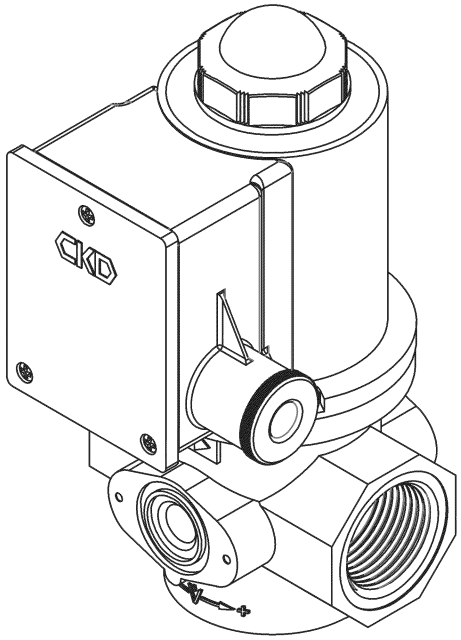
CKD

SM-50512-A

INSTRUCTION MANUAL

Gas Shut-Off Valve

VNA/VLA



- Read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

5th Edition
CKD Corporation

Safety precautions

All customers designing and manufacturing a device which uses CKD products have the responsibility to, and are expected to, manufacture a device that is safe by checking that the safety of the system operated by the following components is secured: the device mechanism, the gas combustion equipment circuit, and the electrical control that controls these components.

It is important to select, operate, handle, and maintain CKD products appropriately to ensure that each CKD product is used safely.

Please observe all warnings and precautions for each CKD product to ensure the safety of not only the CKD products but also your device containing CKD products.

⚠ WARNING

1. This product has been designed and manufactured as a component for industrial use gas combustion equipment. It must only be handled by persons with sufficient relevant knowledge and experience.

2. Use this product within its specifications.

This product must be used within its stated specifications. Do not attempt to alter or modify the product.

Moreover, this product is intended to be used as a component for industrial use gas combustion equipment. It is not intended for use outdoors or in applications listed below. (However, this product may be used under some unintended conditions if the customer consults CKD prior to use, understands and agrees to the product specifications, and provides safety measures that avoid risks in the event of failures.)

(1) Applications that require safety which include nuclear power applications, railroad systems, aviation systems, ships, vehicles, medical equipment, any equipment or application that involves direct contact with food and beverage, amusement equipment, emergency shutoff circuits, press machines, brake circuits, and safeguards.

(2) Applications where serious risks to human life and/or property are expected and safety is especially required.

3. Observe all applicable organization standards and regulations to ensure safety in device design and control.

Applicable organization standards and regulations include:

- JIS B 8415, General Safety Code for Industrial Combustion Furnaces
- Safety Technology Index for Industrial Gas Combustion Equipment (The Japan Gas Association)
- Safety Technology Index for Gas Boiler Combustion Equipment (The Japan Gas Association)
- High Pressure Gas Safety Law, Occupational Safety and Health Act, and other rules, organization standards, and regulations concerning safety

4. Do not install or use this product or remove any equipment until safety is confirmed.

(1) Conduct inspection and services on machines and devices after safety of all systems related to this product is confirmed.

(2) Handle with care as there may be hot surfaces and hot parts even after operation has stopped.

(3) Before inspecting or servicing this product, stop supplying gas and turn off power to the applicable equipment. Be careful of leaks.

5. Provide overcurrent protection device.

Provide overcurrent protection device (such as a molded case circuit breaker and circuit protector) and wire the operating power source according to JIS B 9960-1: 2008, Safety of Machinery – Electrical Equipment of Machines – Part 1: General Requirements.

6. Observe all safety instructions in the pages that follow to prevent accidents.

■ **In this manual, safety instructions are ranked as "DANGER", "WARNING", or "CAUTION".**

DANGER DANGER indicates a hazardous situation which, if not avoided, may result in fatal or serious injury, and there is a high degree of emergency (urgency) to a warning.

WARNING WARNING indicates a hazardous situation which, if not avoided, may result in fatal or serious injury.

CAUTION CAUTION indicates a hazardous situation which, if not avoided, may result in only minor injury or property damage.

Please note that even some instructions labeled as “CAUTION” may lead to serious results depending on the situation. In any case, make sure to observe all instructions as they contain important information.

Important notes on warranty

- Term of warranty

  The product specified herein is warranted for one (1) year from the date on which the product is delivered to the location designated by the customer.

- Scope of warranty

  If the product becomes defective for reasons attributable to CKD within the above term of warranty, CKD will promptly provide replacement for the defective product or part thereof or repair the defective product at one of CKD’s facilities free of charge.

  However, following defects are excluded from this warranty:

  (1) Defects due to use of the product under conditions and in environments not conforming to those stated in this manual.

  (2) Defects due to misuse, including abuse and neglect, and improper maintenance of the product.

  (3) Defects due to reasons other than the delivered product.

  (4) Defects due to use for which the product is not intended.

  (5) Defects due to modifications and alterations to structure, performance, and/or specifications without permission from CKD and repairs not authorized by CKD.

  (6) Defects that could have been avoided if the customer’s equipment, into which the product is incorporated, had functions, structure, etc. generally provided as an accepted standard in the industry.

  (7) Defects due to reasons unforeseen at the level of technology available at the time of delivery.

  (8) Defects due to natural disasters, accidents, or any other causes beyond control of CKD.

  The warranty set forth above covers only the delivered product itself and does not cover any incidental or consequential damages due to failure of the delivered product.

- Determination of compatibility

  It is the responsibility of the customer to determine whether the CKD product is compatible with the system, machinery, and/or device with which the product is to be used.

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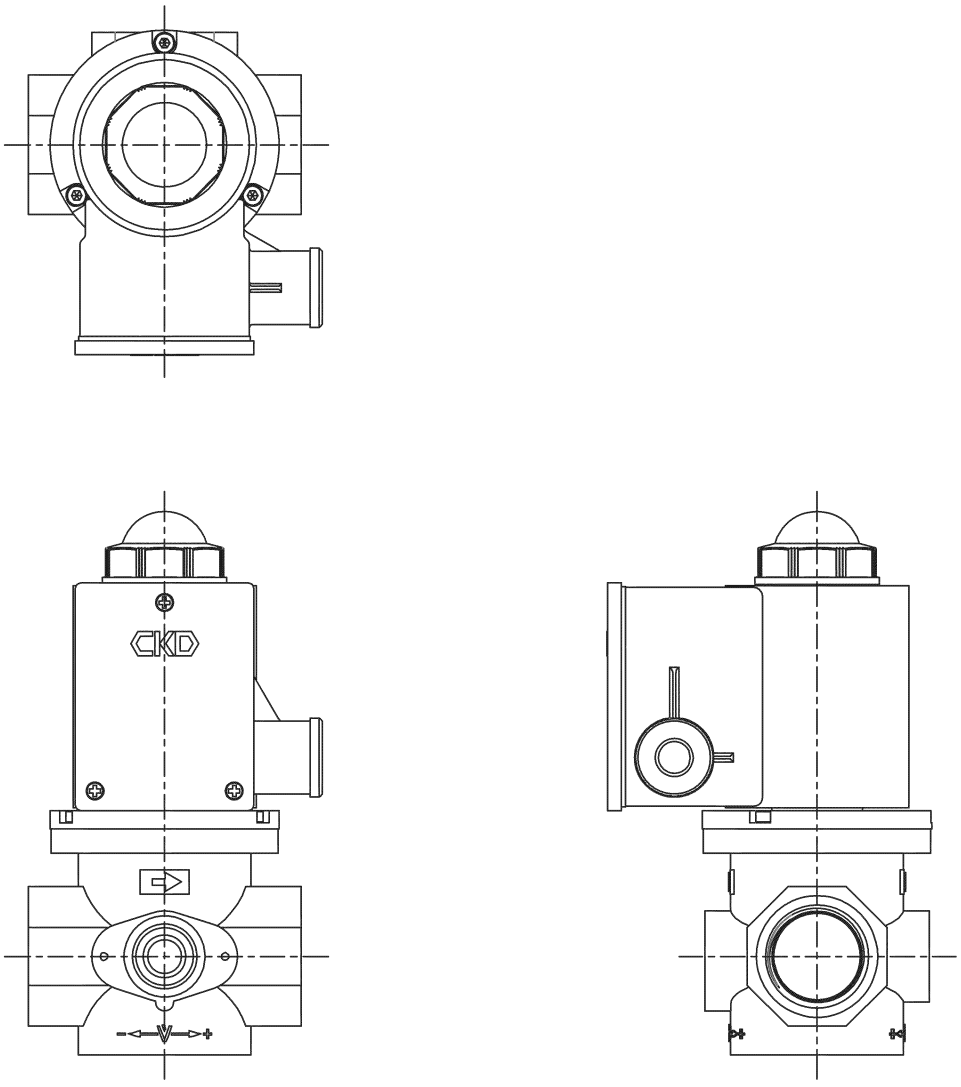
1 Inspections upon delivery

⚠ CAUTION	Do not remove the protection cap from the connection port until just before piping. If removed before beginning piping work, foreign matter can get inside from the connection port and result in product damage or malfunction.

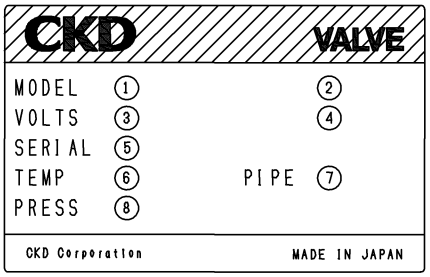
1-1 Product appearance

Check the product's exterior appearance for any abnormality by thoroughly inspecting the product for any damage or loose bolts that may have occurred during transportation.



1-2 Nameplate information

Check the model number, specification, and any other information printed on the product nameplate.



① Model number
② Device number
③ Rated voltage
④ Power consumption
⑤ Serial number
⑥ Ambient temperature
⑦ Nominal diameter
⑧ Maximum working pressure

1-3 Product storage

If the product is not used immediately upon delivery, avoid storing the product in hot, humid locations. Moreover, to protect the product, store it in as much of the original packaging and condition as possible.

2 Installation

⚠ WARNING	For uses not within the designated specifications or for special applications, consult CKD on specifications.

2-1 Installation environment

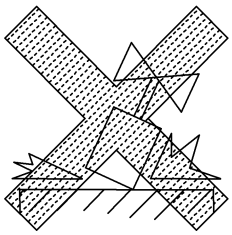
⚠ WARNING	a) Do not use this product in the presence of corrosive gas or in an atmosphere that may affect the material of construction. b) Do not install this product in locations subject to vibration and shock. c) Do not expose this product to direct sunlight, rain, and wind.

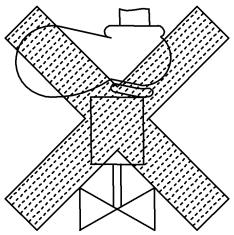
2-2 Mounting

⚠ WARNING	d) Read and understand the manual fully before mounting the product. e) Hold the body of the product when handling and mounting. f) After mounting the product, make sure it is mounted properly by checking for leaks.

2-2-1 Handling

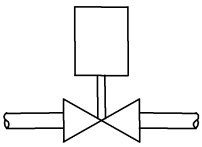
Do not drop or step on the product.



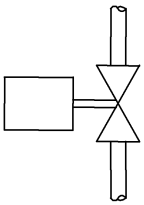


2-2-2 Mounting orientation

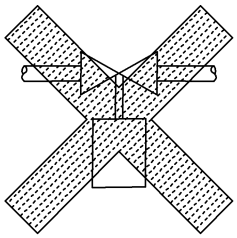
This product can be mounted on the piping vertically (coil is at top) or horizontally (coil is sideways). The coil must not be inclined downward from the horizontal.



Vertical mounting



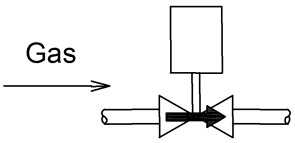
Horizontal mounting

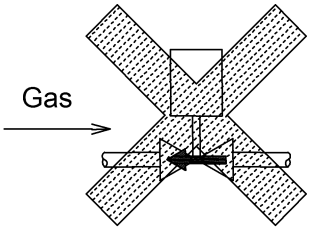


Vertical mounting with coil at bottom

2-2-3 Flow direction

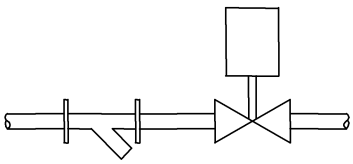
Mount the product so the direction of the arrow on the product corresponds to the direction of gas flow.

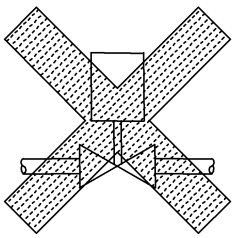




2-2-4 Filter installation

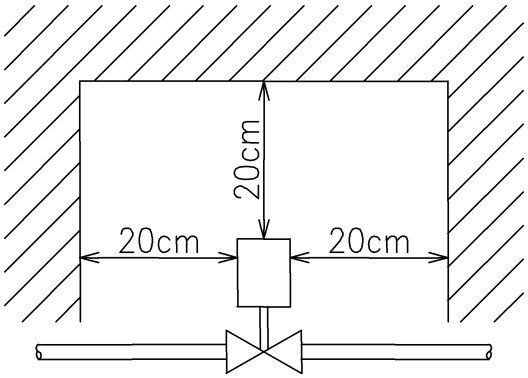
Install a filter upstream of the product to remove dust and other foreign matter.





2-2-5 Space around the product

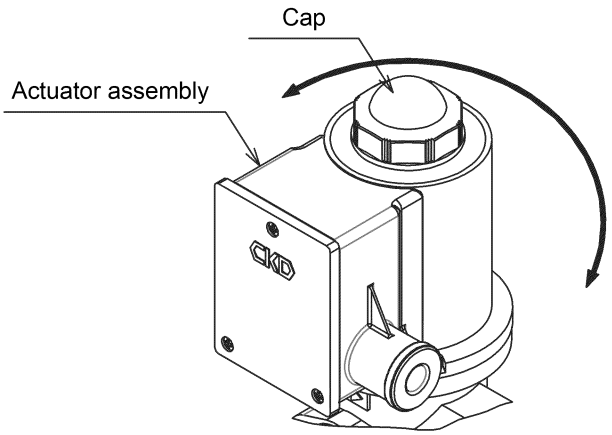
Provide an access space of about 20 cm wide around the product for inspection and maintenance.



2-2-6 Changing the mounting orientation of actuator assembly

If the mounting orientation of actuator assembly needs to be changed due to the shut-off valve's installation space, rotate the actuator assembly directly. If it does not rotate, loosen the cap at the top of the body by about one turn to facilitate rotation of the actuator assembly. Make sure to retighten the cap afterward.

Depending on the working conditions, after using the product for a long period of time, the parts inside the actuator may have changed in size and the actuator assembly may not rotate easily. Rotating it with unreasonable force may cause the lead wires inside to break and result in product malfunction.

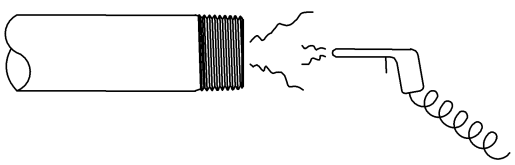


2-3 Piping

⚠ CAUTION	Fasten and secure the piping so that the product is not subject to the weight of piping and vibration.

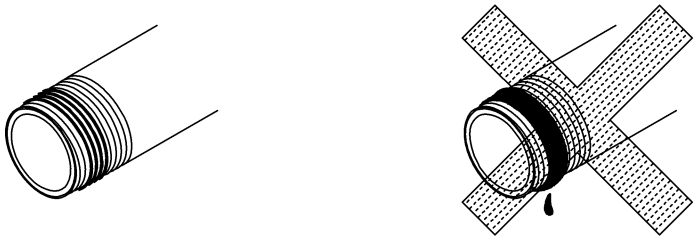
2-3-1 Air flushing

Before piping the product, flush pipes with air to remove machining dust and other foreign matter.



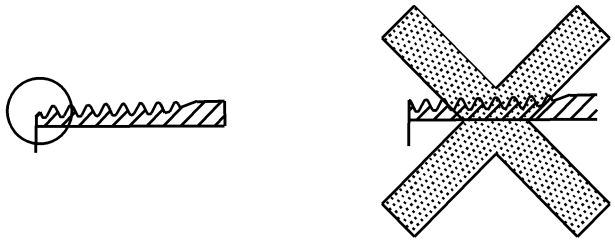
2-3-2 Application of sealant to pipe threads

Before connecting the pipes, apply a sealant designated by the city gas manufacturer to the pipe threads starting with the second thread from the end of the pipe. Do not apply too much. Also, make sure the sealant does not get into the pipes when applying it.



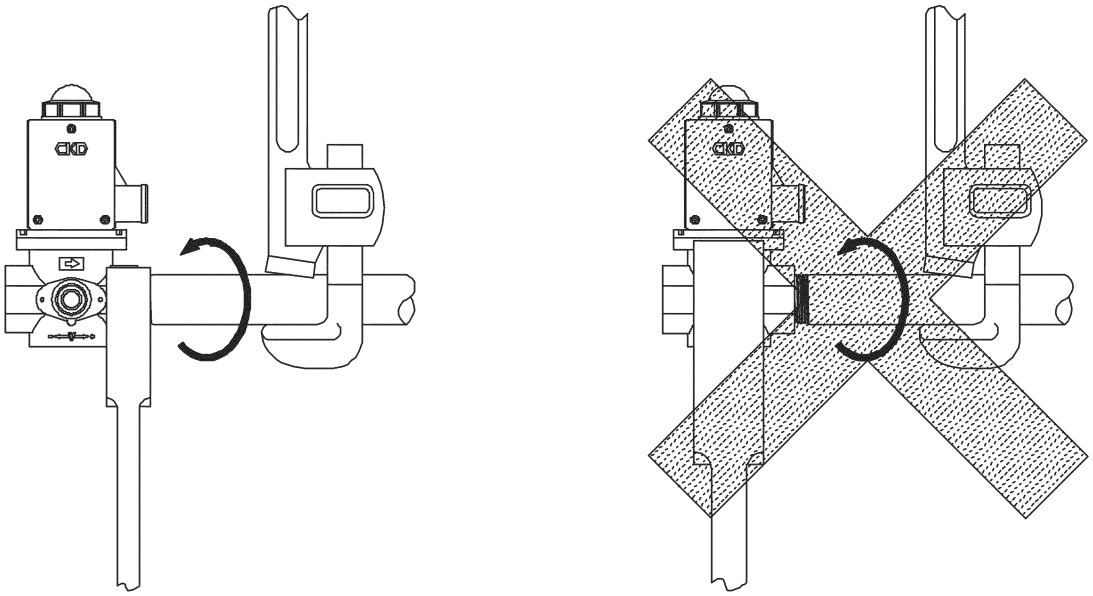
2-3-3 Length of pipe thread

For the gas pipe thread length, observe the effective thread length. Too long or too short may result in damage and leakage. Make sure to file off about one-half pitch of thread from the end.



2-3-4 Mounting and piping

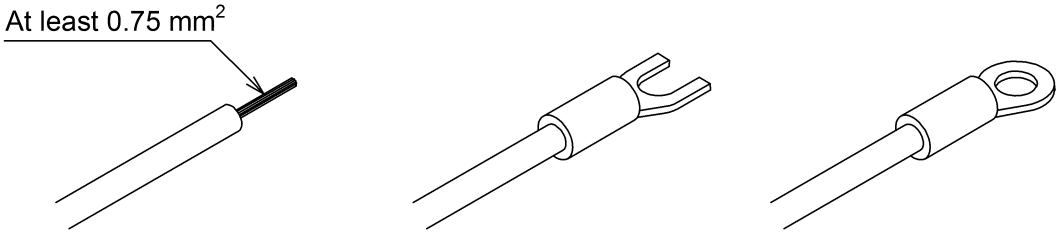
When piping, grip the two opposite faces of body connection port with a wrench. Do not grip any other parts (parts other than the actuator and two opposite faces of the body).



2-4 Wiring

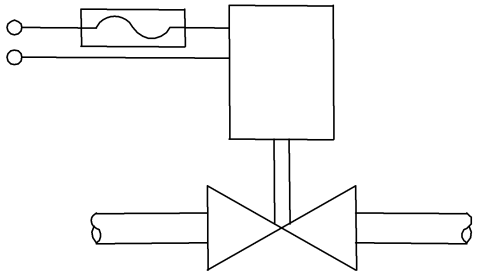
2-4-1 Electric wire

Use an electric wire with a cross-sectional area of at least 0.75 mm^2. For terminal block connection, crimp a spade tongue crimp terminal or a ring tongue crimp terminal (for M4 screws) to the wire.



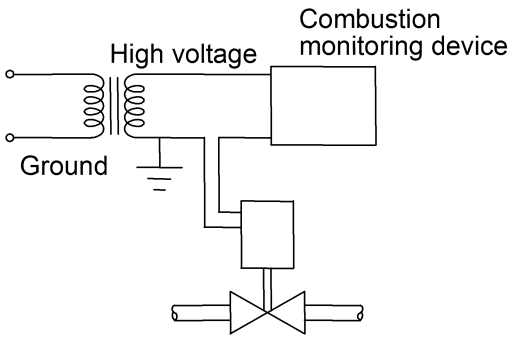
2-4-2 Fuse installation

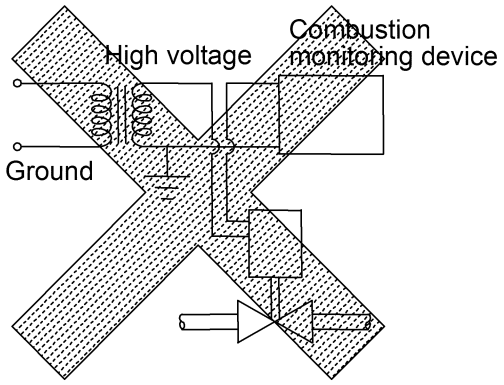
When installing a fuse in the power circuit, make sure to use a fuse of appropriate capacity.



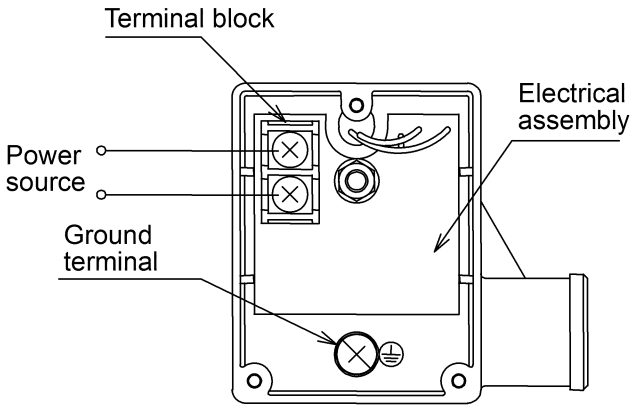
2-4-3 Operating power source connection

When connecting the power source, properly connect the high voltage and ground wiring as shown below.



