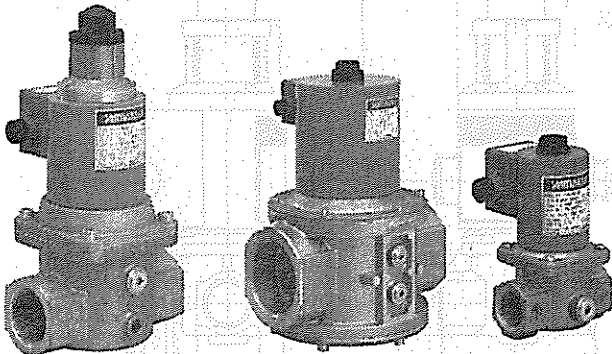


VEN 4000 B/C

EN-Compliant Gas Solenoid Valve User's Manual



VEN 4000C
Slow Opening Type

VEN 4000B
Quick Opening Type

RESTRICTIONS ON USE

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment. Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

1. General

The VEN Series Solenoid Valves are used as ON-OFF or safety shut-off control of a gas burner for city gas, natural gas, LP gas, etc.

Features

- Type**
- Available with two types, B and C.
 - B: Quick opening type. Available with flow rate adjustment.
 - C: Slow opening type. Available with flow rate, step pressure, and slow opening speed adjustments.
- Either type can be adjusted according to the burner's characteristics.
- Available as a small size valve because of its high flow rate with respect to the valve opening.
 - Applicable to a wide pressure range from low to medium.
 - Provided with a variety of sizes from 10A to 80A. (For type C, the sizes are from 10A to 50A)

Structure

- A conduit tube thread and a screw terminal board of JIS standard (CTC19) are used in the terminal box.
- The flow rate, step pressure, and slow opening speed controls are located on the top of the coil for easy adjustment after installation. The burner input control is also available.

- Noise**
- Noiseless operation by employing a DC energized solenoid with a rectifier built into it.

