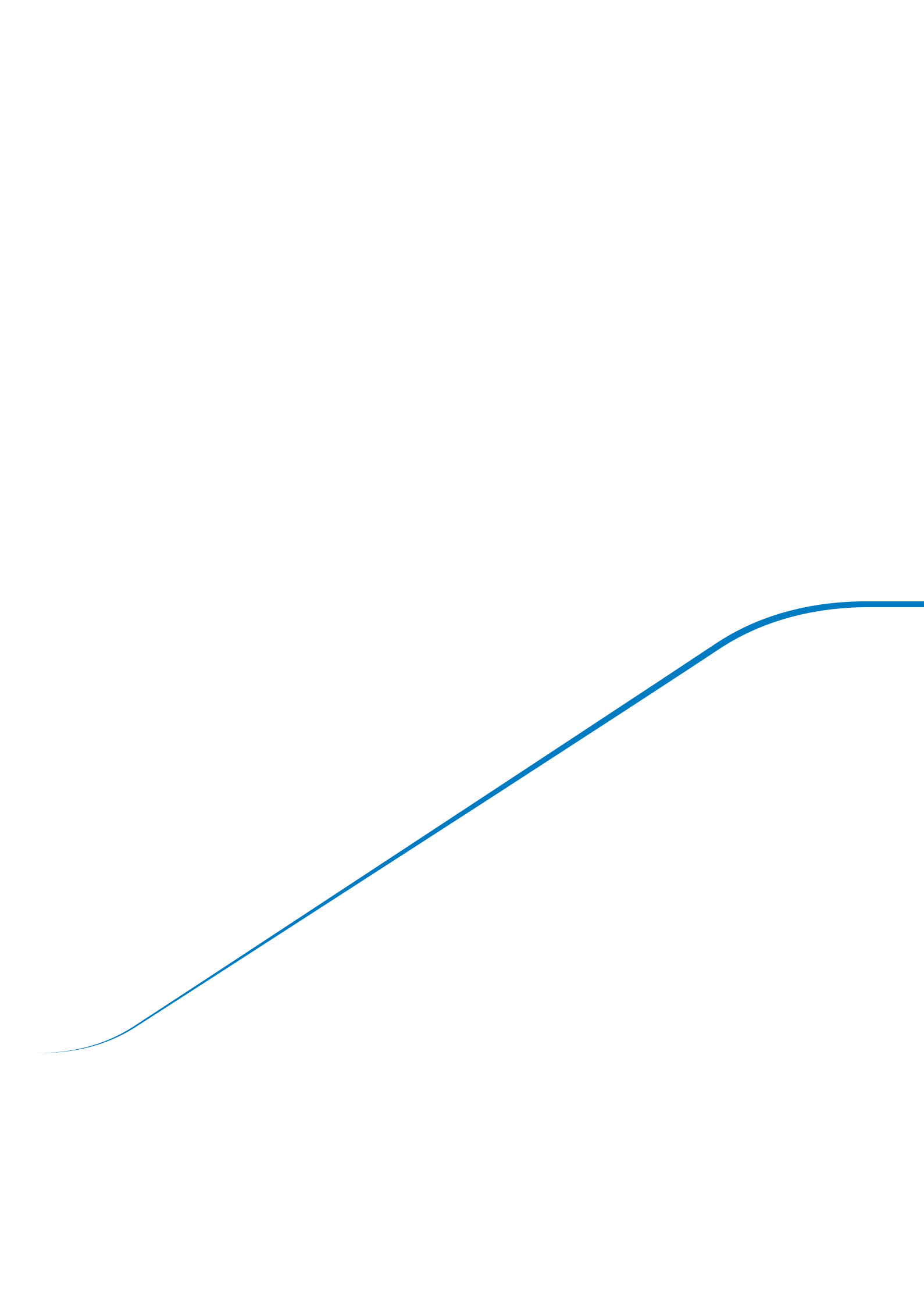




Expertise – Passion – Automation



Life Science





Life Science

On the following pages, we place a range of innovative solutions at your disposal that meet the specific demands of the different life science sectors: solutions that also keep up with your requirements in terms of long-life, quality and compactness.

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- Fluid handling systems
- Quiet temperature control equipment
- Acrylic products for high purity applications
- Specialist pumps
- Miniature valves.

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SMC Germany – Present. Innovative. Cooperative.

SMC is the leading manufacturer, partner and solution provider for pneumatic and electric automation technology. The product groups, include products for air treatment, valves and throttles, actuators (pneumatic and electric), fittings and tubings as well as vacuum and instrumentation components.

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Together, we will help you gain competitive advantages:

- Shorter construction times
- High product functionality at equal costs
- Faster time-to-market

Our products for your life science applications

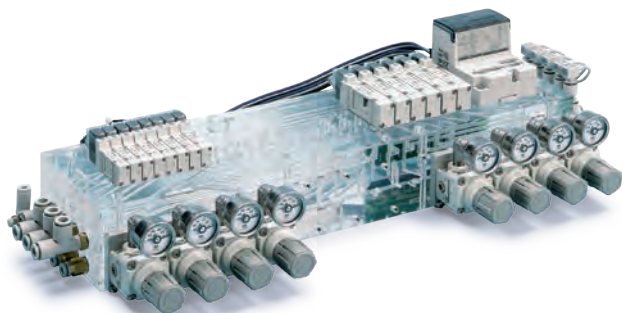
Static control



Fluid control equipment



Customer-specific assemblies



Air line equipment



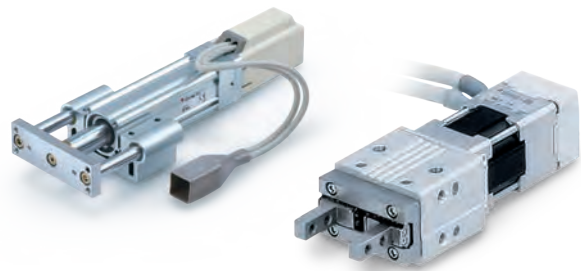
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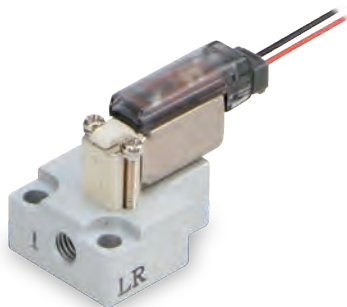
Temperature control



Electric actuators



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Chemical/Liquid valves

Super compact direct acting 2/3-port solenoid valve for chemicals

LVM Series



- Wetted part material:
 - Body plate: PEEK
 - Diaphragm: choice of EPDM, FKM and FFKM.
- Service life: 10 million cycles or more (Based on SMC test conditions)
- Valve chamber volume.

Unit: μL

Series	LVM09/090	LVM10 (for LVM11)	LVM10/100	LVM15/150	LVM20/200
Valve chamber volume	18	11	20	50	84

- Change in volume depending on the open/closed status of the valve (pumping volume) 0.01 μL or less (rocker type)
- Type with power-saving circuit can be selected. Holding power consumption can be reduced substantially.

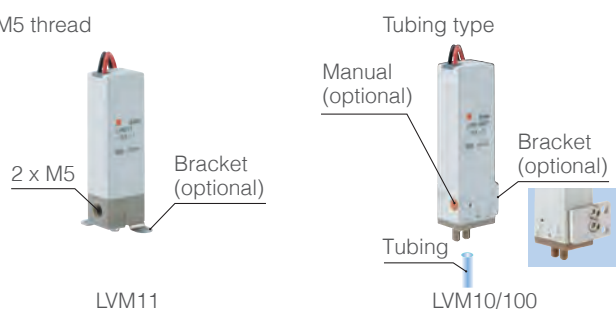
Unit: W

Series		LVM09/090	LVM10/100	LVM15/150	LVM20/200
Power consumption	Inrush	3.3	2.5	5.5	4
	Holding	0.9	1	1	0.6

Piping/Mounting variations

Body ported

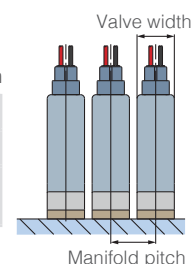
M5 thread



- Space-saving.

Unit: mm

Series	LVM090	LVM10/100	LVM150	LVM200
Valve width	9.5	13	16	20
Manifold pitch	10.5	14	17	21

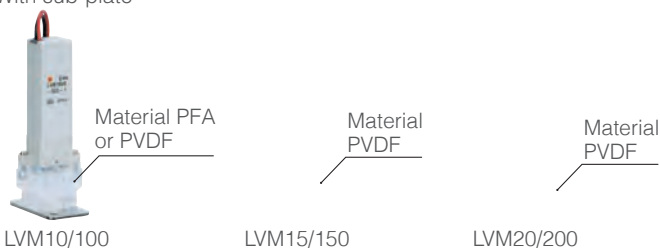


Base mounted

Without sub-plate



With sub-plate



2/3 Port media separated valve

LVMK Series







- Fluid separation structure
- Low particle generation
- Oil free and metal free
- Minimal dead space
- Flow rate adjustment not required for 3 port valve.

Body ported

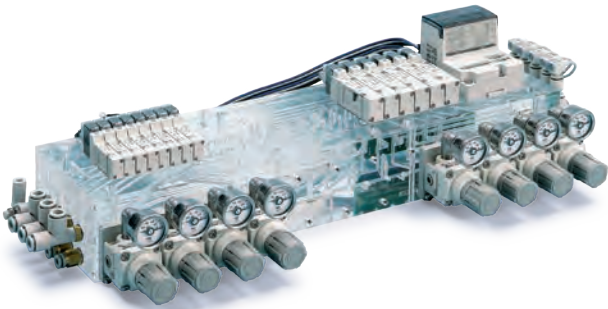
Base mounted



Series variations

	Model	Valve construction	Valve type	Number of ports	Operating pressure range	Orifice diameter [mm]	Valve width [mm]	Flow characteristics				Fluid temperature [°C]	Volume of valve chamber	Weight [g]	Power consumption [W]
								Water		Air					
								Av	Cv	C	b				
	LVM09R3	Diaphragm type direct operated poppet (rocker type)	N.C.	2	-75 kPa to 0.2 MPa	1.1	9.5	0.43 x 10–6	0.018	0.06	0.2		18	20	2
	LVM09R4		N.O.												
	LVM095R		Universal	3											
	LVM11	Diaphragm type direct operated poppet	N.C.	2	0 to 0.25 MPa	1.5		0.96 x 10–6	0.04	0.13	0.22		11	30	2.5 at inrush 1 at holding
	LVM10R1		N.C.	2	-75 kPa to 0.25 MPa	1.4	13								
	LVM10R2		N.O.												
	LVM102R		Universal	3											
	LVM10R3	Diaphragm type direct operated poppet (rocker type)	N.C.	2	-75 kPa to 0.25 MPa	1.4		0.72 x 10–6	0.03	0.1	0.2	5 to 50 no condensation	20	34	1.5
	LVM10R4		N.O.												
	LVM10R6		N.C.												
	LVM105R		Universal	3											
	LVM15R3	Diaphragm type direct operated poppet (rocker type)	N.C.	2	-75 kPa to 0.25 MPa (max. 0.6 MPa)	1.6 (1)	16	0.96 x 10–6 (0.36 x 10–6)	0.04 (0.015)	0.13 (0.05)	0.22 (0.2)		50	45	5.5 at inrush 1 at holding
	LVM15R4		N.O.												
	LVM155R		Universal	3											
	LVM20R3		N.C.	2	-75 kPa to 0.3 MPa	2	20	1.56 x 10–6					84	80	2.5
	LVM20R4		N.O.												
	LVM205R		Universal	3											
	LVMK21	Direct operated poppet	N.C.	2	-90 kPa to 0.2 MPa	2 mm equivalent	21.6	—	0.065	0.23	0.27		—	76	3
	LVMK27													77	
	LVMK202		Universal	3										78	
	LVMK207													78	
	LVMK23		N.C.	2										76	
	LVMK205		Universal	3										79	

Composite valve manifold for air, gas and liquid Custom designed solutions



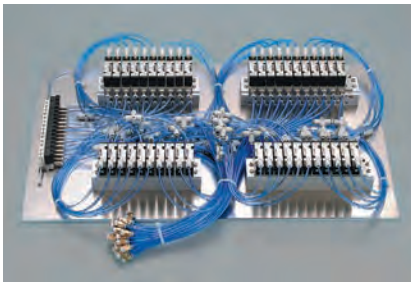
- Space saving:
Reduction in piping volume, manifold can be designed to suit the space
- Lightweight:
Weight reduced by using resin material
- Reduced wiring:
Wiring and wiring time reduced by integrating manifold and PCB
- Flow passage style with high flexibility:
Three-dimensional flow passage that cannot be created by machining or injection moulding
- Reduced piping work:
Reduction in piping work and wiring faults. Improved reliability against leakage
- Transparent flow passage (acrylic):
Easy visual detection of fluid.

Manifold materials

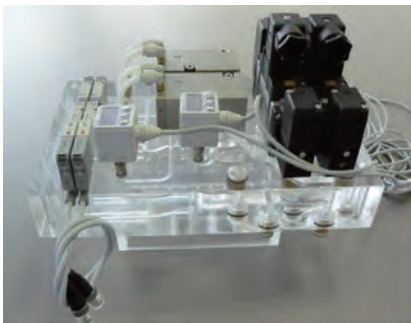
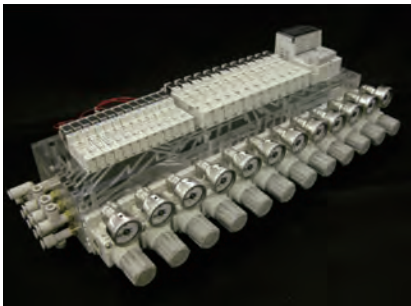
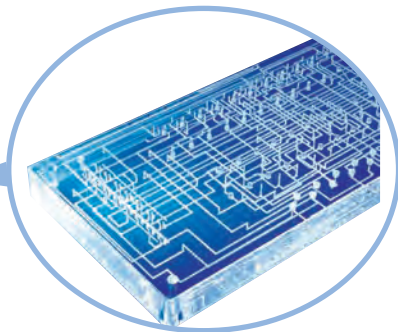
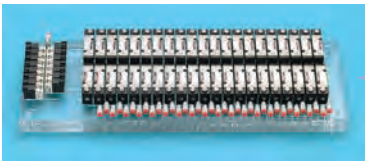
Material		Acrylic PMMA	Polycarbonate PC	Vinyl chloride PVC	Polyetherimide (ULTEM) PEI
Features		Transparency	Impact resistance	Chemical resistance	High temperature property
Continuous operating temperature		60 °C	120 °C	50 °C	170 °C
Impact resistance		○	◎	○	○
Chemical resistance	Alcohol	×	○	◎	◎
	Acid	○	×	◎	◎
	Alkali	×	×	◎	◎

◎ ≥ ○ ≥ ×
 Very good Very poor

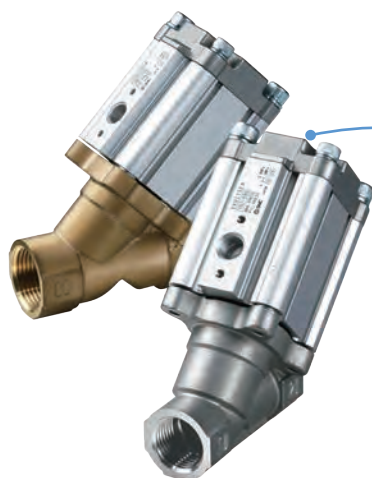
Current type (tube piping)



Composite manifold



Angle seat valve VXB Series

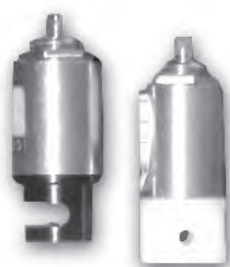


- Low pressure loss due to angle seat structure
- Reduced leakage with rubber seal
- Long service life: 3 million cycles (steam), 5 million cycles (air)
- Low leakage: 10 cm³/min or less
- Space saving: height 100 mm
- Body material: stainless steel SUS 316 L equivalent, bronze.

Specifications

Valve construction	Air operated piston type
Withstand pressure	2.4 MPa
Body material	Stainless steel SUS 316 L equivalent, bronze (CAC)
Seal material	FKM
Environment	Location without corrosive or explosive gases
Max. operating pressure [MPa]	1 (standard), 1.6 (high pressure)

Pinch valve XT34 Series



- SMC series XT34-155 is a compact N.O. air actuated pinch valve. When used in conjunction with tubing material, the “pinching” action of the valve can be used to permit or restrain the flow of media. The XT34 is suitable for a wide range of medical applications, including:
 - Haematology analysers
 - Immunoassay analysers
 - Clinical chemistry analysers
 - Blood gas analysers
 - Medical diagnostic equipment
 - Blood cell counters.
- Features and benefits:
 - Body material is nickel-plated brass
 - Tube holder is constructed of polyacetal material.

Specifications

Max. operating pressure [MPa] (psi)	0.34 (50)
Min. operating pressure [MPa] (psi)	0.15 (22)
Operating temperature	0~60 °C (32~140 °F)
Weight	36 g

Media compatibility






Blood	Reagents
Bleach	Soap
Saline	Water

How to order

	Silicon tube size	
	Inside diameter	Outside diameter
XT34-155-1	0.062 inch (1.57 mm)	0.187 inch (4.75 mm)
XT34-155-2	0.032 inch (0.81 mm)	0.156 inch (3.96 mm)





Process valves for fluid control

VC/VDW/VQ Series

Series	Type	Orifice size (Ømm) [Flow (Cv)]	Port size	Valve type*
	VCC12/13 2/3 port air operated valve for water and chemical-based fluids			
	Manifold	3.8 [0.33]	1/4	N.C.
	VCH40/400 5.0 MPa pneumatic equipment series			
	Body ported	16~18 [4.5~6.3]	1/2, 3/4, 1	N.C./N.O.
	VDW Compact direct operated 2 port solenoid valve for air, medium vacuum and water			
	Body ported	1, 1.6, 2.3, 3.2 [0.04~0.30]	M5, 1/8 On-touch fitting: Ø 3.2, Ø 4, Ø 6	N.C.
	VDW30/40-XF Compact/Lightweight 2 port solenoid valve for water and air			
	Body ported	1~6 [0.04~1.1]	P7, P10 (quick fastener) C4, C6, C8, C10 (one-touch fitting)	N.C.
	VDW200/300 Compact direct operated 3 port solenoid valve for water and air			
	Body ported	1~4 [0.03~0.46]	M5, 1/8, 1/4	C.O.
	VQ20/30 2 port solenoid valve for air			
	Body ported Manifold	3.4~4.8 [0.33~0.81]	Ø 6, Ø 8, Ø 10, Ø 12	N.C.


* N.C.: normally closed; N.O.: normally open; C.O.: common.

VN Series

Series	Type	Orifice size (Ømm) [Flow (Cv)]	Port size/Flange	Valve type*
	VNA 2 port valve for compressed air and air-hydro circuit control			
	Body ported	10~50 [0.88~43]	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2	N.C./N.O. C.O.
	VNB 2 port valve for flow control			
	Body ported	7~50 [0.80~43]	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 Flange: 32, 40, 50	N.C./N.O. C.O.
	VNC 2 port valve for coolant applications			
	Body ported	7~80 [1.25~100]	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 Flange: 32, 40, 50, 65, 80	N.C./N.O.
	VND 2 port valve for steam			
	Body ported	7~50 [1.08~62]	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 Flange: 32, 40, 50	N.C./N.O.

* N.C.: normally closed; N.O.: normally open; C.O.: common.

VXB Series

Series	Type	Orifice size (Ømm) [Flow (Cv)]	Port size	Valve type*
	VXB Angle seat valve for steam, water and air			
	Body ported	11~18 [3.5~7.6]	3/8, 1/2, 3/4	N.C.

* N.C.: normally closed.

VX Series

Series	Type	Orifice size (Ømm) [Flow (Cv)]	Port size/Flange	Valve type*
	VX21/22/23 Direct operated 2 port solenoid valve for air, medium vacuum, water, oil and steam			
	Body ported Manifold	2~10 [0.23~2.21]	1/8, 1/4, 3/8, 1/2 Ø 6, Ø 8, Ø 10, Ø 12	N.C./N.O.
	VXD21/22/23 Pilot operated 2 port solenoid valve for air, water, oil, heated water and high temperature oil			
	Body ported	10~50 [1.9~49]	1/4, 3/8, 1/2, 3/4, 1 Ø 10, Ø 3/8", Ø 12 Flange: 32, 40, 50	N.C./N.O.
	VXP21/22/23 Pilot operated 2 port solenoid valve for steam, air, gas, water and oil			
	Body ported	10~50 [1.9~49]	1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 Flange: 32, 40, 50	N.C./N.O.
	VXZ22/23 Zero differential pressure type pilot operated 2 port solenoid valve for air, medium vacuum, water, oil, heated water and high temperature oil			
	Body ported	10~25 [1.7~10.2]	1/4, 3/8, 1/2, 3/4, 1	N.C./N.O.
	VXS Zero differential pressure type pilot operated 2 port solenoid valve for steam			
	Body ported	10~25 [2.4~12]	1/4, 3/8, 1/2, 3/4, 1	N.C.
	VXH22 High pressure pilot operated 2 port solenoid valve for air, water and oil			
	Body ported	10 [1.9~2.4]	1/4, 3/8, 1/2	N.C.
	VX31/32/33 Direct operated 3 port solenoid valve for water, oil, steam and air			
	Body ported Manifold	1.5~4 [0.08~0.50]	1/8, 1/4, 3/8	N.C./N.O. COM
	VXA21/22, VXA31/32 Direct operated 2/3 port for air, water and oil			
	Body ported Manifold	VXA21/22: 3~10 [0.33~2.4] VXA31/32: 1.5~4 [0.08~0.50]	VXA21/22: 1/8, 1/4, 3/8, 1/2 VXA31/32: 1/8, 1/4, 3/8	VXA21/22: N.C./N.O. VXA31/32: COM.
	VXE2, VXD2, VXE22 Energy saving type 2 port solenoid valve for air, water and oil			
	Body ported Manifold VXE2	2~50 [0.18~49]	1/8, 1/4, 3/8, 1/2, 3/4, 1 Flange: 32, 40, 50	N.C.

* N.C.: normally closed; N.O.: normally open; COM.: common.

Process pumps

Compact solenoid type diaphragm pump

LSP Series



- Dispense volume can be adjusted
- Dispense volume stability (repeatability $\pm 1\%$)
- Shut-off function
- Self-contained system does not need any priming.

Model	Actuation	Dispense volume	Wetted material
LSP111/112	Solenoid type	5 to 50 μL	PEEK, PP, EPDM, FKM
LSP121/122	Solenoid type	50 to 100 μL	
LSP131/132	Solenoid type	100 to 200 μL	

Compact, single acting diaphragm pump

PB Series



- Light and very compact size with wide discharge range
- Large capacity diaphragm
- Transferring and collecting a wide range of fluids
- Simple maintenance.

Model	Actuation	Discharge rate	Wetted material
PB1011A	Built-in solenoid valve	8 to 2000 ml/min	Polypropylene, stainless steel SUS 316
PB1013A	Air operated type	8 to 1000 ml/min	
PB1313A			New PFA (Fluoropolymer)

Compact, double acting diaphragm pump

PAX/PA3000/5000 Series



- Compact, large capacity diaphragm type pump
- Easy maintenance due to structural design that allows the diaphragm and check valve to be replaced individually
- High abrasion resistance/low particle generation
- Built-in pulsation attenuator (PAX Series).

Model	Actuation	Discharge rate	Wetted material
PA3□□0	Automatically operated type	1 to 20 l/min	ADC12 (aluminium) SCS14 (stainless steel)
PA3□13	Air operated type	0.1 to 12 l/min	
PA5□□0	Automatically operated type	5 to 45 l/min	
PA5□13	Air operated type	1 to 24 l/min	
PAX1□12	Automatically operated type Built-in pulsation attenuator	0.5 to 10 l/min	

Fluoropolymer diaphragm pump

PA3300/PAF3000/5000 Series



- High corrosion resistance:
 - Body material: new PFA
 - Diaphragm/seal: PTFE.
- Lightweight and compact
- No metallic parts are used (metal-free), pump made from fluoropolymer.

Model	Actuation	Discharge rate	Wetted material
PA3310 (standard)	Automatically operated type	1 to 13 l/min	New PFA (Fluoropolymer)
PAP3310 (clean room)			
PA3313 (standard)	Air operated type	0.1 to 9 l/min	
PAP3313 (clean room)		0.1 to 9 l/min	
PAF3410	Automatically operated type	1 to 20 l/min	
PAF3413	Air operated type	1 to 15 l/min	
PAF5410	Automatically operated type	5 to 45 l/min	
PAF5413	Air operated type	5 to 38 l/min	

Air valves

Unit manifold valve 3 port solenoid valve VV061 Series



- Valve width 6 mm. Mounting the V060 series
- Variety of valve connection options and systems
- Lightweight 47 g (4 stations)
- Valve, PCB, base and fittings are fully integrated, forming a single compact unit. New concept unit manifold.

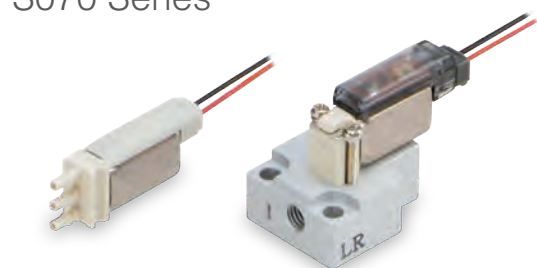
Unit manifold valve specifications

Fluid		Air	
Operating pressure range	Standard	0 to 0.7 MPa	
	High flow type	0 to 0.3 MPa	
Vacuum specifications	Port	1 (P) port	3 (R) port
	Standard	-100 kPa to 0.6 MPa	-100 kPa to 0 MPa
	High flow type	-100 kPa to 0.2 MPa	-100 kPa to 0 MPa
Power consumption	Standard	0.55 W	
	Power saving circuit (long and continuous loading time type)	0.23 W	

Flow characteristics

Type	Effective area [mm ²]	
	1 (P)→2 (A)	2 (A)→3 (R)
Standard	0.07	0.11
High flow type	0.16	0.21

7 mm wide, super compact direct operated 3 port solenoid valve S070 Series



- Valve width: 7 mm
- Extremely lightweight 5 g (valve single unit)
- Operation noise 38 dB(A) or less
- Easy to increase or decrease the number of stations
- Power consumption: 0.35 W (standard), 0.5 W (high pressure), 0.1 W (power saving)
- Rated coil voltage: 3, 5, 6, 12, 24 VDC (± 10 %)
- Coil insulation type: equivalent to class B.

Specifications

Valve construction	Poppet
Fluid	Air / Low vacuum (1.33 x 10 ² Pa)
Maximum operating pressure	0.3 MPa (0.35 W, 0.1 W), 0.5 MPa (0.5 W)
Proof pressure	1 MPa
Ambient and fluid temperature	-10 to 50 °C
Impact/Vibration resistance	30/150 m/s ²
Enclosure	IP40

Flow rate specifications/Response time

Power consumption	Maximum operating pressure	Flow characteristics				Response time [ms]	
		C[dm³/(s•bar)]	b	Cv	Flow rate [l/min], ANR	ON	OFF
0.5 W DC	0.5 Mpa	0.042	0.27	0.011	9.6	3 or less	3 or less
	0.3 Mpa	0.060	0.28	0.016	10.9	5 or less	
0.35 W DC		0.042	0.27	0.011	7.6	3 or less	
		0.1 MPa	0.060	0.28	0.016	6.9	
0.1 W DC (at holding) with power saving circuit	0.3 Mpa	0.021	0.27	0.006	3.8	3 or less	6 or less
	0.1 Mpa	0.042	0.28	0.011	4.8	5 or less	

3 port solenoid valve

V100 Series



- Power consumption 0.35 W. With power saving circuit 0.1 W
- Coil temperature rises: only 1 °C (with power saving circuit)
- Indicator light/surge voltage suppressor integrated in the connector body
- Valve width 10 mm.

Sonic conductance

C: 0.037 (standard)/C: 0.076 (large flow capacity)

Series		Flow rate characteristics		
		C[dm ³ /(s·bar)]	b	Cv
Standard	V1□4	0.037	0.11	0.008
Large flow capacity	V1□4A	0.076	0.07	0.016

Variations

Series		Type of actuation	Operating pressure range [MPa]	Power consumption [W]	
				Standard	With power saving circuit
Standard	V114	N.C.	0 to 0.7	0.35	0.1
	V124	N.O.			
Large flow capacity	V114A	N.C.		1	—
	V124A	N.O.			

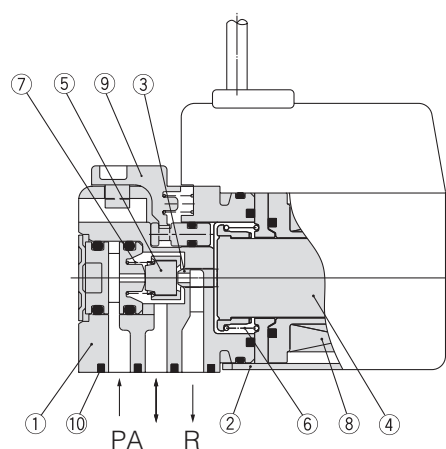
Specifications

Fluid	Air
Ambient and fluid temperature [°C]	-10 to 50 (no freezing)
Response time (DC) [ms] ¹⁾	ON: 5 or less / OFF: 4 or less
Max. operating frequency [Hz]	20
Manual override	Non-locking push, locking slotted
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance [m/s ²] ²⁾	150/30
Enclosure	Dust proof

Note 1) Based on dynamic performance test JIS B8374-1981 (standard type: at coil temperature of 20 °C, with rated voltage, without surge voltage suppressor).

Note 2) - Impact resistance: no malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage.)

- Vibration resistance: no malfunction resulted in 45 to 2000 Hz, a one-sweep test performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states. (Value in the initial stage.).



Component parts

No.	Description	Material
1	Body	Resin
2	Cover	Stainless steel
3	Push rod	Resin
4	Armature assembly	Stainless steel, resin
5	Poppet	FKM
6	Return spring	Stainless steel
7	Poppet spring	
8	Coil assembly	—
9	Manual override	Resin

Replacement parts

No.	Description	Part no.	Material	Note
10	Gasket assembly	V100-31-1A	FKM, steel	Gasket, 2 screws
11	Sub-plate	V100-74-1	Aluminium die-cast	—

Compact proportional valve

PVQ Series







- Service life: lasts 25 million cycles (PVQ30)
Specially coated sliding surface realised 25 million cycles within a set operation range
- Body material:
 - Brass (C36) (PVQ10)
 - Brass (C37) or stainless steel (PVQ30)
 - Seal material: FKM (PVQ10, PVQ30).
- Valve returns to closed position when power supply is turned off
- Leakage amount: 5 cm³/min or less at OFF position
- Can be used for vacuum applications
- Operation noise during opening/closing of the valve reduced
- Repeatability: 3 % or less
Hysteresis: 10 % or less
- Oil free option is available as made-to-order.

Specifications






Model	PVQ13				PVQ31		PVQ33	
Piping type	Base mounted				Body ported		Base mounted	
Valve construction	Direct operated poppet				Direct operated poppet			
Valve type	N.C.				N.C.			
Orifice size [mm]	0.3	0.4	0.6	0.8	1.6	2.3	4.0	
Max. operating pressure [MPa]	0.7	0.45	0.2	0.1	0.7	0.35	0.12	
Flow rate [l/min]	0 to 5	0 to 6		0 to 5	0 to 100			0 to 75
Applied current (power supply)	0 to 85 mA (24 VDC) 0 to 170 mA (12 VDC)				0 to 165 mA (24 VDC) 0 to 330 mA (12 VDC)			
Port size	M5				1/8			
Fluid	Air, inert gas				Air, inert gas			
Ambient temperature	0 to 50 °C				0 to 50 °C			
Hysteresis	10 % or less				10 % or less			13 % or less
Repeatability	3 % or less				3 % or less			

Air preparation


Air filter

Series	Port size	Filtration	Notes
	AF-A Filter		
	M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1	5 µm (Option: 2, 10, 20, 40, 70, 100 µm)	Optional manual or automatic drain
	AFM-A Mist separator		
	1/8, 1/4, 3/8, 1/2, 3/4	0.3 µm	Optional manual or automatic drain
	AFD-A Micro-mist separator		
	1/8, 1/4, 3/8, 1/2, 3/4	0.01 µm	Optional manual or automatic drain
	AF800/900 Large flow air filter		
	1 1/2, 2	5 µm (Option: 2, 10, 20, 40, 70, 100 µm)	Optional manual or automatic drain


Air preparation filter

Series	Port size	Rated flow [l/min] (ANR)	Filtration
	AFF Main line filter		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	300 to 14500	1, 3 µm
	AM Mist separator		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	300 to 14500	0.1, 0.3 µm
	AMD Micro-mist separator		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	300 to 14500	0.01 µm
	AMH Micro-mist separator with prefilter		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	200 to 12000	0.01 µm
	AME Super-mist separator		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	200 to 12000	0.01 µm








Odor removal filter

Series	Port size	Rated flow [l/min] (ANR)	Filtration
	AMF Odor removal filter		
	G 1/8, G 1/4, G 1/2, G 3/4, G 1, G 1 1/2, G 2	200 to 12000	0.01 µm

Water separator

Series	Port size	Max. flow capacity [l/min] (ANR)	Notes
	AMG Water separator		
	G 1/8, G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/2, G 2	300 to 12000	Eliminates water droplets in the compressed air

Additional equipment air preparation

Series	Port size	Notes
	AD Auto drain valve: AD402-A/600	
	1/4, 3/8, 1/2, 3/4, 1	Drainage is automatically discharged in a reliable manner, without requiring human operators. Highly resistant to dust and corrosion.
	AMJ Drain separator for vacuum	
	1/4, 3/8, 1/2, 3/4, 1	Remove water droplets from air by simply installing it in vacuum equipment connection lines. Effective for removing water droplets from the air sucked into vacuum pumps, ejectors, etc.
	ADH Heavy duty auto drain: ADH4000	
	1/2	Easy maintenance. Float style auto drain allows automatic drain discharge without electric power.
	AMP Exhaust cleaner for clean rooms	
	1/4, 3/8, 1/2, 3/4	Exhaust cleaner that can be used inside a clean room. Outlet cleanliness: Particles of 0.3 µm or larger are 35 particles or less/10 L. Silencing effect: 40 dB (A) or more.
	GP46 Pressure gauge with switch	
	1/8, 1/4	A pressure switch function has been added to the gauge. The pressure switch is equipped with a light for verifying operation. The pressure gauge is equipped with a limit indicator. To be used for verifying the supply pressure.
	GD40 Differential pressure gauge: GD40-2-01	
	1/8	The pressure differential at the inlet and the outlet of compressed air equipment can be viewed at a glance on the pressure differential gauge. It is ideal for the maintenance control of filters.
	PPA Compact manometer	
	M5	Pressure measurements can easily be taken anytime, anywhere. Backlight for easy viewing in dark locations. Auto power OFF function to save batteries.

Special regulator for oxygen concentrator

SRA Series



- This regulator is applicable for use with 95 % concentration oxygen.
- Oil free, material resistible against oxygen
- Precise pressure regulation and high repeatability
- Light and compact
- Applicable for use with medical devices.

Specifications

Model		SRA200-01	SR200F-08	SRA202-00-X234	SRA202-00-X235
Port size	Inlet	Rc 1/8	Ø 8 O.D. tubing	Ø 4.8 I.D. tubing	
	Outlet	Rc 1/8	Ø 8 O.D. tubing	Ø 4.8 I.D. tubing	
Proof pressure		0.45 MPa		0.75 MPa	
Operating pressure	Inlet	0.3 MPa		0.5 MPa	
	Outlet	Set pressure + 0.06 MPa			
Set pressure		0.01 to 0.1 MPa		0.13 to 0.15 MPa	0.1 to 0.3 MPa
Fluid		Oxygen, air		Argon	
Lubrication		Use no oil or grease			
Relieving structure		Non-relieving type			
Ambient and fluid temperature		0 to 40 °C		0 to 40 °C	
Flow rate range of operating fluid		0.2 to 6 l/min		0.2 to 5 l/min	0.2 to 2 l/min

How to order

Thread type

SRA200 – **F** **01**
① ②

① Thread type

—	Rc
F	G
N	NPT

② Port size

01	1/8
02	1/4

Fitting type

SRA200F – **06**
①

① Tubing O.D.

06	6 mm
08	8 mm

Barb type (bottom piping)

SRA200 – 00 – X234
SRA202 – 00 – X235

Pressure characteristics (SRA200, SRA200F)

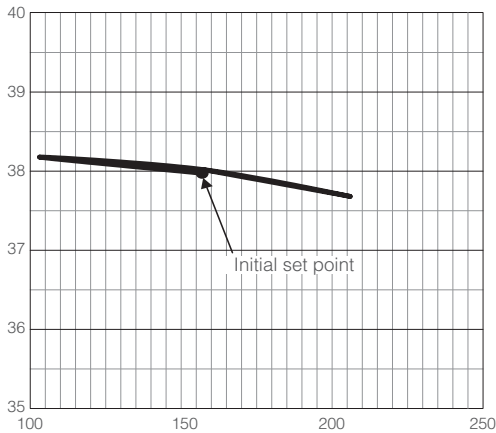
Initial setting

Supply pressure = 157 kPa

Secondary pressure = 38 kPa

Flow = 5 l/min (ANR)

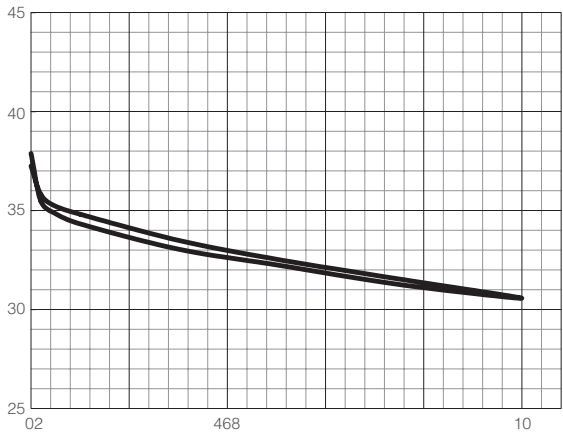
Operating fluid = Air



Flow characteristics (SRA200, SRA200F)

Supply air = 157 kPa

Operating fluid = Air



Refrigerated air dryer

IDFA Series



- High efficiency heat exchanger
- Ozone friendly refrigerants
- Conforms to stringent ISO 8573-1 standards
- State of the art design ensures a constant 3 °C pressure dew point
- Environmentally ozone friendly HFC134a and HFC407C refrigerant gases
- Simple control system, incorporating an easy to read evaporator gauge
- Stainless steel heat exchanger providing long life and low pressure drops
- Compact design for ease of installation
- Ø 10 mm one-touch condensate drain port.

Standard specifications

Model	Operating range			Power supply voltage	Power consumption [W]	Air port connections	Refrigerant	Weight [kg]	Nominal air flow rate [m³/h (ANR)]						
	Inlet air pressure [MPa]	Inlet air temperature [°C]	Ambient temperature [°C]						-4,- (3 °C PDP)	-5,- (7 °C PDP)	-6,- (10 °C PDP)				
IDFA3E-23	0.15 to 1.0	5 to 50	2 to 40 (relative humidity of 85 % or less)	Single phase 230 VAC 50 Hz	180	Rc 3/8	R134a (HFC)	18	12	15	17				
IDFA4E-23						Rc 1/2		22	24	31	34				
IDFA6E-23-K	0.15 to 1.6				208	Rc 3/4		23	36	46	50				
IDFA8E-23-K								27	65	83	91				
IDFA11E-23-K					385	Rc 1		28	80	101	112				
IDFA15E-23-K					470			46	120	152	168				
IDFA22E-23-K					760	R 1	R407C (HFC)	54	182	231	254				
IDFA37E-23-K						R 1 1/2		62	273	347	382				
IDFA55E-23-L					1130	R 2		100	390	432	510				
IDFA75E-23-L								116	660	720	822				
IDFA100F-40	0.15 to 1.0	5 to 60	2 to 45 (relative humidity of 85 % or less)	Three phase 400 VAC	2500	R2	R407C (HFC)	245	860	1040	1230				
IDFA125F-40					2700	R 2 1/2		270	1100	1320	1550				
IDFA150F-40						DIN flange 80		350	1340	1690	1920				
IDFA60-23	0.5 to 1.0	5 to 65	2 to 45	Single phase 230 VAC 50 Hz	820	R 1	R410A (HFC)	49	204	300	360				
IDFA70-23					1300	R1 1/2		68	312	408	480				
IDFA80-23					1950	R 2		95	552	654	720				
IDFA90-23					2220			110	810	900	960				

Membrane air dryer

IDG-A Series



- Possible to supply dry air easily using the hollow fibre membrane
- Non-fluorocarbon
- No Power supply required
- Compatible with low dew point (-60 °C)
- No vibration or heat discharge
- With a dew point indicator.

Flexible piping

IDG1 Series



- Tube configuration for low flow rates
- Outlet air flow rate: 10 l/min (ANR).

Moisture control tube

IDK Series



- Prevents condensation in piping for small cylinders/air grippers
- Diffuses water vapour in the piping to the outside.

Fittings and tubing

Miniature fittings

M Series



Speed controllers with one-touch fitting

AS Series

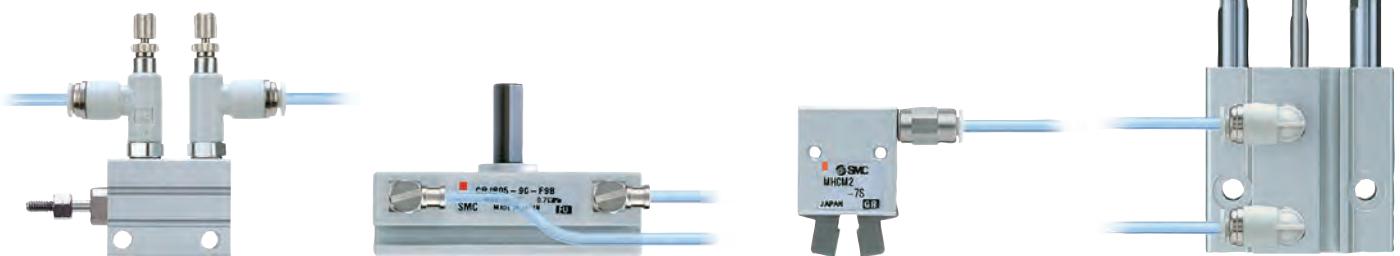


Polyurethane tubing

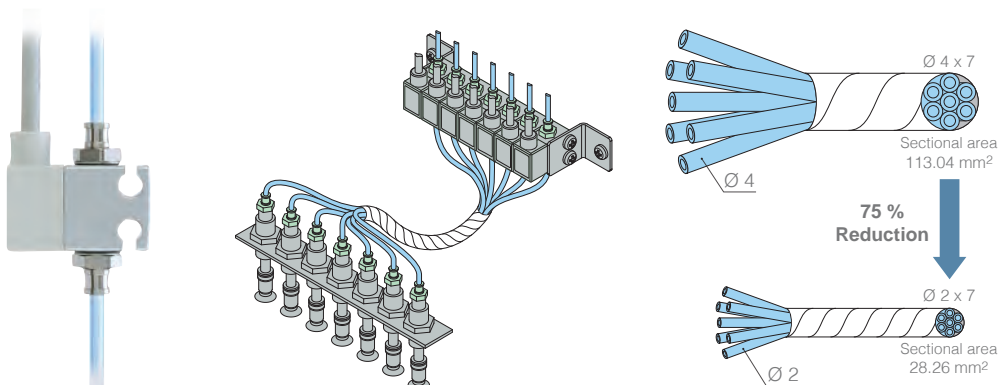
TU Series










Piping for compact actuators











Piping for compact pressure sensors

















General purpose fittings series	Variations	Applicable tubing material	Applicable tubing O.D. [mm]
	<p>One-touch fittings KQ2 Series</p>  <ul style="list-style-type: none"> One-touch connection and release Possible to use for vacuum to -100 kPa 51 different body types. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA	<p>Applicable tubing O.D. [mm]</p> <p>Ø 2 Ø 3.2 Ø 4 Ø 6 Ø 8 Ø 10 Ø 12 Ø 16</p> <p>With seal</p> <p>Electroless nickel plated</p> <p>M3</p> <p>M5</p> <p>M6</p> <p>1/8</p> <p>1/4</p> <p>3/8</p> <p>1/2</p> <p>Unions</p> <p>G 1/8</p> <p>G 1/4</p> <p>G 3/8</p> <p>G 1/2</p>
	<p>Rotary one-touch fittings KS Series (standard) KX Series (high speed)</p>  <ul style="list-style-type: none"> Low torque rotation type for rotating and oscillating applications. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA	<p>M5</p> <p>M6</p> <p>1/8</p> <p>1/4</p> <p>3/8</p> <p>1/2</p>
	<p>One-touch fittings manifold KM Series</p>  <ul style="list-style-type: none"> One-touch in/out connection for compact tubing applications Many varieties (40 types) available. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA	<p>1/4</p> <p>3/8</p> <p>Ø 8</p> <p>Ø 10</p> <p>Ø 12</p>
	<p>Insert fittings KF Series</p>  <ul style="list-style-type: none"> Grease-free Possible to use in vacuum to -101.3 kPa. 	Polyamide, Soft Polyamide, Polyurethane, Polyolefin, Soft Polyolefin, FEP, PFA, Modified PTFE	<p>1/8</p> <p>1/4</p> <p>3/8</p> <p>1/2</p> <p>Unions</p>
	<p>Stainless steel SUS 316 Insert fittings KFG2 Series</p>  <ul style="list-style-type: none"> Fluid temperature: -65 to 260 °C Rubber materials are not used (except swivel elbow) Grease-free. 	FEP, PFA, Modified PTFE, Polyamide, Soft Polyamide, Polyurethane, Soft Polyurethane, Hard Polyurethane, Polyolefin, Soft Polyolefin, Antistatic Soft Polyamide, Antistatic Polyurethane	<p>1/8</p> <p>1/4</p> <p>3/8</p> <p>1/2</p>
	<p>Stainless steel 316 One-touch fittings KQG2 Series</p>  <ul style="list-style-type: none"> Fluid temperature: -5 to 150 °C Seal parts: special FKM Grease-free. 	FEP, PFA, Polyamide, Soft Polyamide, Polyurethane, Polyolefin	<p>M5</p> <p>1/8</p> <p>1/4</p> <p>3/8</p> <p>1/2</p>
	<p>Metal one-touch fittings KQB2 Series</p>  <ul style="list-style-type: none"> Fluid temperature: -5 to 150 °C Grease-free Electroless nickel plated (Brass parts). 	FEP, PFA, Polyamide, Soft Polyamide, Polyurethane, Polyolefin	<p>M5</p> <p>R 1/8</p> <p>G 1/8</p> <p>R 1/4</p> <p>G 1/4</p> <p>R 3/8</p> <p>G 3/8</p> <p>R 1/2</p> <p>G 1/2</p>

● Available as option

General purpose fittings series	Variations	Applicable tubing material	Applicable tubing O.D. [mm]	
	Miniature fittings M Series <ul style="list-style-type: none"> Tubing connection/disconnection without use of tools Compact piping space. 	Polyamide, Soft Polyamide, Polyurethane, FEP, Modified PTFE	<div> <div> <div>Ø 2</div> <div>Ø 3.2</div> <div>Ø 4</div> <div>Ø 6</div> <div>Ø 8</div> <div>Ø 10</div> <div>Ø 12</div> <div>Ø 16</div> </div> <div> <div>With seal</div> <div>Electroless nickel plated</div> </div> </div>	
	Self-align fittings H/DL/L/LL Series <ul style="list-style-type: none"> Applicable for use on soft copper steel pipes. 	Polyamide, Soft Polyamide, Soft Copper (C1220T-0)		
	Self seal fittings KC Series <ul style="list-style-type: none"> One-touch connection and release Built-in self-seal mechanism. 	Polyamide, Soft Polyamide, Polyurethane		
	Multi-connector with one-touch fittings DMK Series <ul style="list-style-type: none"> Prevents installation mistakes. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA		
	Rectangular multi-connector KDM Series <ul style="list-style-type: none"> Prevents installation mistakes. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA		
	Piping module KB Series <ul style="list-style-type: none"> Centralised distribution of supply air. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA		












Clean fittings series	Variations	Applicable tubing material	Applicable tubing O.D. [mm]	
	Clean one-touch fittings KP Series <ul style="list-style-type: none"> Low particulate generation. 	Recommended: Polyolefin, Soft Polyolefin	<div> <div> <div>Ø 3.2</div> <div>Ø 4</div> <div>Ø 6</div> <div>Ø 8</div> <div>Ø 10</div> <div>Ø 12</div> <div>Ø 16</div> </div> <div> <div>With seal</div> <div>Electroless nickel plated</div> </div> </div>	
	Clean one-touch fittings KPQ/KPG Series <ul style="list-style-type: none"> Low particulate generation. 	Polyurethane: 10-Series		

Fitting series for special environments	Variations	Applicable tubing material	Applicable tubing O.D. [mm]
	FR one-touch fittings KR Series  <ul style="list-style-type: none"> For use where weld spatter is generated Flame resistant material UL-94, V-0. 	FR Soft Polyamide, FR Double Layer	Ø 3.2 Ø 4 Ø 6 Ø 8 Ø 10 Ø 12 Ø 16 1/8 1/4 3/8 1/2 Unions With seal Electroless nickel plated
	FR one-touch fittings manifold KRM Series  <ul style="list-style-type: none"> For use where weld spatter is generated Flame resistant material UL-94, V-0. 	FR Soft Polyamide, FR Double Layer	1/4 3/8 Ø 10 Ø 12
	One-touch fittings KG Series  <ul style="list-style-type: none"> For use in corrosive environments Stainless steel. 	Polyamide, Soft Polyamide, Polyurethane, FEP, PFA	M5 1/8 1/4 3/8 1/2 Unions
	Antistatic one-touch fittings KA Series  <ul style="list-style-type: none"> For preventing static electricity. 	Antistatic, Soft Polyamide, Antistatic, Polyurethane	M5 M6 1/8 1/4 3/8 1/2 Unions
	Miniature fittings MS Series  <ul style="list-style-type: none"> For use in corrosive environments Stainless steel SUS 316. 	Polyamide, Soft Polyamide, Polyurethane, FEP, Modified PTFE	M5

	Variations	Colour	Tubing O.D.	
			Metric size [mm]	Inch size [inch]
			Ø 2 (Ø 3/32")	Ø 1/8" (Ø 3.2)
Tubing	Polyamide tubing T/TIA Series • General tubing up to 3.3 MPa at 20 °C.	 Black White Red Blue Yellow Green	Ø 4 (Ø 5/16")	Ø 6 (Ø 5/8")
	Soft polyamide tubing TS/TISA Series • Slightly flexible up to 2.0 MPa max. at 20 °C.	 Black White Red Blue Yellow Green	Ø 8 (Ø 5/8")	Ø 10 (Ø 3/4")
	Polyurethane tubing TU/TIUB Series • Flexible 0.8 MPa max. at 20 °C • FDA compliant special (with suffix "-X214").	 Black White Red Blue Yellow Green Clear Orange (*)	Ø 12 (Ø 1/2")	Ø 16 (Ø 5/8")
	Soft polyurethane tubing TUS Series • Extremely flexible 0.6 MPa max. at 20 °C.	 Black White Red Blue Yellow Green Translucent Yellow Brown	Ø 20 (Ø 3/4")	Ø 25 (Ø 1")
	Flat tubing TU, TUS, TUZ Series • Multi-core, multi-colour specification.	 TU Series 2 to 6 cores TUS Series 2 to 5 cores TUZ Series 2 to 6 cores	Ø 30 (Ø 1 1/4")	Ø 40 (Ø 1 1/2")
	Hard polyurethane tubing TUH Series • 0.8 MPa standard type, 1.0 MPa for high pressure type.	 Black White Blue Translucent	Ø 50 (Ø 2")	Ø 63 (Ø 2 1/2")
	Polyurethane coil tubing TCU Series • For flexible and moving applications.	 1 core 2 cores 3 cores	Ø 75 (Ø 3")	Ø 100 (Ø 4")
	Polyurethane flat tubing TFU Series • For flexible multi-tube applications.	 2 cores 3 cores	Ø 125 (Ø 5")	Ø 150 (Ø 6")
	FR soft polyamide tubing TRS Series • Use in spatter generating atmosphere/flame resistant material. Flame resistance (equivalent to UL-94 standard, V-0)	 Black White Red Blue Green	Ø 150 (Ø 6")	Ø 175 (Ø 7")

* Additional 21 new colors

Tubing

	Variations	Colour	Tubing O.D.	
			Metric size [mm]	Inch size [inch]
			Ø 2 Ø 3 Ø 4 (Ø 3/32")	Ø 6 Ø 8 Ø 10 Ø 12 Ø 16 Ø 19 Ø 25 (Ø 5/16")
Tubing	FR double layer tubing TRB Series 	Black White Red Blue Yellow Green	• • • • • •	• • • • • •
	Flame resistance (equivalent to UL-94 standard, V-0)			
	FR double-layer polyurethane tubing TRBU Series 	Black White Red Blue Yellow Green	• • • • • •	• • • • • •
	Flame resistance (equivalent to UL-94 standard, V-0)			
	Antistatic polyurethane tubing TAU Series <ul style="list-style-type: none"> • For preventing static electricity. 	Black	•	•
	Antistatic soft polyamide tubing TAS Series <ul style="list-style-type: none"> • For preventing static electricity. 	Black	•	•
	Super PFA tubing High purity fluoropolymer tubing TL/TIL Series <ul style="list-style-type: none"> • Outstanding corrosion resistance • Food Sanitation Law compliant • FDA compliant. 	Translucent	•	•
	PFA fluoropolymer tubing TLM/TILM Series <ul style="list-style-type: none"> • Outstanding corrosion resistance • Food Sanitation Law compliant • FDA compliant. 	Black Red Blue Translucent	•	•
	FEP fluoropolymer tubing TH/TIH Series <ul style="list-style-type: none"> • Outstanding corrosion resistance • Food Sanitation Law compliant • FDA compliant. 	Black Red Blue Translucent	•	•
	Modified PTFE tubing TD/TID Series <ul style="list-style-type: none"> • Outstanding corrosion resistance • Food Sanitation Law compliant • FDA compliant. 	Translucent	•	•
	2-layer soft fluoropolymer tubing TQ Series <ul style="list-style-type: none"> • Outstanding corrosion and abrasion resistance. 	Translucent	•	•
	Clean tubing Polyolefin tubing TPH Series <ul style="list-style-type: none"> • FDA compliant. 	Black White Red Blue Yellow Green	•	•
	Clean tubing Soft polyolefin tubing TPS Series <ul style="list-style-type: none"> • FDA compliant. 	Black White Red Blue Yellow Green	•	•

S couplers with sleeve lock

KK Series



Male thread type

Series	Port size					
	M5	R 1/8	R 1/4	R 3/8	R 1/2	R 3/4
KK2	●	●				
KK3		●	●	●		
KK4		●	●	●	●	
KK6				●	●	●

Female thread type

Series	Port size				
	M5	R 1/8	R 1/4	R 3/8	R 1/2
KK2	●				
KK3		●	●	●	
KK4			●	●	
KK6				●	●

Nut fitting type (for reinforced urethane hose)

Series	Applicable tube I.D./O.D. [mm]					
	5/8	6/9	6.5/10	8/12	8.5/12.5	11/16
KK3	●	●	●			
KK4	●	●	●	●	●	
KK6				●	●	●

One-touch fitting type (straight/elbow/bulkhead)

Series	Applicable tube O.D. [mm]						
	Ø 3.2	Ø 4	Ø 6	Ø 8	Ø 10	Ø 12	Ø 16
KK2	●	●	●				
KK3		●	●	●	●		
KK4			●	●	●	●	
KK6						●	●

S couplers without sleeve lock

KKH Series



Male thread type

Series	Port size			
	R 1/8	R 1/4	R 3/8	R 1/2
KKH3	●	●	●	
KKH4	●	●	●	●

Female thread type

Series	Port size		
	R 1/8	R 1/4	R 3/8
KKH3	●	●	●
KKH4		●	●

Nut fitting type (for reinforced urethane hose)

Series	Applicable tubing I.D./O.D. [mm]				
	5/8	6/9	6.5/10	8/12	8.5/12.5
KKH3	●	●	●		
KKH4	●	●	●	●	●

S couplers stainless steel type

KKA Series



Male/Female thread type

Series	Port size							
	R·Rc 1/8	R·Rc 1/4	R·Rc 3/8	R·Rc 1/2	R·Rc 3/4	R·Rc 1	R·Rc 1 1/4	R·Rc 1 1/2
KKA3	●	●	●					
KKA4		●	●	●				
KKA6			●	●	●			
KKA7				●	●	●		
KKA8					●	●	●	
KKA9						●	●	●

Energy saving by pressure loss reduction

KK130 Series



Male thread type

Series	Port size							
	R 1/8	R 1/4	R 3/8	R 1/2	NPT 1/8	NPT 1/4	NPT 3/8	NPT 1/2
KK130	●	●	●	●	●	●	●	●

Female thread type

Series	Port size							
	R 1/8	R 1/4	R 3/8	R 1/2	NPT 1/8	NPT 1/4	NPT 3/8	NPT 1/2
KK130	●	●	●	●	●	●	●	●

Barb fitting type (for rubber hose)

Series	Tube nominal size			
	1/4"	1/4"	3/8"	1/2"
KK130	●	●	●	●

Nut fitting type (for fibre reinforced urethane hose)

Series	Applicable hose I.D./O.D. [mm]					
	5/8	6/9	6.5/10	8/12	8.5/12.5	11/16
KK130	●	●	●	●	●	●

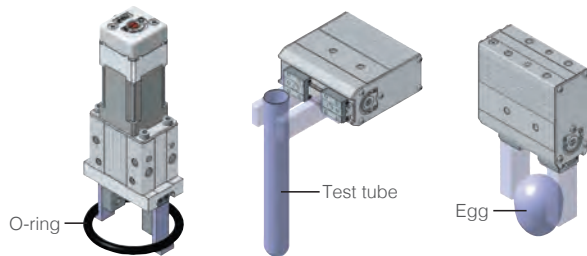
One-touch fitting type

Series	Applicable tube O.D.							
	6	8	10	12	1/4"	5/16"	3/8"	1/2"
KK130	●	●	●	●	●	●	●	●

Electric actuator

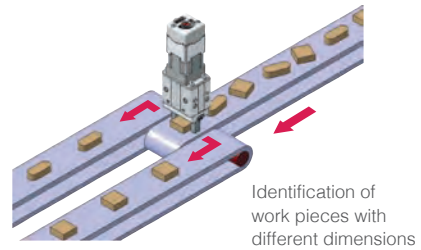
Applications

Gripping of components that are easily deformed or damaged



Speed and gripping force control and positioning

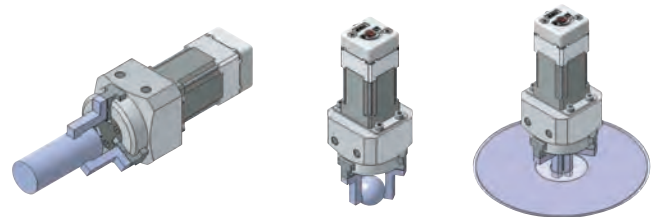
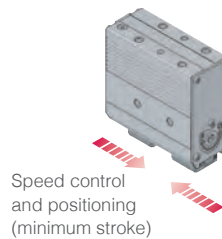
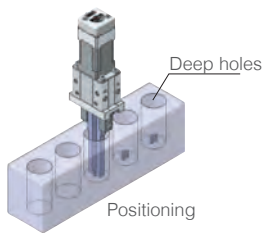
Alignment and selection of randomly lined parts



Gripping in a narrow space

Soft touch/High frequency

Gripping of cylindrical and spherical parts



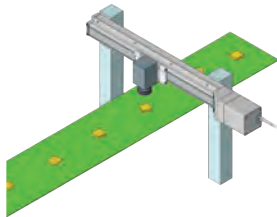
Speed and gripping force control

Precise positioning of work pieces

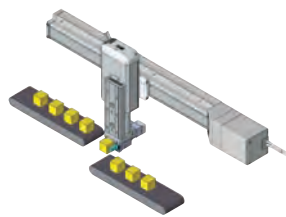
Pick and place

Load and unload transfer of work pieces

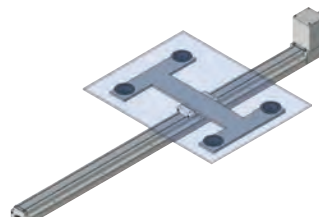
Vertical transfer



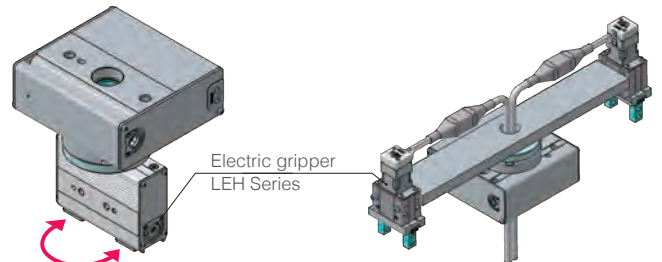
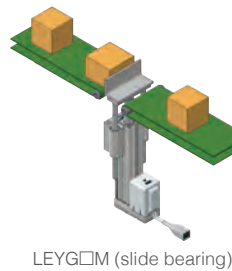
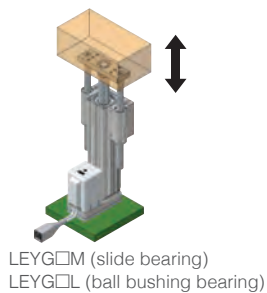
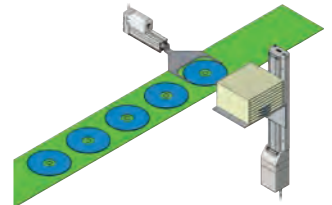
Lifter



Stopper



Rotation



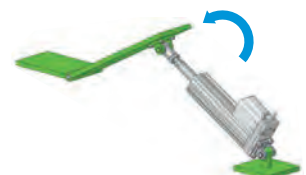
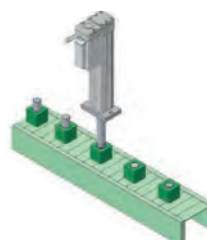
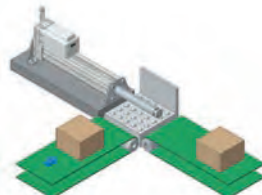
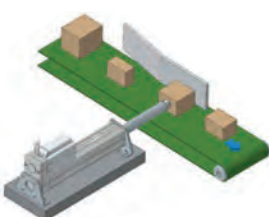
Rotation transfer after gripping in combination with a gripper

Pushing operation

Delivery

Press fitting

Rotation



Electric gripper

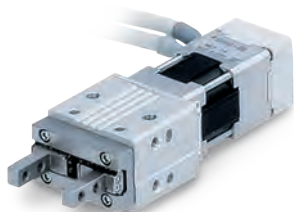
LEH Series

- Drop prevention function (self-lock mechanism) is provided
- Energy saving: power consumption reduced by self-lock mechanism
- Gripping check function is provided.

2 finger electric gripper

LEHZ Series

- Extremely compact and lightweight, with various gripping forces.



2 finger long-stroke electric gripper

LEHF Series

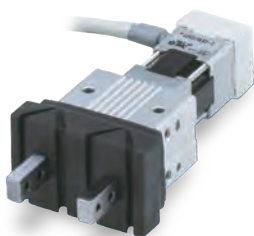
- Possible to hold various types of workpieces due to long stroke.



2 finger electric gripper with dust cover

LEHZJ Series

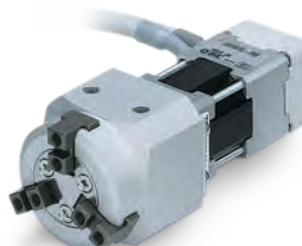
- Sealed-construction dust cover, equivalent to IP50
- 3 selectable cover materials for the fingers.



3 finger electric gripper

LEHS Series

- Suitable for holding round workpieces.



Specifications	Series	Opening/closing stroke both sides [mm]	Gripping force [N]		Opening/ closing speed [mm/s]	Pushing speed [mm/s]	Repeatability [mm]	Controller series
			Basic	Compact				
Step motor (Servo/24 VDC)	LEHZ10	4	6 to 14	2 to 6	5 to 80	5 to 50	±0.02	LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
	LEHZ16	6		3 to 8				
	LEHZ20	10	16 to 40	11 to 28	5 to 100	5 to 50		
	LEHZ25	14						
	LEHZ32	22	52 to 130	—	5 to 120	5 to 50		
	LEHZ40	30	84 to 210	—				
	LEHZJ10	4	6 to 14	3 to 6	5 to 80	5 to 50		
	LEHZJ16	6		4 to 8				
	LEHZJ20	10	16 to 40	11 to 28	5 to 100	5 to 50		
	LEHZJ25	14						
	LEHF10	16 (32)	3 to 7		5 to 80	5 to 20	±0.05	
	LEHF20	24 (48)	11 to 28		5 to 100	5 to 30		
	LEHF32	32 (64)	48 to 120					
	LEHF40	40 (80)	72 to 180					
	LEHS10	4	2.2 to 5.5	1.4 to 3.5	5 to 70	5 to 50	±0.02	
	LEHS20	6	9 to 22	7 to 17	5 to 80	5 to 50		
	LEHS32	8	36 to 90	—	5 to 100	5 to 50		
	LEHS40	12	52 to 130	—	5 to 120	5 to 50		

* () indicates value when "long stroke" is selected.

LEF Series

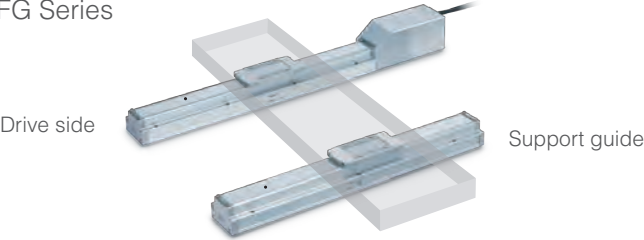


LEFB
Belt drive

- Simple installation: possible to mount the main body without removing the external cover
- Two transmission options: belt drive (LEFB); ball screw drive (LEFS)
- Motor mounting direction can be selected
- Optional non-magnetising type lock mechanism for the motor
- High precision type, LEFSH
- Support guide type, LEFG
- Optional clean room specification ISO Class 4 (ISO 14644-1).

* [] indicates value when "LECPA, JXC92, JXC□3 controller" is selected.
 * { } indicates value when "high precision slider type electric actuator LEFSH" is selected.
 1) Maximum value depends on stroke range.

Support guide
LEFG Series



- Designed to support workpieces with significant overhang
- Standard equipped seal bands prevent grease from splashing and external foreign matter from entering
- Easy assembly thanks to same dimensions as the LEF Series body.

Type	Remarks	Series	Stroke [mm]
For ball screw drive	Step motor (Servo/24 VDC) Servo motor (24 VDC) AC servo motor	LEFG16-S	50 to 500
		LEFG25-S	50 to 800
		LEFG32-S	50 to 1000
		LEFG40-S	150 to 1200
For belt drive	Step motor (Servo/24 VDC) Servo motor (24 VDC)	LEFG16-BT	300 to 1000
		LEFG25-BT	300 to 2000
		LEFG32-BT	
	AC servo motor	LEFG25-BS	300 to 2500
		LEFG32-BS	
		LEFG40-BS	300 to 3000

Electric actuator slider type, high rigidity

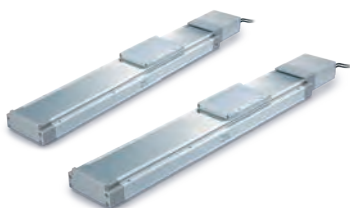
LEJ Series

- Low profile and low centre of gravity (62 mm height)
- Double axis linear guide reduces deflection
- Dustproof construction as it is equipped with seal band as standard
- Maximum acceleration/deceleration: 20,000 mm/s²
- Even further improved position repeatability and lost motion with high precision type, LEJSH
- Standard auto-switches can be mounted.

Ball screw drive

LEJS Series

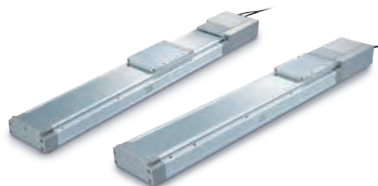
- Suitable for repeatable accurate positioning.



Belt drive

LEJB Series

- Suitable for long-stroke high-speed and light-load transfer.



Drive method	Specifications	Series	Stroke [mm]	Workload [kg]		Max. speed [mm/s]	Screw lead [mm]	Positioning repeatability [mm]	Controller series
				Horizontal	Vertical				
Ball screw drive	AC servo motor (100/200 W)	LEJS40	200 to 1200	15	3	1800	24	±0.02 {±0.01}	LECSA, LECSB, LECSC, LECSS, LECSS-T, LECYU, LECYM
				30	5	1200	16		
				55	10	600	8		
		LEJS63	300 to 1500	30	6	1800	30		
				45	10	1200	20		
				85	20	600	10		
Belt drive		LEJB40	200 to 2000	20 [10]	—	2000	27	±0.04	
		LEJB63	300 to 3000	30	—	3000	42		

* { } indicates value when "high precision type" is selected.

* [] indicates value when the stroke exceeds 1000.

Possible auto switches

3 wire solid state/2 colour - PNP	D-M9PWL
3 wire solid state/2 colour - NPN	D-M9NWL

Electric actuator guide rod slider

LEL Series



- Low-profile electric actuator (48 mm height); no interference with motor even with large workpieces
- Compatible with sliding bearing and ball bushing bearing:
 - Sliding bearing: reduced noise, 60 dB or less
 - Ball bushing bearing: high-speed transport – 1000 mm/s – suitable for moment loads.
- Optional non-magnetising type lock mechanism for the motor
- Manual override screw for adjustment operation when power is turned off
- Adjustable position, speed and positioning
- Standard auto-switches can be mounted with optional rail.

Drive method	Series	Bearing	Stroke [mm]	Workload (horizontal) [kg]	Speed [mm/s]	Equivalent lead [mm]	Positioning repeatability [mm]	Controller series
Step motor (Servo/24 VDC)	LEL25M	Sliding bearing	100 to 1000	3	48 to 500	48	±0.08	LECP6, LECP1, JXC□1
	LEL25L	Ball bushing bearing		5	48 to 1000			

Possible auto switches

3 wire solid state/2 colour - PNP	D-M9PWL
3 wire solid state/2 colour - NPN	D-M9NWL

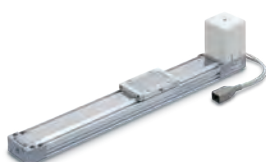
Electric actuator slider type, low profile LEM Series

- Low profile and low centre of gravity
- The drive unit and guide unit are separable (not LEMB)
- Selectable guide mechanism, step motor mounting direction and control method:
 - Guide mechanism: LEMB, LEMC, LEMH, LEMHT
 - Motor mounting direction: top/bottom, right/left.
- Standard auto-switches can be mounted.

Basic type

LEMB Series

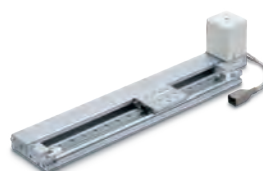
- Light load transfer
- Easy connection to an external guide with floating bracket option
- Long stroke.



Linear guide single axis type

LEMH Series

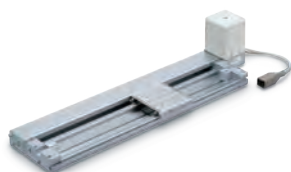
- Workpiece direct mounting
- Provides more moment resistance than the cam follower guide type
- High speed transfer.



Cam follower guide type

LEMC Series

- Workpiece direct mounting
- Long stroke.



Linear guide double axis type

LEMHT Series

- Workpiece direct mounting
- Provides more moment resistance than the linear guide single axis type
- High speed transfer.



Drive method	Specifications	Series	Stroke [mm]	Workload (horizontal) [kg]	Speed [mm/s]	Max. acceleration/ deceleration [mm/s ²] ¹⁾	Screw lead [mm]	Positioning repeatability [mm]	Controller series
Belt drive	Step motor (Servo/24 V DC)	LEMB25	50 to 2000	6 (10)	48 to 1000	20000	48	±0.08	LECP6, LECP1, LECP2, JXC□1
		LEMB32		11 (20)					
		LEMC25		10					
		LEMC32		20					
		LEMH25	50 to 1000	10	48 to 2000				
		LEMH32	50 to 1500	20					
		LEMHT25	50 to 1000	10					
		LEMHT32	50 to 1500	20					

* () when combined with external guide.

1) The acceleration/deceleration is dependent on the work load.

Possible auto switches

3 wire solid state/2 colour - PNP	D-M9PWL
3 wire solid state/2 colour - NPN	D-M9NWL

LEY Series



In-line motor

- Ball screw drive actuator with selectable motor (servo motor, step motor)
- Standard auto-switches can be mounted
- Mounting flexibility: three positions for direct mounting and three types of mounting brackets, plus rod end brackets
- Selectable motor mounting direction
- Optional non-magnetising type lock mechanism for the motor
- Reduced actuator height by in-line motor mounting, in-line motor type LEY□□
- High precision rod type electric actuator, LEYH(D).

* () indicates value when "in-line type" is selected.
 * [] indicates value when "LECPA, JXC92, JXC□3 controller" is selected.
 * { } indicates value when "high precision slider type electric actuator LEYH" is selected.
 1) Not available for in-line motor type.

Possible auto switches

38

Guide rod type electric actuator LEYG Series



- Two compact and integrated guide rods provide lateral load resistance and high non-rotating accuracy
- Compatible with sliding bearing and ball bushing bearing
- Selectable motor mounting direction
- Optional non-magnetising type lock mechanism for the motor
- High precision guide rod type LEYHG
- Reduced actuator height by in-line motor mounting, in-line motor type LEYG□D
- Standard auto-switches can be mounted.

