



**Field Installed  
Valve Package  
Accessory – Model VPA**

Available for use with Magic Aire models  
BV, BM, HB, CH, CE, DU, DV, and DH.

## Installation, Operation and Maintenance Manual

### How to Use this Manual:

This manual gives general instructions regarding installation, operation and maintenance for the VPA models – Factory assembled and field installed valve packages. For more information refer to:

**Catalog brochure** for accessory dimensions, options, pipe connections, guide specifications and performance information.

Follow NEC (National Electrical Code) and local codes.

**New Magic 4** software for faster selection of new accessories.

**Website** [www.magicaire.com](http://www.magicaire.com) for replacement parts guide, software downloads, product data and contact info for your local Magic Aire representative.

**Replacement Parts** – Identify parts needed, and then obtain part numbers in replacement parts guide available at [www.magicaire.com](http://www.magicaire.com).

### SAFETY CONSIDERATIONS

Installation and servicing of this unit can be hazardous due to system pressure, electrical components and equipment location. Only trained and qualified service personnel should perform operations.

When installing this accessory, observe precautions in the literature, tags and labels attached to the equipment, and any other safety precautions that may apply.

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling and installing this accessory.
- Use quenching cloth for all brazing operations.

- Have fire extinguisher available for all brazing operations.

### PREINSTALLATION

**Immediately inspect each unit for damage upon receipt.** Inspect units for external and concealed damage immediately. File any damage claims in accordance with Magic Aire Freight Damage Policy and Terms and Conditions (available at [www.magicaire.com](http://www.magicaire.com)). Do not repair damaged valve packages without written authorization.

### Protect Accessories From Damage

To maintain warranty, protect accessories against adverse weather, theft, vandalism, and debris on jobsite. Prevent dust and debris from being deposited on valve packages.

If the equipment is stored for any length of time before installation, it should remain in its shipping container in a clean, dry, and climate controlled area.

### Installation Considerations

- Valve packages are factory assembled, boxed individually, and shipped loose for field installation and wiring. Interconnecting piping to the coil will be required to be supplied by the field.
- Operating Temperature: 0 °F to 210 °F

- Operating Media shall be chilled and hot water. Not for Steam Service.
- Not for outside use.
- Valve packages for chilled water service are designed with handle extensions intended for use with a maximum of 3/8" thick insulation. Insulation shall be provided by the field.
- Maximum pressure drop at standard operating conditions shall be 30 feet with a clean strainer if applicable.
- Accuracy of components: +/- 5%

Do not operate valve packages above the water flow limit to prevent erosion and noise. Valve Packages are intended for use in treated closed loop chilled or hot water systems. Do not use with open or portable water systems. Such applications may cause scaling and particulate collection interference with the valve function and reduce the life and effectiveness of the valve package.

### Installation – Piping

**Caution:** When valve package connections are made with a solder joint, care should be taken to ensure that components in the valve package are not subjected to high temperatures which may damage seals or other materials. When all joints are complete, perform hydrostatic test for leaks. Check piping for signs of leakage from shipping damage or mishandling. If leaks are found, notify Magic Aire before initiating any repairs.

### Sweat Connections

The valve package sweat connections are intended for low melting temperature, "soft" solders. They are not designed for "silver" solders or other high temperature soldering methods. Use a standard approved soldering procedure after properly cleaning the copper tubes and valves or union tailpiece fittings.

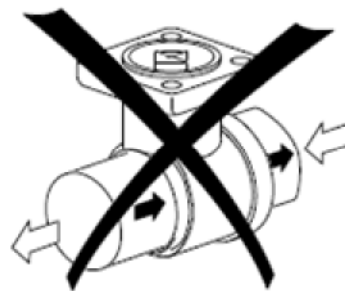
**Caution:** SWEAT CONNECTIONS MUST BE MADE WITH CARE TO AVOID OVERHEATING THE VALVE. If the sweat fitting is an integral part of the valve body, special care must be taken to avoid overheating the Teflon seals of the ball valve, the handle shaft O-rings located within the handle port, and the thread sealant and lock used between the sweat fitting and the valve body. Position the valve lever or handle in the open position and it will eliminate pressure build up and dissipate heat.

A HEAT SINK, SUCH AS A WET RAG, MUST BE USED WHEN MAKING SWEAT CONNECTIONS. IF THE SWEAT CONNECTION IS PART OF A REMOVABLE UNION TAILPIECE, THE TAILPIECE MUST BE REMOVED FROM THE VALVE BEFORE HEAT IS APPLIED TO AVOID DAMAGING THE UNION O-RING. FAILURE TO PROTECT THE VALVE BODY AND ASSOCIATED SEALS CONTAINED WITHIN THE VALVE BODY FROM OVERHEATING WILL CAUSE THE SEALS TO FAIL PREMATURELY, THE VALVE TO LEAK AND VOID THE WARRANTY.

### Piping Components

#### 1. Control Valve:

The A-port must be piped toward the coil to maintain proper control.



#### 2. Actuators:

**WARNING:** The wiring technician must be trained and experienced with electronic circuits. Disconnect power supply before attempting any wiring connections or changes. Make all connections in accordance with wiring diagrams and follow all applicable local and national codes.

Provide disconnect and overload protection as required. Use copper, twisted pair, conductors only. If using electrical conduit, the attachment to the actuator must be made with flexible conduit.

Always read the controller manufacturer's installation literature carefully before making any connections. Follow all instructions in this literature. If you have any questions, contact the controller manufacturer and/or Belimo.

Belimo actuators require a 24 VAC class 2 transformer and draws a maximum of 10 VA per actuator. The actuator enclosure cannot be opened in the field, there are no parts or components to be replaced or repaired.

**Caution:** It is good practice to power electronic or digital controllers from a separate power transformer than that used for actuators or other end devices. The power supply design in our actuators and other end devices use half wave rectification. Some controllers use full wave rectification. When these two different types of power supplies are connected to the same power transformer and the DC commons are connected together, a short circuit is created across one of the diodes in the full wave power supply, damaging the controller. Only use a single power transformer to power the controller and actuator if you know the controller power supply uses half wave rectification.

### **3. Union Orings:**

The O-ring groove is purposely designed wider than the O-ring width so regardless if the pressure is of the internal or external type the O-ring moves to seal the leak path when pressure is applied. Pipe dope or sealant should never be applied to the O-ring, O-ring groove, or mating surface. In the event an O-ring needs replacement, inspect the o-ring groove for damage, pipe dope, or debris. Inspect the mating surface of the tailpiece flange to insure that it is not scratched or deformed. Carefully place the O-ring in the groove. Using a quality non-petroleum based O-ring lubricant at the time of installation will help protect the o-ring from damage by abrasion, pinching, rolling or cutting.

Confirm that the O-ring is properly placed in the groove; and reassemble the union connection. Secure the union nut hand tight, and then tighten an additional 1/8 turn.

### **4. Ball Valves:**

When installing the Ball Valve, space around the unit must be provided for rotation of handle. The ball valve can be used to isolate hydronic equipment for repairs and/or to drain the system. To close The ball valve move the handle until the handle is perpendicular to the valve and piping.

### **5. Automatic Control Valves:**

The Automatic Control Valves can be installed in horizontal and vertical planes. Each Automatic Control Valve has an internal cartridge that is pre-set to a specific flow rate (GPM). This GPM cannot be adjusted in the field; however, the cartridge may be exchanged for a different pre-set replacement cartridge. Each body is identified with a flow direction arrow. It is imperative that the flow arrow points in the direction of flow. Installation of a y-strainer is recommended upstream of any control valve or balancing device. To achieve maximum performance the elimination of air in the fluid is required.

### **6. Circuit Setters:**

The Circuit Setter can be installed in horizontal and vertical planes. To achieve maximum performance the elimination of air in the fluid is required. Straight run requirements of the pipe (upstream and downstream) for the Circuit Setter is not necessary. These operational requirements are designed into the valve body. The Circuit Setter should be manually set in the field by an experienced balance contractor. The desired flow rate, or GPM, is set by slowly adjusting the supplied ball valve until the differential pressure reading across the selected modified venturi reaches the desired GPM. Multiple passes are usually required to properly balance the system. Once this is achieved, lock the memory stop, which is located on the top of the ball valve handle, with an allen wrench. A 4 mm wrench is required for a (1/2" - 1 1/4") and 5 mm for (1 1/2" - 2") respectfully.

**7. Y strainers:**

The Y strainer must be installed on the supply side of the coil, and can be in horizontal and vertical planes. Each Y strainer is identified with a flow direction arrow. It is imperative that the flow arrow points in the direction of flow.

When installing the Y strainer space around the unit must be provided for rotation of the handle and possible cleaning the strainer element.

The Y strainer may be installed with blowdown/Drain Valves down to allow accumulated dirt to be removed.

The Y strainer can be used to isolate hydronic equipment for repairs and/or to drain the system.

To close the Y strainer move the handle until the handle is perpendicular to the valve and piping. If Y strainer's pressure drop becomes excessive, accumulated dirt should be blown down through the Blowdown/Drain Valve to a drain.