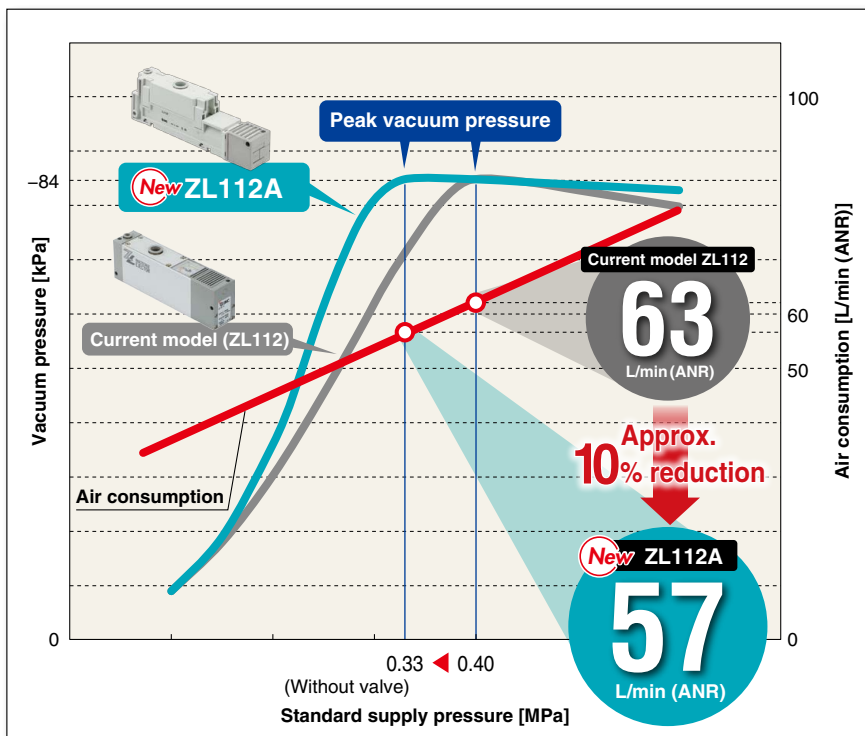


Multistage Ejector

Energy saving

Air consumption

10% reduction



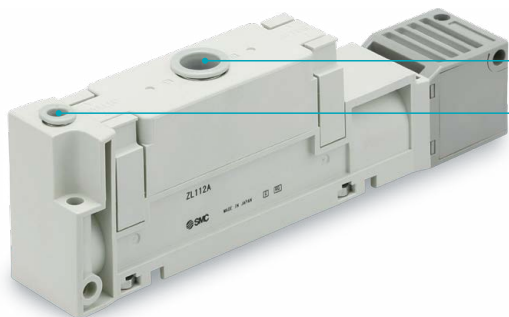
New



Weight

Max. 60% reduction*1

*1 **New ZL112A: 180 g** ← Current model (ZL112): 450 g



Size	Supply (P) port	Vacuum (V) port
Metric size (Light gray)	ø6	ø12
Inch size (Orange)	ø1/4"	ø1/2"



Series	Nozzle diameter [mm]	Standard supply pressure [MPa]	Vacuum pressure [kPa]	Max. suction flow rate [L/min (ANR)]	Air consumption [L/min (ANR)]	Port size		With or without valve			Exhaust type		Vacuum pressure sensor			
						Supply (P) port	Vacuum (V) port	With supply valve and release valve	With supply valve	None	Silencer exhaust	Port exhaust	With digital vacuum pressure switch	With vacuum pressure gauge	With vacuum port adapter	None
ZL112A	1.2	0.33 (Without valve)	-84	100	57	ø6 ø1/4"	ø12 ø1/2"	●	●	●	●	●	●	●	●	●

ZL112A Series

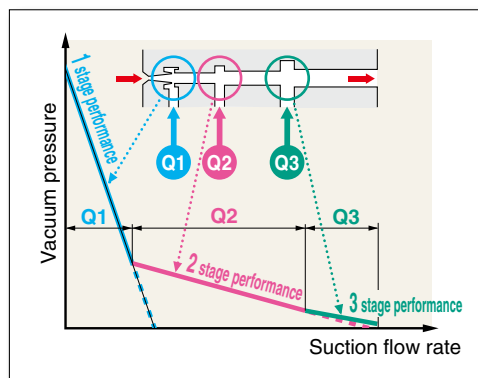


CAT.ES100-108A

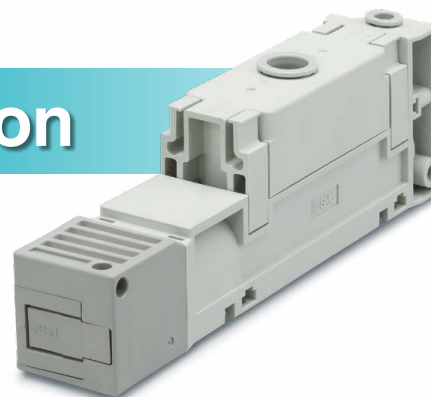
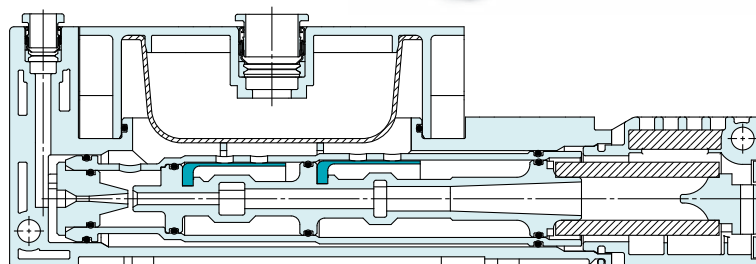
3 stage diffuser construction

Suction flow rate increased by 250%

(Versus ø1.3, one stage model)



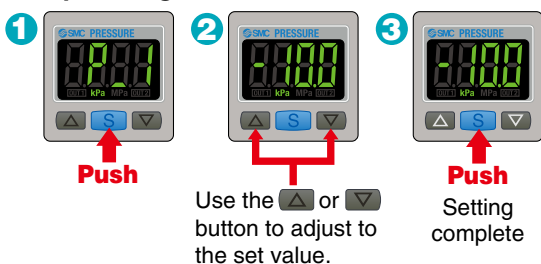
**Suction flow rate:
100 L/min (ANR)**



3 types of vacuum pressure sensors

1 With digital vacuum pressure switch

3-step setting



Output specifications

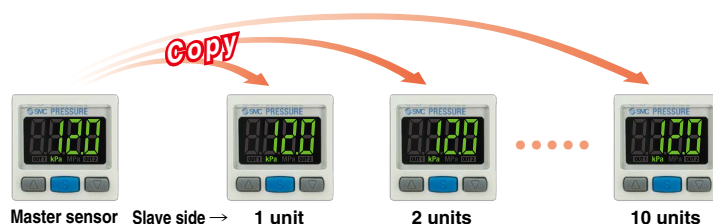
- NPN or PNP open collector 1 output/2 outputs
- NPN or PNP open collector 1 output + Analog output (1 to 5 V or 4 to 20 mA)

Power-saving mode

Power consumption is reduced by turning off the monitor. (Power consumption reduced by 20% at max.)

Can copy to up to 10 units simultaneously

- The settings of the master sensor can be copied to the slave sensors.
- Reduced setting time
 - Minimized risk of setting mistakes



2 With vacuum pressure gauge

Pressure range:

- 100 kPa to 100 kPa (When the fittings are mm spec.)
- 30 inHg to 14 psi (When the fittings are inch spec.)



3 With vacuum port adapter

Port size:

Rc1/8



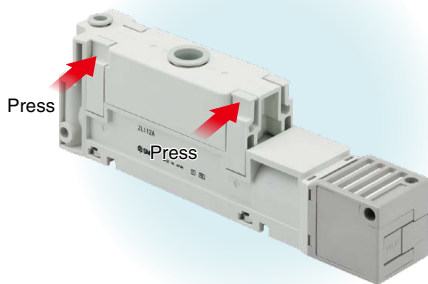
Without vacuum pressure sensor



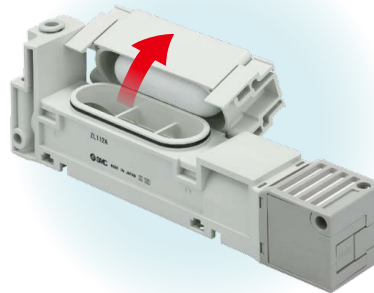
No tools are required! Maintenance labor can be reduced.

Filter element

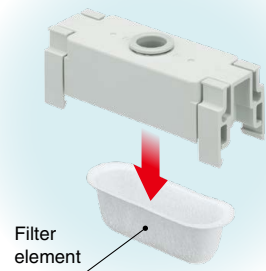
STEP 1 Press the levers.



STEP 2 Remove the suction cover.

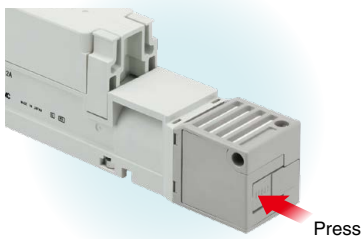


STEP 3 Replace the filter element.

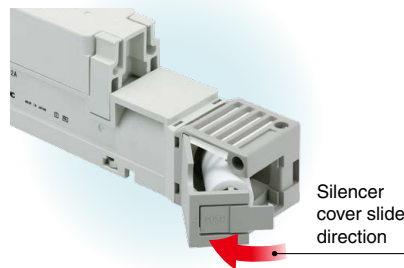


Sound absorbing material

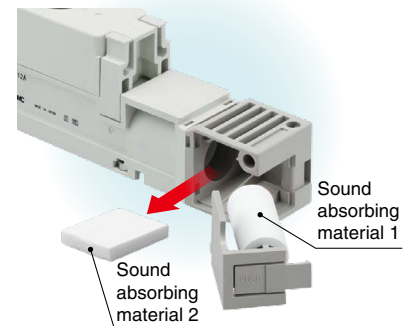
STEP 1 Press the PUSH button.



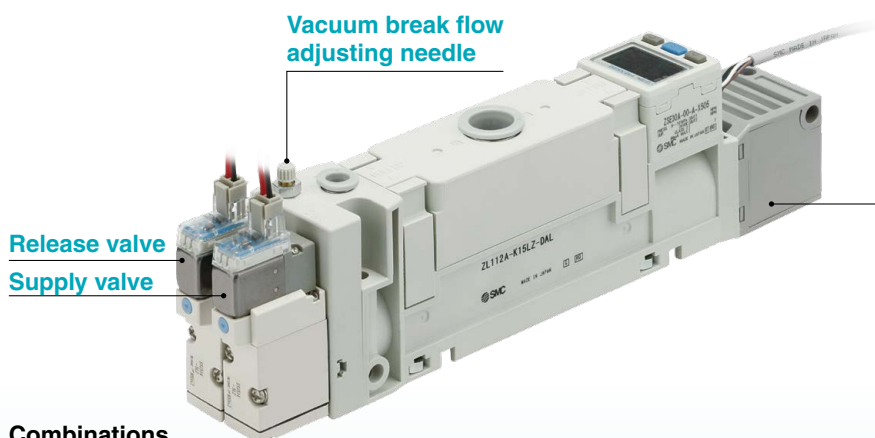
STEP 2 Remove the silencer cover.



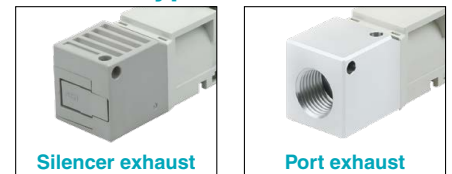
STEP 3 Replace the sound absorbing material.



Supply valve/release valve and exhaust type

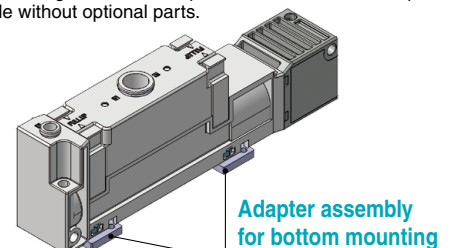


Exhaust type



Option

Bottom mounting with existing ZL112 is compatible by using specified adapter assembly.
* Mounting holes at the top and on the side are compatible without optional parts.



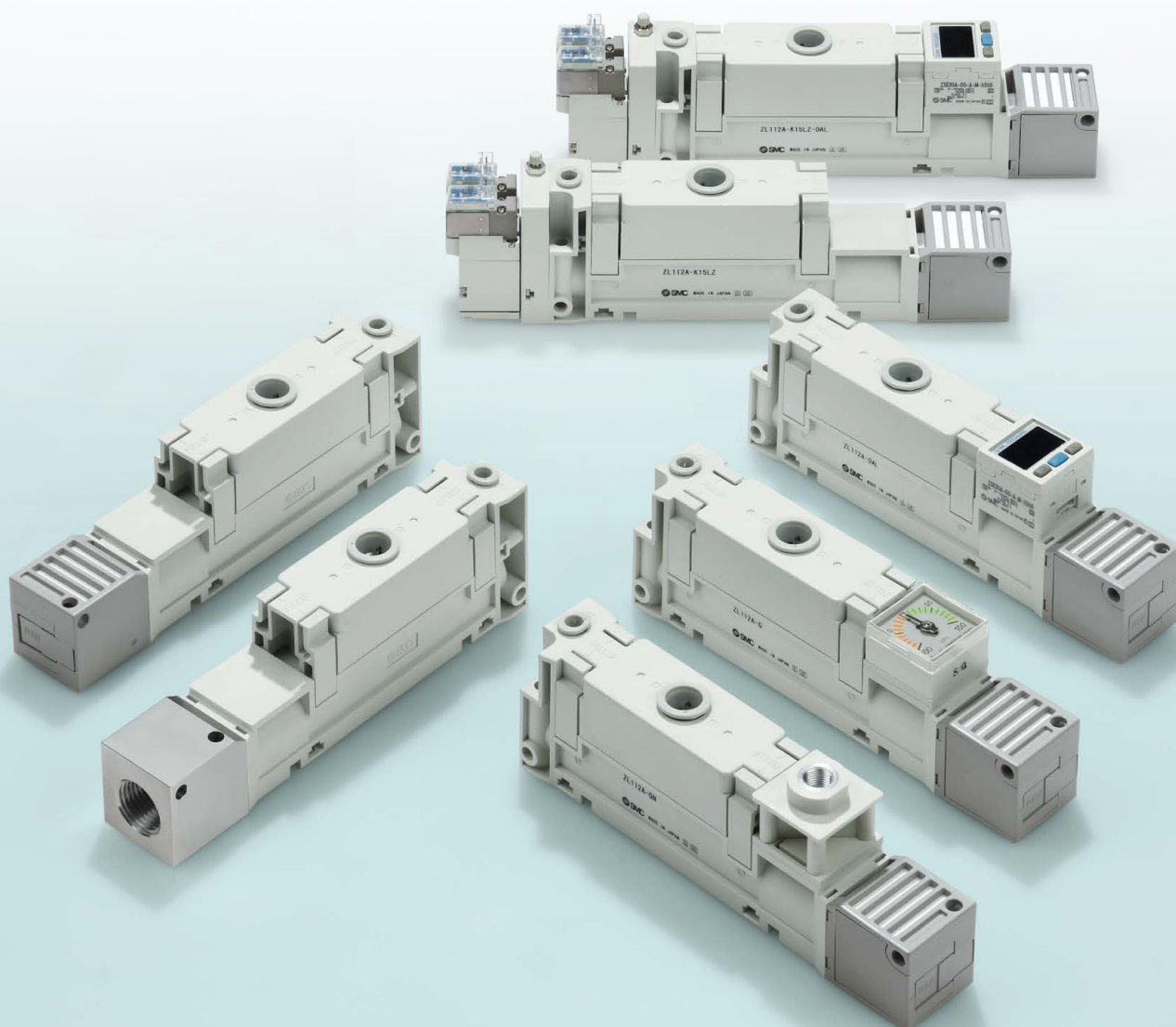
Combinations

	Supply valve	Release valve
Pattern ①	N.C.	N.C.
Pattern ②	N.C.	—
Pattern ③	N.O.	N.C.
Pattern ④	N.O.	—

CONTENTS

Multistage Ejector ZL112A Series

How to Order	p. 4
Ejector Specifications	p. 5
Digital Vacuum Pressure Switch Specifications	p. 6
Vacuum Pressure Gauge Specifications	p. 6
Internal Circuits and Wiring Examples	p. 7
Exhaust Characteristics/Flow Rate Characteristics/Time to Reach Vacuum (Representative value)	p. 8
Vacuum Break Flow Rate Characteristics (Representative value)	p. 8
Construction	p. 9
Dimensions	p. 10

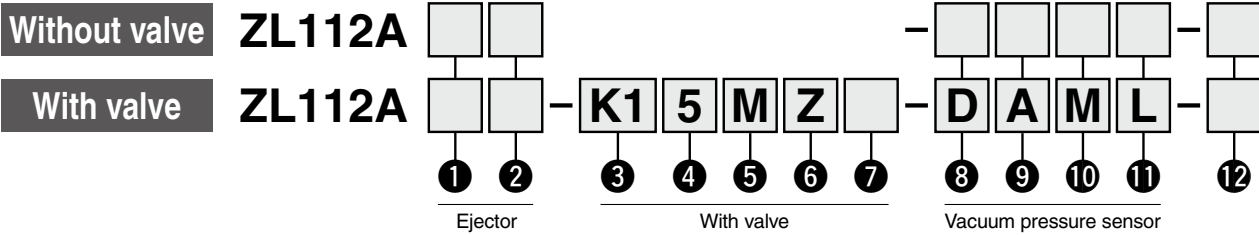


Multistage Ejector

ZL112A Series



How to Order



① Supply (P), Vacuum (V) port/One-touch fitting connection size

Symbol	Supply (P) port	Vacuum (V) port	Vacuum pressure gauge unit specifications*1
Nil	ø6	ø12	kPa
N	ø1/4"	ø1/2"	inHg-psi

*1 When the vacuum pressure gauge (Symbol: G) is selected for ③, these are the unit specification options. Under the New Measurement Act, products with inHg-psi unit specifications are not permitted for use in Japan.

② Exhaust type

Nil	Silencer exhaust
P	Rc1/2 port exhaust
PF	G1/2 port exhaust*1
PN	1/2-14NPT port exhaust

*1 The thread ridge shape is conforming to G thread standard (JIS B 0202), but other shapes are not conforming to ISO 1603 and ISO 1179.

③ Supply valve/Release valve combination

K1	Supply valve (N.C.), Release valve (N.C.)
K2	Supply valve (N.C.)
B1	Supply valve (N.O.), Release valve (N.C.)
B2	Supply valve (N.O.)

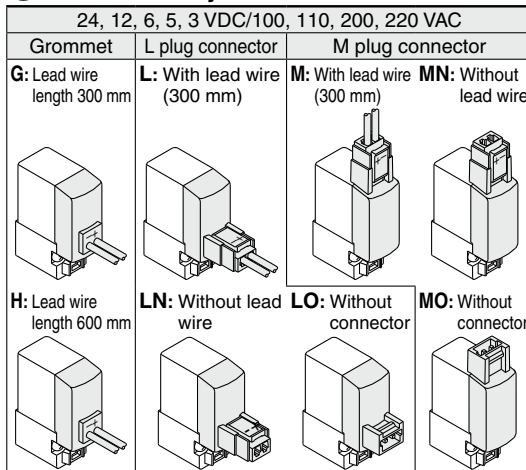
④ Rated voltage

DC		CE-compliant
5	24 VDC	●
6	12 VDC	●
V	6 VDC	●
S	5 VDC	●
R	3 VDC	●

AC (50/60 Hz)		CE-compliant
1	100 VAC	—
2	200 VAC	—
3	110 VAC [115 VAC]	—
4	220 VAC [230 VAC]	—

* CE-compliant: For DC only

⑤ Electrical entry



* LN, MN type: With 2 sockets per valve

* Refer to page 5 for the lead wire length of L and M plug connectors.

⑥ Light/Surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
U	With light/surge voltage suppressor (Non-polar type)

* Type U is 24 or 12 VDC only.

* There is no "S" option for AC voltage valves because the generation of surge voltage is prevented by a rectifier.

⑦ Manual override

Nil	Non-locking push type
D	Push-turn locking slotted type

⑧ Vacuum pressure sensor

Nil	None
GN	Vacuum port adapter Rc1/8
G	Vacuum pressure gauge*1
D	Digital vacuum pressure switch

*1 In ①, the units for mm spec fittings are in kPa.

The units for inch spec fittings are in inHg-psi. (Under the New Measurement Act, products with these unit specifications are not permitted for use in Japan.)

⑩ Unit specifications

(Applicable only when the vacuum pressure sensor specification is "D" for digital vacuum pressure switch)

Nil	With unit switching function
M	SI unit only (kPa)
P	With unit switching function (Initial value psi)

* Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan.

⑪ Lead wire specifications

(Applicable only when the vacuum pressure sensor specification is "D" for digital vacuum pressure switch)

Nil	Without lead wire
L	Lead wire with connector (2 m)

* Output type N and P: 3 core lead wire is included. For other output options, 4 core lead wire is included.

⑨ Output specifications

(Applicable only when the vacuum pressure sensor specification is "D" for digital vacuum pressure switch)

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output
E	PNP open collector 1 output + Analog voltage output
F	PNP open collector 1 output + Analog current output

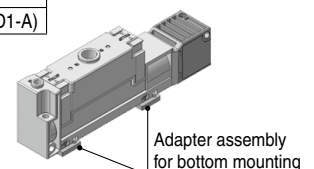
⑫ Option (Included)

Nil	None
B	Adapter assembly for bottom mounting (ZL112A-AD1-A)

* Bottom mounting screw pitch = 28 mm (Interchangeable with the current model ZL112)

* 2 pcs./set, with 4 bolts

* Mounting holes at the top and on the side are compatible without optional parts.



ZL112A Series

Standard

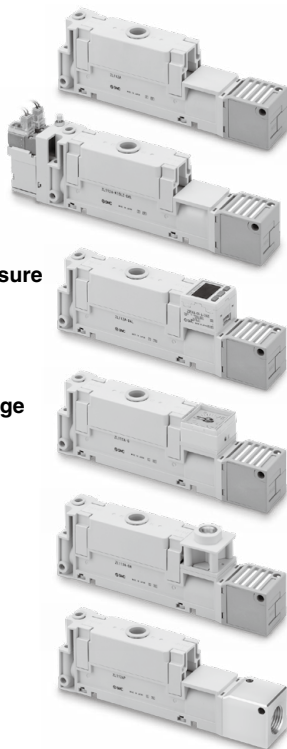
With valve

With digital vacuum pressure switch

With vacuum pressure gauge

With vacuum port adapter

Port exhaust



● Table 1. How to order connector assembly

For DC	SY100-30-4A-	
For 100 VAC	SY100-30-1A-	
For 200 VAC	SY100-30-2A-	
For other AC	SY100-30-3A-	

Lead wire length

Nil	300 mm (Standard)
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

* The solenoid valve mounted on this product is the SMC 3-port solenoid valve SYJ500 series.

For details on solenoid valve functions, refer to the operation manual of the SYJ500 series on the SMC website (<http://www.smcworld.com>).

3-port solenoid valve SYJ500 series

SYJ5 1 4 - 5 M Z - Q

● CE-compliant	
Nil	AC
Q	DC

Multistage ejector ZL series

ZL112A - - - - -

● Manual override	
● Light/Surge voltage suppressor	
● Electrical entry	
● Rated voltage	

● Supply valve/Release valve specifications

- ZL112A□□-K1
Select "1" for both supply and release valve.
- ZL112A□□-K2
Select "1" for supply valve.
- ZL112A□□-B1
Select "2" for supply valve.
Select "1" for release valve.
- ZL112A□□-B2
Select "2" for supply valve.

Ejector Specifications

Model	ZL112A	
Nozzle diameter	1.2 mm	
Standard supply pressure	Without valve: 0.33 MPa	With valve: 0.35 MPa
Maximum vacuum pressure*1	-84 kPa	
Air consumption*1	57 L/min (ANR)	
Maximum suction flow rate*1	100 L/min (ANR)	
Supply pressure range	0.2 to 0.5 MPa	
Operating temperature range	5 to 50°C (No condensation)	
Fluid	Air	
Vibration resistance*2	30 m/s ² (Without pressure switch), 20 m/s ² (With pressure switch)	
Impact resistance*3	150 m/s ² (Without pressure switch), 100 m/s ² (With pressure switch)	

- *1 Values are at the standard supply pressure and based on SMC's measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.
- *2 10 to 500 Hz for 2 hours in each direction of X, Y, and Z (De-energized, Initial value)
- *3 3 times in each direction of X, Y, and Z (De-energized, Initial value)

Supply Valve/Release Valve Specifications

SYJ5 1 4 - 5 M Z - Q

● Type of actuation

1	Normally closed
2	Normally open (Supply valve only)

● Rated voltage

DC	CE-compliant
5	24 VDC ●
6	12 VDC ●
V	6 VDC ●
S	5 VDC ●
R	3 VDC ●

AC (50/60 Hz)	CE-compliant
1	100 VAC —
2	200 VAC —
3	110 VAC [115 VAC] —
4	220 VAC [230 VAC] —

* CE-compliant: For DC only

● CE-compliant

Nil	— (For AC)
Q	CE-compliant (For DC)

● Manual override

Nil	Non-locking push type
D	Push-turn locking slotted type

● Light/Surge voltage suppressor

(Electrical entry: G, H, L, or M)

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
U	With light/surge voltage suppressor (Non-polar type)

- * There is no "S" option for AC voltage valves because the generation of surge voltage is prevented by a rectifier.
- * For type "U", DC voltage is only available.

● Electrical entry

24, 12, 6, 5, 3 VDC/100, 110, 200, 220 VAC

Grommet		L plug connector		M plug connector	
G: Lead wire length 300 mm	L: With lead wire (300 mm)	M: With lead wire (300 mm)	MN: Without lead wire		
H: Lead wire length 600 mm	LN: Without lead wire	LO: Without connector	MO: Without connector		

* LN, MN type: With 2 sockets

* Refer to Table 1 for the lead wire length of L and M plug connectors.

Response time (at 0.5 MPa)*1	25 ms or less
Maximum operating frequency	5 Hz
Manual override	Non-locking push type, Push-turn locking slotted type

*1 Based on JIS B 8419: 2010 dynamic performance test (Standard type: Coil temperature 20°C, at rated voltage, without surge voltage suppressor)

* Refer to the **Web Catalog** for details on valves.

Weight

ZL112A (Basic)	180 g
Port exhaust	+70 g
Digital vacuum pressure switch (Excluding lead wire)	+25 g
Digital vacuum pressure switch (Including 3 cores lead wire)	+56 g
Digital vacuum pressure switch (Including 4 cores lead wire)	+60 g
With supply valve and release valve	+105 g
With supply valve and without release valve	+65 g

Digital Vacuum Pressure Switch Specifications

Rated pressure range		0.0 to -101.0 kPa	
Set pressure range		10.0 to -105.0 kPa	
Withstand pressure		500 kPa	
Smallest settable increment		0.1 kPa	
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas	
Power supply voltage		12 to 24 VDC ±10% (with power supply polarity protection)	
Current consumption		40 mA (at no load)	
Switch output		NPN or PNP open collector 1 output NPN or PNP open collector 2 outputs (selectable)	
Switch output	Maximum load current	80 mA	
	Maximum applied voltage	28 V (at NPN output)	
	Residual voltage	1 V or less (with load current of 80 mA)	
	Response time	2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)	
	Short-circuit protection	Yes	
Repeatability		±0.2% F.S. ±1 digit	
Hysteresis	Hysteresis mode	Variable (0 to variable)	
	Window comparator mode	Variable (0 to variable)	
Analog output	Voltage output ^{*1}	Output voltage (Rated pressure range)	1 to 5 V ±2.5% F.S.
		Linearity	±1% F.S. or less
	Current output ^{*2}	Output impedance	Approx. 1 kΩ
		Output current (Rated pressure range)	4 to 20 mA ±2.5% F.S.
		Linearity	±1% F.S. or less
Load impedance		Maximum load impedance: Power supply voltage 12 V: 300 Ω, Power supply voltage 24 V: 600 Ω Minimum load impedance: 50 Ω	
Display		4-digit, 7-segment, 2-color LCD (Red/Green) Sampling cycle: 5 times/s	
Display accuracy		±2% F.S. ±1 digit (Ambient temperature of 25°C)	
Indicator light		Lights up when switch output is turned ON. (OUT1: Green, OUT2: Red)	
Environmental resistance	Enclosure		IP40
	Operating temperature range		Operating: 0 to 50°C, Stored: -10 to 60°C (No freezing or condensation)
	Operating humidity range		Operating/Stored: 35 to 85% RH (No condensation)
	Withstand voltage		1000 VAC for 1 minute between terminals and housing
	Insulation resistance		50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing
Temperature characteristics		±2% F.S. (25°C standard)	
Lead wire		Oilproof heavy-duty vinyl cable, 3 cores ø3.5, 2 m 4 cores Conductor area: 0.15 mm ² (AWG26) Insulator O.D.: 1.0 mm	
Standards		CE, RoHS compliant	

*1 When analog voltage output is selected, analog current output cannot be used together.
*2 When analog current output is selected, analog voltage output cannot be used together.

● Lead wire assembly with connector

How to Order

ZS - 38 - □ L

● Number of cores

3	3 cores, 1 output
4	4 cores, 2 outputs

* The vacuum pressure switch mounted on this product is equivalent to our SMC product, the ZSE30A series digital pressure switch.

For details on vacuum pressure switch functions, refer to the operation manual of the ZSE30A series on the SMC website (<http://www.smcworld.com>).

● Pressure switch correspondence table

Digital pressure switch
ZSE30A series

(ZL-) ZSE30A-00-□-□-□

Multistage ejector
ZL series

ZL112A-□□□□□-D□-□-□

Unit specifications ●

Output specifications ●

Lead wire specifications ●

How to Order

ZL - ZSE30A - 00 - A - M L

Output specifications ●

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output
E	PNP open collector 1 output + Analog voltage output
F	PNP open collector 1 output + Analog current output

Connector/Lead wire specifications ●

Nil	Without lead wire
L	Lead wire with connector (Length: 2 m)

* Output type N and P: 3 core lead wire is included. For other output options, 4 core lead wire is included.

● Unit specifications

Nil	With unit switching function ^{*1}
M	SI unit only ^{*2}
P	With unit switching function (Initial value psi) ^{*1}

*1 Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan.

*2 Fixed unit: kPa

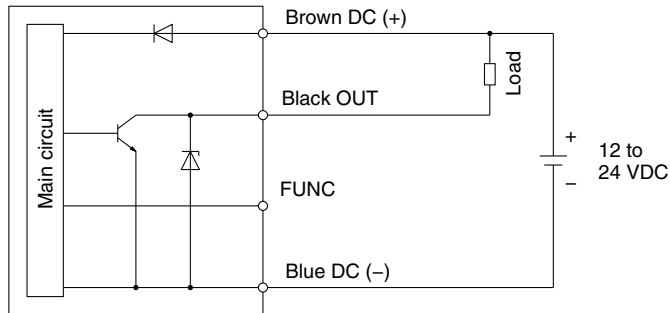
Vacuum Pressure Gauge Specifications

Part no.	GZ30S	NGZ30S
Fluid	Air	
Pressure range	-100 kPa to 100 kPa	-30 inHg to 14 psi
Scale range (Angular)	230°	
Accuracy	±3% F.S. (Full span)	
Class	Class 3	
Operating temperature range	0 to 50°C	
Material	Housing: Polycarbonate/ABS resin	

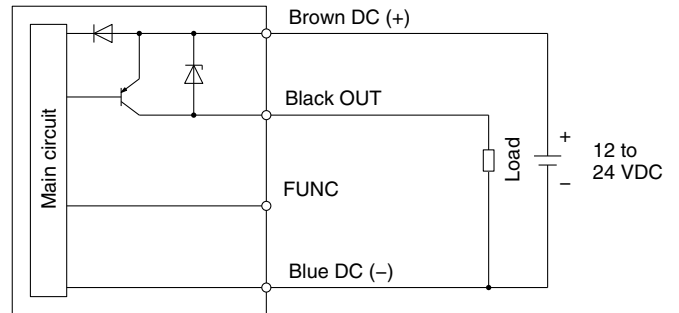
ZL112A Series

Internal Circuits and Wiring Examples

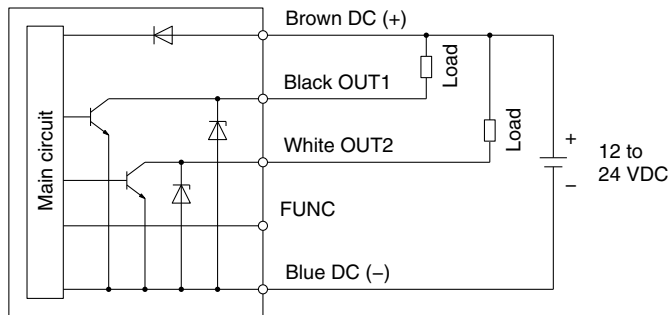
Output specification “N”
NPN (1 output)



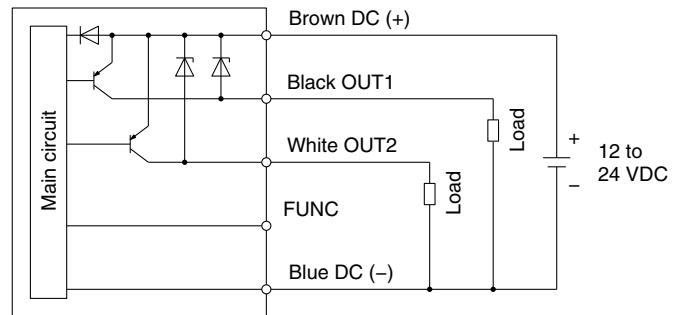
Output specification “P”
PNP (1 output)



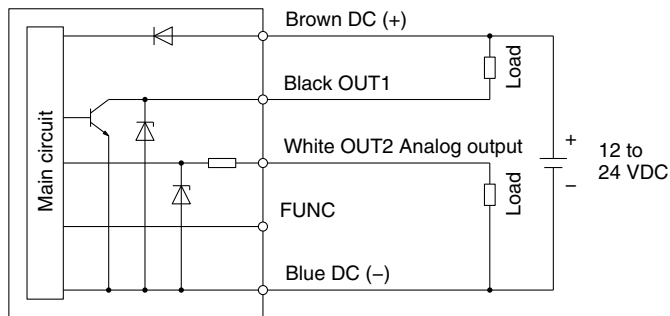
Output specification “A”
NPN (2 outputs)



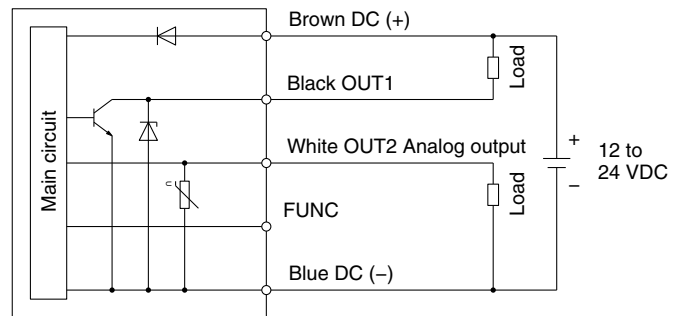
Output specification “B”
PNP (2 outputs)



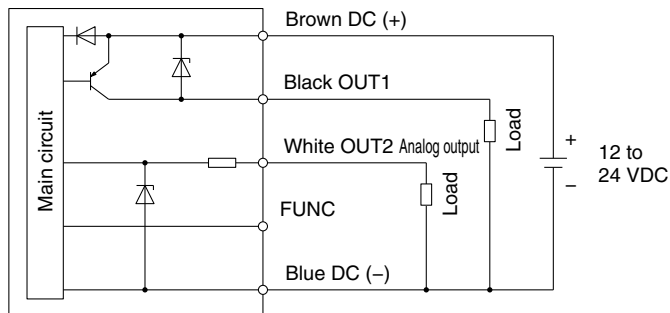
Output specification “C”
NPN (1 output) + Analog voltage output



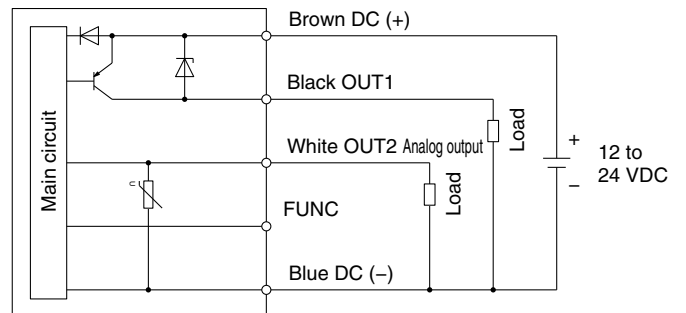
Output specification “D”
NPN (1 output) + Analog current output



Output specification “E”
PNP (1 output) + Analog voltage output



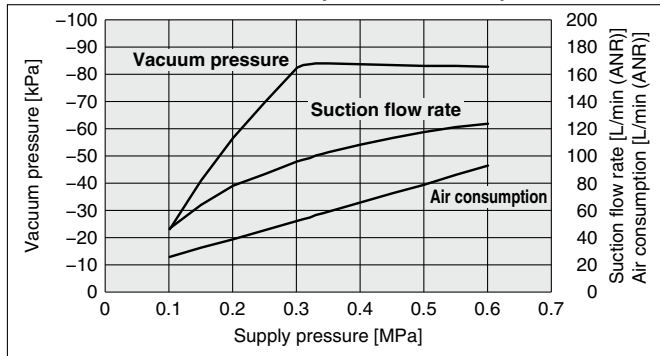
Output specification “F”
PNP (1 output) + Analog current output



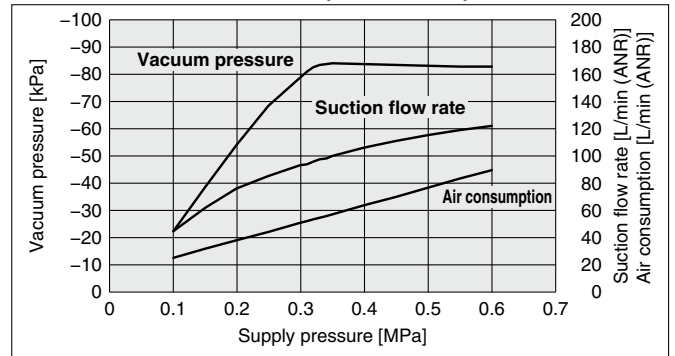
* Refer to the **Web Catalog** for details on pressure switches.

Exhaust Characteristics/Flow Rate Characteristics/Time to Reach Vacuum (Representative value)

Exhaust Characteristics (Without valve)

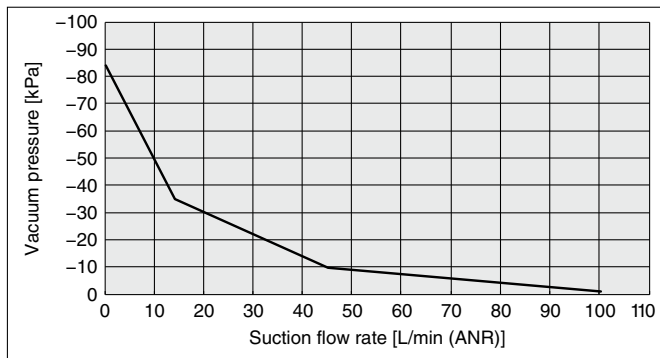


Exhaust Characteristics (With valve)



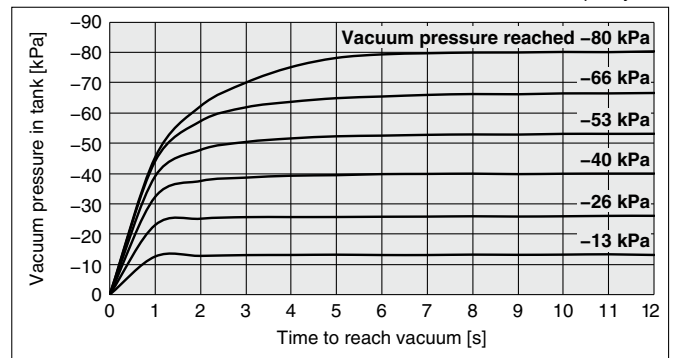
Standard supply pressure: 0.33 MPa (Without valve)
0.35 MPa (With valve)

Flow Rate Characteristics



Time to Reach Vacuum

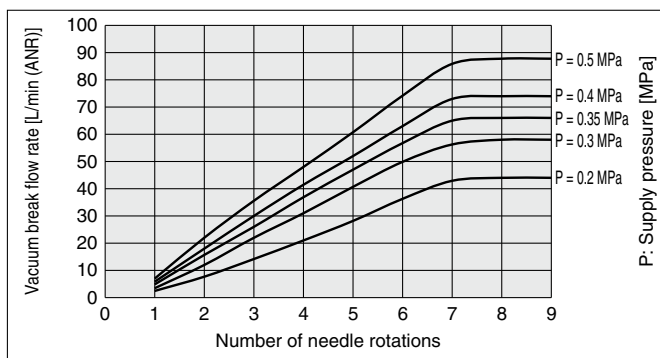
Tank capacity: 1 L



Vacuum Break Flow Rate Characteristics*1 (Representative value)

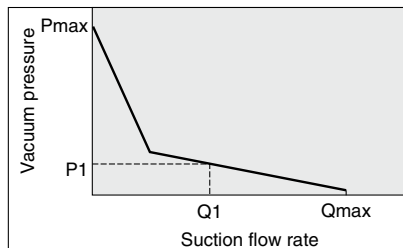
* Silencer exhaust specification

The graph shows the flow rate characteristics at different supply pressures when the vacuum break flow adjusting needle is open from the fully closed state.



* The flow rates shown in this graph are representative values for the ejector with silencer exhaust specification, and the suction flow may vary depending on the piping conditions at the vacuum (V) port and exhaust (EXH) port, etc.

How to Read the Flow Rate Characteristics



The flow rate characteristics indicate the relationship between the vacuum pressure and the suction flow rate of the ejector, and show that when the suction flow rate changes the vacuum pressure also changes. In general, this indicates the relationship at the ejector's standard operating pressure.

In the graph, Pmax indicates the maximum vacuum pressure, and Qmax indicates the maximum suction flow rate. These are the values that are published as specifications in catalogs, etc. Changes in vacuum pressure are explained below.

1. If the ejector's suction port is closed and sealed tight, the suction flow rate becomes "0" and the vacuum pressure increases to the maximum (Pmax).
2. If the suction port is opened and air is allowed to flow (the air leaks), the suction flow rate increases and the vacuum pressure decreases. (the condition of P1 and Q1)
3. If the suction port is opened completely, the suction flow rate increases to the maximum (Qmax), while the vacuum pressure then drops almost to "0" (atmospheric pressure). When adsorbing workpieces which are permeable or subject to leakage, etc., caution is required as the vacuum pressure will not be very high.

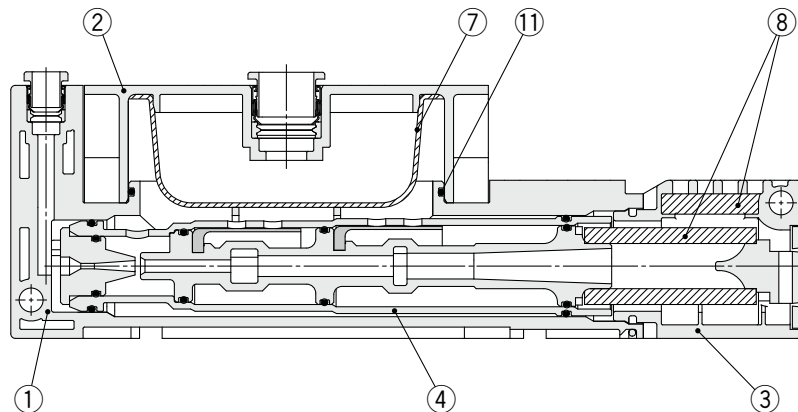
How to Read the Time to Reach Vacuum

The graph indicate the time required to reach a vacuum pressure determined by adsorption conditions for workpieces, etc., starting from atmospheric pressure in a 1 L sealed tank. For the ZL112A, approximately 7.0 seconds are necessary to attain a vacuum pressure of -80 kPa.

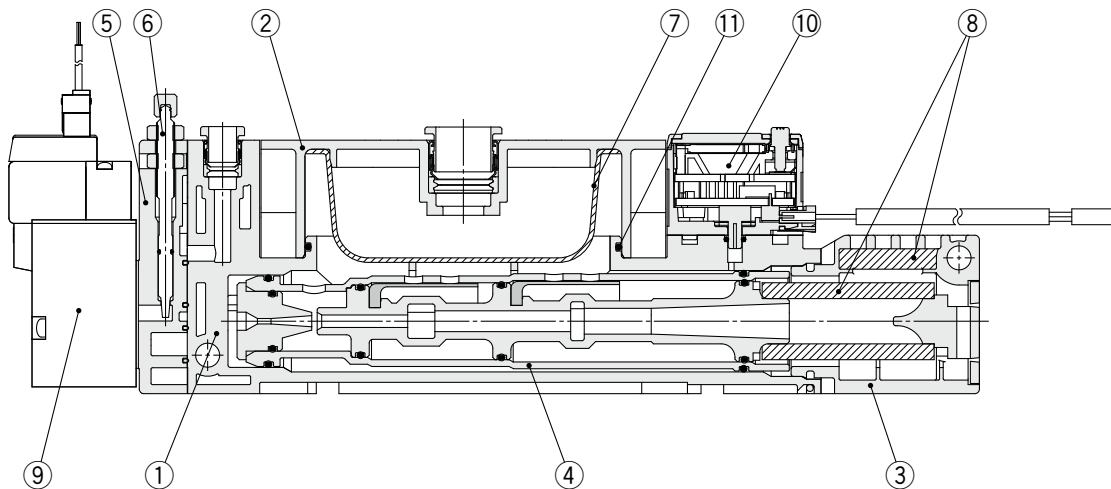
ZL112A Series

Construction

Without valve and pressure switch



With valve and pressure switch



Component/Replacement Parts

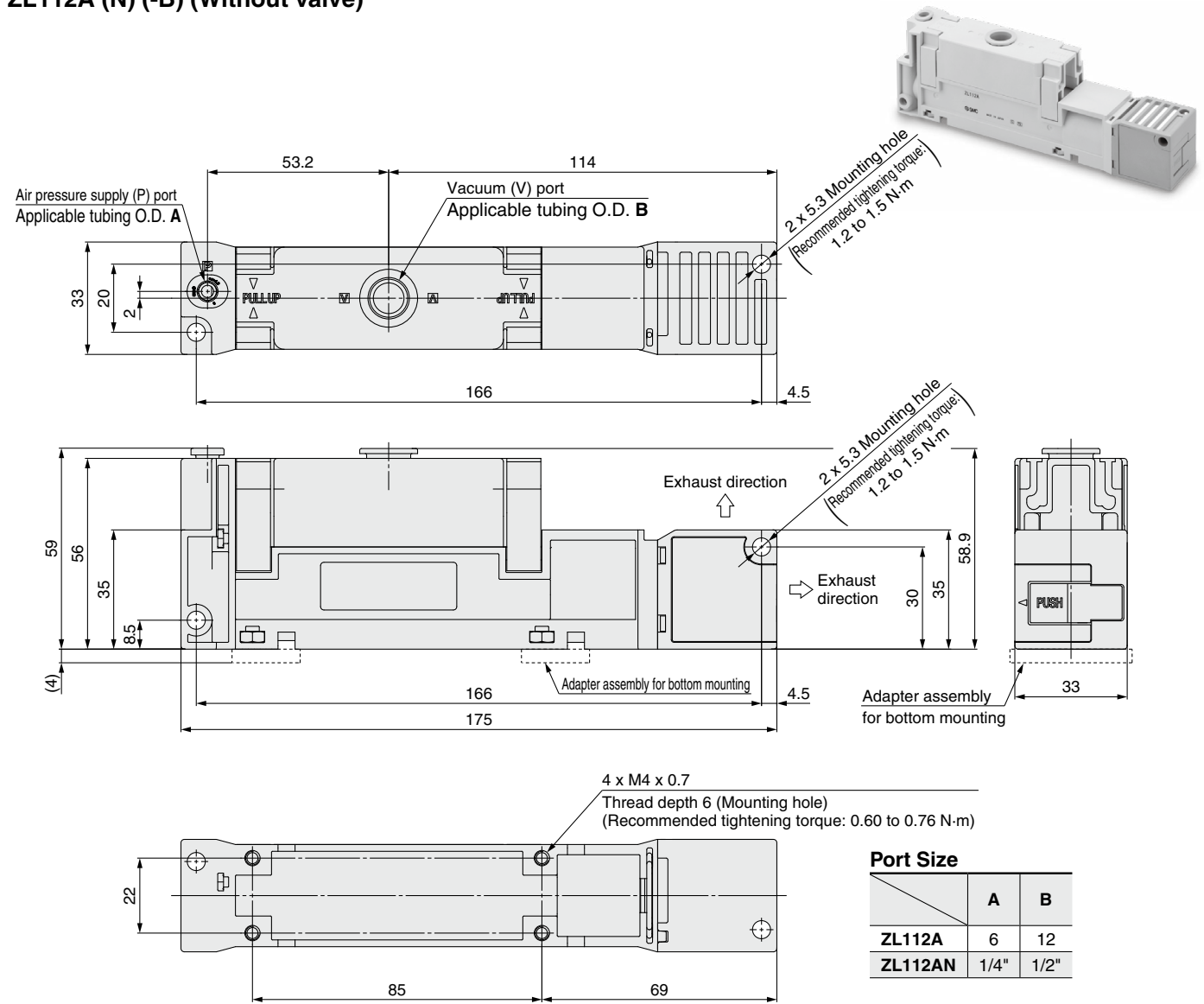
No.	Description	Part number	Material	Note
1	Body assembly	—	Resin, NBR, Steel	
2	Suction cover assembly (Filter element included)	ZL112A-FC1□-A	Resin, NBR, Steel, Non-woven fabric	□: Vacuum port size Nil: ø12, N: ø1/2"
3	Silencer case assembly (Sound absorbing material and clip included)	ZL112A-SC1-A	Resin, Steel	For silencer exhaust
4	Port block assembly (Clip included)	ZL112A-EP1□-A	Aluminum alloy, NBR, Steel	For port exhaust □: Exhaust port size Nil: Rc1/2, G: G1/2, N: 1/2-14NPT
5	Valve plate assembly (Needle is included for models with release valves.)	ZL112A-VP□-A	Resin, NBR, HNBR, Steel	□: Supply valve/Release valve combination*1 1: Supply valve + Release valve, 2: Supply valve only
6	Vacuum break flow adjusting needle	—	Brass (Electroless nickel plating), Resin, NBR, Steel	
7	Filter element	ZL112A-FE1-A	Non-woven fabric	1 pc.
8	Sound absorbing material	ZL112A-SE1-A	Resin	1 pc. of each/set: Sound absorbing material 1 and 2 (page 15)
9	Supply valve, Release valve	SYJ5□4-□□□□-□	—	Refer to how to order the supply valve and release valve. (page 5)*1
10	Digital vacuum pressure switch	ZL-ZSE30A-00-□-□□	—	Vacuum pressure sensor: Digital vacuum pressure switch Refer to how to order the digital vacuum pressure switch. (page 6)
	Vacuum port adapter assembly	ZL112A-AD2-A	Resin, Aluminum alloy, NBR, Steel	Vacuum pressure sensor: Vacuum port adapter
	Pressure gauge assembly	ZL112A-PG□-A	—	Vacuum pressure sensor: Vacuum pressure gauge □: Units for pressure 1 = kPa, 2 = inHg.psi*2
11	O-ring	ZL112A-OR1-A	NBR	5 pcs./set

*1 It is not possible to switch between models without valves and with valves.

*2 Under the New Measurement Act, products with inHg.psi unit specifications are not permitted for use in Japan.

Dimensions

ZL112A (N) (-B) (Without valve)



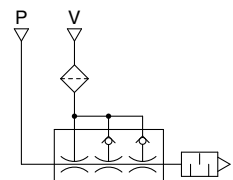
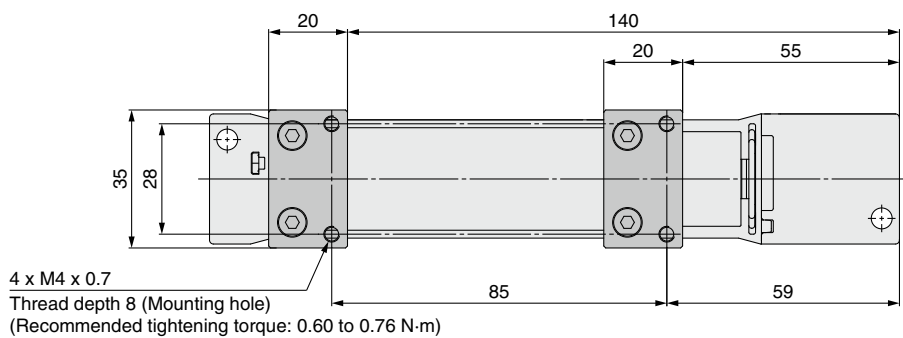
Port Size

	A	B
ZL112A	6	12
ZL112AN	1/4"	1/2"

Release Button

	P port		V port	
	Color	Type	Color	Type
ZL112A	Light gray	Oval	Light gray	Round
ZL112AN	Orange	Round	Orange	Round

ZL112A(N)-B (With adapter assembly for bottom mounting)



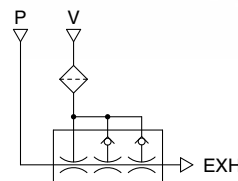
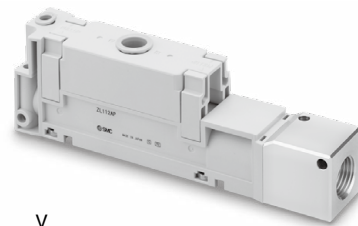
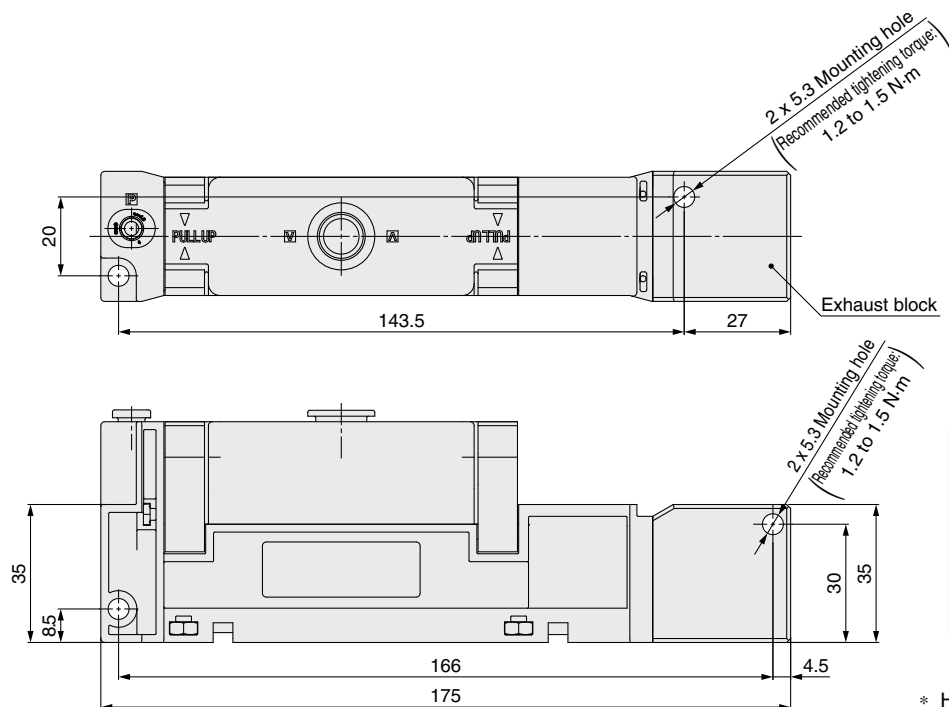
Circuit diagram

* Tighten to the recommended torque to mount the body. Tightening with excessive force may damage the product.

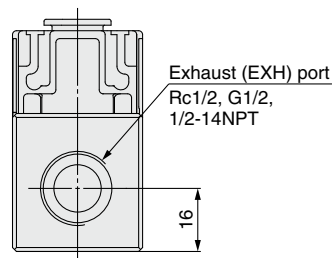
ZL112A Series

Dimensions

ZL112AP□ (Port exhaust)

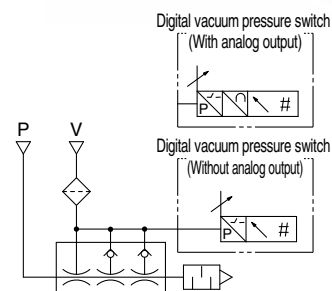
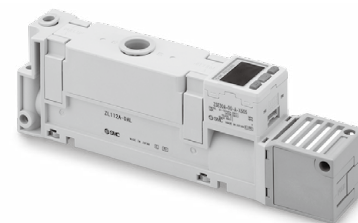
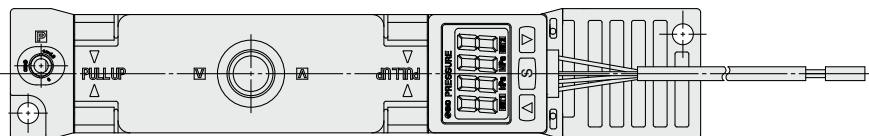


Circuit diagram

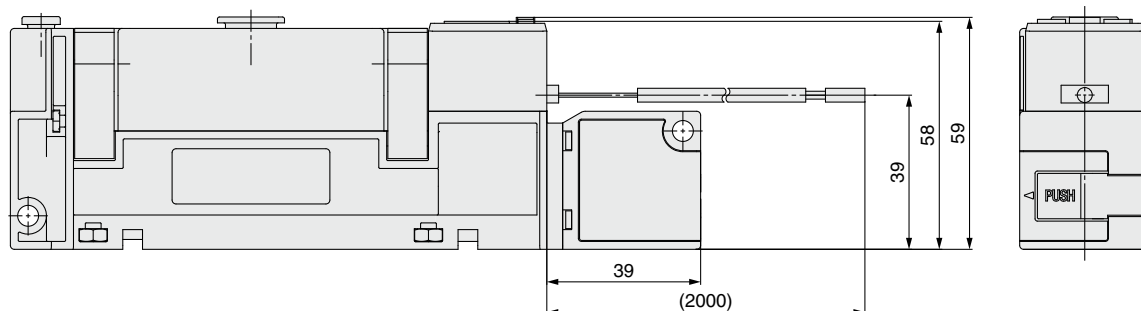


* Hold the exhaust block when connecting a piping to the exhaust port.
(Recommended tightening torque: 20 to 25 N·m)

ZL112A-D□□□ (With digital vacuum pressure switch)



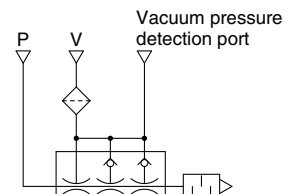
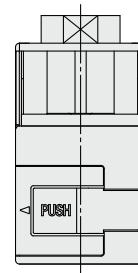
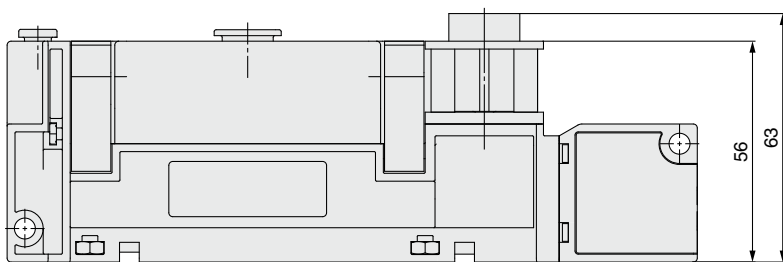
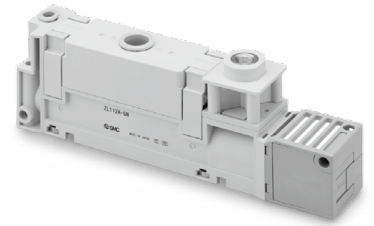
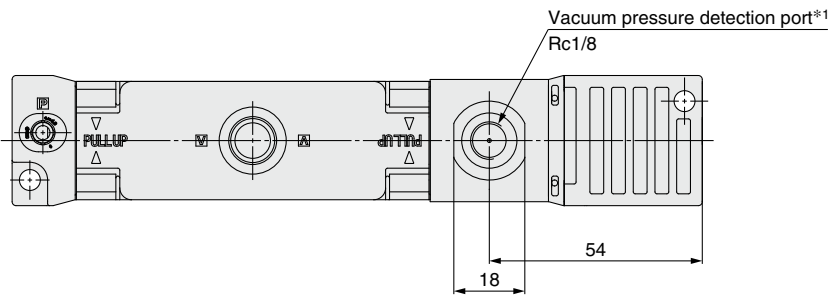
Circuit diagram



* Tighten to the recommended torque to mount the body.
Tightening with excessive force may damage the product.