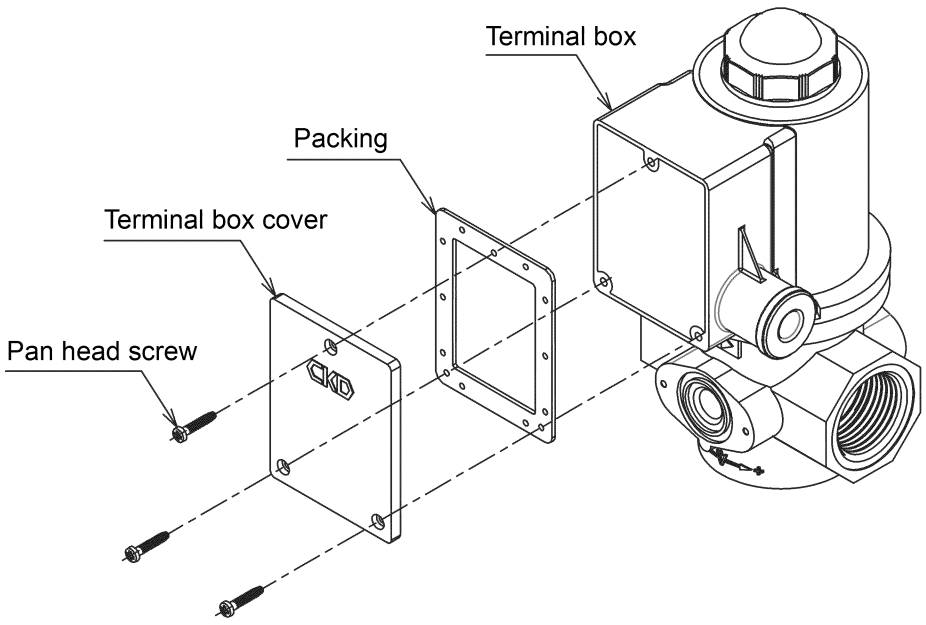


To connect to the shut-off valve terminal block, remove the terminal box cover and feed the electric wire into the terminal box through the CTC19 conduit connection threaded tubing. Tighten the terminal screws at a torque not exceeding 1.4 N·m. Connect the ground terminal to ground to prevent electrical shock in the event of a current leak. Neither AC (alternating current) type nor DC (direct current) type (option) has polarity.



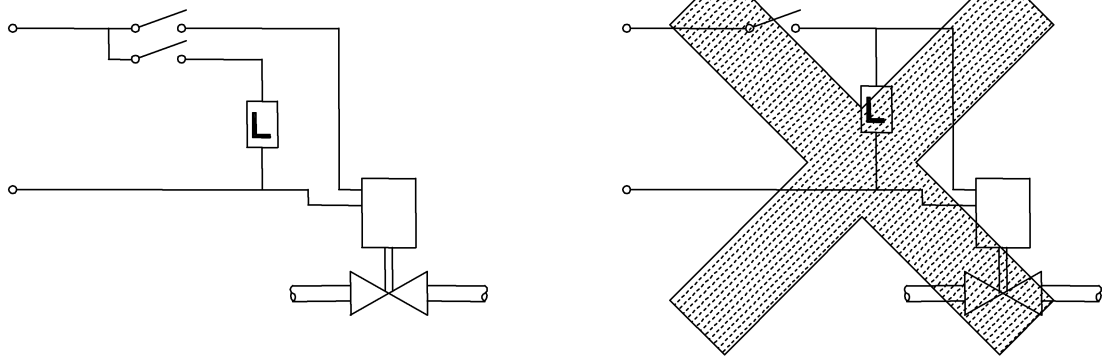
For models with electrification confirmation lamp (Option: L), refer to 2-4-7 Wiring of models with electrification confirmation lamp (Option: L).

After connecting the power source, reattach the terminal box cover. Tighten the terminal box cover mounting screws (pan head screws) at a torque of 0.6 to 0.9 N·m. For models with outdoor specification (Option: ZZ), refer to 4-6 Outdoor specification (Option: ZZ).



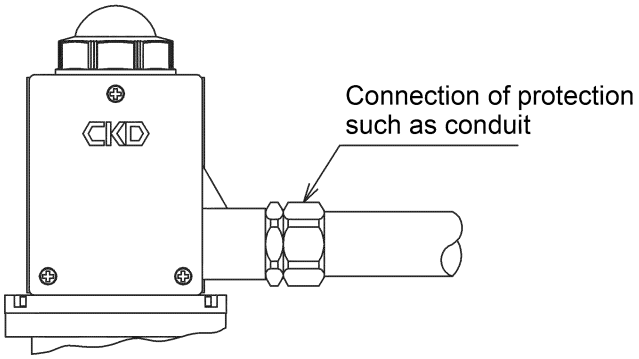
2-4-4 Surge voltage prevention

When connecting the product and inductive load (such as motor, relays) in parallel, wire them as shown below so the surge voltage is not applied to the product.



2-4-5 Conduit connection

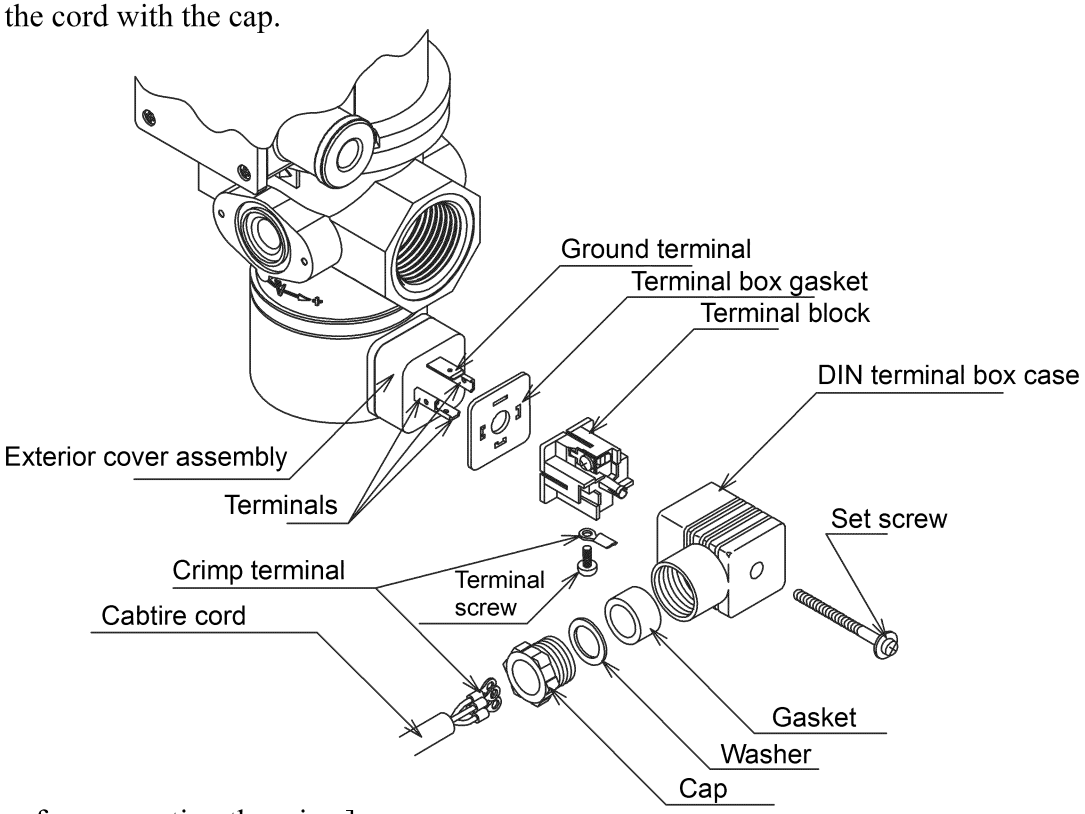
Provide protection such as a conduit for waterproofing and dustproofing the threaded conduit opening and for protecting and enclosing the electric wires connected to the shut-off valve. (Nominal designation of thread: CTC19)



2-4-6 Wiring of models with operation confirmation micro switch (Option: E)

(1) Connecting to DIN terminal
(Nominal designation of thread: PG11)

1) Strip away lead sheath and pass leads through cap, washer, gasket, and DIN terminal box case.
2) Crimp the crimp terminals (for M3 screws) onto leads. Secure the crimped terminals to the terminal block. Terminal screw tightening torque is 0.5 N·m.
3) Attach terminal box gasket and terminal block to the exterior cover assembly. Place DIN terminal box case over them and secure with the set screw. Set screw tightening torque is 0.5 N·m.
4) Secure the cord with the cap.



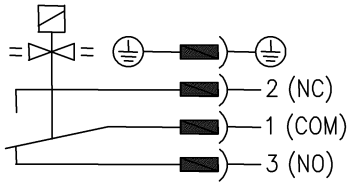
[Precautions for connecting the wires]

- Use a cabtire cord with an outer diameter of ø6 mm to ø10 mm and a nominal cross-sectional area of 0.75 mm^2 to 1.5 mm^2.
- Connect the ground terminal to ground to prevent electrical shock in the event of a current leak.
- To change the orientation of the cord outlet, remove the terminal block from the case, rotate it by 90° for each orientation, and return it to the case.

(2) Electric circuit diagram (of micro switch)

Contacts are shown all closed.
Electrical rating: 5A 125 VAC, 3A 250 VAC

When valve is closed, ON signal is generated between terminals 1(COM) and 3(NO); and when valve is open, ON signal is generated between terminals 1(COM) and 2(NC).

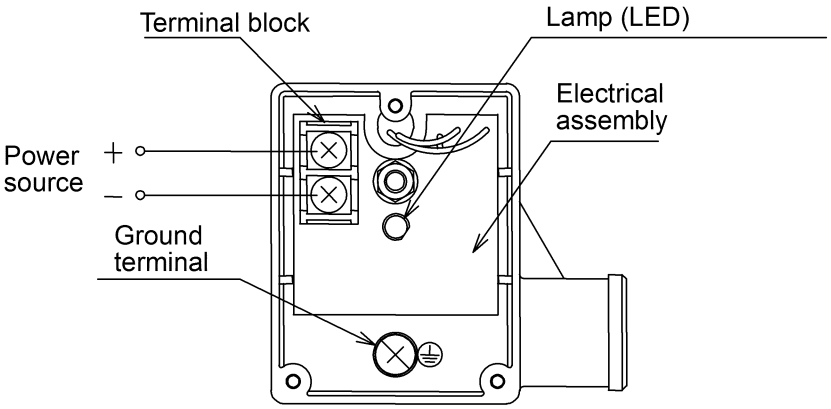


Allowable ambient temperature for models with operation confirmation micro switch is -15°C to 60°C. Under low temperatures, micro switch takes longer time to operate in opening the valve (about 5 seconds at -15°C).

2-4-7 Wiring of models with electrification confirmation lamp (Option: L)

To connect to the shut-off valve terminal block, remove the terminal box cover and feed the electric wire into the terminal box through the CTC19 conduit connection threaded tubing. Tighten the terminal screws at a torque not exceeding 1.4 N·m. Connect the ground terminal to ground to prevent electrical shock in the event of a current leak.

When connecting the power source, do not allow electrical wires to exert external force on the lamp (LED). Securely assemble the lamp to the recess on the terminal box cover. Otherwise, the lamp may not light up. AC (alternating current) type power source has no polarity, but DC (direct current) type (option) has polarity so connect correctly as shown below. (If polarities are reversed, the solenoid valve will operate when connected to power but the lamp will not light up.)

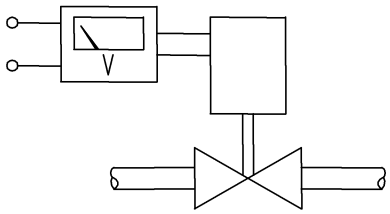


3 Inspections before operation

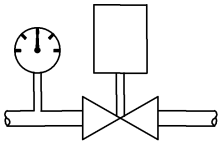
3-1 Conformity with specifications

Make sure operating conditions such as voltage and gas pressure are in conformity with the specifications on the product nameplate.

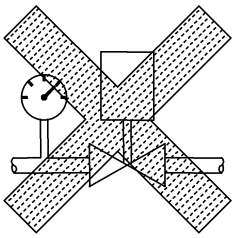
· Power voltage
  Make sure the power voltage is within -15% to +10% of the rated voltage.



· Working pressure
  Make sure the inlet pressure is within the primary working pressure range.

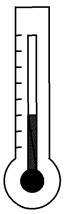


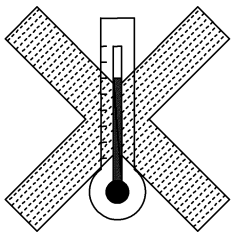
Within working pressure range



Outside working pressure range

· Ambient temperature
  Make sure the installation site's ambient temperature is within the allowable ambient temperature range.





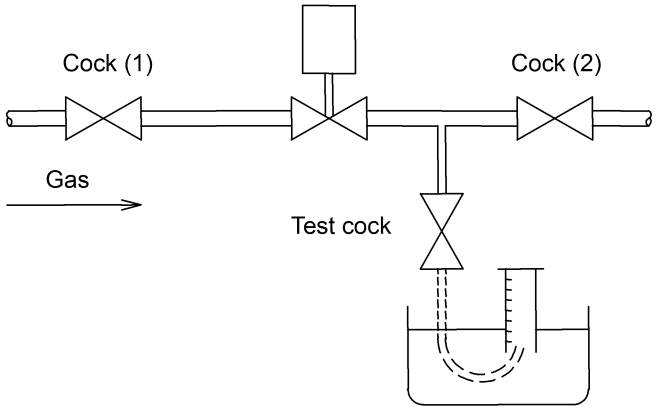
3-2 Actuation

Apply operating power to this product, and make sure the valves actuate and the valves return to the original position when the power is turned off.

3-3 Leakage

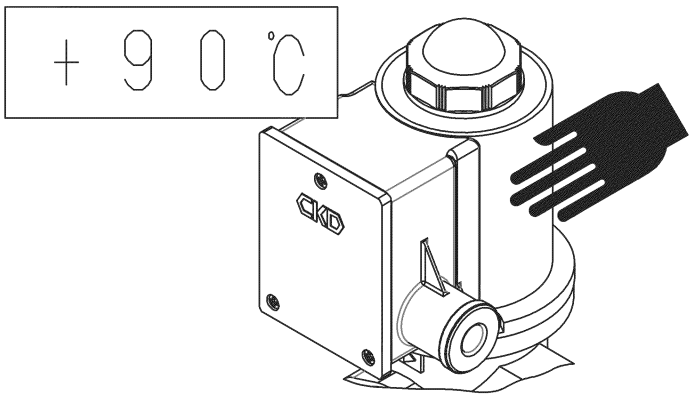
· External leakage
Use a gas leak detector or soap water to make sure there is no external leakage from the connections and from the product.

· Internal leakage
Close shut-off valve. Open cock (1) and close cock (2). Connect rubber hose to the end of test cock. Submerge the loose end of the hose into water by about 10 mm. Check for bubbles that indicate leakage.



3-4 Heat generation of coil

Beware of hot surface. When the power is turned on, surface temperature rises to a high level due to coil temperature rise. (Please be assured that high surface temperature does not affect product performance.)



4 Proper operation

4-1 Precautions

⚠ WARNING	a) This product is not for use as an emergency shutoff valve. · This product is not designed to provide safety protection, like that provided by an emergency shutoff valve. If this product is used in a system which requires safety measures, make sure to adopt other reliable safety measures. b) To protect against possible harm to people and equipment in case of product failure, implement necessary measures beforehand. c) Working fluid · Do not use fluids other those listed in the specification.

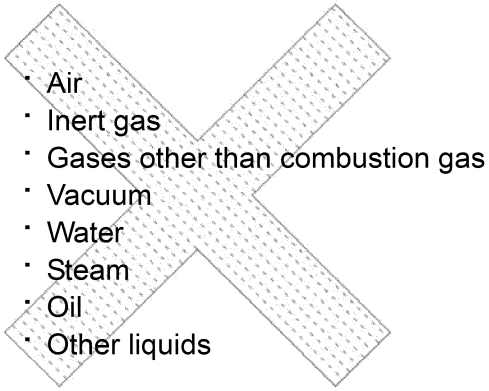
· Do not use this product with fluids other than city gas, natural gas, and LPG.

Working fluid

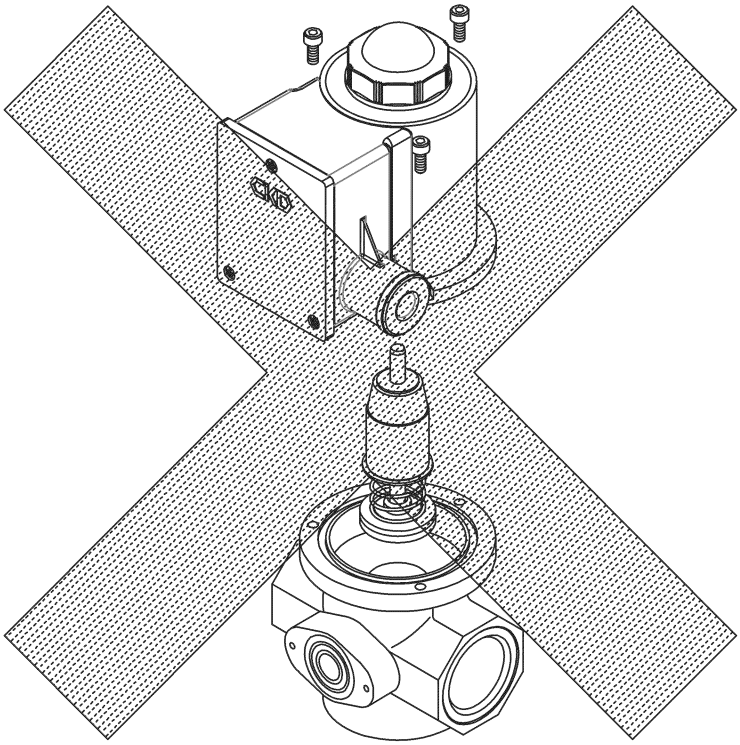
· City gas

· Natural gas

· LPG



· Do not disassemble, repair, or modify this product.



4-2 Flow rate adjustment

For products with following options, flow rate adjustment mechanism is not available.

VNA/VLA - port size - E: With operation confirmation micro switch

VNA/VLA - port size - D: Large flow rate specification

For products with following options, flow rate adjustment is done differently.

VNA - port size - DY: Large flow rate specification with flow adjustment
(Refer to 4-4 Large flow rate specification with flow adjustment (Option: DY).)

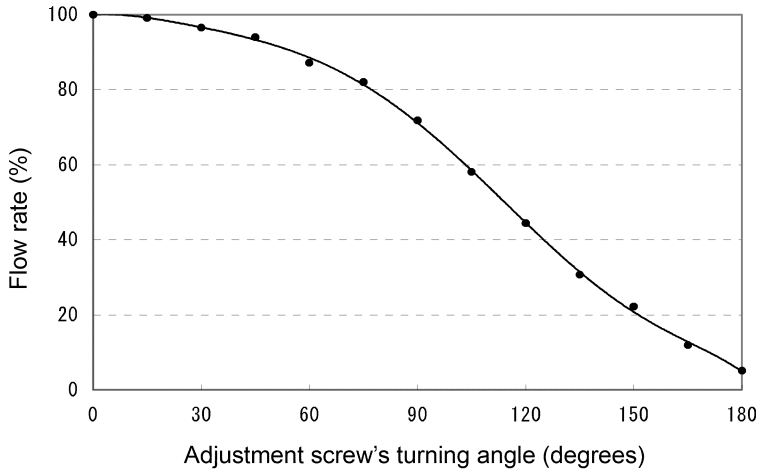
VNA - port size - R, RH: Non-fully closing type
(Refer to 4-7 Non-fully closing type (Option: R, RH).)

(1) Flow rate adjustment characteristics

Pressure condition: P_1 = 2 kPa

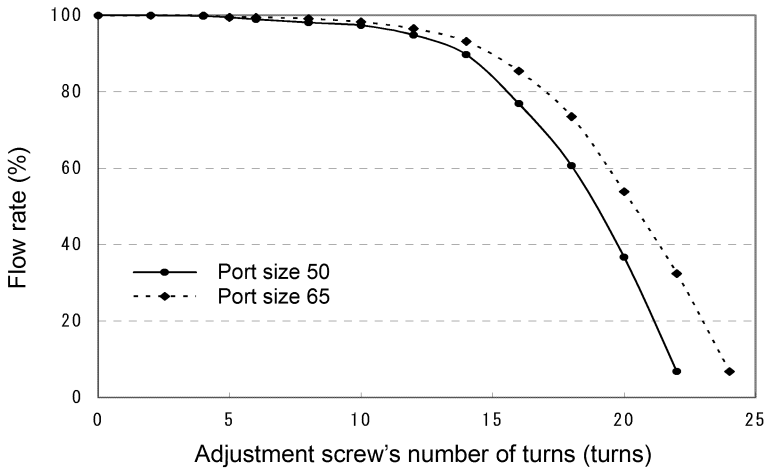
● VNA/VLA-15 to 40

Relationship between turning angle of flow adjustment screw and flow rate (representative value)



● VNA/VLA-50 to 65

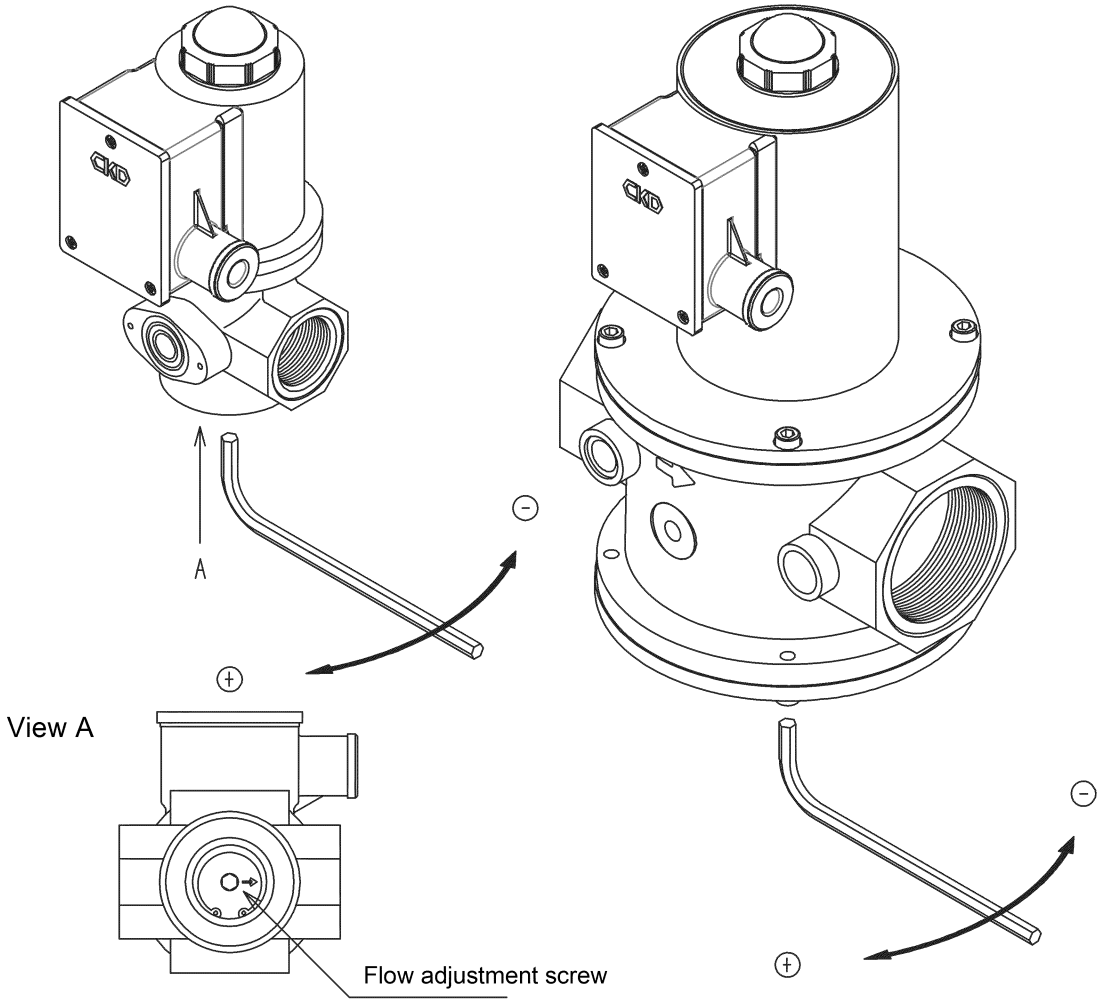
Relationship between number of turns of flow adjustment screw and flow rate (representative value)



(2) How to adjust the flow rate

To adjust the flow rate, turn the flow adjustment screw located at the bottom of the shut-off valve body as shown below to change the flow rate.

1) Turn the flow adjustment screw using a hex key (6 mm across-flats).
2) Turning the screw clockwise decreases flow rate. (Turning the screw counterclockwise increases flow rate.)
3) Flow rate adjustment range is 20% to 100% of maximum flow rate.



[Precautions for adjusting the flow rate]

- Flow rate is adjusted to full flow (fully open) before shipping. (For VNA/VLA-15 to 40, arrow on the flow adjustment screw faces the outlet. For VNA/VLA-50/65, flow adjustment screw is turned counterclockwise until it stops.)
- Flow adjustment screw can be turned at an angle within 180° from fully open position for VNA/VLA-15 to 40. Turning the screw outside this turning angle range and applying excessive force may damage internal parts (flow adjustment cock) and obstruct adjustment.
- Flow adjustment screw can be turned up to about 22 turns from the fully open position for VNA/VLA-50 and about 24 turns from the fully open position for VNA/VLA-65. Turning the screw outside this range of number of turns and applying excessive force may damage internal parts (adjustment plate, flow adjustment screw) and obstruct adjustment.

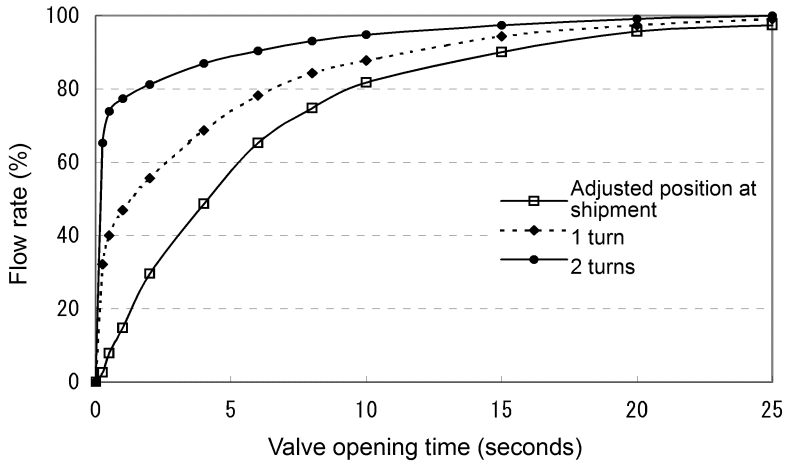
4-3 Start gas adjustment

This feature is available only on VLA series.

(1) Slow opening characteristics

Temperature condition: 20°C
Pressure conditions: P_1 = 2 kPa
ΔP = 0.1 kPa

Relationship between number of turns of damper body and flow rate (representative value: VLA-25)

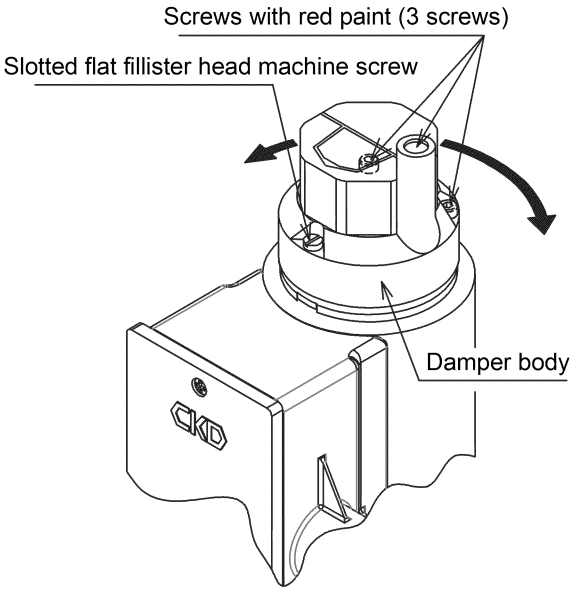


Models other than VLA-25 also show the same tendency.

(2) How to adjust the start gas

To adjust the start gas, turn the damper body as shown in the right to change the flow rate of start gas.

1) Loosen the slotted flat fillister head machine screw.
2) Turning the damper body counterclockwise increases start gas. (Turning the damper body clockwise decreases start gas.)
3) Tighten the slotted flat fillister head machine screw each time adjustment is made.
4) Start gas rate adjustment range is 0% to 70% of maximum flow rate.



[Precautions for adjusting the start gas]

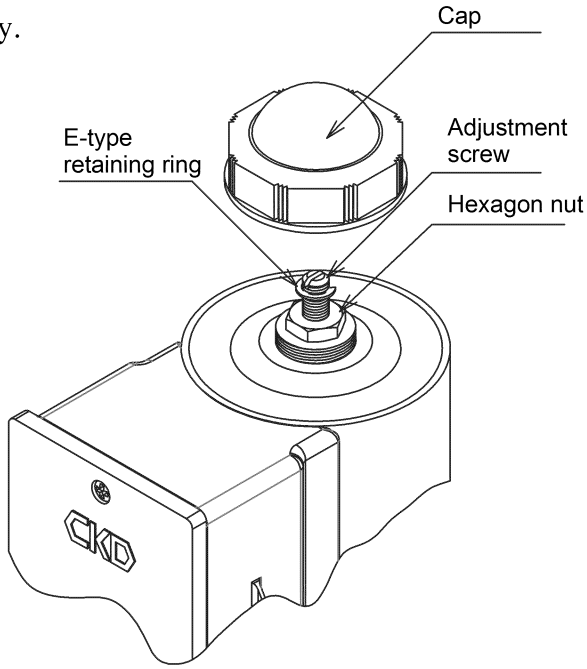
- Start gas flow rate is set to 0% before shipping.
- Do not remove the slotted flat fillister head machine screw. Only loosen it. Do not loosen other screws (heads painted in red).
- Damper body can be turned up to about 3 turns in counterclockwise direction from the position at shipment. Turning the damper body outside this range of number of turns and applying excessive force may damage internal parts (damper collar assembly) and obstruct adjustment.

4-4 Large flow rate specification with flow adjustment (Option: DY)

How to adjust the flow rate

To adjust the flow rate, turn the adjustment screw located at the top of the shut-off valve body as shown below to change the flow rate.

1) Remove the cap at the top of the shut-off valve body.
2) Loosen the hexagon nut.
3) Turn the adjustment screw using a screw driver (-).
4) Turning the screw clockwise decreases flow rate. (Turning the screw counterclockwise increases flow rate.)
5) Flow rate adjustment range is 20% to 100% of maximum flow rate.
6) After adjustment, secure with the hexagon nut and attach the cap.



[Precautions for adjusting the flow rate]

· Flow rate is adjusted to full flow (fully open) before shipping. (Adjustment screw is turned counterclockwise until it stops.)

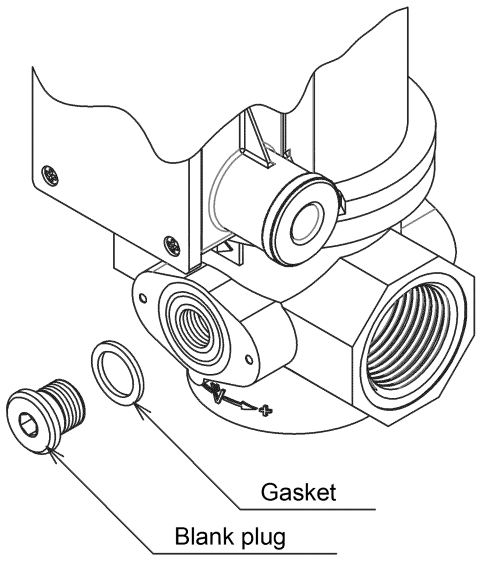
4-5 With pressure detection port (Option: P)

This is a standard feature for products with following options.

VNA/VLA -[port size]- E: With operation confirmation micro switch

VNA -[port size]- R, RH: Non-fully closing type

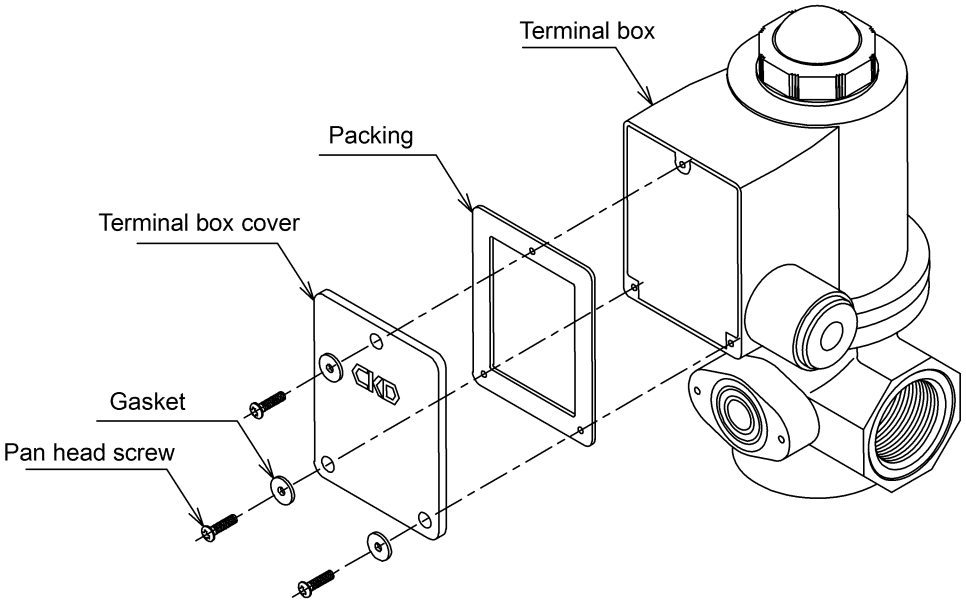
When reattaching the blank plug, implement measures against leakage such as replacing the gasket with a new one and make sure there is no external leakage. (Nominal designation of thread: Rp1/4)



4-6 Outdoor specification (Option: ZZ)

After connecting the power source, reattach the terminal box cover. Tighten the 3 terminal box cover mounting screws (pan head screws) evenly at a torque of 0.3 to 0.5 N·m.

If the shut-off valve has been installed outdoors for a long period of time and the terminal box cover is removed, check that gasket and packing are not showing any signs of deterioration. If there is deterioration, replace the gasket and packing with new ones to ensure waterproof performance.



4-7 Non-fully closing type (Option: R, RH)

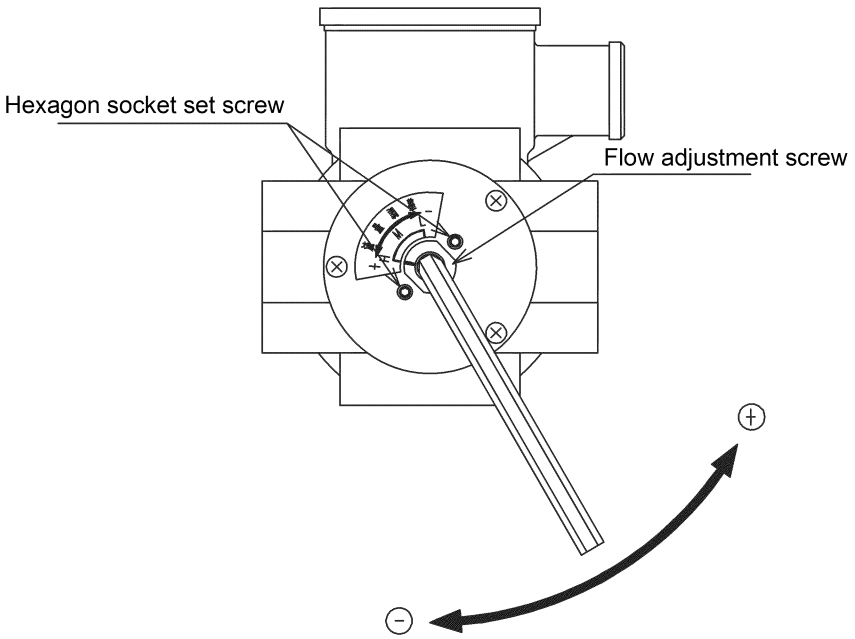
(1) How to adjust the main flow rate

The flow rate is adjusted the same way as in 4-4 Large flow rate specification with flow adjustment (Option: DY). Refer to 4-4.
(However, flow rate adjustment range is 50% to 100% of maximum flow rate.)

(2) How to adjust the bypass flow rate

To adjust the flow rate, turn the flow adjustment screw located at the bottom of the shut-off valve body as shown below to change the flow rate.

1) Loosen the hexagon socket set screws (2 places) at the bottom of the shut-off valve body until they are not touching the flow adjustment screw.
2) Turn the flow adjustment screw using a hex key (6 mm across-flats).
3) Turning the screw clockwise decreases flow rate.
   (Turning the screw counterclockwise increases flow rate.)
4) Flow rate adjustment range is 10% to 100% of maximum flow rate.
5) After adjustment, secure with hexagon socket set screws (2 places).



[Precautions for adjusting the flow rate]

- Flow rate is adjusted to full flow (fully open) before shipping.
  (Adjustment screw is turned counterclockwise until it stops and adjusted to the position corresponding to H on the opening indicator.)
- Flow adjustment screw can be turned within the 70° angle between H and L on the opening indicator. Turning the screw outside this turning angle range and applying excessive force may damage internal parts (flow adjustment cock) and obstruct adjustment.

5 Periodic inspection

⚠ WARNING	Do not disassemble, repair, or modify this product.

Conduct actuation and leakage tests at least once a year (refer to sections 3-2 and 3-3). For repairs in case of abnormal actuation, contact the dealer from whom you made your purchase or your nearest CKD agent.

Conduct periodic inspections according to the periodic inspection procedures for safety shutoff valves given in safety standards such as those listed below.

Published by The Japan Gas Association

"Safety Technology Index for Industrial Gas Combustion Equipment"
"Safety Technology Index for Gas Boiler Combustion Equipment"
"Safety Technology Guide for Gas Engine for Power Generation"

6 Troubleshooting

Cause of the problem and corrective action

Problem	Cause	Investigation	Corrective action
1. Does not open	a. Operating power circuit has failed	Measure voltage at terminal block of electric assembly. Allowable voltage range: -15% to +10% of rated voltage. Ex: For 100 VAC, allowable range is 85 VAC to 110 VAC.	If measured voltage is not within the range specified in left column, inspect and repair the power circuit.
	b. Electric assembly has failed	○ AC type: Alternating current Measure voltage at DC output of rectifier of electric assembly. Allowable voltage range: -15% to +10% of about (rated voltage x 0.9) VDC. Ex: For 100 VAC, allowable range is about 76 VDC to 99 VDC. ○ DC type: Direct current Measure voltage at output of electric assembly. Allowable voltage range: -15% to +10% of rated voltage. Ex: For 24 VDC, allowable range is 20.4 VDC to 26.4 VDC.	If measured voltage is not within the range specified in left column, replace electric assembly or replace the actuator.
	c. Coil burn out or layer short-circuit has occurred.	Turn power OFF and measure coil resistance. (Unit: Ω) Size / 100 VAC / 200 VAC 15: 299 / 1267 20, 25: 299 / 1196 32, 40: 186 / 777 50: 134 / 508 65: 130 / 559 Allowable resistance range: -5% to +5% of above value. Ex: For port size of 15 and 100 VAC, allowable range is 284 to 314 Ω.	If measured value is not within the range specified in left column, replace the actuator. Note 1: Values in the left column are for temperature at 20°C. Note 2: For other voltages and resistance values of products with options, contact CKD.
	d. Abnormal gas pressure was applied.	Check working gas pressure to see if it is over the maximum working pressure.	Inspect and repair the pressure regulator.

Problem	Cause	Investigation	Corrective action
2. Does not close	a. Operating power circuit has failed	Measure voltage at terminal block of electric assembly.	If voltage is applied, inspect and repair the power circuit.
	b. Foreign matter has adhered to valve disc, or other cause	None (Do not disassemble the product.)	Contact the dealer from whom you made your purchase or your nearest CKD agent.
3. Leaks externally	a. Pipe connection seal has failed	Check for leaks from pipe connections.	Repair the pipe connection seal.
4. Leaks internally	a. Foreign matter has adhered to valve disc or valve seat, or they are damaged	None (Do not disassemble the product.)	Contact the dealer from whom you made your purchase or your nearest CKD agent.
5. Flow rate is low	a. Strainer is clogged	None (Do not disassemble the product.)	Contact the dealer from whom you made your purchase or your nearest CKD agent.
6. Does not perform “slow open” (VLA only)	a. Damper oil is leaking	None (Do not disassemble the product.)	Contact the dealer from whom you made your purchase or your nearest CKD agent.

7 Product specification and model number

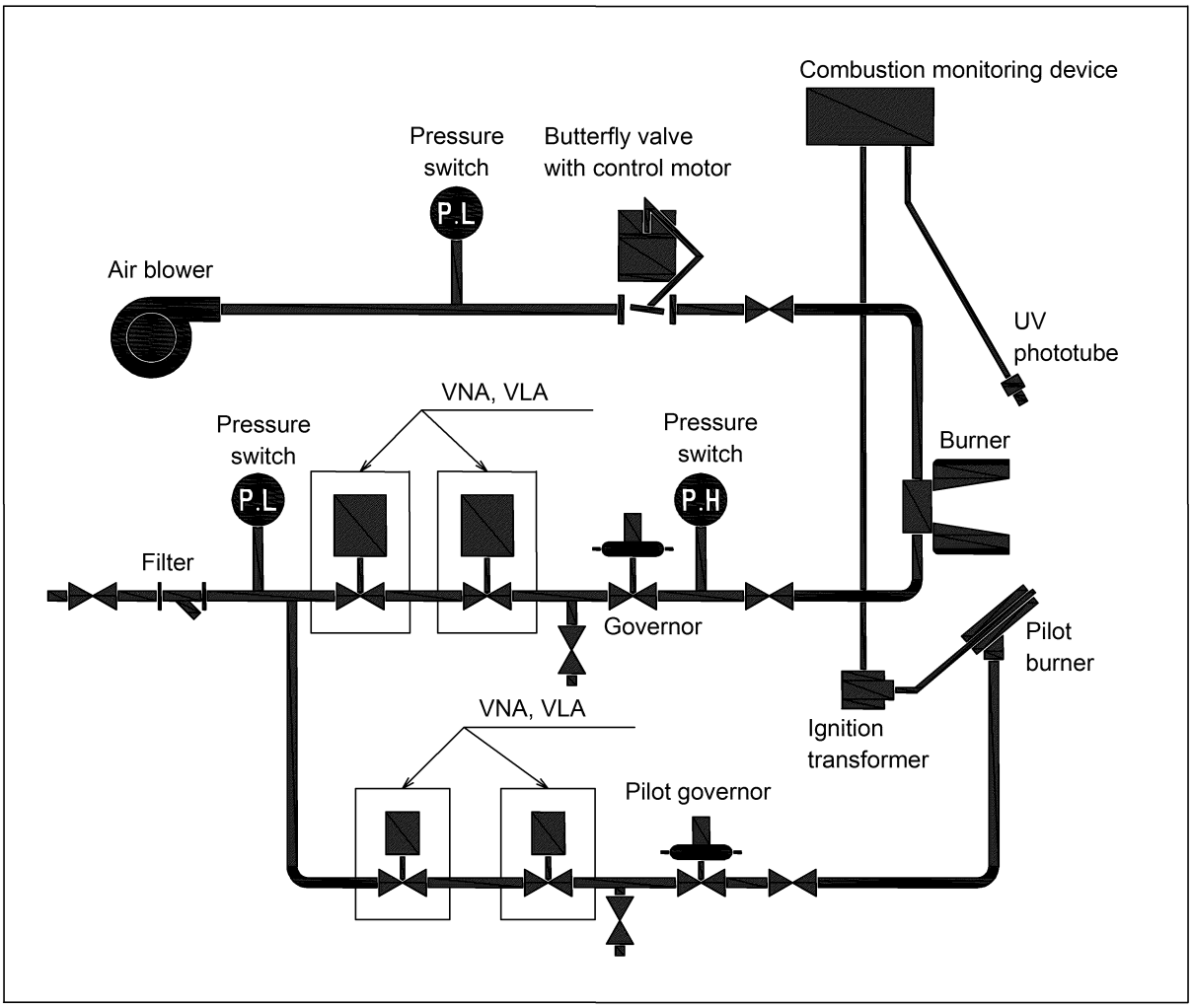
7-1 Product application

This product is used in gas passages as a gas shutoff valve and controls the ON and OFF supply of gas fuel within industrial gas combustion equipment.

(This product is not for use as an emergency shutoff valve.)

An example of how this product can be applied in a gas combustion system is shown below.

Example of application:



7-2 Main features

- VNA/VLA operates under a wide range of pressures, from low to medium
- Flow adjustment (calorie change) can be done easily even after installation
- Improved valve structure prevents foreign matter from adhering
- Sturdy terminal box with JIS-compliant conduit thread designed for VNA/VLA simplifies wiring work
- DC-drive actuator with a built-in rectifier provides safe operation without noise or coil burnout
- VNA/VLA is dust proof and splash proof (IPX4)

7-3 Product specification

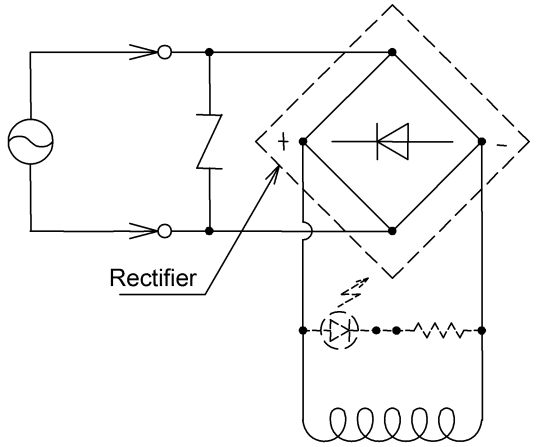
VNA/VLA (standard)

Description \ Port size		15	20	25	32	40	50	65
Working fluid		City gas/Natural gas/LPG						
Working pressure kPa	VNA	0 to 45	0 to 30				0 to 20	
	VLA	0 to 25	0 to 20					
Flow rate m^3/h (ANR) Natural gas specific gravity 0.65 ΔP = 0.25 kPa		6.9	14.8	18.7	30.3	34.5	70.0	112.6
Rated voltage V		AC 100 +10% -15%			AC 200 +10% -15%			
Power consumption (apparent power) VA		31			50		73	74
Ambient temperature °C		-20 to +60 (no freezing)						
Open operation time s	VNA	At most 0.5						
	VLA	About 10.0 (adjustable)						
Close operation time s		At most 1.0						
Flow rate adjustment %		20 to 100						
Start gas flow rate adjustment %		0 to 70						
Mounting orientation		Vertical with coil at top or horizontal with coil lying sideways						
Connection		Screw-in (Rp)						
Port size		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Weight kg	VNA	1.7	2.5	2.4	4.0	3.9	8.3	14.6
	VLA	1.9	2.7	2.6	4.2	4.1	8.9	15.2

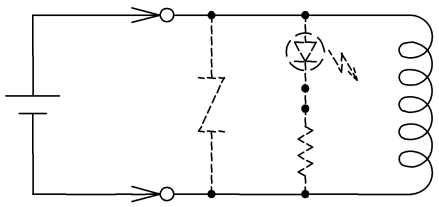
For specifications in more detail or specifications and outside dimensions of products with options, contact CKD.

Electric circuit diagram Models with electrification confirmation lamp (option) contain parts indicated with broken lines.

● AC type: alternating current



● DC type: direct current (option)



7-4 Model number representation

How to order

VNA - 40 - D PY - 100VAC

Model no. / Ⓐ Port size / Ⓑ Capability / Ⓒ Other options / Ⓓ Voltage

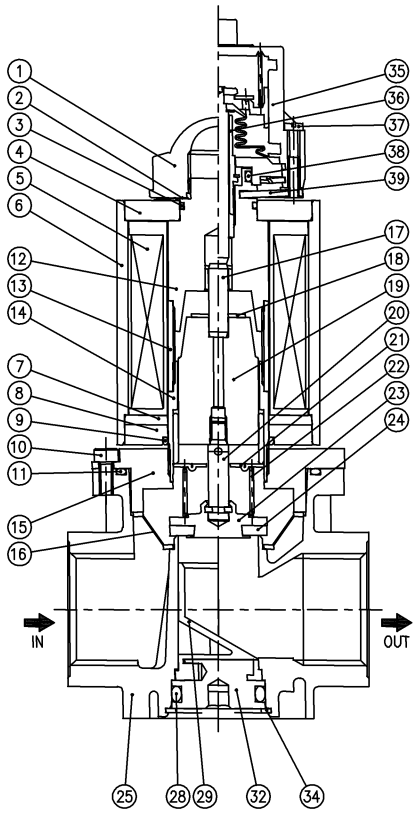
Symbol		Descriptions	Model no. VNA-15	VNA-20	VNA-25	VNA-32	VNA-40	VNA-50	VNA-65
Ⓐ Port size									
15		Rp1/2	●						
20		Rp3/4		●					
25		Rp1			●				
32		Rp1¼				●			
40		Rp1½					●		
50		Rp2						●	
65		Rp2½							●
Ⓑ Capability									
Blank		Standard	●	●	●	●	●	●	●
D		Large flow rate specification				●	●		
Ⓒ Other options									
Blank	Standard	None	●	●	●	●	●	●	●
E	Option	With operation confirmation micro switch	●	●	●	●	●	●	●
H	Option	0.1 MPa specification	●	●	●	●	●		
L	Option	With electrification confirmation lamp	●	●	●	●	●	●	●
P	Option	With pressure detection port	●	●	●	●	●	●	●
V	Option	Vacuum specification	●	●	●				
Y	Option	With flow adjustment				●	●		
ZZ	Option	Outdoor specification	●	●	●	●	●	●	●
Ⓓ Voltage									
100VAC	Standard	100VAC 50/60Hz	●	●	●	●	●	●	●
200VAC	Standard	200VAC 50/60Hz	●	●	●	●	●	●	●
110VAC	Option	110VAC 50/60Hz	●	●	●	●	●	●	●
220VAC	Option	220VAC 50/60Hz	●	●	●	●	●	●	●
24VDC	Option	24VDC	●	●	●	●	●	●	●
100VDC	Option	100VDC	●	●	●	●	●	●	●

*1: Combinations of ● in the table above are possible.
*2: The flow adjustment option (ⒸY) is applicable only to the large flow rate specification (ⒷD).
*3. The large flow rate specification (ⒷD) does not allow the 0.1 MPa specification (ⒸH).
*4. Contact us if you select the multiple options in Ⓒ.
*5. Contact us for a voltage not listed above.

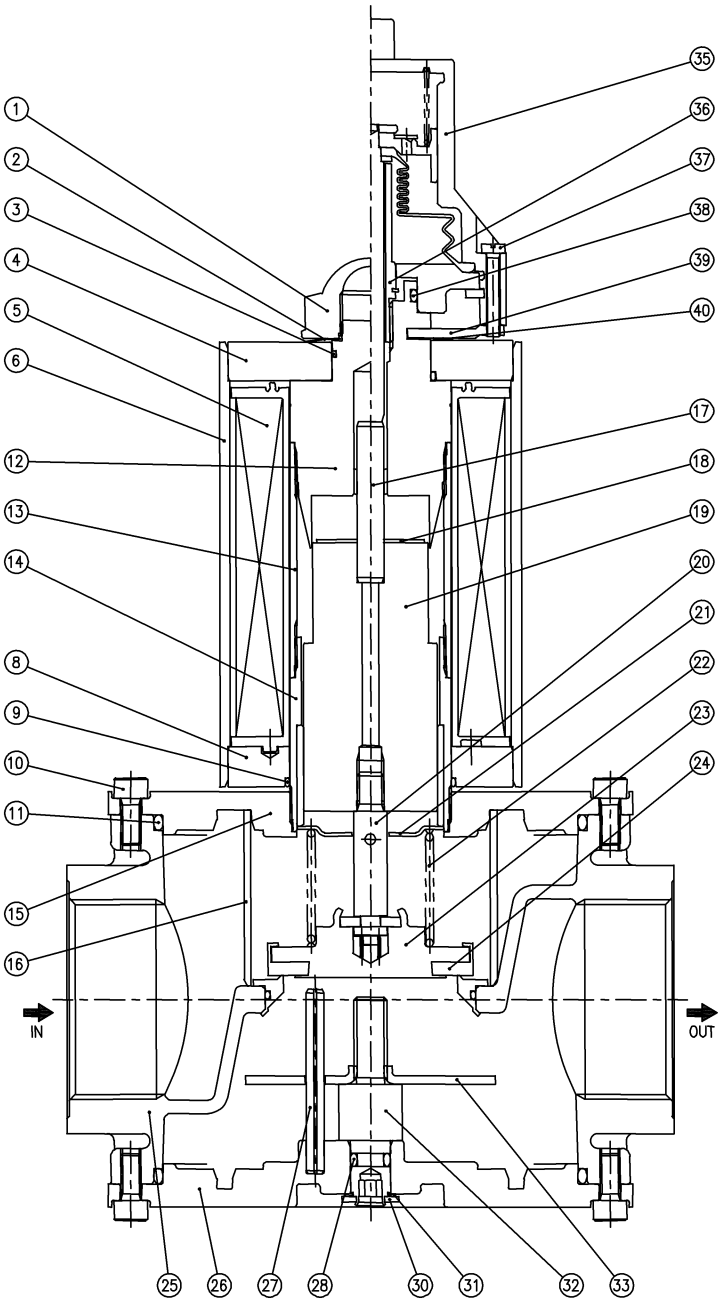
8 Internal structure and outside dimensions

8-1 Internal structure

VNA VLA
15 to 40



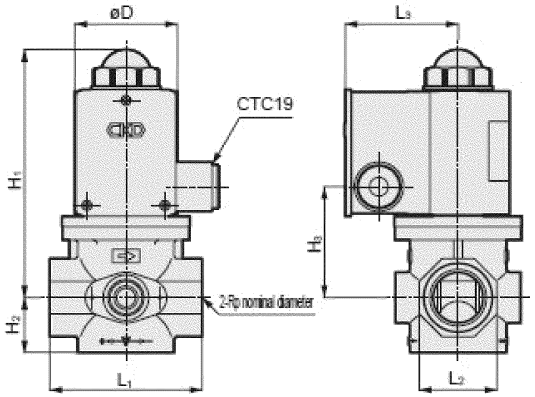
VNA VLA
50/65



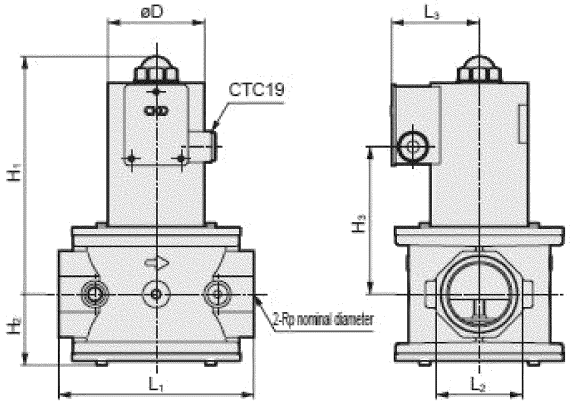
No.	Part name		No.	Part name		No.	Part name	
1	Cap		16	Strainer		31	Wave washer	Body assembly
2	Coned-disc spring		17	Plunger shaft	Armature assembly	32	Flow adjustment screw	
3	O-ring		18	Disc		33	Flow adjustment plate	
4	Ring core A	Actuator assembly	19	Plunger		34	C-type retaining ring	
5	Coil winding		20	Valve spindle		35	Damper assembly	
6	Bonnet		21	Spring supporting disc		36	Damper collar assembly	
7	Ring core C		22	Closing spring		37	Slotted flat fillister head machine screw	
8	Ring core B		23	Disc holder		38	O-ring	
9	O-ring		24	Valve disc		39	Damper mounting bracket	
10	Hexagon socket head cap screw		25	Body	Body assembly	40	Wave washer	
11	O-ring		26	Bottom cover				
12	Core	Core pipe assembly	27	Spring pin				
13	Seamless pipe		28	O-ring				
14	Plunger guide		29	Flow adjustment cock				
15	(Top cover)		30	Plain washer				

8-2 Outside dimensions

● VNA-15 to 40

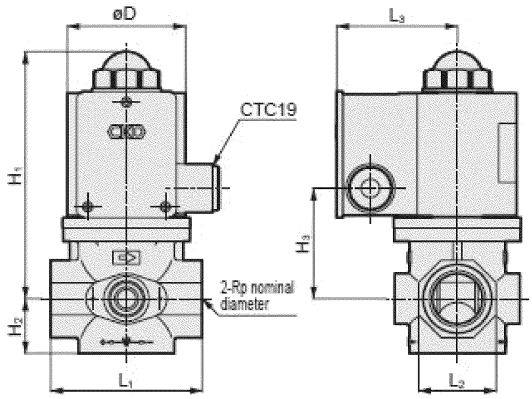


● VNA-50 to 65



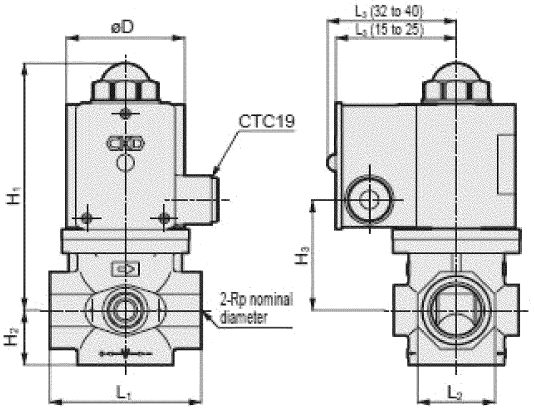
Symbol / Model no.	Nominal diameter	H_1	H_2	H_3	L_1	L_2	L_3	øD
VNA-15	1/2	132.5	24.5	51	69	32	63	50
VNA-20	3/4	147	33	65.5	89	46	68	60.5
VNA-25	1	147	33	65.5	89	46	68	60.5
VNA-32	1¼	166	39.5	84.5	128	65	73	70
VNA-40	1½	166	39.5	84.5	128	65	73	70
VNA-50	2	221	66.5	137	180	80	83	90
VNA-65	2½	232	77.5	148	218	95	101	127
VNA-32-D	1¼	174.5	35	93	128	70	73	70
VNA-40-D	1½	174.5	35	93	128	70	73	70

● Vacuum specification: 1.33 × 10^{-5} to 101 kPa (Anti-vacuum not allowed)
VNA-15/20/25-V



Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-V	1/2	136.5	24.5	55	69	32	68	60.5
VNA-20-V	3/4	147	33	65.5	89	46	73	70
VNA-25-V	1	147	33	65.5	89	46	73	70

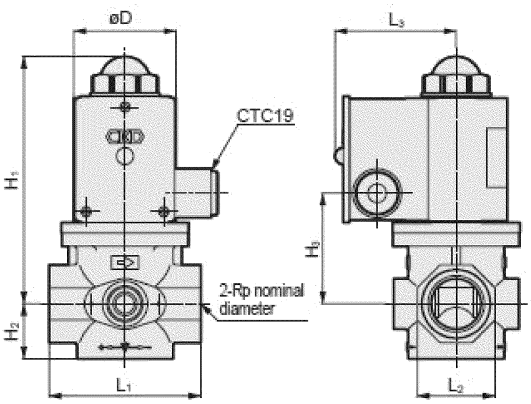
● 0.1 MPa specification
VNA-15 to 40-H



An electrification confirmation lamp is included as standard for port sizes 32 and 40.

