JOHNSON CONTROLS

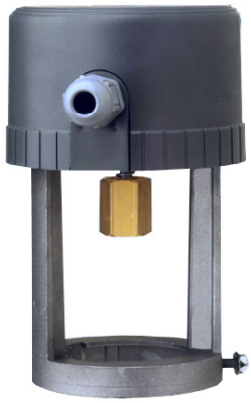
VA-7150
Electric Valve Actuator

Introduction

The VA-7150 series synchronous motor driven actuator provides floating or proportional control of valves with up to 19mm stroke in heating, ventilation and air conditioning applications.

This compact, non-spring return actuator has 500N nominal force and responds to a variety of input signals.

The VA-7150 series can be easily field mounted or ordered factory coupled to VG7000 and VBF series valves in accordance with the specified maximum close-off pressure ratings (see pertinent valve bulletins)



VA-7150 valve actuator

Features and Benefits	
❑ **500N force output in a compact unit**	Covers a wide range of applications with one actuator
❑ **Magnetic clutch**	Provides constant output force for closeoff of valves, and protects motor in stall conditions
❑ **Unique Yoke Design**	Easy field mounting to valves reduces installation and stroke adjustment time
❑ **Positioner with adjustable starting point and span, reverse and direct action modes**	Easy setup and installation and allows sequence control
❑ **"Signal fail" safe position**	Valve safety position after control signal failure, the safety position, up / down, is selectable in-situ

Ordering data

VA-715□ - □□ 0 □

Voltage supply

1	24 VAC, 50 / 60 Hz
3	230 VAC, 50 / 60 Hz (only for floating models)

Valve type

10	Threaded valves: VG7000
82	Flanged valves: VBF

Control Type

0	Floating
2	Proportional 0…10V

Note: floating models with 2KΩ feedback, 0…10V feedback and auxiliary switches are available on request

Ordering procedure

The actuator can be ordered as a separate unit or a factory fitted valve-actuator combination. Should the latter be requested, please just add "**+M**" to the end of the actuator ordering code.

For example:

Item 1 **VG7203AT** (valve body)

Item 2 **VA-7152-1001** (actuator)

Alternatively, to order a factory fitted combination.

Item 1 **VG7203AT** (valve body)

Item 2 **VA-7152-1001+M** (actuator)

Repair Information

Field repairs must not be made. For a replacement actuator, contact the nearest Johnson Controls representative.

Actuator / valve combinations

The VA-7150 can be combined with the following valve ranges:

VG7000 and VG7010 series

VG7□□□□T All body types DN 15…50

VBF series, PN6 and PN10

VBF-□□□□-5200 All body types DN 15…40

For complete ordering information, please refer to the relevant product bulletin

Operation

The VA-715x Series actuators use a reversible synchronous motor and magnetic clutch to accurately position the valve. The combination can reliably generate 500 N of force in either direction.

The actuator maintains the shutoff force even if power to the actuator is removed. When the controller provides a signal for actuator to move in the opposite direction, the shutoff force is reduced and the valve modulates.

The magnetic clutch maintains a constant load at the end of travel, which ensures tight valve shutoff and compensates for seat wear.

Floating Control VA-7150

A controller provides 24 VAC to the up, Down, and Common terminals depending upon the desired movement of the valve stem. The signal causes the motor to rotate in the proper direction. The gear train and drive screw move the valve stem up or down.

When the controller stops sending a signal, the valve stem is held in place and remains in position until the next control signal is sent.

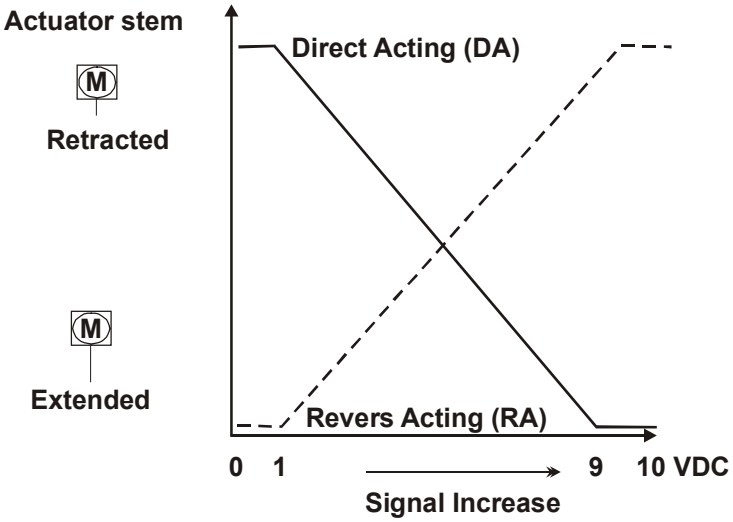
Note: In incremental application, there is no direct correlation between valve position and controller output (0 to 100 %). If correlation is important, use proportional control or actuators that provide position feedback.

Proportional Control VA-7152

The VA-7152 provides a proportional stroke in relation to the input control signal of 0 to 10, 0 to 5, or 5 to 10 VDC jumper selectable input control signal. It also features stroke selection and Direct Acting (DA) or Reverse Acting (RA) jumpers.

An electronic controller provides the proportional input signal to the VA-7152. The signal is compared to the actual valve position via internal feedback potentiometer.

The internal circuit activates the motor to rotate in the proper direction. The gear train and drive screw move the valve stem to the position called for by the input signal.



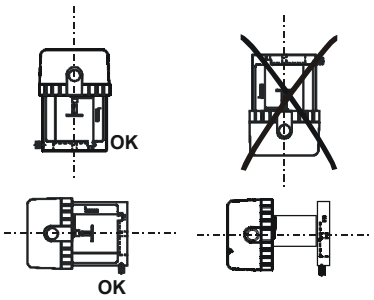
"Signal Fail" safe position

A signal failure on proportional models will cause the actuator to automatically move the stem to a (via jumper) pre-selected position (completely extended or completely retracted).

*M*ounting instructions

When mounting the actuator on a valve, please follow the instructions below:

- It is recommended that the valves be mounted upright in an easily accessible location.



- The actuator must be protected against dripping water, which could enter the housing and damage the mechanism or motor.
- Do not cover with insulating material.
- Sufficient clearance must be allowed for actuator removal (refer to the "Dimension" drawings).
- The valve must be installed so that the plug seats against the flow, as indicated by the arrows on the valve.

Wiring instructions

- All wiring must be in accordance with local regulations and national electrical codes and should be carried out by authorised personnel only.
- Make sure that the line power supply is in accordance with the power supply specified on the device.

WARNING

Shock Hazard

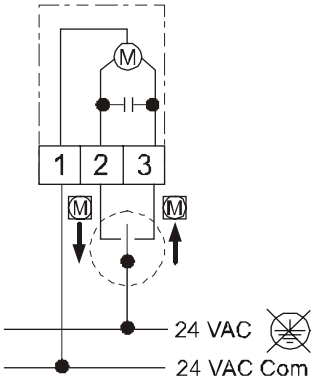
Disconnect the power supply before wiring connections are made to prevent personal injury.

Equipment Damage Hazard

Make and check all wiring connections before applying power to the system. Short circuited or improperly connected wires may result in permanent damage to the unit.

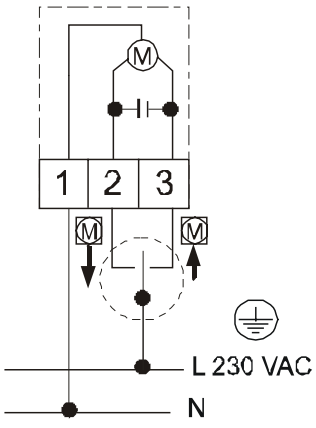
Wiring Diagrams:

