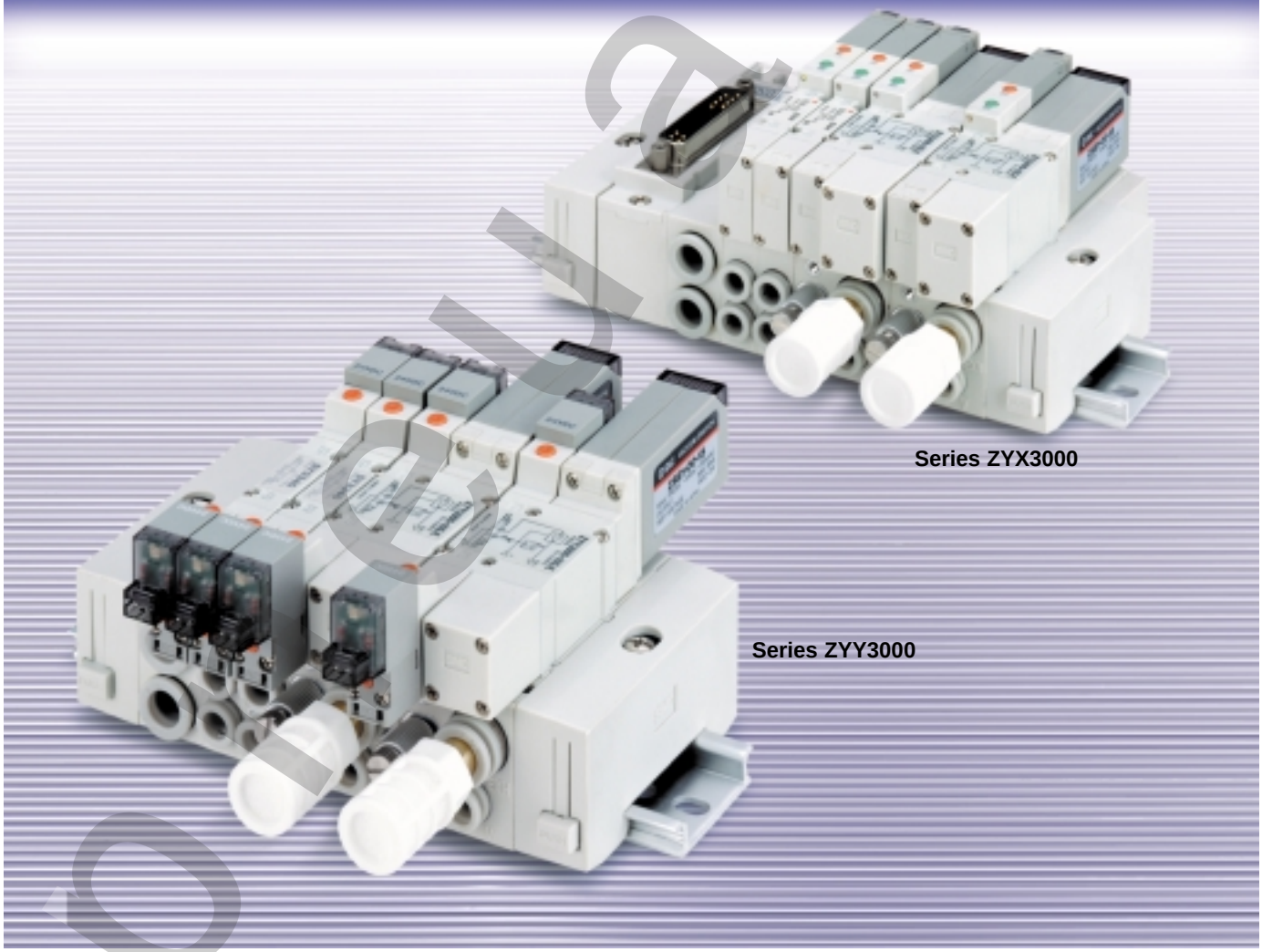
Ejector Valve Unit

Series ZYY/ZYX

Nozzle diameters –– ø0.7, ø1.0
Types ––– S: Standard type
L: Large flow type

Ejector valve unit suitable for vacuum adsorption systems

(A combination of solenoid valve for cylinder drive, etc. + vacuum ejector)



Series ZYX3000

Series ZYY3000

Ejector Valve Unit
Series ZYY/ZYX

How to Order Ejector Valves for ZYY3000

ZY Y3 5 LOU L Z – 10 S – 15

Lead wire/Voltage suppressor specification

LOU	Connector box type

Series

Y3	SY3000

Rated voltage

DC specification

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

AC specification (50/60Hz)

1	100VAC
2	200VAC
3	110VAC [115VAC]
4	220VAC [230VAC]

Note 1) The connector box type and serial transmission type are only available with 5 (24VDC).
Note 2) The plug-in type is only available with 5 (24VDC) and 6 (12VDC).

Electrical entry

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

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

Note 1) Types LN and MN are equipped with sockets (2pcs.).
Note 2) Not compatible with the FU electrical entry which is used on Series SY3000 plug-in type manifolds (45F, 45P□, 45T, 45T1, 45S□, 45S1□, 45S2□, 45S3□).

Light/Surge voltage suppressor

For electrical entry types G, H, L, M

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor Note 2)
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (non-polar type)
U	With light/surge voltage suppressor (non-polar type)

Note 1) Types R and U are DC only.
Note 2) Since surge voltage is prevented with a rectifier in the case of AC, it is not an "S" type.

Manual override

Nil	Non-locking push type
D	Push & turn locking type, screw driver operated
E	Push & turn locking type, manually operated

Nozzle diameter

07	ø0.7mm
10	ø1.0mm

Max. vacuum pressure

S	-84kPa {-630mmHg}
L	-53kPa {-400mmHg}

Silencer

Nil	None
1	With silencer

Vacuum switch

Nil	None
E	With vacuum switch

Output specifications (Vacuum switch)

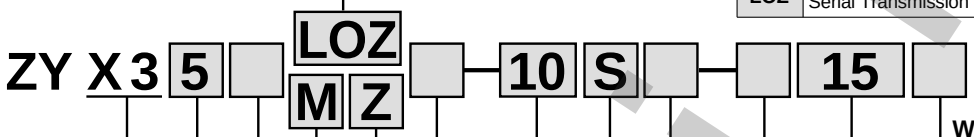
14	NPN open collector, single output Analog, no output, 3 turn setting
15	NPN open collector, single output Analog, no output, 200 degree setting
16	NPN open collector, double output Analog, no output, 3 turn setting
17	NPN open collector, double output Analog, no output, 200 degree setting
18	NPN open collector, single output Analog, with output, 3 turn setting
19	NPN open collector, single output Analog, with output, 200 degree setting
55	PNP open collector, single output Analog, no output, 200 degree setting

