



Manual – BW-series

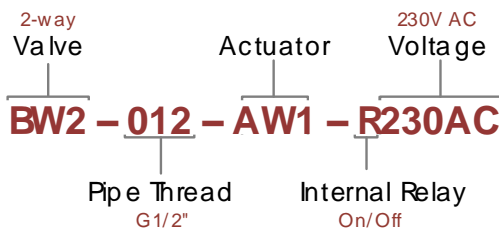
ELECTRICAL BALL VALVES

Energy efficient and robust electrical ball valve with wide field of application. Common applications include ventilation, heating systems, solar water heaters, irrigation systems and industrial equipment.

Features	Value
Media	Neutral liquids and gases.
Medium Temperature	-10..110°C
Ambient Temperature	-10..50°C
Operating pressure	0..10 bar
IP-rating	IP54

All ball valves of the BW series are compatible with the actuators from the AW1 series. The tables below are showing the different versions. The product code of a complete electric ball valve is composed of the code for the actuator and the ball valve.

Example Product Code:

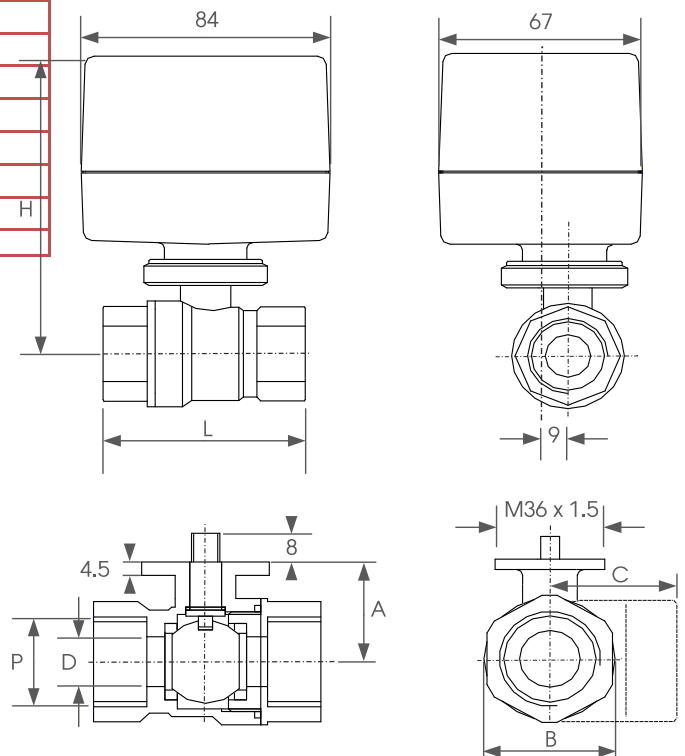


Overview Actuators

Product Code	Power Supply	Operation	P (W)	Open	T (Nm)
AW1-230AC	230V~50Hz	3 way	5W	16s	4
AW1-R230AC	230V~50Hz	On/Off	5W	16s	4
AW1-024AC	24V~50Hz	3 way	5W	16s	4
AW1-R024AC	24V~50Hz	On/Off	5W	16s	4
AW1-024DC	24V DC	3 way	3W	6s	2.5
AW1-R024DC	24V DC	On/Off	3W	6s	2.5
AW1-012DC	12V DC	3 way	3W	6s	2.5 H
AW1-R012DC	12V DC	On/Off	3W	6s	2.5

Overview Ball Valves

Code	Pipe (P)	Function	Orifice (D)	Kv (m³/h)	AxBxC (mm)	LxH (mm)
BW2-012	G1/2"	2/2 way	12 mm	8.6	28x28	50x113
BW2-034	G3/4"	2/2 way	15 mm	21	30x35	58x115
BW2-100	G1"	2/2 way	20 mm	26	35x45	73x120
BW3-012	G1/2"	3/2 way	10 mm	6.4	28x28x28	54x113
BW3-034	G3/4"	3/2 way	13 mm	10	30x35x40	70x115
BW3-100	G1"	3/2 way	18 mm	16	35x45x45	83x120



1. TECHNICAL OVERVIEW

1.1. Principle of operation

Ball valves control the flow of a fluid or gas by means of a rotating ball with a hole. By rotating the ball 90° around its axis, the valve will for example open or close. The valve can have two or three connection ports (2-way or 3-way). The three-way balls have a T-shaped hole. Therefore, different switching schemes are possible. Electric ball valves are actuated with an electric motor. The AW1 actuator features a transmission to arrange a smooth and slow opening and closing with a high torque. The AW1 actuator is equipped with two limit switches. Once the actuator reaches one of the two end positions (90° rotation), the power supply to the electric motor shuts down and no electrical power is needed to stay in the end positions.

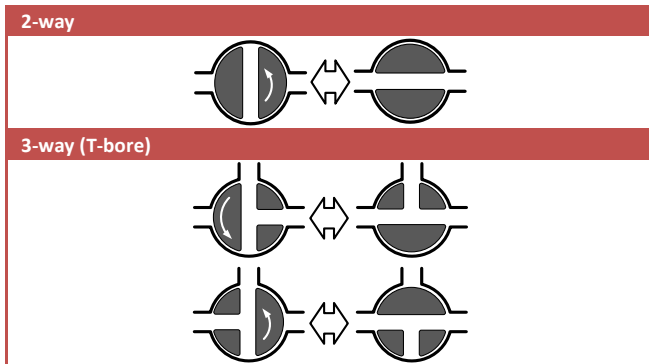
The AW1 actuator is available with 3-point control or On/Off control with internal relay (see Chapter 0).

1.2. Materials

Component	Material
Valve body	Brass (EN: CW617N, CuZn40Pb2)
Ball seal	PTFE
O-ring	EPDM
Actuator housing	PC GF10 (polycarbonate)
Actuator coupling	POM (Polyoxymethylene)

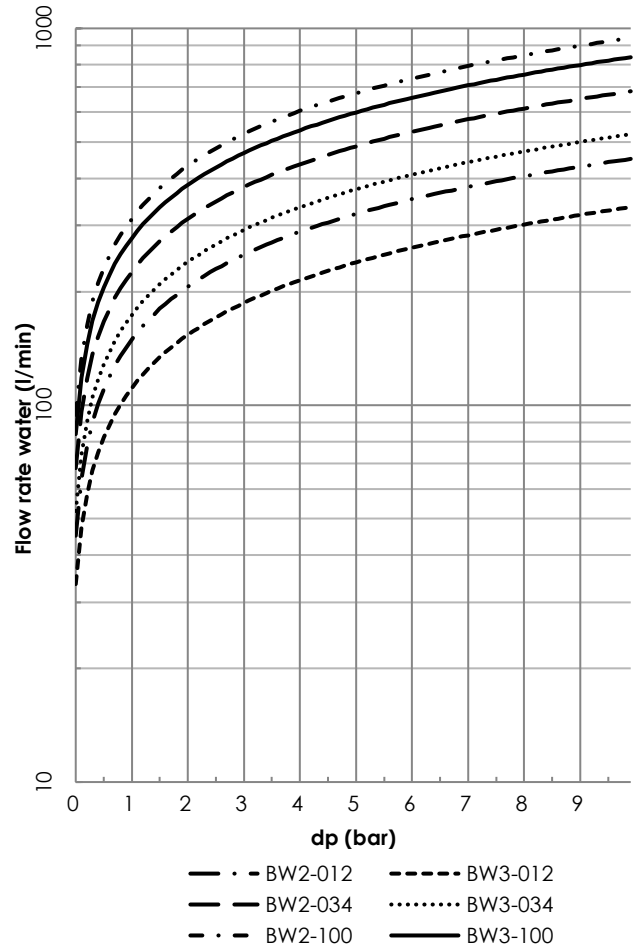
1.3. Circuit Diagram

The table below shows the circuit functions of the ball valves. The 2-way ball valves are open or closed. The 3-way ball valves can be arranged in two different ways (by rotating the ball 180°).



1.4. Flow chart

The following graph shows the flow rate (l/min) of the ball valves as a function of the differential pressure across the inlet and outlet of the valve. The scale of the vertical axis is logarithmic.



1.5. Duty Cycle

The BW-series are suitable for continuous use. High switching frequencies and high pressures can reduce the lifespan.

1.6. Compliance

The actuators are CE marked and comply with the LVD Directive (2006/95/EC) and EMC Directive (2004/108/EC), provided that the cables and connectors are properly connected.

1.7. Description Type Plate

The following figure shows an example of the type plate of the actuator. Observe the specifications and the connection diagram before using the product.

Product code	AW1-R024DC		JP FLUID CONTROL
Voltage	Voltage: 24V DC	+24VDC - +24VDC	
Time to open or close	Closing: 6s		
Electric power	Power: 3W		
Torque	Torque: 2.5Nm		
Degree of protection	IP 54		
CE marking	CE		
RoHS	RoHS		
Wiring diagram			

2. GENERAL SAFETY INSTRUCTIONS

Please read the safety instructions before installing, using or maintaining the device.

- ▶ This device will contain gas and/or liquid under pressure. The actuator only complies protection class IP54 (according to IEC 60529), if the device is properly connected. Improper use may be hazardous.
- ▶ This product is not a safety device and may not be used as such.
- ▶ Never put your hands/body parts or other objects into ports of the valve. The rotating ball can cause serious injuries or damages.
- ▶ Correct transport, proper storage and installation, and proper use and maintenance, are essential for reliable and error-free operation. The product may not function properly as a result of dirt, wear, damage (for example, by dropping) or improper use. Therefore, the product should not be used in applications where a malfunction can cause danger or damage.
- ▶ Check the compatibility of the medium used, temperature and other operating conditions with the materials and specifications of the product. It is the responsibility of the user to select the right product for the application.
- ▶ This product is not intended or approved for medical applications, food and/or application in gas appliances.
- ▶ Never exceed the limits for pressure, temperature or voltage as indicated on the product and/or in the technical documentation.
- ▶ It is not allowed to change the construction of this device.
- ▶ Beware of electric shock when working with electrical equipment.

3. INSTALLATION AND MAINTENANCE

3.1. Safety Instructions

- ▶ It is recommended to install the electric ball valve in a dry environment. In moist environments, make sure that no moisture can penetrate the actuator. Install the ball valve in a safe way to avoid electric shock, burning or other injuries. Make sure the electric ball valve is not in contact with or in the vicinity of flammable materials. Ensure that the product is protected from frost. Frost may damage the product and/or block the moving parts, causing the electric ball valve to malfunction.
- ▶ Maintenance may only be performed when the system is not pressurized, electrically disconnected and cooled down.
- ▶ Turn off the power supply before performing any work on the electric ball valve to prevent the risk of electrical shock and to prevent activation of the actuator.
- ▶ The product is only safe when properly installed and operated by qualified persons. Please read the safety instructions and technical documentation carefully before installation, use or maintenance.
- ▶ Ensure a controlled commissioning after installation or maintenance.

3.2. Installation

Clean fluids and gases

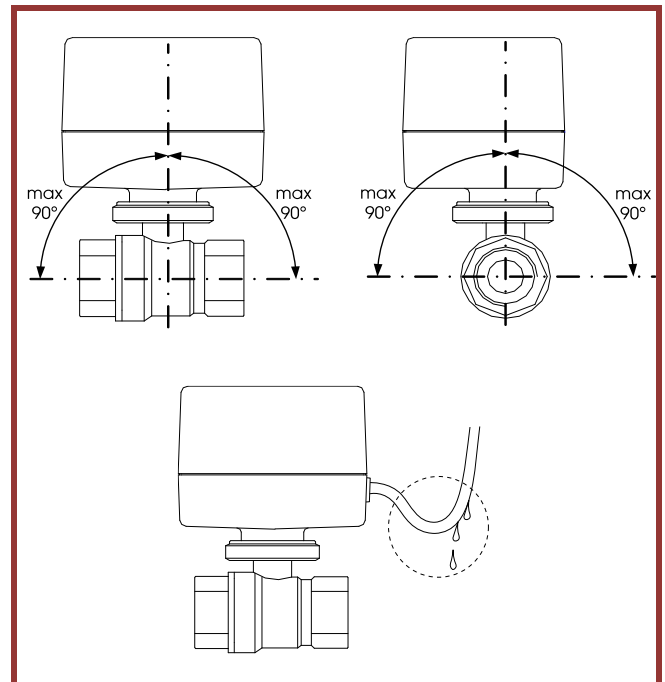
It is recommended to use electrical ball valves in combination with clean liquids or gases. Dirt can cause excessive wear. Make sure that the pipes don't contain dirt before installing the device. Optionally, install a filter (500 µm) upstream of the electric ball valve.

Mounting the valve

The pipes on both sides of the valve must be securely fastened. During installation, make sure that force may only be exercised at designated areas on the valve, such as the hexagon; never on the actuator. Avoid vibration in the pipes. Use a suitable sealant for threaded connections of the ball valve. Avoid the entry of thread sealing material in the valve, this can lead to malfunctioning of the valve.

