSE54□



- Analog output (Voltage)

Series	Type	Rated pressure range
PSE541	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
PSE543	Compound pressure	-14.5 to 145 psi [-100 to 100 kPa]
PSE540	Positive pressure	0 to 145 psi [0 to 1 MPa]

Low Differential Pressure Sensor PSE550



- Suitable for applications such as air current volume maintenance, filter blockage, and liquid surface detection.
- Analog output (Voltage/Current)

Series	Type	Rated differential pressure range
PSE550	Vacuum pressure	0 to 0.29 psi [0 to 2 kPa]

Pressure Sensor for General Fluids PSE56□



- Wetted parts: Stainless steel 316L
- IP65
- Suitable for a wide variety of fluids
- Analog output (Voltage/Current)
- Low leakage
- VCR®, Swagelok® compatible fittings can be selected.

Series	Type	Rated pressure range
PSE561	Vacuum pressure	0 to -14.6 psi [0 to -101 kPa]
PSE563	Compound pressure	-14.5 to 14.5 psi [-100 to 100 kPa]
PSE564	Positive pressure	0 to 72.5 psi [0 to 500 kPa]
PSE560	Positive pressure	0 to 145 psi [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

Series	Type	Rated pressure range	Proof pressure
PSE570	Positive pressure	0 to 145 psi [0 to 1 MPa]	435 psi [3.0 MPa]
PSE573	Compound pressure	-14.5 to 14.5 psi [-100 to 100 kPa]	87 psi [600 kPa]
PSE574	Positive pressure	0 to 72.5 psi [0 to 500 kPa]	218 psi [1.5 MPa]
PSE575	Positive pressure	0 to 290 psi [0 to 2 MPa]	725 psi [5.0 MPa]
PSE576	Positive pressure	0 to 725 psi [0 to 5 MPa]	1813 psi [12.5 MPa]
PSE577	Positive pressure	0 to 1450 psi [0 to 10 MPa]	4351 psi [30 MPa]

Electronic Pressure Switches/Sensors (Remote Type)

Multi-Channel Digital Pressure Sensor Controller **PSE200**



- 4 sensors can be connected.
- Applicable sensors: PSE53□, 54□, 56□, 570, 573
- A single controller can be used to monitor various applications.
- 4 inputs, 5 outputs

Series	Set pressure range
PSE200	-14.6 to 14.6 psi [-101 to 101 kPa]
	1.45 to -14.6 psi [10 to -101 kPa]
	-1.45 to 14.6 psi [-10 to 101 kPa]
	-14.5 to 145 psi [-0.1 to 1 MPa]

2-Color Display Digital Pressure Sensor Controller **PSE300**



- Applicable sensors: PSE53□, 54□, 550, 56□, 570, 573, 574
- Compatible with voltage input and current input
- Response time: 1 ms
- Space saving, Capable of vertical and horizontal contact mounting
- Panel mounting, Bracket mounting, DIN rail mounting

Series	Set pressure range
PSE300	-14.6 to 14.6 psi [-101 to 101 kPa]
	1.45 to -14.6 [10 to -101 kPa]
	-1.45 to 14.5 psi [-10 to 100 kPa]
	-14.5 to 145 psi [-0.1 to 1 MPa]
	-7.25 to 72.5 psi [-50 to 500 kPa]
	-0.029 to 0.29 psi [-0.2 to 2 kPa]

Mechanical Pressure Switches

Pressure Switch/Reed Switch Type **IS10**



- 16% lighter, 11% smaller (Compared with the IS1000)
- Service life: 5 million cycles
- Can be connected to modular type F.R.L. units

Series	Type	Set pressure range
IS10	Positive pressure	14.5 to 58 psi [0.1 to 0.4 MPa]
		14.5 to 87 psi [0.1 to 0.6 MPa]

Pressure Switch/Micro Switch Type **IS3000**



- Can be used for micro loads, around 10 mA e.g.
- With neon light

Series	Type	Set pressure range
IS3000	Positive pressure	4.5 to 102 psi [0.1 to 0.7 MPa]

Mechanical Pressure Switches

General Purpose Pressure Switch/Snap Switch Type ISG



- For general fluids
- Equivalent to IP44
- With neon light

Series	Type	Set pressure range
ISG11□, 21□	Positive pressure	2.9 to 44 psi [0.02 to 0.3 MPa]
ISG12□, 22□	Positive pressure	7.3 to 102 psi [0.05 to 0.7 MPa]
ISG13□, 23□	Positive pressure	14.5 to 145 psi [0.1 to 1.0 MPa]
IS2761	Positive pressure	14.5 to 145 psi [0.1 to 1.0 MPa]
ISG19□, 29□	Vacuum pressure	-1.45 to -14.5 psi [-10 to -100 kPa]

Vacuum Switch/Reed Switch Type ZSM1



- Can be integrated with a ZM ejector system

Series	Type	Set pressure range
ZSM1	Vacuum pressure	3.9 to -11.6 psi [-27 to -80 kPa]

Pressure Gauge with Switch GP46



- A pressure switch function has been added to the gauge.

Series	Size (O.D.)	Connection thread
GP46	ø42.5	R1/8, 1/4

Electronic Flow Switches/Sensors

2-Color Display Digital Flow Switch PFM



- Air, N₂, Ar, CO₂
- Grease-free
- Integrated flow adjustment valve
- Compact, Lightweight, Space saving

Series	Rated flow range cfm [L/min]
PFM	0.01 to 0.35 [0.2 to 10] (0.01 to 0.18 [0.2 to 5])
	0.02 to 0.88 [0.5 to 25] (0.02 to 0.44 [0.5 to 12.5])
	0.04 to 1.77 [1 to 50] (0.04 to 0.88 [1 to 25])
	0.07 to 3.53 [2 to 100] (0.07 to 1.77 [2 to 50])
	() : For CO ₂

2-Color Display Digital Flow Switch PFMB



- Air, N₂
- Grease-free
- Integrated flow adjustment valve
- Compact, Space saving

Series	Rated flow range cfm [L/min]
PFMB	0.07 to 7.06 [2 to 200]
	0.18 to 17.7 [5 to 500]
	0.35 to 35.3 [10 to 1000]
	0.71 to 70.6 [20 to 2000]

Electronic Flow Switches/Sensors

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 cfm [L/min]
PFMC	0.18 to 17.7 [5 to 500]
	0.35 to 35.3 [10 to 1000]
	0.71 to 70.6 [20 to 2000]

Flow Sensor PFMV



- Suction verification of very small workpieces
- Repeatability: ± 2% F.S.
- Response speed: 5 ms or less, Withstand pressure: 73 psi [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 cfm [L/min]
PFMV	0 to 0.02 [0 to 0.5]
	0 to 0.04 [0 to 1]
	0 to 0.11 [0 to 3]
	-0.02 to 0.02 [-0.5 to 0.5]
	-0.04 to 0.04 [-1 to 1]
	-0.11 to 0.11 [-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

Series	Rated flow range cfm [L/min]
PF2A	0.04 to 0.35 [1 to 10]
	0.18 to 1.77 [5 to 50]
	0.35 to 3.53 [10 to 100]
	0.71 to 7.06 [20 to 200]
	1.77 to 17.7 [50 to 500]
	5.30 to 106 [150 to 3000]
	10.6 to 212 [300 to 6000]
	21.2 to 424 [600 to 12000]

3-Color Display Digital Flow Switch for Water PF3W



- 3-color/2-screen display
- Integrated temperature sensor
- 40% smaller than the current product
- IP65 compliant, Non-grease type
- Fluid temperature: 32 to 194°F [0 to 90°C]
- PVC piping type: Applicable to deionized water, chemical liquids, etc.

Series	Rated flow range gal/min [L/min]
PF3W	0.13 to 1.06 [0.5 to 4]
	0.53 to 4.23 [2 to 16]
	1.32 to 10.6 [5 to 40]
	2.64 to 26.4 [10 to 100]
	13.2 to 66.0 [50 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)
- Reverse flow can be detected.
- Operating fluid temperature: 32 to 185°F [0 to 85°C]
- Current consumption: 45 mA

Series	Rated flow range gal/min [L/min]
LFE□	0.13 to 5.28 [0.5 to 20]
	0.66 to 26.4 [2.5 to 100]
	1.32 to 52.8 [5 to 200]

Digital Flow Switch for Water PF2W

Integrated type



Separate type



Monitor

Sensor

- 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
- Compatible with high temperatures up to 194°F [90°C]
- IP65

Series	Rated flow range gal/min [L/min]
PF2W	0.13 to 1.06 [0.5 to 4]
	0.53 to 4.23 [2 to 16]
	1.32 to 10.6 [5 to 40]
	2.64 to 26.4 [10 to 100]

Digital Flow Switch for Deionized Water and Chemical Liquids PF2D



- Body sensor: New PFA, Tube: Super PFA
- Low particle generation, Excellent flow-through characteristics

Series	Rated flow range gal/min [L/min]
PF2D	0.11 to 1.06 [0.4 to 4]
	0.48 to 5.28 [1.8 to 20]
	1.06 to 10.6 [4.0 to 40]

4-Channel Flow Monitor PF2□200



- 1 controller can handle 4 units' worth of flow volume maintenance.
- 4 different flow ranges can be connected to 1 controller.

Series	Applicable sensor	Set flow range
PF2A200/201	For air PF2A5	0.02 to 0.37 cfm [0.5 to 10.5 L/min]
		0.09 to 1.85 cfm [2.5 to 52.5 L/min]
		0.18 to 3.71 cfm [5 to 105 L/min]
		0.35 to 7.42 cfm [10 to 210 L/min]
		0.88 to 18.5 cfm [25 to 525 L/min]
PF2D200/201	For pure water/chemical liquids PF2D5	0.066 to 1.19 gal/min [0.25 to 4.50 L/min]
		0.34 to 5.55 gal/min [1.3 to 21.0 L/min]
		0.66 to 11.9 gal/min [2.5 to 45.0 L/min]

Mechanical Flow Switches

Flow Switch/Diaphragm Type IFW5



- Used as a general relaying device when water stoppage or water volume reduction occurs during the use of a cooling water system, etc.
- With neon light

Series	Rated flow range gal/min [L/min]
IFW5	0.26 to 2.64 [1 to 10]
	2.64 to 5.28 [10 to 20]
	5.28 to 13.2 [20 to 50]

Flow Switch/Paddle Type IF3



- Used as a general relaying device when water stoppage or water volume reduction occurs during the use of a cooling water system, etc.
- Piping sizes range from 3/4 B to 6 B.
- Equivalent to IP42 and IP44

Series	Rated flow range gal/min [L/min]
IF3	3.7 to 15.9 [14 to 60]
	5.28 to 396 [20 to 1500]
	9.5 to 687 [36 to 2600]

Controllers

Flow Controller for Water FC2W-X110



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

Series	Flow rate control range gal/min [L/min]	Set flow rate range gal /min [L/min]
FC2W-X110	0.13 to 1.06 [0.5 to 4.0]	0.11 to 1.10 [0.4 to 4.2]
	0.52 to 4.23 [2.0 to 16.0]	0.42 to 0.44 [1.6 to 16.8]

Static Neutralization Equipment/Ionizers

■ Static Neutralization Equipment/Ionizers



Ionizer/Bar Type/ IZS40/41/42	P.170
Ionizer/ IZS31	P.170
Ionizer/Nozzle Type/ IZN10	P.170
Fan Type Ionizer/ IZF	P.170
Desktop Duster Box/ ZVB	P.171
Electrostatic Sensor/ IZD10/IZE11	P.171
Handheld Electrostatic Meter/ IZH10	P.171

Static Neutralization Equipment/Ionizers

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 control
- Transition wiring may be used.
- High speed static neutralization cartridges and energy saving static neutralization cartridges are available.

Series	Type	Ion generation method	Ion balance
IZS42	Dual AC type	Corona discharge type	±30 V
IZS41	Feedback sensor type	Corona discharge type	±30 V
IZS40	Standard type	Corona discharge type	±30 V

Ionizer IZS31



- Static neutralization time: 0.3 sec
- Select from 3 types of sensors.
- Rapid neutralization of static electricity by a feedback sensor
- Offset voltage control by an auto balance sensor
- High precision type: Accurately controls the offset voltage of the work position
- Body attachment type: Can be used while attached to the ionizer body by detecting the earth return current
- The cartridge can be selected according to the application.
- The high-speed static neutralization type focuses on the speed of static neutralization.
- The low maintenance type improves the maintenance cycle.

Series	Ion generation method	Ion balance
IZS31	Corona discharge type	±30 V (Stainless steel electrode needle: ±100 V)

Ionizer/Nozzle Type IZN10



- Nozzle type: Dust removal and static neutralization by air blow, Spot type static neutralization
- Slim design: 16 mm thick
- RoHS compliant
- Nozzle type can be selected according to the application.
- Energy saving static neutralization nozzle (Short-range static neutralization, Design focuses on offset voltage)
- High flow static neutralization nozzle (Long-range static neutralization, Dust removal)

Series	Ion generation method	Ion balance
IZN10	Corona discharge type	Energy saving static neutralization nozzle: Within ±10 V High flow rate nozzle: Within ±15 V

Fan Type Ionizer IZF



- Thinnest: 40 mm thick
- Fastest: Rapid static neutralization 0.5 seconds
- Offset voltage (Ion balance): ±5 V
- Stable static neutralization performance, Easier maintenance

Series	Maximum air flow	Ion generation method	Offset voltage (Ion balance)
IZF10	0.46 m ³ /min, 0.66 m ³ /min	Corona discharge type	±13 V
IZF21	1.8 m ³ /min	Corona discharge type	±5 V
IZF31	4.4 m ³ /min	Corona discharge type	±5 V

Static Neutralization Equipment/Ionizers

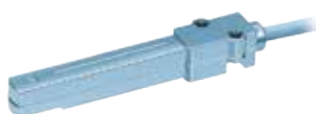
Desktop Duster Box ZVB



- Static neutralization, dust removal, and dust collection processes have been integrated into one box.
- Supports workpieces of various sizes:
Electronic components, lenses, smartphones, lamp covers, cosmetic cases, parts for home appliances
- Static neutralization and dust removal efficiency have been improved by separation from the ion blow and air blow structure.

Series	Size	Ion generation method	Offset voltage
ZVB20	A4	Corona discharge type	Within ± 10 V (Static neutralization distance: 100 mm from the nozzle)
ZVB40	A3	Corona discharge type	Within ± 10 V (Static neutralization distance: 100 mm from the nozzle)

Electrostatic Sensor IZD10



- Detects the electrostatic potential and outputs in an analog voltage

Series	Potential measurement	Output voltage	Effective detection distance
IZD10-110	± 0.4 kV (Detected at a 25 mm distance)	1 to 5 V	10 to 50 mm
IZD10-510	± 20 kV (Detected at a 50 mm distance)	(Output impedance: Approx. 100 Ω)	25 to 75 mm

Electrostatic Sensor 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)

Process Valves

2/3 Port Solenoid Valves/ Air Operated Valves



- Direct Operated 2 Port Solenoid Valve/**VX21/22/23**····· P.173
- 2 Port Solenoid Valve with Built-in Y-strainer/**VXK21/22/23**····· P.173
- Pilot Operated 2 Port Solenoid Valve/**VXD**····· P.173
- Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve/**VXZ**····· P.173
- Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve/**VXS**····· P.173
- Angle Seat Valve/Air Operated Type/**VXB**····· P.174
- Steam Valve/**VND**····· P.174
- Energy Saving Type 2 Port Solenoid Valve/**VXE**····· P.174
- Pilot Operated 2 Port Solenoid Valve/**VXP21/22/23**····· P.174
- Water Hammer Relief, Pilot Operated 2 Port Solenoid Valve/**VXR21/22/23**····· P.174
- Diaphragm Type Pilot Operated 2 Port Solenoid Valve for High Pressure/**VXH**····· P.174
- 2 Port Solenoid Valve/
Air Operated Valve for Dust Collector/**VXF2/VXFA2**····· P.175
- Direct Operated 3 Port Solenoid Valve/**VX31/32/33**····· P.175
- Direct Air Operated 2 Port Valve/**VXA21/22**····· P.175
- Direct Air Operated 3 Port Valve/**VXA31/32**····· P.175

Compact 2/3 Port Solenoid Valves



- Compact Direct Operated 2 Port Solenoid Valve/**VDW**····· P.176
- Compact Direct Operated 2/3 Port Solenoid Valve for Water and Air/**VDW**····· P.176
- Compact/Lightweight 2 Port Solenoid Valve for Water and Air/**VDW30/40-XF**····· P.176
- High Speed 2 Port Valve/**SX10**····· P.176
- Pilot Operated 2 Port Solenoid Valve for Dry Air/**VQ**····· P.176
- Compact Direct Operated 2/3 Port Solenoid Valve for Chemical Liquids/**LVM**····· P.177
- Direct Operated 2/3 Port Isolated Valve/**LVMK20/200**····· P.177
- Process Gas Diaphragm Valve/**AZ**····· P.177
- Normal Close High Vacuum Solenoid Valve/**XSA**····· P.177

5.0 MPa 2/3 Port Solenoid Valves



- 5.0 MPa Pilot Operated 2/3 Port Solenoid Valve & Check Valve/**VCH41/42/410/VCHC40**····· P.178
- Direct Operated Regulator for 6.0 MPa (Relieving Type)/**VCHR**····· P.178
- 5.0 MPa Silencer/**VCHN**····· P.178

2/3 Port Valves for General Purpose Fluid Control



- Process Valve/**VNA**····· P.179
- Process Valve/**VNB**····· P.179
- Steam Valve/**VND**····· P.179

Coolant Valves



- Coolant Valve/**SGC**····· P.180
- 3 MPa/7 MPa High Pressure Coolant Valve/**SGH**····· P.180
- Coolant Valve/**VNC**····· P.180
- High Pressure Coolant Valve/**VNH**····· P.180

Valves for Water and Chemical Base Fluids



- Valve for Water and Chemical Base Fluids (2/3 Port Air Operated Valve)/**VCC**····· P.181
- SUS316L Stainless Steel Fitting/**VCK**····· P.181
- 2-Layer Soft Fluoropolymer Tubing/**TQ**····· P.181

2/3 Port 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*
- Height: 10% smaller*
- Weight: 30% lighter*
- Body materials: Aluminum, Resin, C37, Stainless steel
- Available with One-touch fittings (Resin body)
- * Comparison made with SMC's current 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

2 Port Solenoid Valve with Built-in Y-strainer **VXK**



- For air, water, oil, steam
- Space saving with reduced piping labor
- Built-in strainer

Series	Valve type	Port size	Orifice diameter [mmø]
VXK21/22/23	N.C./N.O.	1/8 to 3/8	2 to 8

Pilot Operated 2 Port Solenoid Valve **VXD**



- For air, water, oil, heated water, high-temperature oil
- Body materials: Aluminum, Resin, C37, Stainless steel, CAC407
- A type with One-touch fittings (Resin body) is available.
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXD	N.C./N.O.	ø10, ø12, ø3/8" 1/4 to 1 32A to 50A	10 to 50

Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve **VXZ**



- For air, water, oil, heated water, high-temperature oil
- Body materials: Aluminum, Resin, C37, Stainless steel
- A type with One-touch fittings (Resin body) is available.
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXZ	N.C./N.O.	ø10, ø12, ø3/8" 1/4 to 1	10 to 25

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



- For steam
- Long service life: 3 million cycles (Based on SMC's test conditions)
- Improved air filtration
- Reduced apparent power: 18 VA → 12 VA, 20 VA → 15 VA
- Reduced coil temperature rise: 248 → to 212°F [120→100°C]
- IP65

Series	Valve type	Port size	Orifice diameter [mmø]
VXS	N.C.	1/4 to 1	10 to 25

2/3 Port Valves/Air Operated Valves

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: 0.6 in³/min [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

Steam Valve/2 Port Valve for Steam **VND**



- For steam control
- Adopts PTFE seals
- With indicator light (Option)
- Air operated type

Series	Valve type	Port size	Orifice diameter [mmø]
VND	N.C./N.O.	1/8 to 2 1 1/4B to 2B	7 to 50

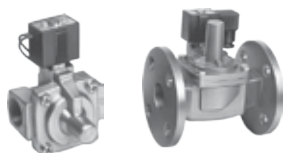
Energy Saving Type 2 Port Solenoid Valve **VXE**



- 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

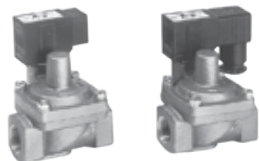
Pilot Operated 2 Port Solenoid Valve **VXP**



- For air, gas, steam, water, oil

Series	Valve type	Port size	Orifice diameter [mmø]
VXP21/22/23	N.C./N.O.	1/4 to 2 32A to 50A	10 to 50

Water Hammer Relief, Pilot Operated 2 Port Solenoid Valve **VXR**



- For water, oil

Series	Valve type	Port size	Orifice diameter [mmø]
VXR21/22/23	N.C./N.O.	1/2 to 2	20 to 50

Diaphragm Type Pilot Operated 2 Port Solenoid Valve for High Pressure **VXH**

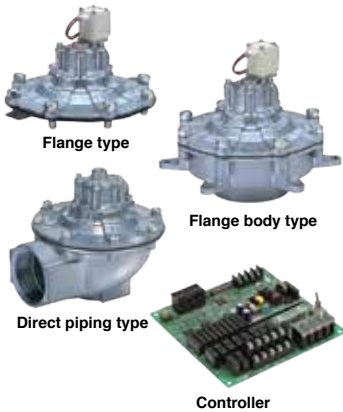


- Maximum operating pressure differential of 290 psi [2 MPa] with an orifice diameter of ø10

Series	Valve type	Port size	Orifice diameter [mmø]
VXH	N.C.	1/4 to 1/2	10

2/3 Port Valves/Air Operated Valves

2 Port Solenoid Valve/Air Operated Valve for Dust Collector **VXF2/VXFA2**



- Piping: Flange type, Flange body type, Direct piping type
- Orifice machining on the outlet is not necessary, so the time required for piping can be reduced. (Flange body type)
- Enclosure: IP65*
 - * Electrical entry flat terminal type terminal is IP40.
- Applicable for high temperatures: Fluid temperature 212°F [100°C]
- A flat terminal type has been added.
- The VXFC series is the designated controller.

Series	Valve type	Port size	Orifice diameter [mmø]
VXF2	N.C.	20A to 100A	22 to 100
VXFA2	N.C.	20A to 100A	22 to 100

Direct Operated 3 Port Solenoid Valve **VX3**



- For air, water, oil, steam
- Manifold type no.: VVX31, VVX32, VVX33

Series	Valve type	Port size	Orifice diameter [mmø]
VX31/32/33	N.C./N.O./COM.	1/8 to 3/8	1.5 to 4

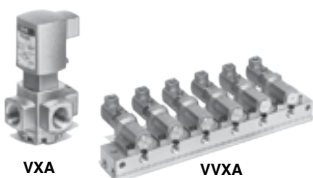
Direct Air Operated 2 Port Valve **VXA**



- For air, water, oil
- Manifold type no.: VVXA21, VVXA22

Series	Valve type	Port size	Orifice diameter [mmø]
VXA21/22	N.C./N.O.	1/8 to 1/2	3 to 10

Direct Air Operated 3 Port Valve **VXA3**



- For air, vacuum, water, oil
- Manifold type no.: VVXA31, VVXA32

Series	Valve type	Port size	Orifice diameter [mmø]
VXA31/32	C.O.	1/8 to 3/8	1.5 to 4

Compact 2/3 Port Solenoid Valves

Compact Direct Operated 2 Port Solenoid Valve **VDW**



- For air, medium vacuum, water
- Body materials: Aluminum, Resin (PPS), C37, 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

Compact Direct Operated 2/3 Port Solenoid Valve for Water and Air **VDW**



Series	Valve type	Port size	Orifice diameter [mmø]
VDW200/300	C.O.	M5 to 1/4 (8A)	1 to 4

Compact/Lightweight 2 Port Solenoid Valve for Water and Air **VDW-XF**



- Compact, lightweight resin body (PPS)
- IP65
- Power consumption: 3 W (Standard), 0.5 W (With power-saving circuit)

Series	Valve type	Port size	Orifice diameter [mmø]
VDW30/40-XF	N.C.	P7, P8 (Quick fastener) ø4, ø6, ø8, ø10	1 to 6

High Speed 2 Port Valve **SX10**



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

Series	Flow rate	Power consumption [W]	Max. operating frequency [Hz]
SX10	50	80	1200
		40	1000
		10	550
		4	350
SX10	100	80	650
		40	550
		10	300
		4	200
SX10	150	80	600
		40	500
		10	250
		4	150

Pilot Operated 2 Port Solenoid Valve for Dry Air **VQ**



- High-frequency operation is possible: High-speed response 7 ms or less (VQ20), 20 ms or less (VQ30)
- Easy piping with One-touch fittings
- The dust-tight, water-jet-proof enclosure (IP65) is compatible with the DIN terminal type.
- Applications: Air-blow, Blow-off of workpieces, etc.
- Manifold type no.: VV2Q22, VV2Q32

Series	Valve type	Port size	Orifice diameter [mmø]
VQ20	N.C.	ø6 to ø12	3.4
VQ30	N.C.	ø6 to ø12	4.8

Compact 2/3 Port Solenoid Valves

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



- Materials of wetted parts Body/plate: PEEK
Diaphragm: Choice of EPDM, FKM, Kalrez®
- Service life: 10 million cycles or more (Based on SMC's test conditions)

Series	Valve structure	Valve type	Orifice diameter [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. Universal	Bottom ported Side ported	Body: PPS Seal: EPDM, FKM

Diaphragm Valve for Ultra High Purity **AZ**



- Cleaned for high purity semiconductor applications and clean room assembled
- Helium leak tested
- SEMI Standards compliant
- User-friendly forged body

Series	Type	Body material	Connection type	Connection size
AZ	Air operated type	316L SS	Face seal	1/4", 3/8", 1/2
AZ	Manually operated type		Tube weld	

Normal Close High Vacuum Solenoid Valve **XSA**



- Minimum operating pressure: 1×10^{-6} Pa (abs)
- Leakage: Internal 1.3×10^{-9} Pa·m³/s, External 1.3×10^{-11} Pa·m³/s
- 2 types of fittings are available.
- Power consumption: Max. 25% reduction
- Weight: Max. 18% lighter (0.5 kg → 0.41 kg)

Series	Valve type	Fluid	Piping	Port size
XSA	Normally closed	Air, Inert gas	Face seal fitting Compression fitting	1/4B, 3/8B

5.0 MPa 2/3 Port Solenoid Valves

725 psi [5.0 MPa] Pilot Operated 2/3 Port Solenoid Valve & Check Valve **VCH/VCHC**



- Service life: 10 million cycles
- Uses a polyurethane elastomer poppet for valve parts
- Improves durability at high pressures

Series	Type	Port size	Orifice diameter [mmφ]
VCH41	2 port valve, N.C.	G3/4, 1	φ16
VCH42	2 port valve, N.O.	G3/4, 1	φ17.5
VCH410	3 port valve	G1/2 to 1	φ18
VCHC40	Check valve	G3/4, 1	φ16

Direct Operated Regulator for 870 psi [6.0 MPa] (Relieving Type) **VCHR**



- Service life: 10 million cycles
 - Improved durability in high-pressure environments through the use of a polyurethane elastomer poppet
 - Uses NSF-H1 approved grease on guide rings (Sliding parts)
 - Improved durability through the use of a metal seal type relief valve
 - Uses a special fluororesin seal for sliding parts
- Stable unattached response, Not easily affected by pressure

Series	Model	Type	Port size	Set pressure psi [MPa]
VCHR	VCHR30/40	Direct operated regulator (Relieving type)	G3/4, 1, 1 1/2	73 to 725 [0.5 to 5.0] (Max. operating pressure: 87 [6.0])

725 psi [5.0 MPa] Silencer **VCHN**



- Reduces clogging with its double-layer structure
- Noise reduction: 35 dB (A)

2/3 Port Valves for General Purpose Fluid Control

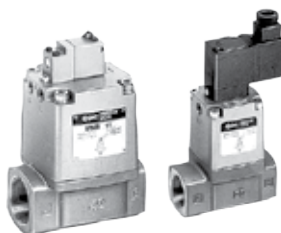
Process Valve/2 Port Valve for Compressed Air and Air-hydro Circuit Control **VNA**



- Exclusively for pneumatic systems and air-hydro circuit controls
- The balance poppet permits normal and reverse flow.
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
VNA	N.C./N.O./C.O.	1/8 to 2	10 to 50

Process Valve/2 Port Valve for Fluid Control **VNB**



- For controlling various fluids
- Can operate with a wide range of fluids, such as air, water, oil, gas, vacuum, etc., depending on the selected body and seal materials
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
VNB	N.C./N.O./C.O.	1/8 to 2 1 1/4B to 2B	7 to 50

Steam Valve/2 Port Valve for Steam **VND**



- For steam control
- Adopts PTFE seals
- With indicator light (Option)
- Air operated type

Series	Valve type	Port size	Orifice diameter [mmø]
VND	N.C./N.O.	1/8 to 2 1 1/4B to 2B	7 to 50

Coolant Valves

Coolant Valve SGC



- High flow type to control coolants (Cutting fluid) in machine tools
- Low power consumption: 0.35 W (at 24 VDC)
- Maximum operating pressure: 73psi, 145psi, 232 psi [0.5 MPa, 1MPa, 1.6 MPa]
- Service life: 5 million cycles or more (Based on SMC's test conditions)
- CE-compliant
- Compatible with G threads (ISO1179-1) as standard
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
SGC	N.C./N.O.	3/8 to 2	9 to 51

High Pressure Coolant Valve SGH



- Maximum operating pressure: 435psi, 1015 psi [3 MPa, 7 MPa]
- Compatible with high-speed grinding and long drilling processes
- Coolant valve for high pressure coolant liquid that is ideal for lubrication, dust blowing, and cooling
- Low power consumption: 0.35 W (at 24 VDC)
- Service life: 3 million cycles or more (Based on SMC's test conditions)
- CE-compliant, Water hammer reduced by 20%
- Compatible with G threads (ISO1179-1) as standard
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
SGH	N.C./N.O.	3/8 to 1	9 to 25

Coolant Valve VNC



- For controlling coolants (Cutting fluid) used in machine tools
- Maximum operating pressure: 73 psi, 145 psi [0.5 MPa, 1 MPa]
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
VNC	N.C./N.O.	1/8 to 2 1 1/4B to 3B	7 to 80

High Pressure Coolant Valve VNH



- For controlling coolants (Cutting fluid) used in machine tools
- Maximum operating pressure: 508 psi, 1015 psi [3.5 MPa, 7 MPa]
- Air operated, external pilot solenoid

Series	Valve type	Port size	Orifice diameter [mmø]
VNH	N.C.	3/8 to 1	3.9 to 15.7

Valves for Water and Chemical Base Fluids

Valve for Water and Chemical Base Fluids (2/3 Port Air Operated Valve) **VCC**



- Applicable for 2 liquid paints (VCC12D)
PTFE diaphragm structure = Elimination of sliding parts
Less paint adhesion
- Mountable on a robot arm (Space saving, Lightweight)
2 valves per station (30 mm pitch)
2/3 port valves mixed mounting
Resin manifold block

Series	Orifice diameter	Fluid
VCC	ø3.8	Water/chemical-based paint, Ink, Cleaning fluid (Water, Butyl acetate), Air

SUS316L Stainless Steel Fitting **VCK**



- Since sealing tape is not required, there is no need to worry about insulation. (Applicable for painting with high voltage)
- Easy insertion/removal of piping in narrow spaces

Series	Material/Description	Port size
VCK	Stainless steel fitting (316L SS)	G1/4

2-Layer Soft Fluoropolymer Tubing **TQ**



- Carries fluids, such as solvent, with a soft and abrasion resistant tube
- 2-layer structure:
Outer layer: Special nylon resin, Inner layer: Special fluoropolymer
- Internal smoothness: Equivalent to Ra 0.02 μm

Series	Tubing O.D.	Color	Fluid
	Metric size		
TQ	ø4, ø6, ø8, ø10, ø12	Translucent (Material color)	Air, Water, Inert gas, Solvent

Chemical Liquid Valves/Fittings/Needle Valves/Tubing

Chemical Liquid Valves



High Purity Chemical Liquid Valve/Air Operated, Integrated Fitting Type/ LVC	P.183
High Purity Chemical Liquid Valve/Air Operated, Threaded Type/ LVA	P.183
High Purity Chemical Liquid Valve/Manually Operated (Integrated Fitting Type/Threaded Type)/ LVH	P.183
Compact Type High Purity Air Operated Chemical Liquid Valve/ LVD	P.184
High Purity Chemical Liquid Valve Non-Metallic Exterior/ LVQ	P.184
Vinyl Chloride Air Operated Valve/ LVP	P.184
PVC Quick Drain Valve/ LVW	P.184

Fittings/Needle Valves



Fluoropolymer Fittings/Hyper Fittings/ LQ1	P.185
Fluoropolymer Fittings/Hyper Fittings/ LQ2	P.185
Fluoropolymer Fittings/Hyper Fittings/Flare Type/ LQ3	P.185
High Purity Fluoropolymer Needle Valve/ LVN	P.185
Fluoropolymer Bore Through Connector/ LQHB	P.185

Tubing



Fluoropolymer Tubing/ TL/TIL	P.186
Fluoropolymer Tubing (PFA)/ TLM/TILM	P.186
Soft Fluoropolymer Tubing/ TD/TID	P.186
FEP Tubing (Fluoropolymer)/ TH/TIH	P.186

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 212°F [100°C]
- Manifold type no.: LLC2, LLC3, LLC4, LLC5

Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVC	Integrated fitting	N.C./N.O./Double acting	Metric: 3 to 25 Inch: 1/8 to 1	4 to 22

High Purity Chemical Liquid Valve/Air Operated, Threaded Type **LVA**



- Body materials: New PFA/Stainless steel/PPS
- Diaphragm materials: PTFE, EPR, or NBR can be selected.
- Manifold type no.: LLA2, LLA3, LLA4, LLA5

Series	Type	Valve type	Port size	Orifice diameter [mmø]
LVA	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
- Fitting types: Double ferrule fittings, Metal gasket seal fittings, Integrated tubing



Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVA	Double ferrule fittings, Metal gasket seal fittings, Integrated tubing	N.C./N.O./Double acting	Metric: 6 to 19 Inch: 1/4 to 1	4 to 22

High Purity Chemical Liquid Valve/Manually Operated (Integrated Fitting Type/Threaded Type) **LVH**



- Body materials: New PFA/Stainless steel/PPS
- Compatible with locking and non-locking types
- Manifold type no.: LLH2, LLH3, LLH4

Series	Type	Valve type	Port size (Applicable tubing O.D.)	Orifice diameter [mmø]
LVH	Manually operated type (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
- Fitting types: Double ferrule fittings, Metal gasket seal fittings, Integrated tubing



Series	Type	Valve type	Applicable tubing O.D.	Orifice diameter [mmø]
LVH□M	Double ferrule fittings, Metal gasket seal fittings, Integrated tubing	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)

Note) Tubing O.D. for the tube extension type

Series	Type	Valve type	Applicable tubing O.D. ^{Note)}		Orifice diameter [mmø]
			Metric	Inch	
LVD	Integrated fittings	N.C./N.O./Double acting	3 to 19	1/8 to 3/4	2 to 16
LVD	Tube extensions	N.C./N.O./Double acting	6 to 19	1/4 to 3/4	4 to 16
LVD-F/FN	LQ1 Integrated fittings	N.C./N.O./Double acting	3 to 25	1/8 to 1	4 to 22
LVD-F/FN	LQ3 Integrated fittings	N.C./N.O./Double acting	6 to 25	1/4 to 1	4 to 22
LVD-F/FN	Tube extensions	N.C./N.O./Double acting	6 to 25	1/4 to 1	4 to 22

High Purity Chemical Liquid Valve/Air Operated, Non-Metallic Exterior **LVQ**



- Screwless construction, Non-metallic construction doesn't use metal screws to secure the body of the actuator
- Body material: New PFA
- Diaphragm material: PTFE
- Actuator material: PVDF

Note) Tubing size

Series	Type	Valve type	Applicable tubing O.D.		Orifice diameter [mmø]
			Metric	Inch	
LVQ	Integrated fitting type	N.C./N.O./Double acting	3 to 25	1/8 to 1	4 to 22
LVQ	Space saving type	N.C./N.O./Double acting	Fitting size: 2 to 6	Fitting size: 2 to 6	4 to 22
LVQ	Tube extension type	N.C./N.O./Double acting	6 to 25 ^{Note)}	1/4 to 1 ^{Note)}	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. 16 A)	16	N.C./N.O./Double acting	With flow rate adjustment
LVP6□	O.D. ø26 (Nominal dia. 20 A)	22	N.C./N.O./Double acting	With flow rate adjustment
LVP6□	O.D. ø32 (Nominal dia. 25 A)	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. 25 A)	ø25	Double acting
LVW80	ø38 (Nominal dia. 32 A)	ø40	Double acting
LVW80	ø48 (Nominal dia. 40 A)	ø40	Double acting
LVW90	ø60 (Nominal dia. 50 A)	ø65	Double acting
LVW90	ø75 (Nominal dia. 65 A)	ø65	Double acting
LVW90	ø89 (Nominal dia. 80 A)	ø80	Double acting

Fittings/Needle Valves

Fluoropolymer Fittings/Hyper Fittings/Insert Bushing Type 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 °F [°C]
LQ1	145 psi [1.0 MPa]	32 to 392 [0 to 200]

Fluoropolymer Fittings/Hyper Fittings/Insert Bushing Type LQ2



- Material: New PFA
- Quadruple-seal construction
- The reducer method allows for tubing size changes without replacing the body.

Series	Max. operating pressure	Operating temperature °F [°C]
LQ2	145 psi [1.0 MPa]	32 to 392 [0 to 200]

Fluoropolymer Fittings/Hyper Fittings/Flare Type LQ3



- Material: New PFA
- Triple-seal construction
- Easy installation

Series	Max. operating pressure	Operating temperature °F [°C]
LQ3	145 psi [1.0 MPa]	Nut material PVDF: 32 to 302 [0 to 150] Nut material PFA: 32 to 392 [0 to 200]

High Purity Fluoropolymer Needle Valve LVN



- Material: New PFA
- Fitting integrated, all-in-one structure
Uses Hyper fittings/LQ2 series
- Triple-seal construction

Series	Applicable tubing O.D.		Flow adjustment range gal/min [L/min]	Orifice diameter [mmø]
	Metric	Inch		
LVN	4 to 12	1/8" to 1/2"	0 to 3.2 [0 to 12]	4.4 to 10

Fluoropolymer Bore Through Connector LQHB

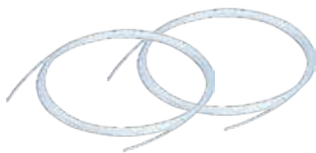


- It is possible to freely choose the tube's positioning. As the tube runs through the fitting itself, a setting is available for any optional position.
- Can be used in the pressure feeding of chemical liquids, etc., during the production process of semiconductors
- Applicable to chemical liquids such as acid, alkali, and deionized water
- Materials: New PFA (Body, nut), PTFE (Collet)

Series	Applicable tubing O.D.		Operating temperature °F [°C]
	Metric size	Inch size	
LQHB	ø3 to ø25	ø1/8" to ø1"	32 to 392 [0 to 200]

Tubing

Fluoropolymer Tubing TL/TIL



- Material: Super PFA
- Maximum operating temperature: 500°F [260°C] (This may vary according to operating conditions.)

* Made to order

Series	Tubing O.D.		Color
	Metric size	Inch size	
TL/TIL	4, 6, 8, 10, 12, 19	1/8", 3/16", 1/4", 3/8", 1/2", 3/4", 1", 1 1/2"*	Translucent

Fluoropolymer Tubing (PFA) TLM/TILM



- Maximum operating temperature: 500°F [260°C] (This may vary according to operating conditions.)
- Food Sanitation Law compliant
- Compliant with the FDA's (Food and Drug Administration) § 177-1550 dissolution test

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

Soft Fluoropolymer Tubing TD/TID



- Maximum operating pressure: 232 psi [1.6 MPa] (at 68°F [20°C])*
- Food Sanitation Law compliant
- Compliant with the FDA's (Food and Drug Administration) § 177-1550 dissolution test
- Maximum operating temperature: 500°F [260°C] (This may vary according to operating conditions.)

* This may vary according to size.

Series	Tubing O.D.		Color
	Metric size	Inch size	
TD/TID	ø4, ø6, ø8, ø10, ø12	ø1/8", ø3/16", ø1/4", ø3/8", ø1/2"	Translucent

FEP Tubing (Fluoropolymer) TH/TH



- Maximum operating pressure: 334 psi [2.3 MPa] (at 68°F [20°C])*
- Food Sanitation Law compliant
- Compliant with the FDA's (Food and Drug Administration) § 177-1550 dissolution test
- Maximum operating temperature: 392°F [200°C] (This may vary according to operating conditions.)

* This may vary according to size.

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

Process Pumps (Diaphragm Pumps)

■ Process Pumps



- Automatically Operated Type (Internal Switching Type)
 - Air Operated Type (External Switching Type)/**PA3000/5000** P.188
- Clean Room/Automatically Operated Type (Internal Switching Type)
 - Air Operated Type (External Switching Type)/**PA(P)3000** P.188
- Automatically Operated Type,
 - Built-in Pulsation Attenuator (Internal Switching Type)/**PAX1000** P.188
- Built-in Solenoid Valve
 - Air Operated (External Switching Type)/**PB1000A** P.188
 - Air Operated (External Switching Type)/**PB1313A** P.188
- Automatically Operated Type (Internal Switching Type)
 - Air Operated Type (External Switching Type)/**PAF3000/5000** P.188
- Products Using Stainless Steel Parts
(Body Tightening Bolts, Switching Valves, etc.)/**PAF3000-X68** P.188

Process Pumps

Process Pump/Double Acting Pump PA/PAP/PAX



Series	Actuation	Discharge rate gal/min [L/min]	Wetted parts material
PA3□□0	Automatically operated type	0.26 to 5.3 [1 to 20]	ADC12 (Aluminum) SCS14 (Stainless steel)
PA3□13	Air operated type	0.026 to 3.2 [0.1 to 12]	ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□□0	Automatically operated type	1.3 to 11.9 [5 to 45]	ADC12 (Aluminum) SCS14 (Stainless steel)
PA5□13	Air operated type	0.26 to 6.3 [1 to 24]	ADC12 (Aluminum) SCS14 (Stainless steel)
PAP3310	Automatically operated type	0.26 to 3.4 [1 to 13]	New PFA (Fluororesin)
PAP3313	Air operated type	0.026 to 2.4 [0.1 to 9]	New PFA (Fluororesin)
PAX1□12	Automatically operated type, Built-in pulsation attenuator	0.13 to 2.6 [0.5 to 10]	ADC12 (Aluminum) SCS14 (Stainless steel)

Process Pump/Single Acting Pump PB



Series	Actuation	Discharge rate oz/min [mL/min]	Wetted parts material
PB1011A	Built-in solenoid valve	0.27 to 67.6 [8 to 2000]	Polypropylene Stainless steel 316
PB1013A	Air operated type	0.27 to 33.8 [8 to 1000]	Polypropylene Stainless steel 316
PB1313A	Air operated type	0.27 to 33.8 [8 to 1000]	New PFA (Fluororesin)

Non-Metallic Pump/Double Acting Pump PAF



Series	Actuation	Discharge rate gal/min [L/min]	Wetted parts material
PAF3410	Automatically operated type	0.26 to 5.3 [1 to 20]	New PFA (Fluororesin)
PAF3413	Air operated type	0.26 to 4.0 [1 to 15]	New PFA (Fluororesin)
PAF3410-X68*	Automatically operated type	0.26 to 5.3 [1 to 20]	New PFA (Fluororesin)
PAF5410	Automatically operated type	1.3 to 11.9 [5 to 45]	New PFA (Fluororesin)
PAF5413	Air operated type	1.3 to 10.0 [5 to 38]	New PFA (Fluororesin)

* 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	P.190
Thermo-chiller/Standard Type/ HRS090	P.190
Thermo-chiller/Standard Type/ HRS100/150	P.190
Thermo-chiller/Inverter Type/ HRSH090	P.190
Thermo-chiller/Inverter Type/ HRSH	P.191
Thermo-chiller/Basic Type/ HRSE	P.191
Thermo-chiller/High-performance Type/ HRZ	P.191
Thermo-chiller/High-performance Inverter Type/ HRZ	P.191
Dual Thermo-chiller/High-performance Inverter Type/ HRZD	P.191
Water-cooled Thermo-chiller/High-performance Type/ HRW	P.192
Water-cooled Thermo-chiller/High-performance Inverter Type/ HRW	P.192

Thermo-cons/Thermoelectric Baths (Peltier-Type Temperature Control Equipment)



Thermo-con/Rack Mount Type/ HECR	P.192
Thermo-con/ HEC	P.192
Thermoelectric Bath/ HEB	P.192
Thermoelectric Bath (Made to Order)/ INR	P.193
Chemical Thermo-con/ HED	P.193

Air Temperature Controllers



Air-Thermo/ HEA	P.193
Thermo-dryer/ IDH	P.193

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	41 to 104°F [5 to 40°C]	1.3 kW, 1.9 kW 2.4 kW, 3.2 kW 5.1 kW, 5.9 kW (60 Hz)	±0.18°F [±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: ±0.9°F [±0.5°C]
- Set temperature range: 41 to 95°F [5 to 35°C]
- Max. ambient temperature: 113°F [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	41 to 95°F [5 to 35°C]	9 kW (60 Hz)	±0.9°F [±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	41 to 95°F [5 to 35°C]	9.5 kW, 14.5 kW (60 Hz)	±0.18°F [±0.1°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: ±0.18°F [±0.1°C]
- Set temperature range: 41 to 104°F [5 to 40°C]

Series	Set temperature range	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRSH090	41 to 104°F [5 to 40°C]	9.5 kW	±0.18°F [±0.1°C]	Air-cooled refrigeration Water-cooled refrigeration	Tap water Deionized water Ethylene glycol aqueous solution (15%)

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: 113°F [45°C]
-
- 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	41 to 95°F [5 to 35°C]	10 kW, 15 kW 20 kW, 25 kW 28 kW	±0.18°F [±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	50 to 86°F [10 to 30°C]	1.2 kW, 1.6 kW 2.2 kW (60 Hz)	±3.6°F [±2.0°C]	Air-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 °F [°C]	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZ	-4 to 104 [-20 to 40] 68 to 194 [20 to 90] -4 to 194 [-20 to 90]	1 kW, 2 kW 4 kW, 8 kW	±0.18°F [±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 °F [°C]	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZ	-4 to 194 [-20 to 90] 50 to 140 [10 to 60]	10 kW	±0.18°F [±0.1°C]	Water-cooled refrigeration	Fluorinated fluid, Tap water, Deionized water, Ethylene glycol aqueous solution (60%)

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 °F [°C]	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRZD	-22 to 194 [-30 to 90]	9.5 kW x 2	±0.18°F [±0.1°C]	Water-cooled refrigeration	Fluorinated fluid Ethylene glycol aqueous solution (60%)

Temperature Control Equipment

Thermo-chillers (Circulating Fluid Temperature Controllers)

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 °F [°C]	Cooling capacity	Temperature stability	Cooling method	Circulating fluid
HRW	68 to 194 [20 to 90]	2 kW, 8 kW 15 kW, 30 kW	±0.54°F [±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: 0.18 to 0.54°F [±0.01 to 0.03°C]
- Set temperature range: 50 to 140°F [10 to 60°C]
- Cooling capacity: 200 W, 400 W, 510 W, 800 W, 1 kW
- Power consumption: 200 W, 400 W

Series	Set temperature range	Cooling capacity	Temperature stability °F [°C]	Cooling method
HECR002	50 to 140°F [10 to 60°C]	200 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled
HECR004	50 to 140°F [10 to 60°C]	400 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled
HECR006	50 to 140°F [10 to 60°C]	510 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled
HECR008	50 to 140°F [10 to 60°C]	800 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled
HECR010	50 to 140°F [10 to 60°C]	1 kW	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled

Peltier-Type Thermo-con HEC

High-precision chiller



- For applications requiring high-precision temperature control
- High-precision, refrigerant-free temperature control equipment that uses a Peltier device
- Simple structure and high reliability
- Can easily be built into equipment due to its compact and low-vibration design
- Compatible with a wide range of power supply voltages
- Compliant with UL Standards, CE-marking

Series	Set temperature range	Cooling capacity	Temperature stability °F [°C]	Cooling method	Circulating fluid
HEC	50 to 140°F [10 to 60°C]	230 W 600 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type air-cooled	Tap water
HEC	50 to 140°F [10 to 60°C]	140 W 320 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type water-cooled	Tap water Ethylene glycol aqueous solution (20%)
HEC	50 to 140°F [10 to 60°C]	600 W 1200 W	±0.018 to 0.054 [±0.01 to 0.03]	Peltier-type water-cooled	Tap water Fluorinated fluid

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	Max. cooling capacity	Temperature stability	Cooling method	Circulating fluid
HEB	5 to 140°F [-15 to 60°C]	140 W 280 W	0.018°F [0.01°C]	Round type Peltier-type water-cooled	Tap water, Fluorinated fluid

Temperature Control Equipment

Thermo-cons/Thermoelectric Baths (Peltier-Type Temperature Control Equipment)

Peltier-Type Thermoelectric Bath **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 °F [°C]	Max. cooling capacity	Temperature stability °F [°C]	Cooling method	Circulating fluid
INR-244-696A	5 to 140 [-15 to 60]	280 W	±0.036 [±0.02]	Peltier-type water-cooled	Tap water Ethylene glycol aqueous solution Fluorinated fluid (Square type can only be used at room temperature.)
INR-244-745	32 to 140 [0 to 60]	140 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-733	32 to 140 [0 to 60]	140 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-747	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-736	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-746	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-734	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-749	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-748	32 to 140 [0 to 60]	320 W	±0.054 [±0.03]	Peltier-type water-cooled	
INR-244-757	32 to 140 [0 to 60]	220 W	±0.054 [±0.03]	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	50 to 140°F [10 to 60°C]	300 W 500 W 750 W	±0.18°F [±0.1°F]	Peltier-type water-cooled	Deionized water, Fluorinated fluid, Ammonia hydrogen peroxide solution, etc.

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	32 to 122°F [0 to 50°C]	22 W	±0.18°F [±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 scfm [L/min (ANR)]	Outlet air temperature adjustment range	Outlet air set pressure range psi [MPa]	Outlet air temperature stability	Cooling method
IDH□4	3.5 to 18 [100 to 500]	59 to 86°F [15 to 30°C]	22 to 123 [0.15 to 0.85]	±0.18 °F [±0.1 °C]	Heater operation PID control
IDH□6	7.1 to 28 [200 to 800]	59 to 86°F [15 to 30°C]	22 to 123 [0.15 to 0.85]	±0.18 °F [±0.1 °C]	

■ Process Gas Equipment



Regulator for Ultra High Purity/ AP	P.195
Regulator for Ultra High Purity/ SL	P.195
Regulator for Ultra High Purity/ AZ	P.195
Back Pressure Regulator for Ultra High Purity/ BP ...	P.195
Air Operated Regulator for Ultra High Purity/ AP□PA ...	P.195
Air Operated Regulator for Ultra High Purity/ AZ□PA ...	P.195
Regulator for General Applications/ AK	P.195
Back Pressure Regulator for General Applications/ BP ...	P.195
Air Operated Regulator for General Applications/ AK□PA ...	P.195
For Ultra High Purity/Air Operated Type/ AP	P.195
For Ultra High Purity/Manually Operated Type/ AP ...	P.195
Process Gas Diaphragm Valve/ AZ	P.195
Check Valve/ AP64	P.196
Vacuum Generator/ AP7/70/71/72	P.196
Flow Switch/ AP74/74B	P.196
Diaphragm Valve for General Applications/ AK	P.196
Regulator for General Applications/ AK1000T	P.196

Process Gas Equipment

Regulators for Ultra High Purity (UHP) AP/SL/AP/AZ



- For UHP gas delivery in semiconductor and other clean industries
- Body material: 316L SS secondary remelt or 316L SS
- Electropolished wetted parts
- External metal seal construction

Series	Type	Application	Body material	Connection type	Connection size
AP/SL	Single stage	Distribution (Compact)	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8"
AP/SL	Single stage	Distribution			1/4", 3/8", 1/2", 3/4"
AP/SL	Single stage	Bulk gas	316L SS		1/2", 3/4", 1"
AP/SL	Single stage	Source	316L SS secondary remelt		1/4", 3/8", 1/2", 3/4"
AP/SL	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2", 3/4"
AP	Two stage	Source	316L SS		1/4", 3/8"
AZ	Single stage	Distribution			1/4", 3/8", 1/2"
AZ	Single stage	Source			1/4", 3/8", 1/2"
AZ	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2"

Regulator/Back Pressure Regulator for General Applications AK/BP



- For a wide variety of applications from semiconductor to general
- Body material of 316 SS or brass is available depending on the gas.

Series	Type	Application	Body material	Connection type	Connection size
AK	Single stage	Distribution	316 SS or Brass	NPT female, Compression	1/4", 3/8", 1/2"
AK	Single stage	Source			1/4", 3/8", 1/2"
AK	Single stage	Sub-atmospheric pressure			1/4", 3/8", 1/2"
AK	Two stage	Source			1/4"
BP	Back pressure regulator	—			1/4"

Diaphragm Valve for Ultra High Purity AP



- For UHP gas delivery in semiconductor and other clean industries
- Used as a gas shutoff valve
- No spring is used for the wetted parts and the drive part is also separated from the diaphragm. Dead space in the flow path is small in order to suppress particle generation.

Series	Type	Body material	Connection type	Connection size
AP	Air operated type	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8", 1/2", 3/4"
AP	Manually operated type			1/4", 3/8", 1/2", 3/4"

Diaphragm Valve for Ultra High Purity AZ



- Cleaned for high-purity semiconductor applications and clean room assembled
- Helium leak tested
- SEMI Standards-compliant
- User-friendly forged body

Series	Type	Body material	Connection type	Connection size
AZ	Air operated type	316L SS	Face seal Tube weld	1/4", 3/8", 1/2"
AZ	Manually operated type			1/4", 3/8", 1/2"

Process Gas Equipment

Check Valve/Vacuum Generator/Flow Switch AP



[Check valve]

- Fluid backflow is prevented by back pressure.
- Unique design with only one moving part in the gas stream, an O-ring
- Springless structure suppresses particle generation by vibration or chattering and pressure fluctuations on the downstream side

[Vacuum generator]

- Vacuum generation equipment
- Applicable to the exhaustion of unnecessary gas remaining inside the piping during gas cylinder replacement

[Flow switch]

- Detects excess flow above a given flow rate caused by pipe breakage, etc.

Series	Type	Body material	Connection type	Connection size
AP	Check valve	316L SS secondary remelt	Face seal Tube weld	1/4", 3/8"
AP	Vacuum generator	316L SS		1/4", 3/8"
AP	Flow switch	316L SS secondary remelt, 316L SS		1/2", 3/4"

Diaphragm Valve for General Applications AK



- Rc, R, and NPT connections have been added to the series.
- For a wide variety of applications from semiconductor to general
- Cleaned for O₂ service
- Compact and lightweight due to the shortening of the actuator (AK3542/4542)
- M5 actuation port (AK3542/4542)
- Compact and lightweight due to the modifying of the knob design (AK3652/4652)
- The knob features a unique design that combines a scalloped round knob with a raised rectangular section to provide two choices of gripping. (AK3652/4652)

Series	Type	Body material	Connection type	Connection size
AK	Air operated type	316 SS	Compression	1/4", 3/8"
AK	Manually operated type		Rc, R, NPT	1/4", 3/8"

Regulator for General Applications AK1000T



- For a wide variety of applications from semiconductor to general
- Compact and lightweight:
Weight: 0.52 kg, Height: 97.5 mm
- Minimum dead leg construction
- Various piping configurations are available:
Select from compression, NPT female, or Rc thread.

Series	Type	Body material	Connection type	Connection size
AK1000T	Manually operated type	316 SS	Compression Rc, NPT	1/4", 3/8"

High Vacuum Equipment

High Vacuum Valves



- Aluminum High Vacuum Angle Valve/**XL**□-2 P.198
- Aluminum High Vacuum Angle Valve/**XL**□ P.198
- Aluminum One-touch Connection and Release High Vacuum Angle Valve/**XLAQ/XLDQ** .. P.198
- Stainless Steel High Vacuum Angle Valve/**XM** P.199
- Stainless Steel High Vacuum In-line Valve/**XY** P.199
- Normal Close High Vacuum Solenoid Valve/**XSA** .. P.199
- Smooth Vent Valve/**XVD** P.199

Slit Valves/Door Valves



- Slit Valve/**XGT** P.199
- Slit Valve/Door Valve/**XGT/XGD** P.200

Rodless Cylinders for Vacuum



- Rodless Cylinder for Vacuum/**CYV** P.200

High Vacuum Valves

Aluminum High Vacuum Angle Valve XL□-2



- Aluminum bodied
Uniform baking temperature
Lightweight, Compact
Minimal outgassing
Minimal contamination from heavy metals
- Bellows are replaceable.

Series	Actuation	Valve type	Shaft seal type	Application	Flange size
XLA-2	Air operated	Single acting (N.C.)	Bellows seal	Dust-free Cleaned	16 to 80
XLC-2		Double acting			16 to 80
XLF-2		Single acting (N.C.)	O-ring seal	High-speed operation High operating cycles	16 to 80
XLG-2		Double acting			16 to 80

Aluminum High Vacuum Angle Valve XL□



- High fluorine resistance
- Minimal outgassing
- Minimal contamination from heavy metals

Series	Actuation	Valve type	Shaft seal type	Application	Flange size
XLA	Air operated	Single acting (N.C.)	Bellows seal	Dust-free Cleaned	16 to 160
XLAV (With solenoid valve)		Single acting (N.C.)			16 to 160
XLC		Double acting			16 to 160
XLCV (With solenoid valve)		Double acting	16 to 80		
XLF		Single acting (N.C.)	O-ring seal	High-speed operation High operating cycles	16 to 160
XLFV (With solenoid valve)		Single acting (N.C.)			16 to 160
XLG		Double acting			16 to 160
XLGV (With solenoid valve)		Double acting			16 to 80
XLD		Single acting (N.C.)	Bellows seal O-ring seal	For preventing dust turbulence For preventing a pump from running overloaded	25 to 160
XLDV (With solenoid valve)		Single acting (N.C.)			25 to 160
XLH	Manual	Manual	Bellows seal	Dust-free Cleaned	16 to 50
XLS	Electromagnetic	Single acting (N.C.)	(Bellows balance)	For portable equipment not requiring air	16, 25

Aluminum One-touch Connection and Release High Vacuum Angle Valve XLAQ/XLDQ



- One-touch connection and release (No tools are required.)

Series	Actuation	Shaft seal type	Valve type	Material	Flange size
XLAQ	Air operated	Bellows seal	Single acting (N.C.)	Body: Aluminum Bellows: Stainless steel 316L	16 to 50
XLDQ		Bellows seal O-ring seal			40, 50

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.

Note) Size 16 is not available for the in-line type.

Series	Actuation	Shaft seal type	Valve type	Material	Flange size
XMA/XYA	Air operated	Bellows seal	Single acting (N.C.)	Body: SCS13 (Equivalent to stainless steel 304) Bellows: Stainless steel 316L	16 to 80 (Note)
XMC/XYC		Bellows seal	Double acting		16 to 80 (Note)
XMD/XYD		Bellows seal O-ring seal	Single acting (N.C.)		25 to 80
XMH/XYH	Manual	Bellows seal	Manual		16 to 50 (Note)

Normal Close High Vacuum Solenoid Valve **XSA**



- Minimum operating pressure: 1×10^{-6} Pa (abs)
- Leakage: Internal 1.3×10^{-9} Pa·m³/s, External 1.3×10^{-11} Pa·m³/s
- 2 types of fittings are available.
- Power consumption: Max. 25% reduction
- Weight: Max. 18% lighter (0.5 kg → 0.41 kg)

Series	Valve type	Fluid	Piping	Port size
XSA	Normally closed	Air, Inert gas	Face seal fitting Compression fitting	1/4B, 3/8B

Smooth Vent Valve **XVD**



- The valve/needle valve-integrated construction requires only 1/4 the piping space of previous models.
- Particle numbers have been significantly reduced through the use of a metal diaphragm in the sheet portion.
- Flow of both the initial air supply and the main air supply can be adjusted.

Series	Valve type	Fluid	Piping	Port size
XVD	Normally closed (Pressurize to open, Spring seal)	Nitrogen, Air, Inert gas, etc.	VCR® Swagelok®	1/4B

Slit Valves/Door Valves

Slit Valve XGT



- This product is suitable to act as the partition valve between the load lock chamber and the transfer chamber or between the transfer chamber and the process chamber in semiconductor equipment or other equipment.

Series	Operating pressure range [Pa]	Fluid	Gate size (Height x Width) [mm]	Operating pressure
XGT	Atmospheric pressure to 1×10^{-6}	Inert gas type vacuum	32 x 222 46 x 236 50 x 336	65 to 87 psi [0.45 to 0.6 MPa]

Slit Valve/Door Valve XGT/XGD



- For 450 mm wafer gate valves
- Top accessible
- Replaceable bellows
- Adopts a 2-stage operating structure
- With end lock mechanism

Series	Operating pressure range [Pa]	Fluid	Gate size (Height x Width) [mm]	Operating pressure
XGT/Slit Valve	Atmospheric pressure to 1×10^{-6}	Inert gas	56 x 496	65 to 87 psi [0.45 to 0.6 MPa]
XGD/Door Valve	Atmospheric pressure to 1×10^{-6}	Inert gas	56 x 496	58 to 87 psi [0.4 to 0.6 MPa]

Rodless Cylinders for Vacuum

Rodless Cylinder for Vacuum CYV



- Air cylinder for transfer in vacuum environments (1.3×10^{-4} Pa)

Series	Operating environment pressure [Pa (ABS)]	Bore size [mm]
CYV	Atmosphere to 1.3×10^{-4}	15, 32

Industrial Filters/Sintered Metal Elements

Industrial Filters



Vessel Series/ FGD	P.202
Vessel Series/ FGE	P.202
Vessel Series/ FGG	P.202
Vessel Series/ FGA	P.202
Vessel Series/ FGC	P.202
Bag Filter/ FGF	P.203
High Precision Filter for Liquids/ FGH	P.203
Quick Change Filter/ FQ1	P.203
Low Maintenance Filter/ FN	P.203

Sintered Metal Elements



Sintered Metal Element/ EB □/ ES □.....	P.203
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Industrial Filters

Industrial Filter/Vessel Series FGD



- Ideal for low-flow filtration (Max. 16 gal/min [60 L/min])
- It is possible to select the antistatic specification (FGDE, FGDF).

Series	Port size	Max. operating pressure	Operating temperature
FGD	Rc3/8, 1/2, 3/4	102, 145 psi [0.7, 1 MPa]	Max 176°F [Max. 80°C]

Industrial Filter/Vessel Series FGE



- Ideal for medium flow rate filtration (Max. 61 gal/min [230 L/min])
- Easy element replacement for the V-band type (With cover anti-scattering mechanism)

Series	Port size	Max. operating pressure	Operating temperature
FGE	R1, 2	102 psi [0.7 MPa]	Max 176°F [Max. 80°C]

Industrial Filter/Vessel Series FGG



- Ideal for high-flow filtration (Max. 92 gal/min [350 L/min])
- Easy element replacement for the V-band type (With cover anti-scattering mechanism)

Series	Port size	Max. operating pressure	Operating temperature
FGG	Rc2	102 psi [0.7 MPa]	Max 176°F [Max. 80°C]

Industrial Filter/Vessel Series FGA



- Ideal for high-flow filtration (Max. 845 gal/min [3200 L/min])

Series	Port size	Max. operating pressure	Operating temperature
FGA	25 to 150 (1B to 6B) JIS 10KFF	145 psi [1 MPa]	Max 176°F [Max. 80°C]

Industrial Filter/Vessel Series FGC



- Ideal for low-flow filtration (Max. 21 gal/min [80 L/min])

Series	Port size	Max. operating pressure	Operating temperature
FGC	15 to 25 (1/2B to 1B) JIS 10KFF	145, 290, 580 psi [1, 2, 4 MPa]	Max 176°F [Max. 80°C]

Industrial Filters

Bag Filter FGF



- Highly effective for the filtration of high-temperature and high-viscosity fluids
- Ideal for high-flow filtration (Max. 528 gal/min [2000 L/min])
- Easy handling of filtered impurities

Series	Port size	Max. operating pressure	Operating temperature
FGF	100 (4B), 150 (6B) JIS 10KFF	73 psi [0.5 MPa]	Max. 176°F [Max. 80°C]

High Precision Filter for Liquids FGH



- Filtration efficiency: 99% or more

Series	Port size	Max. operating pressure	Operating temperature
FGH	Rc3/8 to 1	145 psi [1 MPa]	Max. 176°F [Max. 80°C]

Filter for Cleaning Fluid/Quick Change Filter FQ1



- Ideal for low-flow filtration (Max. 7.9 gal/min [30 L/min])
- No tools are required.
- Takes only 60 seconds for element replacement

Series	Port size	Max. operating pressure	Operating temperature
FQ1	Rc1/2, 3/4, 1	145 psi [1 MPa]	Max. 176°F [Max. 80°C]

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
FN1	Rc1	145 psi [1 MPa]	Max. 176°F [Max. 80°C]
FN4	Rc2	145 psi [1 MPa]	Max. 176°F [Max. 80°C]

Sintered Metal Elements

Sintered Metal Element EB/ES



- Large mechanical strength and withstand pressure, Anti-corrosive
- Mechanical process, caulking, brazing, soldering, welding, and simultaneous sintering are possible.
- Can be cleaned and reused

Series	Material	Nominal filtration accuracy
EB	Bronze	(1) 2, 5, 10, 20, 40, 70, 100, 120 μm () : Semi-standard
ES	Stainless steel	(1) 2, 5, 10, 20, 40, 70, 100, 120 μm () : Semi-standard

Pneumatic Instrumentation Equipment

Positioners



- Electro-Pneumatic Positioner/**IP8000/8100** P.205
- Smart Positioner/**IP8001/8101** P.205
- Pneumatic-Pneumatic Positioner/**IP5000/5100** P.205
- Cylinder Positioner/**IP200** P.205

Regulators



- Filter Regulator/**1301** P.205
- Filter Regulator/**IW** P.205
- Filter Regulator/Made to Order/
AW30-B to AW60-B-X430/X440 P.205
- Filter Regulator: Stainless steel 316 and special
temperature environment (-40°C) specifications/
AW30/40-X2622 P.206

Relays/Valves



- Booster Relay/**IL100/XT240** P.206
- Lock-Up Valve/**IL201/211/220** P.206

Electro-Pneumatic Transducers



- Electro-Pneumatic Transducer/**IT600/601** P.206

Actuators



- Cylinder with Positioner/**CPA2** P.207
- Cylinder with Positioner/**CPS1** P.207

Detection Conversion Units



- Pressure Switch/**IS100** P.207

Solenoid Valves



- NAMUR Interface 3 Port Solenoid Valve/**VFN200N** ... P.207
- NAMUR Interface 5 Port Solenoid Valve/**VFN2000N** .. P.207
- NAMUR Interface 3/5 Port Solenoid Valve
IP67 Compliant, Hygienic Design Type/
VFN2120N-X23/-X36 P.208

Piping Materials



- Double-layered Tubing for Instrumentation Device
(Single-tube/Double-tube)/
IN-241 P.208
- T0604 to T1075-X120/121/166** P.208
- Reinforced Corrugated Cardboard Specification
/Longer Length Reel/**T0604-X64/TH0604-X64** P.208