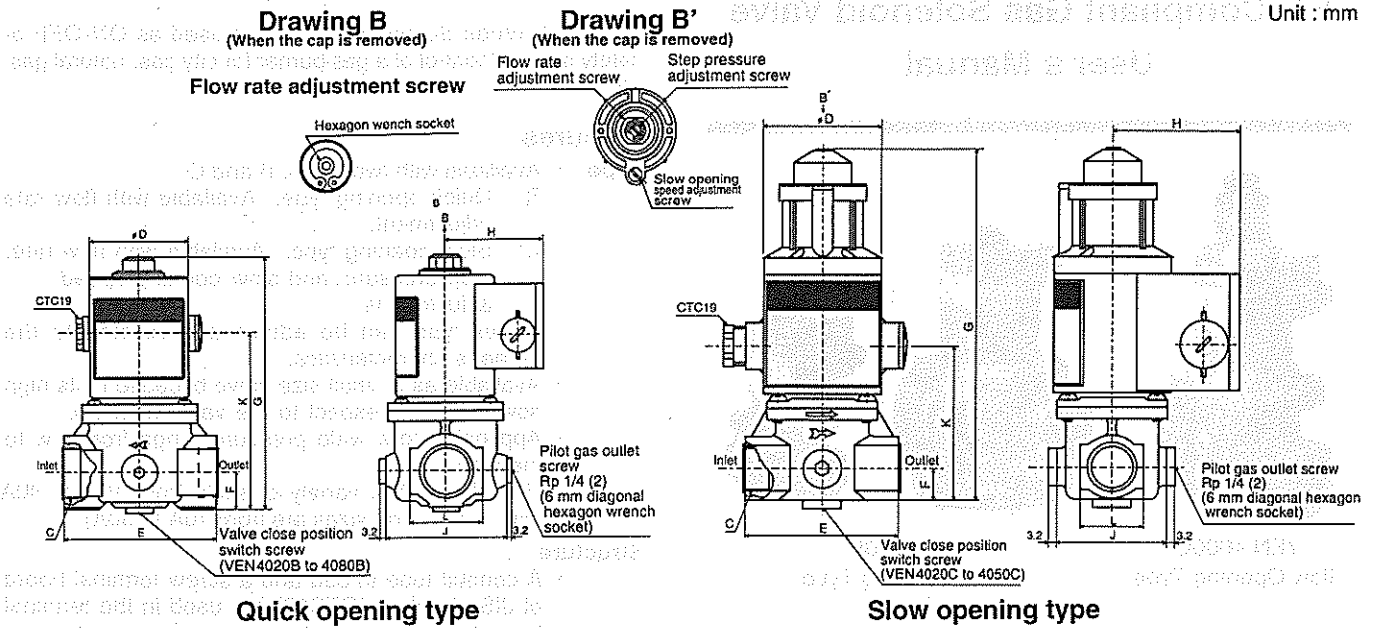
Standard and Approval

- EN161 Approved (European standard)
- Dustproof and waterproof (IP65) protection

2. Specifications

Model Number		Piping Connection (Rp)	Flow Rate (m ³ /h): Differential Pressure 250 Pa		Cv Value	Maximum Operating Pressure (kPa)	Rated Voltage (Vac)	Power Consumption (VA)	Mass (kg)	
Quick opening type	Slow opening type		Specific gravity 0.65	Specific gravity 1.53						
VEN4010 B 1100	VEN4010 C 1100	3/8	6.8	4.4	4.6	35	100	15	1.1	
VEN4010 B 1200	VEN4010 C 1200						200	16		
VEN4015 B 1100	VEN4015 C 1100	1/2	7.6	4.9	5.2		100	15		
VEN4015 B 1200	VEN4015 C 1200						200	16		
VEN4020 B 1100	VEN4020 C 1100	3/4	18.6	12.0	12.8		100	16		1.9
VEN4020 B 1200	VEN4020 C 1200						200	20		
VEN4025 B 1100	VEN4025 C 1100	1	21.8	14.1	14.9	100	16	2.0		
VEN4025 B 1200	VEN4025 C 1200					200	20			
VEN4032 B 1100	VEN4032 C 1100	1 1/4	43.5	28.1	29.8	100	44	5.9		
VEN4032 B 1200	VEN4032 C 1200					200	48			
VEN4040 B 1100	VEN4040 C 1100	1 1/2	53.6	34.7	36.7	100	44	5.8		
VEN4040 B 1200	VEN4040 C 1200					200	48			
VEN4050 B 1100	VEN4050 C 1100	2	74.9	48.4	51.3	100	45	6.4		
VEN4050 B 1200	VEN4050 C 1200					200	56			
VEN4065 B 1100	-	2 1/2	113	73.0	77.4	100	55	14.7		
VEN4065 B 1200	-					200	60			
VEN4080 B 1100	-	3	149	97.0	100	100	115	16.8		
VEN4080 B 1200	-					200	130			
Valve opening time	1s or less (For quick opening type only)		Electrical ratings		100 Vac or 200 Vac, 50/60 Hz					
Slow opening speed	Variable: Factory set to approx. 6s (For slow opening type only)		Permissible power supply voltage		-15 to +10% of the electrical ratings					
Valve closing time	1s or less		Ambient temperature		-15 to +60°C (Also same for allowable fluid temperature)					
Full flow rate adjustment	20 to 100% of maximum flow rate for quick opening type		Piping connection		Rp screw-in type					
Step pressure adjustment	40 to 100% of maximum flow rate for slow opening type		Mounting position		Axis of solenoid coil within ±90° from vertical plane					
Step pressure adjustment	0 to 70% of maximum flow rate (For slow opening type only)		Conduit connection		CTC19 JIS Conduit tube thread					
Body material	Aluminum alloy		Approval		EN161 Class A, Group 2					
Strainer	Built-in strainer		Optional parts		Valve close position switch, Monitor lamp					
Protective structure	IP65									