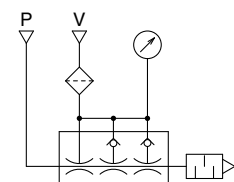
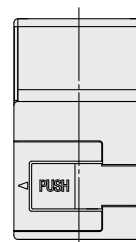
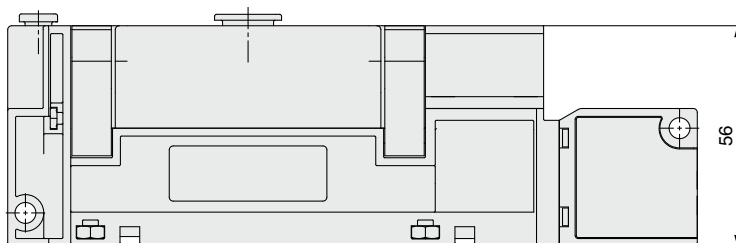
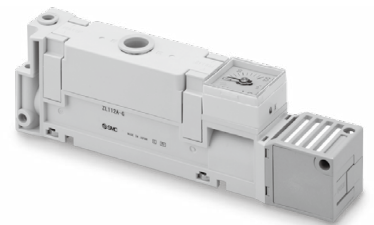
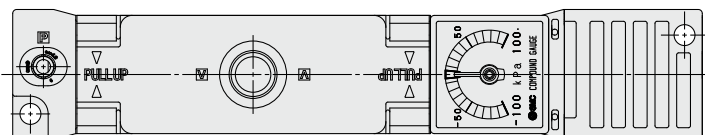
Dimensions

ZL112A-GN (With vacuum port adapter)



*1 Hold across the flats (18) when mounting a fitting to the vacuum pressure detection port.
(Recommended tightening torque: 3 to 5 N·m)

ZL112A-G (With vacuum pressure gauge)

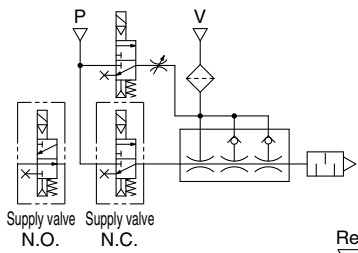


* Tighten to the recommended torque in page 10 and 11 to mount the body.
Tightening with excessive force may damage the product.

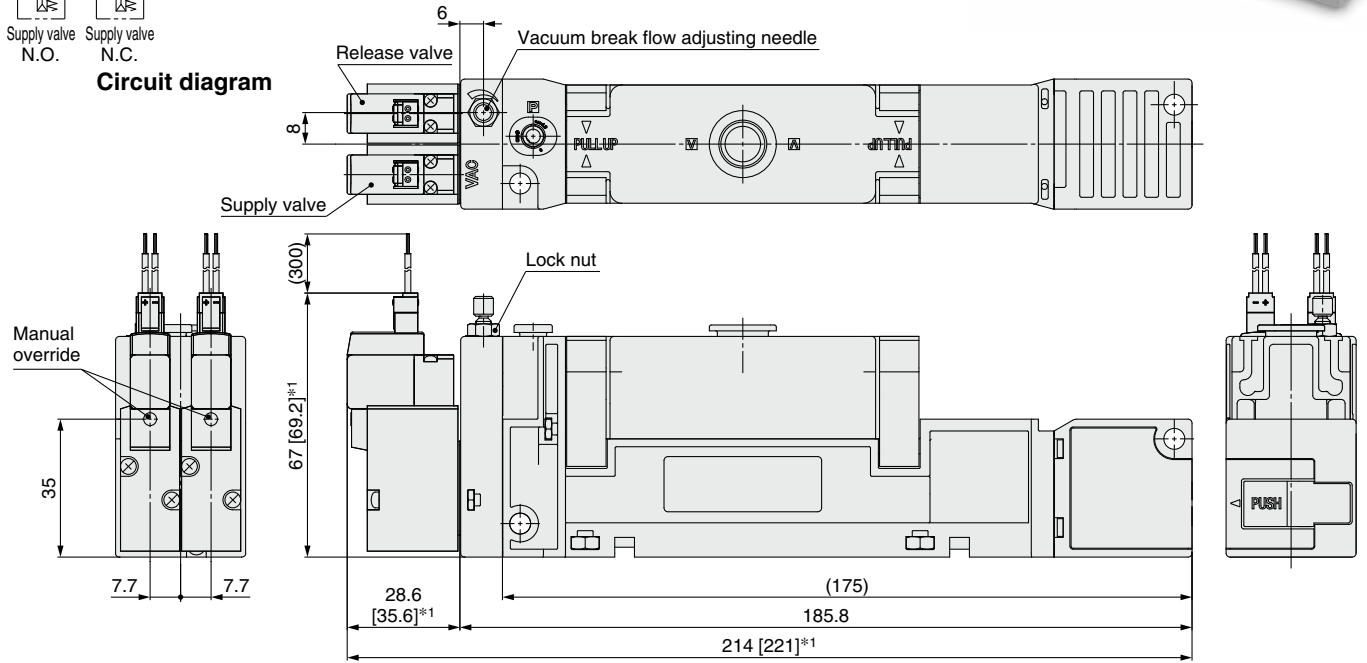
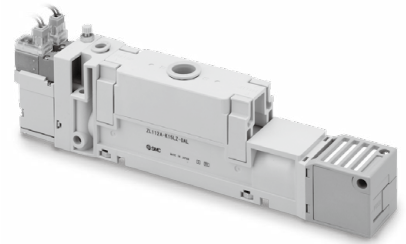
ZL112A Series

Dimensions

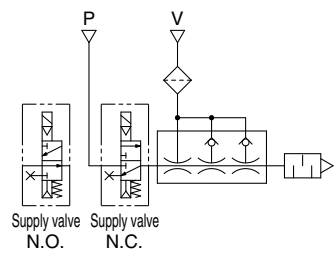
ZL112A-K1-B1 □L□□ (With supply valve and release valve)



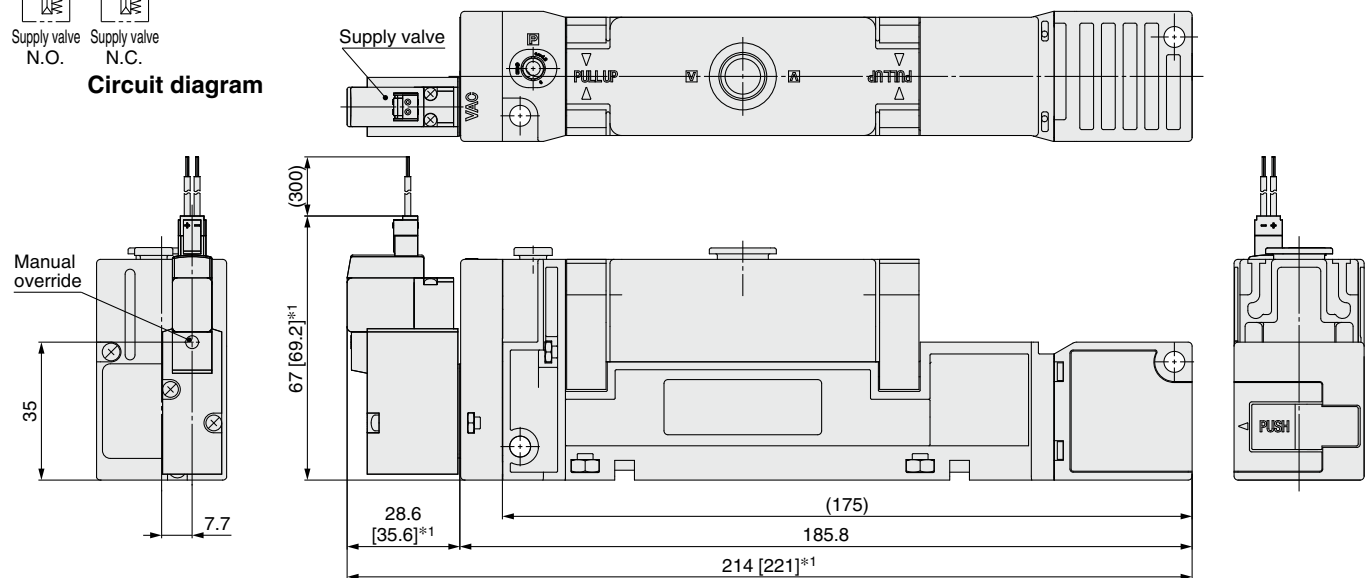
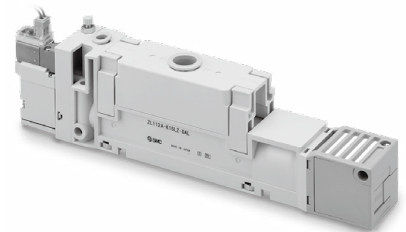
Circuit diagram



ZL112A-K2-B2 □L□□ (With supply valve)



Circuit diagram



*1 [] for AC

* Tighten to the recommended torque in page 10 and 11 to mount the body. Tightening with excessive force may damage the product.



ZL Series

Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <http://www.smcworld.com>

Handling

⚠ Caution

1. Do not drop, hit or apply excessive shock to the product when handling it.

Even if the body looks undamaged, the internal components may be damaged, leading to a malfunction.

2. Use the product within the specified supply pressure range.

Operation over the specified supply pressure range can cause damage to the product.

3. Avoid energizing the solenoid valve for long periods of time.

If a solenoid valve is continuously energized for an extended period of time, the heat generated by the coil assembly may reduce performance and life of the valve or have adverse effects on peripheral equipment.

Therefore, when it is continuously energized for an extended period of time or when the energized period per day is longer than the de-energized period, use N.O. (normally open) type product.

When the valve is mounted onto a control panel, take measures to radiate heat in order to keep the product temperature within the specified range.

4. Tensile force of the solenoid valve and pressure switch lead wire is 30 N. Exceeding this value can cause breakdown. Hold the body when handling the product.

5. Avoid repeatedly bending or stretching the lead wire of the solenoid valve or of the pressure switch.

Lead wires will break if bending stresses or tensile forces are applied to the lead wires repeatedly.

If the lead wire can move, fix it near the body of the product. The recommended bending radius is 40 mm or more. Please contact SMC for details.

6. For specific product precautions on solenoid valves, refer to the solenoid valve (SYJ500 series) catalog.

7. For specific product precautions on pressure switches, refer to the pressure switch (ZSE30A series) catalog.

8. Load to the ejector body

The body material is resin, therefore do not apply load to the port after mounting. Prevent the operation which generates moment, as it may cause performance reduction or damage to the body.

Handling of Suction Cover

⚠ Caution

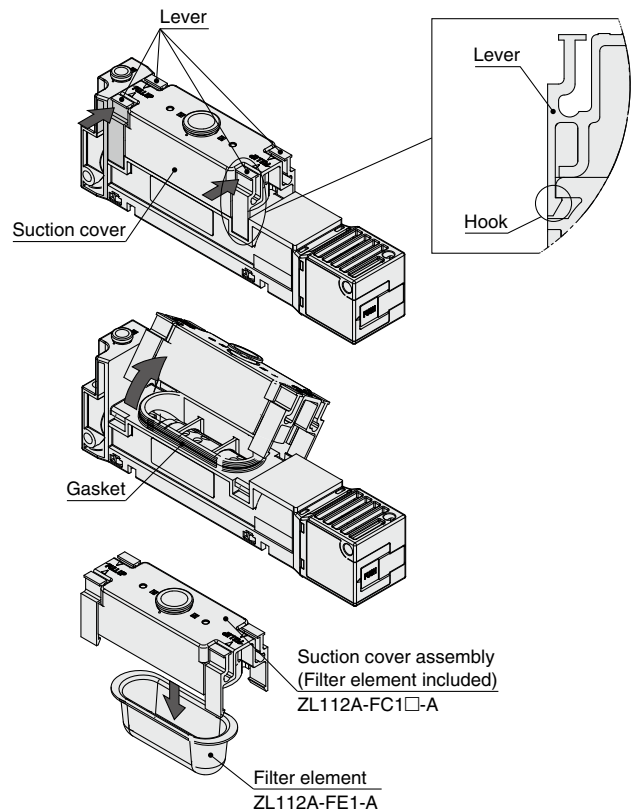
1. The suction cover can be attached or detached at a touch.

Suction cover can be removed by pushing the suction cover levers (2 pcs.) on the side. (It can be removed from the opposite side as well.)

Replace the filter element assembled in the filter case.

Check that the gasket is correctly fit in the groove before mounting the suction cover.

Check that the lever hook is locked in the correct position when mounting the suction cover. If the hook or the lever is damaged or deformed, replace the suction cover assembly.



Ejector Exhaust

⚠ Caution

1. The exhaust resistance should be as small as possible to obtain the full ejector performance.

There should be no shield around the exhaust port for the silencer exhaust specification. For the port exhaust specification, the back pressure should be 5 kPa or less, as exhaust resistance is generated with some piping bore sizes and piping lengths.

DO NOT block the exhaust port. The product will fracture or break.



ZL Series Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <http://www.smcworld.com>

Ejector Exhaust

⚠ Caution

2. If the sound absorbing material is clogged, it will cause a reduction in the ejector performance.

In particular, if it is used in a dusty environment, not only the filter element, but also the sound absorbing material can be clogged. It is recommended to replace the sound absorbing material periodically.

3. Air is exhausted from the connecting part between the silencer case and silencer cover. This does not affect the performance of the product.

4. The sound absorbing material can be replaced with a single operation.

Push the area where word "PUSH" is printed on the silencer cover in direction shown in Fig. 1.

The silencer cover will come out. (See Fig. 2) Remove the sound absorbing material 1 and 2 and replace with the new ones. (See Fig. 3)

After replacing the sound absorbing material, place the end surface of the sound absorbing material 1 to the end surface of the diffuser while engaging the hooks to the hook holes and push the silencer cover back into the place. (See Fig. 4)

Fig. 1

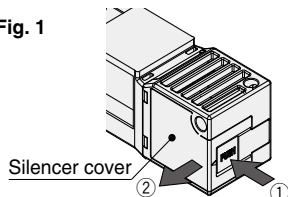


Fig. 2

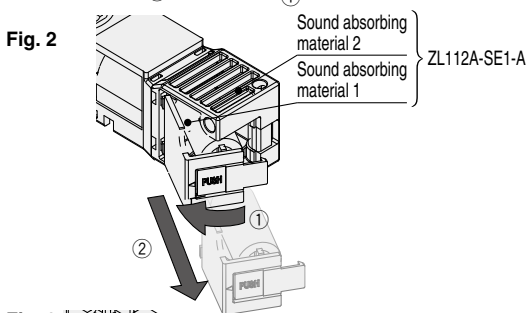


Fig. 3

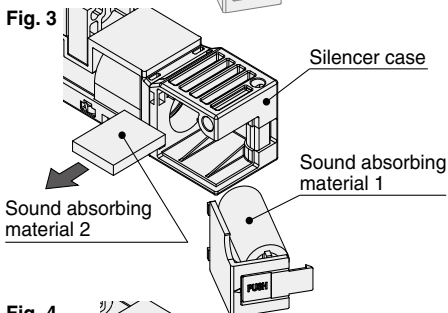
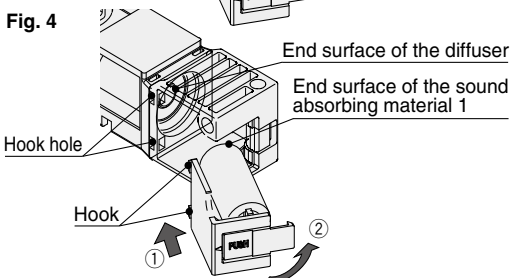


Fig. 4

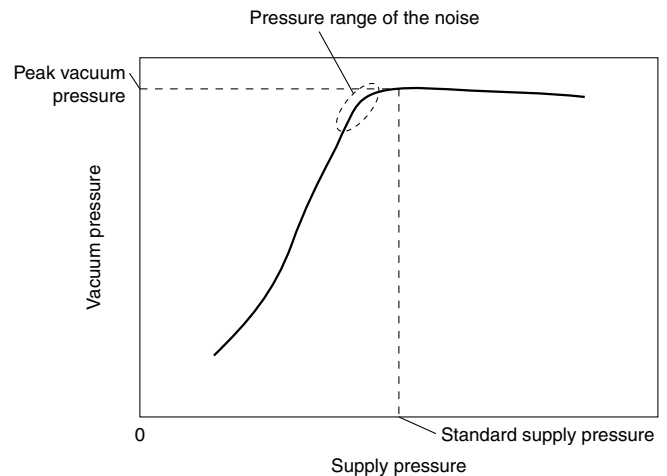


* When the product is mounted with the silencer cover side facing to the wall, maintenance shown in the figures above is not possible. Remove the product from the wall for maintenance.

Exhaust Noise

⚠ Caution

- When vacuum ejector generates vacuum, noise can be heard from the exhaust port when the standard supply pressure is close to the pressure that generates peak vacuum pressure making vacuum pressure unstable. If the vacuum pressure range is adequate for adsorption, there should not be a problem. If the noise causes a problem or affects the setting of the pressure switch, change the supply pressure slightly to avoid the pressure range of the noise.



Vacuum Break Flow Adjusting Needle

⚠ Caution

1. The flow-rate characteristics show the representative values of the product itself.

They may change depending on piping, circuit and pressure conditions, etc. The flow-rate characteristics and the number of needle rotations vary due to the range of the specifications of the product.

2. The needle has a retaining mechanism, so it will not turn further when it reaches the rotation stop position.

Turning the needle too far may cause damage.

3. Do not use tools, such as pliers, to rotate the knob.

This can cause the idle rotation of the knob or damage.

4. Do not over tighten the lock nut.

It is possible to tighten the lock nut (hexagon) manually. When tightening further with tools, tighten by approximately 15° to 30°. Over tightening may cause breakage.

Connection of the Solenoid Valve or Pressure Switch

⚠ Caution

1. Incorrect wiring can damage the switch and cause failure or malfunction. Connections should only be made when the power supply is turned off.

2. Do not attempt to insert or pull out the connector while the power is on. Otherwise, it may cause malfunction.



ZL Series

Specific Product Precautions 3

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <http://www.smcworld.com>

Connection of the Solenoid Valve or Pressure Switch

⚠ Caution

- Malfunctions stemming from noise may occur if the wire is installed in the same route as that of power or high-voltage cable. Wire the switch independently.
- Be sure to ground the frame ground (FG) terminal when using a commercially available switching power supply. (Pressure switch)

Environment

⚠ Warning

- The solenoid valve and pressure switch are not designed to be explosion proof, dust proof or drip proof. Never use in an atmosphere of flammable gas or explosive gas.

⚠ Caution

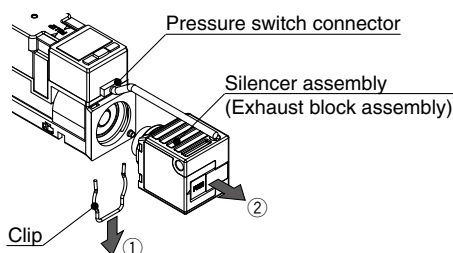
- The pressure switch and CE marked solenoid valve are CE compliant, but not immune to lightning strikes. Take measures against lightning strikes in your system.
- Do not use the product in a place where static electricity is a problem. It may result in system failure or malfunction.

Removal/Mounting of the Solenoid Valve or Pressure Switch Connector

⚠ Caution

- Do not attempt to insert or pull out the connector while the power is on. Otherwise, it may cause switch output malfunction.
- Before removal or mounting of the pressure switch connector, it is necessary to remove the silencer assembly (exhaust block assembly). Remove the silencer assembly (exhaust block assembly) following the procedure below in order to remove or to mount the pressure switch connector.

Remove the clip using flat blade screwdriver from the bottom of the product. Remove the silencer assembly (exhaust block assembly) from the body. Remove or mount the pressure switch connector.



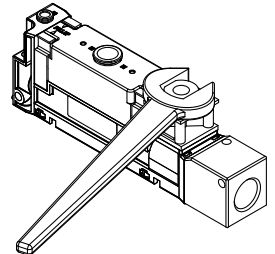
Piping to the Vacuum Port Adapter

⚠ Caution

- When mounting or removing the fitting, etc. to or from the vacuum port adapter, hold the vacuum port adapter with a wrench (across the flats 19).

Recommended tightening torque: 3 to 5 N·m

The product may break, if it is held by hand.



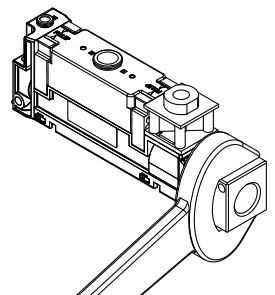
Piping to the Exhaust Port

⚠ Caution

- When mounting or removing the piping to or from the exhaust port, hold the exhaust block with a wrench (across the flats 36).

Recommended tightening torque: 20 to 25 N·m

The product may break, if it is held by hand.



Other Tubing Brands

⚠ Caution

- When using tubing from a manufacturer other than SMC, be careful of the tolerance of the tubing O.D.

1) Nylon tubing: Within ± 0.1 mm


2) Soft nylon tubing: Within ± 0.1 mm


3) Polyurethane tubing: Within $+0.15$ mm, within -0.2 mm


Do not use tubing which does not satisfy the specified tubing O.D. accuracy. It may cause difficulty in connecting the tubing, air leakage after connection, or disconnection of the tubing.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.