

# 3 Port Air Operated Valve

## VPA300/500/700 Series

RoHS


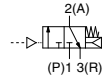

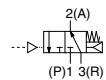

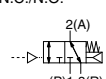

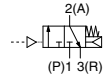

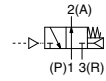

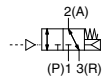

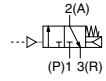

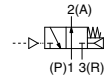

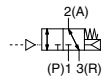


- SYA
- SYJA
- VZA
- VFA
- VFRA
- VPA4
- SYJA
- VZA
- VTA
- VGA
- VPA**
- VPA3



## Model Selection by Operating Conditions 1

### Air Operated Valve: Single Unit

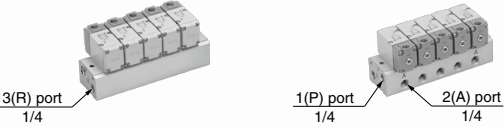
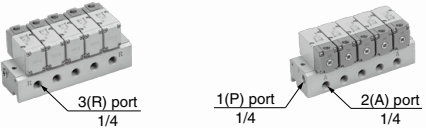
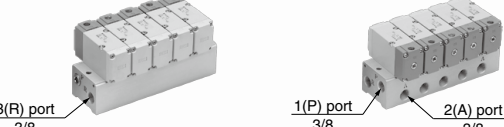
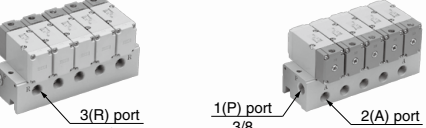

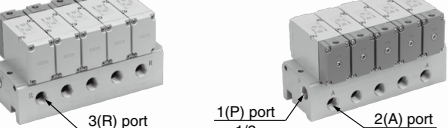
	Series	Sonic conductance C [dm <sup>2</sup> /(s-bar)]	Type of actuation	Port size	Voltage	Electrical entry	Light/surge voltage suppressor	Manual override
Body ported	<b>VPA300</b> 	4.2	N.C. 	1/8 1/4				
	<b>VPA500</b> 	8.9	N.O. 	1/4 3/8				
	<b>VPA700</b> 	15.3	For vacuum N.C./N.O. 	3/8 1/2				
Air operated valve	<b>VPA300</b> 	3.8	N.C. 	1/8 1/4	—	—	—	—
	<b>VPA500</b> 	8.8	N.O. 	1/4 3/8				
	<b>VPA700</b> 	15.0	For vacuum N.C. 	3/8 1/2				
Base mounted	<b>VPA300</b> 	3.8	N.C. 	1/8 1/4				
	<b>VPA500</b> 	8.8	N.O. 	1/4 3/8				
	<b>VPA700</b> 	15.0	For vacuum N.C. 	3/8 1/2				

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## Model Selection by Operating Conditions ②

### Air Operated Valve: Manifold

Series	EXH port type	Manifold base model	Applicable stations <small>(Note)</small>
VPA300	Common EXH	<b>VV3PA3-41</b> 	2 to 20 stations
	Individual EXH	<b>VV3PA3-42</b> 	
VPA500	Common EXH	<b>VV3PA5-41</b> 	2 to 20 stations
	Individual EXH	<b>VV3PA5-42</b> 	
VPA700	Common EXH	<b>VV3PA7-41</b> 	2 to 20 stations
	Individual EXH	<b>VV3PA7-42</b> 	

(Note) Supply pressure to 1(P) ports and exhaust air from 3(R) ports on both sides for 10 stations or more.

SYA

SYJA

VZA

VFA

VFRA

VPA4

SYJA

VZA

VTA

VGA

VPA

VPA3

P. 1569

# 3 Port/Air Operated Valve Body Ported/Single Unit **VPA300/500/700 Series**



VPA300 series



VPA500 series



VPA700 series

## How to Order

VPA **3** **4** **2** **□** - **1** - **01** **□** **A** - **□** - **□**

Series

3	VPA300
5	VPA500
7	VPA700

Valve option

Nil	Standard
V	For vacuum

Port size

Symbol	Port size	VPA300	VPA500	VPA700
01	1/8	○	○	—
02	1/4	○	○	—
03	3/8	—	○	○
04	1/2	—	○	○

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

### Made to Order

Nil	—
X505	Interchangeable specification with the previous valve mounting hole pitch type (Refer to page 1563).

### Bracket

Nil	Without bracket
F	With bracket

### Type of actuation

A	N.C. (Normally closed)
B	N.O. (Normally open)

## Specifications

Fluid	Air	
Type of actuation	N.C. or N.O. (Convertible)	
Operating pressure range (MPa)	Standard	0.2 to 1.0
	For vacuum	-100 kPa to 0.2
Pilot pressure (MPa)	0.2 to 1.0 (Equivalent to the operating pressure or more)	
Ambient and fluid temperature (°C)	-10 to 50 (No freezing)	
Lubrication	Not required	
Mounting orientation	Unrestricted	
Impact/Vibration resistance (m/s <sup>2</sup> ) <sup>Note</sup>	300/50	

Note) Impact resistance: No malfunction to axis and right angle directions of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)

Vibration resistance: No malfunction from test with 45 to 2000 Hz one sweep, to axis and right angle direction of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)

## Flow Rate Characteristics/Weight

Model	Port size	1 ↔ 2 (P ↔ A)			2 ↔ 3 (A ↔ R)			Weight (g) <sup>Note</sup>
		C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv	
VPA342	1/8	3.5	0.26	0.8	3.6	0.26	0.9	118
	1/4	4.2	0.22	1.0	4.2	0.23	1.0	114
VPA542	1/4	7.9	0.21	1.8	7.2	0.27	1.8	237
	3/8	8.9	0.16	2.2	8.9	0.20	2.1	229
VPA742	3/8	11.9	0.21	2.7	11.8	0.20	2.7	501
	1/2	15.1	0.21	3.6	15.3	0.22	3.7	484

Note) Values without brackets

### ⚠ Caution

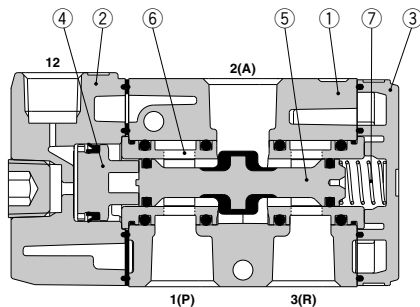
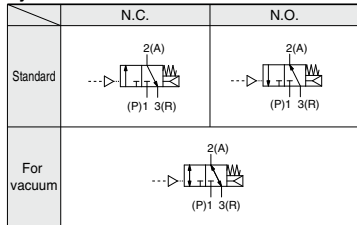
Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Refer to page 1300 for changing the type of actuation.

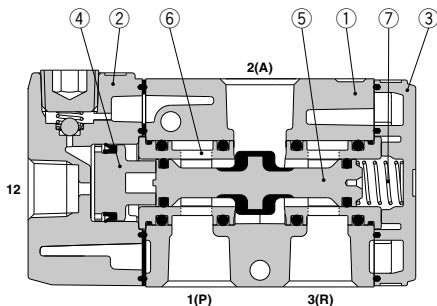
**Construction**

**Standard**

**Symbol**



**For vacuum**



- SYA
- SYJA
- VZA
- VFA
- VFRA
- VPA4
- SYJA
- VZA
- VTA
- VGA
- VPA
- VPA3

**Component Parts**

No.	Description	Material	Note
1	<b>Body</b>	Aluminum die-casted	White
2	<b>Adapter plate</b>	Aluminum die-casted	Gray
3	<b>End plate</b>	Resin	White
4	<b>Piston</b>	Resin	
5	<b>Poppet valve</b>	Aluminum/HNBR	
6	<b>Retainer</b>	Resin	
7	<b>Spring</b>	Stainless steel	

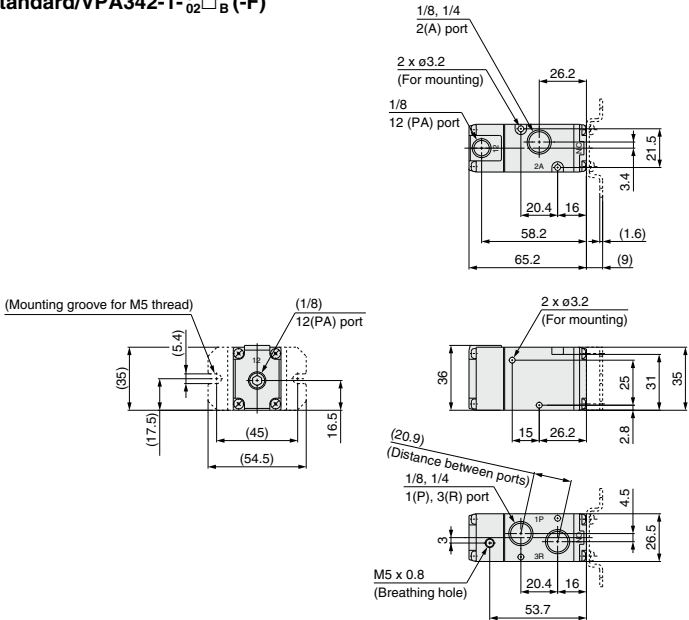
**Bracket Assembly Part No.**

Description	Model	Part no.
Bracket (With 2 screws)	VPA342	VP300-227-1A
	VPA542	VP500-227-1A
	VPA742	VP700-227-1A

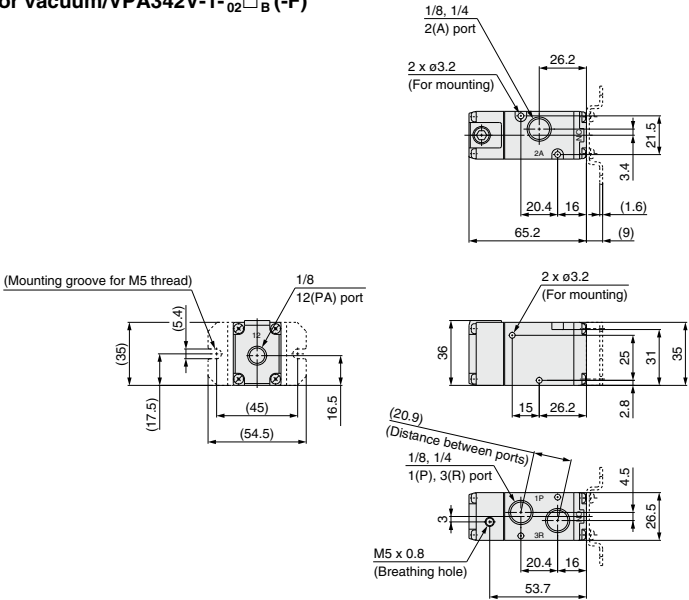
# VPA300/500/700 Series

## VPA300 Series/Body Ported/Dimensions

Standard/VPA342-1-01<sup>01</sup>□<sup>A</sup><sub>B</sub> (-F)

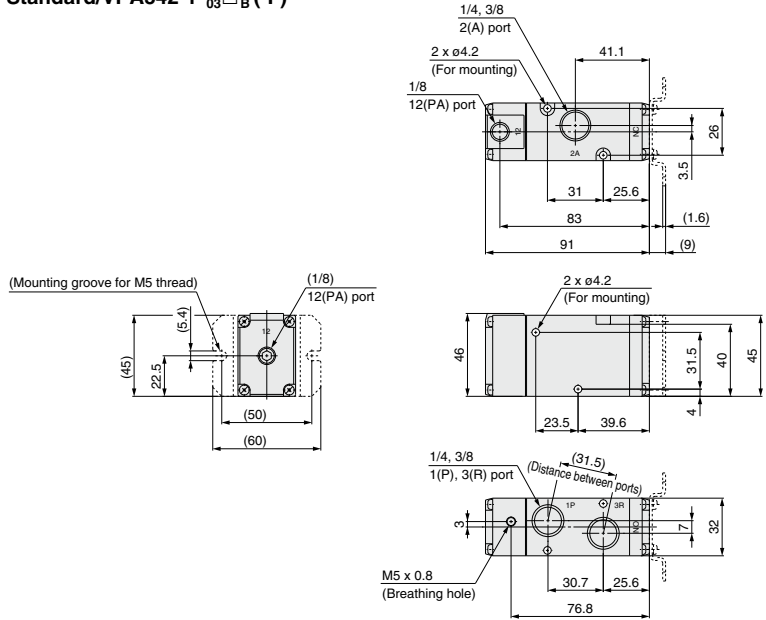


For vacuum/VPA342V-1-01<sup>01</sup>□<sup>A</sup><sub>B</sub> (-F)



