

# BMS1.1

## Proportional Ball Valves Actuators AC/DC 24 V

Installation Instructions

P/N 14-88360-2110 Rev. D

10 2013

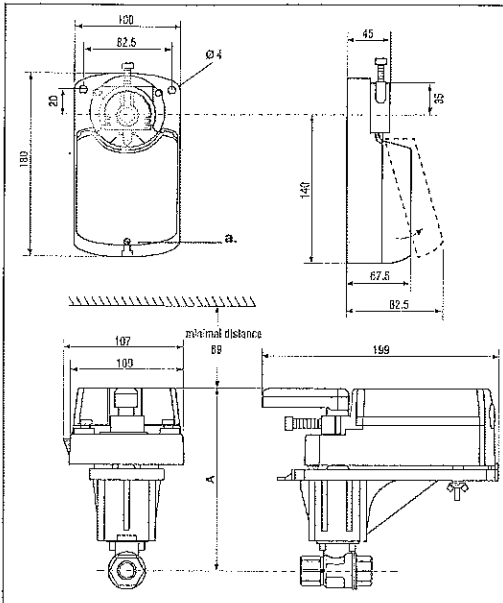
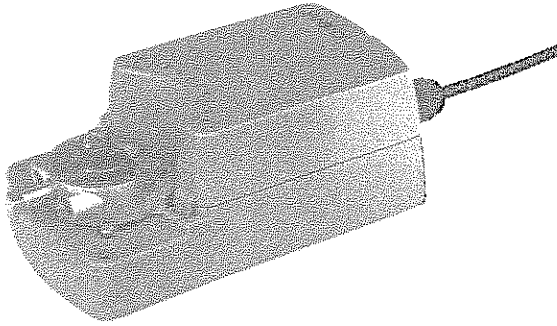


Figure 1: Dimensions (in mm)

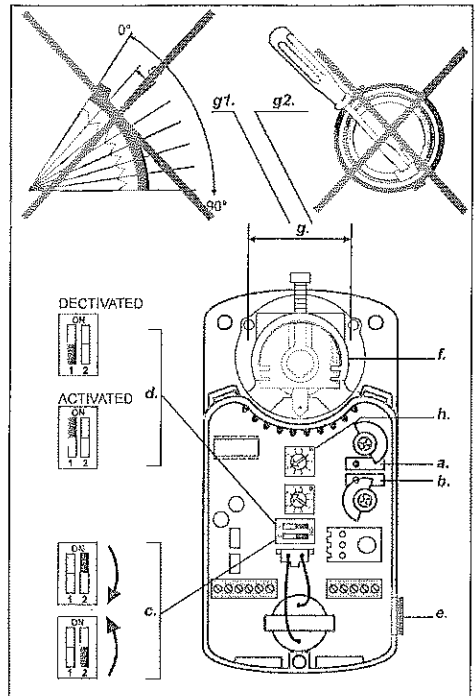


Figure 2: Actuator open

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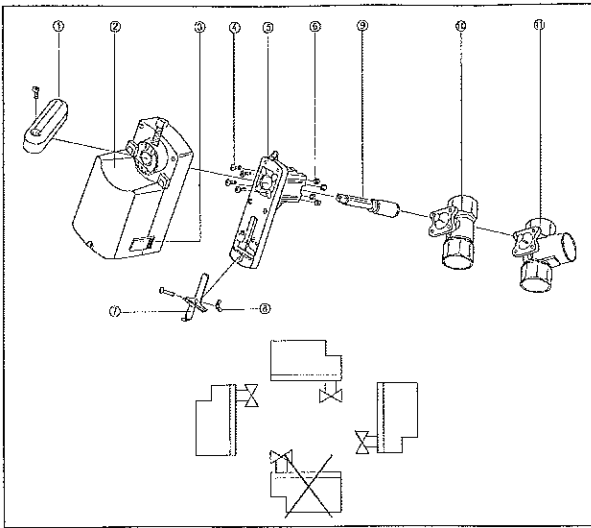


Figure 3: Mounting instructions

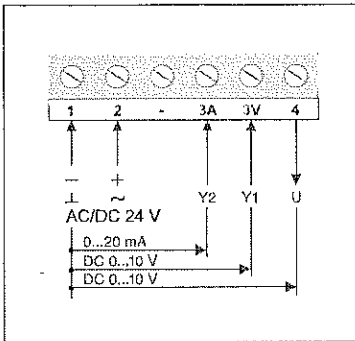


Figure 4: Proportional Control

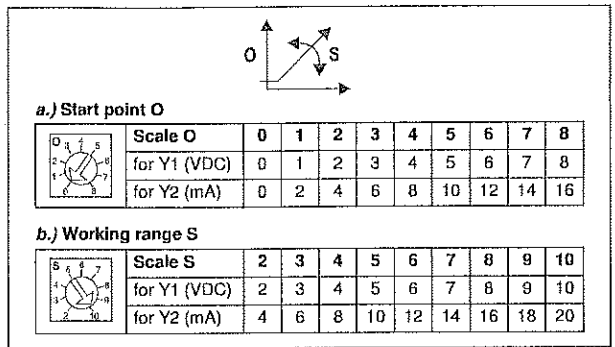


Figure 5: Setting span and OFFSET

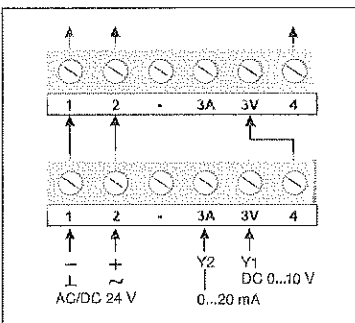


Figure 6: Parallel Connection

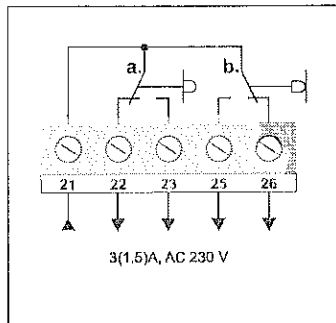


Figure 7: Auxiliary Switches

READ THIS INSTRUCTION SHEET AND THE SAFETY WARNINGS CAREFULLY BEFORE INSTALLING AND SAVE IT FOR FUTURE USE

## General Features

The actuators are intended for the operation of various kind of ballvalves.