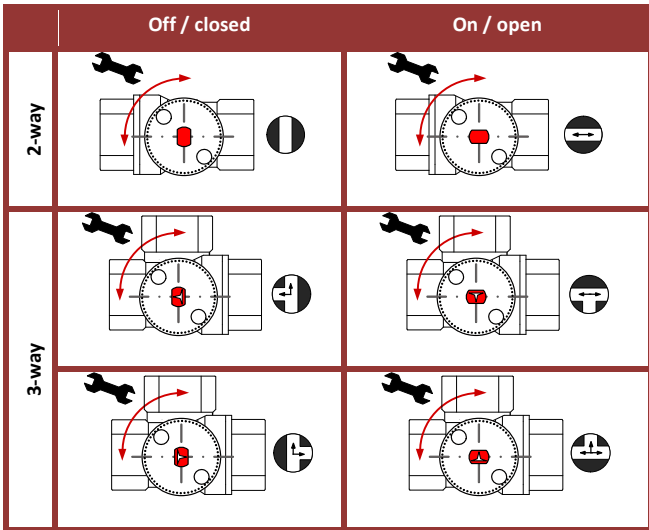
Position

It is recommended to install the electric ball valve in vertical position with the actuator facing upwards. This reduces the probability of the collection of moisture in the actuator. When the electric ball valve is mounted at an angle, it is recommended to deviate maximally 90° from the vertical position. Ensure that drops cannot slip along the cable and enter the actuator.

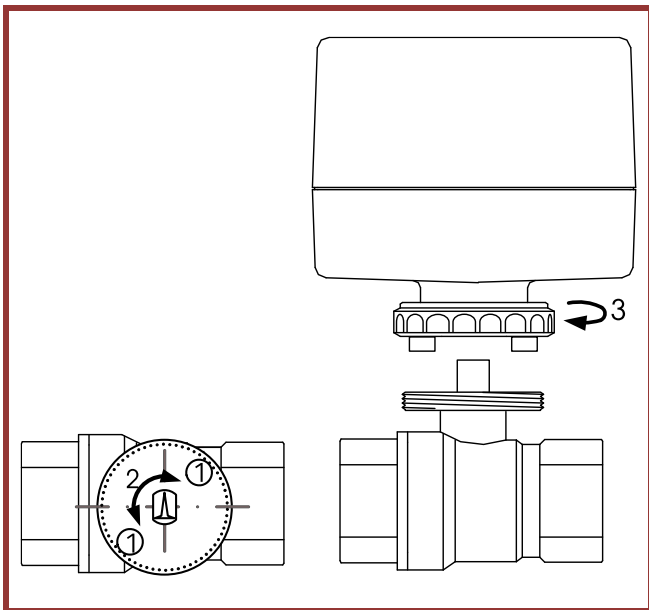


Installation of the actuator on the coil

- ▶ The device can be damaged by the use of unsuitable tools.
- ▶ The 3-way valves can be installed in two different ways by rotating the ball 180°.



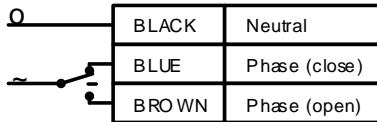
- ▶ The actuator needs to be attached with the aid of the nut present.
- ▶ Make sure that the ball is in the correct position. If necessary, adjust the position (2) using a wrench.
- ▶ The actuator is into the valve body (two ways) with 2-pin (1). Tighten the nut securely (3), so there is no clearance between the actuator and the valve.



3.3. Electrical Wiring Diagram

Verify that the actuator code matches the connection diagram. Improper installation can permanently damage the actuator or lead to dangerous situations. The actuators have internal position switches, which results that only energy consumed during opening or closing.

AW1-230AC, AW1-024AC (3-point)



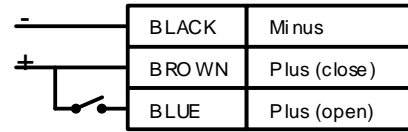
Connecting the blue control wire closes the valve in 16s. Connecting the brown control wire opens the valve in 16s. If both control wires are disconnected, the valve will remain in the current position. In this way, the position of the valve can be regulated. **Never connect the blue and brown control wires at the same time!** This will damage the actuator. The actuator consumes energy only during opening and closing.

AW1-R230AC, AW1-R024AC (ON/OFF, INTERNAL RELAY)



Connecting the control wire (black) opens the valve in 16s. Once the control wire shuts down, the valve closes in 16s. The actuator consumes energy only during opening and closing.

AW1-R024DC, AW1-R012DC (ON/OFF, INTERNAL RELAY)



Connecting the control wire (blue) opens the valve in 6s. Once the control wire shuts down, the valve closes in 6s. The actuator consumes energy only during opening and closing.

AW1-024DC, AW1-012DC (3-point)



Connecting the brown control wire, the valve closes in 6s. Connecting the black control wire, the valve opens in 6s. If both control wires are connected, the position of the valve can be regulated. **Never connect the black and brown control wires at the same time!** This will damage the actuator. The actuator consumes energy only during opening and closing.

4. SPARE PARTS

The valve bodies and actuators of the BW and AW1 series are exchangeable. If only one component is defective, this part can be replaced.

5. DISPOSAL

The removal of the product should be performed in accordance with the applicable laws. Keep in mind the media that are still present in the valve.