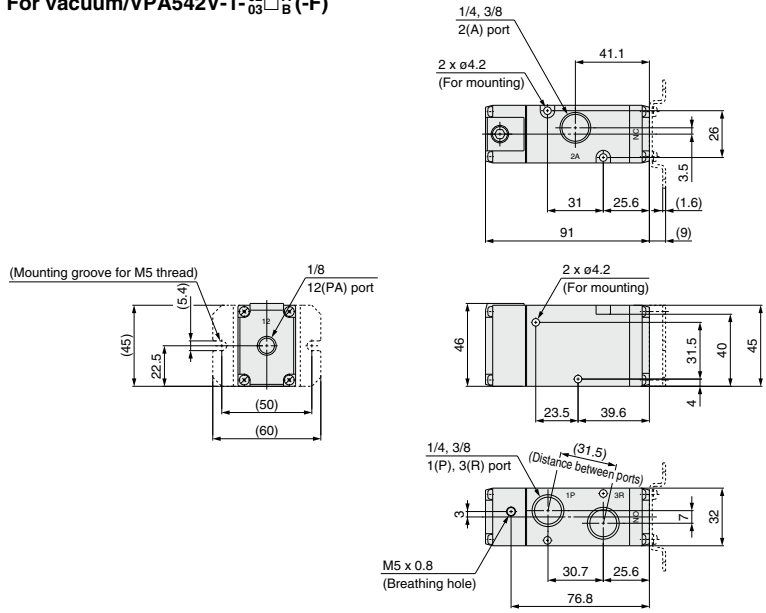
**VPA500 Series/Body Ported/Dimensions**

**Standard/VPA542-1-02<sup>02</sup>□<sup>A</sup><sub>B</sub> (-F)**



SYA
SYJA
VZA
VFA
VFRA
VPA4
SYJA
VZA
VTA
VGA
<b>VPA</b>
VPA3

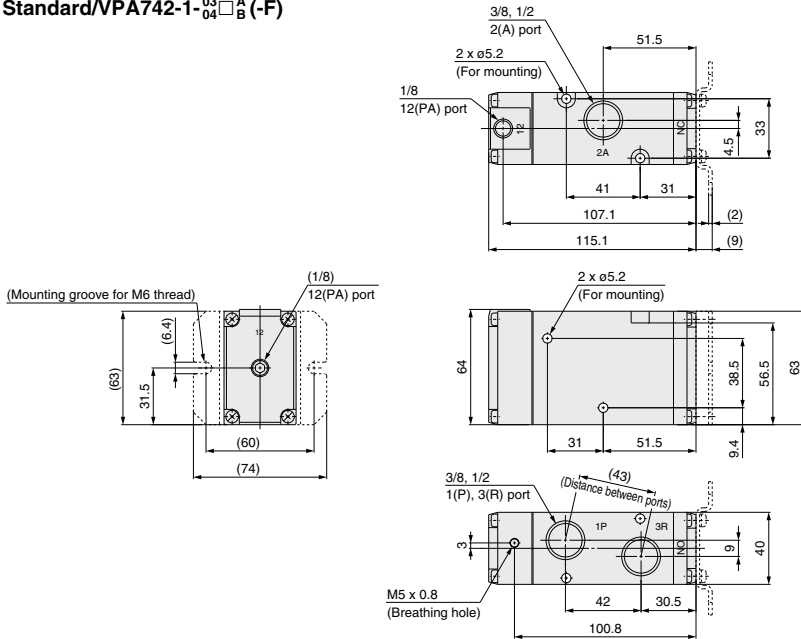
**For vacuum/VPA542V-1-02<sup>02</sup>□<sup>A</sup><sub>B</sub> (-F)**



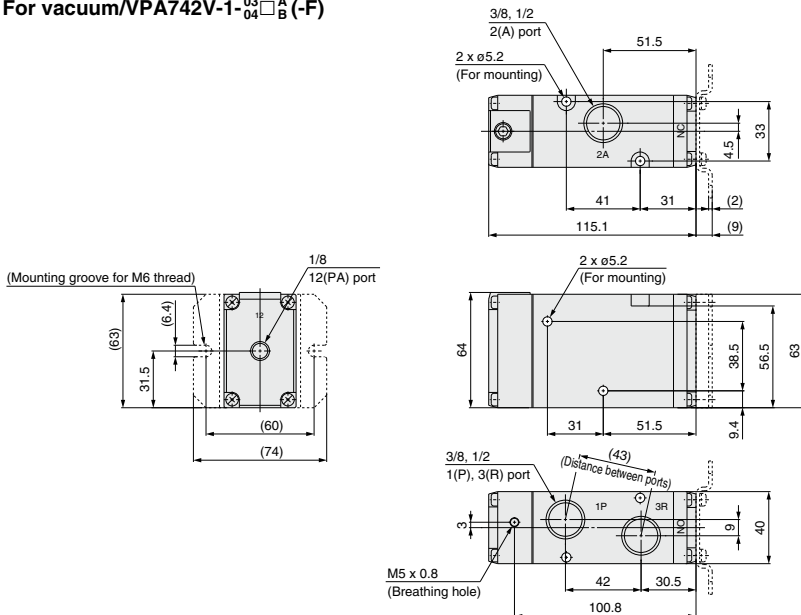
# VPA300/500/700 Series

## VPA700 Series/Body Ported/Dimensions

Standard/VPA742-1- $\frac{03}{04}$ □ $\frac{A}{B}$  (-F)



For vacuum/VPA742V-1- $\frac{03}{04}$ □ $\frac{A}{B}$  (-F)





# VPA300/500 Series

## Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



### 1 Body Ported Interchangeable Specification with the Previous Valve Mounting Hole Pitch Type

The mounting hole has been changed to the long type in order to provide interchangeability with the previous VPA300/500 series.

