

Basic performance oriented general vacuum ejector unit

VSG Series

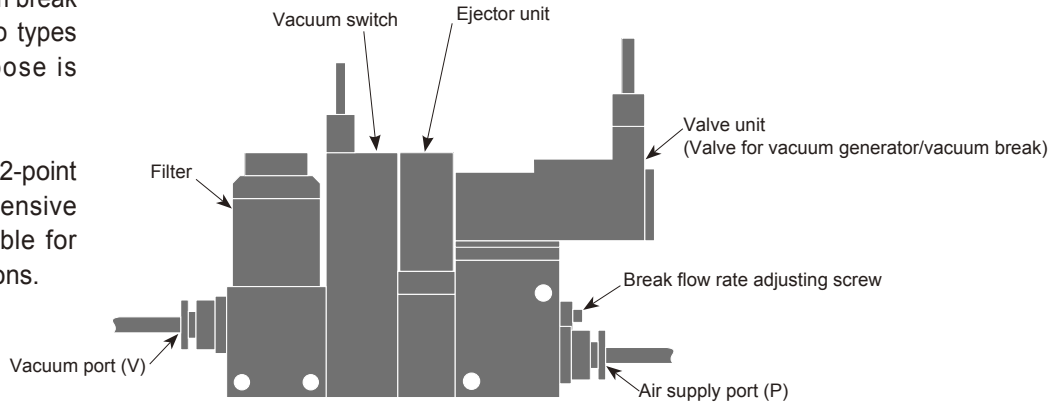
● Nozzle diameter: $\varnothing 0.5$, $\varnothing 0.7$, $\varnothing 1.0$

Vacuum switch and vacuum break valve, etc. are unitized, so types matching the work purpose is selectable.



Features

- Vacuum switch and vacuum break valve, etc. are unitized, so types matching the work purpose is selectable.
- Types with analog output, 2-point switch output, and inexpensive analog output are available for vacuum switch specifications.



Specifications

Descriptions		VSG
Working fluid		Compressed air
Working pressure range	MPa	0.25 to 0.7
Ambient temperature range	°C	5 to 50
Lubrication		Not required

Supply valve specifications

Descriptions		Supply valve
Control method		Pilot operated poppet type
Power voltage		24 VDC $\pm 10\%$ / 100 VAC $\pm 10\%$
Power consumption		1.2W (with LED) / 1.5VA (with LED)
Effective sectional area		5mm ²
Manual override		Push type (non-locking)

Vacuum filter specifications

Descriptions		Vacuum filter
Material	Element	Poly-vinyl formal
	Guard	Polycarbonate transparent
	Body	PBT
Filtration		10 μ m

Vacuum switch specifications

Descriptions		Vacuum switch		
Model no.		VSG...-NA	VSG...-NW	VSG...-A
Output specifications		Switch output 1 point	Switch output 2 point	-
		Analog output 1 point	-	Analog output 1 point
Power voltage	12 to 24 VDC $\pm 10\%$ ripple content rate 10% (P-P) or less			
Power consumption (24 VDC supply)	17mA or less (switch 1 point ON)	25mA or less (switch 2 point ON)	15mA or less (output current 0mA)	
Working fluid	Air, inert gas			
Working pressure range	0 to -100kPa			
Withstanding pressure	200kPa			
Ambient temperature range	0 to 50°C			
Working humidity range	35 to 85%RH (no dew condensation)			
Switch output	Output no.	1	2	-
	Output method	NPN open collector		
	Set pressure range	0 to -100kPa		
	Operation precision	$\pm 3\%$ F.S. (25°C)		
	Hysteresis	Approx. 1 to 15% of setting value	2%F.S. or less	-
	Switch capacity	30 VDC 80mA or less		
	Residual voltage	0.8V or less		
Analog output	Output voltage	1 to 5V	-	1 to 5V
	Zero point voltage	1 ± 0.1 V	-	1 ± 0.1 V
	Span voltage	4 ± 0.1 V	-	4 ± 0.1 V
	Linearity/hysteresis	$\pm 0.5\%$ F.S. or less	-	$\pm 0.5\%$ F.S. or less

Ejector system

VSY

VSH·VSU
VSB·VSC

VSG

Vacuum break valve specifications

Descriptions	Vacuum break valve
Control method	Direct acting poppet type
Power voltage	24 VDC $\pm 10\%$ / 100 VAC $\pm 10\%$
Surge protective circuit	Surge absorber (24 VDC), bridge diode (100 VAC)
Power consumption	1.2W (with LED) / 1.5VA (with LED)
Effective sectional area	0.3mm ²
Manual override	Push type (non-locking)

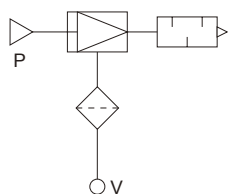
VSK
VSKM

VSJ
VSJM

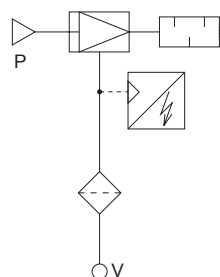
VSX
VSXM

Circuit diagram

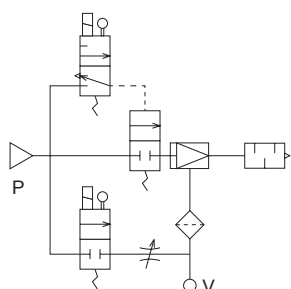
● VSG-*A-* (unit combination: A)



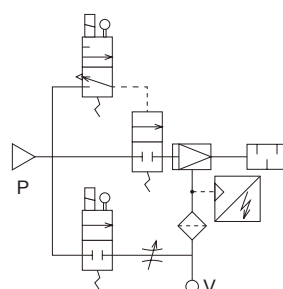
● VSG-*B-* (unit combination: B)



● VSG-*E-* (unit combination: E)



● VSG-*F-* (unit combination: F)



VSQ

VSZM

How to order

● 20mm width discrete vacuum ejector unit

VSG - H 07 F - 6 6 - 3 - NW

Ⓐ Vacuum characteristics

Ⓑ Nozzle diameter

Ⓒ Unit combination

Ⓓ Vacuum port (V)

Ⓔ Air supply port (P)

Ⓕ Solenoid valve voltage

Ⓖ Vacuum switch specifications

Symbol	Descriptions
Ⓐ Vacuum characteristics Note 1	
H	High vacuum/medium flow type
L	Medium vacuum/large flow rate type
E	High vacuum/small flow rate type
Ⓑ Nozzle diameter Note 1, Note 3, Note 4	
05	ø0.5
07	ø0.7
10	ø1.0
Ⓒ Unit combination Note 5, 6	
Refer to Table 1 for unit combinations.	
Ⓓ Vacuum port (V) Note 2, Note 3, Note 4	
4	ø4 push-in joint
6	ø6 push-in joint
Ⓔ Air supply port (P) Note 2, Note 3, Note 4	
4	ø4 push-in joint
6	ø6 push-in joint
Ⓕ Solenoid valve voltage Note 5	
1	100 VAC
3	24 VDC
Ⓖ Vacuum switch specifications Note 6	
NW	NPN output 2 point
NA	NPN output 1 point + analog output
A	Analog output

⚠ Note on model no. selection

Note 1: Ⓐ Ⓑ combination does not allow "E05" combination.

Note 2: Ⓓ Ⓔ combination is only "44" or "66".

Note 3: If Ⓑ is "05", Ⓓ Ⓔ is only "44".

Note 4: If Ⓑ is "07" and "10", Ⓓ Ⓔ is only "66".

Note 5: When Ⓒ unit combination is "A" or "B", Ⓓ solenoid valve voltage can not be selected.

Note 6: When Ⓒ unit combination is "A" or "E", Ⓖ vacuum switch specification can not be selected.

● Model no.

· Filter element for change

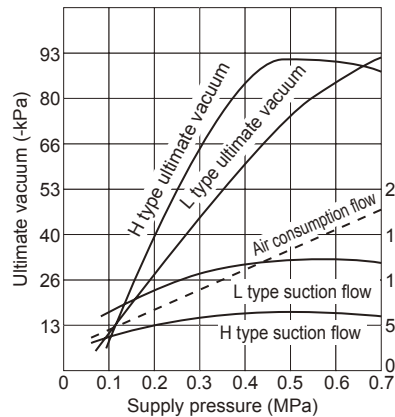
VSG-E

Table 1

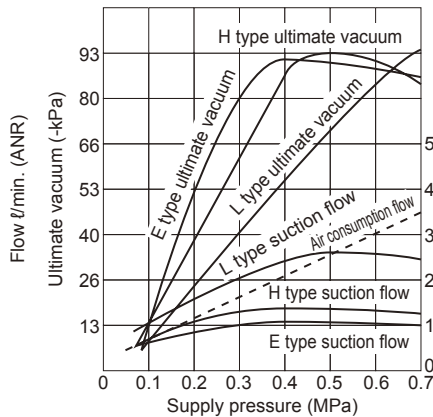
Unit combination				
Symbol	Filter	Vacuum switch with LED display	Vacuum generator valve	Vacuum break valve
A	●	-	-	-
B	●	●	-	-
E	●	-	●	●
F	●	●	●	●

Vacuum characteristics

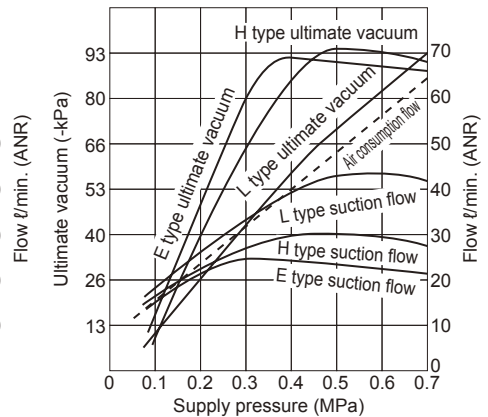
● VSG-#05



● VSG-*07

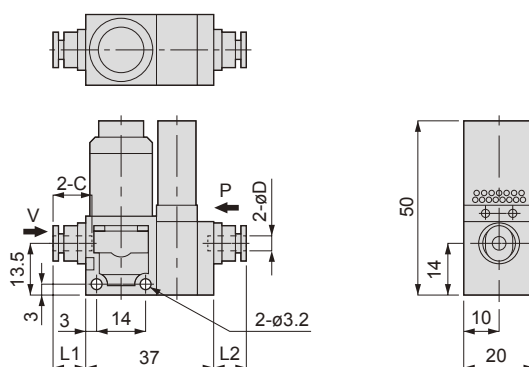


● VSG-*10



Dimensions

● VSG-*A-* (unit combination: A)

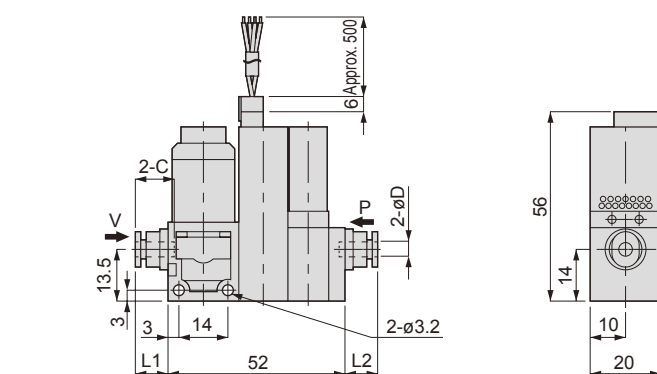


Unit: mm

Model no.	O.D. øD	L1	L2	C	Nozzle diameter (mm)	Ultimate vacuum (-kPa)	Suction flow (ℓ/min. (ANR))	Air consumption (ℓ/min. (ANR))	Weight (g)
VSG-H 05A-44	4	9.9	9.4	11.2	0.5	90	7	11.5	47
VSG-H 07A-66	6	12.3	11.8	11.9	0.7	93	13	23	49
VSG-H 10A-66					1		27	46	48
VSG-L 05A-44	4	9.9	9.4	11.2	0.5	66	12	11.5	46
VSG-L 07A-66	6	12.3	11.8	11.9	0.7		26	23	48
VSG-L 10A-66					1		40	46	47
VSG-E 07A-66	6	12.3	11.8	11.9	0.7	90	10.5	17	48
VSG-E 10A-66					1		21	34	

● VSG-*B-* (unit combination: B)

-NA: hysteresis setting trimmer
 -NW: SW2 vacuum setting trimmer
 Operating indication LED
 -NA: SW vacuum setting trimmer
 -NW: SW1 vacuum setting trimmer



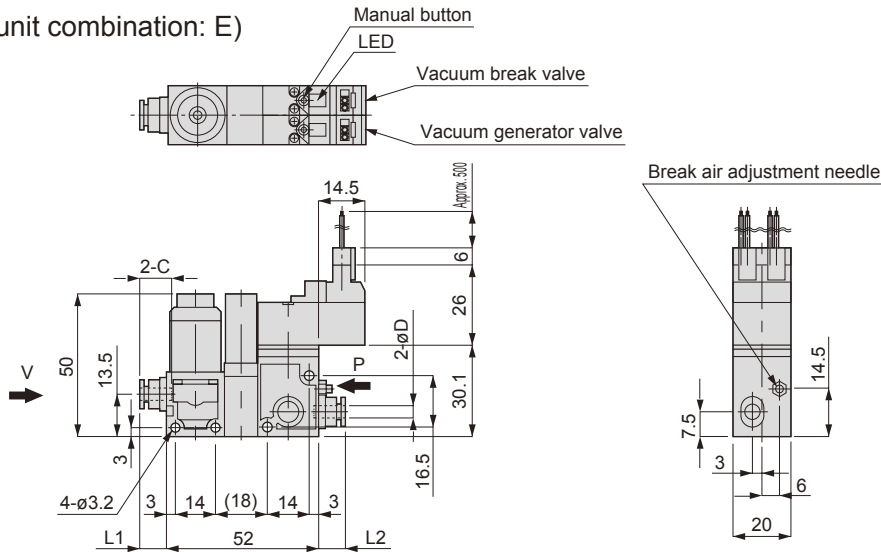
Note: Analog output (-A) is not used the operation indicating LED or vacuum setting trimmers.

Unit: mm

Model no.	O.D. øD	L1	L2	C	Nozzle diameter (mm)	Ultimate vacuum (-kPa)	Suction flow (ℓ/min. (ANR))	Air consumption (ℓ/min. (ANR))	Weight (g)
VSG-H 05B-44*	4	9.9	9.4	11.2	0.5	90	7	11.5	74
VSG-H 07B-66*	6	12.3	11.8	11.9	0.7	93	13	23	75
VSG-H 10B-66*					1		27	46	
VSG-L 05B-44*	4	9.9	9.4	11.2	0.5	66	12	11.5	73
VSG-L 07B-66*	6	12.3	11.8	11.9	0.7		26	23	75
VSG-L 10B-66*					1		40	46	74
VSG-E 07B-66*	6	12.3	11.8	11.9	0.7	90	10.5	17	75
VSG-E 10B-66*					1		21	34	

Dimensions

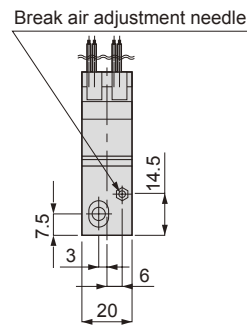
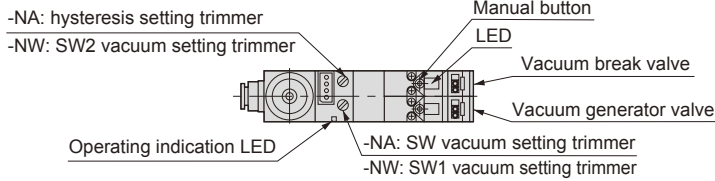
● VSG-*E-* (unit combination: E)



Unit: mm

Model no.	O.D. φD	L1	L2	C	Nozzle diameter (mm)	Ultimate vacuum (-kPa)	Suction flow (ℓ/min. (ANR))	Air consumption (ℓ/min. (ANR))	Weight (g)
VSG-H 05E-44-*	4	9.9	7.9	11.2	0.5	90	7	11.5	99
VSG-H 07E-66-*	6	12.3	10.3	11.9	0.7	93	13	23	100
VSG-H 10E-66-*					1		27	46	101
VSG-L 05E-44-*	4	9.9	7.9	11.2	0.5	66	12	11.5	99
VSG-L 07E-66-*	6	12.3	10.3	11.9	0.7		26	23	101
VSG-L 10E-66-*					1		40	46	100
VSG-E 07E-66-*	6	12.3	10.3	11.9	0.7	90	10.5	17	101
VSG-E 10E-66-*					1		21	34	100

● VSG-*F-* (unit combination: F)



Note: Analog output (-A) is not used the operation indicating LED or vacuum setting trimmers.

Unit: mm

Model no.	O.D. φD	L1	L2	C	Nozzle diameter (mm)	Ultimate vacuum (-kPa)	Suction flow (ℓ/min. (ANR))	Air consumption (ℓ/min. (ANR))	Weight (g)
VSG-H 05F-44-**	4	9.9	7.9	11.2	0.5	90	7	11.5	125
VSG-H 07F-66-**	6	12.3	10.3	11.9	0.7	93	13	23	128
VSG-H 10F-66-**					1		27	46	127
VSG-L 05F-44-**	4	9.9	7.9	11.2	0.5	66	12	11.5	127
VSG-L 07F-66-**	6	12.3	10.3	11.9	0.7		26	23	
VSG-L 10F-66-**					1		40	46	
VSG-E 07F-66-**	6	12.3	10.3	11.9	0.7	90	10.5	17	128
VSG-E 10F-66-**					1		21	34	

Safety precautions

Refer to Intro 13 for the general precautions of the vacuum system components.

