Related vacuum products

■ Vacuum component

CONTENTS

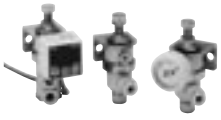
Series variation

Related vacuum products

(Position locking valve)

Series	Model no.	Port size		Remarks	Page
		Vacuum generator side	Workpiece side		
VSECV Series ・Separate circuit workpiece maintains vacuum even if workpiece deviates. ・This is applicable for vacuum pads. 	VSECV-M3	M3			422
	VSECV-M4	M4			
	VSECV-M5	M5			
	VSECV-M6	M6			
	VSECV-6A	R (c) 1/8			

(Compact vacuum regulator)

Series	Model no.	Port size		Remarks	Page
		ø6	ø8		
VSRVV Series ・Terminal pressure can be controlled in addition to main pressure. ・Select either a vacuum pressure switch with a digital indicator or a vacuum pressure gauge. 	VSRVV-*A*	○	○	Elbow (Output: male thread)	426
	VSRVV-*B*	○	○	Elbow (Supply: male thread)	
	VSRVV-*U*	○	○	Union type	

(Vacuum break unit)

Series	Model no.	Port size		Remarks	Page
		Vacuum generator side	Workpiece side		
VSLF Series ・Control vacuum break air while maintaining vacuum characteristics of vacuum ejector. ・Reduction of vacuum break time realized by vacuum break circuit relief function. 	VSLF-44	ø4	ø4		436
	VSLF-66	ø6	ø6		
	VSLF-46A	ø4	R1/8		
	VSLF-66A	ø6	R1/8		

(Vacuum filter)

●: Standard, ○: Option

Series	Model no.	Port size						Remarks	Page
		M5	ø4	ø6	ø8	ø10	ø12		
VSFB Series Large volume union type ・Dust and water drops are eliminated with the cyclone effect and element. ・The entire dust case is removed with a single touch, preventing dust from scattering. 	VSFB-66			●				Filtration area: 20cm^2	440
	VSFB-88				●			Filtration area: 20cm^2	
	VSFB-1010					●		Filtration area: 20cm^2	
	VSFB-1212						●	Filtration area: 20cm^2	
VSFU Series Compact union type ・Tools are not required to replace or clean the element. ・In-line types are easily installed in piping. 	VSFU-1S	○	○	○				Filtration area: 2.8cm^2	
	VSFU-1L	○	○	○				Filtration area: 4.7cm^2	
	VSFU-2	○	○	○				Filtration area: 7.5cm^2	
	VSFU-3			○	○	○		Filtration area: 12.5cm^2	
VSFJ Series Compact socket type ・This is appropriate for discrete ejector, not integrating vacuum filter. 	VSFJ-44		●					Filtration area: 0.8cm^2	
	VSFJ-66			●				Filtration area: 1.1cm^2	

(Vacuum switch)

Series	Model no.	Port size					Remarks	Page
		M5	ø4	ø6	ø8	direct		
VSUS Series ・2 point output and analog output are available. ・Push-in joint, M5 female thread, or direct installation piping connection is available. 	VSUS-NW	○	○	○	○	○	NPN: 2 point output	448
	VSUS-NA	○	○	○	○	○	NPN: Analog output	
	VSUS-PW	○	○	○	○	○	PNP: 2 point output	
	VSUS-PA	○	○	○	○	○	PNP: Analog output	

(Air tweezers)

Series	Model no.	Pad diameter				Rubber Material	Holder shape	Page
		ø2	ø4	ø6	ø8			
VST Series ・Vacuum pad and ejector are integrated into a pen shape component. ・Appropriate for assembly, etc., of small part ・A package type is also available. 	VAT-A*N	○	○	○	○	Nitrile rubber	Type without valve	454
	VAT-A*S	○	○	○	○	Silicon rubber	Type without valve	
	VAT-B*N	○	○	○	○	Nitrile rubber	Valve integrated type	
	VAT-B*S	○	○	○	○	Silicon rubber	Valve integrated type	

Vacuum switch with LED display improves visibility
Vacuum switch with LED display

VSUS Series

● Port size: M5, ø4, ø6, ø8

RoHS

Features

■ Set and applied pressure are displayed on the LED.

■ The 2-point vacuum switch output type or analog output type vacuum switch is selectable to match different applications. Connector wiring facilitates easy wiring layout.

■ The push-in joint, M5 metric screw (female screw), or directly installed piping connection is selectable to match the application.

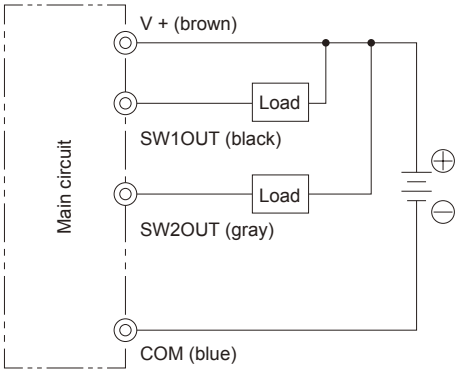
■ Pressure is detected with an electric switch, ensuring stable accuracy.

Specifications

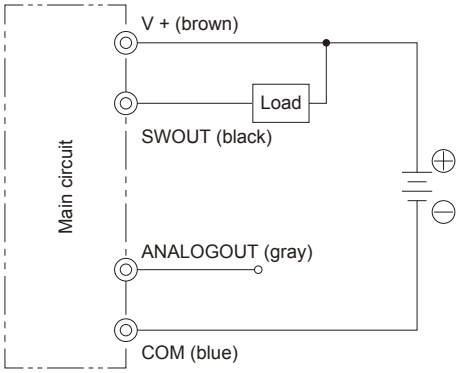
Descriptions		2 point output (NW)	With analog output (NA)	2 point output (PW)	With analog output (PA)
Default setting value		-50kPa (SW1), -10kPa (SW2)	-50kPa	-50kPa (SW1), -10kPa (SW2)	-50kPa
Current consumption		40mA or less			
Pressure detection method		Diffused semiconductor pressure switch			
Working pressure range		-100 to 0kPa			
Set pressure range		-99 to 0kPa			
Withstanding pressure		0.2MPa			
Storage temperature range		-20 to 70°C (atmospheric pressure, humidity 60%RH or less)			
Operating temperature range		0 to 50°C (no freezing and dew condensation)			
Operation humidity range		35 to 85%RH (with no dew condensation)			
Power voltage		12 to 24 VDC ±10% ripple (P - P) 10% or less			
Protective structure		IEC standards IP40 or equivalent			
Pressure setting point		2	1	2	1
Operation precision		±3%F.S. max. (at Ta = 25°C)			
Hysteresis		Fixing (2%F.S. or less)	Variable (0 to 15% F.S.)	Fixing (2%F.S. or less)	Variable (0 to 15% F.S.)
Switch output		NPN open collector output 30V 80mA or less residual voltage 0.8V or less		PNP open collector output power voltage 80mA or less residual voltage 0.8V or less	
Analog output	Output voltage	-	1 to 5V	-	1 to 5V
	Zero pint voltage	-	1±0.1 V	-	1±0.1 V
	Span voltage	-	4±0.1 V	-	4±0.1 V
	Output current	-	1mA or less (load resistance 5kΩ and over)	-	1mA or less (load resistance 5kΩ and over)
	LIN/HYS	-	±0.5%F.S. or less	-	±0.5%F.S. or less
Responsiveness		Approx. 2m/sec or less			
Display		0 to -99kPa (2 digit red LED display)			
Number of display		Approx. 4 times/sec.			
Display precision		±3%F.S. ±2digit			
Resolution		1digit			
Operating indication		SW1: Red LED turns ON when SW1 is above set pressure SW2: Green LED turns ON when SW2 is above set pressure	Red LED turns ON when SW1 is above set pressure	SW1: Red LED turns ON when SW1 is above set pressure SW2: Green LED turns ON when SW2 is above set pressure	Red LED turns ON when SW1 is above set pressure
Function		1. MODE switching switch (ME, S1 or S2) 2. S1 setting trimmer (2/3 rotation trimmer) 3. S2 setting trimmer (2/3 rotation trimmer)	1. MODE switching switch (ME or SW) 2. SW setting trimmer (2/3 rotation trimmer) 3. HYS setting trimmer (set point 0 to 15%)	1. MODE switching switch (ME, S1 or S2) 2. S1 setting trimmer (2/3 rotation trimmer) 3. S2 setting trimmer (2/3 rotation trimmer)	1. MODE switching switch (ME or SW) 2. SW setting trimmer (2/3 rotation trimmer) 3. HYS setting trimmer (set point 0 to 15%)

Electric circuit

● Vacuum switch with 2-point switch output



● Vacuum switch with analog output



How to order

● Vacuum switch

VSUS - P W - M5

Ⓐ Switch output status

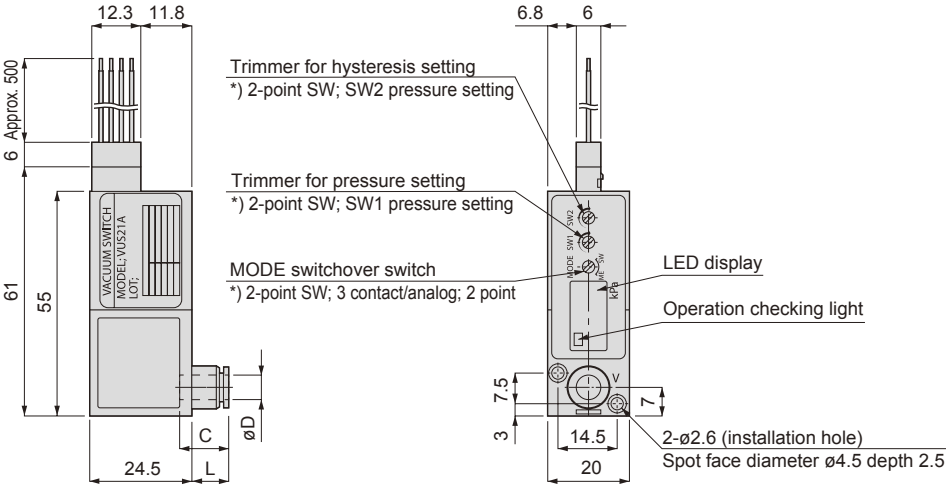
Ⓑ Switch specifications

Ⓒ Port size

Symbol	Descriptions
Ⓐ Switch output status	
N	NPN output
P	PNP output
Ⓑ Switch specifications	
W	2-point output
A	1-point output + analog output
Ⓒ Port size	
4	ø4 push-in joint
6	ø6 push-in joint
8	ø8 push-in joint
M5	M5 x 0.8
F	Direct mount type

