

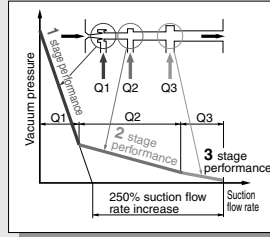
Multistage Ejector

ZL112/212 Series

The production of the ZL112 series was discontinued.
The ZL212 series has been remodeled. Click [here](#) for details.

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

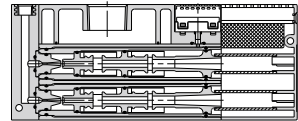
Suction flow rate increased 250% and air consumption reduced 20% with 3 stage diffuser construction (Versus $\phi 1.3$, one stage model)



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

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

- Push
- Adjust to set-value with \square \square buttons.
- Push Finish setting

With One-touch fittings
Makes piping work easy (ZL112 only)

Exhaust port
Built-in silencer

Port exhaust

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

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	Vacuum pressure gauge	Vacuum adapter
			Built-in silencer	Port exhaust	With supply and release valves	With supply valve	ZSE30A		
ZL112	100	63	●	●	●	●	●	●	●
ZL212	200	126	●	●			●	●	●

ZK2
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VQD-V

Multistage Ejector

ZL112 Series

The production of the ZL112 series was discontinued.
Click [here](#) for details.

How to Order

Without valve **ZL1 12**

With valve **ZL1 12** - **K1 5 M Z**

Nozzle diameter •

12	1.2
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Exhaust type •

Nil	Built-in silencer
P	Port exhaust

Exhaust port (EXH) thread type (Port exhaust only) •

Nil	Rc1/2
F	G1/2 ⁽³⁾
N	1/2-14 NPT
T	1/2-14 NPTF

Note 3) The thread ridge shape is conforming to G thread standard (JIS B 0202), but other shapes are not conforming to ISO16030 and ISO1179.

Supply valve/Release valve combination •

K1	Supply valve/Release valve combination
K2	Supply valve/Release valve combination

Rated voltage •

DC specifications	
5	24V
6	12V
V	6V
S	5V
R	3V
AC specifications (50/60 Hz)	
1	100V
2	200V
3	110V[115V]
4	220V[230V]

Electrical entry •

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

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.
* Since surge voltage is prevented by a rectifier in the case of AC, there is no type "S".

Manual override •

Nil	Non-locking push type
D	Locking slotted type

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)
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* 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

Vacuum pressure sensor

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

The production was discontinued.

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	Internal pilot type 0.15 to 0.7 Mpa
Ambient and fluid temperature	-10°C to 50°C (No freezing)
Response time (For 0.5 MPa) ⁽¹⁾	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 ⁽²⁾	150/30 m/s ²
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

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-X267

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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 mode	Variable (0 to variable)
Window comparator mode	Variable (0 to variable)
Analog output	
Voltage output	
Note 1) Output voltage (Rated pressure range)	1 to 5 V ±2.5% F.S.
Linearity	±1% F.S. or less
Output impedance	Approx. 1 kΩ
Note 2) 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 mm 4 cores Conductor area: 0.15 mm ² (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 the 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

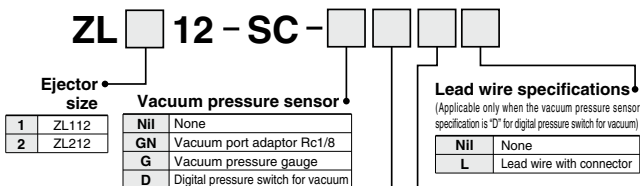
ZL * 12 - SC - D - □ - □ □ □

Output specifications ●

Unit specifications ●

Lead wire specifications ●

How to Order Suction Cover Assembly



● 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

● Unit specifications

(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

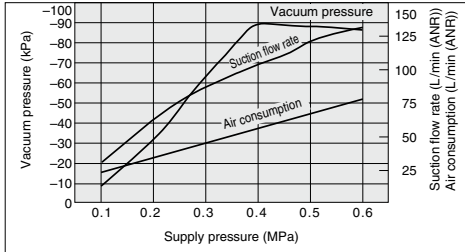
Note 1) W/ unit switching function is not permitted to sell for the domestic use in Japan, because the new Weight and Measure Act has been implemented since October, 99.