Wiring specifications (Vacuum switch)

Nil	Grommet type	Lead wire length 0.6m
L		Lead wire length 3m
C	Connector type	Lead wire length 0.6m
CL		Lead wire length 3m
CN		Connector type

Ejector Valve Unit *Series ZYY/ZYX*

How to Order Ejector Valves for ZYX3000



Lead wire/Voltage suppressor specification

LOZ	Plug-in type Serial Transmission Type

Series

X3	SX3000

Rated voltage

DC specification

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

Note 1) The serial transmission type is 5 (24VDC) only.
Note 2) V, S and R specifications are 45T or 45T1 only.

Common specification

Nil	Positive common
N	Negative common

Note 1) The symbol is "Nil" for the single grommet type and when not equipped with light/surge voltage suppressor.
Note 2) Match with the common specification of the manifold.

Electrical entry

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

Note) For types LN and MN, the single solenoid has 2 sockets and the double solenoid has 3 sockets.

Light/Surge voltage suppressor

For electrical entry types G, H, L, M

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

Manual override

Nil	Non-locking push type
D	Push & turn locking type, screw driver operated

Nozzle diameter

07	ø0.7mm
10	ø1.0mm

Max. vacuum pressure

S	-84kPa {-630mmHg}
L	-53kPa {-400mmHg}

Silencer

Nil	None
1	With silencer

Vacuum switch

Nil	None
E	With vacuum switch

Output specifications (Vacuum switch)

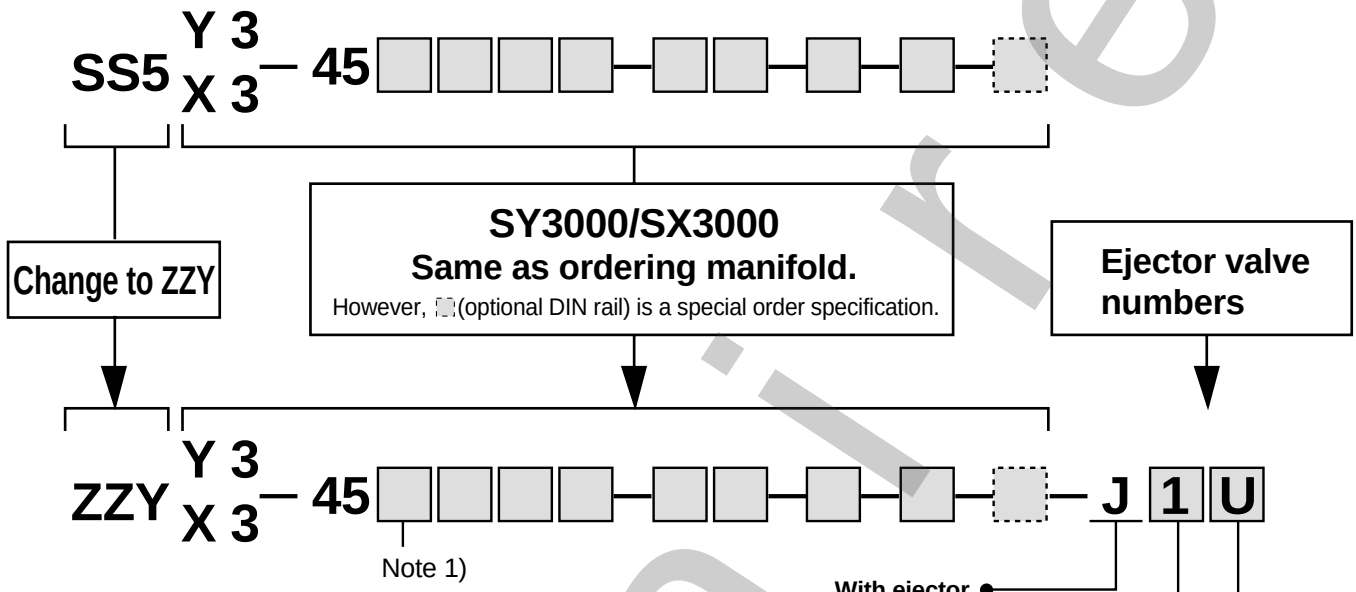
14	NPN open collector, single output Analog, no output, 3 turn setting
15	NPN open collector, single output Analog, no output, 200 degree setting
16	NPN open collector, double output Analog, no output, 3 turn setting
17	NPN open collector, double output Analog, no output, 200 degree setting
18	NPN open collector, single output Analog, with output, 3 turn setting
19	NPN open collector, single output Analog, with output, 200 degree setting
55	PNP open collector, single output Analog, no output, 200 degree setting

Wiring specifications (Vacuum switch)

Nil	Grommet type	Lead wire length 0.6m
L		Lead wire length 3m
C	Connector type	Lead wire length 0.6m
CL		Lead wire length 3m
CN		Connector type

How to Order Manifold Valves for ZYY3000/ZYX3000 (Split Base/DIN Rail Mounting)

For solenoid valve and ejector valve combination



Enter the following together with the manifold number:

1. **Part No. of solenoid for SY3000/SX3000**
2. **Part No. of ejector valve for ZYY3000/ZYX3000**

[Example: When individual wiring type model 45 for SY3000 is selected]

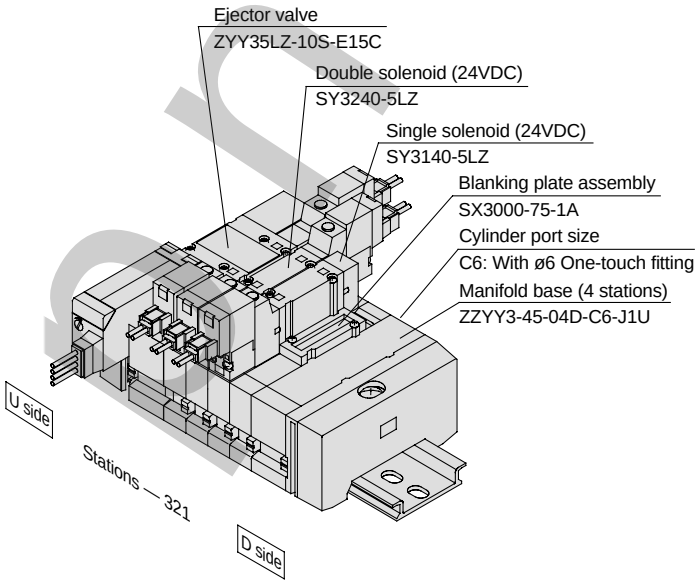
ZZY Y3-45-04D-C6- J1U --------- 1SET

SY3000 manifold model — Ejector valve number

- ∗ SX3000-75-1A ———— 1 SET
- ∗ SY3140-5LZ ———— 1 SET
- ∗ SY3240-5LZ ———— 1 SET
- ∗ ZYY35LZ-10S-E15C —— 1 SET

∗ is the symbol for a built-in assembly. Add the ∗ symbol at the beginning of part numbers for solenoid valves, etc. to be mounted, and enter these together in order from the D side.

Note 1) The combined total of solenoid valve and ejector valve stations is a maximum of 20 stations.
(Example: When there are 12 solenoid valve stations, there are 8 ejector stations.)



For ejector valves only (without solenoid valves)

ZZY - J 1 U

With ejector

Number of ejectors
1 to 10

Ejector mounting position

U	U side
D	D side

[Example] ZZY-JC3N ———— 1 SET

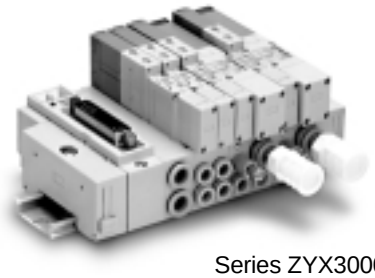
- ∗ ZYY35LZ-10S1-E15C —— 2 SETS
- ∗ ZYY35LZ-10S1 ———— 1 SET

Ejector Valve Unit *Series ZYY/ZYX*

Series SY3000/SX3000
DIN rail mount type can be mounted in manifold /split base combinations

Compact
(integrated construction of ejector and valve)
Copper free measures implemented

Series ZYY3000



Series ZYX3000

Ejector Valve Specifications

Ejector valve model	ZY□3□□□–07S	ZY□3□□□–07L	ZY□3□□□–10S	ZY□3□□□–10L
Nozzle diameter mmø	0.7		1.0	
Max. suction flow rate N//min	11	18	22	32
Max. vacuum pressure kPa	–84 {–630mmHg}	–53 {–400mmHg}	–84 {–630mmHg}	–53 {–400mmHg}
Max. operating pressure	0.6MPa {6kgf/cm²}			
Standard supply pressure	0.45MPa {4.5kgf/cm²}			
Operating temperature range	5 to 50°C			

Supply/Release Valve Specifications

Valve type	Pilot type 3 position 3 port solenoid valve
Type of actuation	Closed center
Fluid	Air
Operating pressure range	0.2 to 0.7MPa {2 to 7.1kgf/cm²}
Ambient and fluid temperature	5 to 50°C
Allowable voltage fluctuation	– 10 to + 10%
Electrical entry	Grommet : G, H L type plug connector : L, LN, LO M type plug connector : M, MN, MO
Power consumption	0.5W (with light: 0.6W) : Series ZYY3000 0.6W (with light: 0.65W) : Series ZYX3000
Effective area (Cv factor)	4.68mm² (0.26)

Series ZYY/ZYX

Electronic Vacuum Pressure Switch Specifications

Model	ZSE1– 00 –14□ –X129 (–X130)	ZSE1– 00 –15□ –X129 (–X130)	ZSE1– 00 –16□ –X129 (–X130)	ZSE1– 00 –17□ –X129 (–X130)	ZSE1– 00 –18□ –X129 (–X130)	ZSE1– 00 –19□ –X129 (–X130)	ZSE1– 00 –55□ –X129 (–X130)
Sensor type	Diffusion type semiconductor pressure sensor						
Set pressure range	0 to –101kPa {0 to –760mmHg}						
Hysteresis	1 to –10% of set pressure (variable)		3% full span or less (fixed)		1 to –10% of set pressure (variable)		
Repeatability	± 1% full span or less						
Temperature characteristics	± 3% full span or less						
Operating voltage	12 to 24VDC (ripple ± 10% or less)						
ON-OFF output	NPN open collector 30V Max. 80mA						PNP open collector Max. 80mA
Analog output	None				1 to 5V		None
Setting points	1 point		2 points		1 point		
Operation indicator light	Lights up when ON (red)		Lights up when ON (OUT1: red, OUT2: green)		Lights up when ON (red)		
Setting trimmer rotation angle	3 turns	200 degrees	3 turns	200 degrees	3 turns	200 degrees	200 degrees
Current consumption	17mA or less (when 24VDC is ON)		25mA or less (when 24VDC is ON)		17mA or less (when 24VDC is ON)		
Max. operating pressure	0.2MPa {2.1kgf/cm²}						

Note 1) When using an ejector, there is no problem if pressure of 0.5MPa {5.1kgf/cm²} is applied for 1 second or less.

Note 2) X129 is for Series ZYX3000 and X130 is for Series ZYY3000.

How to Order Electronic Vacuum Pressure switch

ZSE1 – 00 – [15] [ ] – X [130]

Output specifications

14	NPN open collector, single output Analog, no output, 3 turn setting
15	NPN open collector, single output Analog, no output, 200 degree setting
16	NPN open collector, double output Analog, no output, 3 turn setting
17	NPN open collector, double output Analog, no output, 200 degree setting
18	NPN open collector, single output Analog, with output, 3 turn setting
19	NPN open collector, single output Analog, with output, 200 degree setting
55	PNP open collector, single output Analog, no output, 200 degree setting

Compatible models

129	For Series ZYX3000
130	For Series ZYY3000

Wiring specifications

Nil	Grommet type	Lead wire length 0.6m
L		Lead wire length 3m
C	Connector type	Lead wire length 0.6m
CL		Lead wire length 3m
CN		Without connector

With connector/How to Order

- Without lead wires (1 connector and 4 sockets) ———— ZS-20-A
- With lead wires ———— ZS-20-5A- □

Lead wire length

Nil	0.6m
30	3m
50	5m

Note) When ordering a switch with 5m lead wires, enter the part numbers for both a switch without connector and lead wires with connector.

