



Multistage Ejector

Series ZL



ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum
related

New models! ZL212 large flow rate type and ZL112 with valve.

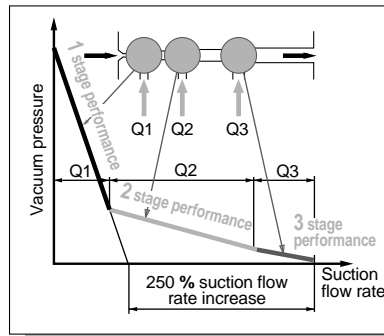
Multistage Ejector



Series ZL 112/212

Energy saving, large flow rate, 3 stage diffuser construction

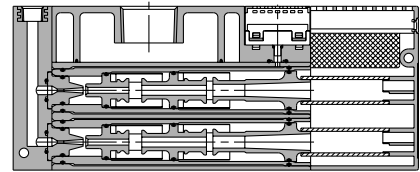
Suction flow rate increased 250% and air consumption reduced 20% with 3 stage diffuser construction
(Versus $\phi 1.3$, one stage model)



	Maximum suction flow rate ℓ/min (ANR)	Air consumption ℓ/min (ANR)
ZL112	100	63
ZL212	200	126

Series ZL212

Diffusers stacked and integrated
Compact size and large flow rate
(twice the flow rate of the ZL112)



Series ZL112 valve option now available (ZL112 only)

Release valve
Supply valve
Release flow rate adjustment needle
One-touch fitting feature
Makes piping work easy (ZL112 only)

Vacuum pressure sensor

- With digital vacuum pressure switch
 - LCD display/ZSE4
 - LCD display with back light/ZSE4B
- With vacuum adapter
- With vacuum pressure gauge

Exhaust port options

- Built-in silencer
- Port exhaust

Series variations

Series	Maximum suction flow rate ℓ/min (ANR)	Air consumption ℓ/min (ANR)	Vacuum pressure sensor options								
			Exhaust port		With valve		Digital vacuum pressure switch			Vacuum pressure gauge	Vacuum adapter
			Built-in silencer	Port exhaust	With supply valve/ release valve	With supply valve	ZSE4E	ZSE4B	ZSE4		
ZL112	100	63	●	●	●	●	●	●	●	●	●
ZL212	200	126	●	●			●	●	●	●	●

Multistage Ejector

Series ZL112

How to Order

Without valve ZL1 12 [] [] [] [] - Q

With valve ZL1 12 [] [] [K1] 5 [M] Z [] [E] 25 [] - Q

Nozzle diameter

12	ø1.2mm
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Exhaust specifications

Nil	Built-in silencer
P	Port exhaust

Exhaust port thread specification (port exhaust only)

Nil	Rc1/2
F	G1/2
N	1/2-14NPT
T	1/2-14NPTF

Supply valve/Release valve combination

K1	With supply and release valves
K2	With supply valve

Rated voltage

DC specifications	
5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

Electrical entry

G		Lead wire length 0.3m
H	Grommet	Lead wire length 0.6m
L		Lead wire length 0.3m
LN	L type plug connector	Without lead wires
LO		Without connector
M		Lead wire length 0.3m
MN	M type plug connector	Without lead wires
MO		Without connector

Lead wire length

Nil	0.5m
L	2.9m

Digital vacuum pressure switch specifications

For E (ZSE4) EB (ZSE4B)		
25	NPN output	Lead wire length 0.5 (2.9)m
26	Analogue output	Lead wire length 0.5 (2.9)m
65	PNP output	Lead wire length 0.5 (2.9)m

* Not required for nil, vacuum adapter (GN) and vacuum pressure gauge (G).

Vacuum pressure sensor

Nil	None
GN	Vacuum adapter Rc1/8
G	With vacuum pressure gauge
E	With digital vacuum pressure switch ZSE4
EB	With digital vacuum pressure switch ZSE4B

Manual override

Nil	Non-locking push type
D	Slotted locking type

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)

Note 1) Type U is 24 or 12VDC only.

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Vacuum related

Series ZL

Standard



With valve



With vacuum pressure gauge



Adapter



Port exhaust



Ejector Specifications

Model	ZL112
Nozzle diameter	ø1.2mm
Maximum suction flow rate	100ℓ/min (ANR)
Air consumption	63ℓ/min (ANR)
Maximum vacuum pressure	-84kPa
Maximum operating pressure	0.7MPa
Supply pressure range	0.2 to 0.5MPa
Standard supply pressure	0.4MPa
Operating temperature range	5 to 50°C

Supply/Release Valve Specifications

Part Number	SYJ514-□□□
Type of valve actuation	N.C.
Fluid	Air
Operating pressure range	0.2 to 0.5MPa
Internal pilot type	
Ambient and fluid temperature	5 to 50°C
Response time (for 0.5MPa) ^{Note 1)}	25ms or less
Maximum operating frequency	5Hz
Manual operation	Non-locking push type, Slotted locking type
Pilot exhaust type	Pilot valve individual exhaust type, Main valve/Pilot valve common exhaust
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance ^{Note 2)}	150/30m/s ²
Enclosure	Dust proof

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

Note 2) Impact resistance: No malfunction when tested with a drop tester in the axial direction and at a right angle to the main valve and armature, one time each in both energized and deenergized states. (initial value)

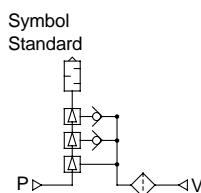
Vibration resistance: No malfunction when tested with one sweep of 8.3 to 2000Hz in the axial direction and at a right angle to the main valve and armature, one time each in both energized and deenergized states. (initial value)

Note 3) Refer to volume 1 "SYJ300/500/700" for details on valves.