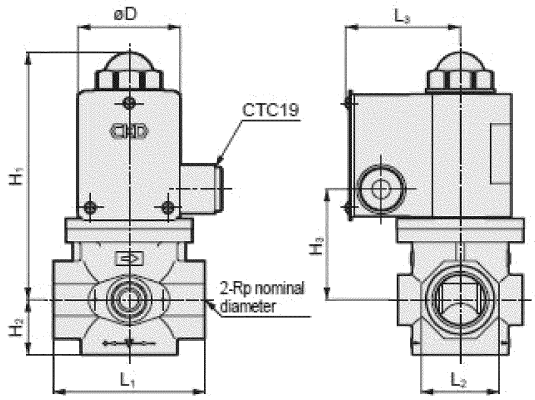
Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-H	1/2	136.5	24.5	55	69	32	68	60.5
VNA-20-H	3/4	147	33	65.5	89	46	73	70
VNA-25-H	1	147	33	65.5	89	46	73	70
VNA-32-H	1¼	193	39.5	111.5	128	65	88	90
VNA-40-H	1½	193	39.5	111.5	128	65	88	90

● With electrification confirmation lamp
VNA-15 to 65-L



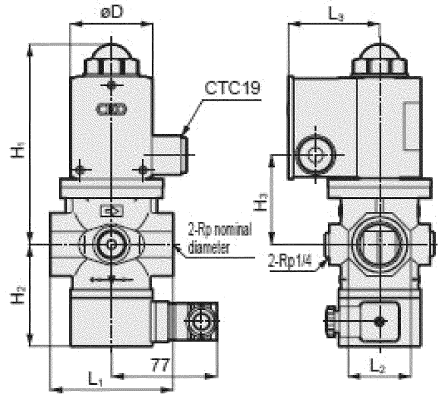
Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-L	1/2	132.5	24.5	51	69	32	68	50
VNA-20-L	3/4	147	33	65.5	89	46	73	60.5
VNA-25-L	1	147	33	65.5	89	46	73	60.5
VNA-32-L	1¼	166	39.5	84.5	128	65	78	70
VNA-40-L	1½	166	39.5	84.5	128	65	78	70
VNA-50-L	2	221	66.5	137	180	80	88	90
VNA-65-L	2½	232	77.5	148	218	95	106	127

● Outdoor specification
VNA-15 to 65-ZZ

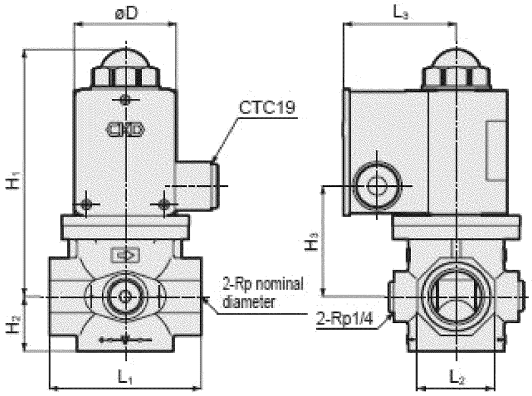


Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-ZZ	1/2	132.5	24.5	51	69	32	63	50
VNA-20-ZZ	3/4	147	33	65.5	89	46	68	60.5
VNA-25-ZZ	1	147	33	65.5	89	46	68	60.5
VNA-32-ZZ	1¼	166	39.5	84.5	128	65	73	70
VNA-40-ZZ	1½	166	39.5	84.5	128	65	73	70
VNA-50-ZZ	2	221	66.5	137	180	80	83	90
VNA-65-ZZ	2½	232	77.5	148	218	95	101	127

● With operation confirmation micro switch
VNA-15 to 65-E



● With pressure detection port
VNA-15 to 65-P

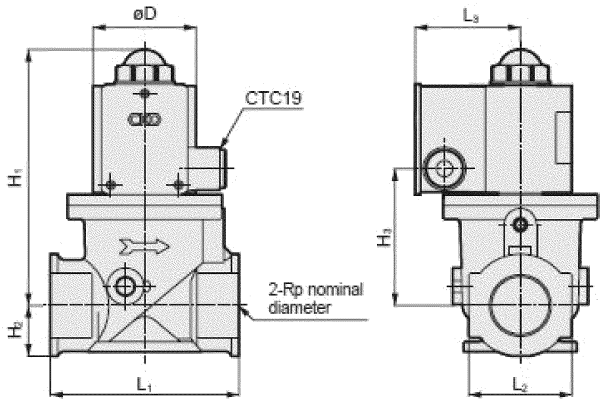


* A pressure detection port is included as standard. Flow adjustment is not included.

Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-E	1/2	132.5	66.5	51	69	32	63	50
VNA-20-E	3/4	147	75	65.5	89	46	68	60.5
VNA-25-E	1	147	75	65.5	89	46	68	60.5
VNA-32-E	1¼	166	81.5	84.5	128	65	73	70
VNA-40-E	1½	166	81.5	84.5	128	65	73	70
VNA-50-E	2	221	104.5	137	180	80	83	90
VNA-65-E	2½	232	115.5	148	218	95	101	127

Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-15-P	1/2	132.5	24.5	51	69	32	63	50
VNA-20-P	3/4	147	33	65.5	89	46	68	60.5
VNA-25-P	1	147	33	65.5	89	46	68	60.5
VNA-32-P	1¼	166	39.5	84.5	128	65	73	70
VNA-40-P	1½	166	39.5	84.5	128	65	73	70
VNA-50-P	2	221	66.5	137	180	80	83	90
VNA-65-P	2½	232	77.5	148	218	95	101	127

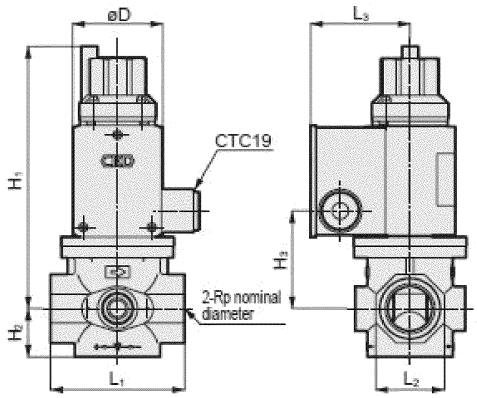
● Large flow rate specification
VNA-32/40-D



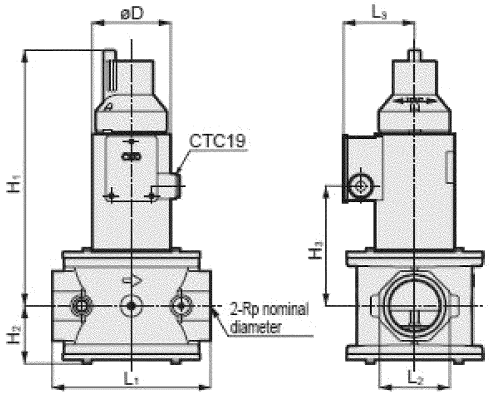
* Flow adjustment is not included.

Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VNA-32-D	1¼	174.5	35	93	128	70	73	70
VNA-40-D	1½	174.5	35	93	128	70	73	70

● VLA-15 to 40

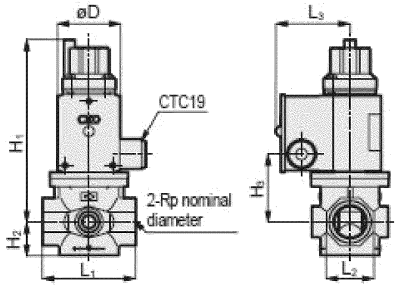


● VLA-50 to 65



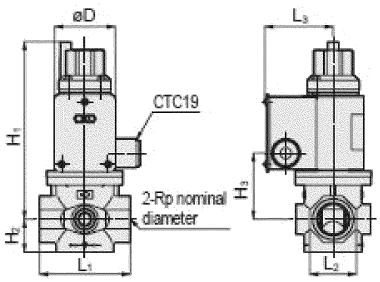
Symbol / Model no.	Nominal diameter	H_1	H_2	H_3	L_1	L_2	L_3	øD
VLA-15	1/2	161.5	24.5	51	69	32	63	50
VLA-20	3/4	176	33	65.5	89	46	68	60.5
VLA-25	1	176	33	65.5	89	46	68	60.5
VLA-32	1¼	195	39.5	84.5	128	65	73	70
VLA-40	1½	195	39.5	84.5	128	65	73	70
VLA-50	2	292.5	66.5	137	180	80	83	90
VLA-65	2½	303.5	77.5	148	218	95	101	127
VLA-32-D	1¼	203.5	35	93	128	70	73	70
VLA-40-D	1½	203.5	35	93	128	70	73	70

● With electrification confirmation lamp
VLA-15 to 65-L



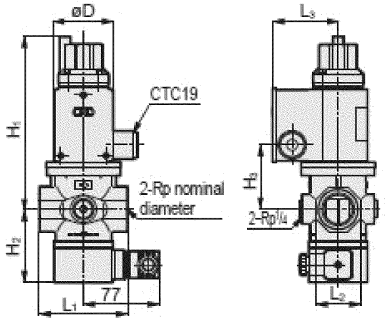
Symbol / Model no.	Nominal diameter	H_1	H_2	H_3	L_1	L_2	L_3	øD
VLA-15-L	1/2	161.5	24.5	51	69	32	68	50
VLA-20-L	3/4	176	33	65.5	89	46	73	60.5
VLA-25-L	1	176	33	65.5	89	46	73	60.5
VLA-32-L	1¼	195	39.5	84.5	128	65	78	70
VLA-40-L	1½	195	39.5	84.5	128	65	78	70
VLA-50-L	2	292.5	66.5	137	180	80	88	90
VLA-65-L	2½	303.5	77.5	148	218	95	106	127

● Outdoor specification
VLA-15 to 65-ZZ



Symbol / Model no.	Nominal diameter	H_1	H_2	H_3	L_1	L_2	L_3	øD
VLA-15-ZZ	1/2	161.5	24.5	51	69	32	63	50
VLA-20-ZZ	3/4	176	33	65.5	89	46	68	60.5
VLA-25-ZZ	1	176	33	65.5	89	46	68	60.5
VLA-32-ZZ	1¼	195	39.5	84.5	128	65	73	70
VLA-40-ZZ	1½	195	39.5	84.5	128	65	73	70
VLA-50-ZZ	2	292.5	66.5	137	180	80	83	90
VLA-65-ZZ	2½	303.5	77.5	148	218	95	101	127

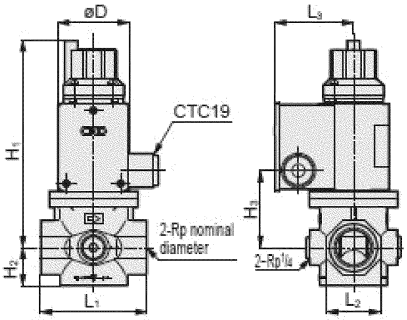
● With operation confirmation micro switch
VLA-15 to 65-E



* A pressure detection port is included as standard. Flow adjustment is not included.

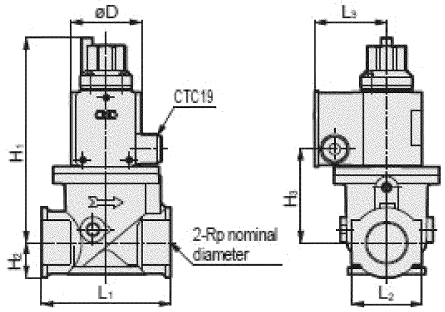
Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VLA-15-E	1/2	161.5	66.5	51	69	32	63	50
VLA-20-E	3/4	176	75	65.5	89	46	68	60.5
VLA-25-E	1	176	75	65.5	89	46	68	60.5
VLA-32-E	1¼	195	81.5	84.5	128	65	73	70
VLA-40-E	1½	195	81.5	84.5	128	65	73	70
VLA-50-E	2	292.5	104.5	137	180	80	83	90
VLA-65-E	2½	303.5	115.5	148	218	95	101	127

● With pressure detection port
VLA-15 to 65-P



Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VLA-15-P	1/2	161.5	24.5	51	69	32	63	50
VLA-20-P	3/4	176	33	65.5	89	46	68	60.5
VLA-25-P	1	176	33	65.5	89	46	68	60.5
VLA-32-P	1¼	195	39.5	84.5	128	65	73	70
VLA-40-P	1½	195	39.5	84.5	128	65	73	70
VLA-50-P	2	292.5	66.5	137	180	80	83	90
VLA-65-P	2½	303.5	77.5	148	218	95	101	127

● Large flow rate specification
VLA-32/40-D



* Flow adjustment is not included.

Symbol / Model no.	Nominal diameter	H1	H2	H3	L1	L2	L3	øD
VLA-32-D	1¼	203.5	35	93	128	70	73	70
VLA-40-D	1½	203.5	35	93	128	70	73	70