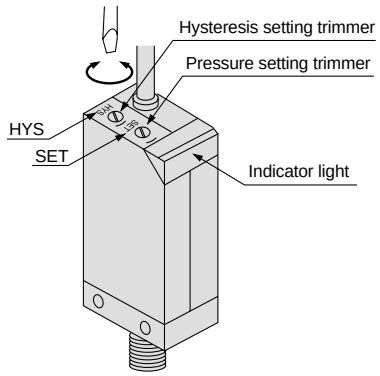
Example) ZSE1-00-15CN-X129 — 1pc.
ZS-20-5A-50 ———— 1pc.

How to Set the Pressure

- The ON pressure is set with the pressure setting trimmer. High vacuum settings are obtained by turning it clockwise.
- When setting, use a flat head screw driver which fits the slot in the trimmer, and turn it gently with your finger tips.

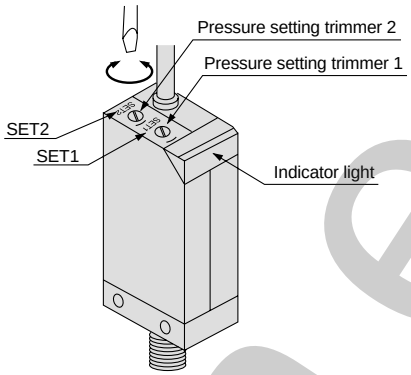
ZSE1-□□-14/-15/-18/-19

- Hysteresis can be set using the hysteresis setting trimmer. The setting is increased by turning it clockwise, and the range is 1 to 10% of the ON pressure.
- When the hysteresis setting trimmer is moved after setting the ON pressure, it must be set again.



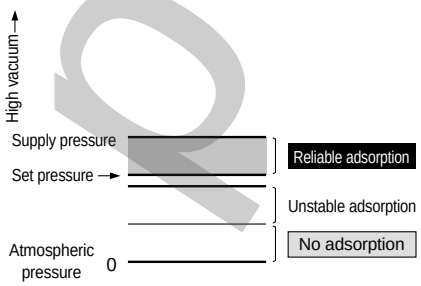
ZSE1-□□-16/-17

- OUT1 (white lead wire, red LED) can be set with pressure setting trimmer 1 (SET1).
- OUT2 (green lead wire, green LED) can be set with pressure setting trimmer 2 (SET2).



- When using to confirm adsorption, set to the minimum vacuum pressure at which adsorption is possible. If set below this value, the switch will turn ON even when adsorption has failed or is insufficient.

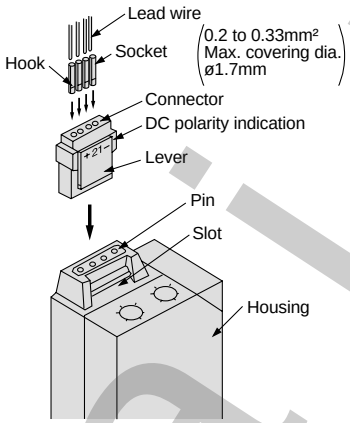
  Also take note that if the setting is too high, the switch may not turn ON even with good adsorption.



How to Use the Connector

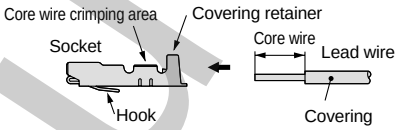
1. Installation and removal of connector

- To install the connector, hold the lever and connector unit between your fingers and insert it straight onto the pins. Then lock it by pressing the pawl of the lever into the slot on the housing.
- To remove the connector, pull it straight out while pressing the lever down with your thumb to release the pawl from the slot.



2. Crimping of lead wire and socket

Strip 3.2 to 3.7mm at the end of the wire, place the exposed core wire into the socket properly and crimp with a crimping tool. When this is done, be sure that the lead wire covering does not get into the core wire crimping area. (Crimping tool: Model DXT170-75-1)

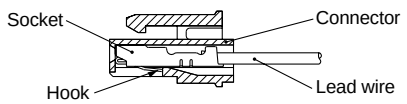


3. Attachment and removal of sockets with lead wire

- Attachment

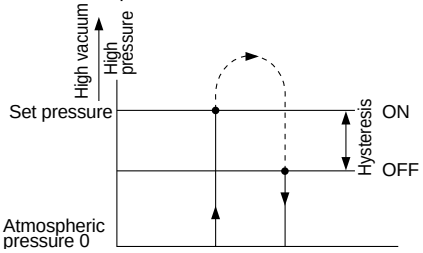
  Insert a socket into a square hole in the connector (+, 1, 2, – indication provided). Holding by the lead wire, push it all the way in until the hook on the socket catches and locks in the seat of the connector. (When it is pushed in, the hook opens and locks automatically.) Then pull the lead wire gently to confirm that it is locked.
- Removal

  To remove a socket from the connector, pull the lead wire out while pushing in the socket's hook using a bar with a thin end (approximately 1mm). If this socket will be used again, spread the hook outward.



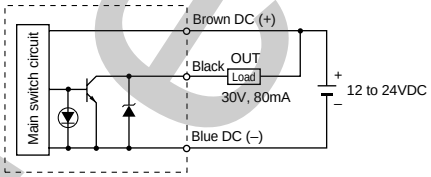
Hysteresis

Hysteresis is the difference between the pressure at which the output signal turns ON and the pressure at which it turns OFF. It turns ON at the set pressure.

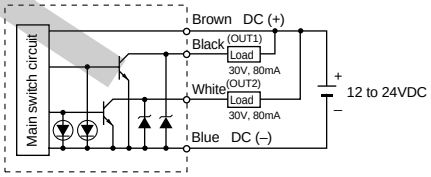


Internal Circuits and Wiring Examples

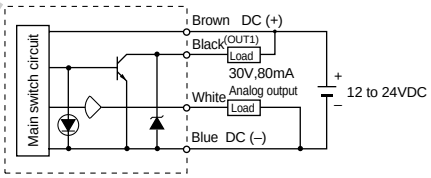
ZSE1-□-14, -15



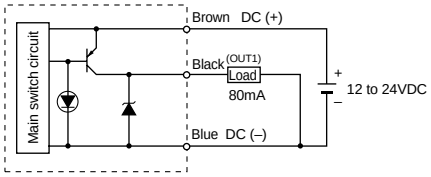
ZSE1-□-16,-17



ZSE1-□-18,-19

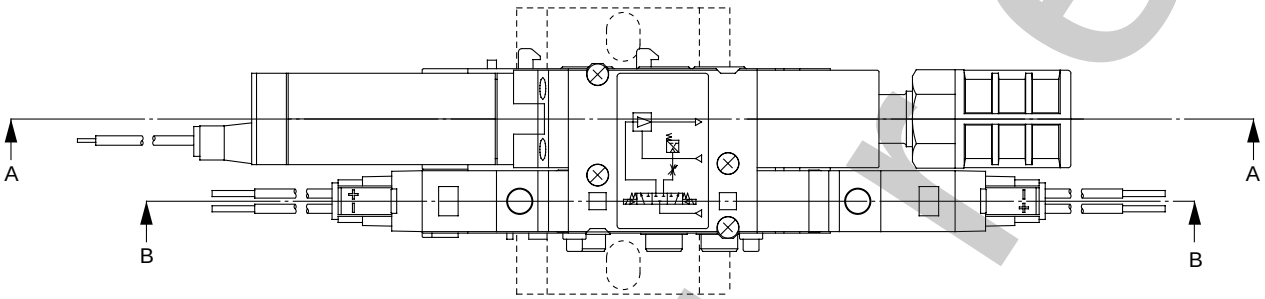


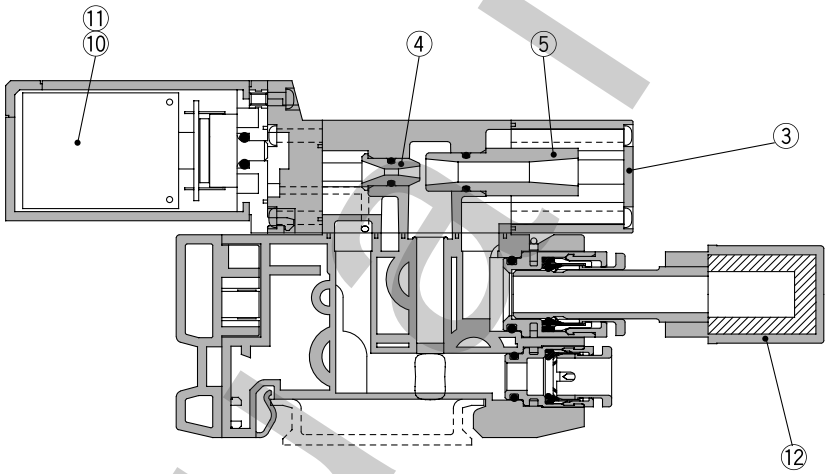
ZSE1-□-55



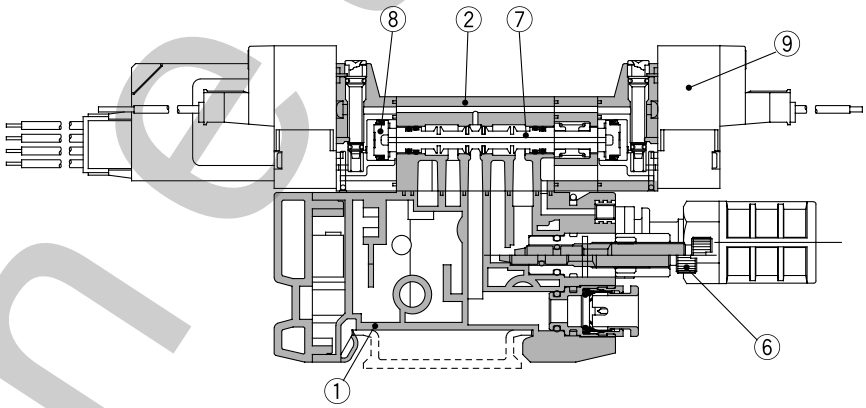
Construction

ZYY3000





Section A-A (ejector)



Section B-B (solenoid valve)

Parts list

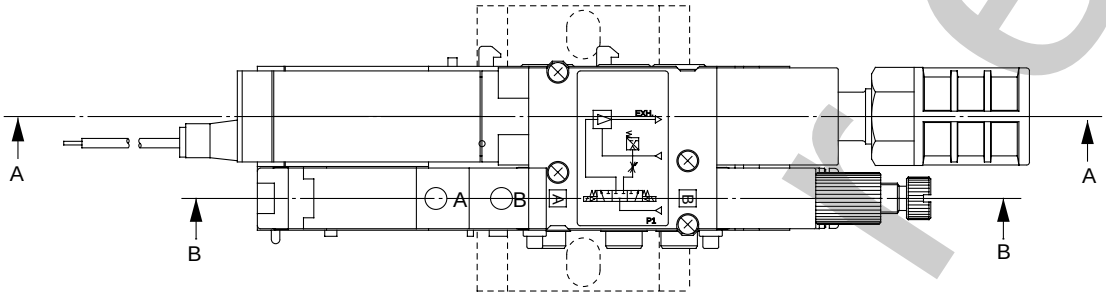
No.	Description	Material	Note
1	**Manifold block**	Resin	Urban white
2	**Body**	Die-cast zinc	Urban white
3	**Silencer cover**	Resin	Urban white
4	**Nozzle**	Aluminum	
5	**Diffuser**	Aluminum	
6	**Needle**	SUS	
7	**Spool**	Aluminum	
8	**Piston**	Resin	

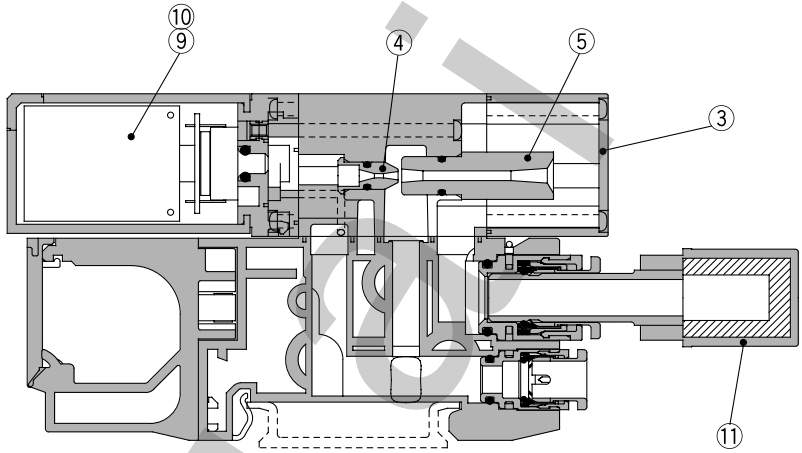
Replacement parts list

No.	Description	Part No.
9	**3 port solenoid valve**	SY114-□□□
10	**Vacuum switch**	ZSE1-00-□□□-X130
11	**End plate assembly**	P44027A
12	**Silencer**	AN203-KM8

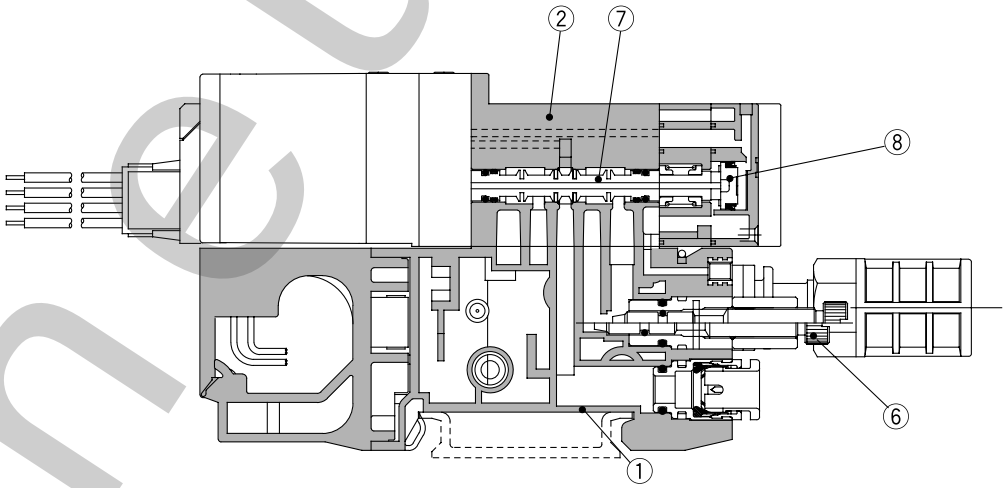
Construction

ZYX3000





Section A-A (ejector)



Section B-B (solenoid valve)

Parts list

No.	Description	Material	Note
1	**Manifold block**	Resin	Urban white
2	**Body**	Die-cast zinc	Urban white
3	**Silencer cover**	Resin	Urban white
4	**Nozzle**	Aluminum	
5	**Diffuser**	Aluminum	
6	**Needle**	SUS	
7	**Spool**	Aluminum	
8	**Piston**	Resin	

Replacement parts list

No.	Description	Part No.
9	**Vacuum switch**	ZSE1-00-□□□-X129
10	**End plate assembly**	P440119A
11	**Silencer**	AN203-KM8

Series ZYY/ZYX

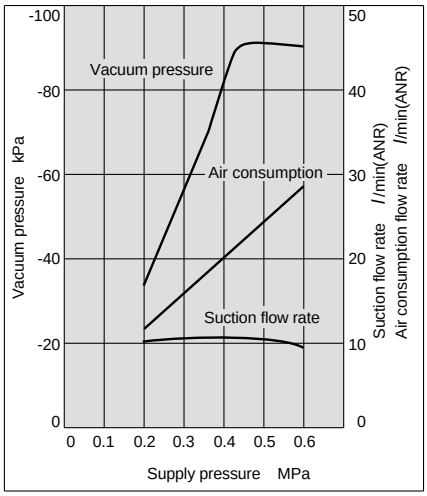
Exhaust Characteristics/Flow Rate Characteristics

The flow rate characteristics correspond to a supply pressure of 0.45MPa {4.5kgf/cm²}.

