

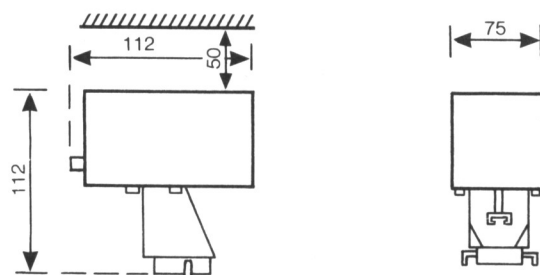
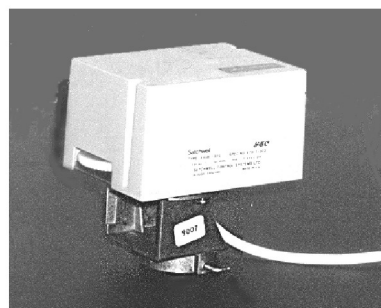
VALVE ACTUATOR

Type AVUE

The AVUE Valve Actuator is a 24 V reversing actuator having a linear output drive and is used in conjunction with any controller providing a 0-10 V dc output signal, to operate Satchwell VEU, VZX 2-port or MEU, MZX 3-port control valves. These control valves are applied, typically, to regulate the flow of either hot or chilled water 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.

FEATURES

- Simple to install. Direct coupling to valve without use of tools.
- Minimal commissioning. No site adjustments required.
- Compact size.
- Universal for use with Satchwell 2 and 3-port unit valves, sizes 1/2" and 3/4" also 1/2" to 2" VZX and MZX valves.
- Makes Satchwell unit valves compatible with any sensor, controller or building automation system providing a 0-10 V dc output control signal.
- Choice of specifications, to suit control signal, type of valve and application.



Dimensions in mm

Weight: 0.62 Kg

SPECIFICATION

Type	AVUE 3304	AVUE 1302	AVUE 1303	AVUE 3354	AVUE 1352	AVUE 1353
Specification no.	478-1-301	478-1-302	478-1-303	478-1-351	478-1-352	478-1-353
Input control signal	0-10 V dc	0-4 V dc	6-10 V dc	0-10 V dc	0-4 V dc	6-10 V dc
Control action	Direct	Direct	Direct	Reverse	Reverse	Reverse
Identification label colour	Red	Orange	Black	Blue	Yellow	Green

Note: Refer to 'Guide to Selection' on page 2 to match control signal, valve and application.

Power Supply:	24 V \pm 10%, 50/60 Hz.
Power Consumption:	5 VA
Action:	Reversing, modulating.
Stroke:	12.7 mm (1/2")
Stroke Time:	60 secs.-50 Hz; 48 secs.-60 Hz.
Thrust:	105N
Electrical Connection:	Fly lead, 3-core, 1.0 m long.
Ambient Temperature Limits:	Operating: -20 to 50°C. Storage or Transit: -40 to 70°C.
Maximum Ambient Humidity:	Operation and storage: 95% rh non-condensing.

Associated Controllers:	Product	See Data Sheet
	DDTE, DWTE, DSTE	DS 1.20
	DRTE	DS 1.21
	CZT (MK4)	DS 2.21
	KZT, KZH	DS 2.53
	KET	DS 2.55
	FSS	DS 2.62
	FSC	DS 2.64
	MMC	DS 2.70
	BAS 2000	DS 13.31/2/3/5
	MSC	DS 2.54
	CVR	DS 2.81
Associated Control Valves:	VEU, MEU	4.02
	VZX,	DS 4.18
	MZX	DS 4.38

CONSTRUCTION

Case:	Mild steel baseplate with moulded polycarbonate cover (Fire resistant to UL 94 V-0).
Mounting Bracket:	Diecast aluminium with angled fixing screws.
Motor:	Split-phase capacitor type, reversing. Continuously rated.
Spindle Coupling:	Simple claw-type engagement for quick assembly.
Manual Operator:	By thumb rotation of partially exposed gear wheel.
Protection Class:	IP40

GUIDE TO SELECTION

The 'AVUE' unit valve actuators are factory set with respect to DA/RA control action and voltage span, 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.

Table 1 defines the operation of the direct and reverse-acting actuators with respect to input voltage signal and type of control valve.

Table 1
Convention of operation

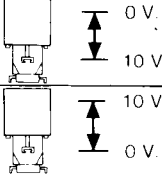
Action	Signal	Spindle Position		Position of ports 1-2
				VEU, VZX, MEU, MZX
Direct	0 V	Retracted	0 V	Closed
Acting	10 V	Extended	10 V	Open
Reverse	10 V	Retracted	10 V	Closed
Acting	0 V	Extended	0 V	Open

Table 2 is a comprehensive, but simple guide to ensure correct selection by logically checking through other known information, for example:-

- Application:**
Controller:
Valve type:
- Single-stage heating cooling, or two-stage heating and cooling etc.
DRTE, KET or BAS etc. as listed in left hand column. A controller output diagram is included for further guidance.
VEU, VZX 2-port or MEU, MZX 3-port as required.

Actuator:

The type reference is given below each valve, relative to application. The colour refers to a prominent label affixed to the side of the actuator frame, for quick and easy identification on site (as illustrated below).

- ACTUATOR SIGNAL/ ACTION**
0-10V dc DA
0-4V dc DA
6-10V dc DA

0-10V dc RA
0-4V dc RA
6-10V dc RA

- IDENTIFICATION LABEL COLOUR**
Red
Orange
Black

Blue
Yellow
Green

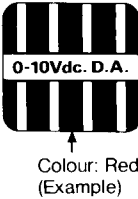
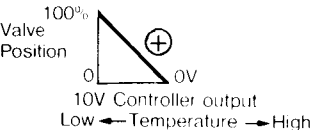
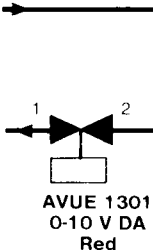
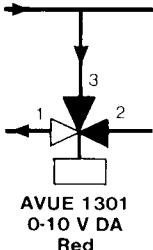
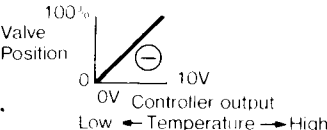
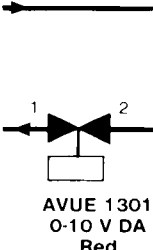