**Figure 1:** Dimensions in mm  
(a). Cover screw

## Mode of operation

**Figure 2:** Actuator open

- (a). Auxiliary switch
- (b). Auxiliary switch
- (c). Direction of rotation
- (d). Self adapting:  
**d1:** Deactivated  
**ON:** Activated
- (e). Manual button
- (f). Adapter for:  
**Round spindles:**  $\varnothing 10...20$  mm  
**Square spindles:**  $\square 10...16$  mm
- (g). 1 - Angle of rotation limiting - Not possible  
2 - Releasing the adapter - Not possible
- (h). Adjusting control signals

The actuators are controlled by a 0...10 VDC or 0...20 mA signal. The motor stops running when the damper end-stop or actuator end-stop is reached. For manual operation of the damper the gearing is disengaged by means of the self-resetting button (See Figure 2 e.).



**WARNING:** When calculating the torque required to operate dampers, it is essential to take into account all the data supplied by the damper manufacturer.

## Installation and adjustment

**Figure 3:** Mounting instructions

### Installation

Attach the actuator to the damper spindle by means of the adapter and secure the locking device with the screws provided.

### Selecting the direction of rotation

- In order to reverse the direction of rotation (CW/CCW), loosen screw (See Figure 1 a.) and remove the cover.
- The direction of rotation can be changed by switching microswitch c (See Figure 2c).
- Factory setting: Clockwise (CW) rotation.

### Control Signal Adapting

By switching microswitch **d1** to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation (See figure 2d).

### Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller (see figure 5).

## Wiring

### WARNING:

- The electrical connections for the actuators must be executed in accordance with the relevant legal requirements.
- **In order to avoid any personal injury or damage to the equipment or other property, always isolate the power supply before commencing any work on the electrical wiring.**
- In order to avoid danger to property, it is important for the equipment to be used solely for which it is intended.



**WARNING:** The integrated circuits in the actuator are sensitive to static electricity. Take suitable precautions.

## Wiring Diagrams

**Figure 4:** Proportional Control

**Figure 5:** Setting Span and OFFSET

- (a). Start point O
- (b). Working Range S

**Figure 6:** Parallel connection

**Figure 7:** Auxiliary switches

- (a). Auxiliary switch factory set at 10° CW
- (b). Auxiliary switch factory set at 80° CW  
Actuator at 0° position

## Electrical connections via safety isolating transformer

- In order to make the electrical connections, loosen screw (Fig. 1 a.) and remove the cover.
- **Actuator wiring diagram:** according to terminal connection (Fig. 4).
- **Parallel connection:** according to terminal connection (Fig. 6).
- **Auxiliary switches:** according to terminal connection (Fig. 7).
- **Feedback potentiometer:** not possible.
- **The electrical installation work should be carried out by a qualified electrician.**
- Wrong connections can damage the equipment. Check the connections before energizing the power supply.
- Local accident prevention regulations should always be adhered to when installing the actuators.
- The actuator moves about slightly while it is working so it is important to use flexible leads for the electrical connections.

## Auxiliary switches adjustment (See Figure 2 a. - b.)

Example:

Switching position adjustment **a.** to 30° and **b.** to 70°.


**30°:** Depress the manual button (Figure 2 e.) and rotate the adapter (Figure 2 f.) to the 30° position. Slightly loosen the Phillips screw in the cam wheel **a.** so that the wheel can be moved by hand. Rotate the cam wheel **a.** counterclockwise until the switch button can be seen. Then tighten-back the Phillips screw in the cam wheel **a.**

**70°:** Rotate the adapter (Figure 2 f.) in the same manner as before to the 70° position. Slightly loosen the Phillips screw in the cam wheel **b.** so that the wheel can be moved by hand.

## Ordering Codes

Codes	Descriptions
BMS1.1	Actuator AC/DC 24 V
BMS1.1S	Actuator AC/DC 24 V with 2 auxiliary switches

## Technical Specifications

<b>Actuators</b>	<b>BMS1.1(S)</b>
Drive torque	8 Nm
Running time	30 s
Power supply	AC 24 V $\pm 20\%$ / DC $\pm 10\%$
Frequency	50-60 Hz
Power consumption:	
	- <i>operating</i> 2.5 W
	- <i>at end stops</i> 0.3 W
For wire sizing	6.0 VA / 3.6 A @ 2ms
Weight	1.1 kg
Control signals	
	- <b>Y1</b> DC 0...10 V / Ri > 250 k $\Omega$
	- <b>Y2</b> 0...20 mA / Ri > 388 k $\Omega$
	<b>Position signal U</b> DC 0...10 V / Ri > 10 k $\Omega$
Angle of rotation:	
	- <i>Working range</i> 90° (93° mech.)
	- <i>Limiting</i> not possible
Auxiliary switch rating	3(1.5) A, AC 230 V
Sound power level	45 dB (A)
Protection class	II
Degree of protection	IP 54 (with cable glands, cable downwards)
Temperature: operating/store	-20°...+50 °C / -30°...+60 °C
Humidity	5...95% RH (not condensing).
Maintenance	Maintenance-free
 Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC