

# Transmitters: Relay Valve

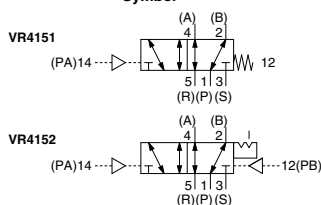
# VR4151/4152 Series

RoHS

Appropriate output sequences are affected according to the signal received from the mechanical valve. It is equivalent to the auxiliary relay of an electrical system.



Symbol



## ⚠ Precautions

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

## Environment

## ⚠ Caution

Operate the valve in an area in which the vibration does not exceed 5 G. Vibrations could cause the valve to malfunction.

## Specifications

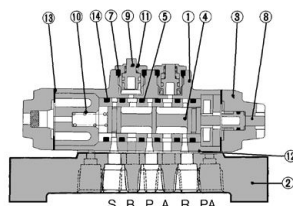
Fluid		Air		
Operating pressure		0 to 1.0 MPa		
Pilot pressure		0.15 to 1.0 MPa		
Ambient and fluid temperature		-5 to 60°C (No freezing)		
Flow rate characteristics		C[dm³/(s·bar)]	b	Cv
Side	1(P) ↔ 2(B)/4(A)	1.6	0.15	0.38
ported	2(B)/4(A) ↔ 3(S)/5(R)	1.5	0.2	0.36
Bottom	1(P) ↔ 2(B)/4(A)	1.6	0.2	0.38
ported	2(B)/4(A) ↔ 3(S)/5(R)	1.5	0.25	0.36
Port size		1/8		
Weight		Side ported	350 g	
		Bottom ported	300 g	
Lubrication		Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)		

## Model

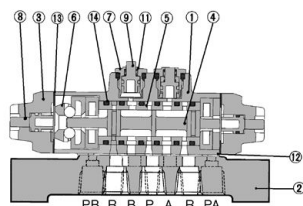
Function	Sub-plate	Model	Indicator
Single pilot	W/o sub-plate	VR4151-00-0	—
		VR4151-00-1	○
	W/ sub-plate	VR4151-01A-0	—
	Side piping	VR4151-01A-1	○
	W/ sub-plate	VR4151-01B-0	—
	Bottom piping	VR4151-01B-1	○
Double pilot	W/o sub-plate	VR4152-00-0	—
		VR4152-00-1	○
	W/ sub-plate	VR4152-01A-0	—
	Side piping	VR4152-01A-1	○
	W/ sub-plate	VR4152-01B-0	—
	Bottom piping	VR4152-01B-1	○

## Construction

VR4151



VR4152



## Component Parts

No.	Description	Material	No.	Description	Material
1	Valve	ADC	8	Manual button	POM
2	Sub-plate	ZDC	9	Piston	POM
3	Pilot cover	ADC	10	Spring	Steel
4	Spool	Stainless steel	11	Spring	Stainless steel
5	Sleeve	Stainless steel	12	Gasket	NBR
6	Detent assembly		13	Gasket	NBR
7	Piston cover	Brass	14	O-ring	NBR

VM

VMG

VR

VR51

VHK

VH

VHS□

VHS



# Transmitters: Shuttle Valve

RoHS

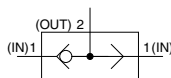
# VR1210/1220 Series

Relay valves for controlling the pneumatic signal lines.

This valve is also called "OR valve". As the air is supplied to either IN side, it is output from the OUT side. When the air pressure levels are different, the air with higher pressure flows to the OUT side.



Symbol



## Model/Specifications

Model	VR1210-01	VR1220-02
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.05 MPa	
Ambient and fluid temperature	-5 to 60°C (No freezing)	
Flow rate characteristics	C[dm <sup>3</sup> /(s·bar)]	1.3
	b	0.2
Port size	1/8	1/4
Weight	24 g	45 g

## How to Order

VR12 1 0 - 01

Port size	Applicable model
01 1/8	VR 1210
02 1/4	VR 1220

### Thread type

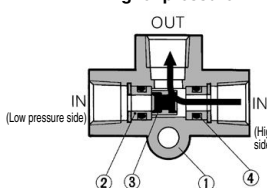
Nll	Rc
N	NPT
F	G

### Body size

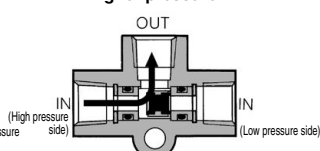
1	1/8 standard
2	1/4 standard

## Construction

When right port has higher pressure



When left port has higher pressure

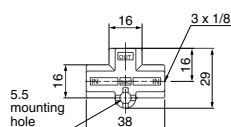


## Component Parts

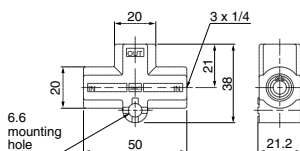
No.	Description	Material	Note	No.	Description	Material	Note
1	Valve body	ADC	Platinum silver	3	Valve	Brass, NBR	
2	Valve guide	Brass		4	O-ring	NBR	

## Dimensions

VR1210



VR1220



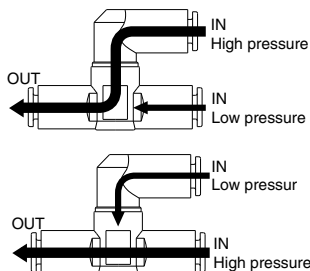
# Transmitters: Shuttle Valve with One-touch Fittings **VR1210F/1220F Series**

RoHS

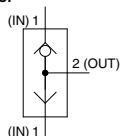
## Relay valves for controlling pneumatic signal lines



When the difference in input air pressure between two IN sides is 0.05 MPa or more, the air with higher pressure constantly flows to the OUT side.



Symbol



## Model

Model	Applicable tubing O.D.									
	Metric size					Inch size				
	3.2	4	6	8	10	1/8"	5/32"	1/4"	5/16"	3/8"
VR1210F	●	●	●	●	●	●	●	●	●	●
VR1220F			●	●	●			●	●	●

## Specifications

Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)
Applicable tubing material <sup>(1)</sup>	Nylon, Soft nylon, Polyurethane

Note 1) Use caution about the maximum operating pressure when soft nylon and polyurethane is used. (Refer to Best Pneumatics No. 7.)

Note 2) Brass components are all electroless nickel plated as standard.  
(Copper-free and fluorine-free)

## Flow rate characteristics

Model	VR1210F				VR1220F			
	Metric size	ø3.2	ø4	ø6	ø8	ø10	ø12	ø14
Applicable tubing O.D.	Inch size	ø1/8"	ø5/32"	ø1/4"	ø5/16"	ø1/4"	ø5/16"	ø3/8"
Flow rate characteristics	C[dm³/(s·bar)]	0.5	0.7	1.3	1.5	1.4	2.1	3.1
	b	0.25	0.25	0.25	0.25	0.25	0.25	0.25

## How to Order

VR 12 **1** 0 F - **06**

Body size

1	1/8 standard
2	1/4 standard

Shuttle valve

With One-touch fittings

Applicable tubing O.D.

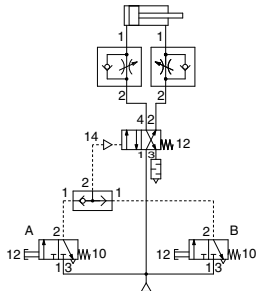
Metric size	Inch size
23 ø3.2*	01 ø1/8"
04 ø4	03 ø5/32"
06 ø6	07 ø1/4"
08 ø8	09 ø5/16"
10 ø10	11 ø3/8"

\* For ø3.2, use ø1/8" tubing.

## Example of Operating Circuit

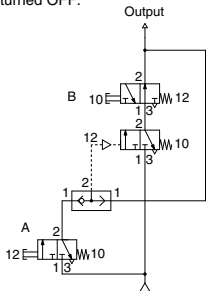
### OR circuit

- If either A or B is turned ON, cylinder is actuated.



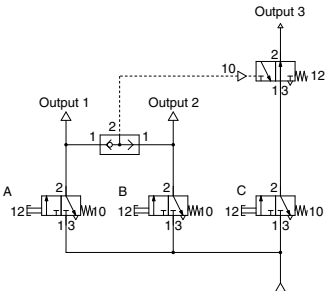
### Self-hold circuit

1. If A is turned ON, the output turns ON.
2. Even though A is turned OFF, the output remains in ON state.
3. If B is turned ON in 2. state, the output is turned OFF.

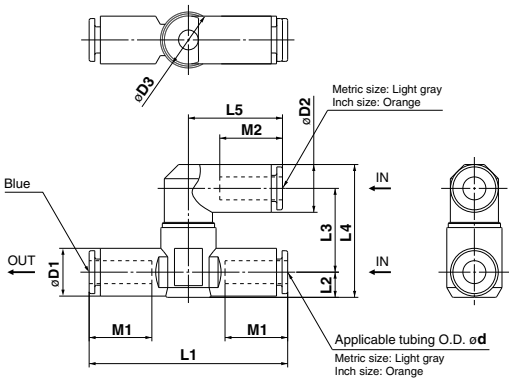


### Interlock circuit

- When either A or B is turned ON, even though C turns ON, the output 3 will not be turned ON.
- Only when both A and B are in OFF state, if C turns ON, the output 3 is turned ON.



## Dimensions



### Metric Size

Model	d	D1	D2	D3	L1	L2	L3	L4	L5	M1	M2	Weight (g)
VR1210F-23	3.2	11.4	8.4	14.8	52	6.2	19.4	29.8	17.5	12.7	12.9	21.4
VR1210F-04	4	11	10.4		53	6	20.3	31.5	21.9	16.5	15.8	15.6
VR1210F-06	6	12.8	12.8		53.2	6.8	22.5	35.6	25.2	16.8	16.8	23.0
VR1210F-08	8	15.2	15.2		60.4	8.1		38.2	28.2	18.7	18.7	24.0
VR1220F-06	6	12.8	12.8	19.8	59	7.4	23.9	37.7	25.2	16.8	16.8	27.2
VR1220F-08	8	15.2	15.2		65	8.2		39.7	28.2	18.7	18.7	31.9
VR1220F-10	10	18.5	18.5		71.6	9.8	25.8	44.8	31	20.8	20.8	43.2

### Inch Size

Model	d	D1	D2	D3	L1	L2	L3	L4	L5	M1	M2	Weight (g)
VR1210F-01	1/8"	11.4	8.4	14.8	52	6.2	19.4	29.8	17.5	12.7	12.9	21.4
VR1210F-03	5/32"	11	10.4		53	6	20.3	31.5	21.9	16.5	15.8	15.6
VR1210F-07	1/4"	13.2	13.2		54.4	7.1	22.5	36.2	25.6	16.8	16.8	23.5
VR1210F-09	5/16"	15.2	15.2		60.4	8.1		38.2	28.2	18.7	18.7	24.0
VR1220F-07	1/4"	13.2	13.2	19.8	59	7.4	23.9	37.9	25.6	16.8	16.8	31.4
VR1220F-09	5/16"	15.2	15.2		65	8.2		39.7	28.2	18.7	18.7	31.9
VR1220F-11	3/8"	17.9	18.5		69.8	9.5	25.8	44.5	31	20.8	20.8	53.0

# Transmitters: AND Valve with One-touch Fittings **VR1211F Series**

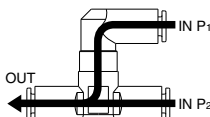
RoHS

## Relay valves for controlling pneumatic signal lines



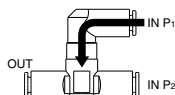
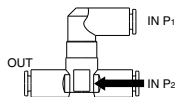
Only when air is supplied to both P<sub>1</sub> and P<sub>2</sub> does air flow to the OUT side.

When air pressure differs, pressure in the lower amount flows to the OUT side.

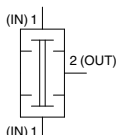


If air is supplied only to either P<sub>1</sub> or P<sub>2</sub>, it does not flow to the OUT side.

Note) Air may flow to the OUT side for a moment until the valve switches. (About 1/100 second) If there is any effect on the connected equipment due to the above air flow, install a speed controller, etc. on the OUT side, and adjust to prevent this effect before use.



Symbol



## Model

Model	Applicable tubing O.D.					
	Metric size			Inch size		
	3.2	4	6	1/8"	5/32"	1/4"
VR1211F	●	●	●	●	●	●

## Specifications

Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Ambient temperature and operating fluid temperature	-5 to 60°C (No freezing)
Applicable tubing material <sup>(1)</sup>	Nylon, Soft nylon, Polyurethane

Note 1) Use caution about the maximum operating pressure when soft nylon and polyurethane is used. (Refer to Best Pneumatics No. 7.)

Note 2) Brass components are all electroless nickel plated as standard.  
(Copper-free and fluorine-free)

## Flow rate characteristics

Model		VR1211F			
Applicable tubing O.D.	Metric size	ø3.2	ø4	ø6	—
	Inch size	ø1/8"	ø5/32"	—	ø1/4"
Flow rate characteristics	C[dm <sup>3</sup> /(s·bar)]	0.3	0.4	0.5	0.6
	b	0.25	0.25	0.25	0.25

## How to Order

VR 12 1 1 F - 06

Body size

1	1/8 standard
---	--------------

AND valve

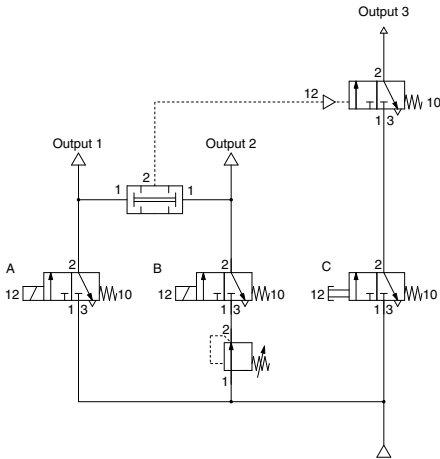
With One-touch fittings

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2 *	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	07	ø1/4"

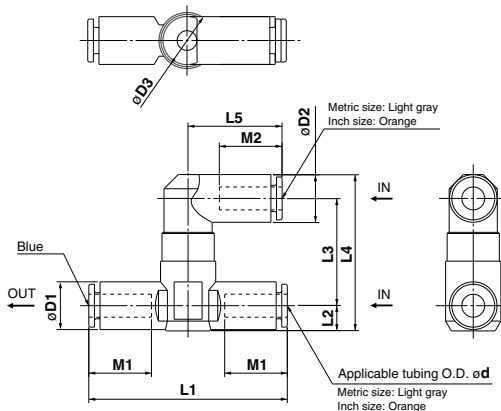
\* For ø3.2, use ø1/8" tubing.

## Example of Operating Circuit



- If both A and B are turned ON, which are in different pressure conditions, both output 1 and 2 will turn ON
- Only when output 1 and 2 are in the ON state, and C turns ON, will output 3 turn ON.
- If either A or B is turned OFF, output 3 will not be turned ON, even if C is turned ON.

## Dimensions



**VM**

**VMG**

**VR**

**VR51**

**VHK**

**VH**

**VHS**

**VHS**

### Metric Size

Model	d	D1	D2	D3	L1	L2	L3	L4	L5	M1	M2	Weight (g)
VR1211F-23	3.2	11.4	8.4	14.8	52	6.2	25.7	36.1	17.5	12.7	12.9	26.4
VR1211F-04	4	11	10.4		53	6.8	26.6	37.8	21.9	16.5	15.8	20.8
VR1211F-06	6	12.8	12.8		53.2		28.8	41.9	25.2	16.8	16.8	25.0

### Inch Size

Model	d	D1	D2	D3	L1	L2	L3	L4	L5	M1	M2	Weight (g)
VR1211F-01	1/8"	11.4	8.4	14.8	52	6.2	25.7	36.1	17.5	12.7	12.9	26.4
VR1211F-03	5/32"	11	10.4		53	6.8	26.6	37.8	21.9	16.5	15.8	20.8
VR1211F-07	1/4"	13.2	13.2		54.4	7.1	28.8	42.5	25.6	16.8	16.8	27.0

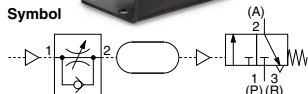
# Transmitters: Time Delay Valve VR2110 Series

RoHS

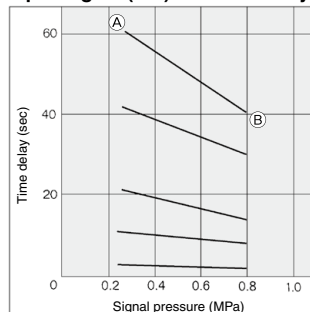
**Combination of adjustable orifice and fixed flow allows transmission of a pneumatic signal after a fixed time period.**



Symbol

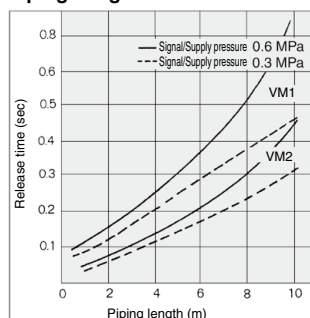


**Input Signal (PIL) vs. Time Delay**



Example) (A) is the point, which is set by the input signal pressure 0.25 MPa, with a delay time of 60 sec. With the same status, if the input signal pressure is increased to 0.8 MPa, the delay time varies to the (B) point (= 40 sec).

**Piping Length vs. Release Time**



If the input signal (PIL) is turned OFF, the release time of the time delay valve changes depending upon the effective area of the valve and the length of piping. Please refer to the above graph for the standard values.

## Model/Specifications

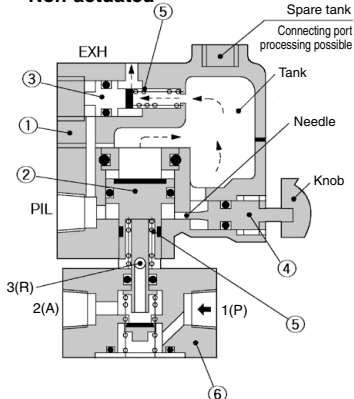
Model		VR2110-01
Supply pressure		0 to 1.0 MPa
Signal pressure		0.25 to 0.8 MPa
Time delay		0.5 to 60 s
Repeatability*		±10% F.S. (Representative valve)
Operating and fluid temperature		-5 to 60°C (No freezing)
Flow rate characteristics	C[dm <sup>3</sup> /(s·bar)]	0.6 [1(P)→2(A)], 0.5 [2(A)→3(R)]
	b	0.2 [1(P)→2(A)], 0.15 [2(A)→4(R)]
Port size		1/8
Weight		480 g

\*) The dispersion is shown excluding the first actuation when actuated 4 times continuously.

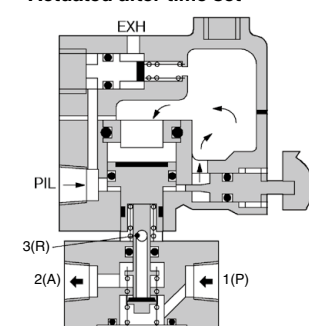
\*) The accuracy may differ from the values above due to the actual conditions, such as pressure fluctuations, temperature changes, operation intervals, changes over time, etc., so be sure to check the actual machine.

