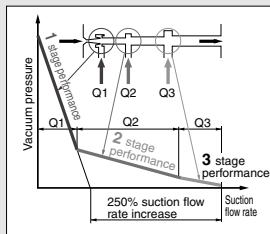


# Multistage Ejector

## ZL112/212 Series

### Energy-saving, large flow rate, 3 stage diffuser construction

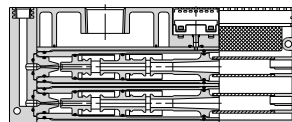
Suction flow rate increased 250% and air consumption reduced 20% with 3 stage diffuser construction  
(Versus  $\phi 1.3$ , one stage model)



	Suction flow rate (L/min (ANR))	Air consumption (L/min (ANR))
<b>ZL112</b>	<b>100</b>	<b>63</b>
<b>ZL212</b>	<b>200</b>	<b>126</b>

### ZL212 Series

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



#### Vacuum pressure sensor

With adaptor for vacuum



With vacuum pressure gauge



Digital vacuum pressure switch



ZSE30A

- Rated pressure range: 0.0 to -101.0 kPa

- 3-step setting

①



Push

②



Adjust to set-value with  $\Delta$   $\nabla$  buttons.

③



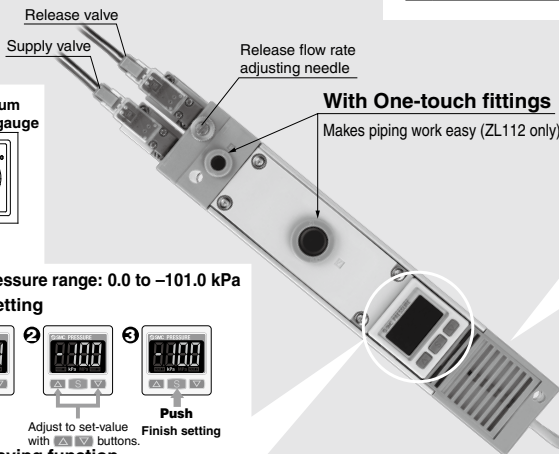
Push

Finish setting

- Power-saving function

Power consumption is reduced by turning off the monitor. (Reduce power consumption by up to 20%.)

\* For ZSE30A series, refer to the Best Pneumatics No. 8 for details.



#### With One-touch fittings

Makes piping work easy (ZL112 only)