Option Specifications

Vacuum pressure gauge specifications

Part number	GZ30S
Fluid	Air
Pressure range	-100 to 100kPa
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



Option Specifications

With digital vacuum pressure switch (ZSE4)



Digital vacuum pressure switch specifications

Part number	ZSE4-00-□□-X105	ZSE4B-00-□□-X105	
Display	LCD	LCD with back light	
Pressure setting range	-101 to 10KPa {-760 to 75mmHg}		
Maximum operating pressure	200KPa		
Operation indicator light (lights up when ON)	Green		ZX
Response frequency	200Hz (5ms)		ZR
Hysteresis	Hysteresis mode	Variable (3 digits or more)	ZM
	Window comparator mode	Fixed (3 digits)	ZY
Fluid	Air, Non-corrosive gas		ZH
Temperature characteristics	±3% F.S. or less		ZU
Repeatability	±1% F.S. or less		ZL
Operating voltage	12 to 24VDC (ripple ±10% or less)		ZF
Current consumption	25mA or less	45mA or less	ZP
Pressure indication	3 1/2 digits (character height 8mm)		ZCU
Self diagnostic function	(Over current ^{Note 1)} , Over pressure, Data error, Presence of pressure at 0 clear		Vacuum related
Operating temperature range	0 to 50°C (with no condensation)		
Noise resistance	500Vp-p, Pulse width: 1μS, Start up: 1nS		
Withstand voltage	Between external terminal batch and case: 1000VAC 50/60Hz for 1 min.		
Insulation resistance	Between external terminal batch and case: 2MΩ (at 500VDC)		
Vibration resistance	2hrs. each in X, Y, Z directions at smaller of 10 to 500Hz with amplitude 1.5mm, or acceleration 10G		
Impact resistance	100G in X, Y, Z directions, 3 times each		

Note 1) Not available on Analogue output type.

* Refer to volume 4 "Pressure Switch" for details on switches.

Output specifications

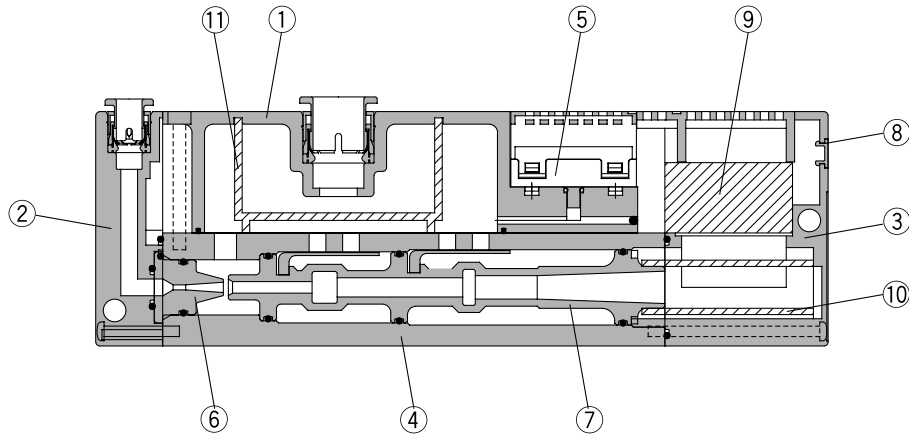
ZSE4 ZSE4B		
	-25 (L)	1 output NPN open collector 30V, 80mA or less
	-26 (L)	Analogue output (1 to 5V)
	-67 (L)	1 output PNP open collector 80mA or less

* Refer to volume 4 "Pressure Switch" for details on switches.

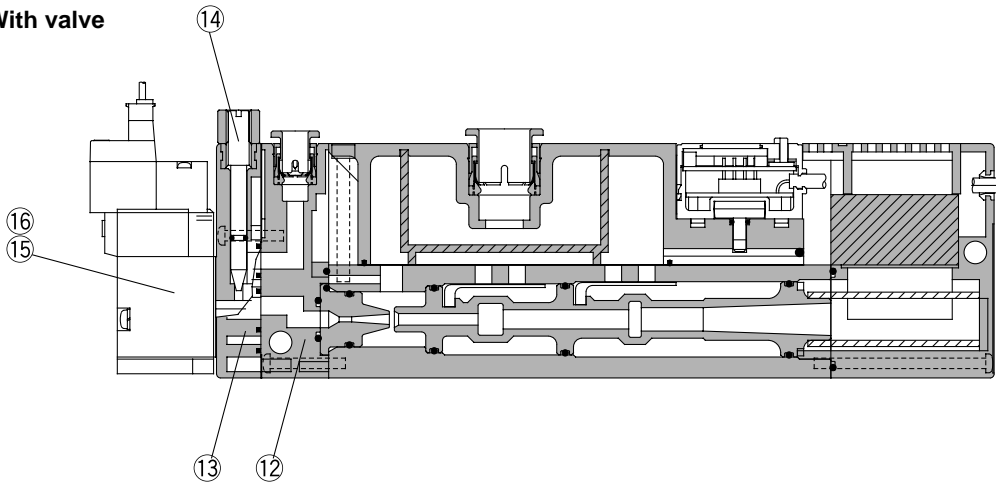
Series ZL

Construction

Without valve



With valve



Parts list

No.	Description	Part No.	Note
1	Suction cover		
2	Front cover		Without valve
3	End cover		
4	Body		
5	Vacuum sensor unit		
6	Nozzle		
7	Diffuser		
8	Detent plug	P397110	Other than vacuum switch
	Lead wire cover	P397176	Vacuum switch specifications
12	Front cover B		With valve
13	Valve plate		With valve
14	Needle		With valve
15	Supply valve (N.C.)	SYJ514	With valve
16	Release valve (N.C.)	SYJ514	With valve

Replacement parts

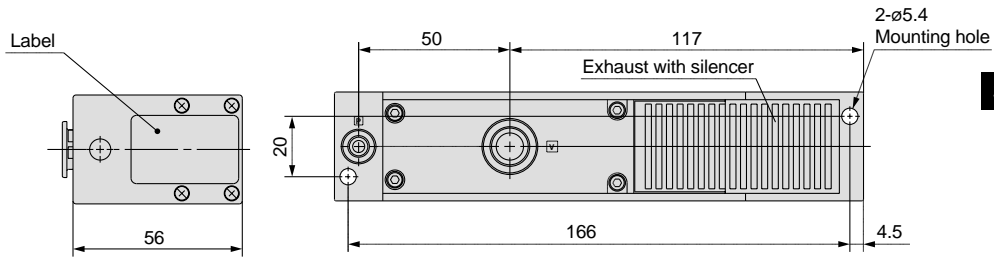
No.	Description	Material	Part No.
9	Sound absorbing material B	PVF	ZL112-SP01 (set no. for 9, 10 & 11)
10	Sound absorbing material A	PVF	
11	Suction filter	PE	

* When ordering a vacuum pressure gauge or a digital vacuum pressure switch separately, use the part numbers shown in the option specifications on page 3.7-5.

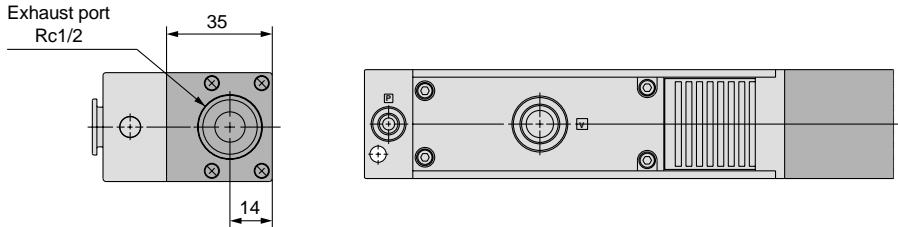
Dimensions/Series ZL112 (without Valve)