Specifications	Series	Stroke [mm]	Pushing force [N]	Workload [kg]		Speed [mm/s]	Screw lead [mm]	Positioning repeatability [mm]	Controller series
				Horizontal	Vertical				
Step motor (Servo/24 VDC)	LEYG16□	30 to 200	14 to 38	6 [4]	1.5	15 to 500	10	±0.02	LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
			27 to 74	17 [11]	3.5	8 to 250	5		
			51 to 141	30 [20]	7.5	4 to 125	2.5		
	LEYG25□	30 to 300	63 to 122	20 [12]	7	18 to 500	12		
			126 to 238	40 [30]	15	9 to 250	6		
			232 to 452	60 [30]	29	5 to 125	3		
	LEYG32□		80 to 189	30 [20]	9	24 to 500	16		
			156 to 370	45 [40]	20	12 to 300 [250]	8		
			296 to 707	60 [40]	41	6 to 150 [125]	4		
	LEYG40□		132 to 283	50 [30]	11	24 to 500 [300]	16		
			266 to 553	60 [60]	25	12 to 350 [150]	8		
			562 to 1058	80 [60]	51	6 to 175 [75]	4		
Servo motor (24 VDC)	LEYG16□A	30 to 200	16 to 30	3	1.5	1 to 500	10	LECA6	
			30 to 58	6	3.5	1 to 250	5		
			57 to 111	12	7.5	1 to 125	2.5		
	LEYG25□A	18 to 35	7	2	2 to 500	12			
		37 to 72	15	5	1 to 250	6			
		66 to 130	30	11	1 to 125	3			
AC servo motor (100/200 W)	LEY(H)G25□	30 to 300	65 to 131	18	7	max. 900	12	±0.02 {±0.01}	LECSA, LECSB, LECSC, LECSS, LECSS-T, LECYU, LECYM
			127 to 255	50	15	max. 450	6		
			242 to 485		29	max. 225	3		
	LEY(H)G32□		79 (98) to 157(197)	30	7 (10)	max. 1200 (1000)	20 (16)		
			154 (192) to 308 (385)	60	17 (22)	max. 600 (500)	10 (8)		
			294 (368) to 588 (736)		35 (44)	max. 300 (250)	5 (4)		

* () indicates value when "in-line type" is selected.

* [] indicates value when "LECPA, JXC92, JXC□3 controller" is selected.

* { } indicates value when "high precision rod type electric actuator LEYHG" is selected.

Possible auto switches

3 wire solid state/2 colour - PNP	D-M9PWL
3 wire solid state/2 colour - NPN	D-M9NWL

Electric slide table

LES Series

- High rigidity type LESH□ available
- Reduced cycle time: maximum acceleration 5000 mm/s²; maximum speed 400 mm/s
- Easy and flexible mounting of the table, with selectable motor:
 - Step motor (servo/24 VDC): ideal for high load transfer at a low speed and pushing operation
 - Servo motor (24 VDC): stable at high speed and suitable for silent operations.
- Optional dustproof specification, IP5X equivalent.

Basic type

LES□R Series

- Compact and space saving through built-in motor.



LESR
Compact



LESHR
High rigidity

Symmetrical type

LES□L Series

- Compact and space saving through built-in motor
- The locations of the table and cable are the opposite of those of the basic type.



LESL
Compact



LESHL
High rigidity

In-line motor type

LES□D Series

- Reduced width and height through in-line motor mounting.



LESD
Compact



LESHD
High rigidity

Specifications		Series	Stroke [mm]	Pushing force [N]	Workload [kg]		Speed [mm/s]	Screw lead [mm]	Positioning repeatability [mm]	Controller series
					Horizontal	Vertical				
Compact type	Step motor (Servo/24 VDC)	LES8□	30, 50, 75	6 to 15	1	0.5	10 to 200	4	±0.05	LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
				4 to 10		0.25	20 to 400	8		
		LES16□	30, 50, 75, 100	23.5 to 55	3	3	10 to 200	5		
				15 to 35		1.5	20 to 400	10		
		LES25□	30, 50, 75, 100, 125, 150	77 to 180	5	5	10 to 200	8		
				43 to 100		2.5	20 to 400	16		
	Servo motor (24 VDC)	LES8□A	30, 50, 75	7.5 to 11	1	1	1 to 200	4		LECA6
				5 to 7.5		0.5	1 to 400	8		
		LES16□A	30, 50, 75, 100	17.5 to 35	3	3	1 to 200	5		
				10 to 20		1.5	1 to 400	10		
		LES25□A ¹⁾	30, 50, 75, 100, 125, 150	31 to 62	5	4	1 to 200	8		
				19 to 38		2	1 to 400	16		
High rigidity type	Step motor (Servo/24 VDC)	LESH8□	50, 75	6 to 15	2	0.5	10 to 200	4		LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
				4 to 10	1	0.25	20 to 400	8		
		LESH16□	50, 100	23.5 to 55	8	2	10 to 200	5		
				15 to 35	5	1	20 to 400	10		
		LESH25□	50, 100, 150	77 to 180	12	4	10 to 150	8		
				43 to 100	8	2	20 to 400	16		
	Servo motor (24 VDC)	LESH8□A	50, 75	7.5 to 11	2	0.5	1 to 200	4		LECA6
				5 to 7.5	1	0.25	1 to 400	8		
		LESH16□A	50, 100	17.5 to 35	5	2	1 to 200	5		
				10 to 20	2.5	1	1 to 400	10		
		LESH25□A ¹⁾	50, 100, 150	31 to 62	6	2.5	1 to 150	8		
				19 to 38	4	1.5	1 to 400	16		

1) Not available for in-line motor type.

Electric actuator miniature type

LEP Series



LEPY
Rod type



LEPS
Slide table type

- Compact and lightweight
- Motor type selectable:
 - High pushing force type – basic type
 - Compact and lightweight motor type (size 10 only).
- Manual override screw for adjustment operation when power is turned off
- Possible to set position, speed and force.

Specifications	Type	Series	Stroke [mm]	Screw lead [mm]	Pushing force [N]		Max. workload (horizontal) [Kg]		Max. workload (vertical) [Kg]		Speed (horizontal) [mm/s]		Positioning repeatability [mm]	Controller series
					Basic	Compact	Basic	Compact	Basic	Compact	Basic	Compact		
Step motor (Servo/24 VDC)	Miniature rod type	LEPY6	25, 50 75	4	14 to 20	—	2.0	—	0.5	—	10 to 150	—	±0.05	LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
				8	7 to 10		1.0		0.25		20 to 300 (250)			
		LEPY10		5	25 to 50	24 to 40	6.0	4.0	1.5	10 to 200				
				10	12.5 to 25	12 to 20	3.0	2.0	1.0	20 to 350 (250)				
	Miniature slide table type	LEPS6	25, 50	4	14 to 20	—	1.0	—	0.5	—	10 to 150	—		
				8	7 to 10		0.75		0.25		20 to 300 (250)			
		LEPS10		5	25 to 50	24 to 40	2.0	1.5	10 to 200					
				10	12.5 to 25	12 to 20	1.5	1.0	20 to 350 (250)					

* () indicates value when stroke is 25 mm.

Electric rotary table

LER Series



- Adjustable speed, acceleration and position
- Easy setting operation and installation
- Selectable rotation angles, with continuous rotation model available: 90°, 180°, 320° (310° for LER10), 360°
- Maximum acceleration 3000 °/s², maximum speed 420 °/s.

Specifications	Series	Rotating torque [N·m]		Speed [°/s]		Positioning repeatability [°]		Controller series ¹⁾
		Basic	High torque	Basic	High torque	Basic	High torque	
Step motor (Servo/24 V DC)	LER10	0.22	0.32	30 to 420	20 to 280	±0.05 [±0.01] (±0.05)		LECP6, LECP1, LECPA, JXC□1, JXC92, JXC□3
	LER30	0.8	1.2			±0.05 [±0.01] (±0.03)		
	LER50	6.6	10					

* [] indicates value when an external stopper is used.

* () indicates value when "high precision type" is selected.

1) LECPA, LECP1, JXC92 and JXC□3: not available for 360° rotation angle.

Controller & drivers

	Compatible motor	Control method	Compatible encoder		Compatible option		
			Type	Resolution	Teaching box	Network gateway unit	Blank controller ¹⁾
Controller (24 VDC) LECP6 	Step 24 VDC	Positioning (64 points)	Incremental	800	✓	✓	✓
Controller (24 VDC) LECA6 	Servo 24 VDC				✓	✓	✓
Programless controller (24 VDC) LECP1 	Step 24 VDC	Positioning (14 points)			✗	✗	✗
Programless controller, with stroke study (24 VDC) LECP2 		Positioning (14 points) ²⁾			✗	✗	✗
Pulse input type step motor driver (24 VDC) LECPA 		Pulse input			✓	✗	✓
4 axis controller (24 VDC) JXC73/83 		Positioning (2048 points)			✗	✗	✗
3 axis controller (24 VDC) JXC92 		Positioning (2048 points) ³⁾			✗	✗	✗
4 axis controller (24 VDC) JXC93 		Positioning (2048 points) ³⁾			✗	✗	✗
Direct input type step motor controller (24 VDC) JXC91/E1/P1/D1/L1 		Positioning (64 points) & Network direct input ⁴⁾			✓	✗	✓

1) A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with.

Refer to catalogue of each controller/driver series for more information.

2) 2 stroke end points plus 12 intermediate points.

3) Communication protocol: EtherNet/IP™.

4) Communication protocols: EtherCAT®, EtherNet/IP™, PROFINET, DeviceNet™, IO-Link.

Step data input type controller

LEC Series



LECP6

Step motor (Servo/24 VDC)

- LECP6 compatible with actuators series: LEF, LEL, LEM, LEY/LEYG, LES, LEP, LER, LEH
- LECA6 compatible with actuators series: LEF, LEY/LEYG, LES
- 64 points positioning
- Software or teaching box for programming the parameters.

Programless controller

LECP1 Series



- Compatible with actuators series: LEF, LEL, LEM, LEY/LEYG, LES, LEP, LER, LEH
- 14 points positioning
- Speed and acceleration: 16-level adjustment via switches
- No software to put into operation (control panel setting).

Programless controller, with stroke study

LECP2 Series



- Specialised for LEM series
- 14 points positioning: 2 stroke end points + 12 intermediate points positioning
- Speed and acceleration: 16-level adjustment via switches
- No software to put into operation (control panel setting).

Pulse input type controller

LECPA Series



- Compatible with actuators series: LEF, LEY/LEYG, LES, LEP, LER, LEH
- Type activated controller through pulse signals, capable of positioning at any position
- Software or teaching box for setting data.

Step motor controller

JXC91/E1/P1/D1/L1 Series



JXC91

EtherNet/IP



JXCE1

EtherCAT



JXCP1

PROFINET



JXCD1

DeviceNet








JXCL1

IO-Link

- Compatible with actuators series: LEF, LEY/LEYG, LES, LEP, LER, LEH, LEL, LEM
- Direct operation through a fieldbus or industrial Ethernet network:
 - 10/100 Mbps high-speed communication for JXC91/E1/P1, up to 500 kbps for JXCD1, 230.4 kbps for JXCL1
 - Real time operation.
- Dual port connection, IN and OUT, that allows for linear topology or Device Level Ring (DLR) topology (not for JXCL1 or JXCD1):
 - Less wiring
 - Good recovery after disconnection
 - Easy identification of disconnected spot.
- IO-Link compatible type, JXCL1:
 - Higher control of the applications
 - Cost-effective: plug & play, minimum hardware and programming costs
 - Integral communication, from sensors to actuators
 - Noise immunity.
- Software or teaching box for setting data.

AC servo motor drivers

	Compatible motor	Control method	Compatible encoder		Setting/graph/monitor method
			Type	Resolution	
Pulse/positioning 100/200/400 W (100/200 VAC) LECSA 	AC servo	Positioning (max. 7 points) & pulse input	Incremental	131072 (17-bit)	Digital I/O signal or pulse signal input through PLC (setup software – MR configurator2™)
Pulse 100/200/400 W (100/200 VAC) LECSB 		Pulse input	Absolute	262144 (18-bit)	Pulse signal input through PLC (setup software – MR configurator2™)
CC-Link 100/200/400 W (100/200 VAC) LECSC 		Positioning (max. 255 points) & network direct input (CC-Link)			PLC (CC-Link master unit) (setup software – MR configurator2™)
SSCNET III 100/200/400 W (100/200 VAC) LECSS 		Network direct input (SSCNET III) ¹⁾			PLC (positioning unit/motion controller) (setup software – MR configurator2™)
SSCNET III/H 100/200/400 W (200 VAC) LECSS-T 		Network direct input (SSCNET III/H) ^{1, 2)}		4194304 (22-bit)	

1) High-speed optical communication.

2) STO (Safe Torque Off) safety function available.

AC servo motor driver

LECS Series



LECSA/LECSB
Pulse input type



LECSC
CC-Link V2



LECSS
SSCNET III



LECSS-T
SSCNET III/H

- Compatible with actuators series: LEF, LEJ, LEY/LEYG
- With display setting function.

LECSA Series – Pulse input type or positioning type, for incremental encoder

- Positioning type, with up to 7 positioning points by point table.

LECSB Series – Pulse input type, for absolute encoder

- 10/6 parallel inputs/outputs.

LECSC Series – CC-Link direct input type, for absolute encoder

- Suitable for multipoint positioning, being possible to set position data/speed data and operation start/stop.

LECSS Series – SSCNET III type, for absolute encoder

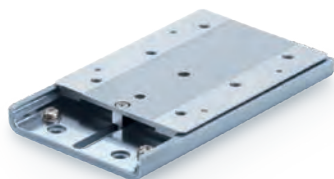
- Optimum for interpolation and with enhanced noise resistance by using the fibre optics for communication.

LECSS-T Series – SSCNET III/H type, for absolute encoder ^{New}

- Optical communication protocol with STO – Safe Torque Off – function (in accordance with IEC61800-5-2) and homing done by z-phase, ideal for machines with axis motion.

Card motor

LAT3 Series



- 3 functions in 1 unit (Linear guide, Linear motor, Displacement sensor)
- Compact design – 9 mm thickness – and lightweight – from 130 to 360 g
- Easy programming by cycle time entry method:
Operation setting is completed by only introducing 3 parameters:
target position + positioning time + workload
- Modbus serial communication compatible.

Series	Stroke [mm]	Sensor (optical linear encoder)	Linear motor	Linear guide	Pushing	Positioning repeatability	Pushing measurement	Maximum load mass [g]		Maximum speed [mm/s]
		Resolution [μm]	Type		Instantaneous max. thrust [N]	Accuracy [μm]		Horizontal	Vertical ¹⁾	
LAT3	10, 20, 30	30	Moving magnet type linear motor	Linear guide with circulating balls	5.2 up to 6	±90	±100	1000	100 (50)	400
LAT3F	10, 20, 30, 50	1.25				±5	±10			
LAT3M	50	5				±20	±40		—	

* () indicates value when 30 mm is selected.

1) Vertical is not possible when 50 mm stroke is selected.

Card motor controller

LATCA Series



- Direct and remote control of LAT3 card motor
- 3 types of input signals to work with:
 - Step data input: I/O for general, with 15 step data and 6/4 parallel I/O
 - Pulse input: with 4 step data and 6/4 parallel I/O
 - Serial input (based on step data input): allows the connection in series of up to 16 controllers via RS485.
- Automatic calculation of speed, acceleration and deceleration with cycle time entry method.

Compatible motor	Operation method	Parallel inputs/outputs	Position & speed setting method	Compatible encoder type
Moving magnet type linear motor	Step data input	6 inputs/4 outputs	Software	Incremental
	Pulse input		Inputted pulse	
	Serial input		Software or inputted data	

Electric cylinders

LZ Series



- Able to operate the stroke with only ON/OFF signals. It can be operated like an air cylinder
- Simple extension and retraction motion control
- Thrust control
- Suitable for an environment where an air supply is not available
- Two sizes that offer an equivalent thrust to a Ø 16 and Ø 25 air cylinder.

Basic specifications

Thrust	Horizontal mounting: up to 80 N (LDZ□3) Vertical mounting: up to 40 N (LDZ□3L) Horizontal mounting: up to 196 N (LDZ□5) Vertical mounting: up to 100 N (LDZ□5L)
Speed	up to 200 mm/s
Standard strokes	25, 40, 50, 100, 200 mm
Motor type	24 VDC









Electro-pneumatic pressure regulator








	Series	Series	Input	Model	Set pressure range	Sensitivity	Accuracy						
Electro-pneumatic pressure regulator	ITV0000 Series 6 l/min (ANR) ¹⁾		Current DC 4 to 20 mA (sink type) Current DC 0 to 20 mA (sink type) Voltage DC 0 to 5 V Voltage DC 0 to 10 V	ITV001	0.001 ~ 0.1 MPa	0.2 kPa	Linearity Within ±1 % F.S. Hysteresis Within 0.5 % F.S.						
				ITV003	0.001 ~ 0.5 MPa	1.0 kPa							
				ITV005	0.001 ~ 0.9 MPa	1.8 kPa							
				ITV009	-1 ~ -100 KPa	0.2 kPa							
	ITV1000 Series 200 l/min (ANR) ¹⁾ • Parts in contact with fluids are oil free.		Current DC 4 to 20 mA (sink type) Current DC 0 to 20 mA (sink type) Voltage DC 0 to 5 V Voltage DC 0 to 10 V CC-Link compatible DeviceNet™ compatible PROFIBUS DP compatible RS-232C communication IO-Link	ITV101	0.005 ~ 0.1 MPa	0.2 kPa							
				ITV103	0.005 ~ 0.5 MPa	1.0 kPa							
	ITV2000 Series 1500 l/min (ANR) ¹⁾			ITV105	0.005 ~ 0.9 MPa	1.8 kPa							
				ITV201	0.005 ~ 0.1 MPa	0.2 kPa							
				ITV203	0.005 ~ 0.5 MPa	1.0 kPa							
				ITV205	0.005 ~ 0.9 MPa	1.8 kPa							
	ITV3000 Series 4000 l/min (ANR) ¹⁾			ITV209	-1.3 ~ -80 kPa	0.16 kPa							
				ITV301	0.005 ~ 0.1 MPa	0.2 kPa							
				ITV303	0.005 ~ 0.5 MPa	1.0 kPa							
				ITV305	0.005 ~ 0.9 MPa	1.8 kPa							
				ITVX Series		ITVX2030	0.01 ~ 3.0 MPa	±30 kPa	Linearity Within ±1 % F.S. Hysteresis 1 % or less F.S.				
	ITVH Series		Current DC 4 to 20 mA (Sink type) Current DC 0 to 20 mA (Sink type) Voltage DC 0 to 5 V Voltage DC 0 to 10 V							ITVH2020	0.2 ~ 2.0 MPa	±20 kPa	Linearity Within ±1 % F.S. Hysteresis 1 % or less F.S.

1) Pressure range 0.9 MPa. Supply pressure 1.0 MPa. Set pressure 0.6 MPa.