Floating models 24 VAC



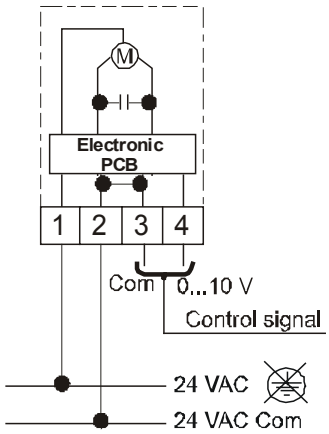
VA-7150-xx01

Floating models 230VAC



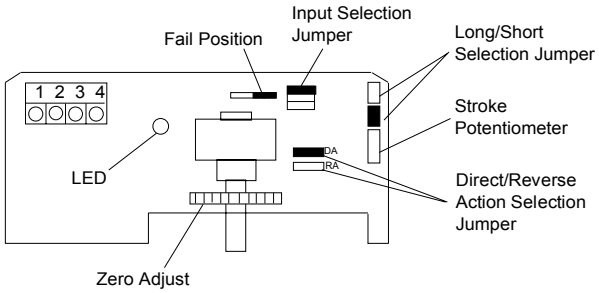
VA-7150-xx03

Proportional model 24 VAC



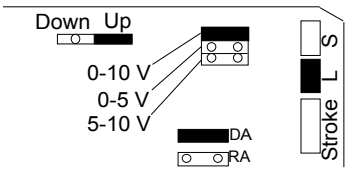
VA-7152-xx01

Adjustments for proportional models



VA-7152 Components

Factory calibration is set for direct acting 1 to 9 VDC ± 0.5 VDC for use with 0 to 10 VDC controller and 19 mm stroke. Valve fail position jumper is factory positioned for fully up.



Jumpers

Calibration

1. Set the input selection jumpers to match the desired operating range:
   - Top Jumper = 0 to 10 V
   - Center Jumper = 0 to 5 V
   - Bottom Jumper = 5 to 10 V
2. Set the short/long travel selection jumper:
   - Short for stroke lengths 13 mm or less
   - Long for strokes over 13 mm
3. Set the direct/reverse action jumper so that the valve stem travels in the desired direction (per changes in control signal):
   - Direct Action DA (Top jumper) = stroke down on signal increase
   - Reverse Action RA (Bottom jumper) = stroke up on signal increase
4. Set the signal fail position jumper to select default position of fully up or fully down. If the signal is lost at the actuator (open connection), the actuator will default to the pre- designated position of full up or full down.
5. Apply voltage specified by application requirements to drive the actuator to the full up position using the following chart:

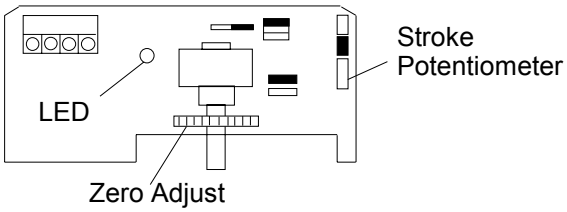
Application Values	Calibration Values
0-10	1-9
0-5	1-4
5-10	6-9

Note: Use of the calibration values in Figure 3 will ensure proper shutoff throughout the life of the valve (accounts for seat wear).

DA: full up (minimum voltage)

RA: full up (maximum voltage)

VA-7152 Calibration Values



VA-7152 Adjustments

6. To ensure that the valve stem is in the full up position, turn the zero adjust knob completely to the left, until the valve stem reaches the end of stroke.
7. Slowly turn the zero adjust knob to the right, and stop as soon as the LED flashes or goes out.

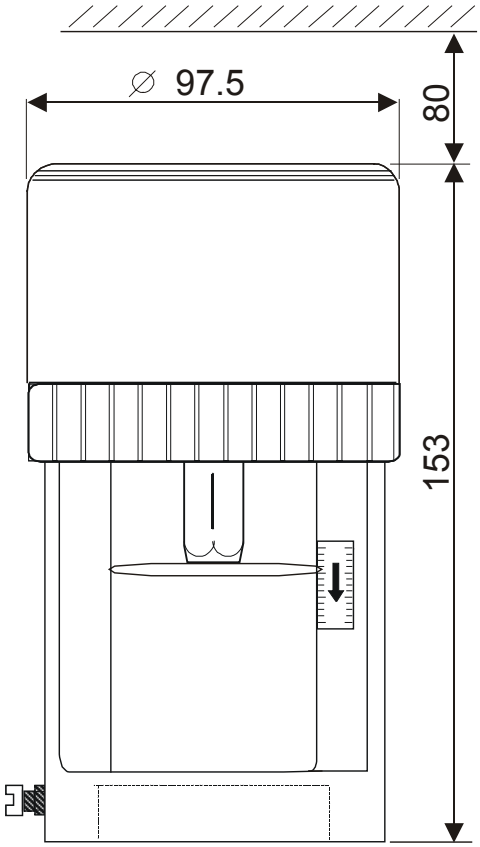
Note: As the actuator is driving, the LED will be on. The actuator circuit contains a time out feature. If calibration takes longer than 3-10 minutes, the LED will go out giving a false satisfied condition.
If this occurs, turn off the power, wait several seconds, turn the power on, and then readjust the zeroing knob.