Table 2

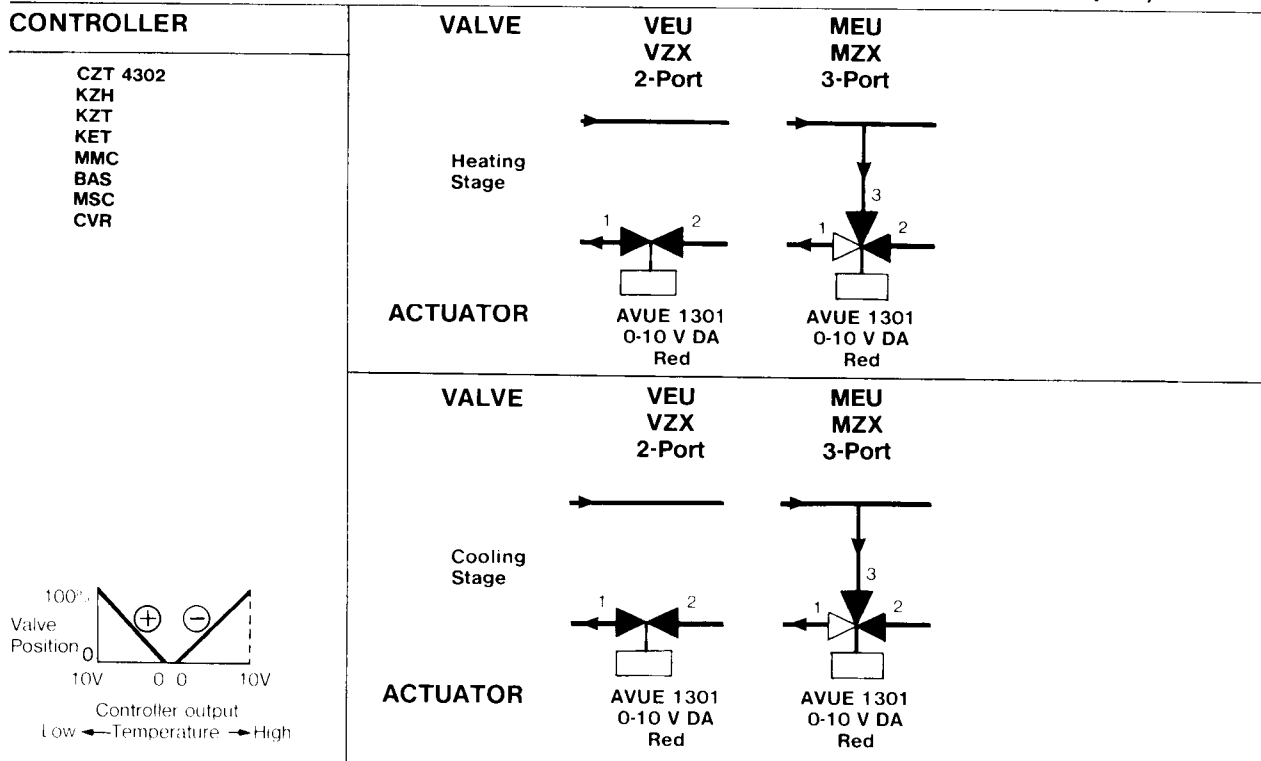
APPLICATION: Single-Stage Heating

CONTROLLER		VALVE	
DRTE	KET	VEU	MEU
DDTE	FSS	VZX	MZX
DWTE	FSC	2-Port	3-Port
DSTE	MMC		
CZT 4302	BAS		
CZT 4303	MSC		
KZH	CVR		
KZT			
			
10V Controller output Low ← Temperature → High			
		ACTUATOR	
			
		AVUE 1301 0-10 V DA Red	AVUE 1301 0-10 V DA Red

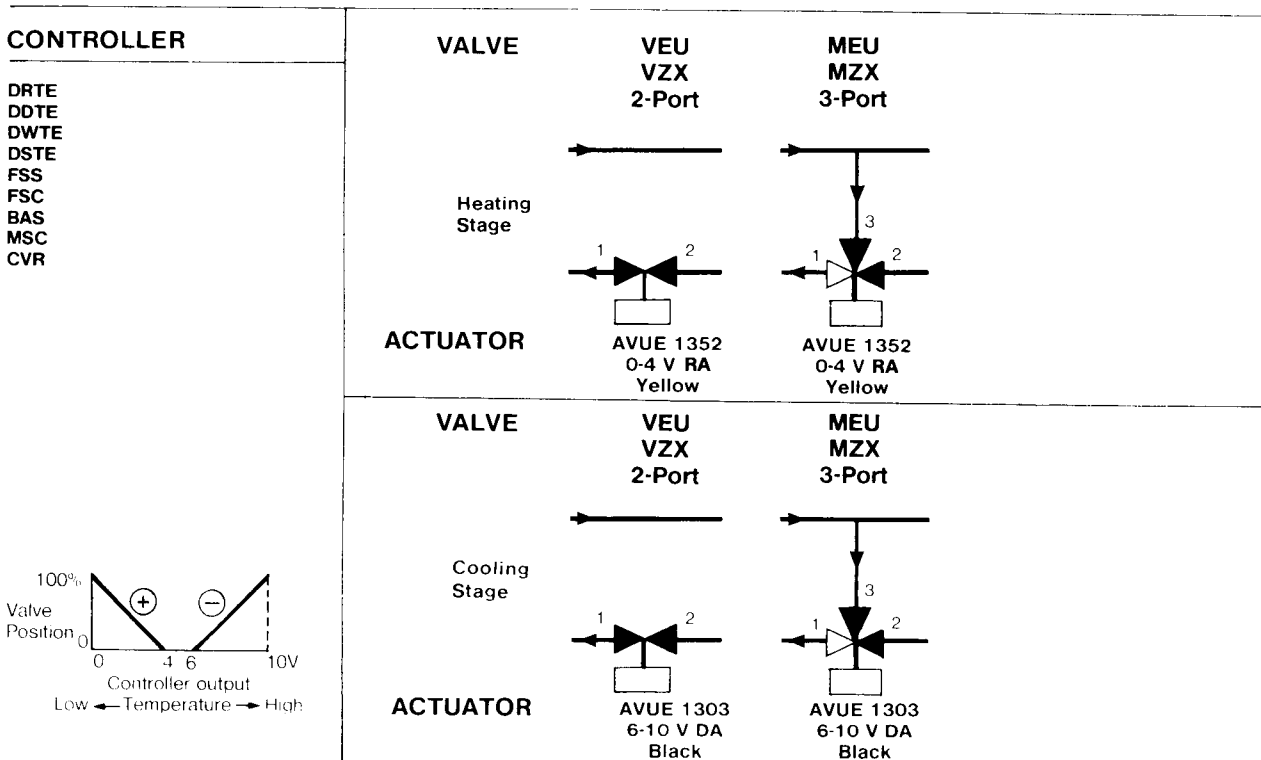
APPLICATION: Single-Stage Cooling

CONTROLLER		VALVE	
DRTE	FSS	VEU	MEU
DDTE	FSC	VZX	MZX
DWTE	MMC	2-Port	3-Port
DSTE	BAS		
CZT 4302	MSC		
KZH	CVR		
KZT			
KET			
			
Valve Position		ACTUATOR	
0V Controller output		AVUE 1301	
Low → Temperature → High		0-10 V DA	
		Red	

APPLICATION: Two-Stage, Heating and Cooling (Two separate 0-10 V dc controller outputs)



APPLICATION: Two-Stage, Heating and Cooling (One common 0-10 V dc controller output)



INSTALLATION

Observe the following **IMPORTANT** points:-

- Ambient temperature must be within limits -20 to 50°C.
- Ensure that location is reasonably clean and dry with adequate access for fitting and wiring.
- Do not install with actuator below level of valve.

Note: There is not any need to remove the actuator cover.

1. Check that actuator specification number is correct for application, see commissioning Note 1.
2. Unscrew the two captive angled fixing screws in mounting frame and with the valve spindle fully withdrawn, tilt actuator and lower over valve so that the claw coupling on actuator spindle engages with the grooved bush on top of valve spindle.
3. Now lower actuator frame onto valve clamping face and tighten the two angled screws. Tools are not required.
4. Connect colour-coded flying lead to controller, as

resistance limitations under 'Wiring Precautions'. Ensure cable is routed clear of valve and pipework. Refer to page 4 for typical wiring diagrams.

Do not switch on the power supply until the commissioning steps on page 3 have been completed.

COMMISSIONING

1. Check that actuator specification number is correct for application by reference to coloured identification label. See 'Guide to Selection' on page 2.
2. Check that actuator is correctly fitted to valve, also that flying lead is routed clear of valve body and pipework and correctly connected to controller.

TYPICAL APPLICATIONS

2-STAGE HEATING & COOLING (CZT 4302)

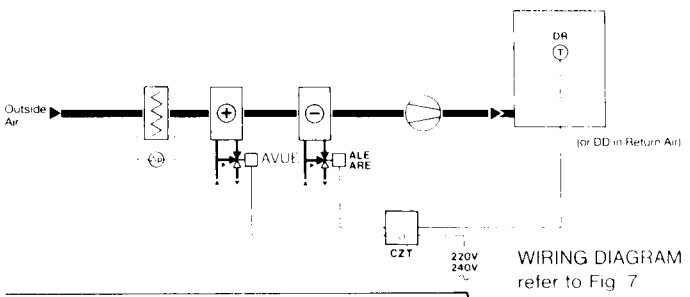


Fig. 1

3-STAGE HEATING, AIR DAMPERS AND COOLING (KET)

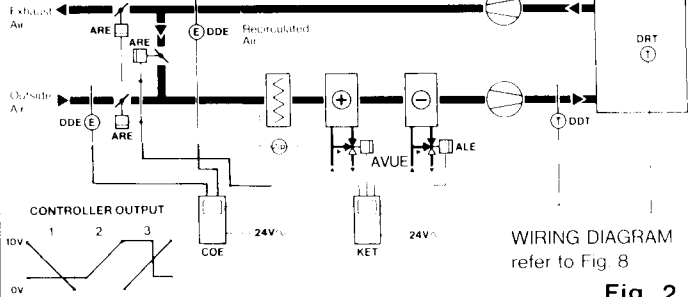


Fig. 2

CONNECTION DIAGRAMS (Typical)