## Construction

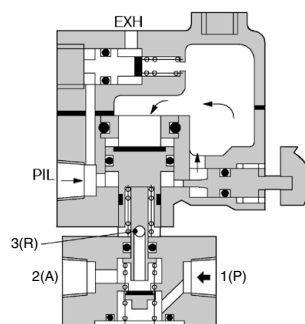
### Non-actuated



### Actuated after time set



### Actuated before time set



## Component Parts

No.	Description	Material	Note	No.	Description	Material	Note
1	Valve body	ADC	Platinum silver	5	Return spring	Steel	
2	Differential piston	Brass, NBR		6	Mechanical valve	Body: ZDC	VM130□01-00A (Body color: White)
3	Exhaust piston	Brass, NBR					
4	Needle	Brass					





## How to Order

VR2110 - **01** -  

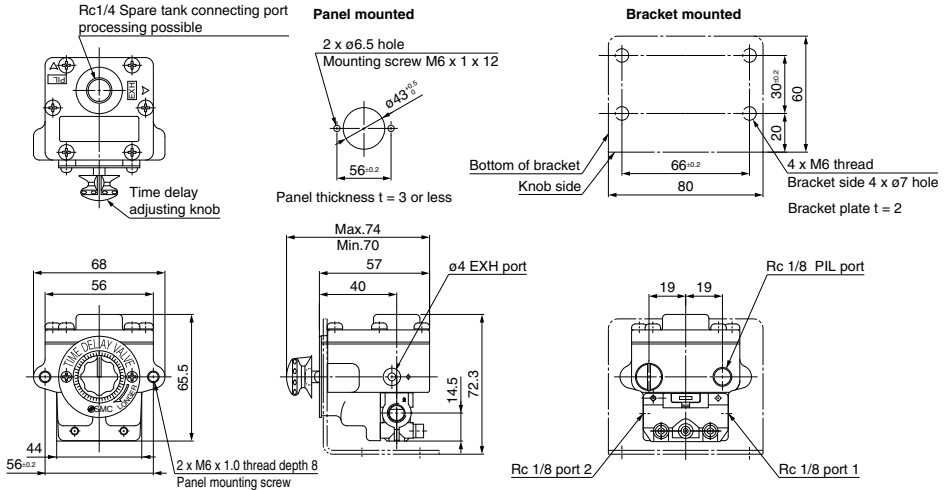
### Port size

<b>01</b>	Rc 1/8
<b>N01</b>	NPT 1/8
<b>F01</b>	G 1/8

### Option

<b>X3</b>	Secondary tank connection port Rc 1/4
<b>X102</b>	N.O. N.C. common type (With VM430)

## Dimensions



## ⚠ Precautions

**For safety instructions, be sure to read back page 50 or the operation manual before using the product.**

### Pneumatic Pressure

#### ⚠ Caution

1. Use regulated air using a regulator for input signal air.  
When the input signal air fluctuates, there will be larger differences in the delayed time, making it impossible to obtain the intended functions. Make sure to regulate the air using a regulator to avoid any influence of pressure fluctuation due to air consumption of other equipment.

### Operation

#### ⚠ Warning

1. The time delay adjusting knob should be operated by hand only. Do not over tighten the knob.  
If operating the knob with pliers or a jig or when the knob is over tightened, the needle at the adjusting part may be damaged causing an operation failure.  
The knob should be operated by hand only. Do not tighten the knob further than the fully closed position of the needle (the position at which the needle stops rotating when it is tightened gently by hand).

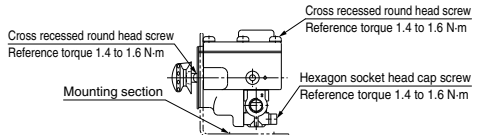
#### ⚠ Caution

1. Differences in the delayed time may be larger due to adhesion of the seal when the product is operated for the first time following an extended period of non-operation.  
When the product is operated after an extended period of non-operation, the tolerance for the accuracy of repeatability for the time delay may be outside of the  $\pm 10\%$  range. To eliminate this issue, run the time delay valve a number of cycles prior to operation.