Scale: 40%

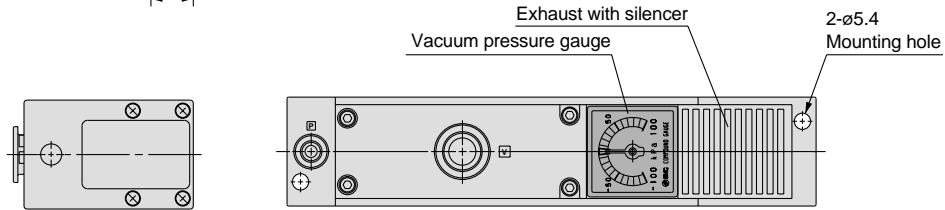
**Standard
ZL112**



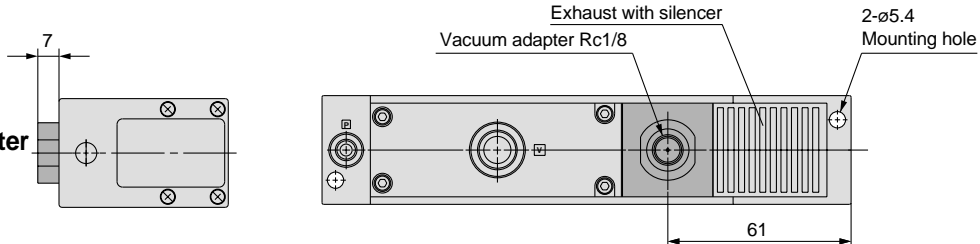
**Port exhaust
ZL112P**



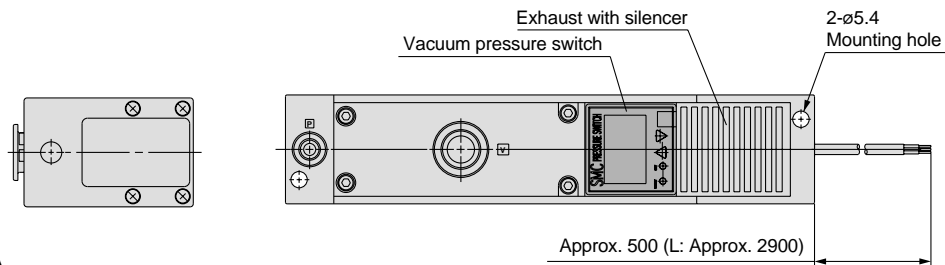
**With vacuum
pressure gauge
ZL112-G**



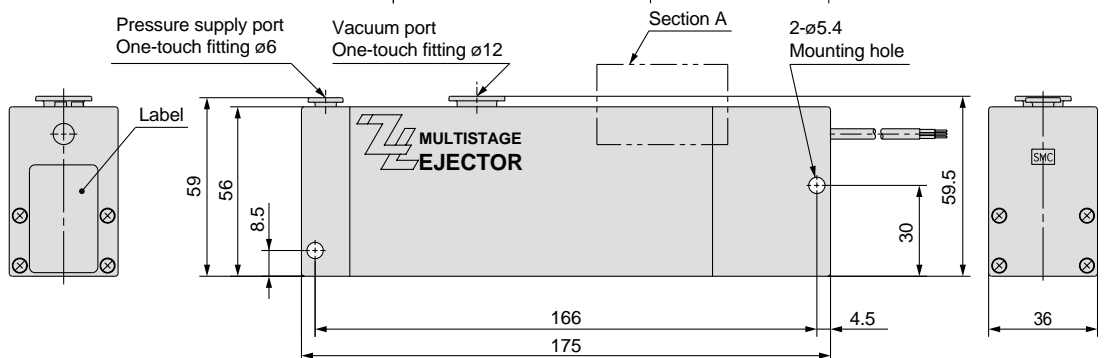
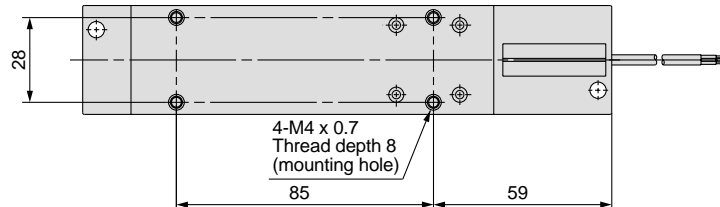
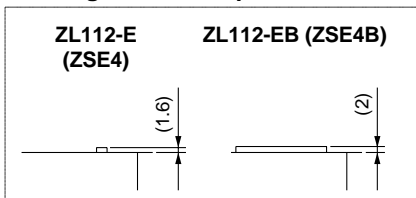
**With vacuum adapter
ZL112-GN**



**With digital vacuum
pressure switch
ZL112-E**



**Section A
with digital vacuum pressure switch**



ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

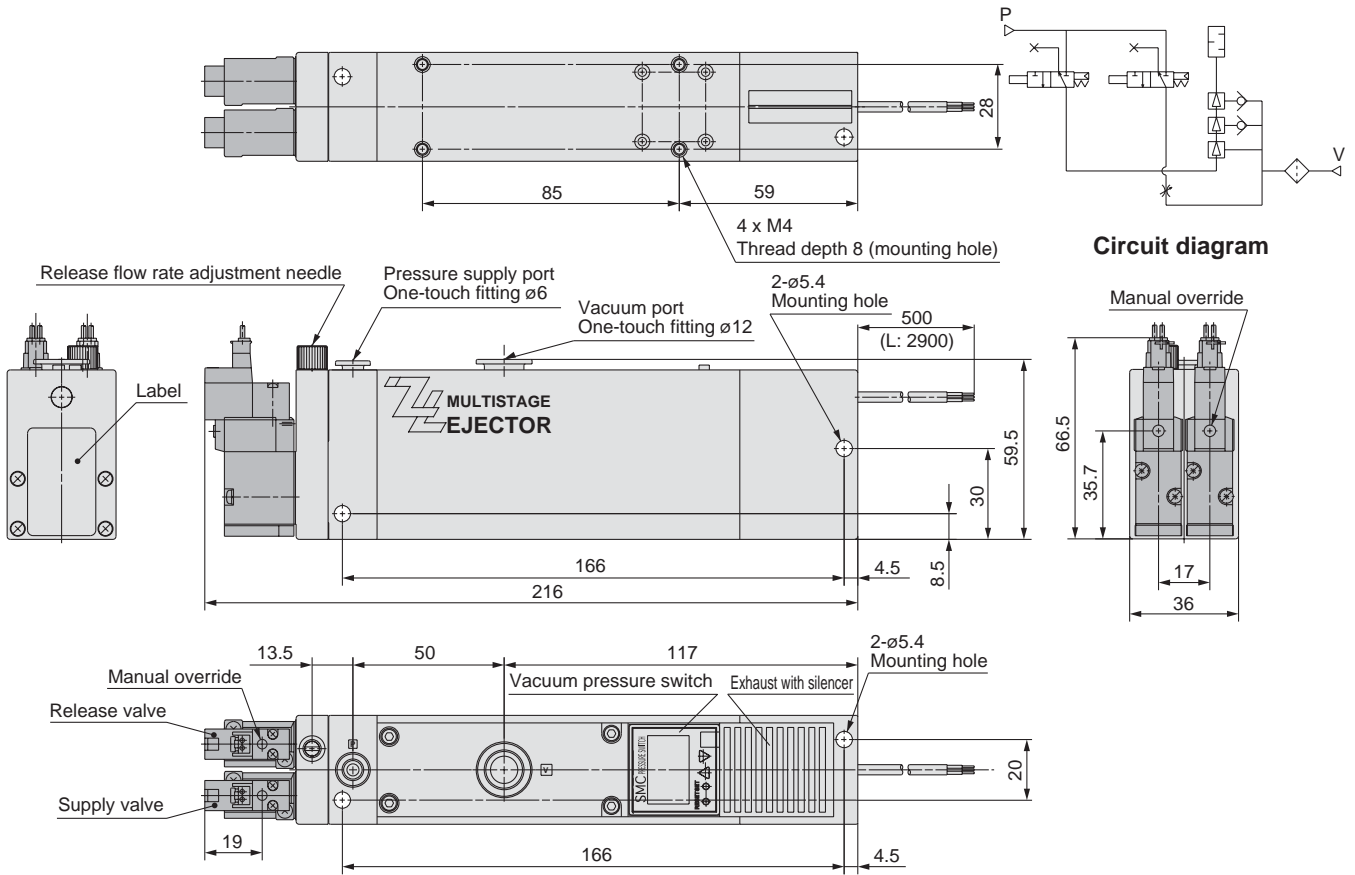
Vacuum related

Series ZL

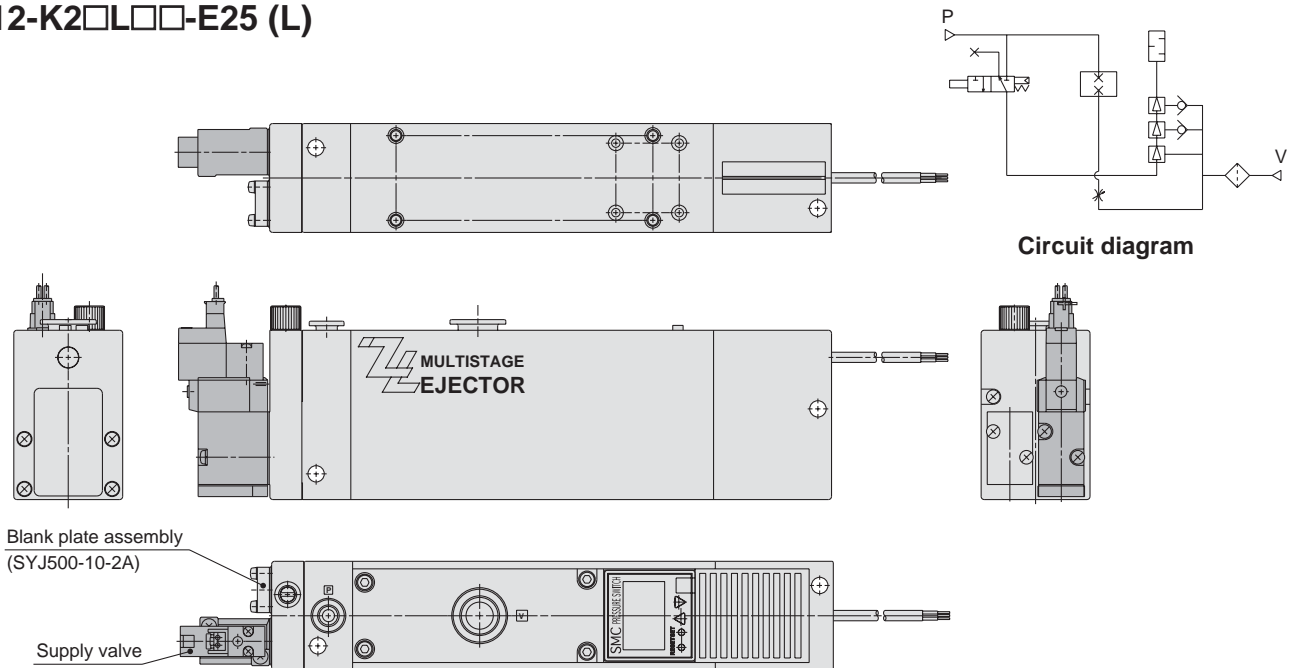
Dimensions/Series ZL112 (with Valve)

With supply valve and release valve
ZL112-K1□L□□-E25 (L)

Scale: 40%



With supply valve
ZL112-K2□L□□-E25 (L)



Multistage Ejector Series ZL212

Standard



With vacuum pressure gauge



With digital vacuum pressure switch



With adaptor



Port exhaust



How to Order

ZL2 12 [] [] [] [] -Q

Nozzle diameter
12 ø1.2mm

Exhaust specifications

Nil	Built-in silencer
P	Port exhaust

Vacuum pressure sensor

Nil	None
GN	Adaptor Rc1/8
G	With vacuum pressure gauge
E	With digital vacuum pressure switch ZSE4
EB	With digital vacuum pressure switch ZSE4B

Lead wire length

Nil	0.5m
L	2.9m

Digital vacuum pressure switch specifications

For E (ZSE4) EB (ZSE4B)		
25	NPN output	Lead wire length 0.6 (3.0)m
26	Analogue output	Lead wire length 0.6 (3.0)m
65	PNP output	Lead wire length 0.6 (3.0)m

* Not required for nil, vacuum adaptor (GN) and vacuum pressure gauge (G).

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

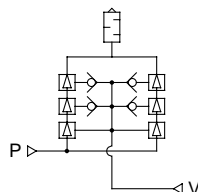
ZCU

Vacuum related

Ejector Specifications

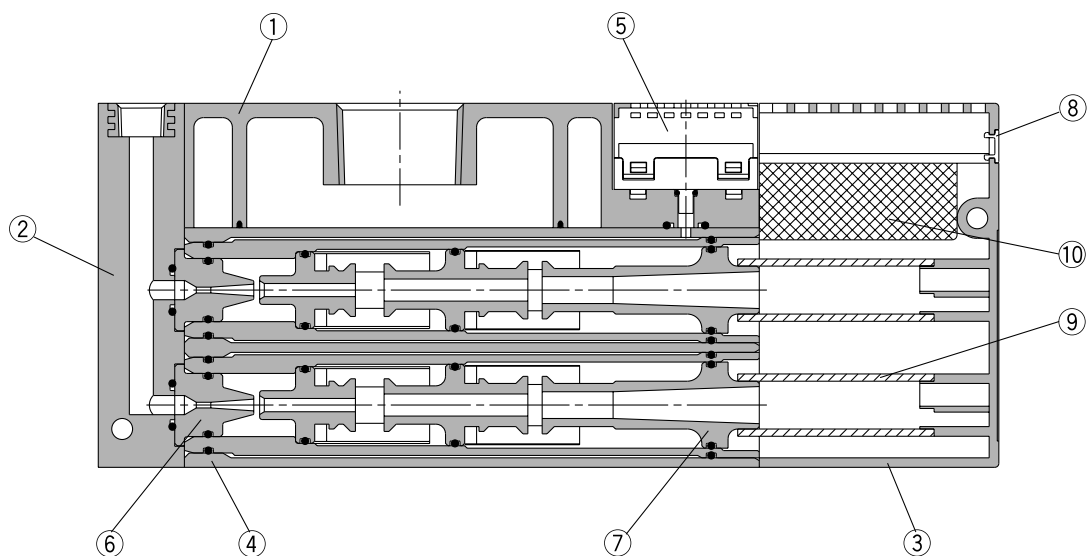
Model	ZL212
Nozzle diameter	ø1.2mm x 2
Maximum suction flow rate	200ℓ/min (ANR)
Air consumption	126ℓ/min (ANR)
Maximum vacuum pressure	-84kPa
Maximum operating pressure	0.7MPa
Supply pressure range	0.2 to 0.5MPa
Standard supply pressure	0.4MPa
Operating temperature range	5 to 50°C

Symbol
Standard



Series ZL

Construction



Parts list

No.	Description	Part No.	Note
1	Suction cover		
2	Front cover A		
3	End plate		
4	Body		
5	Vacuum sensor unit		
6	Nozzle		
7	Diffuser		
8	Detent plug	P397110	Other than vacuum switch
	Lead wire cover	P397176	Vacuum switch specifications

Replacement parts

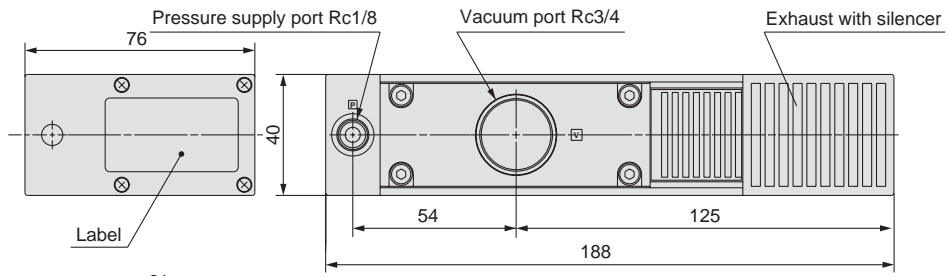
No.	Description	Material	Part No.
9	Sound absorbing material A	PVF	P397114
10	Sound absorbing material	PVF	P397230

* When ordering a vacuum pressure gauge or a digital vacuum pressure switch separately, use the part numbers shown in the option specifications on page 3.7-5.

