

VCBM Series

2-Way FCU Balancing Modulating Valve

SPECIFICATION DATA



APPLICATION

Honeywell VCBM series FCU balancing modulating valve is a new type of valve for FCU temperature control in HVAC hydronic system. It combines the dynamic balancing and electric modulating functions in one unit, It has a coherent structure, high flow control precision and stability.

VCBM series FCU balancing modulating valve can also be used in zoning control and other applications when it has the same demand.

VCBM series FCU balancing modulating valve is a self balanced flow and modulating control valve, used in 2-way modulating controls, of flow rate 0.28 to 2.3 m³/h. It consists of a VC79 series actuator and a VCBM series flow control valve with a replaceable modulating valve insert and a constant flow balancing cartridge.

Features

VCBM Series Control Valve

- Integrated dynamic balancing and electric modulating controls in one unit
- High accuracy constant flow control. Within control range, differential pressure fluctuation across the valve will not affect flow rate.
- No calibration required
- Quick and easy installation
- Integrated valve body reduced installation space
- Brass (Chrome) plated dynamic cartridge resists corrosion & long service life
- Twist lock mount for actuator head. Actuator can be installed after plumbing work has been completed to prevent damage
- Valve body is made of cast bronze which is not subject to dezincification (due to oxygen dissolved in water)
- The actuator provides sinusoidal piston travel action for perfect flow characteristic curve, to eliminate water hammer synchronously in most applications.

VC79 series Actuator

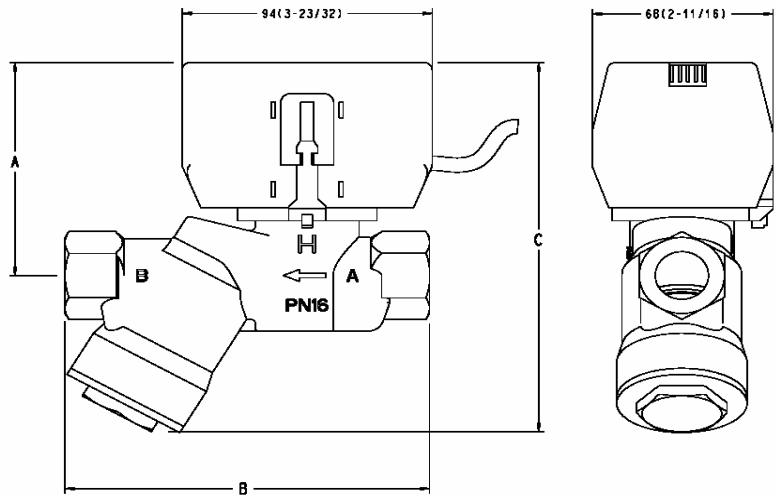
- All actuators are interchangeable and suitable for valves from 1/2" through 1" providing installation flexibility with minimum stocking requirement.
- Actuator is powered by a unidirectional motor and crank arm mechanism.
- Locking tab secures actuator to valve body. To remove the head, the tab must be depressed and actuator rotated 45°.
- Complete actuator is constructed for moisture and humidity resistant material.

SPECIFICATIONS

Valve Body Pressure:	Static - 300 psi (20 Bars), Burst - 1500 psi (100 Bars)
Operational ΔP:	Max. 60 psi (4 Bars)
Media temperature:	1° to 95°C (min / max)
Valve Body:	Bronze
Modulating Insert:	Ryton™ (polyphenylene sulphide), & Noryl™ (polyphenylene oxide); O-ring seals of EPDM rubber; stainless steel stem
Max. Flow Control Precision:	±5%
Input Signal:	0(2) ~ 10VDC
Flow Cartridge:	Brass, Chrome plated , flow rate 0.28 to 2.3 m ³ /h
Valve End Connection:	BSPP (Internal Thread)
Nominal timing:	Valve opens in 120 sec @60Hz (140 secs @ 50 Hz)
Actuator Voltage:	24VAC 50/60Hz
Power consumption:	4W Max. nominal Voltage (during valve position change)
Electrical termination:	With integral 1m lead cable,
Operating ambient temperature:	0 to 65°C
Shipping & storage temperature:	-40 to +65°C
Atmosphere:	non-corrosive, non-explosive
Dimensions:	See Diagram

