

MODEL AL-160·150 series SAFETY RELIEF VALVE

MODEL AL-260 series RELIEF VALVE

INSTRUCTION MANUAL

Thank you very much for purchasing our safety valves. Please read this instruction manual thoroughly before using the safety valve, so that you may do so correctly and safely. Please carefully store this manual in a handy place. The following safety symbols are used in this manual.



Warning

This symbol indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



Caution

This symbol indicates a hazardous situation that, if not avoided, may result in minor or moderate injury or may result in only property damage.

1. Specifications



Warning

- (1) This product cannot be used for apparatus and facilities with considerable vibration.
*Vibration may cause the product to make errors.
- (2) Do not use the product with metal seat on equipment and apparatus that do not allow any valve seat leakage.
*The product with metal seat has valve seat leakage within tolerance, and cannot be sealed completely (Zero valve seat leakage cannot be obtained).



Caution

Please confirm that the indications on the product name plate coincide with the specifications of the ordered product model before usage.
*In case they do not coincide, do not use the product and contact us.

Model	AL-160*150 (AL-140*)	AL-150H (AL-140H*)	AL-160L*150L	AL-150T (AL-140T*)	AL-150TML	AL-260 (AL-250*)
Size	15A-50A					
Seat type	Metal seat			Soft seat		Metal seat
Cap type	Closed type		Open type with a lever	Closed type	Closed type with a lever	Closed type
Application	Steam, Air, Water, Oil, and Other non-corrosive fluid		Steam, Air	Air, Water, Oil, and Other non-corrosive fluid		Water, Oil, and Other non-corrosive fluid
Working pressure	0.05-1.0MPa	1.0-1.6MPa (1.0-2.0MPa*)	0.05-1.0MPa	0.05-1.0MPa		
Temperature range	5-220℃			5-120℃		
Material	Cast bronze (Cast stainless steel*)					
	Spring case					
	Valve and valve seat	Stainless steel (SCS14A)		Stainless steel (SCS14A) + Synthetic rubber		Stainless steel
	Connection	JIS Rc screwed				

(1) AL-140-140H-140T-250 (marked with*) are the same as AL-150-150H-150T-260 respectively, except that the former are totally made of stainless steel.

(2) AL-150TR-250R-260R are the closed and handle-equipped variations of AL-150T-250-260 respectively.

These closed and handle-equipped types can be used only for liquid such as water or oil.

(3) The temperature range shall be 5-120℃ when liquid such as water or oil is used to AL-160-150-150H-140-140H.

(4) Setting pressure is, when steam is used, the inlet pressure at which the safety valve pops. When air, gas, water and other non-corrosive fluid is used, it means the inlet pressure at which slight flow can be detected at the outlet side of the safety relief valve.

(5) Please contact us for inquiries regarding blowdown pressure. It varies depending on setting pressure and the kind of fluid.

(6) AL-160L and AL-150L can be manually operated at more than 75% of setting pressure.

AL-150TML can be manually operated at pressure shown in the table on the right.

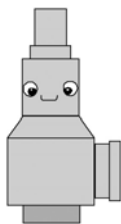
(7) An open type valve has the structure that fluid blows out from a part other than the outlet.

A closed type valve has the structure that fluid blows out only from the outlet.

AL-150TML can be manually operated with the lever at the pressure shown below.

Nominal size	Difference between setting pressure and Inlet pressure
15A - 25A	1.0 MPa or less
32A, 40A	0.6 MPa or less
50A	0.4 MPa or less

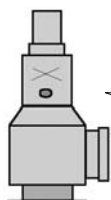




**Please read the following
before operation!!**

**Incorrect installation causes malfunction of the product. Please note that
any repair due to improper handling or misuse is subject to a charge.**

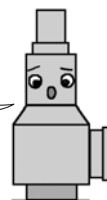
Remove the foreign objects from inside of the
piping before installing products.



Foreign objects and
scratches make me
leak the fluid!!

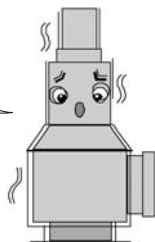
Safety valves and safety relief valves have
allowable leakage.

Be aware of
allowable leakage.

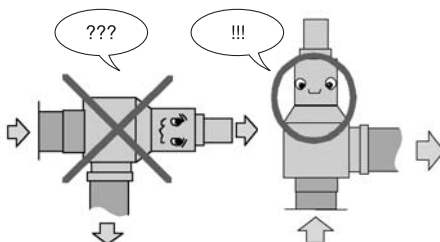


Install the product in a place free from
vibration.

I hate vibration!!

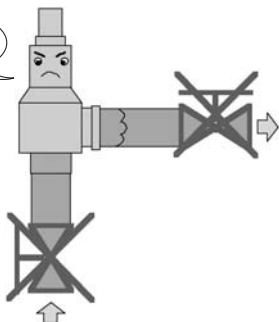


Install the product at the proper position



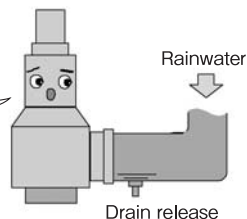
Do not install any closing devices such as
stop valves or others at the inlet or outlet side.

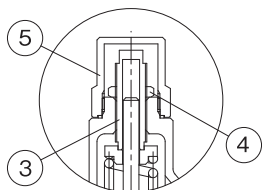
I can't blow!!



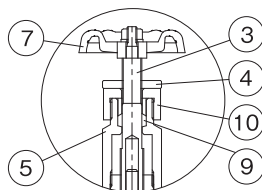
In case installing outdoor, be sure to prevent
the rain water from entering from the outlet
piping. Lead the pipe at the outlet side in the
safer direction.

Rainwater makes
me rusty!
The rust causes
leakage when it
gets stuck!

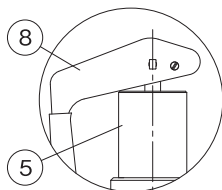




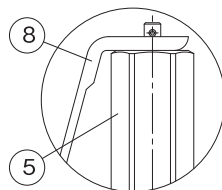
AL-140T•150T•250•260



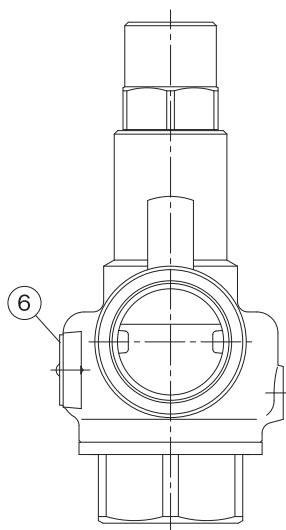
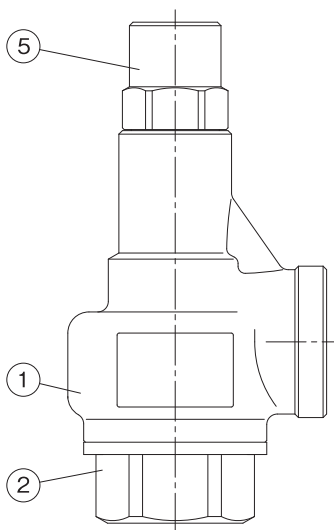
AL-150TR•250R•260R



AL-160L•150L



AL-150TML



AL-140•160•150•140H•150H

No.	Part name	No.	Part name
1	Spring case	6	Name plate
2	Valve seat	7	Handle
3	Adjusting screw	8	Lever
4	Lock nut	9	Gland packing
5	Cap	10	Gland nut

2. Installation

Warning

- (1) Do not install any closing devices such as stop valves or others at the inlet or outlet side.
- (2) Attach a blow-off pipe onto the outlet so that the fluid is led to a safe place at blow-off.
*Be aware of scalding and other injuries at blow-off.
- (3) Do not disassemble the valve.
*Disassembling the valve at your discretion may affect the original performance.
- (4) When installing the product, please fasten the hexagonal part of valve seat [2] with a spanner.
In case installing exit side of piping, do not adjust direction by exit side of piping.
*Doing so may result in injury or burns caused by blow-off due to crack in screw part of spring case [1] or due to loosened connection between spring case [1] and valve seat [2].
- (5) Do not apply the product for the line of viscous liquid that may fix valve and valve seat.
*Doing so results in inoperative due to fixed valve and valve seat.

Caution

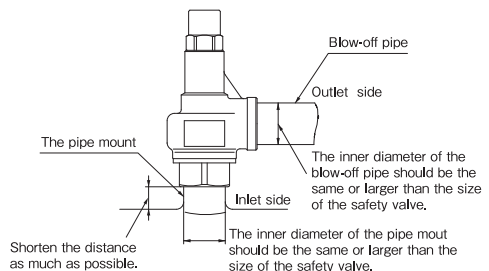
- (1) Cleanse the inside of the pipe to remove foreign objects and scales from the piping lines before connecting the valve.
*Failure to do so prevents the product from functioning correctly. **Please note that all repairs for any failure due to foreign objects shall be charged.**
- (2) Match the fluid flow direction with the inlet and outlet of the product to ensure proper installation.
*Failure to do so may prevent the valve from functioning.
- (3) Install the valve perpendicularly with cap [5] located at the top.
*Failure to do so may affect the original performance.
- (4) Securely support and fasten the piping. (Refer to the instruction below for fixing pipe mount and blow-off pipe.)
*Excess stress on the piping may cause deformation, obstructing proper opening and closing of the valve.
- (5) If the product is installed in a place where the fluid discharge may trigger the alarm or soil other equipment, extend the blow-off pipe to the outside of the building.
*Lack of consideration for the location of the blow-off pipe end can result in soiling other equipment.
- (6) Ensure that the piping connections are secure.
*Failure to do so may result in leakage from the joints when vibration is induced, and may cause scalding by the fluid.
- (7) When drainage, rain water, etc. may be collected at the blow-off pipe, prepare drain pipes in the position which can drain them.
*Failure to do so may prevent the valve from functioning properly due to rusting.
- (8) The inner diameter of the pipe mount and that of blow-off pipe should be the same as or larger than the size of inlet and outlet of the valve respectively.
*Failure to do so may prevent the valve from functioning properly or result in insufficient discharge volume.

● Pipe mount for installing safety relief valve

- (1) A pipe mount should have sufficient strength and rigidity against the stress caused in reaction against the exhaust flowing up through the axis of the blow-off pipe.
- (2) Install the safety relief valve vertically as close as possible to the can body and header. By doing so, the pressure loss of the pipe mount can be suppressed, preventing decrease in the discharge volume and unstable functioning of the safety valve. The pipe mount should be installed where it can be easily maintained and inspected.
- (3) The inner diameter of the pipe mount should be the same or larger than the size of the safety relief valve.

● Blow-off pipe of safety relief valve

- (1) Install a blow-off pipe and expansion joint so that the stress caused by the thermal expansion of the equipment or the fluctuation of the blow-off pipe due to the heat of the safety relief valve does not affect the safety relief valve.
- (2) The inner diameter of a blow-off pipe should be the same as or larger than that of the outlet pipe of the safety relief valve in order not to induce any excessive back pressure.



3. Maintenance

Warning

- (1) Do not touch the valve and piping with bare hand, even when handling lever [8].
*Doing so may result in injury or burns in case of high-temperature fluid.
- (2) Do not touch the valve unreasonably.
*Doing so may result in injury or burns in case of high-temperature fluid.
- (3) Wear earplugs and do not stand in front of the blow-off pipe when checking the operation of the valve.
Do not look into the pipe or put your hand out to the pipe.
*The product makes a loud blowing noise during operation. Be aware of spluttering fluid from the product.
- (4) Do not remove cap [5] except in the case of pressure adjustment of AL-250 or AL-260.
*Doing so may result in injury or burns due to the blow-off from the adjusting screw.
(No blow-off from the adjusting screw occurs with AL-250 and AL-260.)
- (5) Do not disassemble the product.
*Please contact us in the case of malfunction.

Inspect the product daily and periodically to detect failures such as seat leakage or leakage out of the valve body.

Caution

- (1) In the case of raising the fluid pressure, check beforehand that no problems will occur regarding the equipment installed onto the piping.
*Failure to do so may result in damage to the equipment.
- (2) Remove the condensate completely from the piping in the case it is not operated for a long time.
*Failure to do so may result in malfunction of the valve due to scales and foreign objects in the piping.
- (3) The products must be checked before re-operation when having the plant shutdown for a long time.

4. Setting pressure adjustment

Do not adjust the setting pressure EXCEPT on AL-150TR•250•250R•260•260R. Please adjust the setting pressure only on AL-150TR•250•250R•260•260R within each setting pressure range on page 6 of this leaflet. Do not set the pressure at a value out of each setting pressure range.

Warning

- (1) When adjusting the setting pressure of AL-150TR•250•250R•260•260R, give the adjusting screw [3] or handle [7] 1/4 to 1/3 of turn slowly and check the operation per each turn. Be careful of sudden blow-off caused by an excessive turn. In such case, step away from the product immediately.
*Such sudden blow-off may cause injury or burns in case of high-temperature fluid.
- (2) Do not touch the product with bare hands when turning the handle of AL-150TR•250R•260R.
*Doing so may result in injury or burns in case of high-temperature fluid.

● Adjustment procedure for AL-250 and AL-260

- (1) Remove cap [5].
- (2) Loosen lock nut [4] by turning it counterclockwise.
- (3) Turn adjusting screw [3] clockwise to increase the setting pressure. To decrease the setting pressure, turn it counterclockwise. When adjusting the pressure, give adjusting screw [3] 1/4 to 1/3 turn slowly and check the operation per each turn.
- (4) After adjustment, fasten lock nut [4] by turning it clockwise.
- (5) Fasten cap [5].

● Adjustment procedure for AL-150TR•250R•260R

- (1) Loosen lock nut [4] by turning it counterclockwise by hand. (Lock nut [4] is knurled on its outer side and can be easily rotated by hand.)
- (2) Turn handle [7] clockwise to increase the setting pressure. To decrease the setting pressure, turn it counterclockwise. When adjusting the pressure, give handle [7] 1/4 to 1/3 turn slowly and check the operation per each turn.
* Handle [7] has the limit in the range of movement. Do not force it to turn beyond the limit.
Doing so may cause damage or malfunction.
- (3) After adjustment, fasten lock nut [4] by hand.

Setting pressure range for AL-150TR•250•250R•260•260R

Size	Setting pressure range (MPa)					
	A	B	C	D	E	F
15	0.05-0.2	0.21-0.4	0.41-0.55	0.56-0.75	0.76-1.0	—
20	0.05-0.2	0.21-0.35	0.36-0.45	0.46-0.6	0.61-0.75	0.76-1.0
25	0.05-0.2	0.21-0.35	0.36-0.45	0.46-0.55	0.56-0.8	0.81-1.0
32	0.05-0.2	0.21-0.4	0.41-0.65	0.66-1.0	—	—
40	0.05-0.2	0.21-0.4	0.41-0.65	0.66-0.8	0.81-1.0	—
50	0.05-0.2	0.21-0.4	0.41-0.65	0.66-0.8	0.81-1.0	—

5. Troubleshooting

Trouble	Cause	Measures and treatment
Leakage at outlet side	Scale stuck between valve and valve seat	Operate the product to remove the scale. Contact us for repair at the factory in case the trouble still exists.
	Scratches between valve and valve seat.(Damage to O-ring)	Contact us for repair at the factory. The product needs to be disassembled and part replacement.
	Malfunction due to excessive vibration imposed to piping on which the product installed	Do not install the product to devices and equipment subject to excessive vibration.
	Excessive pressure momentarily generated due to pulsation of fluid	Lower the normal pressure, or contact us for readjustment at the factory to raise the setting pressure. *1
	Small difference between setting pressure and normal pressure	Enlarge the difference between setting pressure and normal pressure. Contact us when readjustment of the setting pressure is required. *1
	Fluid flowing into the outlet piping	Change the piping layout so that the fluid does not flow into the outlet piping.
Operates at pressures lower than setting pressure.	Mismatch between specifications of the product and actual conditions of use	Check setting pressure on name plate [6]. Replace the product if conditions of use conflicts with specifications.
	Malfunction of pressure gauge	Calibrate or replace pressure gauge.
	Scratches between valve and valve seat. (Damage to O-ring)	Contact us for repair at the factory. The product needs to be disassembled and part replacement.
	Wrong setting pressure observed	Contact us for repair at the factory.

Trouble	Cause	Measures and treatment
Does not operate when pressure reaches setting pressure	Mismatch between specifications of the product and actual conditions of use	Check setting pressure on name plate [6]. Replace the product if conditions of use conflicts with specifications.
	Malfunction of pressure gauge	Calibrate or replace pressure gauge.
	Valve and valve seat not moving smoothly	Contact us for repair at the factory. The product needs to be disassembled and cleaned.
	Back pressure on piping at outlet side	Remove back pressure and change the piping layout not to allow back pressure exist.
	Wrong setting pressure observed	Contact us for repair at the factory.
Blows constantly all the time	Scale stuck between valve and valve seat	Operate the product to remove the scale. Contact us for repair at the factory in case the trouble still exists.
	Valve and valve seat not moving smoothly	Contact us for repair at the factory. The product needs to be disassembled and cleaned.
	Normal pressure higher than closing pressure	Enlarge the difference between setting pressure and normal pressure. Contact us for readjustment of setting pressure at the factory.*1
	The product installed at the outlet side of pressure reducing valve with malfunction due to its high reduced pressure.	Repair the pressure reducing valve. Contact us for repair at the factory in case the pressure reducing valve is Yoshitake product.
Lever does not lift up (AL-160L·150L·150TML)	Low inlet pressure	Raise inlet pressure to the level described in (6) of "1. Specifications."
	Valve and valve seat not moving smoothly	Contact us for repair at the factory. The product needs to be disassembled and cleaned.
Does not stop blowing when the lever is released after operation by lever. (AL-160L·150L·150TML)	Scale or dirt stuck between valve and valve seat	Operate the product by lever again to remove the scale or dirt. Contact us for repair at the factory in case the trouble still exists.
	Valve and valve seat not moving smoothly	Contact us for repair at the factory. The product needs to be disassembled and cleaned.
Leakage at gland of handle (AL-150TR·250R·260R)	Loose gland nut [10]	Re-fasten gland nut [10]
	Worn-out gland packing [9]	Re-fasten gland nut [10]. Contact us for repair at the factory in case the trouble still exists, for the product needs to be disassembled and part replacement.

*1: Please refer to "4. Setting pressure adjustment" for AL-150TR·250·250R·260·260R.

6. Disassembly and inspection

Caution

Do not disassemble the product. * Contact us in case any trouble.



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