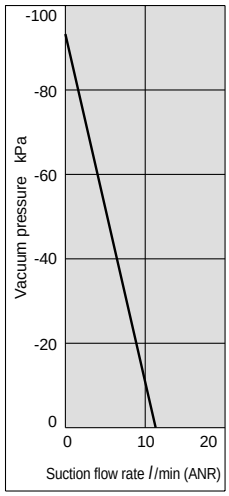
ZY Y3 X3 □□□□□-07S

Max. vacuum pressure: –84KPa{–630mmHg}

Exhaust characteristics



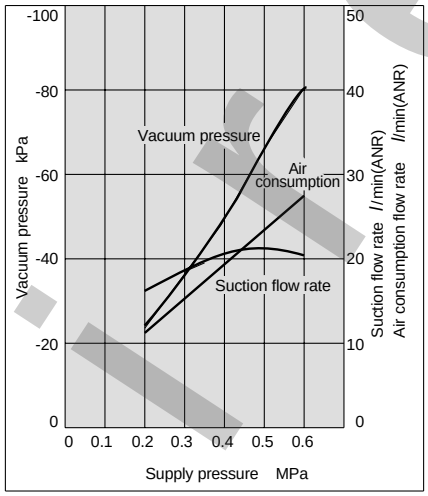
Flow rate characteristics



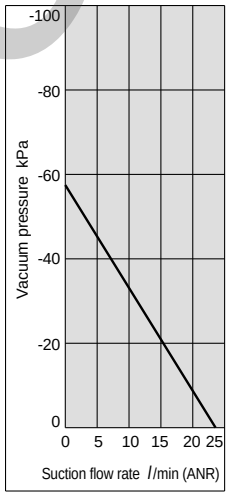
ZY Y3 X3 □□□□□-07L

Max. vacuum pressure: –53KPa {–400mmHg}

Exhaust characteristics



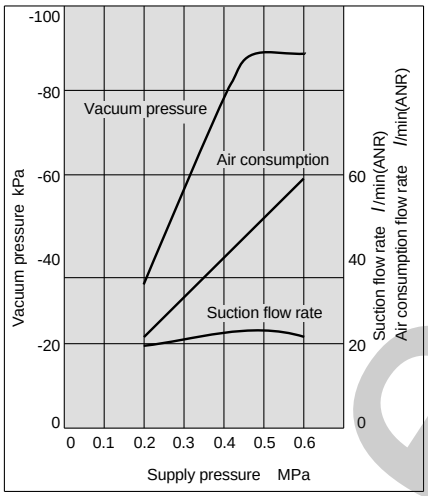
Flow rate characteristics



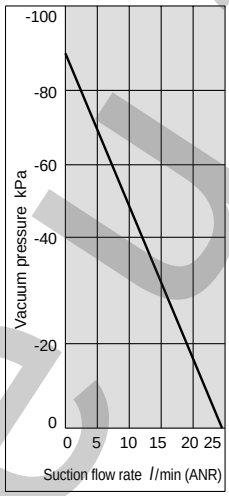
ZY Y3 X3 □□□□□-10S

Max. vacuum pressure: –84KPa {–630mmHg}

Exhaust characteristics



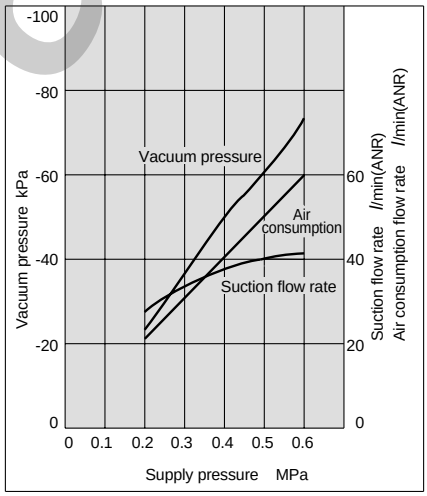
Flow rate characteristics



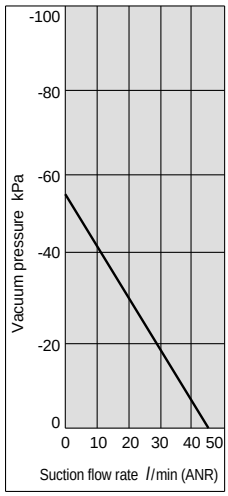
ZY Y3 X3 □□□□□-10L

Max. vacuum pressure: –53KPa{–400mmHg}

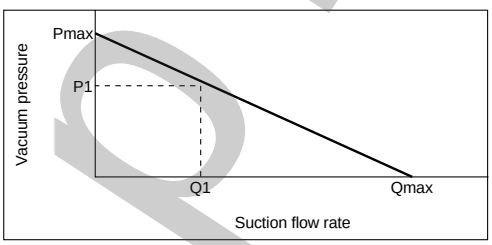
Exhaust characteristics



Flow rate characteristics



Viewing the flow rate characteristic graphs



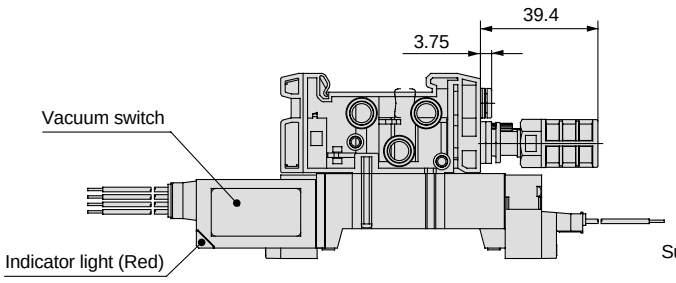
The flow rate characteristics indicate the relationship between the vacuum pressure and the suction flow rate of the ejector, and show that when the suction flow rate changes the vacuum pressure also changes. In general, this indicates the relationship at the ejector's standard operating pressure. In 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. The methods for changing the vacuum pressure will be explained in order.

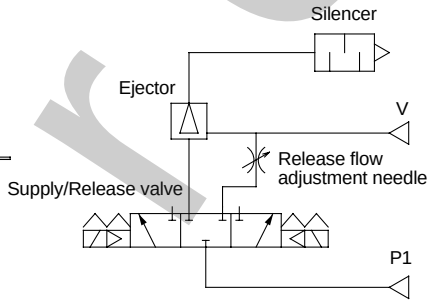
1. If the ejector's suction port is closed and sealed tight, the suction flow rate becomes "0" and the vacuum pressure increases to the maximum (Pmax).
2. If the suction port is opened gradually and air is allowed to flow (the air leaks), the inlet flow rate increases and the vacuum pressure decreases. (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).

   In this way, when the suction flow rate changes the vacuum pressure also changes. In other words, when there is no leakage at the vacuum port (vacuum piping), the vacuum pressure increases to the maximum, but the vacuum pressure drops as the amount of leakage increases, and when the amount of leakage and the maximum suction flow rate become equal, the vacuum pressure decreases nearly to "0". When adsorbing work pieces which are permeable or subject to leakage, etc., caution is required as the vacuum pressure will not be very high.