#### Exhaust port

Built-in silencer



Port exhaust

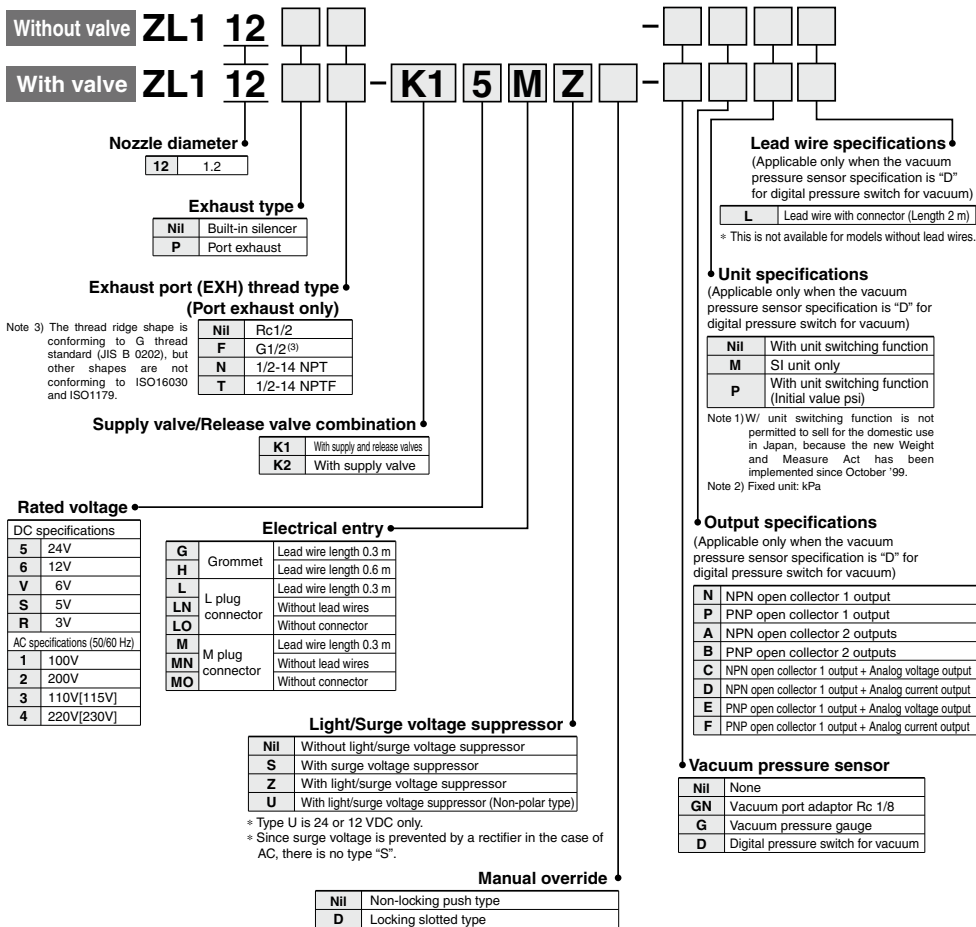


### Series Variations

Series	Maximum suction flow rate (L/min (ANR))	Air consumption (L/min (ANR))	Vacuum pressure sensor option					
			Exhaust port		With valve		With digital vacuum pressure switch ZSE30A	Vacuum pressure gauge
			Built-in silencer	Port exhaust	With supply and release valves	With supply valve		Vacuum adaptor
<b>ZL112</b>	100	63	●	●	●	●	●	●
<b>ZL212</b>	200	126	●	●			●	●

# Multistage Ejector **ZL112 Series**

## How to Order



**Standard**

**With valve**

**With vacuum pressure gauge**

**Vacuum port adapter**

**Port exhaust**

**Ejector Specifications**

Model	ZL112
Nozzle diameter	1.2 mm
Maximum suction flow rate	100 L/min (ANR)
Air consumption	63 L/min (ANR)
Maximum vacuum pressure	-84 kPa
Maximum operating pressure	0.7 MPa
Supply pressure range	0.2 to 0.5 MPa
Standard supply pressure	0.4 MPa
Operating temperature range	5 to 50°C

**Supply/Release Valve Specifications**

Part no.	SYJ514-□□□□
Type of valve actuation	N.C.
Fluid	Air
Operating pressure range	0.15 to 0.7 Mpa
Internal pilot type	
Ambient and fluid temperature	-10°C to 50°C (No freezing)
Response time (For 0.5 MPa) <sup>(1)</sup>	25 ms or less
Maximum operating frequency	5 Hz
Manual override	Non-locking push type/Locking slotted type
Pilot exhaust type	Pilot valve individual exhaust, Main valve/Pilot valve common exhaust
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance <sup>(2)</sup>	150/30 m/s <sup>2</sup>
Enclosure	Dust proof

Note 1) Based on JIS B 8374-1981 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 45 to 2000 Hz 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 "Best Pneumatics No. 1-2" for details on valves.

**Vacuum Pressure Gauge Specifications**

Part no.	GZ30S
Fluid	Air
Pressure range	-100 to 100 kPa
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

**Weight**

ZL112 (Basic)	450 g
Port exhaust	+110 g
Digital pressure switch for vacuum (Excluding lead wire)	+43 g
Digital pressure switch for vacuum (Including 3 cores lead wire)	+81 g
Digital pressure switch for vacuum (Including 4 cores lead wire)	+85 g
Valve (per 1 pc.)	+45 g

**ZK2**
**ZQ**
**ZR**
**ZB**
**ZA**
**ZX**
**ZM**
**ZL**
**ZH**
**ZH**
**ZH**
**-X267**
**ZHP**
**ZU**
**VQD-V**

# ZL112 Series

## Vacuum Pressure Switch Unit/Digital Pressure Switch for Vacuum: ZSE30A-00-□-□□□



### Specifications

Rated pressure range	0.0 to -101.0 kPa
Set pressure range	10.0 to -105.0 kPa
Withstand pressure	500 kPa
Minimum unit setting	0.1 kPa
Applicable fluid	Air
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)
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 Window comparator mode
Variable	Variable (0 to variable)
Output voltage (Rated pressure range)	1 to 5 V ±2.5% F.S.
Linearity	±1% F.S. or less
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/sec.
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)
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. (Based on 25°C)
Lead wire	Oilproof heavy-duty vinyl cable, 3 cores ø3.5, 2 m 4 cores Conductor area: 0.15 mm <sup>2</sup> (AWG26) Insulator O.D.: 1.0 mm
Standards	CE Marking, UL/CSA, RoHS compliance

### Vacuum Pressure Switch Replacement

It is impossible to replace only the vacuum pressure switch.  
Please replace the suction cover assembly.  
For ordering information, refer to How to Order.

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

For details about vacuum pressure switch functions, refer to the ZSE30A series in the Best Pneumatics No. 8.

#### ●Pressure switch correspondence table

Digital pressure switch  
ZSE30A series

ZSE30A-00-□-□□□

Multistage ejector  
ZL series

ZL \* 12 \* - \* - \* - \* - D - □ - □

Multistage ejector  
suction cover assembly

ZL \* 12 - SC - D - □ - □

Output specifications

Unit specifications

Lead wire specifications

### How to Order Suction Cover Assembly

ZL	12	-	SC	-	□	□	□	□
Ejector size	Vacuum pressure sensor	Lead wire specifications	Unit specifications	Output specifications	Unit specifications	Output specifications	Unit specifications	Output specifications
1 ZL112	NII None	NII None	NII With unit display switching function	N NPN open collector 1 output	M Fixed SI unit	N NPN open collector 1 output	M Fixed SI unit	N NPN open collector 1 output
2 ZL212	GN Vacuum port adaptor Rc1/8	L Lead wire with connector	P With unit display switching function	P PNP open collector 1 output	P With unit display switching function	G Vacuum pressure gauge	P With unit display switching function	P PNP open collector 1 output
	D Digital pressure switch for vacuum			A NPN open collector 2 outputs		D NPN open collector 1 output+Analog voltage output		A NPN open collector 2 outputs
				B PNP open collector 2 outputs		E PNP open collector 1 output+Analog current output		B PNP open collector 2 outputs
				C NPN open collector 1 output+Analog voltage output		F PNP open collector 1 output+Analog current output		C NPN open collector 1 output+Analog voltage output
				D NPN open collector 1 output+Analog current output				D NPN open collector 1 output+Analog current output
				E PNP open collector 1 output+Analog voltage output				E PNP open collector 1 output+Analog voltage output
				F PNP open collector 1 output+Analog current output				F PNP open collector 1 output+Analog current output

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

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

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

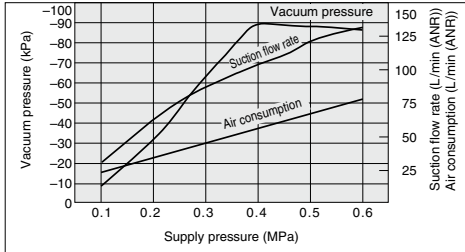
NII	With unit display switching function
M	Fixed SI unit
P	With unit display switching function

Note 1) W/ unit switching function is not permitted to sell for the domestic use in Japan, because the new Weight and Measure Act has been implemented since October, 99.  
Note 2) Fixed unit: kPa

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

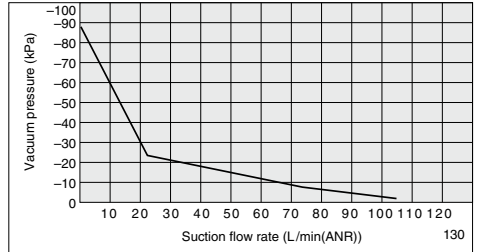
### ZL112

#### Exhaust Characteristics



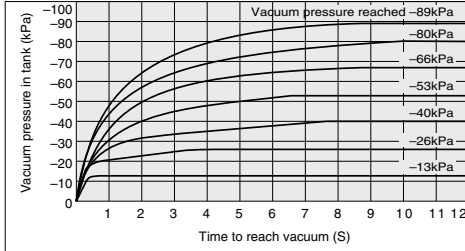
#### Flow Rate Characteristics

Supply pressure: 0.4 MPa



#### Time to Reach Vacuum

Tank capacity: 1L  
Supply pressure: 0.4 MPa

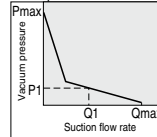


#### <How to Read the Graph>

The graphics indicate the time required to reach a vacuum pressure determined by adsorption conditions for workpieces, etc., starting from atmospheric pressure in a 1L sealed tank. Approximately 8.8 seconds are necessary to attain a vacuum pressure of -89 kPa.

#### <How to Read the Graph>

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.

ZK2

ZQ

ZR

ZB

ZA

ZX

ZM

ZL

ZH

ZH

ZH-X267

ZHP

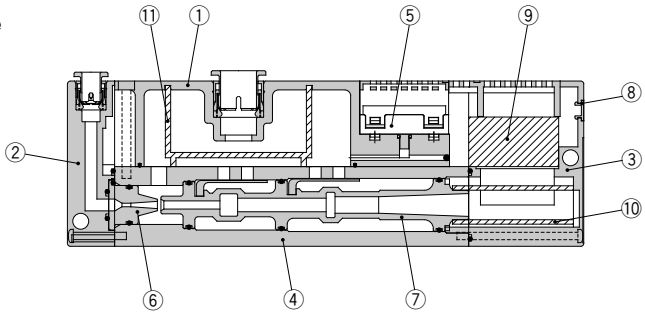
ZU

VQD-V

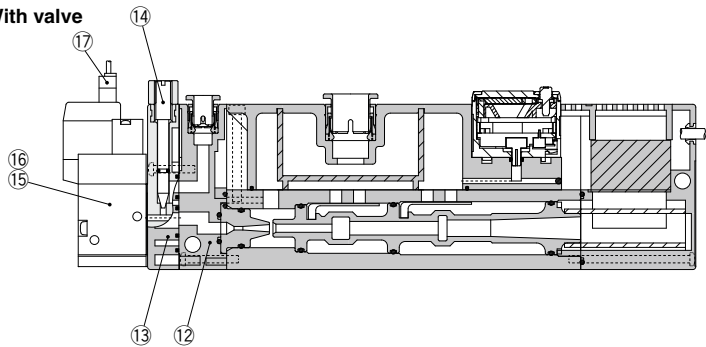
# ZL112 Series

## Construction

Without valve



With valve



### Comonent Parts

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		Other than vacuum switch
	Lead wire cover		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
17	Connector assembly	SYJ100-30-□A-□	With valve (Table1.)

### 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	

### ●Table1. How to order connector assembly

For DC

SY100-30-4A-□

For 100 VAC

SY100-30-1A-□

For other AC

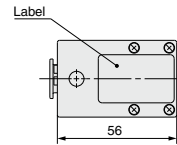
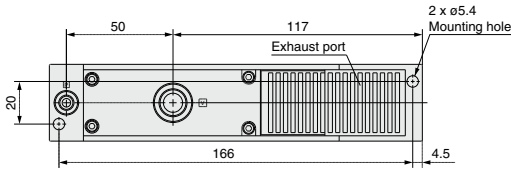
SY100-30-3A-□

### Lead wire length ●

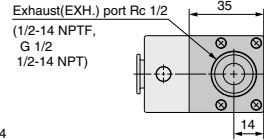
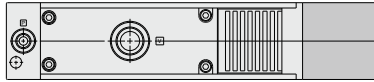
Nil	300mm(Standard)
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm
50	5000mm

## Dimensions: ZL112 Series (Without Valve)

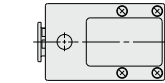
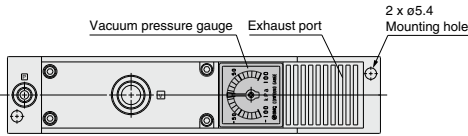
**Standard  
ZL112**



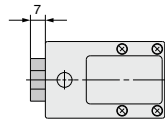
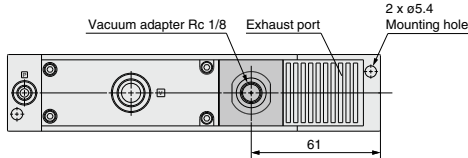
**Port exhaust  
ZL112P**