Positioners

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



IP8001 (Lever type)



IP8101 (Rotary type)

- Enclosure: JISF8007 IP65 (Compliant with IEC 60529)
- Monitoring function
- Explosion-proof construction
 - Electro-pneumatic positioner: TIS explosion-proof construction (Exd II BT5)
 - ATEX intrinsically safe explosion-proof construction (II 2G Ex ib II CT5/T6)
 - Smart positioner: ATEX intrinsically safe explosion-proof construction (II 1G Ex ia II CT4/T5/T6)
- HART transmission function (Smart positioner)

Description	Series	Type	Port size [Rc, NPT, G]	Supply air pressure psi [MPa]	Input current
Electro-pneumatic positioner	IP8000	Lever type	1/4	20 to 102 [0.14 to 0.7]	4 to 20 mA DC
Electro-pneumatic positioner	IP8100	Rotary type	1/4	20 to 102 [0.14 to 0.7]	4 to 20 mA DC
Smart positioner	IP8001	Lever type	1/4	20 to 102 [0.14 to 0.7]	4 to 20 mA DC
Smart positioner	IP8101	Rotary type	1/4	44 to 102 [0.14 to 0.7]	4 to 20 mA DC

Pneumatic-Pneumatic Positioner IP5000/5100



- JIS F8007 IP55

Series	Port size	Supply air pressure	Input pressure
IP5000/5100	Rc1/4	20 to 102 psi [0.14 to 0.7 MPa]	2.9 to 15 psi [0.02 to 0.1 MPa]

Cylinder Positioner IP200



- Servo-mechanism allows for precise and stable position control of cylinders
- Can be used as a cylinder position control unit for general industrial machines

Series	Port size	Supply air pressure	Input pressure
IP200	Rc1/4	44 to 102 psi [0.3 to 0.7 MPa]	2.9 to 15 psi [0.02 to 0.1 MPa]

Regulators

Filter Regulator 1301/IW



Series	Port size	Set pressure psi [MPa]	Filtration accuracy [μ m]
1301	Rc1/4	2.9 to 29 [0.02 to 0.2] 2.9 to 42 [0.02 to 0.29] 2.9 to 71 [0.02 to 0.49]	5
IW		2.9 to 29 [0.02 to 0.2] 2.9 to 44 [0.02 to 0.3] 2.9 to 73 [0.02 to 0.5]	

Filter Regulator: Made to Order AW30-B to AW60-B-X430/X440



- Special temperature environment:
Special materials are used in the manufacturing of seals and resin parts to allow them to withstand various temperature conditions in cold or tropical (hot) climates.

Series	Environment	Port size	Set pressure	Filtration accuracy
AW30-B to AW60-B-X430	Low temperature -22 to 140°F [-30 to 60°C]	1/4 to 1	7.3 to 123 psi [0.05 to 0.85 MPa]	5 μ m
AW30-B to AW60-B-X440	High temperature 23 to 176°F [-5 to 80°C]		2.9 to 29 psi [0.02 to 0.2 MPa]	

Regulators

Filter Regulator **AW30/40-X2622**



- Stainless steel 316 and special temperature environment (–40°F [–40°C]) specifications
- External parts material: Stainless steel 316
- Ambient and fluid temperatures: –40 to 176°F [–40 to 80°C]
- NACE International Standards compliant

Series	Port size	Set pressure psi [MPa]	Nominal filtration rating [μ m]
AW30/40-X2622	1/4, 3/8, 1/2, 3/4	7.3 to 123 [0.05 to 0.85]	5

Relays/Valves

Booster Relay **IL100/XT240**



- Used when the piping distance between the instrumentation and operational area is long, or when the operational area has a large capacity
- Can help accelerate actuation speed considerably

Series	Port size	Pressure ratio	Input/Output pressure
IL100	Rc1/4, 3/8	1 : 1	102 psi [0.7 MPa]
XT240	Rc, NPT1/4 (IN), 1 (SUP, OUT)	1 : 1	102 psi [0.7 MPa]

Lock-Up Valve **IL201/211/220**



- The lock-up valve is used when any air source or air supply piping line failure occurs in the air operated process control line.
- Single acting, Double acting: Retains the pressure at the operating area as an emergency operation until the air source recovers to its normal state
- 3 port: Changes the supply port if a problem occurs

Series	Port size	Set pressure psi [MPa]	Shut-off pneumatic circuit pressure
IL201/211/220	Rc1/4	20 to 102 [0.14 to 0.7]	102 psi [0.7 MPa]

Electro-Pneumatic Transducers

Electro-Pneumatic Transducer **IT600/601**



- Air pressure in proportion to the current signal can be output.
- Wide output pressure range: 2.9 to 87 psi [0.02 to 0.6 MPa]
- Fast response
- Independent electric unit/Explosion-proof (flameproof) construction
- Easy span adjustment

Series	Port size	Supply pressure psi [MPa]	Input current
IT600	Rc1/4	20 to 35 [0.14 to 0.24]	4 to 20 mA DC
IT601	Rc1/4	35 to 102 [0.24 to 0.7]	4 to 20 mA DC

Actuators

Cylinder with Positioner CP



- Cylinder positioning in proportion to the input signal (air pressure) is possible.
- Correction operation function: Returns to the initial setting position even when the position deviates due to load variations

Series	Bore size	Stroke [mm]	Air connection port	Supply pressure psi [MPa]	Input pressure psi [MPa]
CPA2	ø50 to 100	25 to 300	Rc1/4 female thread	44 to 102 [0.3 to 0.7]	2.9 to 15 [0.02 to 0.1]
CPS1	ø125 to 300	30 to 300	Rc1/4 female thread	44 to 102 [0.3 to 0.7]	2.9 to 15 [0.02 to 0.1]

Detection Conversion Units

Pressure Switch IS



- The pressure switch IS100 series can be utilized for automatic air pressure control in a wide variety of fields, such as industrial machinery or chemical plants.
- Pressure adjustment range: 2.9 to 15 psi [0.02 to 0.1 MPa]
- Electric wiring: Various wiring and entry methods can be selected.
- Mechanical service life: 100,000 cycles

Series	Port size	Pressure adjustment range	Contact
IS100	Rc1/4	2.9 to 15 psi [0.02 to 0.1MPa]	Using micro switch A, B 2 contacts

Solenoid Valves

NAMUR Interface 3 Port Solenoid Valve VFN200N



- The interface surface is compliant with NAMUR Standards.
Can be directly installed on industrial valve actuators that comply with NAMUR

Series	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) C	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) b	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) Cv	Power consumption [W]
VFN200N	5.41	0.31	1.38	1.8

NAMUR Interface 5 Port Solenoid Valve VFN2000N



- The interface surface is compliant with NAMUR Standards.
Can be directly installed on industrial valve actuators that comply with NAMUR

Series	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) C	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) b	Flow rate characteristics 4/2 → 5/3 (A/B → EA/EB) Cv	Power consumption [W]
VFN2000N	4.57	0.17	1.06	1.8

Solenoid Valves

NAMUR Interface 3/5 Port Solenoid Valve IP67 Compliant, Hygienic Design Type **VFN2120N-X23/-X36**



- A hygienic design has been adopted.
Resin body with less concaves
Direct cleaning of the valve is possible. (IP67)
- 3 port/5 port valves are available.
Due to the function plate, 3/5 port valves are selectable.
- Low power consumption
Power consumption: 0.5 W
- Port threads: NPT1/4, G1/4

Series	Flow rate characteristics (Cv/Effective area)	Manual override	Type of coil insulation	Power consumption [W]
VFN2120N-X23/-X36	0.8/11 mm ²	Push type Locking type (Tool required) Locking type (Manual type)	Class B	0.5

Piping Materials

Double-layered Tubing for Instrumentation Device (Single-tube/Double-tube) **IN-241, T-X120/121/166**



- Double-layered tubing with an external layer of vinyl chloride or polyolefin to protect the inner tubing
- Inner tubing color: Black or Black + White

Series	Tube size O.D. [øD] x I.D. [ød]	Fluid
IN-241, T-X120/121/166	ø6 x ø4 ø8 x ø6 ø10 x ø7.5	Air

Reinforced Corrugated Cardboard Specification/Longer Length Reel: Nylon Tubing **T0604-X64**



- Length per roll: 500/250 m
- For general pneumatic tubing
- Nylon tubing

Series	Tube size O.D. [øD] x I.D. [ød]	Fluid
T0604-X64	ø6 x ø4	Air, Water

Reinforced Corrugated Cardboard Specification/Longer Length Reel: FEP Tubing (Fluoropolymer) **TH0604-X64**

- Length per roll: 500/250 m
- Operating temperature: 392°F [200°C]
- Compatible with the Food Sanitation Law.

Series	Tube size O.D. [øD] x I.D. [ød]	Fluid
TH0604-X64	ø6 x ø4	Air, Water, Inert gas

Hydraulic Equipment

Hydraulic Cylinders

Hydraulic Cylinders



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JIS Standard Compact Hydraulic Cylinder/ CHKD/CHKG ..	P.210
Small Bore Hydraulic Cylinder/ CHN	P.210
Round Type Hydraulic Cylinder/ CHM	P.210
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Hydraulic Equipment

Hydraulic Filters



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Water Cooled Oil Coolers



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Hydraulic Cylinders

Compact Hydraulic Cylinder **CHQ/CHDQ**



- Lightweight, compact aluminum body
- It is possible to mount auto switches.
- Same longitudinal dimensions for cylinders with/without auto switches
- With auto switch (CHDQ series: CHDQ, CHDQW)

Series	Nominal pressure	Body material	Action	Bore size [mm]
CHQ	508 psi [3.5 MPa]	Aluminum	Double acting, Single rod	20, 32, 40, 50, 63, 80, 100
CHQW	508 psi [3.5 MPa]	Aluminum	Double acting, Double rod	20, 32, 40, 50, 63, 80, 100

JIS Standard Compact Hydraulic Cylinder **CHK□/CHDK□**



- Lightweight, compact aluminum body
- It is possible to mount auto switches.
- Same longitudinal dimensions for cylinders with/without auto switches
- Compliant with JIS Standards (CHKD series)
- With auto switch (CHDK□ series: CHDKD, CHDKG)

Series	Nominal pressure	Body material	Action	Bore size [mm]
CHKD	1450 psi [10 MPa]	Aluminum	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100
CHKG	2321 psi [16 MPa]	Aluminum	Double acting, Single rod	20, 25, 32, 40, 50, 63, 80, 100

Small Bore Hydraulic Cylinder **CHN**



- Lightweight with a stainless steel tube and aluminum cover
- Uses a cushion seal type mechanism, Reduces impact at the stroke end, Improves durability
- Smaller cover section compared to tie-rod cylinders

Series	Nominal pressure	Tube material	Action	Bore size [mm]
CHN	1015 psi [7 MPa]	Stainless steel	Double acting, Single rod	20, 25, 32, 40

Round Type Hydraulic Cylinder **CHM/CHDM**



- Lightweight with an aluminum tube and cover
- With auto switch (CHDM series: CHDM)

Series	Nominal pressure	Tube material	Action	Bore size [mm]
CHM	508 psi [3.5 MPa]	Aluminum	Double acting, Single rod	20, 25, 32, 40

ISO Standard Hydraulic Cylinder **CHS□/CHDS□**



- Cylinder with built-in cover and mounting bracket allows for easy disassembly and assembly
- Smaller cover section compared to tie-rod cylinders
- Reduced overall length (Compared to the CH2 series)
- With auto switch (CHDS□ series: CHDSD, CHDSG)

