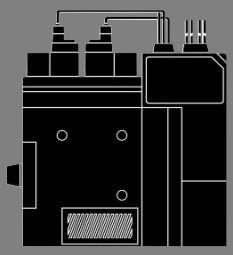
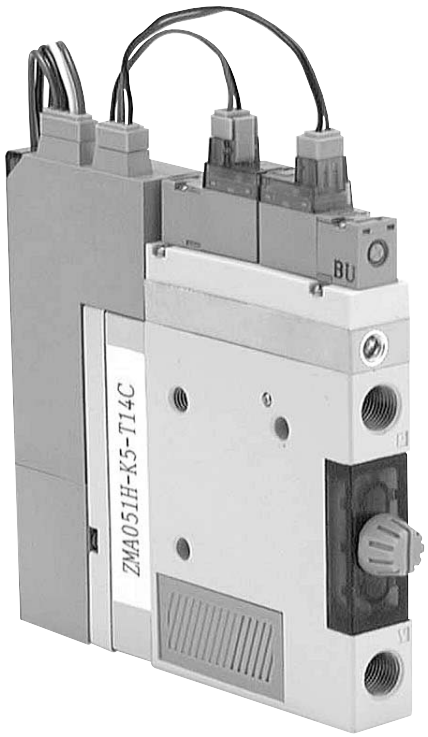
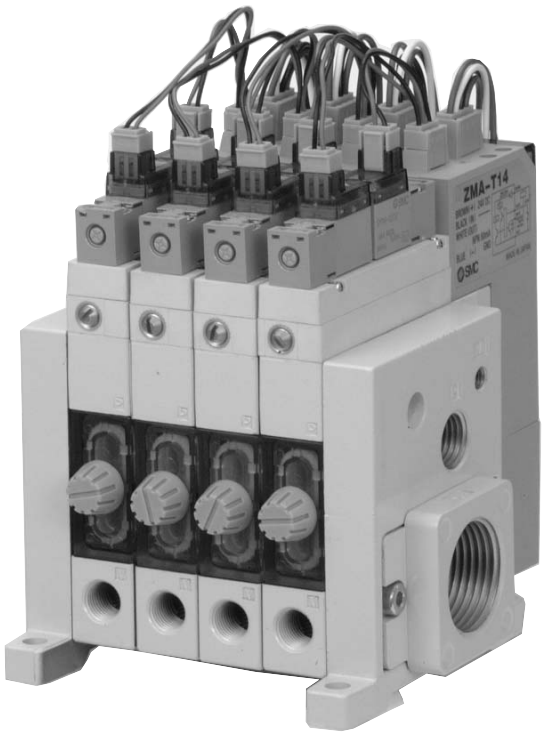


Vacuum Ejector
With Solid State Timer
Series ZMA



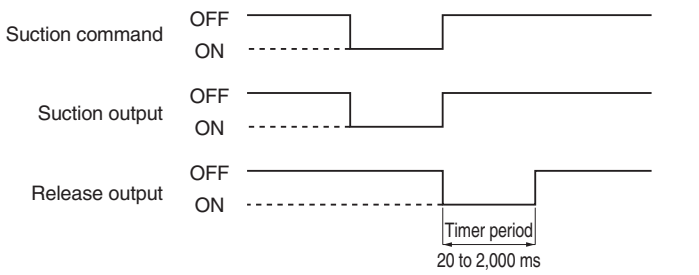


Incorporates solid state timer function for release valve control (Timer setting with PLC is unnecessary)

Allows sharing of switch/valve power supply, and single line for suction signal (Valve wiring is unnecessary)

Timer can be easily adjusted without programming (Reduction of the load of PLC)

Timing Chart



Note) When power is supplied, release output is performed once for the time period only.

⚠ Precautions

Be sure to read before handling. Refer to pages 13-15-3 to 13-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to page 13-1-5 for Precautions on every series.

Mounting

⚠ Warning

1. Do not drop or bump.
Do not drop, bump or apply excessive impact (1,000 m/s^2) when handling. Even if the switch body is not damaged, the switch may suffer internal damage that will lead to malfunction.

2. Hold the product from the body side when handling.
The tensile strength of the power cord is 49 N, and pulling it with a greater force can cause failure.

3. When handling the product, never move or loosen the switch assembly or the switch assembly mounting screws.

Wiring

⚠ Warning

1. Do not allow repeated bending or stretching forces to be applied to lead wires.
Wiring arrangements in which repeated bending stress or stretching force is applied to the lead wires can cause broken wires.

Pressure Source

⚠ Warning

1. Vacuum pressure switches
There will be no change in performance if a pressure of approximately 0.5 MPa is applied momentarily (when releasing vacuum), but care should be taken that pressures of 0.2 MPa or more are not applied on a regular basis.

Operating Environment

⚠ Warning

1. The product cannot be used in a strong magnetic field.

Vacuum Ejector
With Solid State Timer
Series ZMA

How to Order

ZMA 07 1 H ☐ — K 5 — T14 C

Nozzle diameter

05	0.5 mm
07	0.7 mm
10	1.0 mm
13	1.3 mm
15	1.5 mm

Body type

1	For single unit
3	Common SUP for manifold
5	Individual SUP for manifold

Standard supply pressure

H	0.5 MPa
M	0.35 MPa
S	0.45 MPa

∗ Refer to "Table (1)" for selection of standard supply pressure and nozzle diameter.

Thread type

Nil	Rc
T	NPTF
F	G

Valve

K	With air supply valve, Vacuum release valve

Rated voltage

5	24 VDC

Switch model

T14	1 point setting, No analog output available 3 turns, NPN output
T54	1 point setting, No analog output available 3 turns, PNP output

Electrical entry of vacuum switch (Connector type)

C	Lead wire length 0.6 m
C	Lead wire length 3 m
CN	No lead wire

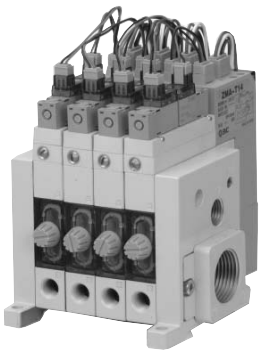
∗ Refer to "Table (2)" for lead wire with 4-wire connecor.

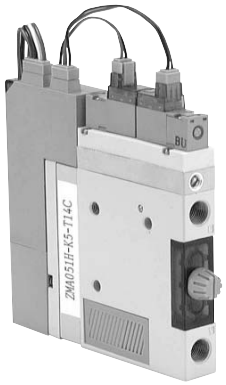
Table (1)
Combination of Nozzle Diameter and Standard Supply Pressure

Nozzle diameter	Standard supply pressure (MPa)		
	M (0.35)	**S (0.45)**	**H (0.5)**
ø0.5	—	—	●
ø0.7	●	—	●
ø1.0	●	—	●
ø1.3	●	●	●
ø1.5	—	●	—

Table (2)

Lead wire with 4-wire connector	P5022-6-1 (0.6 m)
	P5022-6-2 (3 m)





Model

Nozzle diameter (mm)	Model	Standard supply pressure			Maximum suction flow rate (ℓ/min (ANR))	Air consumption (ℓ/min (ANR))	Diffuser construction
		H	M	S			
0.5	**ZMA05□H**	0.5 MPa	—	—	18	12	2nd stage diffuser
0.7	**ZMA07□H**				24	23	
1.0	**ZMA10□H**				36	46	
1.3	**ZMA13□H**				40	95	
0.7	**ZMA07□M**	—	0.35 MPa	—	20	16	
1.0	**ZMA10□M**				26	32	
1.3	**ZMA13□M**				36	70	
1.3	**ZMA13□S**	—	—	0.45 MPa	38	75	1st stage diffuser
1.5	**ZMA15□S**				45	90	

Vacuum Ejector Specifications

Fluid	Air
Max. operating pressure	0.7 MPa
Max. vacuum pressure	–84 kPa
Supply pressure range	0.25 to 0.55 MPa
Operating temperature range	5 to 50°C
Suction filter	Polyethylene sintered metal (30 μm)

Valve Specifications

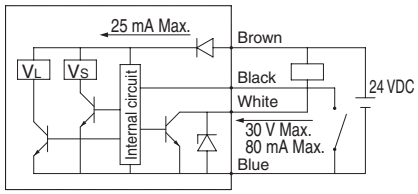
How to operate	Pilot type
Main valve	Poppet
Effective area (Cv factor)	3 mm² (0.17)
Operating pressure range	0.25 to 0.6 MPa
Electrical entry	Plug connector
Max. operating frequency	5 Hz
Voltage	24 VDC

Vacuum Switch with Timer Specifications (for controlling solenoid valve)

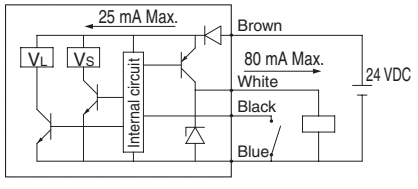
Power source	Operating voltage	24 VDC ± 10%
	Consumption current per one unit	1.1 W (at switch output OFF)
Sensor switch output	Number of output	1
	Output	NPN/PNP open collector
	Setting trimmer	3 turns
	Operation indicator light	Red LED lighting
	Temperature characteristics	±3% FS or less
	Hysteresis	3% FS or less (fixed)
Part of timer	Timer period	20 to 2,000 ms
	Setting trimmer	3 turns
	Temperature characteristics	±3% FS or less