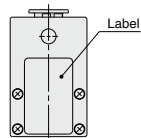
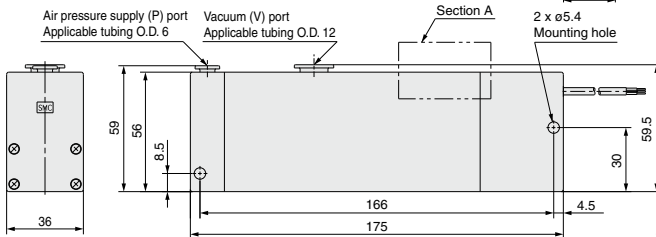
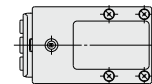
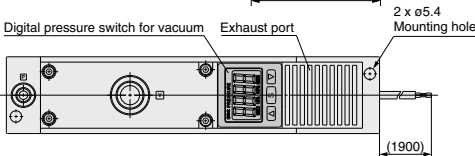
**With vacuum pressure gauge  
ZL112-G**



**With vacuum adapter  
ZL112-GN**

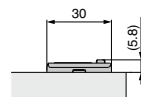


**With digital pressure switch for vacuum  
ZL112-D□□□**

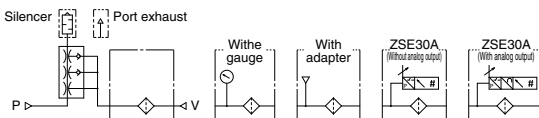


**Section A/  
With Digital Pressure Switch for Vacuum**

**ZL112-D□□□ (ZSE30A)**



### Circuit diagram

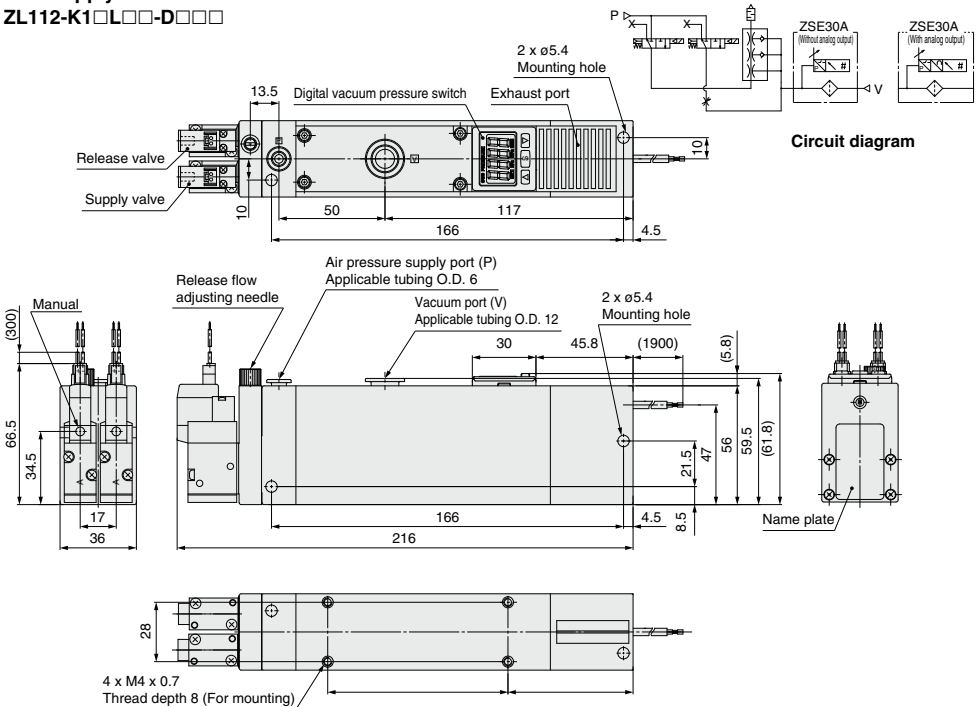


# ZL112 Series

## Dimensions: ZL112 Series (With Valve)

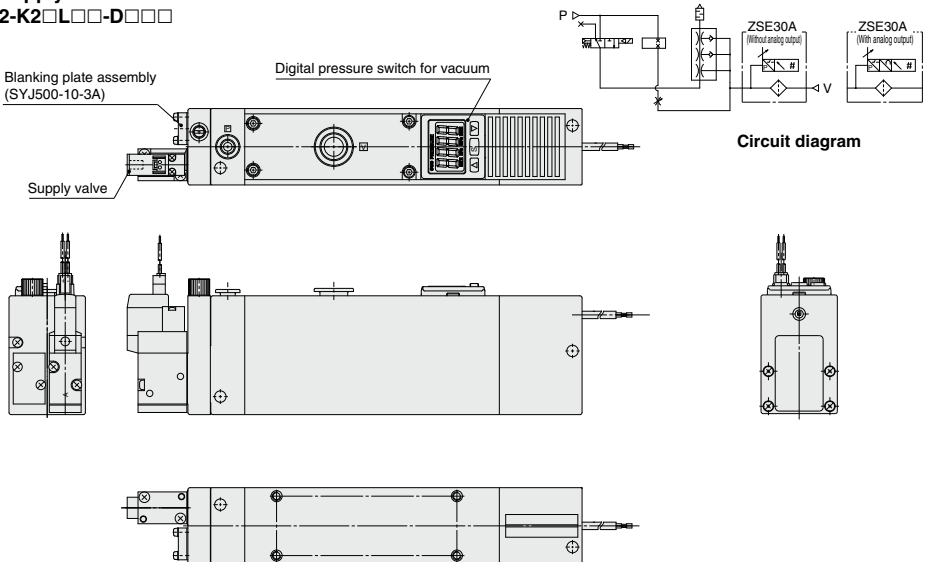
With supply valve and release valve

ZL112-K1□L□□-D□□□



With supply valve

ZL112-K2□L□□-D□□□





# Multistage Ejector ZL212 Series

Standard



With vacuum pressure gauge



With digital vacuum pressure switch



With adaptor



Port exhaust



## How to Order

ZL2 12

Nozzle diameter  
12 1.2

Exhaust specifications  
Nil Built-in silencer  
P Port exhaust

Vacuum pressure sensor  
Nil None  
GN Vacuum port adaptor Rc 1/8  
G Vacuum pressure gauge  
D Digital pressure switch for vacuum

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

L Lead wire with connector (Length 2 m)  
\* This is not available for models without lead wires.

### Unit specifications

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

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

Note 1) W/ unit switching function is not permitted to sell for the domestic use in Japan, because the new Weight and Measure Act has been implemented since October '99.

Note 2) Fixed unit: kPa

### Output specifications

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

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



**Made to Order**  
(Refer to page 218 for details.)

Symbol	Specifications/Contents
X132	Supply valve/Vacuum release valve

## Ejector Specifications

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

## Weight

ZL212	700 g
Port exhaust	+300 g
Digital pressure switch for vacuum (Excluding lead wire)	+43 g
Digital pressure switch for vacuum (Including 3 cores lead wire)	+81 g
Digital pressure switch for vacuum (Including 4 cores lead wire)	+85 g
Valve (per 1 pc.)	+45 g

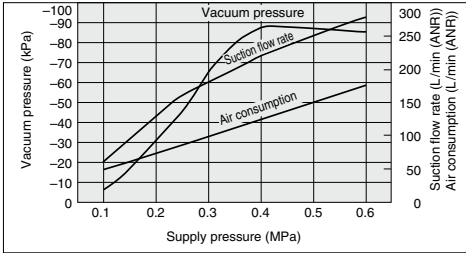


# ZL212 Series

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

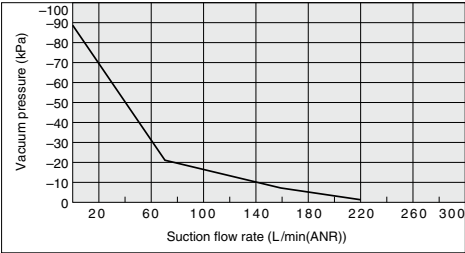
### ZL212

#### Exhaust Characteristics



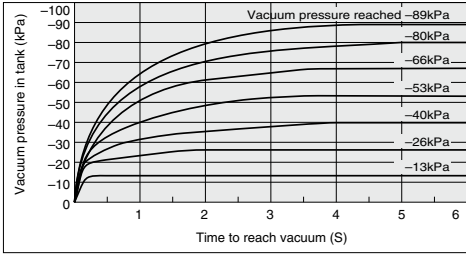
#### Flow Rate Characteristics

Supply pressure: 0.4 MPa



#### Time to Reach Vacuum

Tank capacity: 1L  
Supply pressure: 0.4 MPa

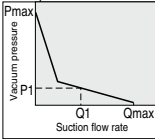


##### <How to Read the Graph>

The graphics indicate the time required to reach a vacuum pressure determined by adsorption conditions for workpieces, etc., starting from atmospheric pressure in a 1L sealed tank. Approximately 8.8 seconds are necessary to attain a vacuum pressure of -89 kPa.

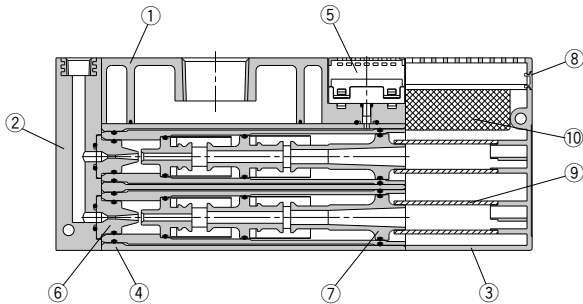
##### <How to Read the Graph>

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.

## Construction



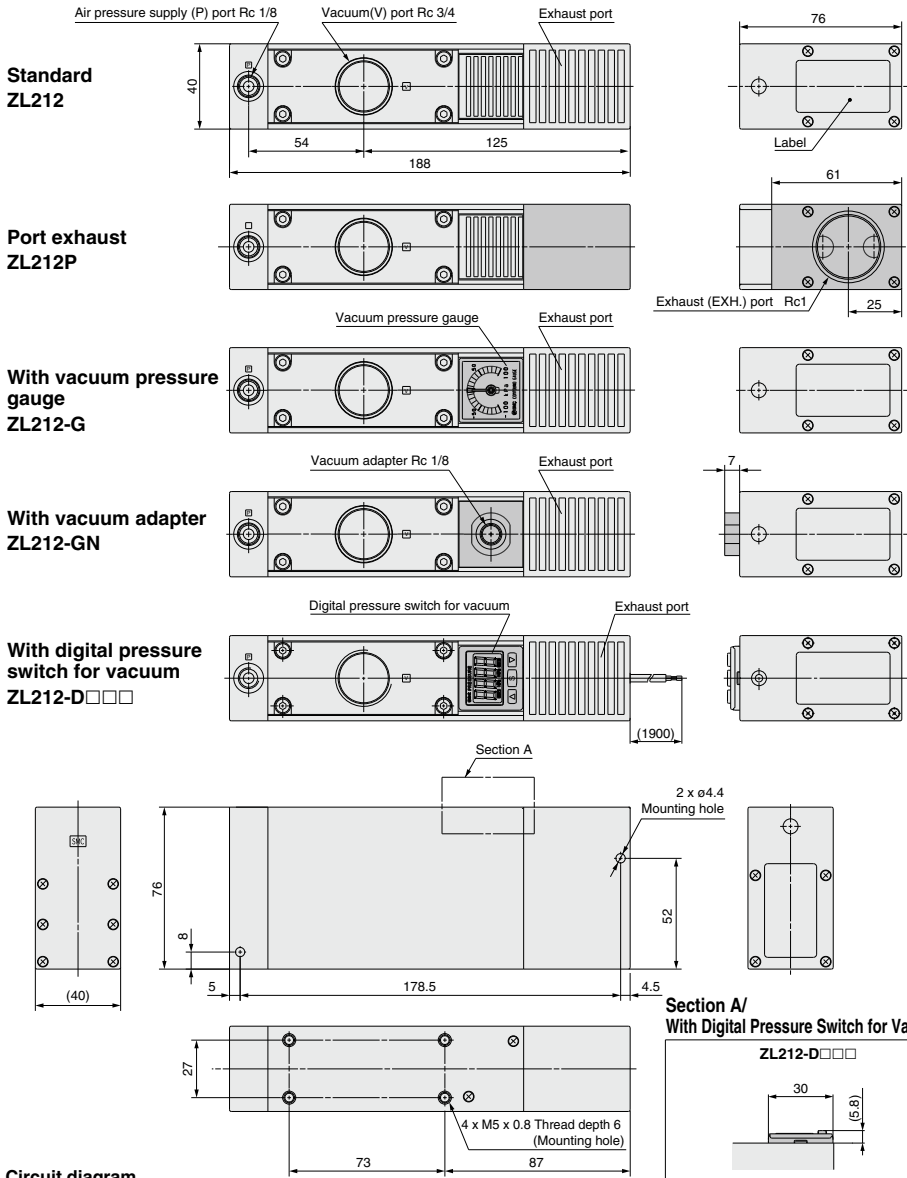
#### Component Parts

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

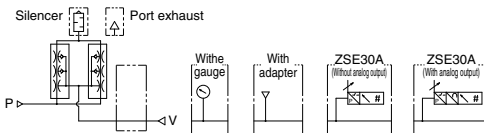
#### Replacement Parts

No.	Description	Material	Part no.
9	Sound absorbing material A	PVA sponge	ZL212-SP01
10	Sound absorbing material	PVA sponge	(Set no. for 9 & 10)

## Dimensions: ZL212 Series



### Circuit diagram



ZK2
ZQ
ZR
ZB
ZA
ZX
ZM
<b>ZL</b>
ZH
ZH
ZH-X267
ZHP
ZU
VQD-V

## 1 With Supply and Release Valves

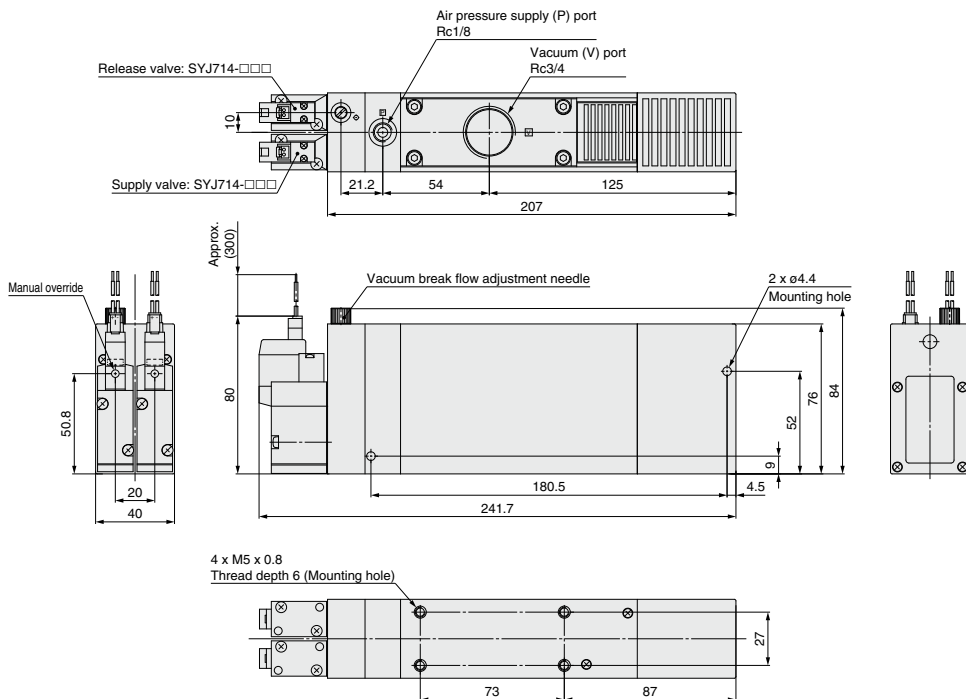
ZL212 Valve Voltage Electrical entry — Vacuum pressure switch Electrical entry — X132

With supply and release valves

ZL212 type with supply and release valves



## Dimensions





## ZL Series

# Specific Product Precautions

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 49 to 51 for Vacuum Equipment Precautions.

### Operation of Ejector Valves

#### Caution

1. When the air supply valve is turned ON, vacuum is generated by the flow of compressed air from the nozzle to the diffuser.

When the vacuum release valve is turned ON, the vacuum is quickly released as air passes through the release flow adjustment needle and flows to the vacuum port.

### Operating Environment

#### Caution

1. Avoid use exposed to direct sunlight.

### Solenoid Valves (ZL112 Series)

#### Caution

1. For specific product precautions on solenoid valves, refer to the Best Pneumatics No. 1-2.

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