Series	Nominal pressure	Tube material	Action	Bore size [mm]
CHSD	1450 psi [10 MPa]	Stainless steel	Double acting, Single rod	40, 50, 63, 80, 100
CHSG	2321 psi [16 MPa]	Stainless steel	Double acting, Single rod	32, 40, 50, 63, 80, 100

Hydraulic Cylinders

JIS Standard Hydraulic Cylinder CH2/CHD2



- Uses a cushion seal type mechanism, Reduces impact at the stroke end, Improves durability
- Rod cover with block construction makes for easy disassembly and assembly
- With auto switch (CHD2 series: CHD2E, CHD2EW, CHD2F, CHD2FW, CHD2G, CHD2H)

Series	Nominal pressure	Tube material	Action	Bore size [mm]
CH2E	508 psi [3.5 MPa]	Aluminum	Double acting, Single rod	32, 40, 50, 63, 80, 100
CH2EW	508 psi [3.5 MPa]	Aluminum	Double acting, Double rod	32, 40, 50, 63, 80, 100
CH2F	1015 psi [7 MPa]	Stainless steel	Double acting, Single rod	32, 40, 50, 63, 80, 100
CH2FW	1015 psi [7 MPa]	Stainless steel	Double acting, Double rod	32, 40, 50, 63, 80, 100
CH2G	2031 psi [14 MPa]	Iron	Double acting, Single rod	32, 40, 50, 63, 80, 100
CH2H	2031 psi [14 MPa]	Stainless steel	Double acting, Single rod	32, 40, 50, 63, 80, 100

Tie-rod Type Hydraulic Cylinder CHA/CHDA



- With auto switch (CHDA series: CHDA, CHDAW)

Series	Nominal pressure	Tube material	Action	Bore size [mm]
CHA	508 psi [3.5 MPa]	Aluminum	Double acting, Single rod	40, 50, 63, 80, 100
CHAW	508 psi [3.5 MPa]	Aluminum	Double acting, Double rod	40, 50, 63, 80, 100
CHA□F	508 psi [3.5 MPa]	Iron	Double acting, Single rod	40, 50, 63, 80, 100, 125, 160
CHAW□F	508 psi [3.5 MPa]	Iron	Double acting, Double rod	40, 50, 63, 80, 100, 125, 160

Air-Hydro Booster CQ2



- Converts air pressure to hydraulic pressure for high-pressure hydraulic cylinder actuation
- No hydraulic pump is required. High hydraulic pressure can easily be obtained.
- Applications: For lifting workpieces, for automatic clamping devices, hydraulic pressure source for low profile hydraulic cylinders

Series	Pneumatic cylinder dia. [mm]	Generated hydraulic pressure (with 73 psi [0.5 MPa])	Amount of discharged oil [cm ³]
CQ2	100, 140, 160	508 to 2031 psi [3.5 to 14 MPa]	17 to 105

Auto Switches

Auto Switch D



Series	Type	Features
D series	Solid state auto switch	General purpose type 2-color indicator 2-color indicator with diagnostic output Water resistant 2-color indicator With timer
D series	Reed auto switch	General purpose type 2-color indicator

Hydraulic Filters

Vertical Suction Filter FHIA



- Vertical suction filters are designed for installation between the pump and reservoir tank. Their main function is to protect the pump.
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size	Rated flow rate	Operating pressure	Element [μm] (Nominal filtration)
FHIA	1/2B to 4B	7.9 to 343 gal/min [30 to 130 L/min]	Negative pressure	Micromesh: 74, 105, 149

Suction Filter with Case FH99



- Compact, Lightweight
- Cover and case material: Aluminum casting
- Prevents pump cavitation
- Easy element maintenance
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size	Rated flow rate	Operating pressure	Element [μm] (Nominal filtration)
FH99	INLET: 1B to 4B	5.3 to 238 gal/min [20 to 900 L/min]	Negative pressure	Micromesh: 74, 105, 149

Suction Guard FHG



- Prevents collected dust from falling into the tank
- The replacement of flushing oil is not required.
- Easy maintenance and no air mixing
- Integrated lubrication port strainer, suction filter, and air breather
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size	Rated flow rate [L/min]	Operating pressure	Element [μm] (Nominal filtration)
FHG	1/2B to 3B	4.8 to 119 gal/min [18 to 450 L/min]	Negative pressure	Micromesh: 74, 105, 149

Line Filter FH



- Compact, solid, and safe design
- Easy element replacement
- Easy fluid flow direction reversal
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size	Rated flow rate gal/min [L/min]	Operating pressure	Element [μm] (Nominal filtration)
FH34	Threaded (Rc) 3/8 to 1 1/2 Flange SSA 15 (1/2B) to 80 (3B)	2.6 to 159 [10 to 600]	3.5, 7, 14, 21	Paper: 5, 10, 20
FH44		2.6 to 159 [10 to 600]	3.5, 7, 14, 21	
FH54		2.6 to 159 [10 to 600]	3.5, 7, 14, 21	
FH64		2.6 to 159 [10 to 600]	3.5, 7, 14, 21	

Vertical Return Filter FHBA



- Vertical return filters are designed for mounting directly on top of oil tanks used in hydraulic systems. They prevent the dust generated within the circuit from entering the tank and help keep the oil clean. This efficient configuration reduces the total number of filters required.
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size [Rc]	Max. flow rate gal/min [L/min]	Element [μm] (Nominal filtration)
FHBA	3/4 to 1 1/2	39.6, 79.3, 106 [150, 300, 400]	Paper: 5, 10, 20 Micromesh: 5, 10, 20

Hydraulic Filters

Return Filter FH100



- Easy maintenance
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size [Rc]	Rated flow rate gal/min [L/min]	Element [μm] (Nominal filtration)
FH100	3/4 to 3	Paper: 13.2 to 159 [50 to 600] Micromesh: 15.9 to 185 [60 to 700]	Paper: 5, 10, 20 Micromesh: 74, 105

Oil Filter FH150



- Compact, Lightweight
Cover material: Aluminum die-casted
- Easy maintenance
- It is possible to detect clogging with the differential pressure indicator and differential pressure indication switch (CB-□□H).

Series	Port size [Rc]	Rated flow rate gal/min [L/min]	Element [μm] (Nominal filtration)
FH150	1/4 to 1/2	1.3 to 5.3 [5 to 20]	Paper: 5, 10, 20

Magnetic Separator FHM



- Magnetic separators protect machinery from malfunctions, reduced precision, and burnout by adsorbing and eliminating contaminants in the fluid by means of magnetism. This helps extend the service life of hydraulic equipment.

Series	Applicable fluid storage volume [L/unit]	Flow speed	Fluid
FHM	20 to 200	3 m/min or less	FHMN: Petroleum, Water glycol, Cutting oil, Emulsion FHMV: Phosphoric ester

Water Cooled Oil Coolers

Fixed Pipe Type Oil Cooler: Water Cooled, Iron Particle Type HOWF



- High heat transfer coefficient through the effects of turbulence
- Compact design requiring less installation space: 1/2 to 1/5 the size of current oil coolers
- Flexible installation orientation
- Minimal pressure drop

Series	Heat transfer area (Inside pipe) [m ²]	Heat exchange volume [kW]	Flow rate gal/min [L/min] Oil side	Flow rate gal/min [L/min] Cooling water side
HOWF	0.077 to 1.28	5.2 to 73	5.3 to 211 [20 to 800]	10.6 to 33 [40 to 125]

Floating Pipe Type Oil Cooler: Water Cooled, Copper Particle Type HOW



- High heat conductivity
- Compact design requiring less installation space: 1/2 to 1/5 the size of current oil coolers
- High heat transfer coefficient through the effects of turbulence
- Minimal pressure drop

Series	Heat transfer area (Inside pipe) [m ²]	Heat exchange volume [kW]	Flow rate gal/min [L/min] Oil side	Flow rate gal/min [L/min] Cooling water side
HOW	0.084 to 0.75	6 to 52	5.3 to 106 [20 to 400]	6.6 to 26.4 [25 to 100]

Other Derived Series

Clean/Low Particle Generation 10-/11-/12-/13-/21-/22-



Description	Model	Features/Specifications
Clean series	10-/11- 12-/13-	<ul style="list-style-type: none"> Prevents particle generation in a clean room Particle generation from the equipment is leveled from Grade 1 to 4. Select based on the cleanliness class of the clean room. Fluorine grease is used. Products are sealed and shipped in anti-static double bags.
Copper, Fluorine, Silicone-free, Low particle generation	21-/22-	<ul style="list-style-type: none"> Suitable for environments where the presence of copper, fluorine, or silicone materials is restricted. Lithium soap-based grease is used. Construction is the same as the clean series. Standard packaging (Double packaging is not used.)

Series Compatible with Secondary Batteries 25A-



Description	Model	Features/Specifications
Series compatible with secondary batteries	25A-	<ul style="list-style-type: none"> Copper (Cu) and zinc (Zn) free Compatible with low dew points -94°F [-70°C] Uses grease compatible with a low dew point for a longer service life

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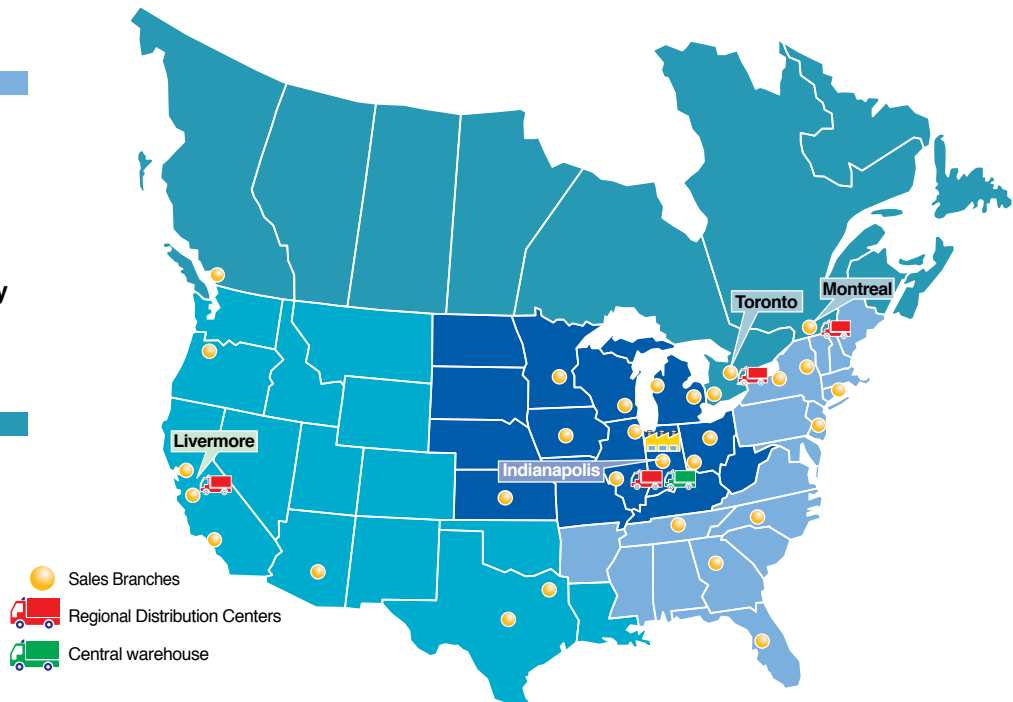
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