



# AIR VENTS

**Rapid Initial Air Vent  
Automatic Air Vent**



# Free Float for Venting Air

No failure-prone levers or hinges. Only one moving part, the free float, eliminates concentrated wear and provides long, maintenance-free service life.

- **Rapid Initial Air Vent**  
VAS  
VA1/VA3/VA4/VA5
- **Automatic Air Vent**  
VC2/VC3/VC4

Precision-ground float with three-point seating provides the tightest seal at high water level.

- **Rapid Initial Air Vent**  
VS1A
- **Automatic Air Vent**  
VS1C



VAS



VA Series



VS1A



SA3



VC Series



VS1C

## X-element for Venting Air & Gas from Steam Systems



LA Series

### What is the X-element?

A multi-diaphragm valve mechanism filled with a thermoliquid which opens and closes the vent at a temperature approximately 22 °C less than saturated steam temperature, allowing the discharge of any air or gas.



# & Gas\* from Liquid Piping

\* Do not use for toxic, flammable or otherwise hazardous fluids

Air Vent Class	Medium	Piping Direction	Operating Pressure Range (MPaG)	Maximum Operating Temperature (°C)	Maximum Venting Capacity (ℓ/min)*	Body Material	Model	
Rapid Initial Air Vent	Water, Hot Water	Vertical Piping	0.01 – 1.0	100	180	Cast Iron	VAS (20mm)	
					500		VAS (40mm)	
					1400		VA1	
					3200		VA3	
					5600		VA4	
					11000		VA5	
	Special Fluids (Non-toxic and Non-flammable)		0.01 – 2.1	150	270	Cast Stainless Steel	VS1A	
Automatic Air Vent	Water, Hot Water	Vertical Piping	0.01 – 0.3	100	5.4	Brass	SA3-3	
			0.1 – 1.0		9.2		SA3-10	
			0.05 – 0.5	90	25	Bronze	VC2	
			0.1 – 0.6		90	Cast Iron	VC3	
			0.1 – 1.0		380		VC4	
	Special Fluids (Non-toxic and Non-flammable)			0.01 – 1.0	150	170	Cast Stainless Steel	VS1C-10
				0.01 – 2.1		130		VS1C-21

\* For air at 20 °C under atmospheric pressure. Pressure differential is 0.1 MPa for rapid initial air vents, maximum operating pressure for automatic air vents.

Air Vent Class	Medium	Piping Direction	Operating Pressure Range (MPaG)	Maximum Operating Temperature (°C)	Maximum Venting Capacity (ℓ/min)*	Body Material	Model
Automatic Air Vent	Steam	Angle	0.01 – 1.3	200	1900	Brass	LA13L
		Vertical Piping	0.01 – 2.1	235	2000	Cast Stainless Steel	LA21

\* For air at 20 °C under atmospheric pressure.

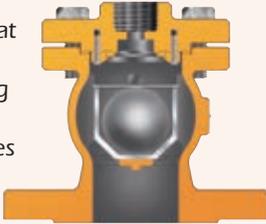
# TLV Air Vents

## For Liquid

### Rapid Initial Air Vent

#### VAS / VA Series / VS1A

Used for venting large amounts of initial air or gas at system start-up. Once the valve closes after discharging initial air, it will not open again, even if air accumulates inside the product, until the internal pressure drops to near atmospheric pressure.



**!** If air is expected to accumulate in the piping during operation, use together with an automatic air vent.

### Automatic Air Vent

#### SA3 / VC Series / VS1C

Discharge air or gas automatically as it enters the vent at start-up and during operation. Facilitates drainage of the system by introducing air at system shutdown.



**!** If a large volume of air needs to be discharged at start-up, use together with a rapid initial air vent.

### Air Vent Class Selection

System for Air Venting	Air Vent Class Required	
	Rapid Initial Air Vent	Automatic Air Vent
Water pumps		
Air conditioners, solar water heating systems		
Supply water pipe, storage tank		

## For Steam

#### LA Series

Remove air or gas from steam systems and shorten start-up time. Facilitates drainage of the system by introducing air at system shutdown.



## For Liquid

### Rapid Initial Air Vent

#### Water • Hot Water

## VAS



**Compact**

#### Features

- Small and compact with simple construction
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Precision-ground float and valve seat rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

#### Application

- Processes requiring the rapid supply of water
- Water supply pipe, water pump, water tank, etc.

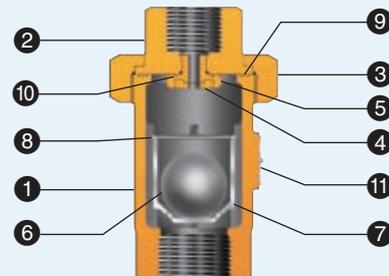
Note: Once the valve closes it will not open again, even if air accumulates. If air is expected to accumulate, use together with an automatic air vent.

#### Specifications

Model	VAS		
Connection	Screwed (Rc(PT))		
Size (mm)	Inlet	20	40
	Outlet	15	25
Body Material	Cast Iron (FC250)		
Maximum Operating Pressure (MPaG) PMO	1.0		
Minimum Operating Pressure (MPaG)	0.01		
Maximum Operating Temperature (°C) TMO	100		
Maximum Venting Capacity (ℓ/min)*	180	500	

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):  
 Maximum Allowable Pressure (MPaG) PMA: 1.6  
 Maximum Allowable Temperature (°C) TMA: 100

#### Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Float Guide
②	Union	⑧	Snap Ring
③	Cap Nut	⑨	Union Gasket
④	Valve Seat	⑩	Valve Seat Gasket
⑤	Valve Seat Holder	⑪	Nameplate
⑥	Float		

## Special Fluids (Non-toxic, Non-flammable)

# VA Series



### Features

- Simple construction and trouble free operation
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Precision-ground float and valve seat rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

### Application

- Processes requiring the rapid supply of water
  - Water supply pipe, water pump, water tank, etc.

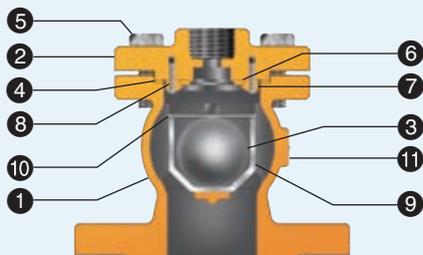
Note: Once the valve closes it will not open again, even if air accumulates.  
If air is expected to accumulate, use together with an automatic air vent.

### Specifications

Model	VA1	VA3	VA4	VA5	
Connection	Inlet	Flanged (ASME 150RF)			
	Outlet	Screwed (Rc(PT))		Flanged (ASME 150RF)	
Size (mm)	Inlet	50	80	100	150
	Outlet	20	32	65	100
Body Material	Cast Iron (FC250)				
Maximum Operating Pressure (MPaG) PMO	1.0				
Minimum Operating Pressure (MPaG)	0.01				
Maximum Operating Temperature (°C) TMO	100				
Maximum Venting Capacity (ℓ/min)*	1 400	3 200	5 600	11 000	

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):  
Maximum Allowable Pressure (MPaG) PMA: 1.0  
Maximum Allowable Temperature (°C) TMA: 150

### Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Valve Seat Holder
②	Cover	⑧	Set Screw
③	Float	⑨	Float Guide
④	Cover Gasket	⑩	Snap Ring
⑤	Cover Bolt	⑪	Nameplate
⑥	Valve Seat		

# VS1A



### Features

- Achieves the tightest seal with three-point seating
- Works in liquids with low specific gravity ( $\rho \geq 0.8$ )
- High corrosion resistance due to stainless steel body and fluorine rubber (FPM) valve seat
- Useable with high pressures and temperatures
- Also functions as a vacuum breaker

### Application

- Processes requiring rapid supply of special fluids
  - Supply pipe, pump, liquid storage tank, etc.

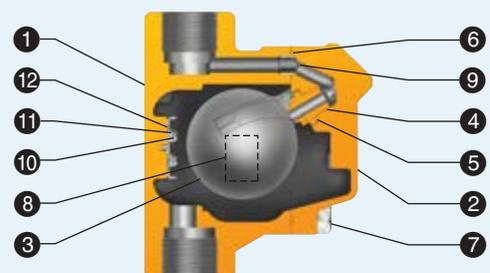
Note: Once the valve closes it will not open again, even if air accumulates.  
If air is expected to accumulate, use together with an automatic air vent.

### Specifications

Model	VS1A
Connection	Screwed (Rc(PT))
Size (mm)	15, 20, 25
Body Material	Cast Stainless Steel (CF8)
Maximum Operating Pressure (MPaG) PMO	2.1
Minimum Operating Pressure (MPaG)	0.01
Maximum Operating Temperature (°C) TMO	150
Maximum Venting Capacity (ℓ/min)*	270

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):  
Maximum Allowable Pressure (MPaG) PMA: 2.1  
Maximum Allowable Temperature (°C) TMA: 220

### Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Cover Bolt
②	Cover	⑧	Nameplate
③	Float	⑨	Connector
④	Valve Seat	⑩	Screw
⑤	Valve Seat Gasket	⑪	Spring Washer
⑥	Cover Gasket	⑫	Plate

# For Liquid

## Automatic Air Vent

### Water • Hot Water

#### SA3



#### Features

- Extremely compact size
- Auxiliary valve seat enables maintenance during operation
- Provides a tight seal, even at extremely low pressure (0.01 MPa for SA3 with no.3 orifice)

#### Application

- Suitable for small and narrow installation spaces
- Suitable for small air conditioning equipment
  - Fan coil, radiator, etc.

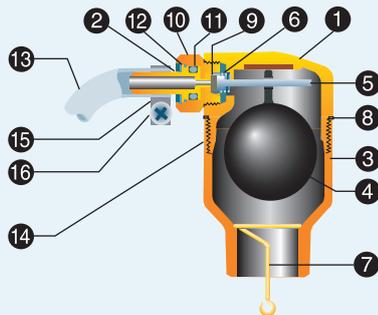
#### Specifications

Model	SA3	
Connection	Screwed (Rc(PT))	
Size (mm)	10, 15, 20	
Body Material	Brass (C3771)	
Orifice Number	3	10
Maximum Operating Pressure (MPaG) PMO	0.3	1.0
Minimum Operating Pressure (MPaG)	0.01	0.1
Maximum Operating Temperature (°C) TMO	100	
Maximum Venting Capacity (ℓ/min)*	5.4	9.2

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):  
 Maximum Allowable Pressure (MPaG) PMA: 1.0  
 Maximum Allowable Temperature (°C) TMA: 100

#### Construction

No.	Part Name
①	Body
②	Valve Seat
③	Base
④	Float
⑤	Valve Holder
⑥	Coil Spring
⑦	Siphon Rod
⑧	Body Gasket
⑨	Valve
⑩	Valve Seat Holder
⑪	O-ring
⑫	Snap Ring
⑬	Valve Seat



No.	Part Name
⑭	Nameplate
⑮	Worm-drive Clamp
⑯	Clamp Screw

#### VC Series



#### Features

- Simple construction and trouble free operation
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Free float and valve seat with rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

#### Application

- General use air vent
  - Water supply pipe, cooling/heating equipment, etc.

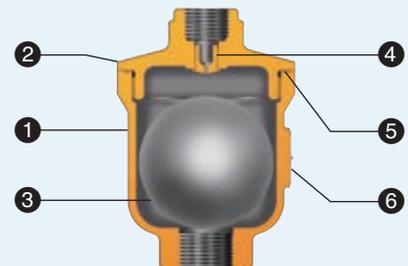
#### Specifications

Model	VC2	VC3	VC4
Connection	Screwed (Rc(PT))		
Size (mm)	Inlet	15	25
	Outlet	10	
Body Material	Bronze (CAC406)	Cast Iron (FC250)	
Maximum Operating Pressure (MPaG) PMO	0.5	0.6	1.0
Minimum Operating Pressure (MPaG)	0.05	0.1	0.1
Maximum Operating Temperature (°C) TMO	90		
Maximum Venting Capacity (ℓ/min)*	25	90	380

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):  
 Maximum Allowable Pressure (MPaG) PMA: 0.5 (VC2), 0.6 (VC3), 1.0 (VC4)  
 Maximum Allowable Temperature (°C) TMA: 185 (VC2), 220 (VC3), 150 (VC4)

#### Construction

No.	Part Name
①	Body
②	Cover
③	Float
④	Valve Seat
⑤	Cover Gasket
⑥	Nameplate



## Special Fluids (Non-toxic, Non-flammable)

### VS1C



Stainless Steel

Tight Sealing

#### Features

- Achieves the tightest seal with three-point seating
- Works in liquids with low specific gravity ( $\rho \geq 0.8$ )
- High corrosion resistance due to stainless steel body and fluorine rubber (FPM) valve seat
- Useable with high pressures and temperatures
- Also functions as a vacuum breaker

#### Application

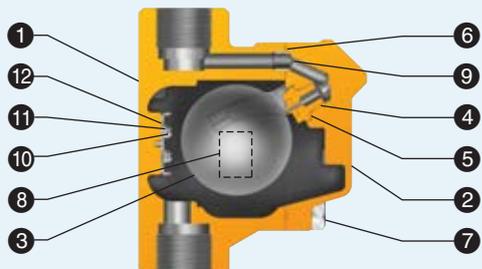
- Suitable for facilities and piping using special fluids
  - Supply pipe, pump, liquid storage tank, etc.