Dimension and Weight

Size	A (mm)	B (mm)	C (mm)	Weight (kg)
DN15	89	137	154	1.15
DN20	89	137	154	1.18
DN25	89	147	154	1.28



VC Series Actuator Selection

Model	Voltage	Input Signal	Electrical Termination	Application
VC7931ZZ11T	24VAC/50(60)Hz	0(2) ~ 10VDC	integral 1meter lead wire	2-Pipe/4-Pipe Fan-coil

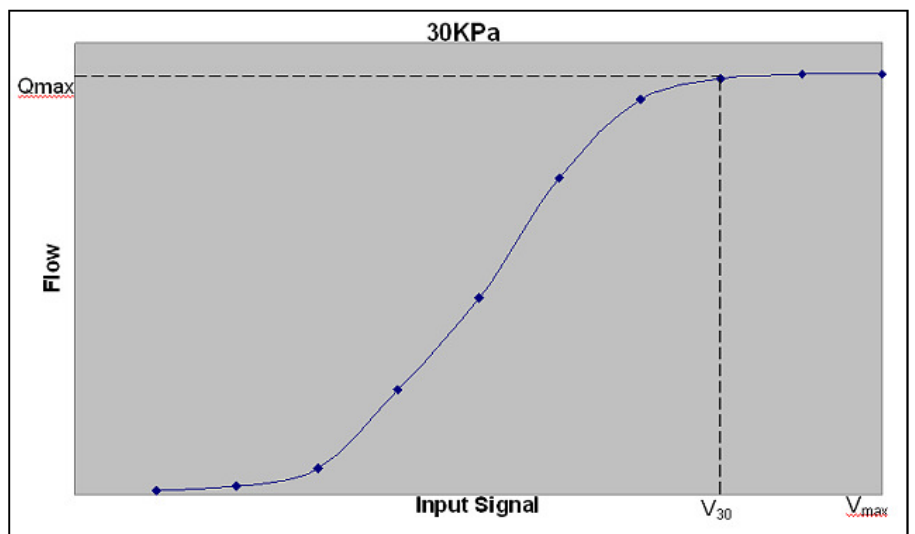
VCBM Series Flow Control Valve Selection

OS#	Size	Max Flow (m ³ /h)	Differential Pressure at Valve Fully open (KPa)	OS#	Size	Max Flow (m ³ /h)	Differential Pressure at Valve Fully open (KPa)
VCBM15BPS01	DN15 BSPP	0.28	22-180	VCBM20BPL02	DN20 BSPP	0.76	22-180
VCBM15BPS02		0.36		VCBM20BPL03		0.86	
VCBM15BPS03		0.43		VCBM20BPL04		0.94	
VCBM15BPS04		0.50		VCBM20BPL05		1.12	
VCBM15BPS05		0.57		VCBM20BPL06		1.33	
VCBM15BPL01		0.65		VCBM20BPL07		1.51	
VCBM15BPL02		0.76		VCBM20BPL08		1.69	
VCBM15BPL03		0.86		VCBM20BPM08		1.76	
VCBM15BPL04		0.94		VCBM20BPM09		1.98	
VCBM15BPL05		1.12		VCBM20BPM10		2.20	
VCBM20BPS01	DN20 BSPP	0.28	22-180	VCBM20BPH10	DN25 BSPP	2.30	40-320
VCBM20BPS02		0.36		VCBM25BPL08		1.69	22-180
VCBM20BPS03		0.43		VCBM25BPM08		1.76	30-220
VCBM20BPS04		0.50		VCBM25BPM09		1.98	
VCBM20BPS05		0.57		VCBM25BPM10		2.20	
VCBM20BPL01		0.65		VCBM25BPH10		2.30	40-320

