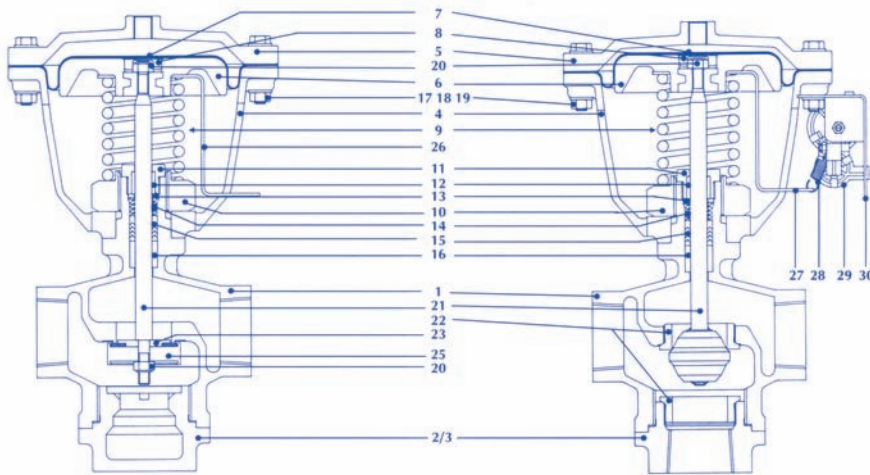


### Parts List On/Off & Modulating

The parts list numbers apply to both screwed and flanged valves for 2-way and 3-way styles although only the Fig. 71 and Fig. 75AK are shown here for example purposes only.



On/Off Soft Seat  
Fig. 71

Modulating 3-Way  
Fig. 75AK

### Components & Materials

1. Body  
Bronze or Stainless Steel
2. Bottom Cover 2-Way  
Bronze or Stainless Steel
3. Bottom Cover 3-Way  
Bronze or Stainless Steel
4. Actuator Yoke  
Cast Aluminium (Plastic Coated)
5. Actuator Cover  
Cast Aluminium (Plastic Coated)
6. Actuator Disc  
Cast Aluminium (Plastic Coated)
7. Diaphragm  
Nylon Reinforced Epichlorhydrin
8. Diaphragm Spacer  
Epichlorhydrin
9. Actuator Spring  
Chrome Vanadium Steel
10. Yoke Retaining Nut  
Steel Zinc Plated
11. Gland Nut  
Brass or Stainless Steel
12. Header Guide Bush  
Carbon Reinforced ptfе
13. Packing Spring Washer  
Brass or Stainless Steel
14. Packing Spring  
Stainless Steel
15. Gland Seal Set  
ptfe Chevron Rings
16. Lower Guide Bush  
Carbon Reinforced ptfе
17. Hex Head Bolt  
Steel Zinc Plated
18. Plain Washer  
Steel Zinc Plated
19. Hex Nut  
Stainless Steel
20. Locknut  
Stainless Steel
21. Spindle/Plug Assy  
Stainless Steel
22. Valve Seat  
Stainless Steel
23. Insert Retaining Ring  
Stainless Steel
24. Soft Seat Insert  
Glass Filled ptfе
25. Plug  
Stainless Steel
26. Stroke Indicator Alarm  
Steel Zinc Plated
27. Stroke Take Off Arm  
Steel Zinc Plated
28. Range Spring  
Stainless Steel
29. AK Positioner  
Polysulphone
30. Mounting Bracket  
Steel Plastic Coated

### Valve Sizing

Fig. 75AK-78AK linear 3-way

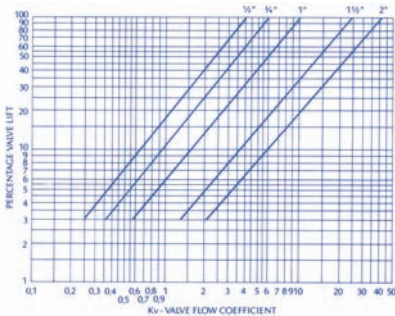
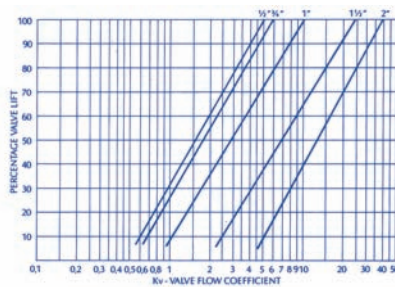


Fig. 74AK-77AK equal percentage 2-way



#### