Honeywell Home

VC6800, VC6900 Series Modulating Control Valves

PRODUCT DATA



The VC6800/6900 Series Modulating Control Valves provide optimum control of hot and/or chilled water flow in various heating and cooling applications, such as fan coil units, reheat coils and perimeter heating systems.

The VC hydronic valve consists of a valve body and replaceable characterized cartridge assembly. When used with a Resideo VC6800/6900 series actuator, the valve provides linear flow in either diverting or mixing applications. They are designed to provide sinusoidal valve actuator travel, and therefore operate silently and resist water hammer.

Compatible with 24 Vac, 3-wire signal, the VC series valve actuator is used with either a single pole double throw two-position controller for on-off control, or a floating controller, for modulating control. Through an internal switching mechanism, the actuator takes power only while driving the valve to the commanded position.

SPECIFICATIONS

Supply Voltage:	**Color coded label**
24V, 50-60Hz; Class 2 circuit	Blue
230V, 50-60Hz Model	Red

Power consumption: 4 Watts Max. at nominal Voltage (during valve position change).
Note: Use 24 V Class 2 transformer and provide 6 VA for transformer and connection wire sizing.

End Switch Rating:
2.2 A inductive from 5 to 110 Vac
1.0 A inductive above 110 to 277 Vac
Min. DC switching capability: 5mA @ 24 Vdc
Note: Use cable models for mixed line and low voltage applications.

Maximum Duty Cycle: 15%

Nominal timing: Opens in 2 minutes @ 60 Hz

Actual full stroke timing is 140 sec
Note: Timing is approximately 20% longer @ 50Hz

Electrical termination: 3 versions available:
(1) Molex® (header # 39-30-1060). Requires mating connector (receptacle/housing # 39-01-2060)– VC6930. OR
(2) With integral 1 meter (nominal 39") leadwire cable– VC6931. OR
(3) With integral 1.5 meter plenum-rated leadwire cable and 3/8" flexible conduit connector (low voltage only)– VC6934
VC6934 meets UL94-5V requirements for installation in return air plenums.

Operating ambient temperature: 0 to 65 °C (32 to 150 °F) (VC6934/6834 are 0 to 60 °C [32 to 140 °F] max.)

Min. and max. fluid temperatures: 1 to 95 °C (34 to 203 °F)

Shipping and storage temperature:
-40 to +65 °C (-40 to +150 °F)

Atmosphere: Non-corrosive, non-explosive.

Operating pressure differential: Max. – 4 Bar (60 psi)

Pressure rating:
Static – 20 Bar (300 psi)
Burst – 100 Bar (1500 psi)

Valve material: Body of brass; cartridge of Ryton® (polyphenylene sulphide), Noryl® (polyphenylene oxide), and Fortron®, O-ring seals of EPDM rubber, Stainless steel stem

Stem Travel: 10 mm (0.4 inches)

Flow Characteristics: Linear

The specifications above are nominal and conform to generally acceptable industry standards. Resideo is not responsible for damages resulting from misapplication or misuse of its products.

Accessories and Replacement Parts:
40007029-002: Wrench for removing VC cartridge
VCZZ1100: 2-way characterized cartridge, unit pack
VCZZ1400: 2-way equal percentage cartridge, unit pack
VCZZ1500: 2-way equal percentage cartridge, unit pack
VCZZ1600: 2-way equal percentage cartridge, unit pack
VCZZ6100: 3-way linear cartridge, unit pack

Table 1. Series 70, 0/2-10 Vdc Actuator

Model Series	Voltage (50/60 Hz)	Auxiliary Switch	Nominal Full Open Timing (@ 60Hz)	Electrical Connection
VC6830	24 Vac	SPDT	120 seconds	Molex®
VC6831				1 meter cable
VC6834				Conduit/ 1.5 meter plenum cable
VC6930		—		Molex™
VC6931		—		1 meter cable
VC6934		—		Conduit/ 1.5 meter plenum cable
VC6940		—	—	1 meter cable
VC6982	230 Vac	—	120 seconds	Molex™

NOTE: Timing is approximately 20% longer @ 50 Hz.

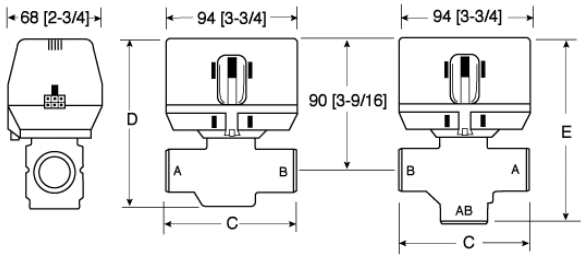


Fig. 1. Nominal Dimensions in inches and millimeters

Table 2. Valve Sizes

Dimension / [4] Pipe Fitting Sizes	C		D		E	
	mm	inches	mm	inches	mm	inches
1/2" BSPP (int.) [2]	98	3-7/8	111	4-3/8	136	5-11/32
1/2" BSPT (int.)						
3/4" BSPP (int.)	94	3-11/16	113	4-7/16	130	5-1/8
3/4" BSPT (int.)						
3/4" BSPP (ext.)						
22mm Compression [3]	112	4-7/16			140	5-1/2
1" BSPP (int.)	94	3-11/16			136	5-11/32
1" BSPP (ext.)	95	3-11/17	114	4-7/17	137	5-11/33
1" BSPT (int.)	94	3-11/16	113	4-7/16	136	5-11/32
28mm Compression [3]	116	4-9/16			147	5-13/16
North America Standard Models						
3/8" Flare [1]	98	3-7/8	111	4-3/8	136	5-11/32
1/2" Sweat	89	3-1/2			130	5-1/8
1/2" Flare [1]	98	3-7/8			136	5-11/32
1/2" Inverted Flare [1]						
1/2" NPT (int.)						
3/4" NPT (int.)	94	3-11/16	113	4-7/16	130	5-1/8
3/4" Sweat					132	5-3/16
1" NPT (int.)					136	
1" Sweat						5-11/32
1-1/4" Sweat	110	4-5/16	118	4-5/8	142	5-5/8
1-1/4" NPT (int.)						

[1] No adapters
[2] Suitable for use as 15 mm compression fitting
[3] Dimensions shown with nuts and olives installed
[4] **Some models not available in all countries**

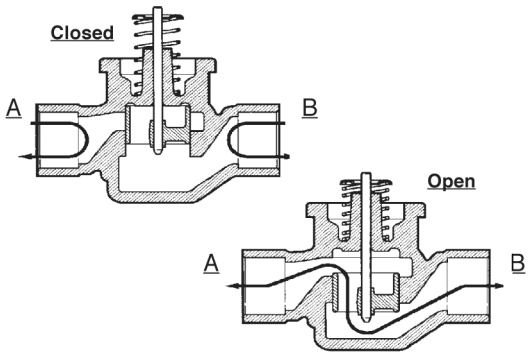


Fig. 2. Fluid flow of 2-way VC

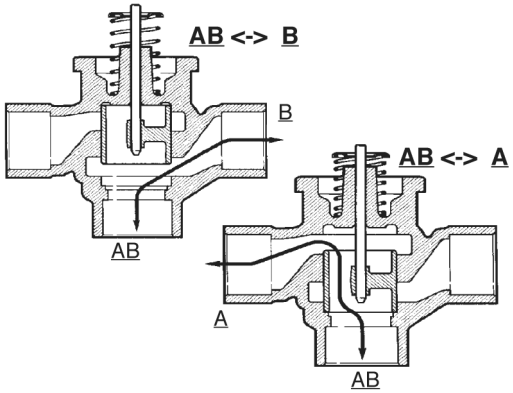


Fig. 3. Fluid flow of 3-way valves

Table 3. Flow capacity ratings of valves in Kv or Cv

2-Way Valve Number / [5] Pipe Fitting Sizes	Cartridge	1000	1100 [4]	1400	1500	1600
		Nominal kvs Rating [8]				
VCZAF	1/2" BSPP (int.) [2]	3.0	2.6		0.7	1.3
VCZAB	1/2" BSPT (int.)		2.9			
VCZAJ	3/4" BSPP (int.)	5.3	4.5	3.3	0.8	1.5
VCZAK	3/4" BSPT (int.)					
VCZAH	3/4" BSPP (ext.)					
VCZAG	22mm Compression [3]		4.6	3.7		
VCZAP	1" BSPP (int.)	6.0	5.7	4.2	0.8	1.5
VCZAQ	1" BSPP (ext.)		5.3			
VCZAT	1" BSPT (int.)		5.7			
VCZAN	28mm Compression [3]		5.4			
North America Standard Models		**Nominal Cv Rating**				
VCZAC	3/8" Flare [1]		2.1			
VCZAA	1/2" Sweat		3.2	2.9	0.7	1.3
VCZAD	1/2" Flare [1]		3.1			
VCZAE	1/2" Inverted Flare [1]		3.2			
VCZBB	1/2" NPT (int.)		3.4	2.9	0.7	1.3
VCZAL	3/4" NPT (int.)		4.7	3.9	0.8	1.5
VCZAM	3/4" Sweat		4.6			
VCZAR	1" NPT (int.)		6.6	4.2		
VCZAS	1" Sweat		6.2			
VCZBE	1-1/4" Sweat		7.0			
VCZBD	1-1/4" NPT (int.)					