### Maintenance

#### ⚠ Warning

1. Perform inspection on a regular basis as necessary, such as at the beginning of operation, to verify that the time delay valve operates properly.
2. Check whether the bolts on the mounting surface or the VR21 body are loose or damaged.  
If the bolts are loose, refer to the drawing below and use a hexagon wrench or a Phillips head screwdriver to tighten them.



VM

VMG

VR

VR51

VHK

VH

VHS□

VHS

# Transmitters: Pneumatic-electric Relay

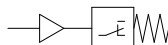


# VR3200/3201/3202 Series

**Pneumatic-electric relay converts pneumatic signal to electric relay.**



Symbol



## Precautions

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

## Piping

### Warning

When connecting a pipe fitting to the IN port, place the wrench over the hexagon portion of the lid.

If the wrench is placed over the micro-switch body, the neck of the microswitch could break.

## Operation

### Caution

1. When the air is in a continually supplied state for long periods of time, the recovery time may be delayed due to the adherence of the seal.

Use caution when supplying air continually for long periods of time.

## Model/Specifications

Model	VR3200-□01	VR3201-□01	VR3202-□01
Construction	Open type	Splashproof (IP44 equivalent) Conduit: G1/2	Splashproof/Conduit with ground terminal: Pg13.5
Weight	130 g	260 g	260 g
Operating pressure	0.1 to 1.0 MPa		
Ambient and fluid temperature	-5 to 60°C (No freezing)		
Contacts	1ab		
Port size	1/8		
Standard	—		

Note) Voltage is up to 30 VDC. Voltage other than that will be inapplicable.

## Microswitch Rating

Voltage	Non-inductive load (A)				Inductive load (A)			
	Resistance load		Light load		Inductive load		Electric motor load	
	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
125 VAC	15	15	3	1.5	15	15	5	2.5
250 VAC	15	15	2.5	1.25	15	15	3	1.5
8 VDC	15	15	3	1.5	15	15	5	2.5
14 VDC	15	15	3	1.5	10	10	5	2.5
30 VDC	6	6	3	1.5	5	5	5	2.5
125 VDC	0.5	0.5	0.5	0.5	0.05	0.05	0.05	0.05
250 VDC	0.25	0.25	0.25	0.25	0.03	0.03	0.03	0.03

## How to Order

VR320 0 - 01

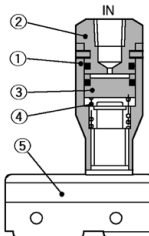
### Port size

01	Rc 1/8
N01	NPT 1/8
F01	G 1/8

### Construction

0	Open type
1	Splashproof (IP44 equivalent)
2	Splashproof with ground terminal (IP44 equivalent)/CE-compliant

## Construction



## Component Parts

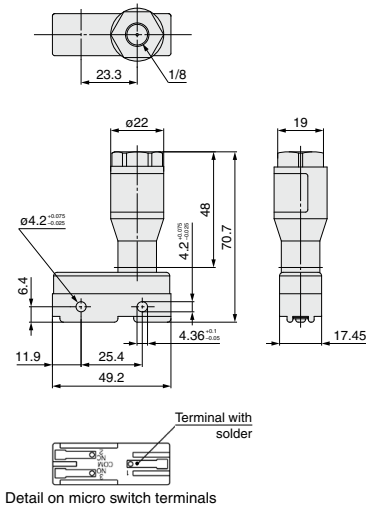
No.	Description	Material	Note	No.	Description	Material	Note
1	Body	Brass		4	Spring	Stainless steel	
2	Cap	Brass		5	Microswitch		Contacts 1 ab
3	Piston	POM					



Transmitters:  
Pneumatic-electric Relay **VR3200/3201/3202 Series**

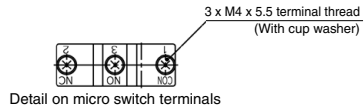
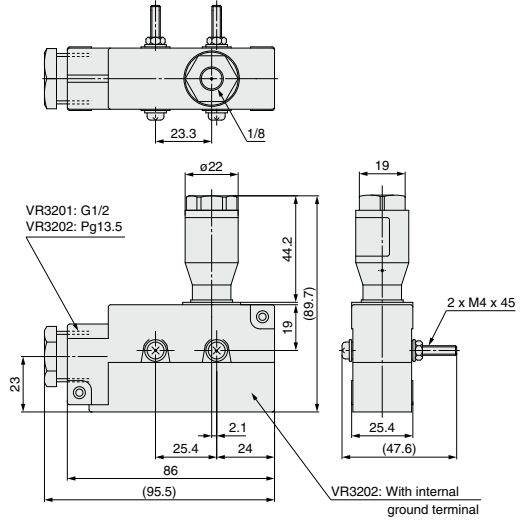
**Dimensions**

**VR3200**



Detail on micro switch terminals

**VR3201, VR3202**



Detail on micro switch terminals

**VM**

**VMG**

**VR**

**VR51**

**VHK**

**VH**

**VHS**

**VHS**

# Transmitters: Pneumatic Indicator *VR3100 Series*

**RoHS**

**Indicates the presence of pneumatic pressure. It is equivalent to the pilot lamp of an electrical system.**



Symbol

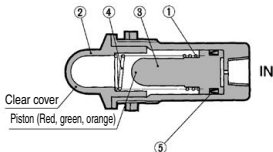


### Model/Specifications

Model	VR3100-01R	VR3100-01G	VR3100-01O
Color of indicator	Red	Green	Orange
Operating pressure	0.1 to 0.8 MPa		
Ambient and fluid temp.	-5 to 60°C (No freezing)		
Frequency	100 c.p.m. or less		
Port size	Rc 1/8		
Weight	40g		

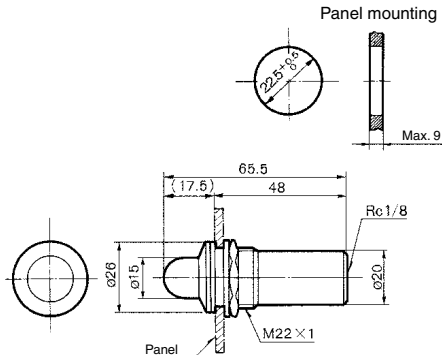
\* When the air is in a continually supplied state for long periods of time, the recovery time may be delayed due to the adherence of the seal.  
Use caution when supplying air continually for long periods of time.

## Construction



No.	Description	Material	Note
1	<b>Body</b>	Aluminum alloy	
2	<b>Indicator window</b>	Acrylic	
3	<b>Piston</b>	POM	
4	<b>Return spring</b>	Stainless steel	
5	<b>DY seal</b>	NBR	

## Dimensions



# Transmitters: Miniature Pneumatic Indicator *VR3110 Series*

**RoHS**

**This is an ultra-compact air indicator light to monitor the presence of air pressure.**

It is equivalent to the pilot lamp of an electrical system.

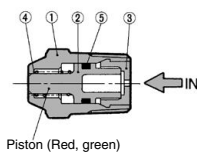
**Symbol**

## Model/Specifications

Model	VR3110-01R	VR3110-01G
Color of indicator	Red	Green
Operating pressure	0.15 to 1.0 MPa	
Ambient and fluid temp.	-5 to 60°C (No freezing)	
Frequency	300 c.p.m. or less	
Port size	R 1/8	
Weight	6g	

every time may be delayed due to the adherence of the seal.

## Construction



No.	Description	Material	Note
1	<b>Body</b>	Brass	
2	<b>Piston A</b>	POM	
3	<b>Plug</b>	PE	
4	<b>Spring</b>	Stainless steel	
5	<b>O-ring</b>	NBR	

## Dimensions