BASIC DIAGRAM FOR AVUE ACTUATORS

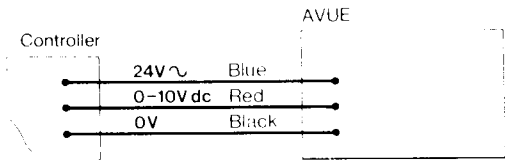


Fig. 3

SEPARATE 24 VOLT POWER SUPPLY TO AVUE

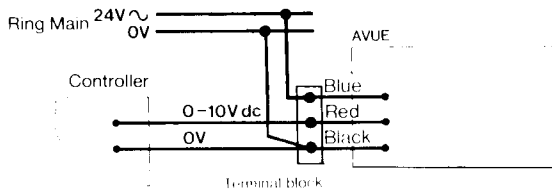


Fig. 4

TWO-STAGE SEQUENTIAL OPERATION

from one 0-10 volt command signal, incorporating dead zone

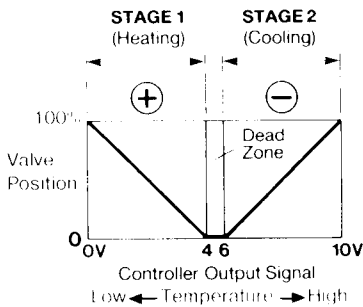
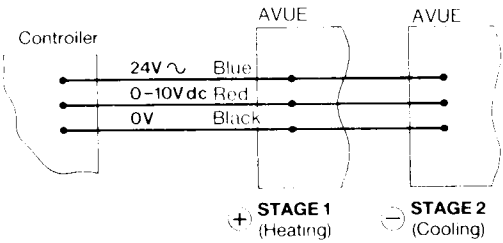


Fig. 5

1-STAGE HEATING OR COOLING (DRTE)

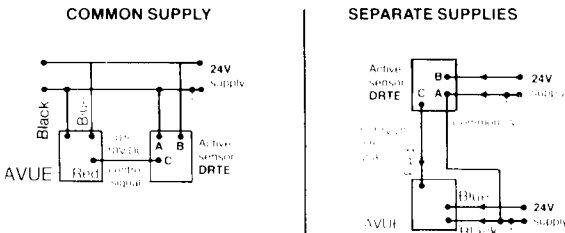


Fig. 6

2-STAGE HEATING & COOLING (CZT 4302)

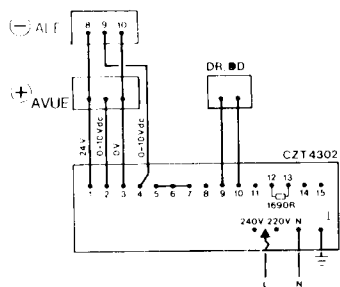


Fig. 7

WIRING PRECAUTIONS

Wiring from actuator to controller*	Max. length of 1.5mm ² cable unscreened	Max. resistance per conductor
24V~ supply	100m	3 Ω
0-10V dc signal	100m	50 Ω

For longer lengths of 24 volt supply wiring, increase cable size and observe maximum resistance; also run separate return from 0V connection (Black) as fig 4.

Where screening is required, use either screened cable or MICC.

* When wiring to BAS 2000 outstations refer to the appropriate outstation data sheet for the wiring precautions.

3-STAGE HEATING, AIR DAMPERS & COOLING (KET)

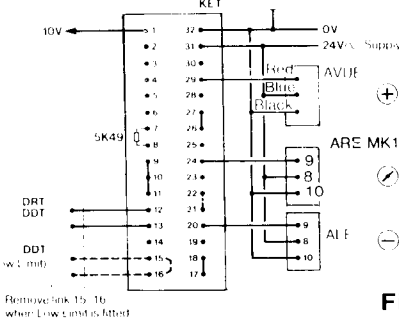


Fig. 8

CAUTION

- Observe local wiring regulations and usual safety precautions. Note fusing and earthing requirements.
- These are low voltage devices: do not exceed rated voltages.
- Do not switch on power supply until commissioning checks have been completed. See page 3 for details.
- Observe limits of water temperature, system pressure and maximum differential pressure for control valves.
- Observe wiring precautions.

- Observe maximum and minimum ambient temperature.
- Interference with those parts under sealed covers renders the guarantee void.
- Design and performance of Satchwell equipment are subject to continual improvement and therefore liable to alteration without notice.
- Information is given for guidance only and Satchwell do not accept responsibility for the selection or 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.