

# AVUE, AVUX, AVUM



## FEATURES

- Compact construction
- Accurate positioning
- Simple installation and commissioning (self referencing/auto stroking)
- Direct coupling to valves without the need for linkage kits or mounting brackets, VP224R does require a small nipple adaptor between valve stem and actuator clasp
- Actuator fits to the valve without the use of tools
- Built-in Manual Override as standard (screwdriver operated for security)
- Neat compact design eases fitting in terminal units
- Fly lead simplifies wiring to the controller
- Approved to European EMC and safety standards
- Manual Override Reset facility (AVUE)

The AVUE, AVUX, AVUM are compact actuators having a linear output drive; they can be used in conjunction with any common controller providing a modulating or 3 point floating output signal to drive the VP224R, VZX, MZX, VEU, MEU and FEU valves.

All these control valves may be applied to regulate the flow of either hot or chilled water supplying heating or cooling coils in various types of terminal unit, for example fan coil units, reheat coils associated with variable air volume units, also small air handling plants and heat exchangers.

- The AVUE is a 0-10V modulating actuator in direct or reverse acting
- The AVUX is a 24Vac 3-point floating actuator.
- The AVUM is a mains voltage (230Vac) 3-point floating actuator

## VALVE COMPATIBILITY

The long stroke (12.7 mm) versions in both direct and reverse acting are compatible with the DN40-50 VP224R pressure independent zone valves and the DN15-50 VZX 2-port and MZX 3-port globe valves.

The short stroke (9.5mm) versions are compatible with installed base of 2-port VEU (Mk 4) 3-port MEU (Mk 4) and 4-port and FEU (Mk 5/6) zone control valves.

Compatibility is detailed further on page 3.


**SPECIFICATIONS**

Order Type	AVUE5305	AVUE5355	AVUE5304	AVUE5354	AVUX5202	AVUM5601
Input Control Signal	0-10Vdc				24Vac	230Vac
Control Action: VZX,MZX, VEU, MEU, FEU	Direct Acting (DA)	Reverse Acting (RA)	Direct Acting (DA)	Reverse Acting (RA)	Floating	
Control Action VP224R	-	-	Reverse Acting (RA)	Direct Acting (DA)	Floating	
Stroke (mm)	9.5	9.5	12.7	12.7	9.5 or 12.7 depending on valve fitted	
Stroke Time(s)	85	85	110	110	85 or 110s depending on valve stroke length	
Thrust (N) (Minimum):	220					
Power Supply	AVUE/AVUX: 24Vac ± 10%, 50Hz, AVUM: 230Vac (±10%), 50Hz					
Power Consumption (VA) (Maximum)	3.1	3.1	3.1	3.1	2.3	3.6
Protection Class	IP 40					
EMC	EN61326 1997 & FCC					
Safety	EN60730-1					
Ambient Temperatures	Operating: 0 to 50°C Storage/Transit -40 to 70°C					
Ambient Humidity	Operation & Storage: 0% to 95% rh non-condensing					
Case	Moulded plastic housing (fire resistance to UL94V-0)					
Drive	Operates on a screw jack principle, driven by a reversible synchronous motor via a gear train and magnetic clutch.					
Motor	Split phase, capacitor reversing type, continuously rated.					
Spindle Coupling	Claw coupling.					
Manual Override	Adjusted by means of a screwdriver slot in the top of the cover. AVUE has a reset button on underside for use when manual override is operated when unit is powered up.					
Mounting Attitude	See Installation on Page 4 for details.					
Wiring	Colour coded fly lead, 1.5m long, 3 core.					

## AVUE ACTUATORS (0-10V MODULATING) GUIDE TO SELECTION

The 'AVUE' unit valve actuators are factory set with respect to Direct Acting (DA)/Reverse Acting (RA) control action to minimise site installation and commissioning time. To ensure correct selection of actuator specification to suit the particular application, controller and type of control valve, please refer to the tables and diagrams below.

### CONVENTION OF OPERATION OF DIRECT AND REVERSE-ACTING ACTUATORS (12.7mm UNITS)

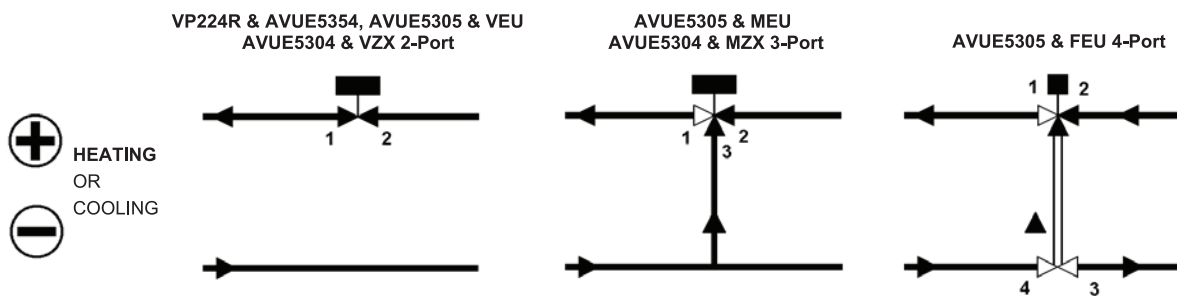
Actuator	Signal	Spindle Position 		VZX / MZX		VP224R	
				ACTION	Position of Ports 1-2	ACTION	Position of Ports A-B
AVUE5304	0V 10V	Retracted Extended	0% 100%	Direct Acting (DA)	Closed Open	Reverse Acting (RA)	Open Closed
AVUE5354	0V 10V	Extended Retracted	100% 0%	Reverse Acting (RA)	Open Closed	Direct Acting (DA)	Closed Open

### VALVE COMPATIBILITY AND CONVENTION OF DIRECT AND REVERSE ACTING (ALL UNITS)

Actuator	Valve			
	VP224R	VZX (2 port) / MZX (3 port) (Series 4)	VEU (2 port) / MEU (3 port) (Series 4)	FEU Mk5/6 (4 Port) (Series 5/6)
AVUE5305 (9.5 mm stroke)	No	No	Direct Acting	Direct Acting
AVUE5355 (9.5mm stroke)	No	No	Reverse Acting	Reverse Acting
AVUE5304 (12.7mm stroke)	Reverse Acting	Direct Acting	No	No
AVUE5354 (12.7mm stroke)	Direct Acting	Reverse Acting	No	No

AVUX5202 and AVUM5601 floating actuators will connect to all valves noted in the table above.

### AVUE ACTUATOR/VALVE COMBINATIONS (DIRECT ACTING)



## INSTALLATION

### Mounting and checking the flow setting

Before the AVUE/X/M is mounted onto the VP224R pressure independent control valve, it is advisable, if not already done so, to set the flow to the required design flow rate.

If the maximum flow rate has already been set, a valve tag/hanger ID should have been completed and attached to the valve.

If the maximum flow rate has been set using the hand flow setting knob, the top section of the valve tag should be completed, if the valve tag/hanger ID has the bottom section completed, presume a balancing engineer has finely set the flow on the valve already. In this instance the actuator should be mounted and commissioned as necessary.

If the desired flow through the valve is known, the flow can be set using the hand flow setting knob. The valve data sheet should be consulted for the setting position needed. Once done the upper portion of the valve tag/hanger ID should be completed and the actuator mounted and commissioned as necessary.

If the desired flow is not known and it is necessary to fit the actuator for commissioning purposes, then the actuator may be fitted but the valve tag/hanger ID should not be filled but left for the balancing engineer at a later stage.

*Note: It is necessary to fit a stem nipple on to the VP224R valve prior to mounting the actuator. The stem nipple is supplied loose with the AVE5354, AVUX5202 and AVUM5601 actuators.*

## CAUTION

The actuator can be mounted in any position but it is advisable to orientate the installation so that condensation or any potential water leaks can not enter the housing.

Ambient temperature must be within limits 0 to 50°C.

Never run the actuator without a valve attached to it.

Ensure that location is reasonably clean and dry with adequate access for fitting and wiring.

Do not install near large contactors, electrical machinery, or welding equipment.

Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.

Do not operate the manual override with power connected to the actuator.

Applying power to the actuator before fitting to the valve will drive the actuator spindle away from its preset installation position and adjustment of the Manual Override will then be required to enable fitting to the valve.

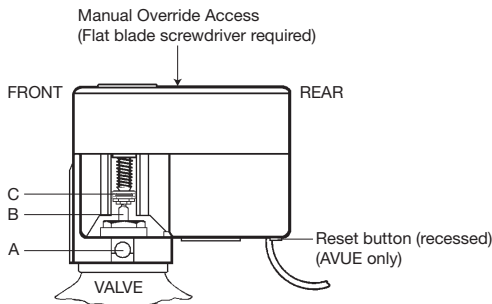
*Note: There is no need to remove the actuator cover.*

1. Check that actuator specification number is correct for the application (see Commissioning Note 1) and that it is the correct voltage for the controller or device being used.
2. Ensure that the two captive fixing screws (A) in the mounting frame are fully retracted. With the valve spindle (B) fully withdrawn, tilt the actuator and lower it over the valve so that the claw coupling (C) on actuator spindle engages with the grooved bush on top of the valve spindle. On the VP224R, this is a loose adaptor.
3. Lower the actuator frame onto the valve until it is flush with the valve clamping face. Finger tighten the two captive screws. Tools are not required.