Digital pressure switch

Series variations

	Individual sensor					Monitor			
	PSE53□	PSE54□	PSE56□	PSE570	PSE550	PSE300	PSE200	PSE300AC	
Model									
Fluid	Air		General fluids		Air	Sensor input amount: 1 input	Sensor input amount: 4 inputs	Sensor input amount: 1 input	
Calibration method	—					Push-button calibration			
Set pressure range	0 to 1 MPa 0 to -101 kPa 0 to 101 kPa -101 to 101 kPa	0 to 1 MPa 0 to -101 kPa -100 to 100 kPa	0 to 1 MPa 0 to -101 kPa -100 to 100 MPa 0 to 500 kPa	0 to 1 MPa 0 to 2 MPa 0 to 5 MPa 0 to 10 MPa -100 to 100 kPa -100 to 100 kPa 0 to 500 kPa	0 to 2 kPa (and specials)	-0.1 to 1 MPa 10 to -101 kPa -100 to 100 kPa -10 to 100 kPa -50 to 500 kPa -0.2 to 2 kPa	-0.1 to 1 MPa 10 to -101 kPa -101 to 101 kPa -10 to 101 kPa	0 to 2 kPa 0 to 100 kPa 0 to 500 kPa 0 to 1 Mpa 0 to 2 Mpa 0 to 5 Mpa 0 to 10 MPa -100 to 0 kPa -100 to 100 kPa	
Power supply voltage	12 to 24 VDC ±10 % (ripple p-p 10 % or less)								
Temperature characteristics (25 °C reference)	±2 % F.S. (0 to 50 °C)		±2 % F.S. (0 to 50 °C) ±3 % F.S. (-10 to 60 °C)		±3 % F.S. (0 to 50 °C)	±0.5 % F.S. (0 to 50 °C)			
Repeatability	±1 % F.S.	±0.2 % F.S.			±0.3 % F.S.	±0.1 % F.S. ±1 digit			
Hysteresis	—					Hysteresis mode: variable Window comparator mode: variable	Hysteresis mode: variable Window comparator mode: fixed (3 digits)	Hysteresis mode: variable	
Output	Analogue voltage output		Analogue voltage output Analogue current output			NPN/PNP open collector 2 outputs Analogue voltage output Analogue current output	NPN/PNP open collector 1 CH: 2 outputs 2 to 4 CH: 1 output each	NPN/PNP open collector 2 outputs	
Display (resolution)	—					2-colour display (0.1 %)	1-colour display (0.1 %)	3-colour display	
Enclosure	IP40		IP65		IP40	IP40	Front only IP65 The rest IP40	IP65	
Note	—					Panel mounting possible Selectable pressure unit Auto shift function Auto preset function Display calibration function Anti-chattering function Peak hold Bottom hold			Selectable pressure unit Auto preset function Display calibration function Anti-chattering function Peak hold Bottom hold

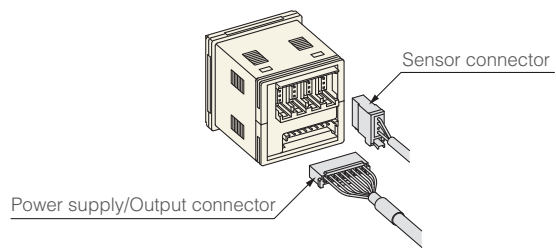
	Integrated sensor and controller type						
	ZSE10/ISE10	ZSE20/ISE20	ZSE20A/ISE20A	ZSE20B/ISE20B	ISE70/71	ISE7□G	ZSE20C/ISE20C
Model							
Fluid	Air					General fluids	
Calibration method	Push-button calibration						
Rated pressure range	-0.1 to 1 MPa 0 to -101 kPa -100 to 100 kPa	-101 to 0 kPa -100 to 100 kPa -100 kPa to 1 MPa	-101 to 0 kPa -100 to 100 kPa -100 kPa to 1 MPa	-101 to 0 kPa -100 to 100 kPa -100 kPa to 1 MPa	0 to 1 MPa 0 to 1.6 MPa	0 to 1 MPa 0 to 2 MPa 0 to 5 MPa 0 to 10 MPa	-101 to 0 kPa -100 to 100 kPa -100 kPa to 1 MPa -100 kPa to 2 MPa
Power supply voltage	12 to 24 VDC ±10 % (Ripple 10 % or less)						
Temperature characteristics (25 °C reference)	±2 % F.S. (-5 to 50 °C)				±2 % F.S. (0 to 50 °C)	±3 % F.S. (ISE70G), ±5 % F.S. (ISE7#G) (-5 to 50 °C)	±3 % F.S. (-5 to 50 °C)
Repeatability	±0.2 % F.S. ±1 digit				±0.5 % F.S.		±0.2 % F.S. ±1 digit
Hysteresis	Hysteresis mode: variable Window comparator mode: variable						
Output	NPN/PNP open collector Analogue voltage output	NPN/PNP open collector	NPN/PNP open collector Analogue voltage output Analogue current output		NPN/PNP open collector		NPN/PNP open collector Analogue voltage output Analogue current output
Display	1-colour display	3-colour display					
Enclosure	IP40			IP65	IP67		IP65
Note	Panel mounting possible DIN rail mountable Selectable pressure unit Anti-chattering function Display calibration function Power saving mode Copy function	Panel mounting possible Selectable pressure unit Anti-chattering function Display calibration function Power saving mode	Panel mounting possible Selectable pressure unit Anti-chattering function Auto shift function Display calibration function Power saving mode Copy function	Panel mounting possible Selectable pressure unit Anti-chattering function Auto shift function Display calibration function Power saving mode Copy function IO-Link compatible	Selectable pressure unit Anti-chattering function Display calibration function Power saving mode IO-Link compatible		Panel mounting possible Selectable pressure unit Anti-chattering function Auto shift function Display calibration function Power saving mode Copy function

Digital flow switch

Series variations

- Flow rate setting and monitoring are possible with the digital display
- Two types are available: integrated and remote type
- Three types of output: switch, accumulated pulse and analogue outputs
- Switching from instantaneous flow rate display to accumulated flow display is possible
- Two independent flow rate settings are possible
- Water resistant construction conforming to IP65.

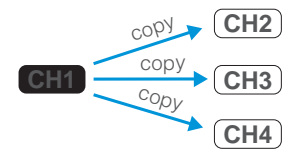
Connection



Function

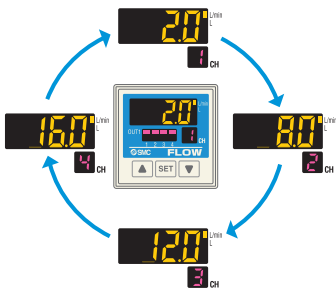
Copy function
Possible to copy information from one channel to one or more other channels.

Copying CH1 setting to CH2, 3 and 4.

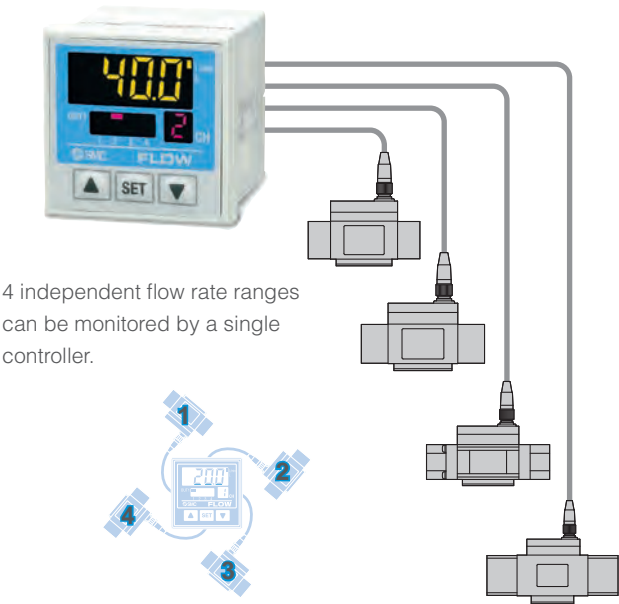


- Key lock function
- Unit switching function
- Peak value and bottom value holding.

Channel scan function
Allows constant monitoring of the displayed flow value for each channel.

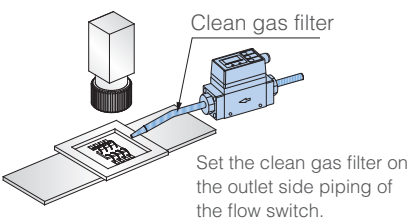


A single controller can monitor the flow rate of 4 different sensors

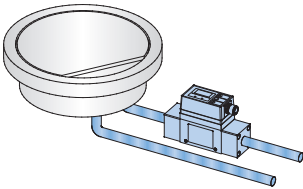


Application examples

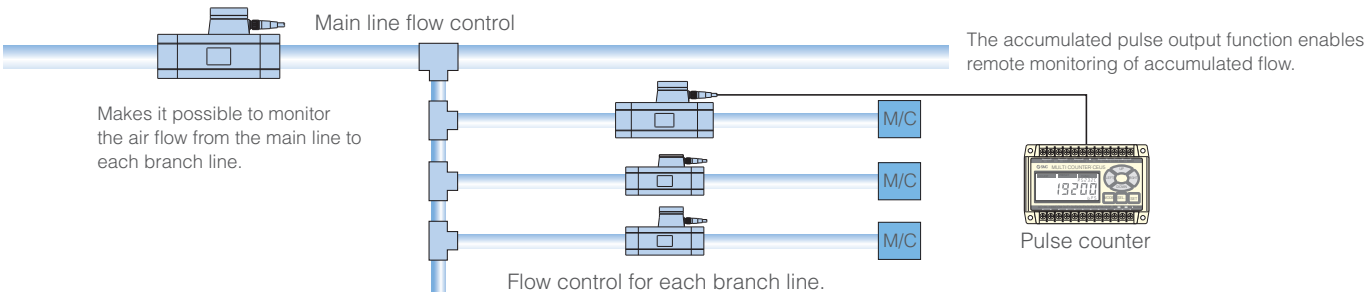
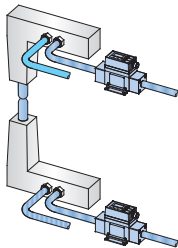
Flow control of N₂ gas to prevent detection camera shimmering and lead frame oxidation.



Flow control of cooling water for wafer temperature regulation and high frequency power supply.






Flow control of pressurized cooling water for welding gun.



For air, N₂, Ar and CO₂


PFM Series

Flow rate measurement range [l/min]	Integrated type	Remote type	
		Sensor unit	Display unit
			
0.2 to 10 (0.2 to 5)	PFM710	PFM510	PFM300
0.5 to 25 (0.5 to 12.5)	PFM725	PFM525	
1 to 50 (1 to 25)	PFM750	PFM550	
2 to 100 (2 to 50)	PFM711	PFM511	

(): In the case of CO₂.


For air and N₂

PFMB Series

Flow rate measurement range [l/min]	Integrated type
	
2 to 200	PFMB7201
5 to 500	PFMB7501
10 to 1000	PFMB7102
20 to 2000	PFMB7202



For air and N₂

PFMC Series

Flow rate measurement range [l/min]	Integrated type
	
5 to 500	PFMC7501
10 to 1000	PFMC7102
20 to 2000	PFMC7202





For dry air

PFMV Series

Flow rate measurement range [l/min]	Remote type	
	Sensor unit	Display unit
		
0 to 0.5	PFMV505	PFMV300
0 to 1	PFMV510	
0 to 3	PFMV530	
-0.5 to 0.5	PFMV505F	
-1 to 1	PFMV510F	
-3 to 3	PFMV530F	


For air

PF2A Series

Flow rate measurement range [l/min]	Integrated type	Remote type		
		Sensor unit	Display unit	Display unit (4ch)
				
1 to 10	PF2A710	PF2A510	PF2A30□	PF2A20□
5 to 50	PF2A750	PF2A550		
10 to 100	PF2A711	PF2A511	PF2A31□	
20 to 200	PF2A721	PF2A521		
50 to 500	PF2A751	PF2A551		





For air, large flow

PF3A7□H Series

Flow rate measurement range [l/min]	Integrated type	Display unit
		
30 to 3000	PF3A703H	PFG3 □0
60 to 6000	PF3A706H	
120 to 12000	PF3A712H	




For water

PF2W Series

Flow rate measurement range [l/min]	Integrated type	Remote type		
		Sensor unit	Display unit	Display unit (4ch)
				
0.5 to 4	PF2W704(T)	PF2W504(T)	PF2W30□	PF2W20□
2 to 16	PF2W720(T)	PF2W520(T)		
5 to 40	PF2W740(T)	PF2W540(T)		
10 to 100	PF2W711	PF2W511	PF2W33□	



For water and water soluble coolants

LFE Series

Flow rate measurement range [l/min]	Integrated type	Remote type	
		Sensor unit	Display unit
			
0.5 to 20	LFE1 □	LFE1 □	LFE0 □
2.5 to 100	LFE2 □	LFE2 □	
5 to 200	LFE3 □	LFE3 □	





For deionized water and chemicals

PF2D Series

Flow rate measurement range [l/min]	Integrated type	Remote type	
		Display unit	Display unit (4ch)
			
0.4 to 4	PF2D504	PF2D300□	PF2D200□
1.8 to 20	PF2D520		
4 to 40	PF2D540		




For water

PF3W Series

Flow rate measurement range [l/min]	Integrated type	Integrated type with IO-Link	Remote type	
			Sensor unit	Display unit
				
0.5 to 4	PF3W704	PF3W704-X445	PF3W504	PF3W30
2 to 16	PF3W720	PF3W720-X445	PF3W520	
5 to 40	PF3W740	PF3W740-X445	PF3W540	
10 to 100	PF3W711	—	PF3W511	
50 to 250	PF3W721		PF3W521	

For deionised water and chemicals (PVC piping)

PF3W Series

Flow rate measurement range [l/min]	Integrated type	Remote type	
		Sensor unit	Display unit
			
10 to 100	PF3W711-U25	PF3W511-U25	PF3W30
30 to 250	PF3W721-U30	PF3W521-U30	

Ionizer nozzle type

IZN10E Series



- Slim and lightweight
- Offset voltage: $\pm 10\text{V}$
- Nozzle variations
- With external switch input function (2 inputs)
- Easy maintenance
- Intermittent control timer.

Specifications

Model		IZN10E-□ (NPN specification)	IZN10E-□□P (PNP specification)
Ion generation method		Corona discharge type	
Method of applying voltage		High frequency AC type	
Applied voltage ¹⁾		2.5 kVAC	
Offset voltage (Ion balance) ²⁾	Energy saving static neutralisation nozzle	±10 V	
	High flow rate nozzle	±15 V	
Air purge	Fluid	Air (clean dry air)	
	Operating pressure ^{3) 4)}	0.05 MPa to 0.7 MPa	
	Connecting tube size	Ø 6, Ø 1/4 inch	
Power supply voltage		24 VDC ±10 %	
Current consumption		80 mA or less	
Input signal	Discharge stop signal	Connected to 0 V Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connected to +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less
	Reset signal		
	External switch signal 1		
	External switch signal 2		
Output signal	Discharge signal	Max. load current: 40 mA Residual voltage: 1 V or less (Load current at 40 mA) Max. applied voltage: 26.4 VDC	Max. load current: 40 mA Residual voltage: 1 V or less (Load current at 40 mA)
	Error signal		
	Maintenance signal		
Effective static neutralisation range ⁵⁾		20 to 500 mm	
Ambient temperature (Operating/Stored)		0 to 55 °C	
Ambient humidity (Operating/Stored)		35 to 65 % RH (no condensation)	
Material	Housing	ABS, stainless steel	
	Nozzle	Stainless steel	
	Emitter	Tungsten	
Impact resistance		100 m/s ²	
Body weight	Energy saving static neutralisation nozzle	70 g	
	High flow rate nozzle	70 g	
	Female threads for piping	75 g	
Bracket weight	L-bracket	30 g	
	Pivoting bracket	40 g	
	DIN rail mounting bracket (single unit)	40 g	
Standards/Directive		CE, UL, CSA, RoHS	

1) Measured with a probe of 1000 MΩ and 5 pF.

2) Measurement values based on a charged plate (dimensions: 150 mm x 150 mm; capacitance: 20 pF) defined by ANSI standard (ANSI/ESD STM3.1-2006). The distance between the charged plate and the ionizer: 100 mm, the air purge is 0.3 MPa (energy saving static neutralisation nozzle) / 0.1 MPa (high flow rate nozzle).

3) Static electricity cannot be neutralized without air purge. As the concentration of ozone inside the nozzle increases, there is a possibility that the product and surrounding equipment may be adversely affected, so be sure to purge air during ion generation.

4) To stop the air purge temporarily during operation, turn the discharge stop signal input OFF to prevent the increase of ozone concentration inside the nozzle.

5) Except female threads for piping.

Ionizer fan type IZF21/31 Series



- Extensive and rapid static neutralisation
- Ion balance: ± 5 V
- Optional adjustable louvre to adjust the static neutralisation area
- Improved performance and easier maintenance through several functions and features:
 - Functions: averaging function, automatic balance adjustment function, optional automatic cleaning function, flow rate adjustment function
 - Tool-less replaceable emitter cartridge
 - Optional filter to prevent the entry of foreign matter into the motor and to avoid short-circuit between emitters.
- Modular, compact and slim design.

Specification

Model		IZF21-□	IZF21-P	IZF31-□□	IZF31-P
		NPN	PNP	NPN	PNP
Maximum air flow		1800 l/min		4400 l/min	
Applied voltage		±5 kV			
Ion generation method		Corona discharge type			
Method of applying voltage		DC type			
Offset voltage (ion balance)		±5 V			
Power supply voltage		24 VDC ±10 %			
Current consumption		0.9 A or less		1.3 A or less	
Input signal	Ionizer stop signal	Connect with 0 V Voltage range: 5 VDC or less	Connect with +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less	Connect with 0 V Voltage range: 5 VDC or less	Connect with +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less
	Cleaning input signal	Current consumption: 5 mA or less	Current consumption: 5 mA or less	Current consumption: 5 mA or less	Current consumption: 5 mA or less
Output signal	Maintenance signal	Maximum load current: 100 mA Residual voltage: 1 V or less	Maximum load current: 100 mA Residual voltage: 1 V or less	Maximum load current: 100 mA Residual voltage: 1 V or less	Maximum load current: 100 mA Residual voltage: 1 V or less
	Error signal	(Load current: 100 mA) Maximum applied voltage: 26.4 VDC	(Load current: 100 mA)	(Load current: 100 mA) Maximum applied voltage: 26.4 VDC	(Load current: 100 mA)
Ambient temperature		Operating: 0 to 50 °C Stored: -10 to 60 °C			
Ambient humidity		Operating, stored: 35 to 80 % RH (no condensation)			
Material		Case: ABS/PBT/stainless steel Emitter: tungsten			
Impact resistance		100 m/s ²			
Applicable standard/directive		CE (EMC directive: 2014/30/EU)			

Ionizer fan type IZF10/IZF10R Series



- Ion balance ± 13 V
- Compact design and lightweight
- Two types available (IZF10):
 - Rapid deionizing type: 1.5 seconds deionizing time
 - Low noise type: 48 dB(A).
- Alarm functions: high voltage error, electrode needle contamination detector
- Flow rate adjustment function (IZF10R).

Specifications

Model	IZF10-□□	IZF10-L-□□	IZF10R-□□	IZF10-P-□□	IZF10-LP-□□	IZF10R-P-□□
Maximum air flow	660 l/min	460 l/min	800 l/min (Max.)	660 l/min	460 l/min	800 l/min (Max.)
Ion generation method	Corona discharge type					
Power supply voltage	24 VDC ±10 %					
Power consumption	220 mA or less	140 mA or less	270 mA or less	250 mA or less	170 mA or less	270 mA or less
Switch output	NPN open collector output Maximum load current: 80 mA Residual voltage: 1 V or less (Load current: 80 mA) Maximum load voltage: 26.4 VDC		NPN open collector output Maximum load current: 150 mA Residual voltage: 1 V or less (Load current: 150 mA) Maximum load voltage: 26.4 VDC	PNP open collector output Maximum load current: 80 mA Residual voltage: 1 V or less (Load current: 80 mA)		PNP open collector output Maximum load current: 150 mA Residual voltage: 1 V or less (Load current: 150 mA)
Ambient temperature	Operating: 0 to 50 °C Stored: -10 to 60 °C					
Ambient humidity	Operating, stored: 35 to 80 % RH (no condensation)					
Weight	280 g (With bracket: 360 g)		260 g (With bracket: 340 g)	280 g (With bracket: 360 g)		260 g (With bracket: 340 g)

Ionizer bar type

IZS40/41/42 Series



- Standard type IZS40 Series
Simple operation: only power ON/OFF required
- Feedback sensor type IZS41 Series
Feedback sensor enables the rapid elimination of static electricity
 - Energy saving run mode
 - Continuous neutralization run mode.
- Dual AC type IZS42 Series
Reduced potential amplitude: 25 V or less
- Reduction of adjustment and maintenance time using an auto balance sensor:
 - Built-in type (standard): the sensor is installed within the ionizer body and may be mounted anywhere.
- Setting ionizer with remote control
 - Can recognize and control up to 16 ionizers through address setting.
- Low maintenance electrode cartridges
- Transition wiring may be used.

Specifications

Model		IZS40	IZS41-□□ (NPN)	IZS41-□□P (PNP)	IZS42-□□ (NPN)	IZS42-□□P (PNP)
Ion generation method		Corona discharge type				
Electrode voltage type		AC, DC	AC, sensing AC, DC			Dual AC
Electrode voltage		±7000 V			±6000 V	
Ion balance ¹⁾		±30 V				
Air purge	Fluid	Air (clean dry air)				
	Operating pressure	0.5 MPa or less				
	Proof pressure	0.7 MPa				
	Connecting tube O.D.	Ø 6, Ø 8, Ø 10				
Current consumption		330 mA or less	440 mA or less (sensing AC, automatic run/manual run: 480 mA or less)		700 mA or less (automatic run/manual run: 740 mA or less)	
Power supply voltage		24 VDC ±10 % (100 to 240 VAC: AC adapter option)				
Power supply voltage in transition wiring		—	24 VDC to 26.4 VDC			
Input signal	Discharge stop signal	—	Connect to 0 V Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connect to +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less	Connect to 0 V Voltage range: 5 V DC or less Current consumption: 5 mA or less	Connect to +24 V Voltage range: 19 V DC to power supply voltage Current consumption: 5 mA or less
	Electrode contamination detection signal					
Output signal	Maintenance signal	—	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current)	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current)
	Error signal					
Function		High voltage error detection (ion discharge stops if error found)	Ion balance control with the built-in sensor, electrode contamination detection, high voltage error detection (ion discharge stops if error found), ion discharge stop input, transition wiring, remote control (sold separately), external sensor connection			
Effective operating distance		50 to 2000 mm	50 to 2000 mm (sensing AC mode: 200 to 2000 mm, manual run/automatic run: 100 to 2000 mm)		50 to 2000 mm (Manual run/automatic run: 100 to 2000 mm)	
Ambient and fluid temperature		0 to 40 °C				
Ambient humidity		35 to 80 % RH (with no condensation)				
Material		Ionizer cover: ABS; Electrode cartridge: PBT; Electrode: tungsten, single crystal silicon				
Impact resistance		100 m/s ²				
Standards/Directive		CE (EMC directive: 2004/108/EC)				

1) Conditions: installation distance = 300 mm, air purge used.

Ionizer bar type

IZT40/41/42 Series



- Separate controller bar type ionizer
- IZT40: Standard type / IZT41: AC type / IZT42: Dual AC type
- Potential amplitude: As low as 25 V or less
- Rapid neutralisation of static electricity: As fast as 0.1 s
- Compact: Height 37 mm x width 30 mm
- One controller can control a maximum of 4 ionizers
- Monitor and operate bars which are installed in an inaccessible location
- Multiple alarms & functions.

Specifications

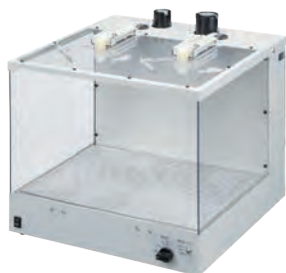
Model		IZT40	IZT41 (NPN specification)	IZT41 (PNP specification)	IZT42 (NPN specification)	IZT42 (PNP specification)
Ion generation method		Corona discharge type				
Method of applying voltage		AC, DC ¹⁾	AC, DC ¹⁾		Dual AC	
Applied voltage		±7,000 V			±6,000 V	
Offset voltage ²⁾		Within ±30 V				
Air purge	Fluid	Air (clean dry air)				
	Operating pressure	0.5 MPa or less				
	Proof pressure	0.7 MPa				
	Connecting tube size (One side can be plugged)	Metric size: Ø 4, Ø 6, Ø 8, Ø 10 Inch size: Ø 3/16", Ø 1/4", Ø 5/16", Ø 3/8"				
Current consumption		0.7 A or less (+0.6 A or less per ionizer when connected)	0.8 A or less (+0.7 A or less per ionizer when connected)		1.4 A or less (+1.3 A or less per ionizer when connected)	
Power supply voltage		24 VDC ±10 % (100 to 240 VAC: AC adapter option: applicable when only one bar is used)				
Input signal	Ion generation stop signal	—	Connected to DC (–) Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connected to DC (+) Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less	Connected to DC (–) Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connected to DC (+) Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less
Output signal	Maintenance detection signal	—	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA)	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA)
	Error signal					
Function		High-voltage abnormality detection (ion generation stops when abnormality is detected)	Auto balance, maintenance detection, high-voltage abnormality detection (ion generation stops when abnormality is detected) and ion generation stop input			
Effective static neutralisation distance		50 to 2000 mm				
Ambient and fluid temperatures	Controller, high-voltage power supply module	0 to 40 °C				
	Bar	0 to 50 °C				
Ambient humidity		35 to 80 % RH (no condensation)				
Material	Controller	Cover: ABS, aluminium; switch: silicone rubber				
	High-voltage power supply module	Cover: ABS, aluminium				
	Bar	Cover: ABS; Emitter cartridge: PBT; Emitter: Tungsten or single crystal silicon; High-voltage cable: Silicone rubber, PVC				
Standards		CE (EMC Directive)				

1) Apply cathode or anode to DC.

2) When the air purge is performed between a charged object and an ionizer at a distance of 300 mm.

Desktop duster box

ZVB Series



- Integration of three processes – static neutralisation, dust removal and dust collection – in a single box by using nozzle type ionizers:
 - Efficient static neutralisation with a diffusion-type nozzle
 - Dust removal with dedicated nozzles for the air blow
 - Dust collection with a maintenance-free pneumatic dust collector.
 All this thanks to a structure that separates ion blow and air blow
- Ion balance: ± 10 V
- Use of emitters that are easy to remove, replace and clean
- Optional photoelectric sensor for automatic workpiece detection and immediate start of the operation.

Specifications

Model	ZVB20	ZVB40
Ionizer type	Nozzle type	
Number of ionizers	1	2
Ion generation method	Corona discharge type	
Method of applying voltage	High frequency AC type	
Discharge time	0.3 s (1000 V→100 V)	
Offset voltage	Within ± 10 V (Static neutralisation distance: 100 mm from the nozzle)	
Fluid	Air (dry air)	
Operating pressure range	0.2 to 0.8 MPa	
Power supply voltage	85 to 264 VAC 50 / 60 Hz (when using the exclusive AC adaptor)	
Operating time setting	Continuous/timer [2/5/10 s]	
Additional air blow setting	Continuous blow/pulse blow [50 / 100 ms intervals]	
Operating temperature range	0 to 55 °C ¹⁾	
Air consumption ²⁾	420 l/min (ANR)	800 l/min (ANR)
Weight ³⁾	5.1 kg	9.9 kg
Standards/Directive	CE (EMC directive: 2014/30/EU)	

1) No freezing.

2) When supply pressure to the dust collector is set to 0.3 MPa (ZVB20) / 0.4 MPa (ZVB40) and additional air blow supply pressure to 0.2 MPa. Based on SMC's measuring conditions.

3) Overall weight excluding optional parts.

Clean products

High purity chemical valve

Large bore size

LVC80-Z Series

LVH80M-Z Series



- Large bore size
- Air operated: Series LVC80-Z
- Manually operated: Series LVH80M-Z
- Applicable tubing O.D.: 1 1/4", 1 1/2"
- Height: 189 mm
- Lower pilot pressure 0.4 to 0.6 MPa.

For organic solvents

LVA- $\frac{D}{G}$ - $\frac{AD}{ND}$ Series

LVH- $\frac{D}{G}$ - $\frac{AD}{ND}$ Series



- For organic solvents
- Air operated: Series LVA- $\frac{D}{G}$ - $\frac{AD}{ND}$
- Manually operated: Series LVH- $\frac{D}{G}$ - $\frac{AD}{ND}$
- Body: SUS; Actuator: ADC; Buffer: FKM/EPDM (selectable)
- Can be specified for EP polishing (Made to Order)
- Fitting type: Double-ferrule fittings, metal gasket seal fittings, tube extension
- Not subject to list control under the Export Trade Control Order.

Integrated fitting type

LVC Series



- N.C./N.O./Double acting with same configuration
- Compatible with 100 °C fluid temperature
- Body material: new PFA.

Threaded ports

LVA Series



- Diaphragm material PTFE, EPR, NBR are selectable
- Body material: new PFA, stainless steel, PPS.

Manually operated

LVH Series



- Locking and non-locking types available
- Integrated fitting type/threaded type
- Body material: new PFA, stainless steel, PPS.

Compact type

LVD Series



- Compact type has been introduced as a new series to complement the conventional LVC Series with integrated fittings
- Mounting base dimensions conform to SEMI Standard, F65-1101 (except for LVD10)
- Dimension across inlet/outlet ports: reduced by up to 29 %
- Body: new PFA; Diaphragm: PTFE; Actuator section: PPS, PVDF.

HYPER FITTING®

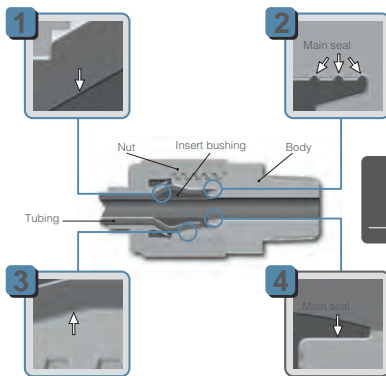
LQ1/LQ3 Series

High purity fluoropolymer fittings & tubing

LQ1 Series

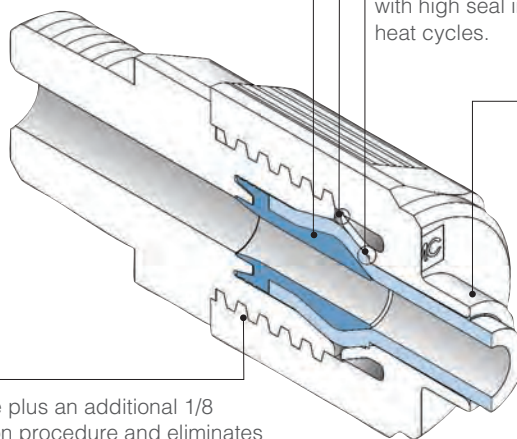


Quadruple seal construction.
Our new patented high-performance quadruple seal construction, as well as our precision insertion tooling provide maximum leak protection in your process circuitry.



Reducer type: the tubing size can be changed by replacing the nut and the insert bushing on the same body.

Close adhesion of fittings and tubing facilitates excellent flow-through characteristics with minimal liquid residual.



A seal lock provided for the nut to prevent loosening and trapezoidal screw threads tightened at a high torque provide a construction with high seal integrity even when subjected to heat cycles.

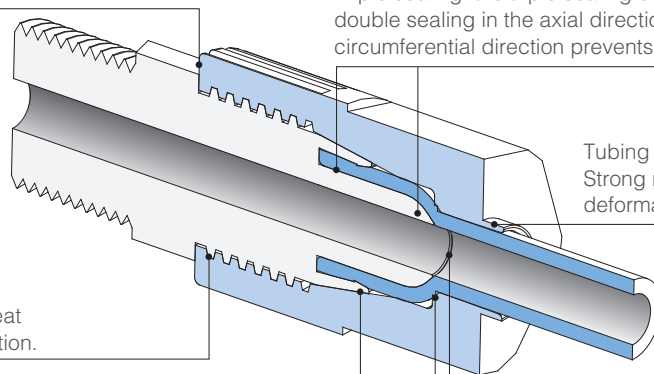
A tubing support on the nut provides strong resistance to bending and crimping deformation of tubing.

Tightening to the end surface plus an additional 1/8 turn simplifies the confirmation procedure and eliminates the need of tightening torque control.

Collet type

LQ3 Series

The nut can be easily assembled into the fitting body with no need for alignment.



Triple sealing: the triple sealing construction consisting of double sealing in the axial direction and single sealing in the circumferential direction prevents liquid leakage.

Tubing supports:
Strong resistance to tube bending and deformation.

Locking:
Trapezoidal thread that withstands heat stress and prevents oblique nut insertion.

Locking: two-stage pressing construction of the collet end ensures sealing and tube locking. The cylindrical part is also provided with the tube locking mechanism. Improved sealing and tube retention.

Improved flow-through characteristics:
Excellent flow-through characteristics are achieved by minimising liquid deposit.

LQ₃¹ Series

□ : Only for series LQ1 ■ : Common to series LQ1 and LQ3

Series	Shape	Size	Port size							Tube O.D.														
										Metric size								Inch size						
			None	1/8"	1/4"	3/8"	1/2"	3/4"	1"	Ø 3	Ø 4	Ø 6	Ø 8	Ø 10	Ø 12	Ø 19	Ø 25	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"
Connector LQ ₃ ¹ H	Male	1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Female	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Elbow LQ ₃ ¹ L	Male	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Female	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Run tee LQ ₃ ¹ R	Male	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Female	6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Branch tee LQ ₃ ¹ B	Male	1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Female	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Union elbow LQ ₃ ¹ E		3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Union tee LQ ₃ ¹ T		4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Panel mount union LQ ₃ ¹ P		5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Union LQ ₃ ¹ U		6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Union flange LQ ₃ ¹ F		1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Note 1) Standard size ○ With reducer ●
Note 2) The union flange is only available with LQ1 (Size 4, 5, 6).

Item \ Model		LQ1 Series						LQ3 Series			
		LQ1□10	LQ1□20	LQ1□30	LQ1□40	LQ1□50	LQ1□60	LQ3□20	LQ3□30	LQ3□40	LQ3□50
Maximum operating pressure (at 20 °C)		1.0 MPa						1.0 MPa			
Operating temperature		0 to 200 °C						0 to 200 °C			
Applicable tubing size	mm size	Ø 3 to Ø 25						Ø 3 to Ø 25			
	inch size	1/8"~1"						1/8"~1 1/2"			

Fluoropolymer tubing

TL/TIL Series
• Material: super PFA



LQ-Fittings

TLM/TILM Series
• Material: PFA
TD/TID Series
• Material: Modified PTFE

FEP tubing

TH/TIH Series
• Material: FEP



Precision clean regulator

SRP Series



- Achieves very low flow consumption
- Excellent corrosion resistance
 - SUS316 is used for all metal parts in contact with the fluid.
- Precision:
 - Setting sensitivity: 0.3 % F.S
 - Repeatability: ± 1 % F.S.
- Oil free.

Clean regulator/fluororesin type

SRF Series



- Wetted part materials: Body: new PFA; Diaphragm: PTFE
- 3 types available:
 - Integrated fitting
 - With nut
 - Tube extension.

Clean regulator

SRH Series



- Outstanding corrosion resistance
 - All metal parts in contact with fluid use stainless steel SUS316.
- Oil free
- 2 types of diaphragm material available:
 - PTFE
 - Fluororubber.
- Designed to minimize residual fluid.

Clean gas filter

SFA/B/C Series

Cartridge type/disc type

SFA Series



Cartridge type/straight type

SFB Series



Disposable type/multiple disc type

SFC Series



Clean air filter

SFD Series



Cartridge type/straight type

SFD Series

Clean exhaust filter

SFE Series



- 2 in 1: Filter and silencer at the same time
- 3 mounting types:
 - Male thread
 - Plug-in
 - One-touch fitting.
- Maximum flow capacity: 200 l/min (ANR)
- Bracket available.

Clean air module

LLB Series



- Modularised clean equipment (reduced piping labour/space saving)
- Easily obtains clean air
- Nominal filtration rating: 0.01 μm
- Fluid contact space: grease free, silicone free
- Clean-room assembly and double-packaging.

Temperature control

Custom-designed temperature control and cooling water related equipment series

Thermo-chiller

HRS Series

Circulating fluid temperature controller



- International standard: CE, UL
- Cooling capacity (50 Hz) 1100 W/1700 W/2100 W/2600 W/4700 W/4900 W
- Lightweight 43 kg / 73 kg
- Temperature stability: ± 0.1 °C
- Temperature range setting: 5 to 40 °C
- Options
 - With earth leakage breaker
 - With automatic water fill function
 - High pressure pump.

Thermo-chiller (standard type)

HRS100/150 Series

Circulating fluid temperature controller



- No heater required; circulating fluid is heated using heat exhausted by refrigerating circuit
- Cooling capacity 10 kW, 14.5 kW
- Max. ambient temperature 35 °C
- Temperature stability ± 1.0 °C
- Set temperature range 5 to 35 °C
- Low-noise design: 70 dB(A)
- Outdoor installation: IPX4.

Thermo-chiller large type (inverter type)

HRSH Series

Circulating fluid temperature controller



- Outstanding energy saving effect with the triple inverter
- Cooling capacity 10 kW, 15 kW, 20 kW, 25 kW, 28 kW
- Max. ambient temperature 45 °C
- Temperature stability ± 0.1 °C
- Compact, space-saving
- Outdoor installation: IPX4
- Low-noise design (max. operation noise 66 dB).

Thermo-chiller (basic type)

HRSE Series

Circulating fluid temperature controller



- Simple function and performance. Thermo-chiller of the basic type
- Cooling capacity 1000 W, 1400 W, 1900 W
- Temperature stability ± 2.0 °C
- Set temperature range 10 to 30 °C
- Compact/Lightweight 35 kg
- Maintenance free: magnetic pump
- Low-noise design: 55 dB (A).

Thermo-chiller (rack mount type)

HRR Series

Circulating fluid temperature controller



- Mountable in a 19-inch rack. Saves space by mounting multiple equipment together in a rack
- Temperature stability: ± 0.1 °C
- Set temperature range: 10 to 35 °C
- Cooling capacity (50 Hz): 1000 W, 1600 W, 2000 W, 2500 W
- Built-in bypass valve and flow sensor (standard)
- International standards: CE.

Thermo-con

HECR Series

Peltier-type chiller



- Mountable in a 19-inch rack. Saves space by mounting multiple equipment together in a rack
- Cooling capacity 200 W, 400 W, 510 W, 800 W, 1000 W, 1200 W
- Temperature stability ± 0.01 to 0.03 °C
- Set temperature range 10 to 60 °C
- Learning control function
- Low vibration, low noise.

Thermo-con

HEC Series

Circulating electronic cooling/heating type



- Temperature stability: ± 0.01 to 0.03 °C
- Set temperature range: 10 to 60 °C
- Cooling capacity: 600 W, 1200 W
- Type of circulating fluid: Water, fluorinated chemicals
- International standards: CE, UL
- High-precision temperature control type developed by SMC for large cooling capacity with a compact design.

Thermoelectric bath

HEB Series

Constant temperature bath electronic cooling/heating type



- Set temperature range: -15 °C to 60 °C
- Temperature stability: ± 0.01 °C
- Type of fluid: Water, fluorinated chemicals
- International standards: CE, UL
- Low temperature distribution is achieved by stirring fluid up-and-down and around the tank.

Peltier-type thermoelectric bath lineup

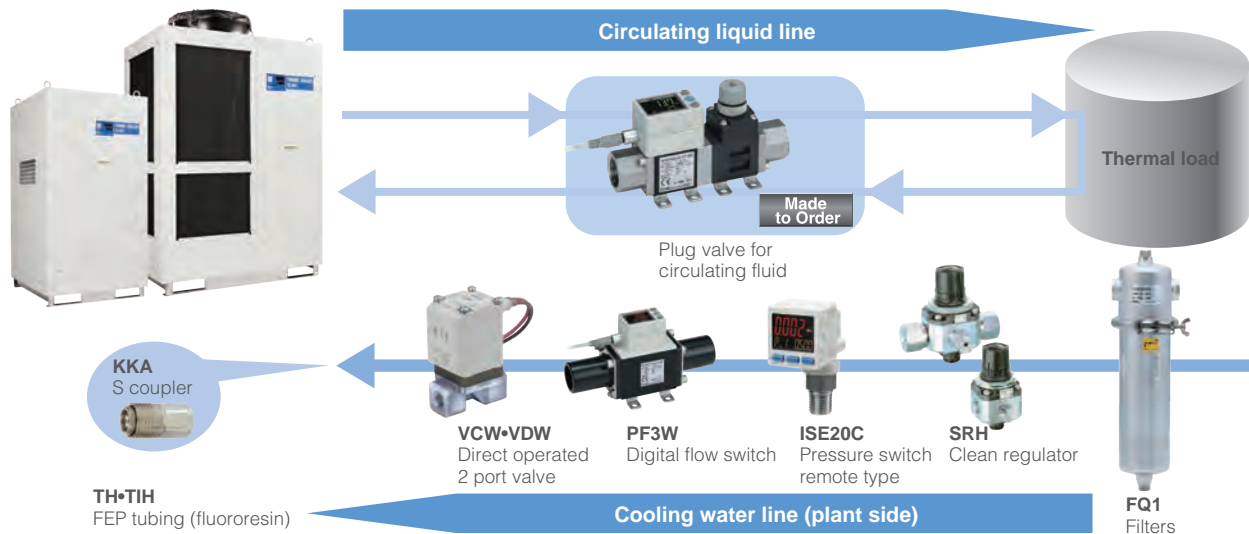
INR-244 Series



- Set temperature range: 0 to 60 °C
- Temperature stability: ± 0.03 °C
- Cooling capacity 140 W, 220 W, 320 W
- Type of fluid: Water, ethylene glycol aqueous solution, fluorinated fluids
- Tank capacity: 10 to 39 L
- International standards: CE, UL.

Temperature control peripherals

Our most suitable products for circulating liquid and cooling lines used in temperature control equipment



Applications for thermo-chiller/thermo-con

Medical devices

- X-ray tube cooling / digital X-ray detector/CT
- MRI
- Lithotripter
- Laser applications

Analyser

- Clinical analyser
- Spectrometry
- Incubator
- Material analyser (i.e. chromatography)
- Electron microscope

Pharma/Biotechnology

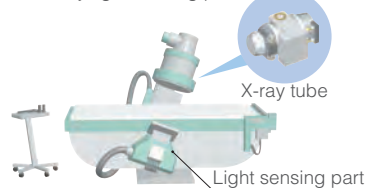
- Packaging
- Laboratory
- UV sterilisation
- Bioreactors
- Coating / Plasma generators

MRI



X-ray (digital) instrument

- Temperature control of X-ray tube and X-ray light sensing part

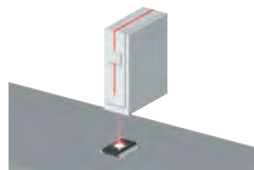


Reagent cooling equipment



Laser marker

- Cooling of laser irradiated part



Concentrating equipment



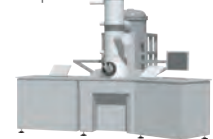
UV curing device (printing, painting, bonding and sealing)

- Cooling of UV lamp



Electronic microscope

- Temperature control of electron-beam irradiated part

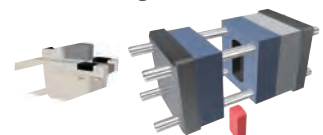


Ultrasonic wave inspection machine

- Temperature control of ultrasonic wave laser part

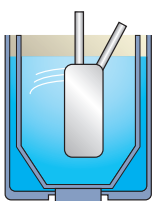


Mould cooling



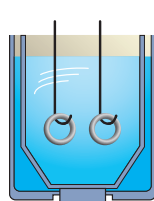
Applications for thermo-bath

Semiconductor manufacturing



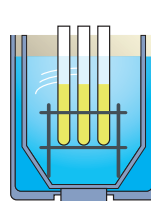
Evaporation of chemicals for MOCVD samples, materials and parts
Temperature control of diffusion gas

Various tests



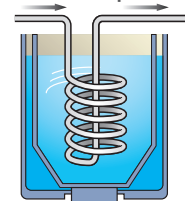
Thermal test with immersion

Physical and chemical analysis



Temperature control of various samples, materials and parts

Various chemical processes



Indirect temperature control of chemicals and liquids with high viscosity

Vacuum equipment

Vacuum ejector, in-line type

ZU-A Series



- In-line type vacuum ejector: Compact and lightweight
- Maximum vacuum pressure: -90 kPa
- Nozzle diameters: 0.3 mm, 0.4 mm, 0.5 mm and 0.7 mm
- Piping variations. One-touch fittings: Ø 4 mm, Ø 5/32" and Ø 6 mm. Screw-in connections: Rc 1/8.

Compact vacuum unit

ZB Series



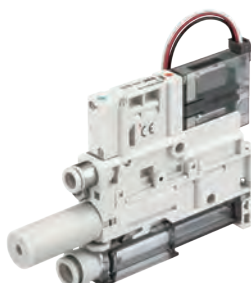
- Compact and lightweight: can be mounted on moving parts
- High speed absorption: directly operated supply valve and reduction of internal volume
- Energy saving design: lower supply pressure
- Digital vacuum switch with copy function available as option.

Single units (N.C. supply valve, N.C. release valve, 24 VDC)

Nozzle Ø [mm]	Part number	Port		Suction flow [l/min]	Max. vacuum pressure
		Air (PV, PD)	Vacuum (V)		
0.4	ZB0411-K15L-C4	M5 thread depth 4	Ø 4 mm	3.5	-90 kPa
0.6	ZB0611-K15L-C4			7	
0.4	ZB0421-K15L-C4			3.5	
0.6	ZB0621-K15L-C4			7	

Vacuum unit

ZK2 Series



- Energy saving switch turns off supply valve when vacuum level is reached reducing air consumption. Vacuum is kept by check valve. Supply valve is turned on again when the vacuum lowers to the set pressure
- Two-stage ejector reduces air consumption and increases suction flow rate
- Supply valve with self-holding function
- Linked supply and release valve.

Ejector module - Single units (N.C. supply valve, N.C. release valve, 24 VDC)

Nozzle Ø [mm]	Part number	Switch output	Switch pressure range [kPa]	Suction flow [l/min]	Max. vacuum pressure
0.7	ZK2A07K5CL-06	2 x PNP	0 ~ -101	29	-91 kPa
1.0	ZK2A10K5CL-06			44	
1.2	ZK2A12K5CL-08			61	
1.5	ZK2A15K5CL-08			67	

Ejector module - Single units (N.C. supply valve, N.C. release valve, 24 VDC) with energy saving vacuum switch

Nozzle Ø [mm]	Part number	Switch output	Switch pressure range [kPa]	Suction flow [l/min]	Max. vacuum pressure
0.7	ZK2A07K5RW-06	1 x PNP	100 ~ -100	29	-91 kPa
1.0	ZK2A10K5RW-06			44	
1.2	ZK2A12K5RW-08			61	
1.5	ZK2A15K5RW-08			67	

Vacuum filter

AFJ Series



- Two types for different applications
- Water drop removal type AFJ-S, up to 500 l/min, for both dust and water droplets removal
- Filtration rating: 5, 40, 80 μ m
- Port sizes: from 1/8 to 1/2
- Standard options: bracket; bowl material, selectable flow direction.

Vacuum regulator

IRV Series



- For the adjustment of vacuum pressure
- Single-sided connections optional
- 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).

Vacuum ejector

ZH Series



- Body ported type. Compact and lightweight
- Maximum flow rate: 155 l/min
- Nozzle diameters: 0.5, 0.7, 1, 1.3, 1.5, 1.8 and 2 mm
- Multiple piping variations
- One-touch fittings: Metric size \varnothing 6, 8 10 and 12, inch size \varnothing 1/4", 5/16", 3/8" and 1/2"
- Screw-in connections: \varnothing 1/8 to 1/2 metric and inch size
- 4 mounting types: direct, standard bracket, L-bracket or DIN rail
- Accessories: silencer and brackets
- Also available as box type (with built-in silencer).

SMC and advanced pressure technology

APTech

In spring 2007, SMC Corporation Japan purchased Advanced Pressure Technology – better known as APTech – from its directors.

Based in Napa, California, USA, APTech was founded in the late 1980's by Rene Zakhour. Rene's objectives were to provide products with uncompromising quality, performance and reliability from a company offering exceptional service and technical support – almost identical values to those on which SMC has based its successful approach to business.

From July 2008, our European customers have been able to purchase – through SMC – APTech's excellent range of high quality products made exclusively for biotechnical applications and pharmaceutical, PV and semiconductor industries.

These include a great range of high purity gas regulators, which are made, tested and packaged in ultra-high clean room conditions, thereby ensuring excellent levels of quality (ISO 9001 standard).

If you would like more information on APTech products, ask your local representative for more information today.



AP Series

- Diaphragm valves for ultra-high purity
- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Air operated type/Manually operated type
- High pressure type: max. 3000 psig (20.7 MPa).



AK Series

- Single or two stage regulator for general applications
- High inlet pressure type: max. 3500 psig (24.1 MPa)
- Body material: stainless steel and brass available
- Ni-Cr-Mo alloy (2.4602) internals available for corrosion resistance.



AK AP Series

- Pneumatic actuation pressure regulator
- Actuation control pressure isolated from process gas by two seals
- High inlet pressure type: max. 3500 psig (24.1 MPa)
- Body material: 316 SS
- Ni-Cr-Mo alloy (2.4602) internals available for corrosion resistance.



KT Series

- Single stage regulator
- Inlet pressure: max. 10000 psig (69 MPa)
- Body material: Stainless steel or brass
- Self-relieving or non-relieving available.

SMC's Global Service Network

Europe

Germany **SMC Deutschland GmbH**

Boschring 13-15, 63329 Egelsbach, Germany
Phone: (0) 6103/402-0 Fax: (0) 6103/402-139

Switzerland **SMC Schweiz AG**

Dorfstrasse 7, Postfach, 8484 Weisslingen, Switzerland
Phone: 052/396 31 31 Fax: 052/396 31 91

U.K. **SMC Pneumatics (U.K.) Ltd.**

Vincent Avenue, Crownhill, Milton Keynes, Buckinghamshire MK8 0AN, United Kingdom
Phone: 0845-121-5122 Fax: 01908 555064

France **SMC France**

1, Boulevard de Strasbourg, Parc Gustave Eiffel
Bussy Saint Georges F-77607 Marne La Vallée Cedex 3, France
Phone: (0)1-6476 1000 Fax: (0)1-6476 1010

Spain/Portugal **SMC España S.A.**

Zuazobidea 14, 01015 Vitoria, Spain
Phone: 945184100 Fax: 945-184 510

Italy **SMC Italia S.p.A.**

Via Garibaldi 62, I-20061 Carugate, (Milano), Italy
Phone: (0)2-9271.1 Fax: (0)2-9271360

Greece **SMC Italia Hellas Branch**

Tatoiou 103, Metamorphosi. 14451 Attica, Greece
Phone: 210 2717265

Ireland **SMC Pneumatics (Ireland) Ltd.**

2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin, Ireland
Phone: (0)1-403 9000 Fax: (0)1-464-0500

Netherlands **SMC Nederland BV**

De Ruyterkade 120, NL-1011 AB Amsterdam, The Netherlands
Phone: (0)20-5318888 Fax: (0)20-5318880

Belgium **SMC Belgium NV/SA**

Ternesseelei 232, 2160 Wommelgem, Belgium
Phone: +32-3-355-1464 Fax: +32-3-355-1466

Denmark **SMC Danmark A/S**

Egeskovvej 1, DK-8700 Horsens, Denmark
Phone: 70252900 Fax: 70252901

Austria **SMC Pneumatik GmbH (Austria)**

Girakstrasse 8, AT-2100 Korneuburg, Austria
Phone: 2262 62 280 Fax: 2262 62 285

Czech Republic **SMC Industrial Automation CZ s.r.o.**

Hudcova 78a, CZ-61200 Brno, Czech Republic
Phone: 5 414 24611 Fax: 5 412 18034

Hungary **SMC Hungary Ipari Automatizálási Kft.**

Torbágy u. 19, HU-2045 Törökbálint, Hungary
Phone: +36 23 513 000 Fax: +36 23 513 001

Poland **SMC Industrial Automation Sp. z o.o.**

ul. Stefana Batorego 10A. Pass, 05-870 Blonie, Poland
Tel. (+48) 22 344 40 00 Fax (+48) 22 344 40 05

Slovakia **SMC Priemyselná Automatizácia Spol s.r.o.**

Fantranská 1223, Teplicka nad vahom, 01301, Slovakia
Phone: 41-321321-1 Fax: 41-321321-0

Slovenia **SMC Industrijska Avtomatika d.o.o.**

Mirnska cesta 7, SLO-8210 Trebnje, Slovenia
Phone: 7388 5412 Fax: 7388 5435

Bulgaria **SMC Industrial Automation Bulgaria EOOD**

Business Park Sofia, Building 8-6th floor, BG-1715 Sofia, Bulgaria
Phone: 2 9744492 Fax: 2 9744519

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Business Park Sofia, Building 8C, 6th floor, BG-1766 Sofia, Bulgaria
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Finland **SMC Automation Oy**

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Phone: 207 513513 Fax: 207 513595

Norway **SMC Pneumatics Norway AS**

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Phone: 781 77 00 Fax: 781 77 01

Lithuania **SMC Pneumatics, UAB**

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Phone: +370-5-230-8118

Romania **SMC Romania S.r.l.**

Str Frunzei 29, Sector 2, Bucharest, Romania
Phone: 213205111 Fax: 213261489

Russia **SMC Pneumatik LLC.**

Business center, building 3, 15 Kondratjevskij prospect,
St.Petersburg, Russia, 195197
Phone: (812) 303-6600 Fax: (812) 303-6601

Kazakhstan **LLP "SMC Kazakhstan"**

Office 509, 18, Tsiolkovskij str. Astana, Rep. of Kazakhstan
Phone: (7172) 541-407

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China <Beijing/Shanghai> **SMC (China) Co., Ltd.**

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China <Guangzhou> **SMC Automation (Guangzhou) Limited**

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Phone: +82-(02) 3219-0700 Fax: +82-(02) 3219-0702

Singapore **SMC Pneumatics (S.E.A.) Pte. Ltd. (Sales subsidiary)**

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Thailand **SMC (Thailand) Ltd.**

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No.25(A)South Race Course Street, Tamwe Township, Yangon, Myanmar
Phone: +95 01-557-886

America

U.S.A. **SMC Corporation of America**

10100 SMC Blvd. Noblesville IN 46060, U.S.A.
Phone: 317-899-4440 Fax: 317-899-0819

Canada **SMC Pneumatics (Canada) Ltd.**

6700 Millcreek Drive, Unit #3, Mississauga, ON L5N 8B3, Canada
Phone: +1-905-812-0400 Fax: +1-905-812-8686

Mexico **SMC Corporation (Mexico), S.A. de C.V.**

Carr. Silao-Trejo K.M. 2.5 S/N Predio San Jose del Durazno C.P. 36100, Silao, Gto. Mexico
Phone: 472-72-2-55-00 Fax: 472-72-2-59-44, 472-72-2-59-46

Brazil **SMC Pneumáticos do Brasil Ltda.**

Av. Piraporinha, 777 Bairro Planalto, São Bernardo do Campo São Paulo, Brazil ZIP : 09891-001
Phone: 11-4082-0777 Fax: 11-4082-0685

Chile **SMC Pneumatics (Chile) S.A.**

Av. La Montana, #1115 P. Norte km. 16,5 Parque Industrial Valle Grande, Lampa, Santiago, Chile
Phone: +56-2-270-86-00 Fax: +56-2-270-86-01

Colombia **SMC Pneumatics (Chile) S.A.**

Av. La Montana, #1115 P. Norte km. 16,5 Parque Industrial Valle Grande, Lampa, Santiago, Chile
Phone: +56-2-270-86-00 Fax: +56-2-270-86-01

Argentina **SMC Argentina S.A.**

Austria Norte 1831, Troncos del Talar, Parque Industrial Tigre, Buenos Aires - Argentina
Phone/Fax: +54-011-4555-5762

Bolivia **SMC Pneumatics Bolivia S.r.l.**

Av. Canal Cotoca # 2635 (entre Calle 9 y 10) Santa Cruz, Bolivia
Phone: (0) 3-3649957 Fax: (0) 3-3649959

Venezuela **SMC Neumatica Venezuela S.A.**

Ave. Michelena Zona Industrial Edificio Canaima Local 4 Valencia-Edo Carabobo, Venezuela
Phone: 241-8345617 Fax: 241-8348258

Peru **SMC CORPORATION PERU S.A.C.**

Calle Andres Reyes 191, San Isidro, Lima, LIMA27, Peru
Phone: 1-4401280 Fax: 1-4401280

Ecuador <Distributor> **ASSISTECH CIA. LTDA.**

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Phone: 6003690/6003691 6003692/2807963 Fax: 2804750



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SMC Deutschland GmbH
Boschring 13-15 · 63329 Egelsbach
Tel. +49 (0) 6103 402-0
info@smc.de
www.smc.de