Connection Example

T14

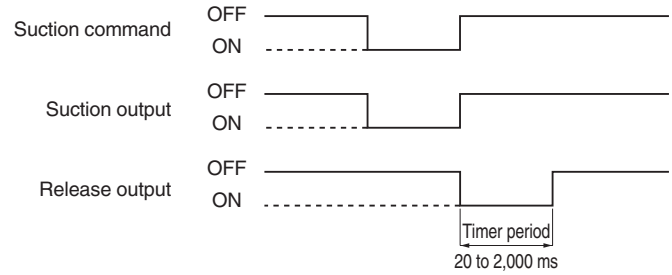


T54



VL: Pilot valve for vacuum pressure
VS: Pilot valve for vacuum release

Timing Chart

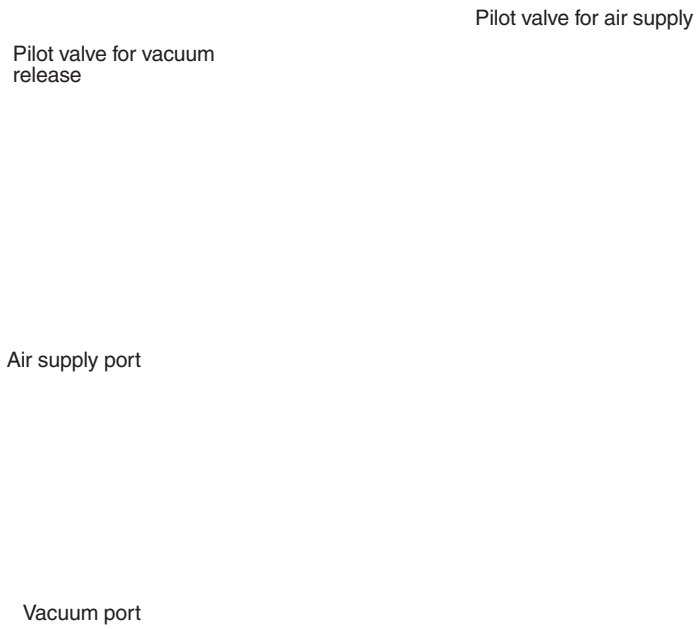


Note) When power is supplied, release output is performed once for the time period only.

Wiring

Brown	DC (+)
Black	Suction command
White	Switch output
Blue	DC (–)

Construction: ZMA□1□-K□L-E□



Component Parts

No.	Description	Material	Note
①	Body	Aluminum die-casted	
②	Valve cover	Zinc die-casted	
③	Adapter plate	Zinc die-casted	
④	Cover	Zinc die-casted	ZMA-HCB
⑤	Tension bolt	Stainless steel/Polyacetal	
⑥	Flow adjustment screw	Brass	Electroless nickel plated

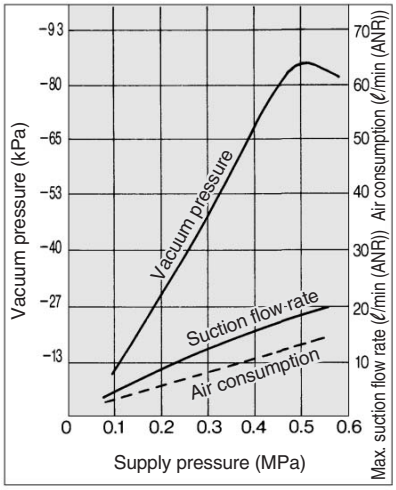
Replacement Parts

No.	Description	Material	Part no.
⑦	Filter cover assembly	—	ZMA-FCB-0
⑧	Diffuser assembly	—	ZMA□□0□-0
⑨	Suction filter	Polyethylene	ZM-SF
⑩	Silencer assembly	—	ZM-SA
⑪	Pilot valve	—	SY114-5LOZ
⑫	Poppet valve assembly	—	ZM-PV-0
⑬	Vacuum switch with timer	—	ZMA-T14CN (NPN) ZMA-T54CN (PNP)
⑭	Check valve	NBR	ZM-CV
⑮	Connector assembly	—	ZMA-VC-1A

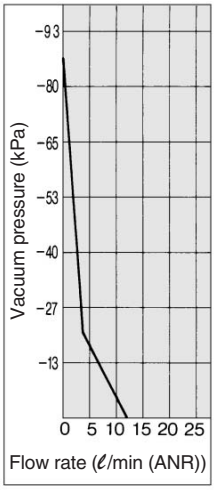
Exhaust Characteristics/Flow Characteristics, Standard Supply Pressure: H···0.5 MPa

ZMA05□H

Exhaust Characteristics

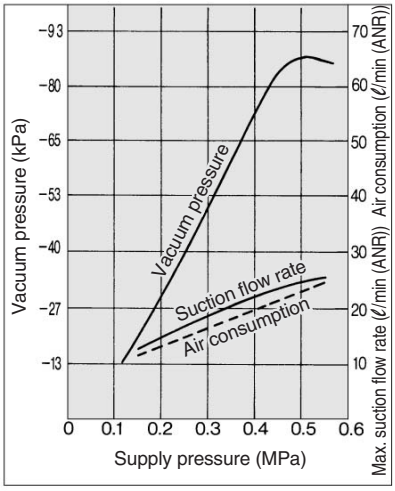


Flow Characteristics

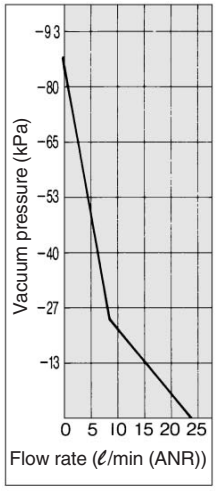


ZMA07□H

Exhaust Characteristics

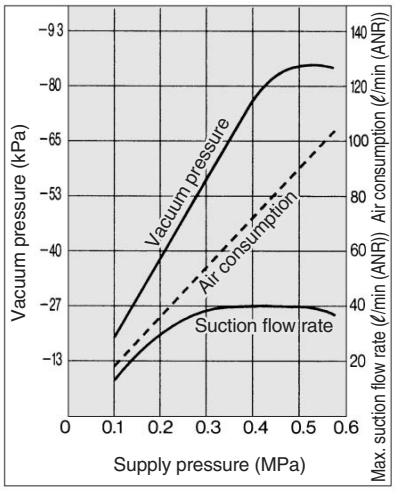


Flow Characteristics

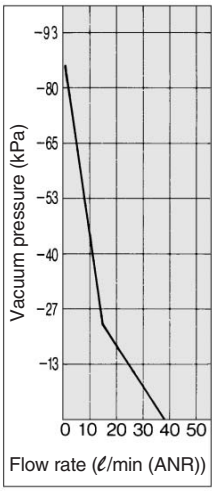


ZMA10□H

Exhaust Characteristics

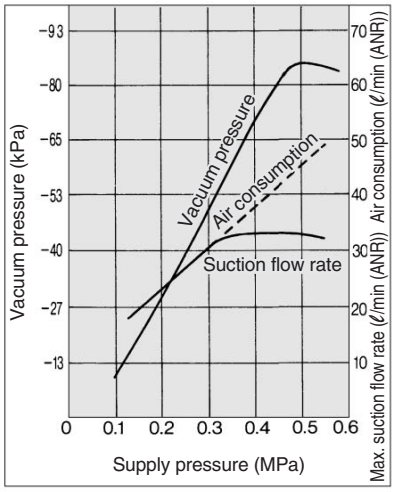


Flow Characteristics

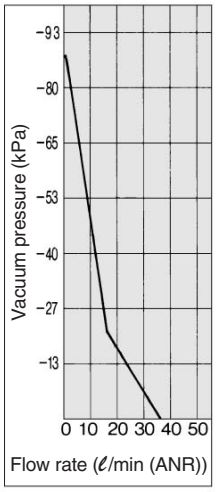


ZMA13□H

Exhaust Characteristics



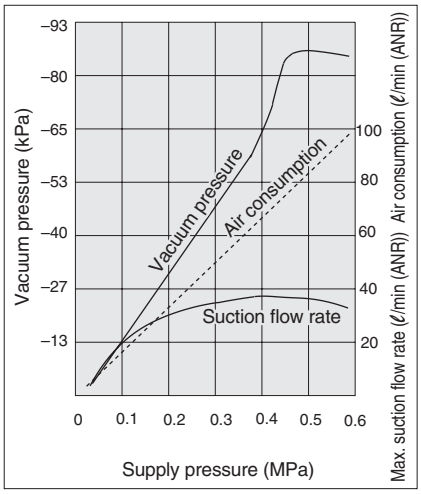
Flow Characteristics



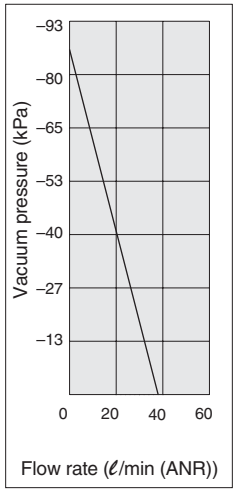
Exhaust Characteristics/Flow Characteristics, Standard Supply Pressure: S···0.45 MPa

ZMA13□S

Exhaust Characteristics

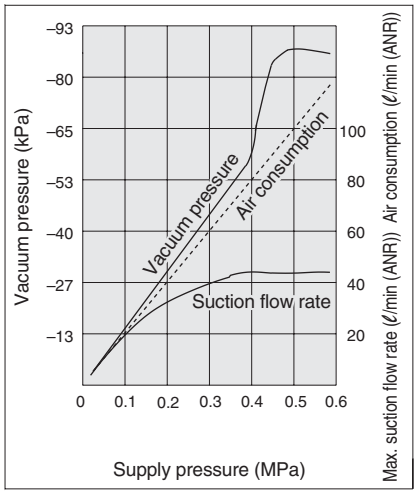


Flow Characteristics

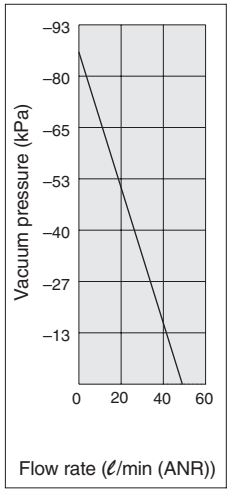


ZMA15□S

Exhaust Characteristics



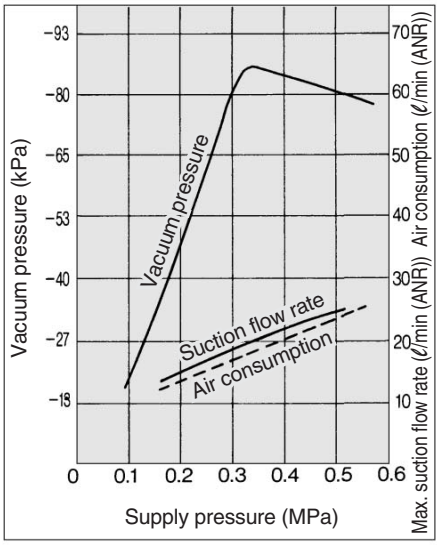
Flow Characteristics



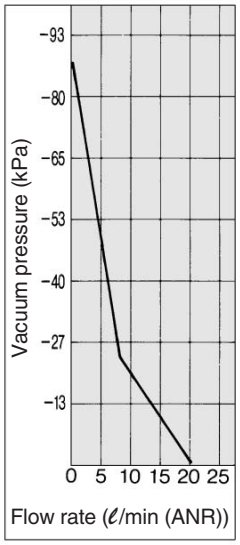
Exhaust Characteristics/Flow Characteristics, Standard Supply Pressure: M···0.35 MPa

ZM07□M

Exhaust Characteristics

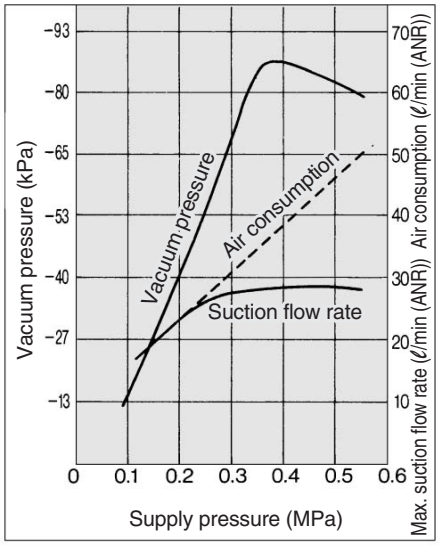


Flow Characteristics

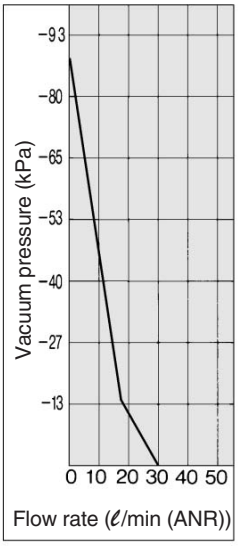


ZM10□M

Exhaust Characteristics

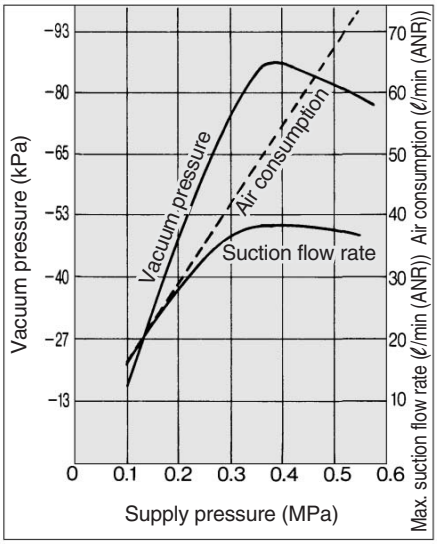


Flow Characteristics

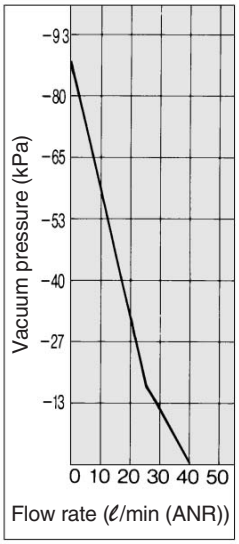


ZM13□M

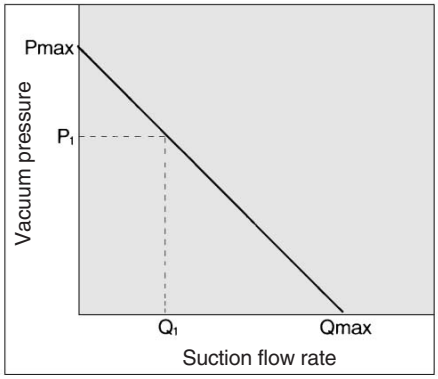
Exhaust Characteristics



Flow Characteristics



How to Read Flow Characteristics Graph



Flow characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow rate changes, a change in vacuum pressure will also be expressed. Normally this relationship is expressed in ejector standard use.

In graph, Pmax is max. vacuum pressure and Qmax is max. suction flow. The valves are specified according to catalog use. Changes in vacuum pressure are expressed in the below order.

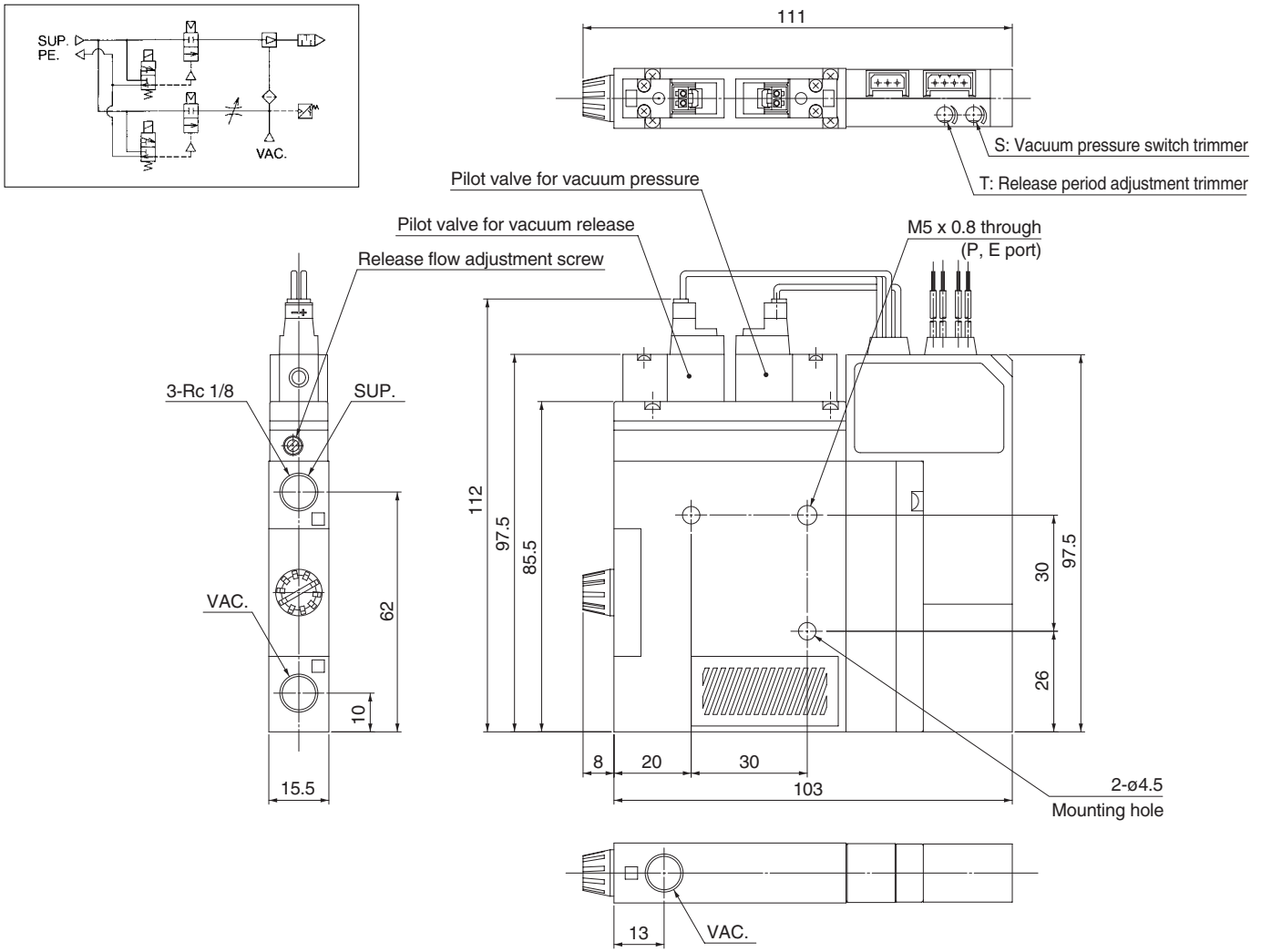
Changes in vacuum pressure are expressed in the order below.

1. When ejector suction port is covered and made airtight, suction flow is 0 and vacuum pressure is at maximum value (Pmax).
2. When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition P_1 and Q_1)
3. When suction port is opened further, suction flow moves to maximum value (Qmax), but vacuum pressure is near 0. (atmospheric pressure).

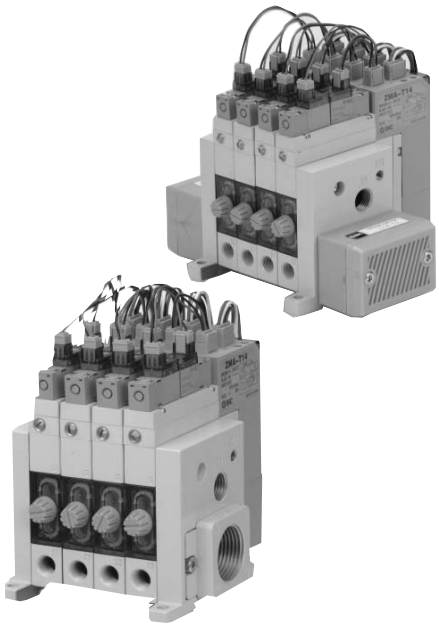
   When vacuum port (vacuum piping) has no leakage, vacuum pressure becomes maximum, and vacuum pressure decreases as leakage increases. When leakage value is the same as max. suction flow, vacuum pressure is near 0.

   When ventirative or leaky work must be adsorbed, please note that vacuum pressure will not be high.

Dimensions


SUP.
PE.
VAC.
111
S: Vacuum pressure switch trimmer
T: Release period adjustment trimmer
Pilot valve for vacuum pressure
Pilot valve for vacuum release
Release flow adjustment screw
M5 x 0.8 through
(P, E port)
3-Rc 1/8
SUP.
VAC.
62
10
15.5
112
97.5
85.5
30
97.5
26
8
20
30
103
2-ø4.5
Mounting hole
13
VAC.

Manifold Specifications: Series ZZMA



Manifold Specifications

Manifold style	Stacking
Common SUP port*	Rc 1/4
Individual SUP port*	Rc 1/8
Common EXH port	Rc 1/2, 3/4
EXH port location	Right side/Left side/Both sides**
Max. number of stations	Max.10 stations
Silencer	ZZM-SA (With bolts)

∗ Mixed mounting of common SUP and individual SUP types possible.
∗∗ Right or left to the VAC port.