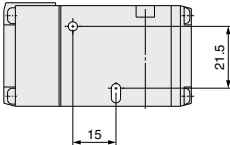
#### How to Order Valve

VPA<sup>3</sup><sub>5</sub>42 □ -1- □ □ -X505

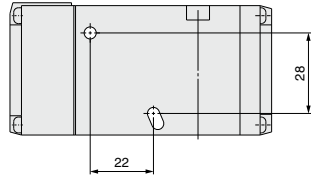
- Entry is the same as standard products.  
The specifications, performance and external dimensions are the same as those of standard models.

Note) VPA742 is not available because the mounting hole pitch is the same as the previous type.

VPA342



VPA542



SYA

SYJA

VZA

VFA

VFRA

VPA4

SYJA

VZA

VTA

VGA

VPA

VPA3

# 3 Port/Air Operated Valve Base Mounted/Single Unit VPA300/500/700 Series



VPA300 series



VPA500 series



VPA700 series

## How to Order

VPA **3** **4** **4** **□** - **1** - **01** **□** **A**

### Series

3	VPA300
5	VPA500
7	VPA700

### Body option

Nil	Standard
V	For vacuum

### Type of actuation

A	N.C. (Normally closed)
B	N.O. (Normally open)

### Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

### Port size (Sub-plate)

Symbol	Port size	VPA300	VPA500	VPA700
Nil		Without sub-plate*		
01	1/8	○	—	—
02	1/4	○	○	—
03	3/8	—	○	○
04	1/2	—	—	○

\* With a gasket and two mounting bolts

## Specifications

Fluid	Air	
Type of actuation	N.C. or N.O. (Convertible)	
Operating pressure range (MPa)	Standard	0.2 to 1.0
	For vacuum	-100 kPa to 0.2
Pilot pressure (MPa)	0.2 to 1.0 (Equivalent to the operating pressure or more)	
Ambient and fluid temperature (°C)	-10 to 50 (No freezing)	
Lubrication	Not required	
Mounting orientation	Unrestricted	
Impact/Vibration resistance (m/s <sup>2</sup> ) <sup>Note</sup>	300/50	

Note) Impact resistance: No malfunction to axis and right angle directions of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)

Vibration resistance: No malfunction from test with 45 to 2000 Hz one sweep, to axis and right angle direction of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)

## Flow Rate Characteristics/Weight

Model	Port size	1 ↔ 2 (P ↔ A)			2 ↔ 3 (A ↔ R)			Weight (g) <sup>Note)</sup>
		C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv	
VPA344	1/8	3.6	0.22	0.8	3.5	0.24	0.8	185 (118)
	1/4	3.9	0.22	0.9	3.8	0.14	0.9	180 (118)
VPA544	1/4	7.5	0.16	1.7	7.3	0.20	1.7	358 (233)
	3/8	8.8	0.07	2.0	8.8	0.13	2.0	350 (233)
VPA744	3/8	12.9	0.10	2.9	13.3	0.24	3.1	693 (476)
	1/2	14.7	0.05	3.3	15.0	0.17	3.4	675 (476)

Note) ( ): Values without sub-plate

### ⚠ Caution

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

Refer to page 1300 for changing the type of actuation.

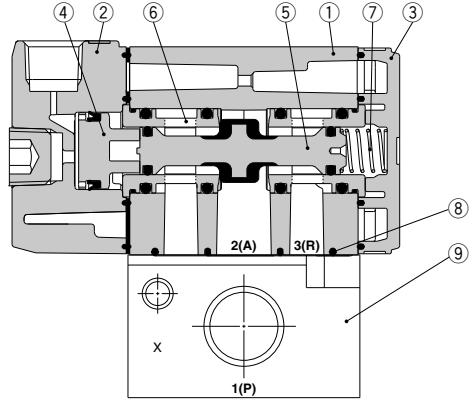
# Air Operated Valve Base Mounted/Single Unit **VPA300/500/700 Series**

## Construction

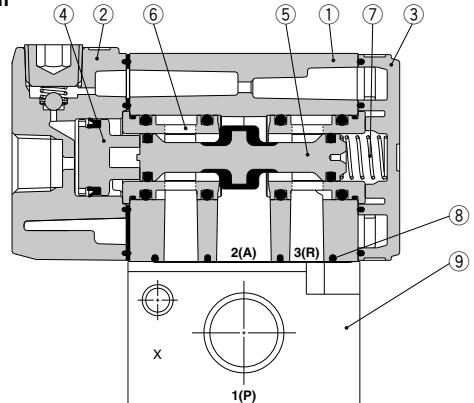
### Symbol

	N.C.	N.O.
Standard		
For vacuum		

### Standard



### For vacuum



### Component Parts

No.	Description	Material	Note
1	<b>Body</b>	Aluminum die-casted	White
2	<b>Adapter plate</b>	Aluminum die-casted	Gray
3	<b>End plate</b>	Resin	White
4	<b>Piston</b>	Resin	
5	<b>Poppet valve</b>	Aluminum/HNBR	
6	<b>Retainer</b>	Resin	
7	<b>Spring</b>	Stainless steel	

### Replacement Parts

No.	Description	Part no.			Note
		VP344	VP544	VP744	
8	<b>Gasket</b>	VP300-217-1	VP500-217-1	VP700-217-1	HNBR
9	<b>Sub-plate</b>	VP300-202-□	VP500-202-□	VP700-202-□	Aluminum die-casted
—	<b>Hexagon socket head bolt (1 pc.)</b>	VP300-224-1 (M3 x 36)	VP500-224-1 (M4 x 46)	VP700-224-1 (M5 x 66)	For valve mounting

### Caution

**Tightening Torque of Mounting Screw**

**M3: 0.8 N·m**  
**M4: 1.4 N·m**  
**M5: 2.9 N·m**

### How to Order Sub-plate

**VP 3 00-202-1**

#### Series

3	VPA344
5	VPA544
7	VPA744

#### Thread type

	Nil	Rc
F	F	G
N	N	NPT
T	T	NPTF

#### Port size

Symbol	VPA344	VPA544	VPA744
1	1/8	1/4	3/8
2	1/4	3/8	1/2

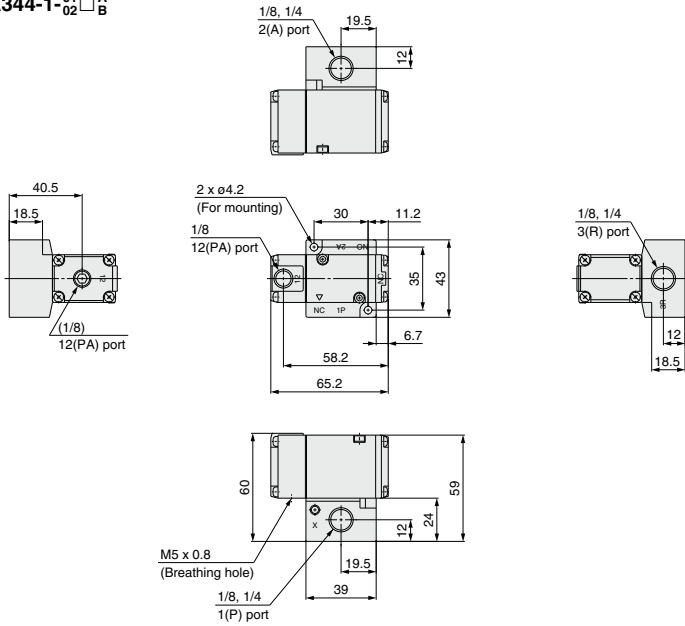


SYA  
SYJA  
VZA  
VFA  
VFRA  
VPA4  
SYJA  
VZA  
VTA  
VGA  
VPA  
VPA3

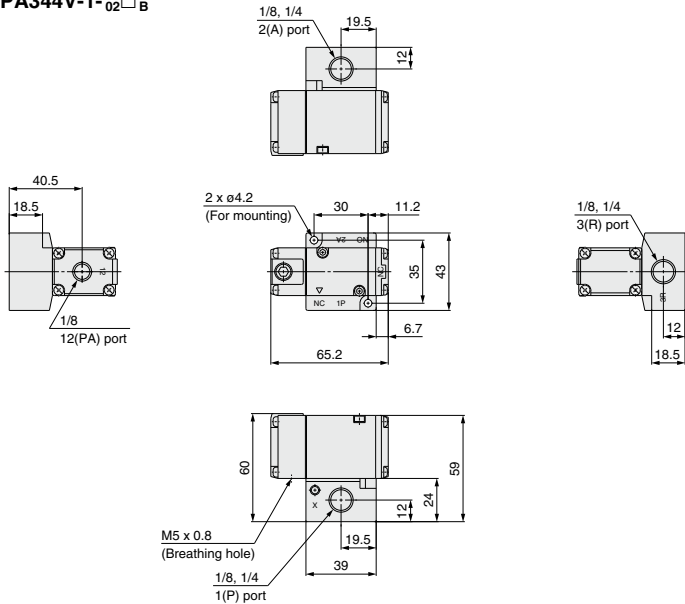
# VPA300/500/700 Series

## VPA300 Series/Base Mounted/Dimensions

Standard/VPA344-1-01 □ A  
02 □ B



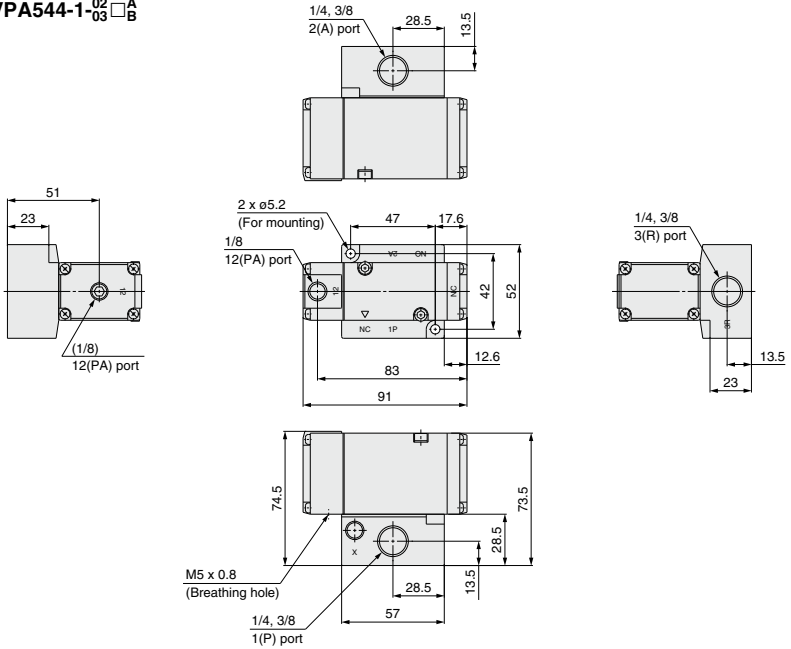
For vacuum/VPA344V-1-01 □ A  
02 □ B



# Air Operated Valve Base Mounted/Single Unit **VPA300/500/700 Series**

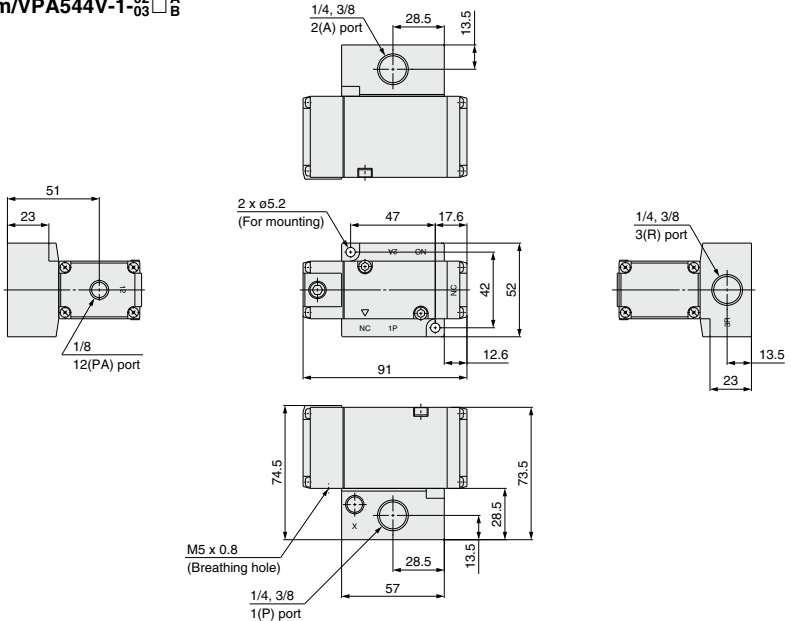
## VPA500 Series/Base Mounted/Dimensions