Note 2) Fixed unit: kPa

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

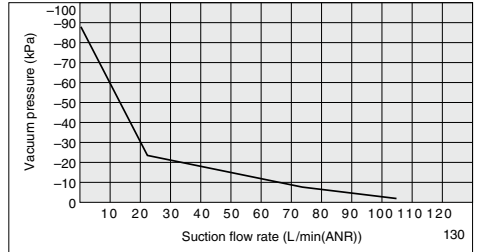
ZL112

Exhaust Characteristics



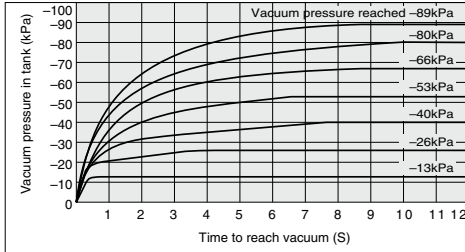
Flow Rate Characteristics

Supply pressure: 0.4 MPa



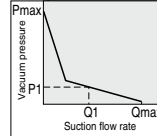
Time to Reach Vacuum

Tank capacity: 1L
Supply pressure: 0.4 MPa



<How to Read the Graph>

The 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.

<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.

ZK2

ZQ

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ZX

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ZH-X267

ZHP

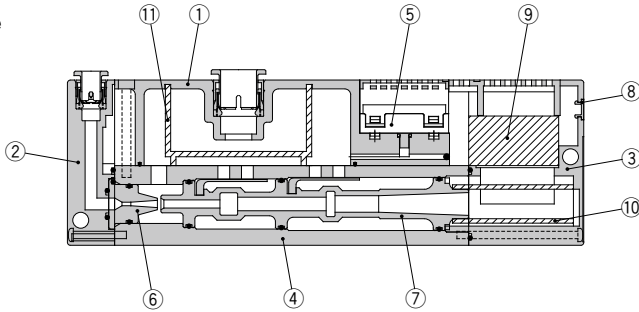
ZU

VQD-V

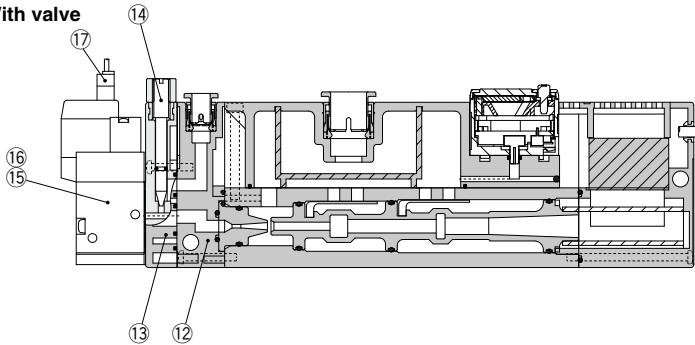
ZL112 Series

Construction

Without valve



With valve



Component 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

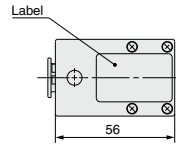
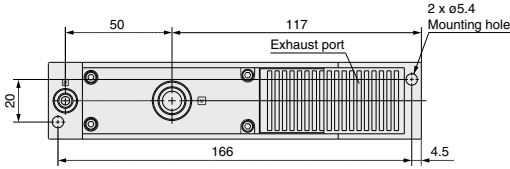
SY100-30-3A-□

Lead wire length ●

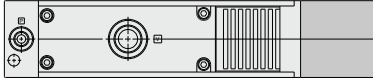
Nil	300mm(Standard)
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm
50	5000mm

Dimensions: ZL112 Series (Without Valve)

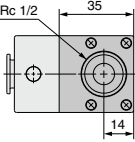
**Standard
ZL112**



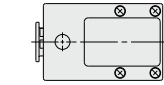
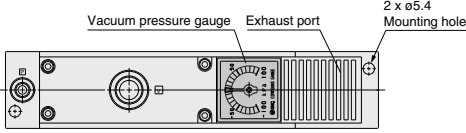
**Port exhaust
ZL112P**



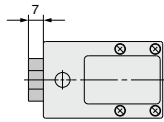
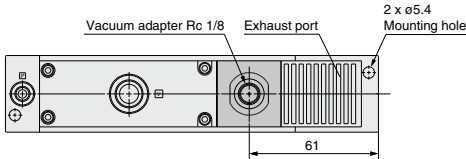
Exhaust(EXH.) port Rc 1/2
(1/2-14 NPTF,
G 1/2
1/2-14 NPT)



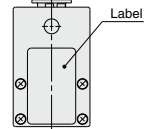
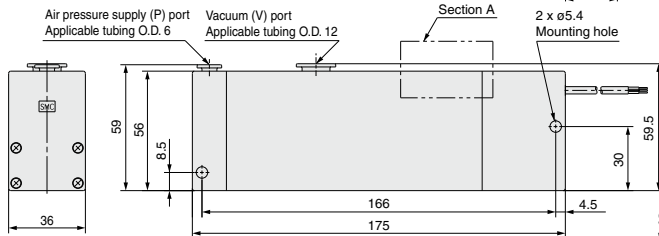
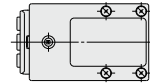
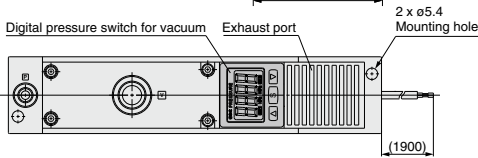
**With vacuum pressure gauge
ZL112-G**



**With vacuum adapter
ZL112-GN**

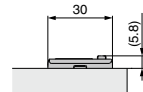


**With digital pressure switch for vacuum
ZL112-D□□□**

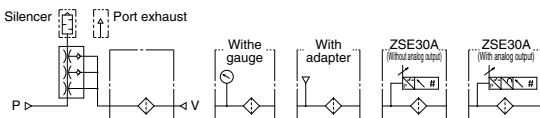


**Section A/
With Digital Pressure Switch for Vacuum**

ZL112-D□□□ (ZSE30A)



Circuit diagram



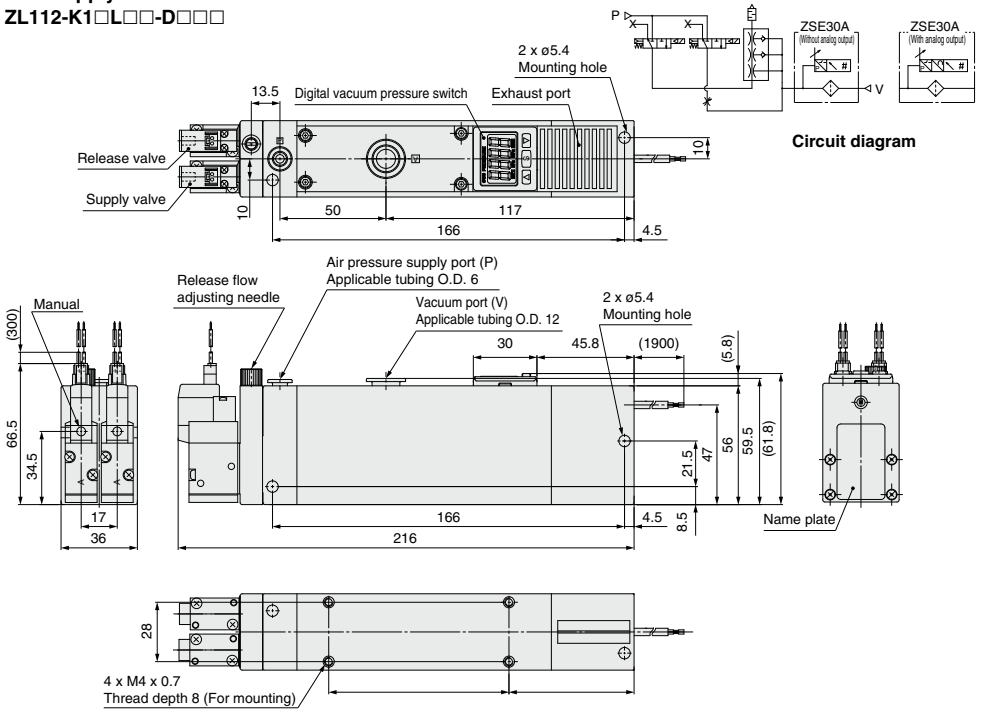
ZK2
ZQ
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ZH
ZH-X267
ZHP
ZU
VQD-V