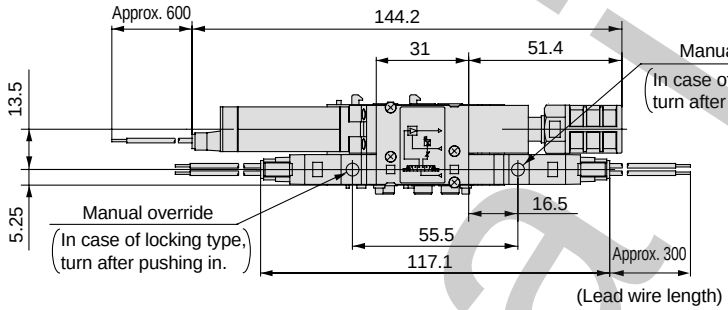
Ejector Valve Dimensions

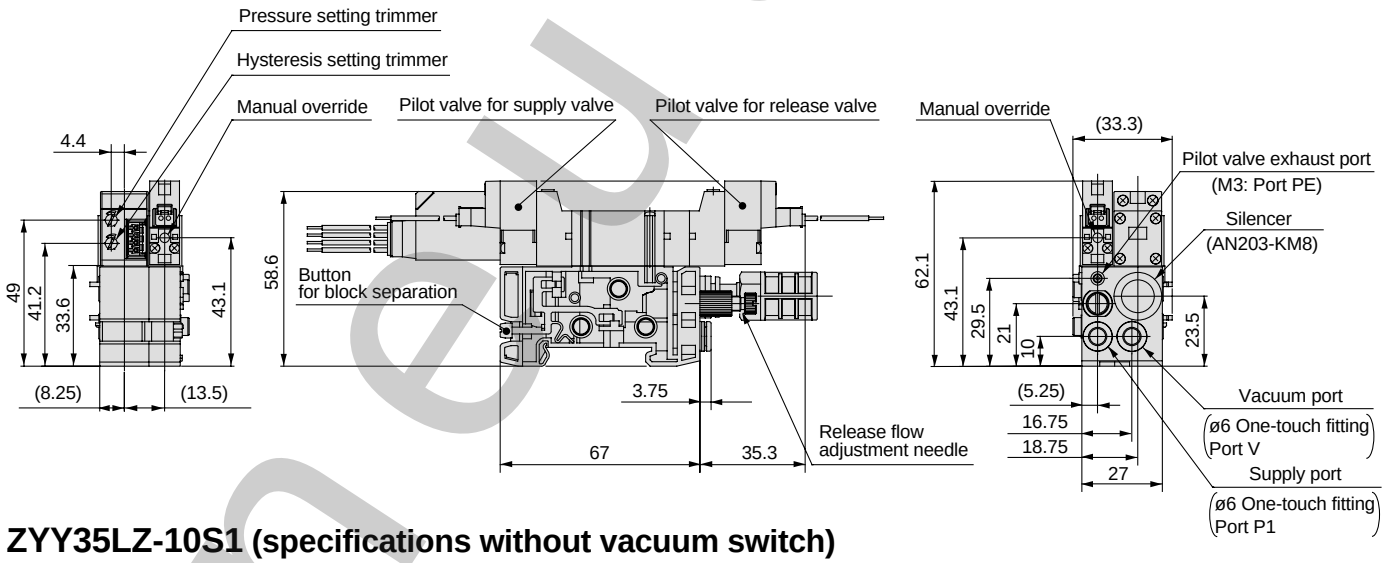
ZYY35LZ-10S1-E15C



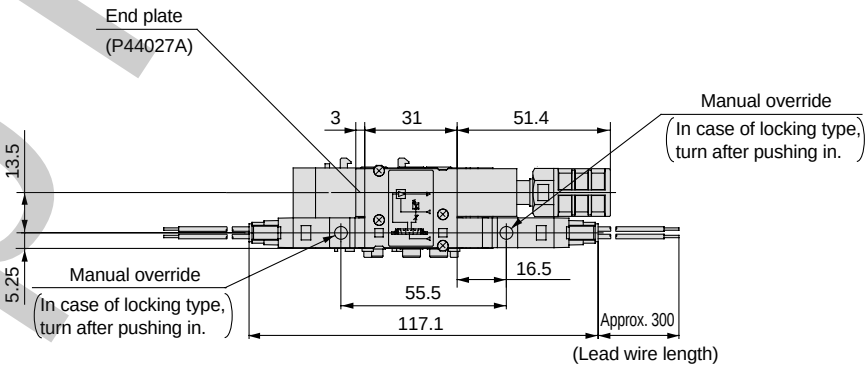


Circuit diagram





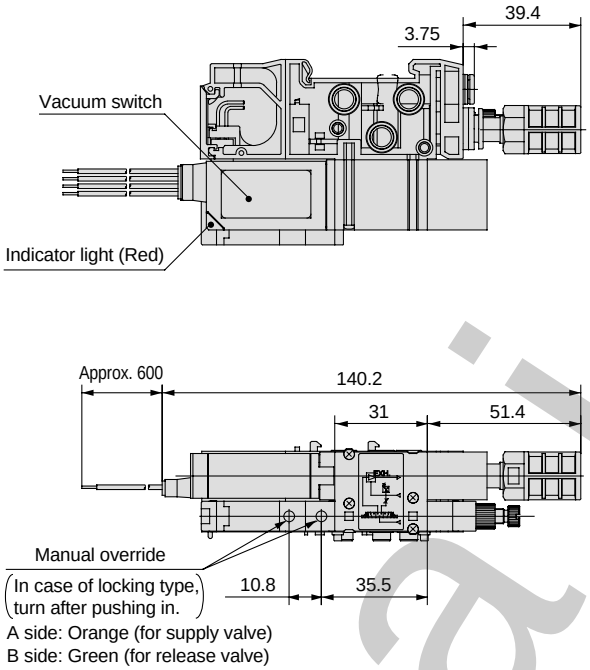
ZYY35LZ-10S1 (specifications without vacuum switch)

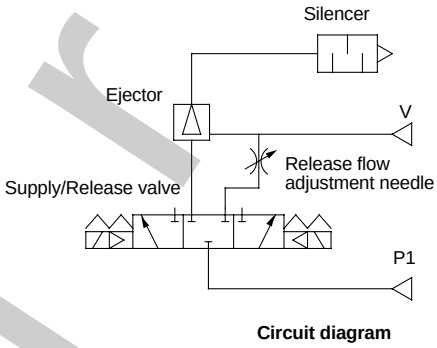


Series ZYY/ZYX

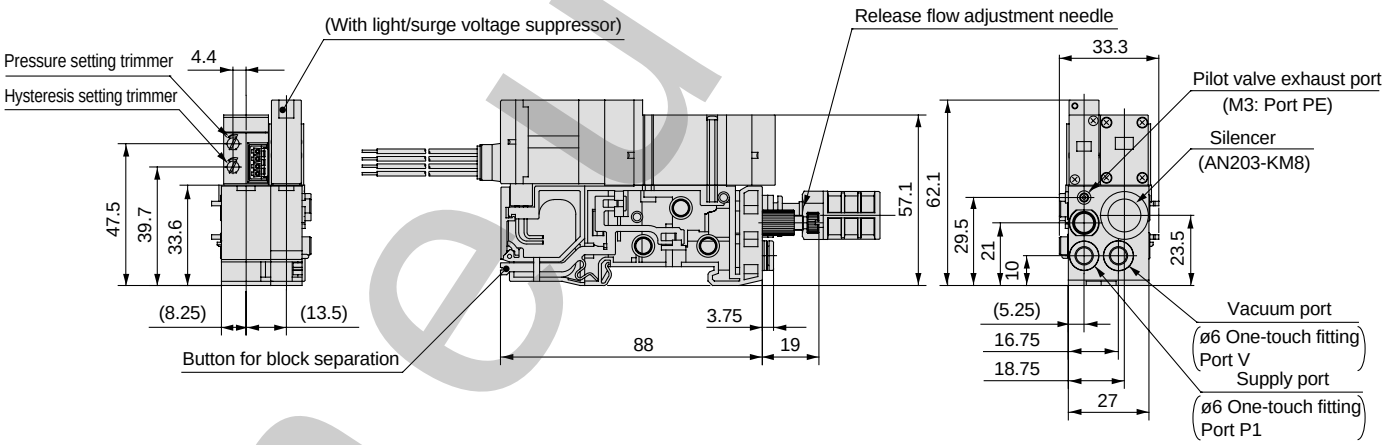
Ejector Valve Dimensions

ZYX35LOZ-10S1-E15C





Circuit diagram



ZYX35LOZ-10S1 (specifications without vacuum switch)