*Note: The claw coupling should already be in the optimum position; if not, adjust the Manual Override on the top of the unit (a small, flat-blade screwdriver will be required; turning the screw clockwise will drive the claw coupling down). Not applicable for the VP224R valve.*

4. Connect the colour-coded fly lead to the controller, as in the appropriate connection diagram (see Page 5), observing cable length and resistance limitations under 'Wiring Precautions'. Ensure the cable is routed clear of valve and pipework.

## INSTALLATION



- A: Locking screw
- B: Valve stem with coupler
- C: Actuator claw

## WIRING PRECAUTIONS

Wiring from actuator to controller <sup>a</sup>	Max. length 1.5mm <sup>2</sup> cable unscreened	Max. resistance per conductor
AVUE 24Vac supply	100m	3Ω
AVUE 0-10Vdc signal	100m	50Ω
AVUX 24Vac	100m	5Ω
AVUM - 230Vac	100m	10Ω

## COMMISSIONING

1. Check that actuator specification number is correct for application by reference to identification label. See 'Guide to Selection' and that it is the correct voltage for the controller or device being used.
2. Check ambient temperature conditions.
3. Check that the actuator has been correctly assembled to the valve as directed in the installation instructions and that the fly lead is routed clear of the valve body and pipework.
4. Check that the control circuit wiring is correct and in accordance with the overall control system wiring diagram.
5. Switch on the ac supply and adjust the controller set value to check that the actuator operates through its full stroke and in the correct direction with respect to high or low set value settings. Check that the actuators and valves operate in the correct sequence with two-stage control systems. Refer to the actuator selection guide.
6. Check for correct operation of the valve when power is applied from the controller or device and that the actuator operates in both directions.
7. Wait approximately 85 seconds (short stroke models) or 110 seconds (long stroke models) for the valve to self reference.

## MANUAL OVERRIDE RESET FACILITY (AVUE only)

The purpose of the Reset button (on the underside of the AVUE actuator) is to cause the actuator to drive to a point of self reference. A Reset is required only in the following circumstances:

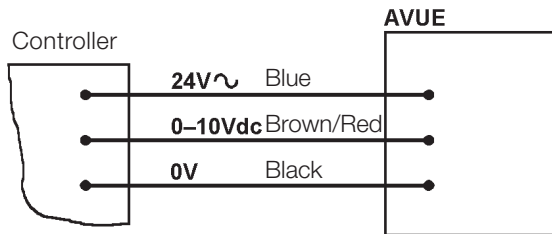
1. If the Manual Override has been operated when the actuator is powered up
2. If it is necessary to re-align the actuator to a point of self reference during maintenance. The AVUE will automatically reset on restoration of power, following a power failure.

For longer lengths, increase cable size and observe maximum resistance shown in the table. Screen the wiring using either screened cable or MICC and earth the screen at the controller only.

For longer lengths of AVUE 24Vac supply wiring, increase cable size and observe maximum resistance, also run separate return from 0V connection (Black). See connections diagram.

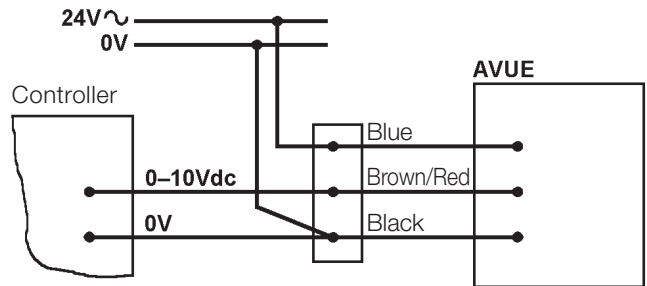
## WIRING DIAGRAMS

### Basic Diagram

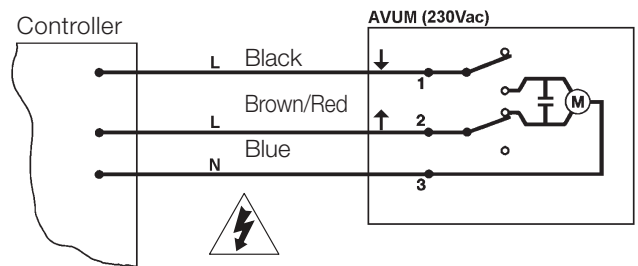
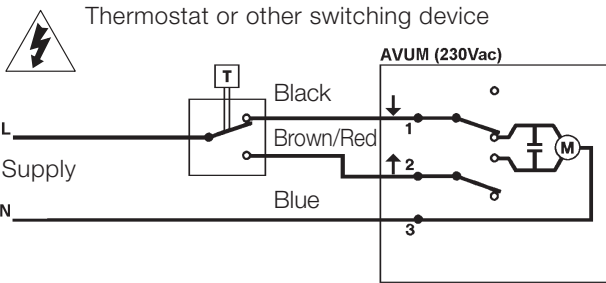


Up to 10 AVUE actuators can be connected in parallel. Ensure that the 24Vac supply is rated to operate the number of AVUEs connected to it.

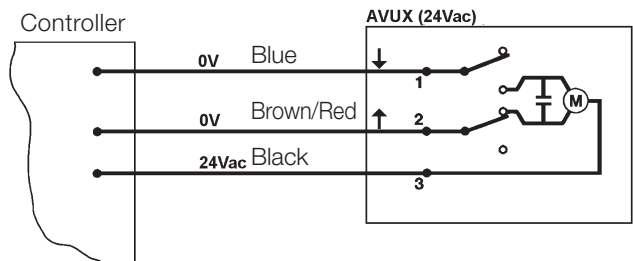
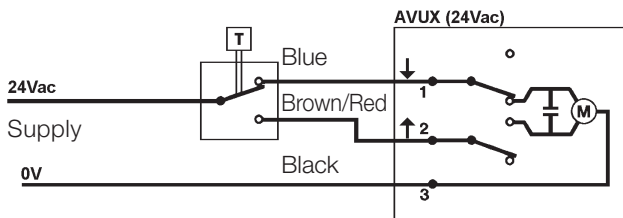
### Separate 24 Volt Power Supply



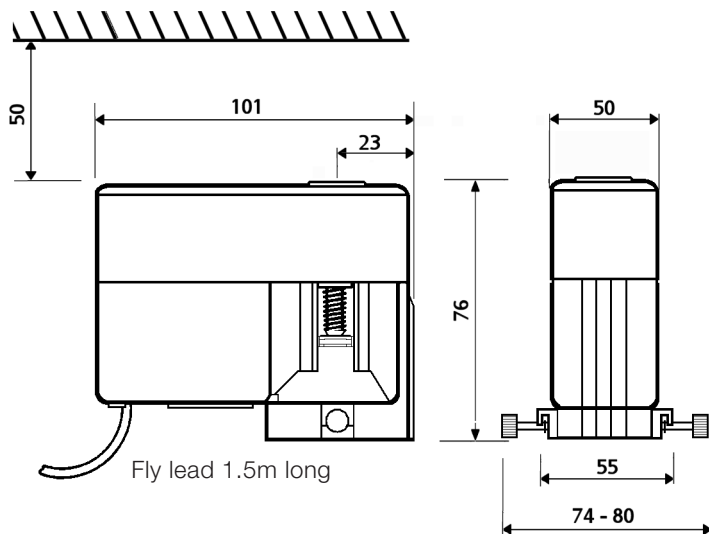
Up to 10 AVUE actuators can be connected in parallel. Ensure that the 24Vac supply is rated to operate the number of AVUEs connected to it.



### Thermostat or other switching device



### DIMENSIONS mm



Weight: AVUE 333g  
 AVUX 320g  
 AVUM 400g

### WARNINGS

**Warning - Steam or hot water hazard. Before removing actuator from valve or opening valve ensure that the valve control medium is isolated and relieve the pressure. Work should only be carried out by a competent engineer.**

**The AVUM is at mains potential. Local wiring precautions and usual safety precautions must be observed. Do not remove the cover as mains potential will be exposed.**

#### Cautions

- The AVUE is a low voltage (24Vac) device and should only be used with the appropriate controller. Local wiring precautions and usual safety precautions must be observed.
- Observe wiring precautions on Page 6.
- Observe installation instructions on Page 4.
- Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.
- Applying power to the actuator before installing on the valve will drive the actuator spindle away from its preset installation position and adjustment of the Manual Override will then be required to enable fitting to the valve.
- If any equipment covers have to be removed during the installation of this equipment, ensure that they are refitted after installation to comply with UL and CE safety requirements.
- Do not install near large contactors, electrical machinery, or welding equipment.
- Observe maximum and minimum ambient temperatures.
- Check maximum differential pressure of valve to be driven. Do not exceed maximum differential pressure.
- Interference with parts under sealed covers invalidates the guarantee.
- Design and performance of Schneider Electric equipment is subject to improvement and therefore liable to alteration without notice.
- Information is given for guidance only and Schneider Electric does not accept responsibility for the selection and installation of its products unless information has been given by the Company in writing relating to a specific application.
- A periodic system and tuning check of the control system is recommended. Please contact you local sales office for details.

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