CAUTION

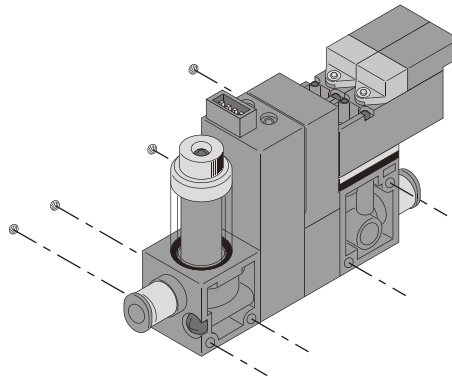
- Monitor if piping resistance or required vacuum release flow is large. Insufficient vacuum release flow could cause problems. Check specifications before use.

How to use

Ejector system

1. Fixing method

Fix the vacuum ejector VSG with M3 screws using the fixing holes on the resin body.
(Refer to external dimension drawings for mounting hole pitch.)



VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

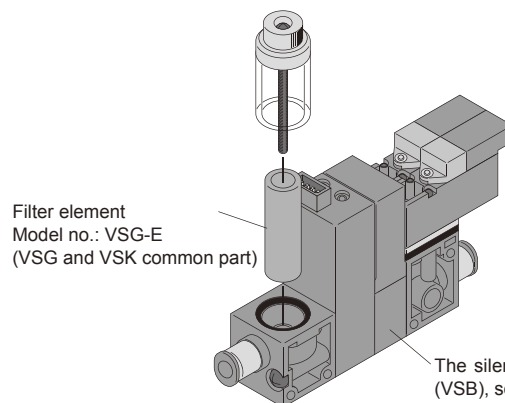
VSJ
VSJM

VSX
VSXM

VSQ

VSZM

2. Element replacing method



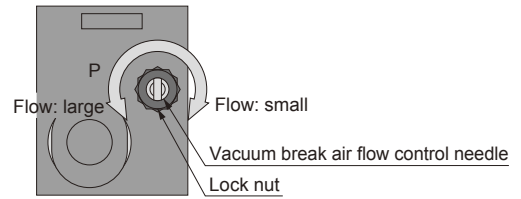
How to use

3. Adjustment method of break valve

■ Adjustment method of break air

- Turning the vacuum release air adjustment needle to right (CW) decreases the release air flow and turning it to left (CCW) increases it.

* After adjusting vacuum release air, tighten the lock nut so that the setting does not change.



4. Attaching and removing individual connectors

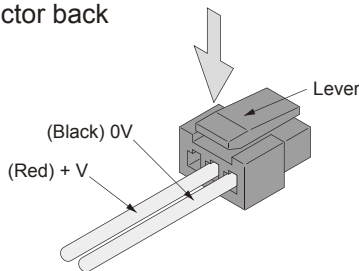
■ Attaching individual connectors

- Individually inserted connectors are installed by inserting until they stop.

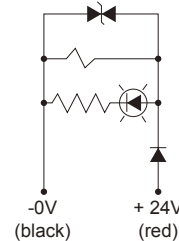
■ Removing individual connectors

- To remove individually inserted connectors, hold the lever on the back of the connector down and pull the plug out.

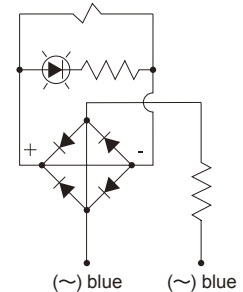
■ Connector back



● 24 VDC



● 100 VAC



5. Handling the vacuum switch

1. Pressure setting

- ① Energizing (check wiring and supply DC power.)
- ② Turn the hysteresis setting trimmer (HYS) fully in the CCW direction to set hysteresis to a minimum. (Only for vacuum switch with analog output (-NA))

Note) If vacuum is unstable, output destabilizes if hysteresis is setting minimum.

- ③ Adjust the pressure setting trimmer (S1 or S2, SW) to the required setting.
- ④ Apply pressure and confirm that operation actually takes place.

(For vacuum switches with analog output (-NA))

Switch output (SW): The operation (LED red) turns on when set pressure is exceeded.

(For 2-point switch output vacuum switch (-NW))

Switch output 1 (S1): The operation (LED red) turns on when set pressure is exceeded.

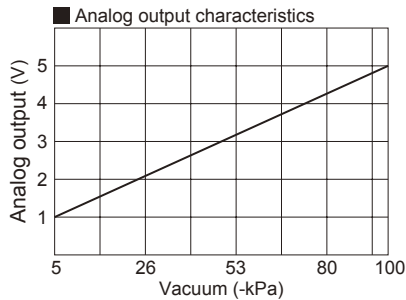
Switch output 2 (S2): The operation (LED green) turns on when set pressure is exceeded.

2. Setting hysteresis (only for vacuum switches with analog output (-NA))

- ① Hysteresis is adjusted using the hysteresis setting trimmer (HYS)
- ② Hysteresis is adjusted from 1 to 15% of the setting. Hysteresis increases when the trimmer is turned to CW.
- ③ Checking hysteresis
Gradually raise and lower pressure near the set pressure, and using the vacuum gauge, monitor values at which the operation LED turns on or off. The difference in pressure displayed when the LED is on or off is hysteresis.
- ④ Example of hysteresis adjustment
 - If pressure has a pulse and output is thin and intermittent, use large hysteresis.
 - To set the tolerable range for pressure drops.

How to use

3. Analog output vacuum switch (-A) output characteristics



4. Wiring and piping

- (1) Turn power off before wiring.
- (2) Check lead color and terminal output when wiring.
- (3) Refer to Fig. 1 Connection method when connecting wires.
- (4) Do not apply strong tension or excessively bend to leads.
- (5) The cable is connected or disconnected from the connector. When disconnecting the cable, hold the connector, press down on the stopper and pull the cable out. Load is applied on the switch PCB each time the cable is connected or disconnected, so minimize the times this step is done.

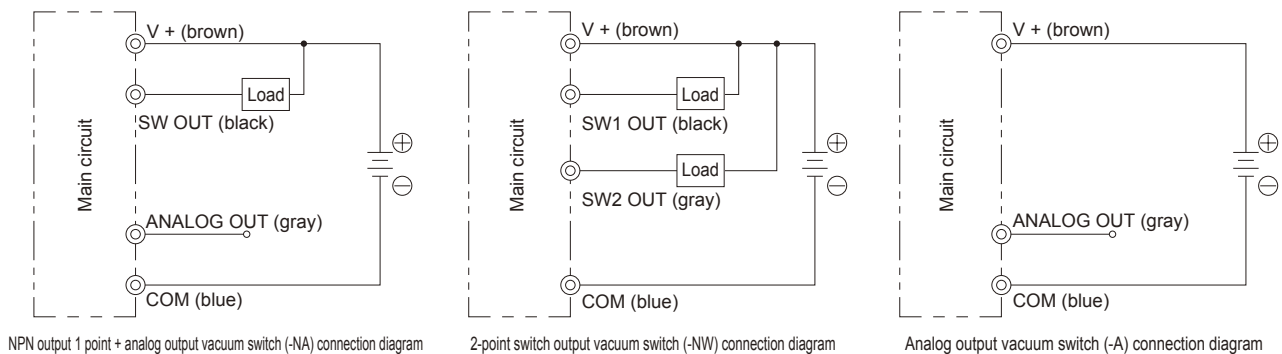


Fig. 1 Connection method

5. Cautions

- ① This product is not drip- or dust-proof. Avoid using in exposure to water, oil, or dust.
- ② This product is not explosion-proof. Avoid using in exposure to flammable or explosive gases or fluids.
- ③ Do not use this product for applications where set temperature range is exceeded. The sensor could be damaged.
- ④ When applying positive pressure during the vacuum release, check that the pressure exceeding 0.2 MPa is not applied constantly.
- ⑤ This product cannot be used in an atmosphere or for fluids containing corrosive substances.
- ⑥ Use clean fluid as possible.
- ⑦ Use a stable DC power supply.
- ⑧ Insert a surge voltage suppressing circuit in the relay and solenoid valve, etc., connected to the output or power terminal. Avoid using where current could exceed 80 mA.
- ⑨ When using unit power, such as switching power, ground the FG terminal.
- ⑩ Check that the output terminal (black and gray) is not short-circuited with other terminals.
- ⑪ Do not apply excessive external force to the switch.
- ⑫ Do not use wiring or applications that may cause noise, etc., to be applied. The product could break.
- ⑬ When setting pressure or hysteresis, use the enclosed dedicated screwdriver to turn the trimmer carefully within its rotation range. Do not apply force.

Ejector system

VSY

VSH·VSU
VSB·VSC

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VSQ

VSZM