3. Dimensions



Quick opening type

Slow opening type

Model Number		C Piping Connection	D	E	F	G		H	J	K	L
Quick opening type	Slow opening type					Quick opening type	Slow opening type				
VEN4010 B 1100	VEN4010 C 1100	Rp $\frac{3}{8}$	ø 55	72	15	121	167.5	60	65	75.5	30
VEN4010 B 1200	VEN4010 C 1200										
VEN4015 B 1100	VEN4015 C 1100	Rp $\frac{1}{2}$	ø 63	86.5	24	165	210	64	77.5	116.5	45
VEN4015 B 1200	VEN4015 C 1200										
VEN4020 B 1100	VEN4020 C 1100	Rp $\frac{3}{4}$	ø 63	100	33	230	284.5	75.5	108	172	64
VEN4020 B 1200	VEN4020 C 1200										
VEN4025 B 1100	VEN4025 C 1100	Rp 1	ø 85	150	40	249	304	79.5	131	194	78
VEN4025 B 1200	VEN4025 C 1200										
VEN4032 B 1100	VEN4032 C 1100	Rp $1\frac{1}{4}$	ø 95	170	90	343	-	90	200	276	110
VEN4032 B 1200	VEN4032 C 1200										
VEN4040 B 1100	VEN4040 C 1100	Rp $1\frac{1}{2}$	ø 115	240	90	343	-	98	200	276	110
VEN4040 B 1200	VEN4040 C 1200										
VEN4050 B 1100	VEN4050 C 1100	Rp 2	ø 130	170	40	249	304	79.5	131	194	78
VEN4050 B 1200	VEN4050 C 1200										
VEN4065 B 1100	-	Rp $2\frac{1}{2}$	ø 115	240	90	343	-	90	200	276	110
VEN4065 B 1200	-										
VEN4080 B 1100	-	Rp 3	ø 130	170	40	249	304	79.5	131	194	78
VEN4080 B 1200	-										

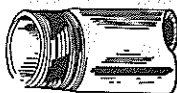
4. Installation and Connection

1. Notes on installation

Sealing compound application

Apply sealing compound appropriately. Do not apply the sealing compound to the two threads at the end of the pipe. Remove dust and burrs from the pipe.

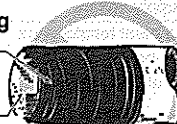
Right



Wrong

Too much sealing compound applied

Dust and burrs remain

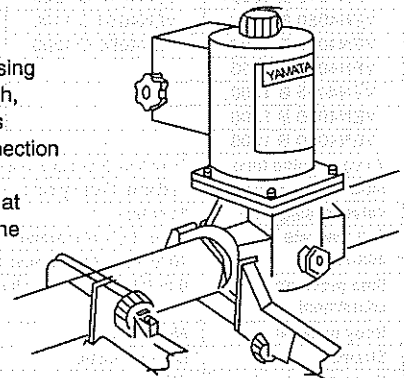


WARNING

To avoid risk of gas explosion, be sure to close the main valve of the city, natural, or LP gas supply you use, when installing, removing, or adjusting the VEN series gas solenoid valve.

Mounting

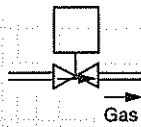
To mount the pipe, using a spanner or a wrench, hold the two flat parts at the valve unit connection port. Never hold the valve at the solenoid part or the valve body.



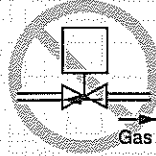
Flow direction

Be sure to observe the arrow mark at the side on the valve for flowing direction of gas.

Right



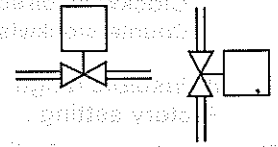
Wrong



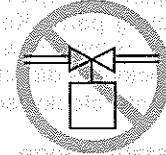
Mounting position

Mount the valve with the solenoid on top or on the side. Never mount the valve with the solenoid underneath or the valve will not operate.

Right



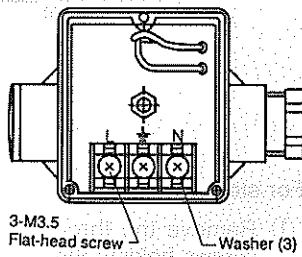
Wrong



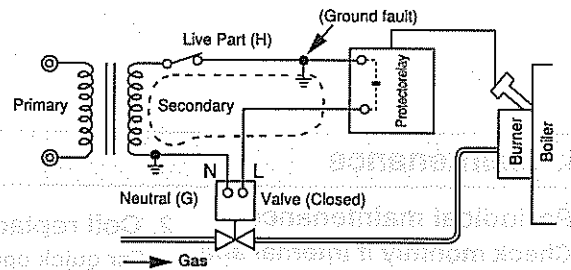
2. Notes on connection

Detail of terminal box

(When the cover is removed)



Connection to the valve and the power supply



Make connections correctly to avoid risk of gas leakage. If a ground fault occurs, with the connections shown in the figure, the grounding current does not flow through the valve, and the valve remains closed.