#### Specifications

Model	VS1C	
Connection	Screwed (Rc(PT))	
Size (mm)	15, 20, 25	
Body Material	Cast Stainless Steel (CF8)	
Orifice Number	10	21
Maximum Operating Pressure (MPaG) PMO	1.0	2.1
Minimum Operating Pressure (MPaG)	0.01	
Maximum Operating Temperature (°C) TMO	150	
Maximum Venting Capacity (ℓ/min)*	170	130

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):  
 Maximum Allowable Pressure (MPaG) PMA: 2.1  
 Maximum Allowable Temperature (°C) TMA: 220

#### Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Cover Bolt
②	Cover	⑧	Nameplate
③	Float	⑨	Connector
④	Valve Seat	⑩	Screw
⑤	Valve Seat Gasket	⑪	Spring Washer
⑥	Cover Gasket	⑫	Plate

### LA Series



X-element

Compact

#### Features

- Vents hot air up to just 22 °C below saturated steam temperature
- Fail-open mechanism
- High heat resistance
- Compact with large venting capacity

#### Application

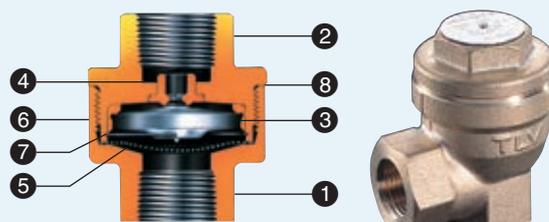
- Batch processes requiring large volume air venting
- Where hot-air locking occurs during operation
  - Double-jacketed kettle, pressing machine, etc.

#### Specifications

Model	LA13L	LA21
Connection	Screwed (Rc(PT))	
Size (mm)	15, 20	15
Body Material	Brass (C3771)	Cast Stainless Steel (CF8)
Maximum Operating Pressure (MPaG) PMO	1.3	2.1
Minimum Operating Pressure (MPaG)	0.01	0.01
Maximum Operating Temperature (°C) TMO	200	235
Maximum Venting Capacity (ℓ/min)*	1 900	2 000

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):  
 Maximum Allowable Pressure (MPaG) PMA: 1.6 (LA13L), 6.3 (LA21)  
 Maximum Allowable Temperature (°C) TMA: 220 (LA13L), 425 (LA21)

#### Construction



LA21

LA13L

No.	Part Name	No.	Part Name
①	Body	⑤	Screen
②	Cover	⑥	Nameplate
③	X-element	⑦	Snap Ring
④	Valve Seat	⑧	Cover Gasket

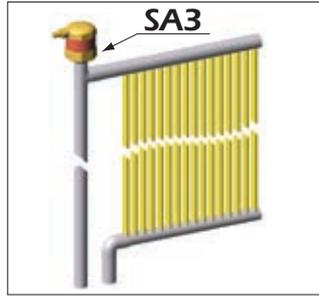
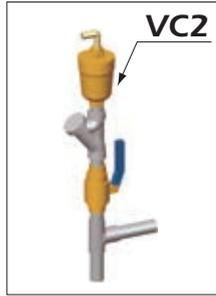
# Application Examples

## For Liquid

## For Steam

### Rapid Initial Air Vent

### Automatic Air Vent



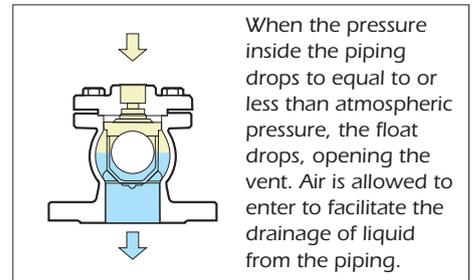
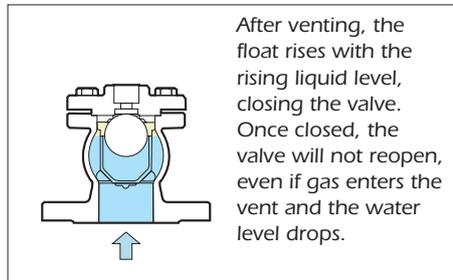
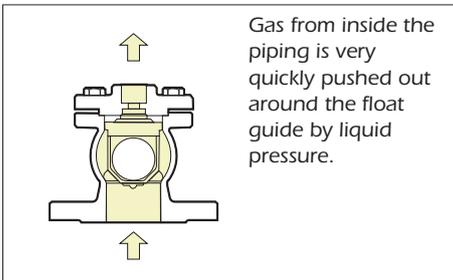
Note: • Inlet piping with no horizontal portion is recommended for water/air displacement. If there is a horizontal portion, make the pipe diameter of the horizontal portion larger than the vertical portion or make the horizontal portion as short as possible.  
 • Make sure the inlet piping diameter is at least as large as the product's inlet diameter. For the inlet connection especially for products\* with a nominal diameter of 15 mm, use a pipe/fitting, etc. with an inner diameter of at least 16 mm, such as a schedule 40 pipe nipple with a nominal diameter of 15 mm. A smaller pipe may prevent water/air displacement. (\*Except SA3)

## Operation

### For Liquid

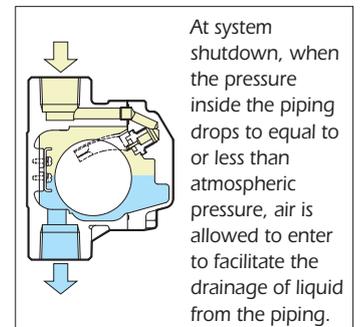
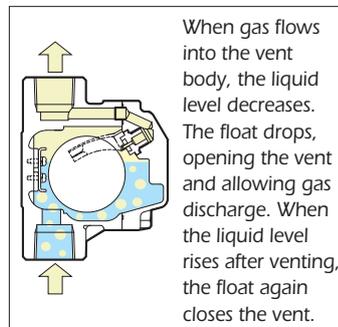
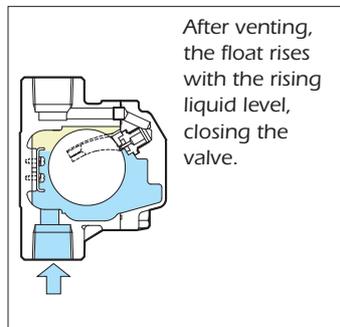
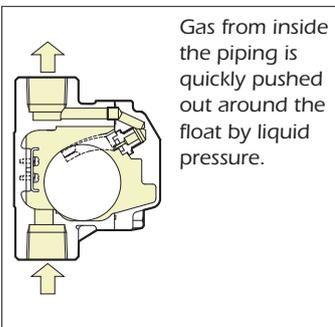
### Rapid Initial Air Vent

#### VA Series



### Automatic Air Vent

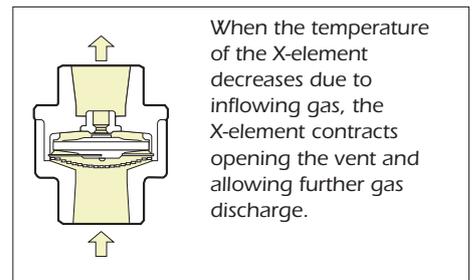
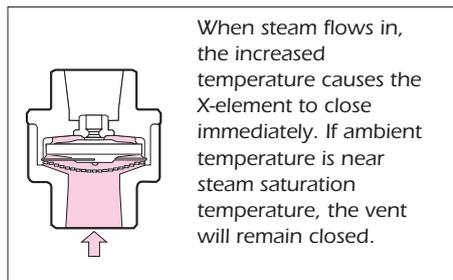
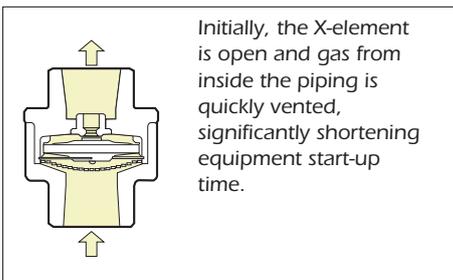
#### VS1C



## For Steam

### Automatic Air Vent

#### LA Series



# TLV INTERNATIONAL, INC.

881 Nagasuna, Noguchi, Kakogawa, Hyogo 675-8511, JAPAN  
 Tel: [81]-(0)79-427-1818 Fax: [81]-(0)79-425-1167  
 E-mail: [tlv-japan@tlv.co.jp](mailto:tlv-japan@tlv.co.jp) <https://www.tlv.com>

Manufacturer  
**TLV CO., LTD.**  
 Kakogawa, Japan  
 is approved by LRQA Ltd, to ISO 9001/14001

ISO 9001  
 ISO 14001