Standard/VPA544-1-02 A B



- SYA
- SYJA
- VZA
- VFA
- VFRA
- VPA4
- SYJA
- VZA
- VTA
- VGA
- VPA
- VPA3

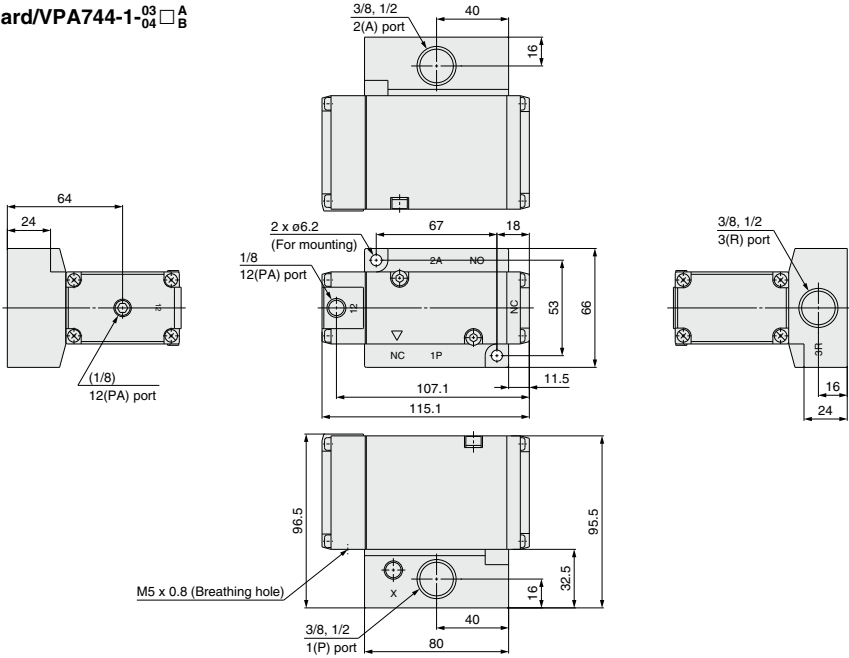
For vacuum/VPA544V-1-02 A B



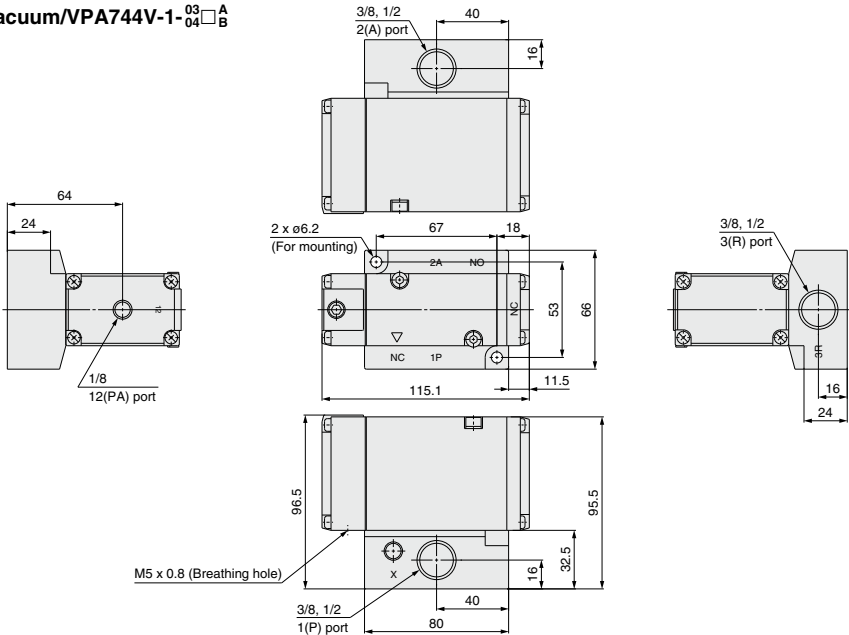
# VPA300/500/700 Series

## VPA700 Series/Base Mounted/Dimensions

Standard/VPA744-1-<sup>03</sup>/<sub>04</sub> □ <sup>A</sup>/<sub>B</sub>



For vacuum/VPA744V-1-<sup>03</sup>/<sub>04</sub> □ <sup>A</sup>/<sub>B</sub>



# 3 Port/Air Operated Valve Manifold Common Exhaust **Type 41/** Individual Exhaust **Type 42**

# VPA300/500/700 Series

## How to Order Manifold

Type 41/Common exhaust

VV3PA **3** - 41 - **04** 1 - **02** □



Series

3	VPA300
5	VPA500
7	VPA700

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Stations

02	2 stations
:	:
20	20 stations

Port size

Symbol	Port size	Applicable series
02	1/4	VPA300
03	3/8	VPA500
04	1/2	VPA700

Type 42/Individual exhaust

VV3PA **3** - 42 - **04** 3 - **02** □



Series

3	VPA300
5	VPA500
7	VPA700

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Stations

02	2 stations
:	:
20	20 stations

Port size

Symbol	Port size	Applicable series
02	1/4	VPA300
03	3/8	VPA500
04	1/2	VPA700

## Manifold Option

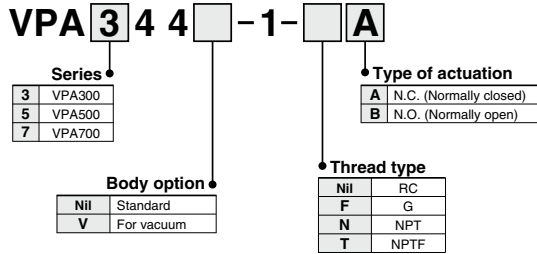
Description	Part no.	Applicable manifold base model
Blanking plate assembly (With a gasket and two mounting bolts)	VP300-25-1A	VV3PA3
	VP500-25-1A	VV3PA5
	VP700-25-1A	VV3PA7



SYA
SYJA
VZA
VFA
VFRA
VPA4
SYJA
VZA
VTA
VGA
VPA
VPA3

# VPA300/500/700 Series

## How to Order Valve (With a gasket and two mounting bolts)



## Manifold Specifications

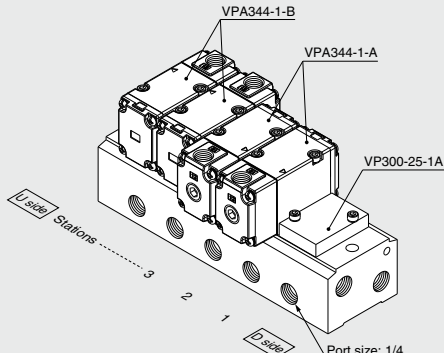
