



# 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  
VS1A

- **Automatic Air Vent**

VC2/VC3/VC4  
VS1C

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

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)	
					1 400		VA1	
					3 200		VA3	
					5 600		VA4	
					11 000		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	Brass	SA3-3	
			0.1 – 1.0		9		SA3-10	
			0.05 – 0.5	90	25	Bronze	VC2	
			0.1 – 0.6		90	Cast Iron	VC3	
			0.1 – 1.0		370		VC4	
	Special Fluids (Non-toxic and Non-flammable)			0.01 – 1.0	150	180	Cast Stainless Steel	VS1C-10
				0.01 – 2.1		120		VS1C-21

\* For standard 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	1 900	Brass	LA13L
		Vertical Piping	0.01 – 2.1	235	2 000	Cast Stainless Steel	LA21

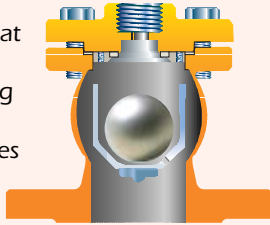
# TLV Air Vents

## 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, fire extinguishing facilities		
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, preventing the formation of a vacuum as steam condenses.



## 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.

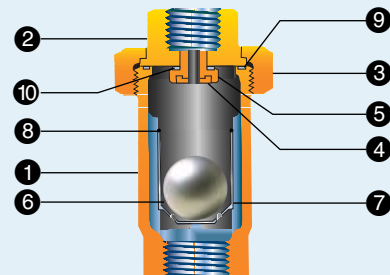
Note: Once the valve closes it will not open again, even if air accumulates. If air is expected to accumulate, use together with an automatic air vent.

#### 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: 1.57  
 Maximum Allowable Temperature (°C) TMA: 220

#### Construction



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

# 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.

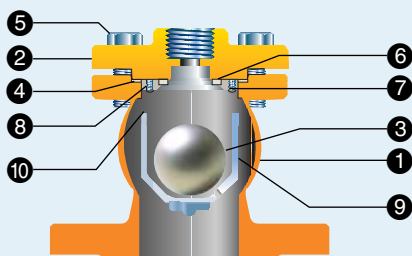
Note: Once the valve closes it will not open again, even if air accumulates.  
If air is expected to accumulate, use together with an automatic air vent.

## Specifications

Model	VA1	VA3	VA4	VA5	
Connection	Inlet Flanged (ASME 150RF)				
	Outlet Screwed (Rc(PT))		Outlet 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: 220

## Construction



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

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

# VS1A



## Features

- Achieves the tightest seal with 3-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.

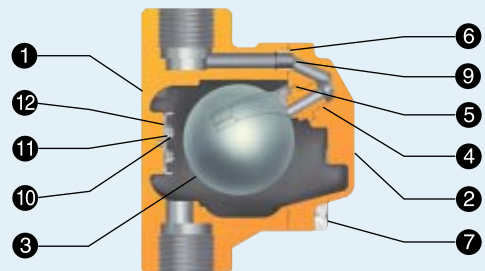
Note: Once the valve closes it will not open again, even if air accumulates.  
If air is expected to accumulate, use together with an automatic air vent.

## 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 standard air at 20 °C under atmospheric pressure. Discharge capacities are for a Δp of 0.1 MPa. Larger pressure differentials have greater discharge capacities. 1 MPa = 10.197 kg/cm²

# 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.

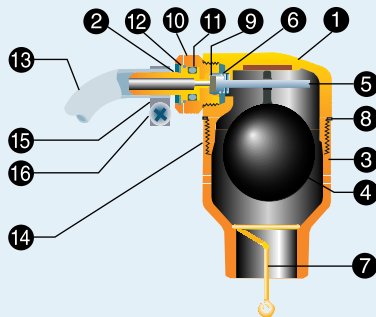
#### Specifications

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	9

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.

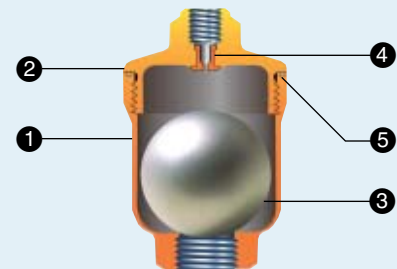
#### Specifications

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	370

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: 220

#### Construction

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



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

### VS1C



**Stainless Steel**  
**Tight Sealing**

#### Features

- Achieves the tightest seal with 3-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

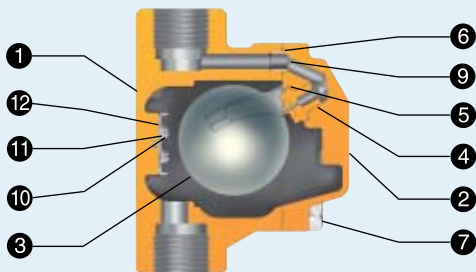
- Suitable for facilities and piping using special fluids
  - Supply pipe, pump, liquid storage tank, etc.

#### 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)*	180	120

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
- Also functions as a vacuum breaker

#### Application

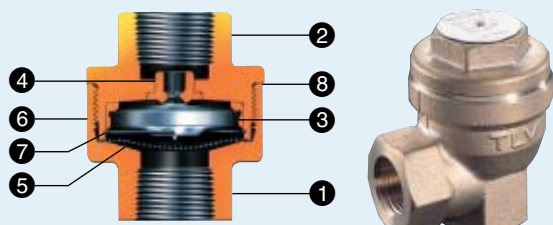
- Batch processes requiring large volume air venting
- Where hot-air locking occurs during operation
  - Double-jacketed kettle, pressing machine, etc.

#### 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
Maximum Differential Pressure (MPaG)	1.3	2.1
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

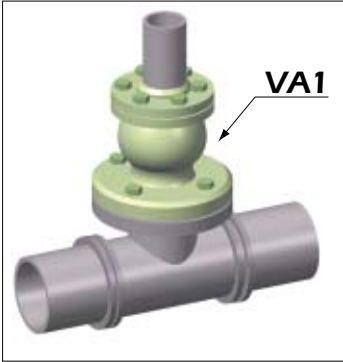
LA13L

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

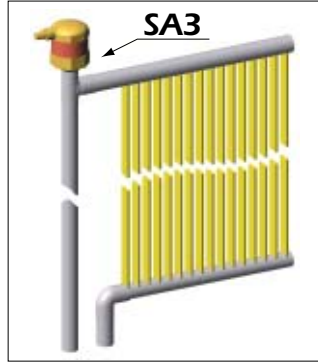
# Application Examples

## For Liquid

### Rapid Initial Air Vent



### Automatic Air Vent



## For Steam

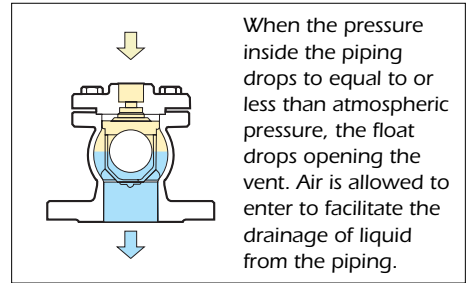
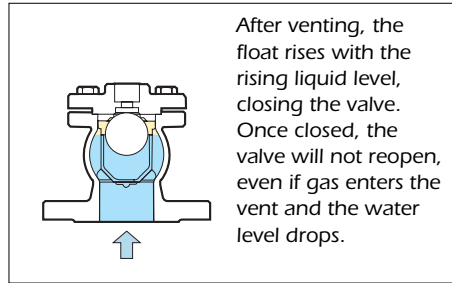
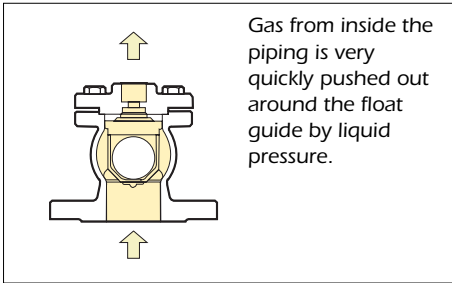


## Operation

### For Liquid

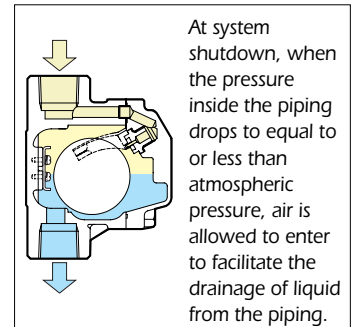
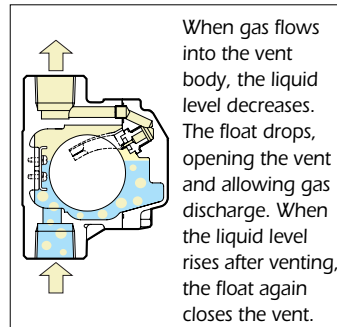
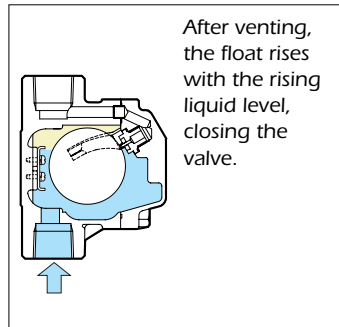
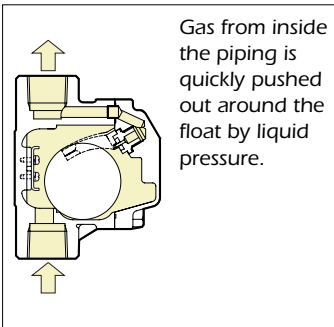
#### Rapid Initial Air Vent

##### VA Series



#### Automatic Air Vent

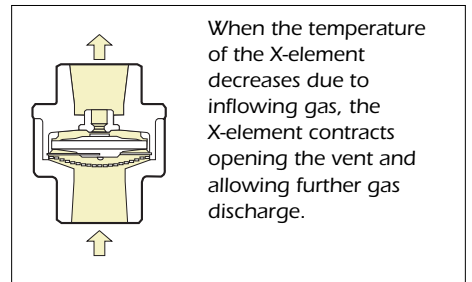
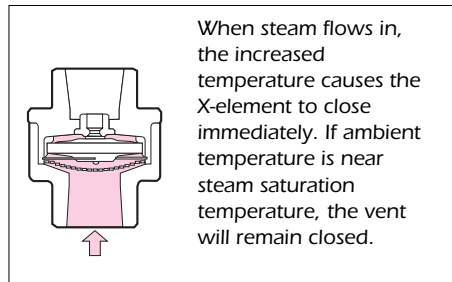
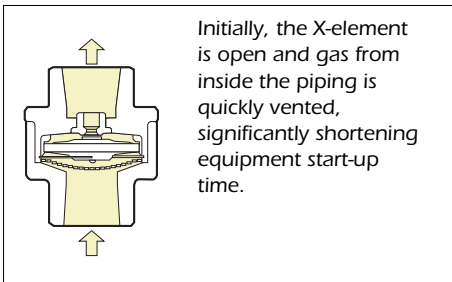
##### VS1C



## For Steam

#### Automatic Air Vent

##### LA Series



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 Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001/ISO 14001