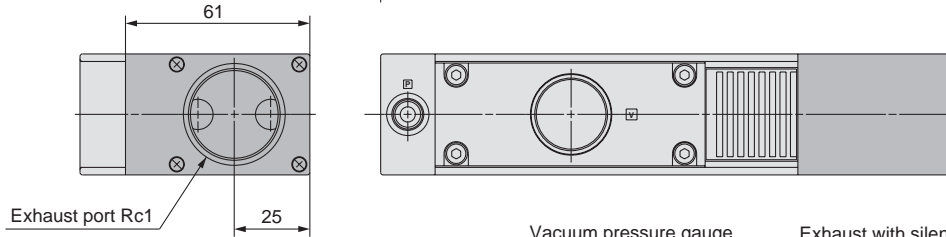
Dimensions/Series ZL212

Scale: 40%

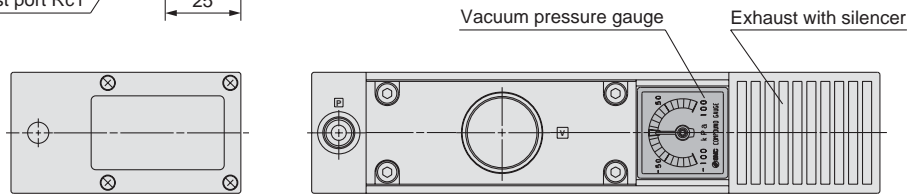
**Standard
ZL212**



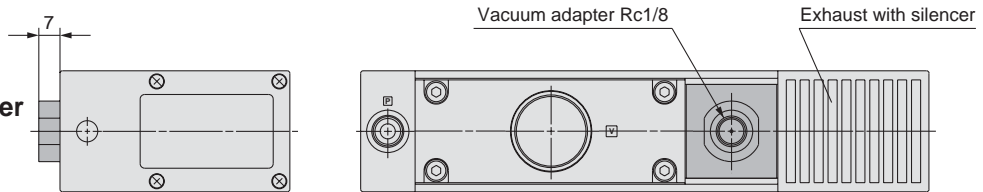
**Port exhaust
ZL212P**



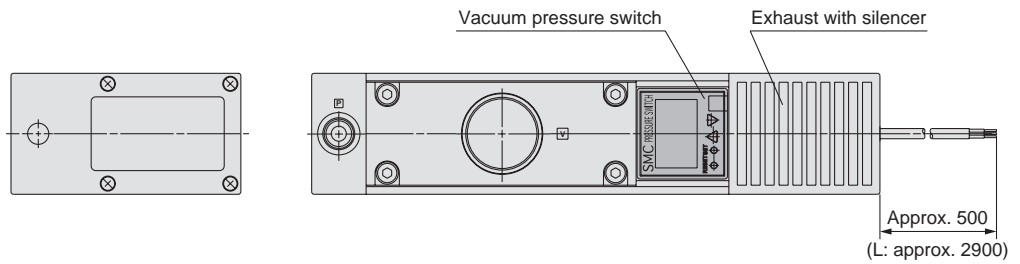
**With vacuum
pressure gauge
ZL212-G**



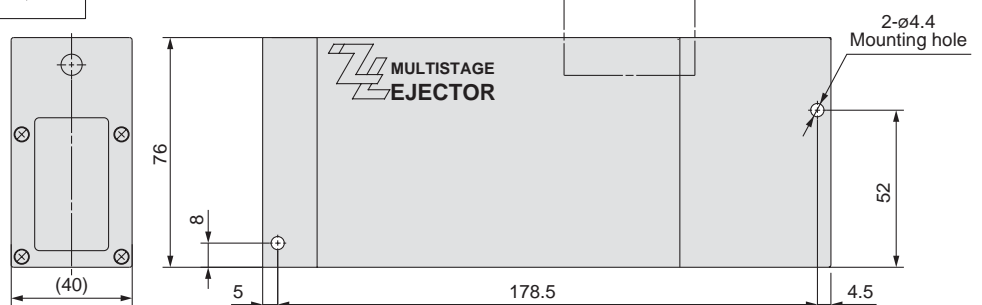
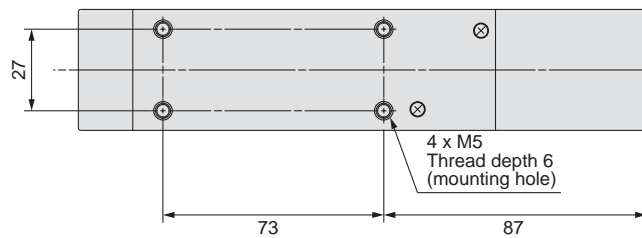
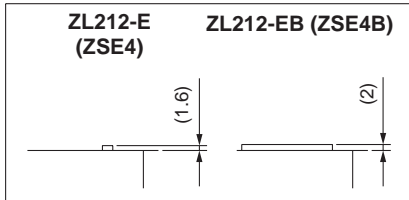
**With vacuum adapter
ZL212-GN**



**With digital vacuum
pressure switch
ZL212-E**



**Section A
with digital vacuum pressure switch**



ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum related

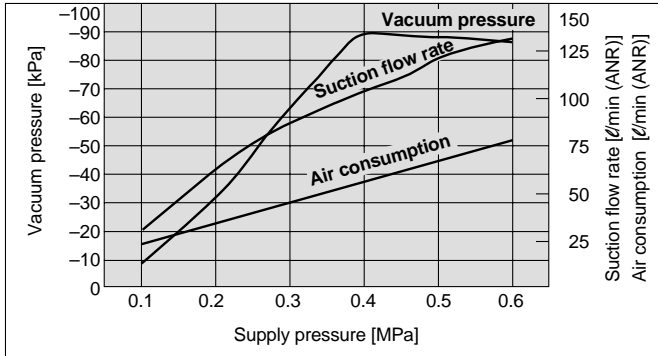


Series ZL Specific Product Precautions

Selection

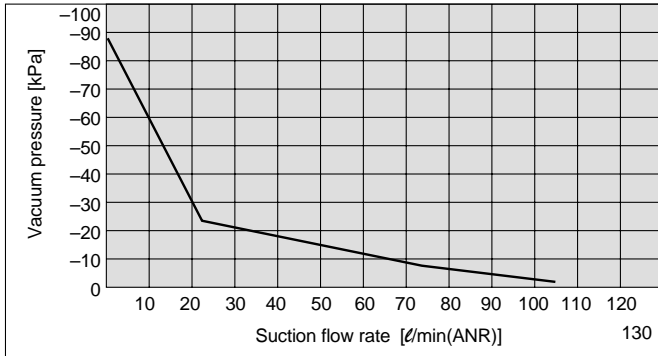
ZL112

Exhaust characteristics



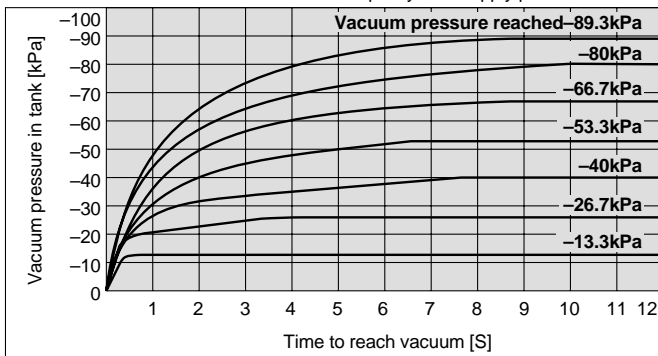
Flow rate Characteristics

Supply pressure: 0.4MPa



Time to reach vacuum

Measurement conditions/Tank capacity: 1ℓ Supply pressure: 0.4MPa

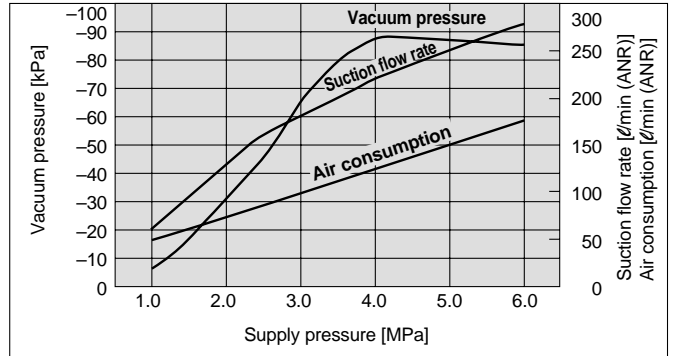


Viewing the graphs

The graphics indicate the time required to reach a vacuum pressure determined by adsorption conditions for work pieces, etc., starting from atmospheric pressure in a 1ℓ sealed tank. Approximately 8.8 seconds are necessary to attain a vacuum pressure of -89.3kPa.

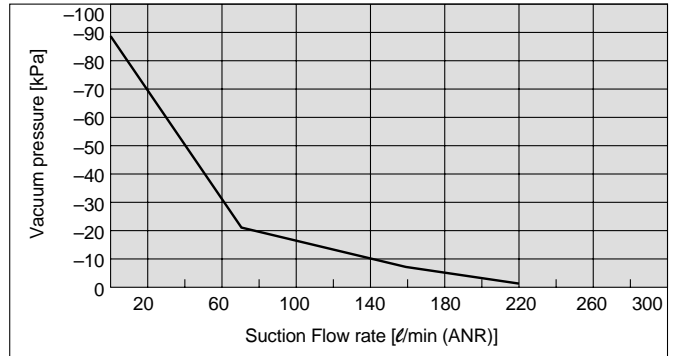
ZL212

Exhaust characteristics



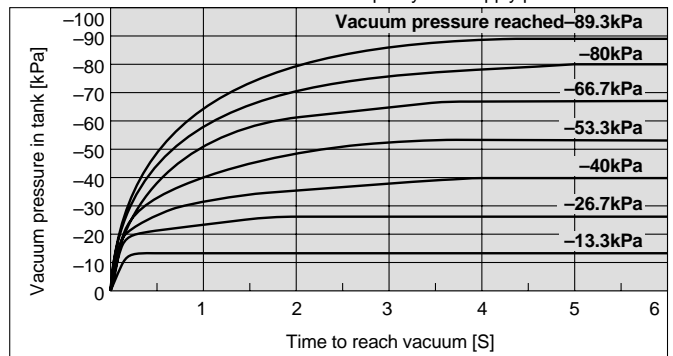
Flow rate characteristics

Supply pressure: 0.4MPa



Time to reach vacuum

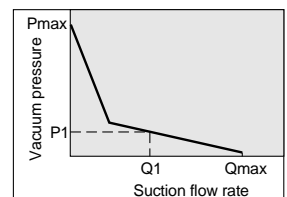
Measurement conditions/Tank capacity: 1ℓ Supply pressure: 0.4MPa



Viewing the graphs

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 work pieces which are permeable or subject to leakage, etc., caution is required as the vacuum pressure will not be very high.