Flow Characteristic Chart Under $\Delta P=30, 40, 60\text{KPa}$ Of VCBM Series (Flow vs Input Signal)

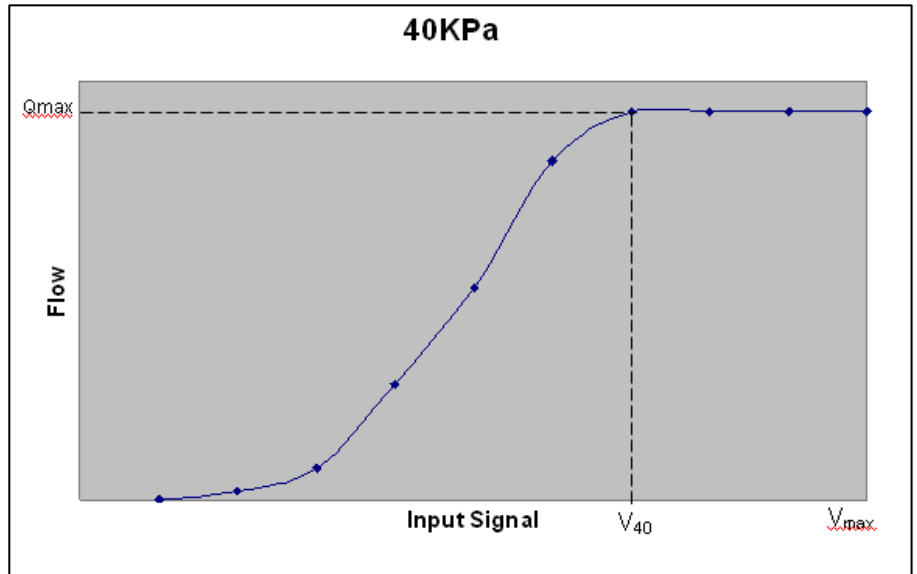
As shown right figure, the flow characteristic curve of VCBM series shows the relationship between input signal (0- V_{max}) and output flow under 30kPa differential pressure.

According to the figure, electric modulating function works within input signal 0~ V_{30} , to modulate the flow according to area temperature requirement; The constant flow function works within input signal V_{30} ~ V_{max} , to maintain the flow at Max. design flow.



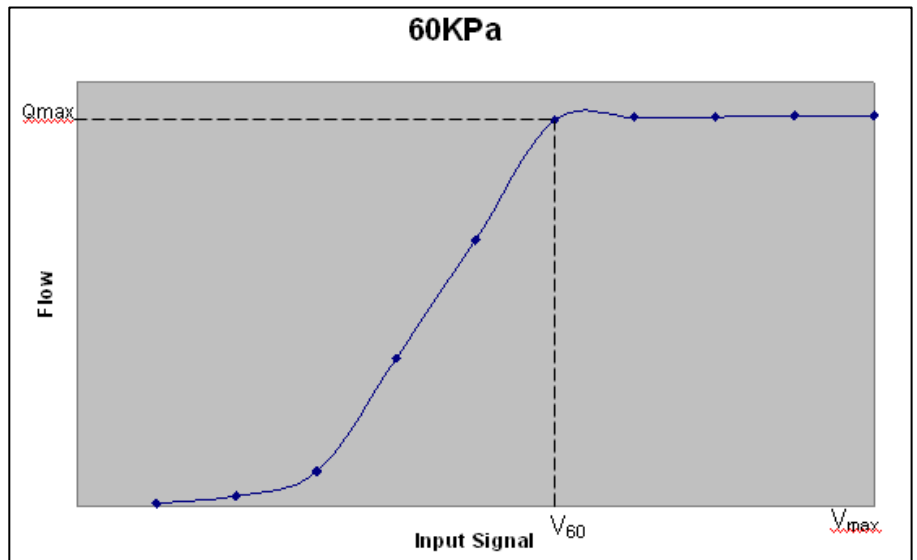
As shown right figure, the flow characteristic curve of VCBM series shows the relationship between input signal ($0-V_{max}$) and output flow under 40kPa differential pressure.

According to the figure, electric modulating function works within input signal $0\sim V_{40}$, to modulate the flow according to area temperature requirement; the constant flow function works within input signal $V_{40}\sim V_{max}$, to maintain the flow at Max. design flow.

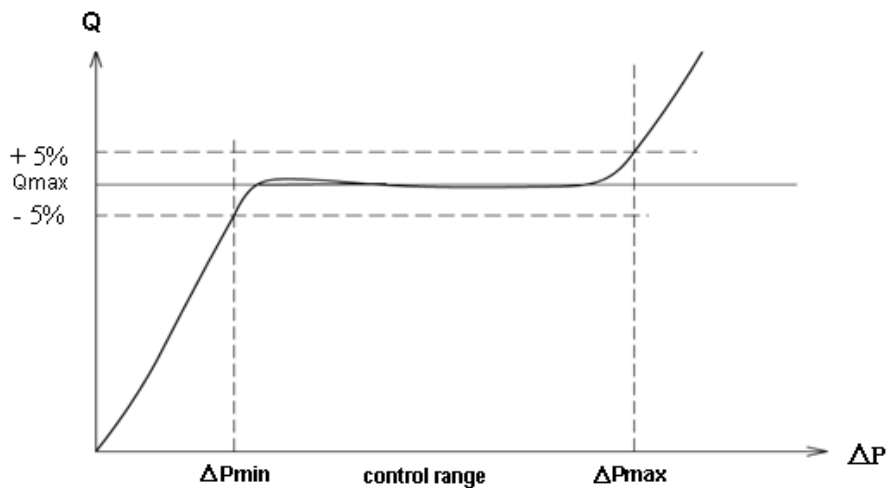


As shown right figure, the flow characteristic curve of VCBM series shows the relationship between input signal ($0-V_{max}$) and output flow under 60kPa differential pressure.

According to the figure, electric modulating function works within input signal $0\sim V_{60}$, to modulate the flow according to area temperature requirement; the constant flow function works within input signal $V_{60}\sim V_{max}$, to maintain the flow at Max. design flow.



Flowrate-Differential Pressure Characteristic Curve



Operation

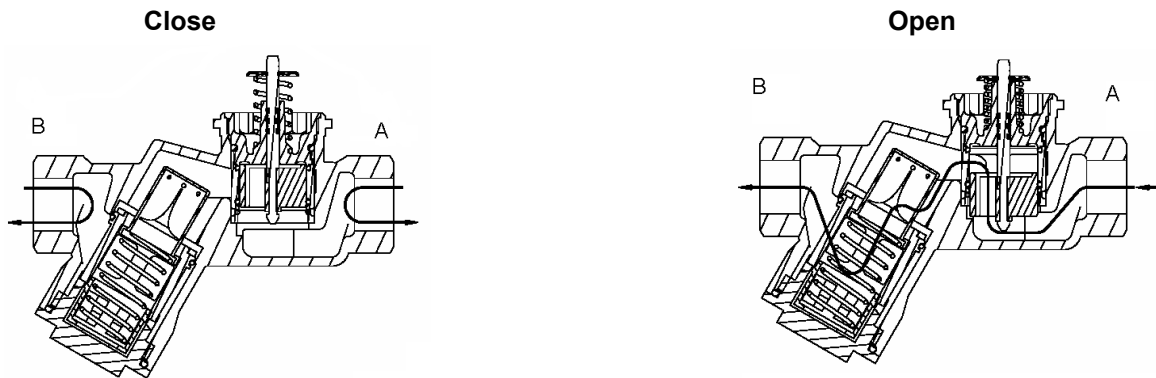


Figure1: Flow is from A to B.
Valve is closed when the stem is in the up position.

Manual Opener

The manual opener can be manipulated only when in the up position. The motorized valve can be opened by firmly pushing the red manual lever down and in. This holds the valve in the open position, and with auxiliary switch models the N.O. 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 red 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.

Installation

WHEN INSTALLING

- Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
- Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
- Installer must be a trained, experienced service-person.
- Always conduct a thorough checkout when installation is completed.
- 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 position to suit the most convenient wiring mode.
- An extra 25 mm head clearance is required to remove the actuator.

CAUTION!

Disconnect power supply before connecting wiring to prevent electrical shock and equipment damage.

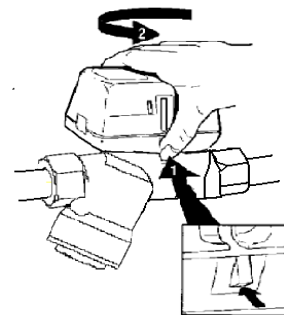
IMPORTANT

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

TO INSTALL OR REPLACE ACTUATOR

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 lead wires to actuator. Where appropriate, label wires for rewiring.
4. To assemble, Fit the actuator connection and the valve body connection together, Then press up on the latch mechanism located directly below the red manual open lever with thumb. Simultaneously press the actuator down towards the body with moderate hand force and turn the actuator clockwise by 1/8 turn (45 degrees). The actuator head is automatically latched to the valve. To remove, The inverse way is done

Note: The actuator can also be installed at right angles to the valve body but in this position the latch mechanism is not engaged.



5. Install the new actuator by reversing the process in (4).
6. Reconnect lead wires.
7. Restore power, and check out operation.

Wiring

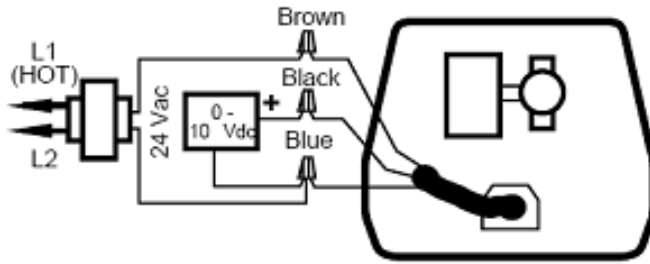


Figure2 “3 Wire” VC79 series Actuator

Applications

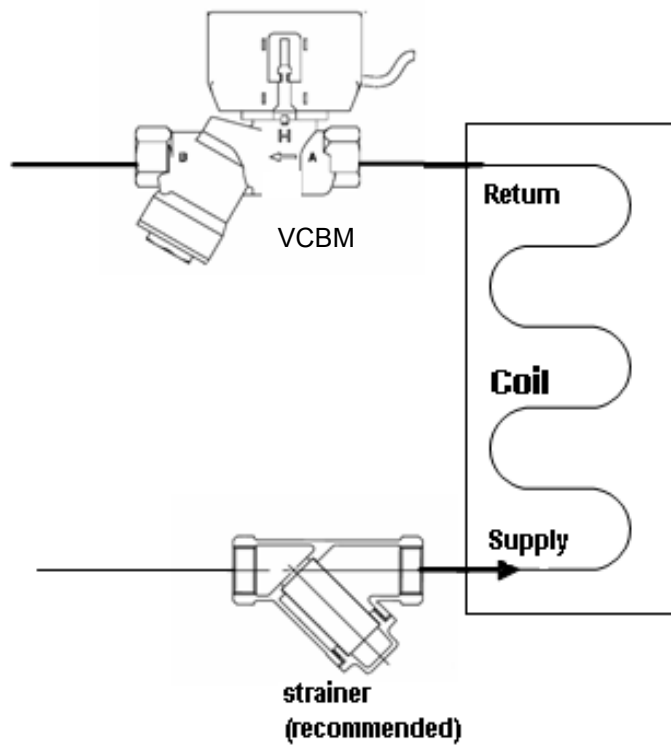


Figure3: VCBM series FCU balancing modulating valve in FCU system

Honeywell

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