Dimensions

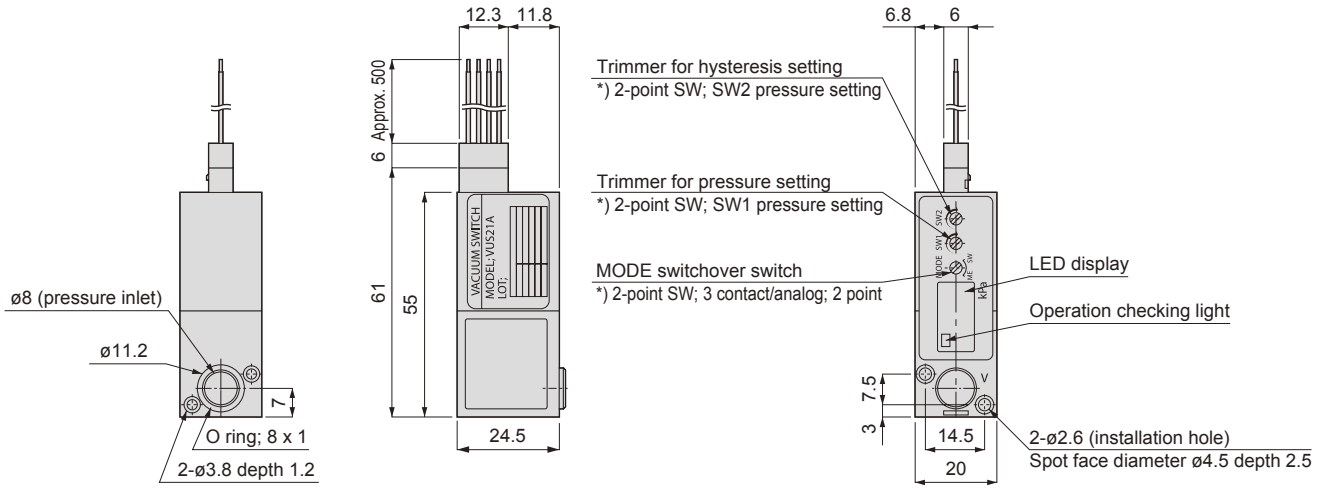
● Push-in joint type



Unit: mm

Model no.	Tube outer diameter øD	L	C	Weight (g)
VSUS-**-4	4	6.1	11.2	28
VSUS-**-6	6	8.9	11.9	28
VSUS-**-8	8	17.3	18.2	34.5

● Direct mount type

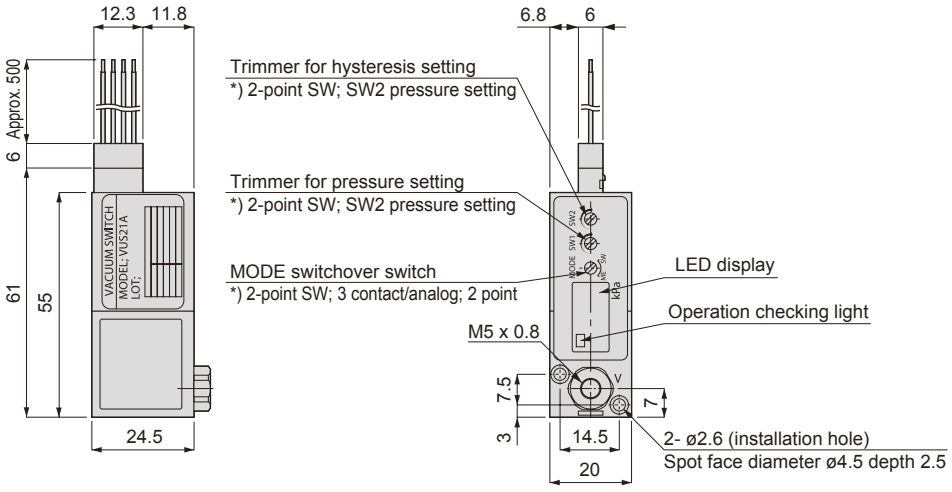


Unit: mm

Model no.	Weight (g)
VSUS-**-F	19

Dimensions

● Female thread type



Unit: mm

Model no.	Weight (g)
VSUS-**-M5	28.5

Safety precautions

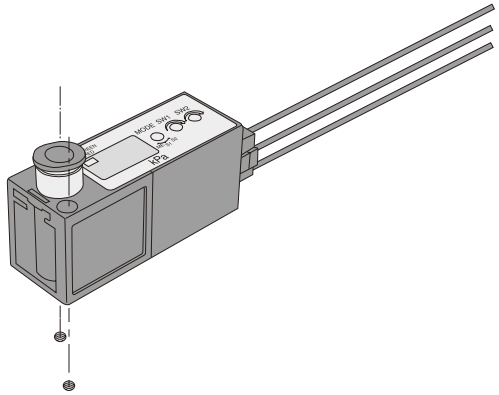
⚠ CAUTION

- Do not use this vacuum switch in fluids or in an atmosphere with corrosive substances. The switch may fail.
- Do not use wiring or applications that may cause noise (surge), etc., to be applied. The switch may fail.
- Do not use this vacuum switch in an atmosphere containing fluids or flammable or explosive gases. This device is not explosion-proof, so fire or explosion may occur.
- Do not use this vacuum switch where it may be exposed to water, oil, or dust. This device is not drip-proof, so faults may occur.
- Do not use this vacuum switch for applications that generate heat exceeding the working temperature range. The switch may fail.
- Turn power off before wiring. Check the lead wire color during wiring, and check that the output terminal, power terminal, and COM terminal are not short-circuited. The switch may fail if these terminals are short-circuited.
- Do not apply excessive tension or bend the connector cable excessively. Wires or connector section may break.
- Check that pressure exceeding 0.2 MPa is not constantly applied during a vacuum break. Constant application of this pressure may damage the switch.
- When setting pressure or hysteresis, use a small screwdriver, and gently turn the trimmer within its rotation range. Do not force it. The trimmer or PCB may be damaged if excessive force is applied during adjustment.
- Use stabilized DC power.
- Insert a surge voltage absorption circuit in the relay or solenoid valve, etc., connected to the output terminal or power terminal. Avoid uses in which current exceeds 80 mA.
- Ground the FG terminal when using unit power, such as switching power.
- Do not short-circuit the output terminal (black or gray lead) with other terminals.
- Do not apply excessive external impact or force to the switch.
- M2.5 screw installation holes are provided on the switch body. Tighten screws into these holes with the recommended tightening torque.
- Use clean fluids when possible.

How to use

Fixing the VSUS vacuum switch with LED display

① Fixing the VSUS vacuum switch with LED display
Fix the VSUS vacuum switch with LED display with M2.5 screws using installation holes on the body. (See the procedures of dimensions for fixing hole spacing.)



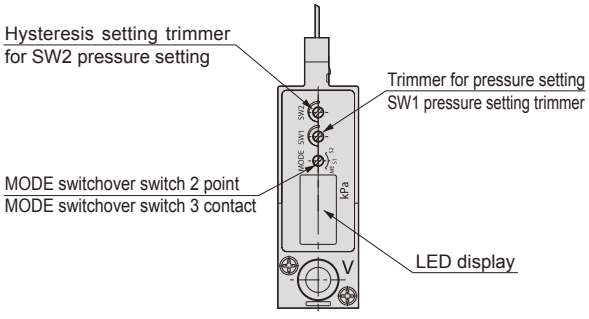
Using the vacuum switch

1. Setting pressure

① Energizing (checking wiring and supplying DC power.)
② Set the display change switch to pressure setting mode (ME→S1 or S2, SW).
② -2. Only for analog output vacuum switches
Turn the hysteresis setting trimmer (HYS) fully in the CCW direction to set hysteresis to a minimum.
③ Turn the pressure setting trimmer (S1 or S2, SW) with a small screwdriver, setting it to the required setting.
④ Set the display change switch to ME, apply pressure, and check that the switch operates appropriately.
(For vacuum sensors with 2-point switch output)
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.
(For vacuum sensors with analog output)
Switch output (SW): The operation LED (red) turns on when set pressure is exceeded.

2. Setting hysteresis

① Hysteresis is adjusted using the hysteresis setting trimmer (HYS).
② Hysteresis is adjusted from 0 to 15% of the setting. Hysteresis increases when the trimmer is turned to CW.
③ Checking hysteresis
Set the display change switch to pressure display mode (ME) and gradually increase and decrease pressure near the set pressure. Read values at which the operation indicator is turned on and off. The difference in displayed values 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.



* Upper level: Vacuum switch with analog output
Lower level: Vacuum switch with 2-point switch output