3-Way Valve Number	Cartridge / [5] Pipe Fitting Sizes	6000	6100	6400	6500	6600
		Nominal kvs Rating [8]				
VCZME	1/2" BSPP (int.) [2]	3.4	3.2			
VCZMN	1/2" BSPT (int.)		3.3			
VCZMH	3/4" BSPP (int.)	7.0	5.9			
VCZMJ	3/4" BSPT (int.)		5.3			
VCZMG	3/4" BSPP (ext.)	6.9	5.7			
VCZMF	22mm Compression [3]	7.1	5.9			
VCZMP	1" BSPP (int.)	7.7	6.4			
VCZMQ	1" BSPP (ext.)		6.8			
VCZMT	1" BSPT (int.)		6.9			
VCZMM	28mm Compression [3]		6.4			
North America Standard Models		**Nominal Cv Rating**				
VCZMB	3/8" Flare [1]		2.7			
VCZMA	1/2" Sweat		3.8			
VCZMC	1/2" Flare [1]					
VCZMD	1/2" Inverted Flare [1]		4.2			
VCZNB	1/2" NPT (int.)		3.7			
VCZMK	3/4" NPT (int.)		6.6			
VCZML	3/4" Sweat		5.9			
VCZMR	1" NPT (int.)		8.6			
VCZMS	1" Sweat		6.6			
VCZNE	1-1/4" Sweat		8.6			
VCZND	1-1/4" NPT (int.)					
FLOW CHARACTERISTIC		Quick Open	Linear	Equal Percentage		
APPLICATION		On-Off			[7]	
		[6]	Modulating			

[1] No adapters
[2] Suitable for use as 15 mm compression fitting
[3] Includes compression nuts and olives
[4] "1200" series cartridge has the same Cv/kV rating as "1100" series. Suitable for use in potable water applications.
[5] Model availability is country specific. **Some models are not available in all countries**
[6] Can be used for modulating with appropriate software
[7] Use balancing valve for very low flow on-off applications
[8] Multiply the kv rating by 1.167 to obtain Cv rating
Example: 2-way, 3/4" BSPT (internally threaded) valve number VCZAJ1400 has a kv rating of 3.9; 3-way 1/2" Sweat valve number VCzMA6100 has a Cv rating of 3.8.

INSTALLATION

When Installing This Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. Always conduct a thorough checkout when installation is completed.
5. While not necessary to remove the actuator from the body, it can be removed for ease of installation. The actuator can be installed in any of the four orientations to suit the most convenient wiring direction. Actuator latching mechanism works only when the lengths of the actuator and the valve body are parallel to each other.
6. An extra 1" (25 mm) head clearance is required to remove the actuator.

⚠ CAUTION

Disconnect power supply before connecting wiring to prevent electrical shock and equipment damage.
On 24V systems, never jumper the valve coil terminals, even temporarily. This may damage the thermostat.

IMPORTANT

For trouble-free operation of the product, good installation practice must include initial system flushing, chemical water treatment, and the use of a 50 micron (preferably 5 micron) 10% side stream system filter(s). Remove all filter(s) before flushing. Limit flow through the filter to 5~10% of total system flow to prevent 'starving' the system. Ensure filter cartridge is changed frequently enough to prevent clogging.

Put the VC actuator manual lever in the manual open or the fully open (down) position to allow initial system flushing with the actuator mounted. This may be done without electrical hook-up. Alternatively, reusable flush caps, part # 272866B, may be purchased separately for use in initial flushing of dirty hydronic systems.

Do not use boiler additives, solder flux and wetted materials which are petroleum based or contain mineral oil, hydrocarbons, or ethylene glycol acetate. Compounds which can be used, with minimum 50% water dilution, are diethylene glycol, ethylene glycol, and propylene glycol (antifreeze solutions).

PLUMBING

The valve may be plumbed in any angle, including vertical piping, but preferably not with the actuator below the horizontal level of valve body. Make sure there is enough room around the actuator for servicing or replacement.

For use in diverting applications, the valve is installed with the flow water entering through bottom port AB, and diverting through end ports A or B. In mixing applications the valve is installed with inlet to A or B and outlet through AB.

Mount the valve directly in the tube or pipe. Do not grip actuator while making and tightening up plumbing connections. Either hold valve body in your hand or attach adjustable spanner (38 mm or 1-1/2") across the hexagonal or flat faces on the valve body. (Fig. 4).

If assembling the valve train on a bench, take care not to deform body with vice. Do not place the raised “H” logo between the jaws of the vice. Excess jaw force can deform the body.

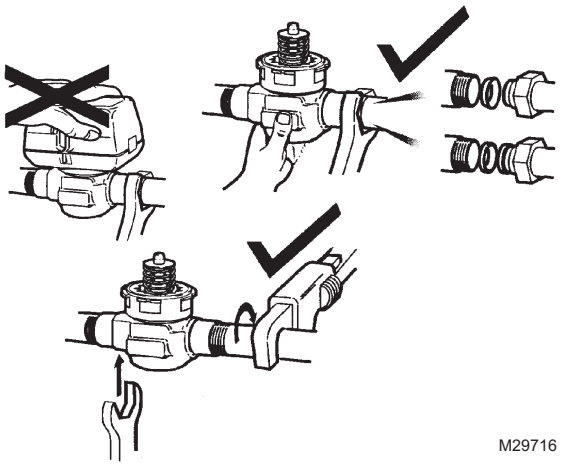


Fig. 4. Plumbing of the VC valve.

COMPRESSION MODELS

For compression fitted models, tighten the compression nuts enough to make a watertight seal.
TAKE CARE NOT TO OVER TIGHTEN.
Maximum torque limit is 45 Nm (33 ft-lb) for the 22 mm compression fitting, and 65 Nm (48 ft-lb) for the 28 mm compression fitting.

SWEAT MODELS

On sweat fitted valves, the cartridge is shipped loose to avoid being damaged during the solder operation.

1. Remove valve actuator from body and solder the connecting pipes in accordance with normal soldering practices.
2. After soldering and valve has cooled, remove cartridge assembly from plastic bag, insert into the valve body and tighten down with enclosed wrench (part# 40007029-002) until it bottoms out. DO NOT OVER TIGHTEN (maximum torque is 4.5 Nm [40 in-lb]). The top surface of the cartridge will be flush with the top edge of the body casting.
3. Replace valve actuator.

TO INSTALL REPLACEMENT ACTUATOR

NOTE: Installation of a new actuator does not require draining the system provided the valve body and valve cartridge assembly remain in the pipeline.

1. Check replacement part number and voltage ratings for match with old device.
2. Disconnect power supply before servicing to avoid electrical shock or equipment damage.
3. Disconnect leadwires to actuator, or depress tab on Molex™ connector and remove. Where appropriate, label wires for rewiring.
4. The actuator head is automatically latched to the valve. To remove, press up on the latch mechanism located directly below the white manual open lever with thumb (See Fig. 5). Simultaneously press the actuator down towards the body with moderate hand force and turn the actuator counter-clockwise by 1/8 turn (45 degrees). Lift actuator off the valve body.

   NOTE: The actuator can also be installed at right angles to the valve body but in this position the latch mechanism will not engage.

5. Install the new actuator by reversing the process in (4).
6. Reconnect leadwires or Molex™ connector.
7. Restore power, and check out operation.

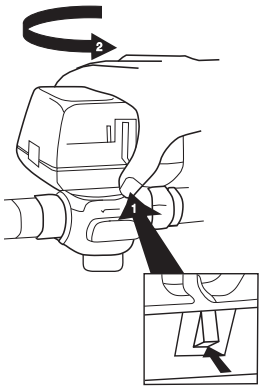


Fig. 5. Latch Mechanism to detach Actuator

MANUAL OPENER

The manual opener can be manipulated only when in the up position. The “A” port can be opened by firmly pushing the white manual lever down to midway and in. In this position both the “A” and “B” ports are open, and with auxiliary switch models the switch is closed. This "manual open" position may be used for filling, venting, or draining the system, or for opening the valve in case of power failure. The valve can be restored manually to the closed position by depressing the white manual lever lightly and then pulling the lever out. The valve and actuator will return to the automatic position when power is restored.

NOTE: If the valve is powered open, it can not be manually closed unless actuator is removed.

WIRING

One controller and a separate transformer is required to operate each valve. A common controller may be used with isolation relays between each actuator. Actuator interaction can result otherwise.

Figures 6A and 6B show single unit wiring connections. Port "A" *open* and *closed* denote valve open and closed positions respectively. On auxiliary switch models, contact makes in between (NC) terminal 1 (orange wire) and (NO) terminal 4 (grey wire) in mid-range of opening cycle. On Molex™ connector models, valve and auxiliary switch voltage must be the same to meet approval requirement. When mixing line voltage and 24 Vac (Safety Extra Low Voltage) application together, the cable version must be used.

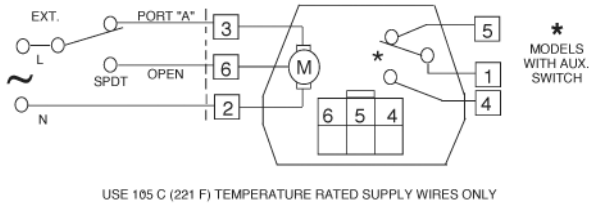


Fig. 6a. Connector Pin Configuration for Molex™ Models for SPDT, Floating Controller (Series 60)

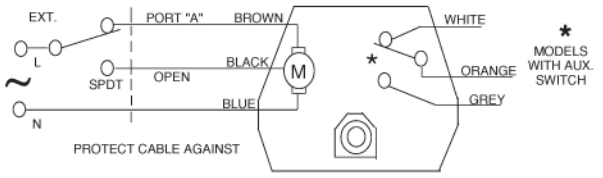
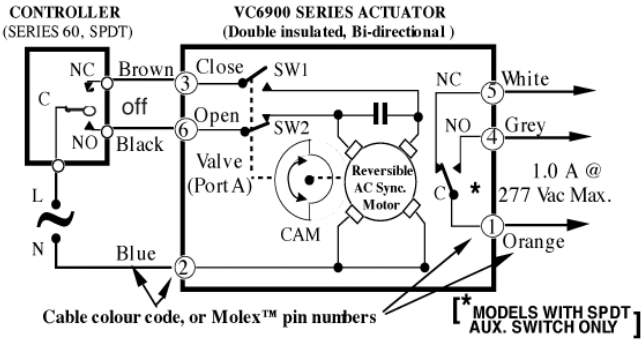


Fig. 6b. Wiring Colour Code for Cable Models for SPDT, Floating Controller (Series 30)

OPERATIONS

WITH SERIES 60 FLOATING CONTROLLER
(refer to Fig. 7)

The series 60 floating controller is an SPDT controller with a centre-off position. On a change in temperature from the set point, the controller will close the NO or NC contacts, driving the valve to an intermediate position until a further change at the controller. The valve is set between the limits of the controller to satisfy various load requirements. In the event of a power failure, the valve will stay at whatever position it was in when the power was interrupted. When power is restored, the valve will the valve will respond to the controller demand.



SERVICE

This valve should be serviced by a trained, experienced service technician.

1. If the valve is leaking, drain system OR isolate valve from the system. Do not remove body from plumbing.
2. Check to see if the cartridge needs to be replaced.
3. If the motor or other internal parts of the actuator is damaged, replace the entire actuator assembly.

NOTE: Resideo hydronic valves are designed and tested for silent operation in properly designed and installed systems. However, water noises may occur as a result of excessive water velocity. Piping noises may occur in high temperature (over 212 °F [100 °C]) systems with insufficient water pressure.

CHECKOUT

1. Raise the set point of the thermostat above room temperature to initiate a call for heat.
2. Observe all control devices - 2 way valve should open. Port A in 3 way valve should open, and port B should close. The auxiliary switch (if present) should operate and make at the end of the opening stroke, activating the auxiliary equipment.
3. Lower the set point of the zone thermostat below room temperature.
4. Observe the control devices. 2 way valve should close. Port A in 3 way valve should close, and port B should open.



WEEE Directive 2012/19/EU Waste of Electrical and Electronic Equipment

Do not dispose of this device and contained batteries with general household waste. For proper treatment, recovery and recycling, please take the device and contained batteries to designated collection points. Disposing of this device and contained batteries correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

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