Series	Base model	Piping specifications			Applicable valve	Applicable stations <sup>Note)</sup>	Manifold base Weight: W [g] Stations: n
		1P (SUP) port type	3R (EXH) port type	Port size			
VPA300	VV3PA3-41	Common	Common	1/4	VPA344	2 to 20 stations	W = 110n + 90
	Individual						
VPA500	VV3PA5-41		Common	3/8	VPA544	2 to 20 stations	W = 190n + 150
	Individual						
VPA700	VV3PA7-41		Common	1/2	VPA744	2 to 20 stations	W = 410n + 380
	Individual						

Note) Supply pressure to 1(P) ports and exhaust air from 3(R) ports on both sides for 10 stations or more.

- Refer to back page 1300 for changing the type of actuation.

## How to Order Manifold Assembly (Example)

### Ordering example (VV3PA3-41)



VV3PA3-41-051-02 ..... 1 set (Type 41, 5-station manifold base part no.)  
 \* VP300-25-1A ..... 1 set (Blanking plate assembly part no.)  
 \* VPA344-1-A ..... 2 sets (N.C. type part no.)  
 \* VPA344-1-B ..... 2 sets (N.O. type part no.)

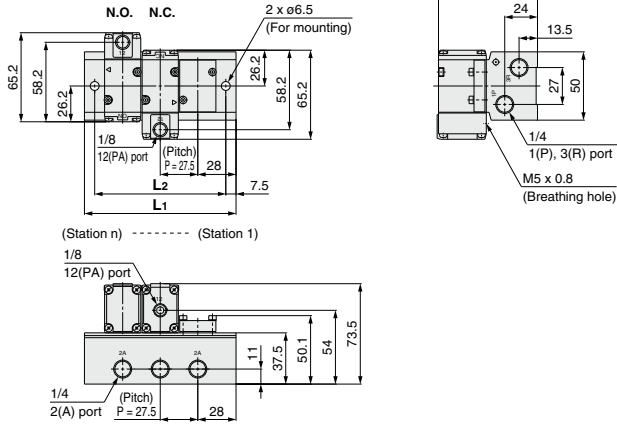
The asterisk denotes the symbol for assembly.  
 Prefix it to the part nos. of the valve, etc.

\* Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.



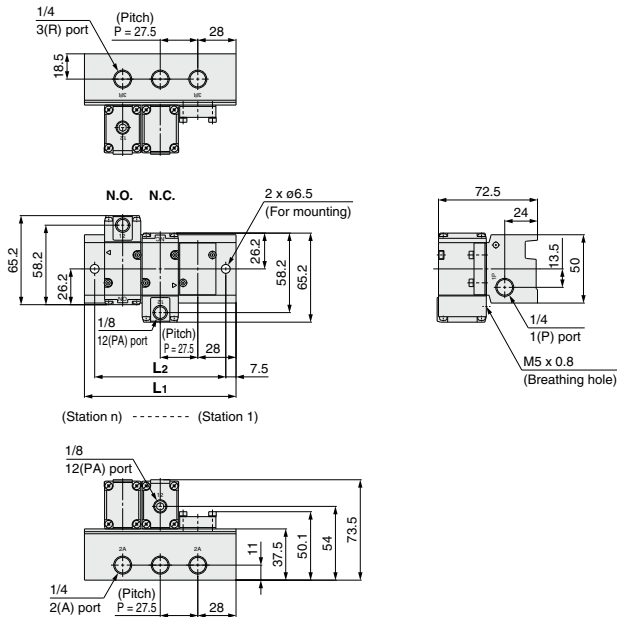
**VPA300 Series/Dimensions**

**Type 41/Common exhaust: VV3PA3-41-Stations1-02**



Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5	441	468.5	496	523.5	551	578.5
L2	68.5	96	123.5	151	178.5	206	233.5	261	288.5	316	343.5	371	398.5	426	453.5	481	508.5	536	563.5

**Type 42/Individual exhaust: VV3PA3-42-Stations3-02**



Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5	441	468.5	496	523.5	551	578.5
L2	68.5	96	123.5	151	178.5	206	233.5	261	288.5	316	343.5	371	398.5	426	453.5	481	508.5	536	563.5

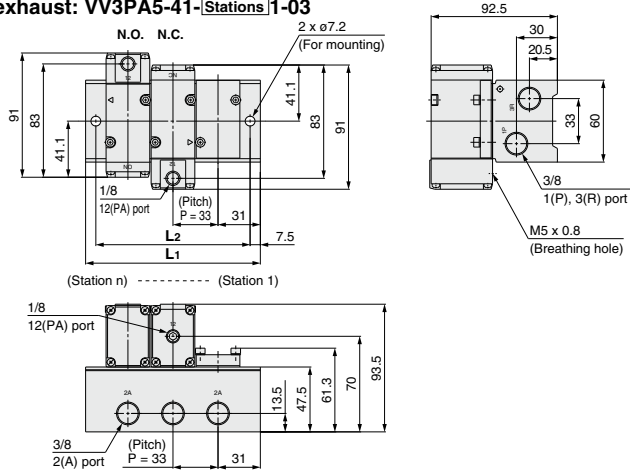
- SYA
- SYJA
- VZA
- VFA
- VFRA
- VPA4
- SYJA
- VZA
- VTA
- VGA
- VPA
- VPA3



# VPA300/500/700 Series

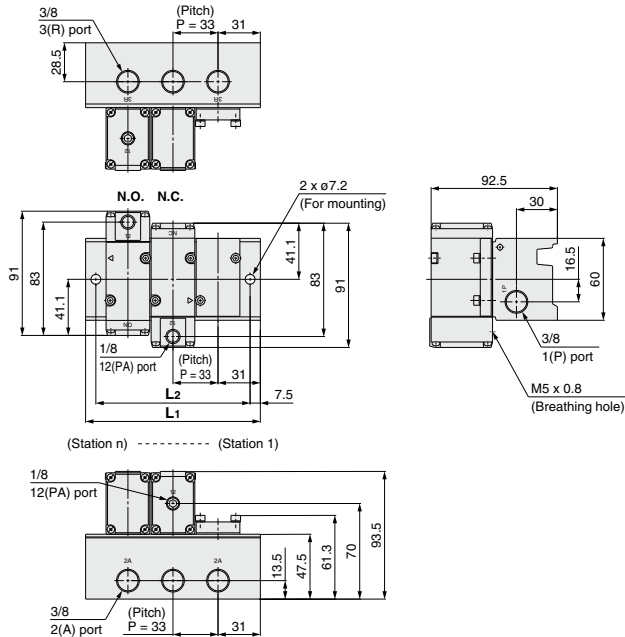
## VPA500 Series/Dimensions

### Type 41/Common exhaust: VV3PA5-41-Stations1-03



Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	95	128	161	194	227	260	293	326	359	392	425	458	491	524	557	590	623	656	689
L2	80	113	146	179	212	245	278	311	344	377	410	443	476	509	542	575	608	641	674

### Type 42/Individual exhaust: VV3PA5-42-Stations3-03

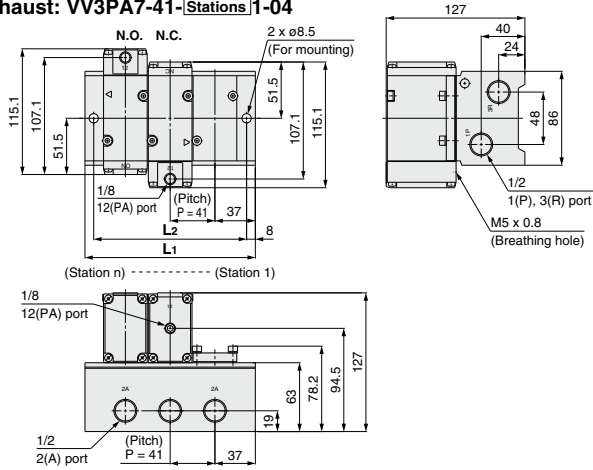


Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	95	128	161	194	227	260	293	326	359	392	425	458	491	524	557	590	623	656	689
L2	80	113	146	179	212	245	278	311	344	377	410	443	476	509	542	575	608	641	674

**Air Operated Valve**  
**Common Exhaust Type 41 / Individual Exhaust Type 42 *VPA300/500/700 Series***

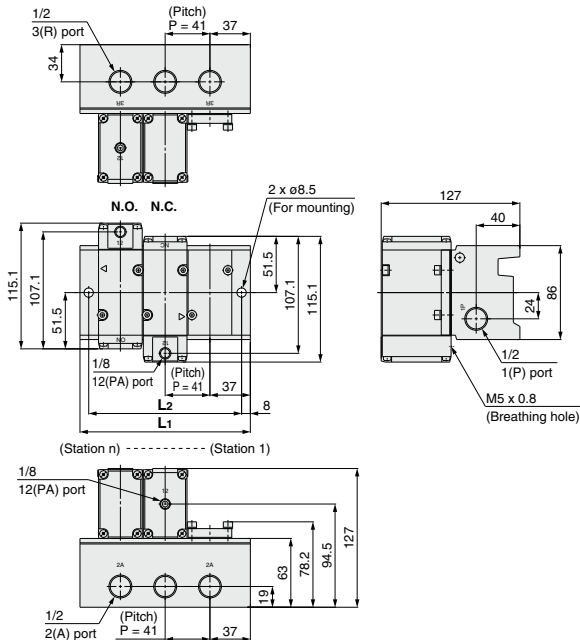
**VPA700 Series/Dimensions**

**Type 41/Common exhaust: VV3PA7-41-Stations 1-04**



Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	115	156	197	238	279	320	361	402	443	484	525	566	607	648	689	730	771	812	853
L2	99	140	181	222	263	304	345	386	427	468	509	550	591	632	673	714	755	796	837

**Type 42/Individual exhaust: VV3PA7-42-Stations 3-04**



Station n	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	115	156	197	238	279	320	361	402	443	484	525	566	607	648	689	730	771	812	853
L2	99	140	181	222	263	304	345	386	427	468	509	550	591	632	673	714	755	796	837

- SYA
- SYJA
- VZA
- VFA
- VFRA
- VPA4
- SYJA
- VZA
- VTA
- VGA
- VPA
- VPA3