ZL112 Series

Dimensions: ZL112 Series (With Valve)

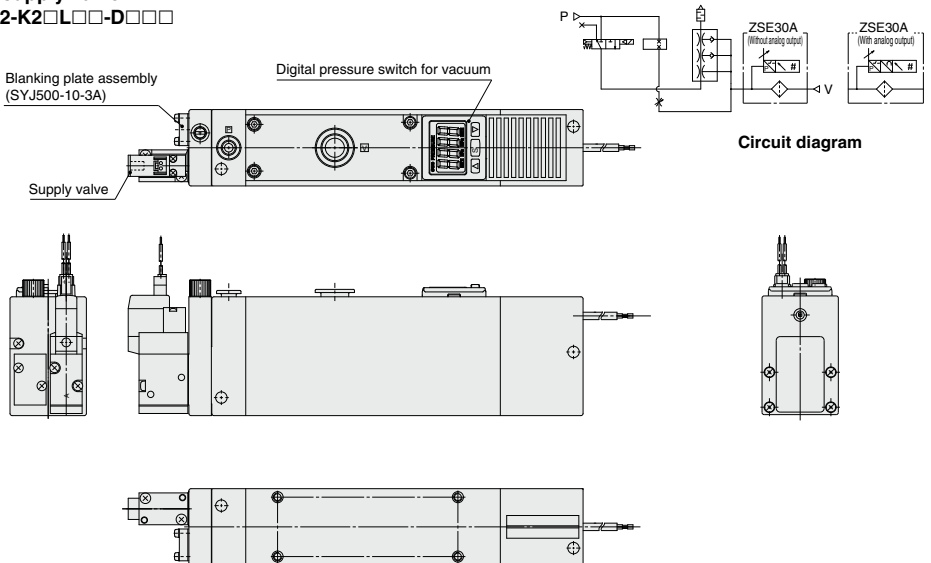
With supply valve and release valve

ZL112-K1□L□□-D□□□



With supply valve

ZL112-K2□L□□-D□□□



Multistage Ejector

ZL212 Series

The ZL212 series has been remodeled.
Click [here](#) for details.

Standard



With vacuum pressure gauge



With digital vacuum pressure switch



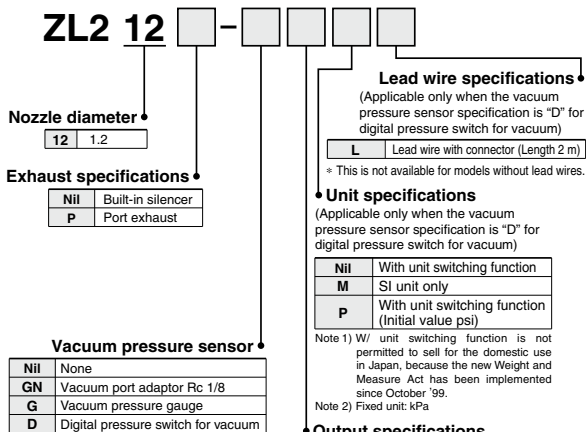
With adaptor



Port exhaust



How to Order



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

Symbol	Specifications/Contents
X132	Supply valve/Vacuum release valve

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

Ejector Specifications

Model	ZL212
Nozzle diameter	1.2 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.)	+75 g

ZK2

ZQ

ZR

ZB

ZA

ZX

ZM

ZL

ZH

ZH

ZH-X267

ZHP

ZU

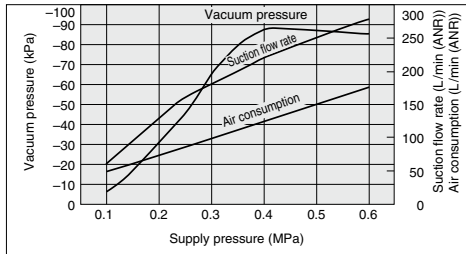
VQD-V

ZL212 Series

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

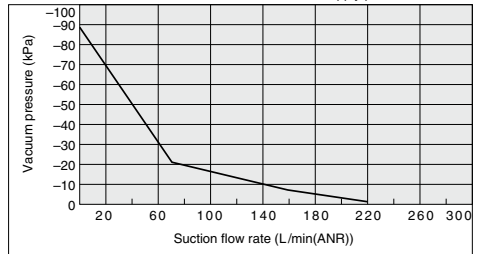
ZL212

Exhaust Characteristics



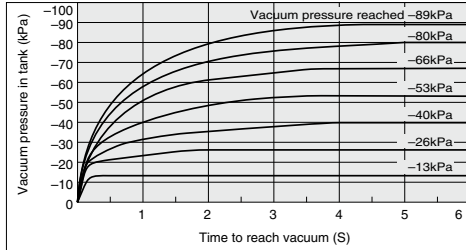
Flow Rate Characteristics

Supply pressure: 0.4 MPa



Time to Reach Vacuum

Tank capacity: 1L
Supply pressure: 0.4 MPa

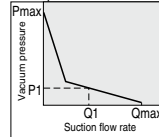


<How to Read the Graph>

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.

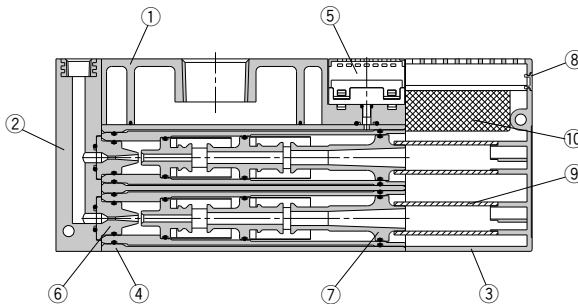
<How to Read the Graph>

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



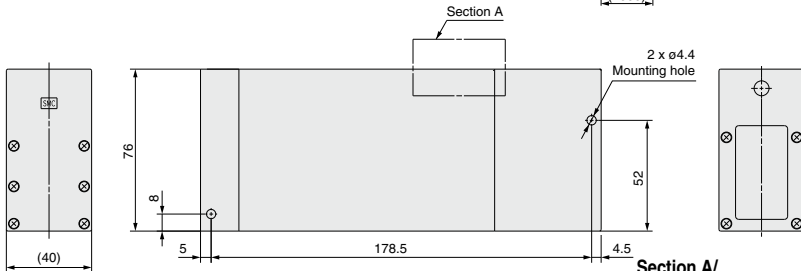
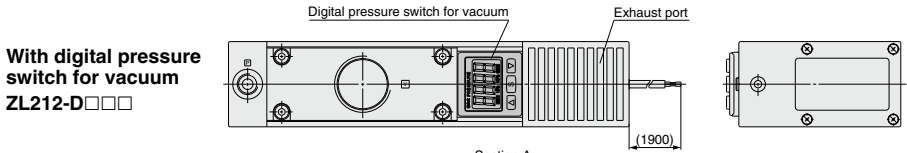
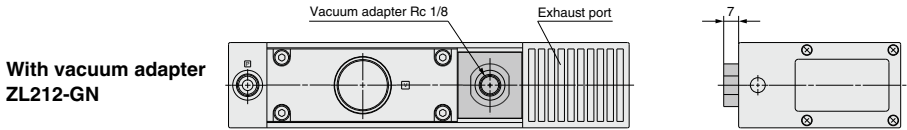
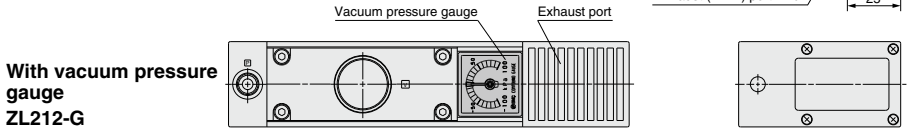
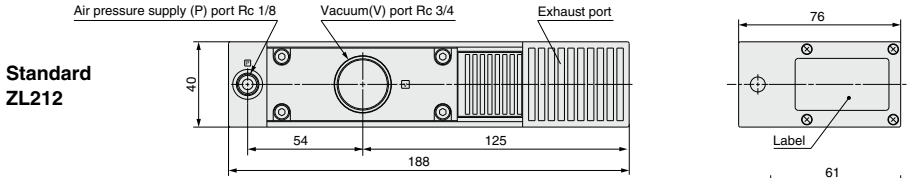
Component Parts

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

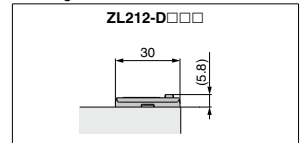
Replacement Parts

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)

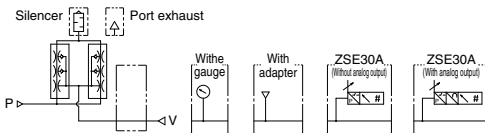
Dimensions: ZL212 Series



Section A/ With Digital Pressure Switch for Vacuum



Circuit diagram



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



1 With Supply and Release Valves

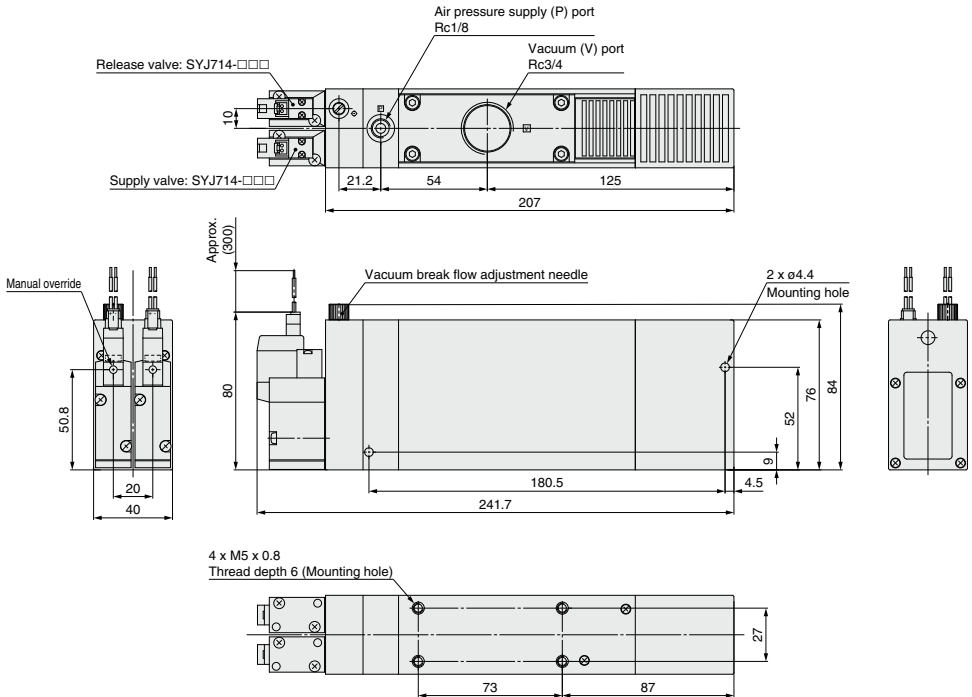
ZL212 [Valve] [Voltage] [Electrical entry] — [Vacuum pressure switch] [Electrical entry] — X132

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.

ZK2

ZQ

ZR

ZB

ZA

ZX

ZM

ZL

ZH

ZH

ZH
-X267

ZHP

ZU

VQD-V