5. Adjustment

1. Quick opening type

Flow rate adjustment with the valve opened fully is possible.

• Maximum flow rate adjustment

- ① Turn and remove the plastic cap at the top by hand.
- ② To adjust flow rate, using a hexagon wrench, turn the hexagon wrench socket at the center.

Flow rate adjustment screw (Hexagon wrench socket)

↻ Clockwise direction:

Decreases gas flow rate.

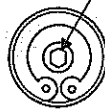
↻ Counterclockwise direction:

Increases gas flow rate.

Adjustable range : 20 to 100%, variable

Factory setting : 100% for maximum flow rate

- ③ After completed the adjustment, reinstall the plastic cap.



2. Slow opening type

Flow rate, step pressure, and slow opening speed adjustments are possible.

• Maximum flow rate adjustment

- ① Loosen the two screws and remove the black plastic cap.
- ② To adjust flow rate, using a spanner, hold the center shaft at the two cutting parts outside the center screw, and turn the shaft.

↻ Clockwise direction:

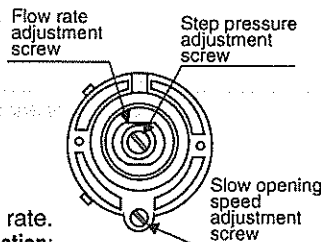
Decreases gas flow rate.

↻ Counterclockwise direction:

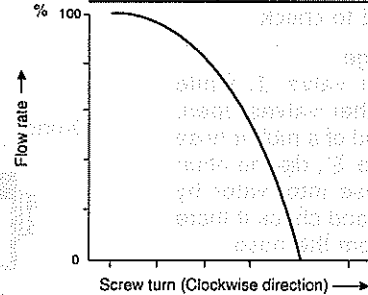
Increases gas flow rate.

Adjustable range : 40 to 100%, variable

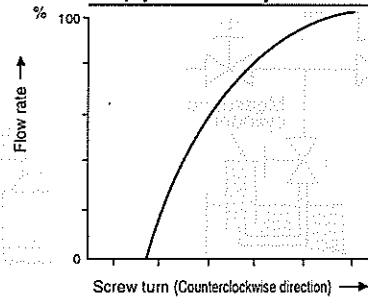
Factory setting : 100% (at maximum)



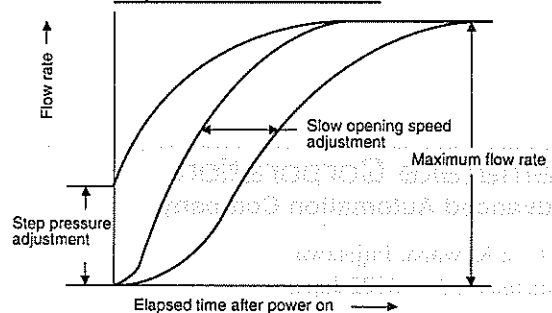
Flow rate adjustment characteristic



Step pressure adjustment characteristic



Adjustment characteristic



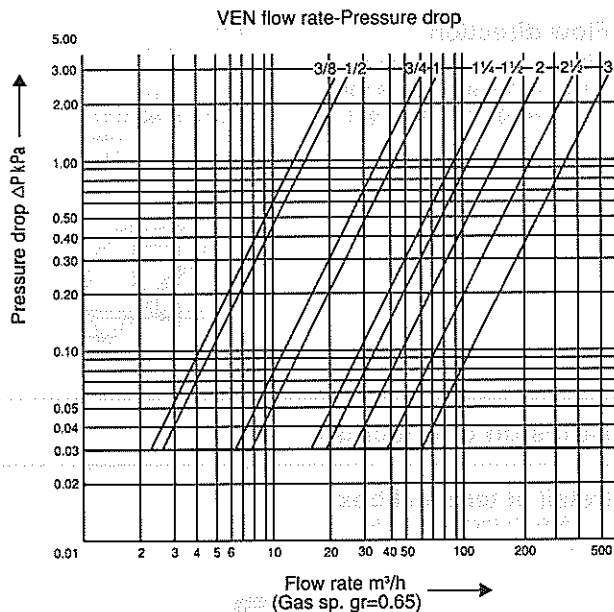
Adjustment: First, turn the maximum flow rate adjustment screw to obtain an appropriate input to the burner as a maximum flow rate. Then, adjust step pressure and slow opening speed for non-delay, smooth ignition.