Maximum Ejector Stations (Max. operable nos. simultaneously)

Manifold model \ Ejector model	ZM053 ZM054	ZM073 ZM074	ZM103 ZM104	ZM133 ZM134
ZZMA Stations — 06 R/L	10	8	5	4
ZZMA Stations — 06B	10	10	8	6
ZZMA Stations — 04 R/L	10	8	5	4
ZZMA Stations — 04B	10	10	8	6

∗ Effective area of external silencer is 160 mm^2.

How to Order Ejector Manifold

ZZMA 06 — ☐ 06 R

Number of stations

01	1 station
⋮	⋮
10	10 stations (max.)

Thread type

Nil	Rc
T	NPTF
F	G

Common EXH port size

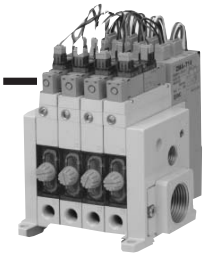
04	1/2
06	3/4
S	Silencer dedicated for ZZMA (ZZM-SA)

Port and silencer location

R	Right side
L	Left side
B	Both sides

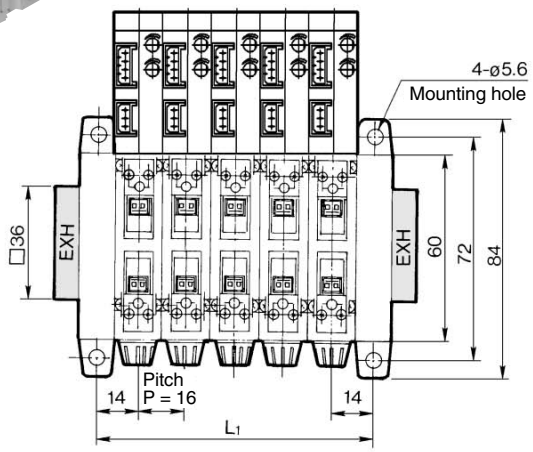
Note) Right and left side are viewed from the front side of VAC port.

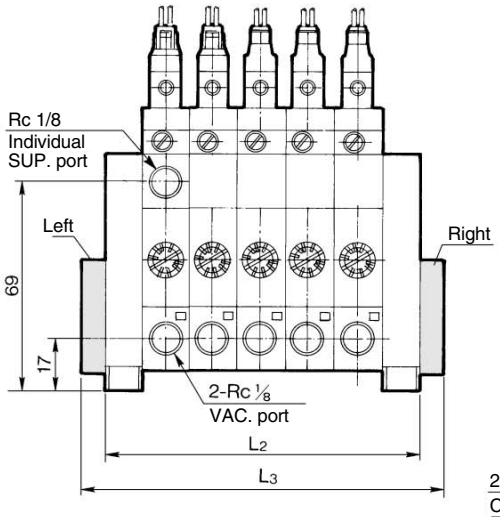
∗ Indicate the ejector model no. below the manifold base no.
Example) Manifold model no.: ZZMA04-SR (1 pc.)
Ejector model no. : ∗ZMA073H-K5-T14C (4 pcs.)

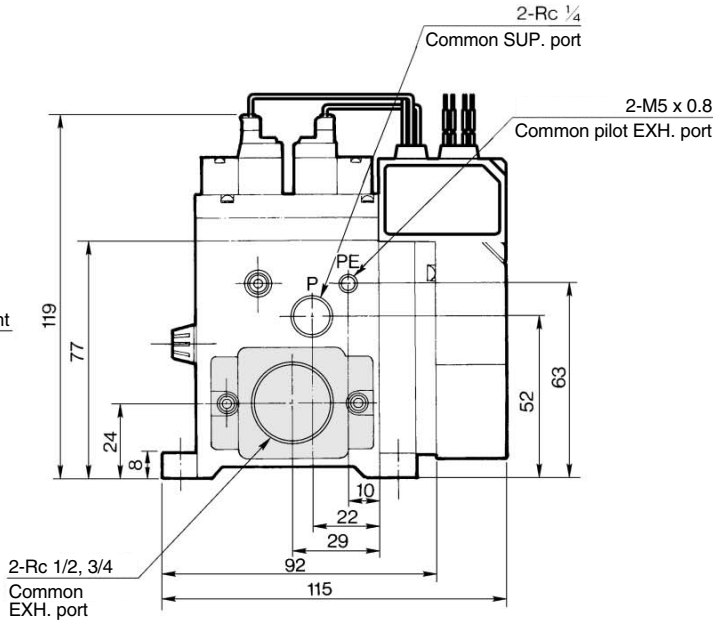


Manifold

ZZMA | Number of ejectors | — | Common EXH port | Port position

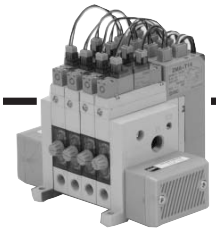






(mm)

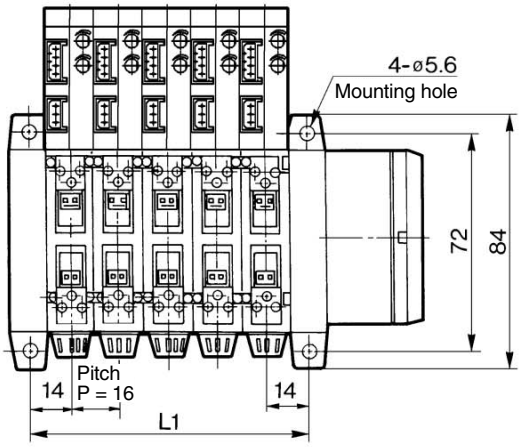
L \ Stations	1	2	3	4	5	6	7	8	9	10
L1	28 ± 1.5	44 ± 1.5	60 ± 1.5	76 ± 1.5	92 ± 1.5	108 ± 2.0	124 ± 2.0	140 ± 2.0	156 ± 2.0	172 ± 2.0
L2	40 ± 1.5	56 ± 1.5	72 ± 1.5	88 ± 1.5	104 ± 1.5	120 ± 2.0	136 ± 2.0	152 ± 2.0	168 ± 2.0	184 ± 2.0
L3	56 ± 1.5	72 ± 1.5	88 ± 1.5	104 ± 1.5	120 ± 1.5	136 ± 2.0	152 ± 2.0	168 ± 2.0	184 ± 2.0	200 ± 2.0

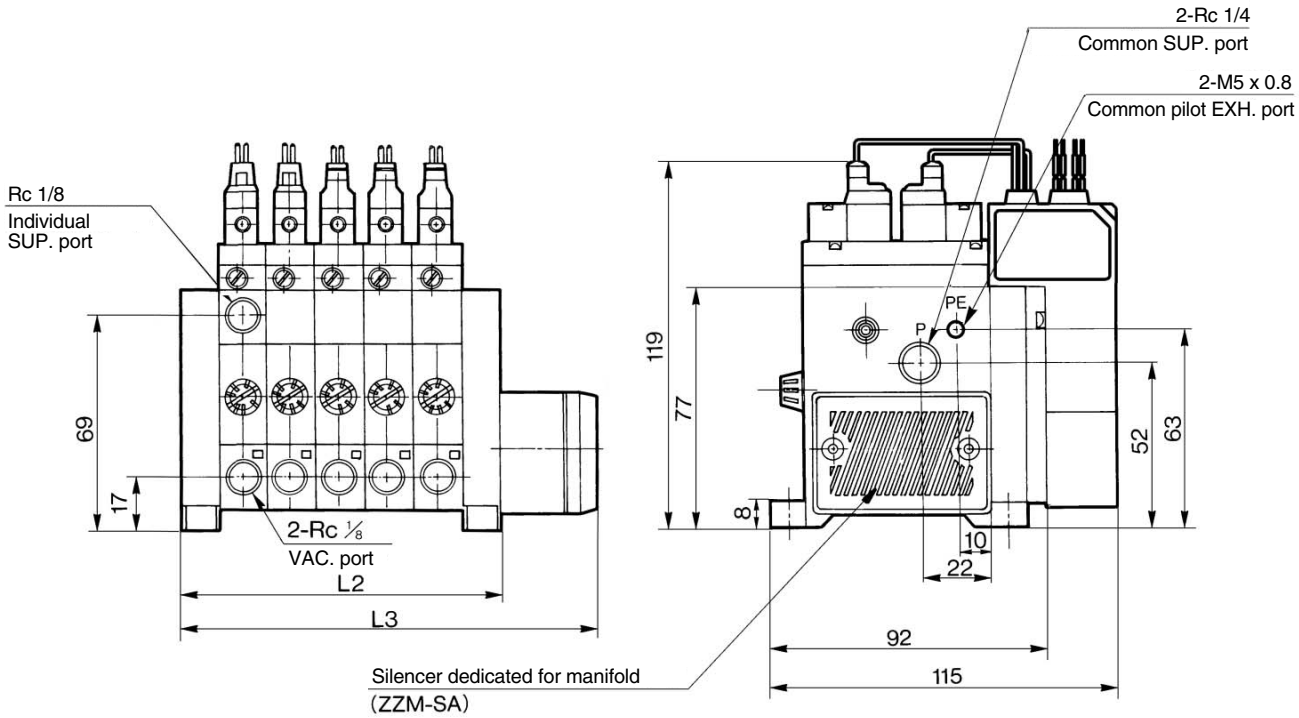


<Components>

Manifold/With Silencer — Manifold with Silencer Dedicated for Manifold

ZZMA [Number of ejectors] **—S** [Position of silencer]





(mm)

L \ Stations	1	2	3	4	5	6	7	8	9	10
L1	28 ± 1.5	44 ± 1.5	60 ± 1.5	76 ± 1.5	92 ± 1.5	108 ± 2.0	124 ± 2.0	140 ± 2.0	156 ± 2.0	172 ± 2.0
L2	40 ± 1.5	56 ± 1.5	72 ± 1.5	88 ± 1.5	104 ± 1.5	120 ± 2.0	136 ± 2.0	152 ± 2.0	168 ± 2.0	184 ± 2.0
L3	72 ± 1.5	88 ± 1.5	104 ± 1.5	120 ± 1.5	136 ± 1.5	152 ± 2.0	168 ± 2.0	184 ± 2.0	200 ± 2.0	216 ± 2.0