8. Apply the input voltage specified by application requirements to drive the valve stem to the full down position per calibration value (figure 3).
9. To ensure that the valve stem is in the full down position, adjust the stroke potentiometer fully clockwise until the valve stem reaches the end of stroke.
10. Slowly turn stroke potentiometer counterclockwise until LED goes off.
11. Adjust voltage to drive actuator to the full up position. Verify zero adjustment.
12. Check for proper operation using the desired minimum and maximum operating voltages. Allow the actuator to operate through several complete cycles.

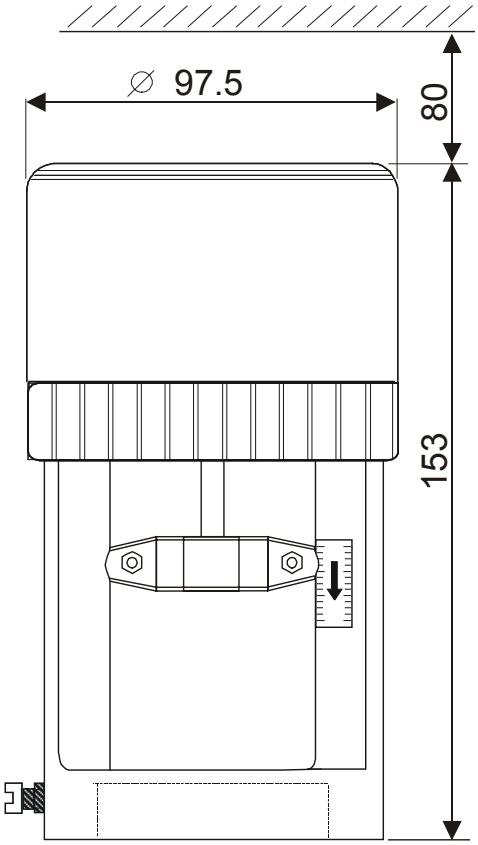
Note: The LED will remain on for 3-10 minutes after the actuator has completed operation cycle.

13. Replace the cover and secure with the screw. The unit is ready for operation.

Dimensions (in mm)



VA-715x-100x



VA-715x-820x

Specifications

Models:	Floating		Proportional
Action / control:	Optional 0…10 VDC feedback Optional 2 kΩ feedback Optional 1 aux. switch		0…10 VDC
Type of motor:	Synchronous / reversible		
Supply voltage (50/60 Hz):	230 V ±15%	24 V ± 15%	24 V ± 15%
Motor ratings:	2.7 VA	2.7 VA	2.7 VA
Electronic positioner ratings:	-		2 VA 100 kΩ input impedance
Actuator force:	500 N ± 20%		
Stroke:	20 mm maximum		
Nominal speed at 50 Hz (60 Hz):	10 (8,5) s/mm		
Enclosure protection:	IP 40 (IEC 60529)		
Materials:			
Enclosure:	Self extinguishing VO-UL 94 ABS + PC		
Yoke:	Die cast aluminium		
Ambient Operating condition:	-5 to +55° C, non condensing		
Ambient Storage condition:	-20 to +65 °C, non condensing		
Electrical connections:	2.5 mm^2	2.5 mm^2	1.5 mm^2
Optional PCBs:	-	1.5 mm^2	1.5 mm^2
Net weight:	0.8 kg		
CE **Compliance:**	European Directives: EMC (89 / 336 EEC) according to standard EN 50081-1 and EN 50082-1 LVD (73 / 23 / EEC) according to standard EN 60335		

The performance specifications are nominal and conform to acceptable industrial standards. For application at conditions beyond these specifications, consult the local Johnson Controls office.
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