• **Step pressure adjustment**

- ③ To adjust step pressure, turn the screw at the center.
 - ↻ **Clockwise direction** : Decreases step pressure.
 - ↻ **Counterclockwise direction** : Increases step pressure.
- Adjustable range** : 0 to 70%, variable
Factory setting : 0%

• **Slow opening speed adjustment**

- ④ To adjust slow opening speed, turn the screw at the projecting part. Keep the screw head below the surface of the screw hole for adjustment.
 - ↻ **Clockwise direction** : Decreases opening speed.
 - ↻ **Counterclockwise direction** : Increases opening speed.
- Adjustable range** : 2 to 30s
Factory setting : Approx. 6s
- ⑤ After completed the above three adjustments, reinstall the black plastic cap.

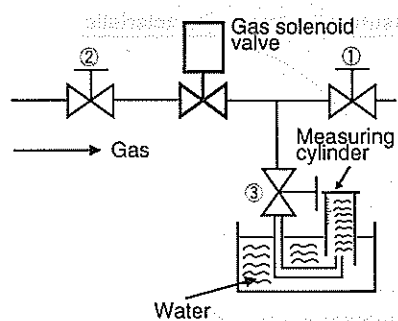


6. Maintenance

1. Periodical maintenance

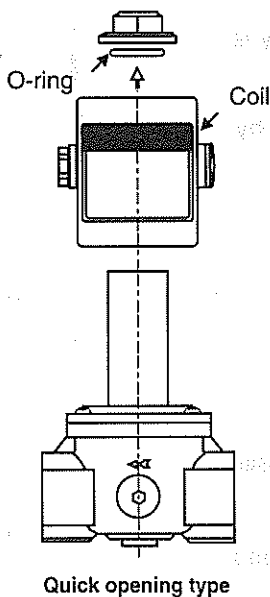
Check monthly if internal and external gas leakage occurs from the gas solenoid valve.

- **External leakage**
Close manual valves ① and ③, and use a gas detector or a leak detecting liquid to check.
- **Internal leakage**
Close manual valve ① while holding the other valves open, connect one end of a rubber hose to manual valve ③, dip the other end of the hose into water by about 10 mm, and check if there are bubbles from the hose.



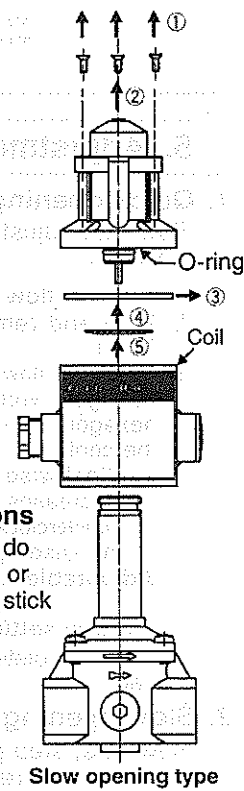
2. Coil replacement

- **For quick opening type**
 - ① Turn and remove the plastic cap.
 - ② Remove the coil.



• **For slow opening type**

- ① Remove the three screws holding the aluminum die-cast base.
- ② Turn and pull out the aluminum die-cast base upward.
- ③ Hold down the plate and slide it to remove.
- ④ Remove the tooth washer.
- ⑤ Remove the coil.



! Handling Precautions
When replacing a coil, do not damage the O-ring or allow foreign matter to stick to the O-ring.

Yamatake Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL: <http://www.azbil.com>

Printed on recycled paper. (07)

Specifications are subject to change without notice.

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Printed in Japan.
1st Edition: Issued in Dec. 1996
8th Edition: Issued in Oct. 2007 (B)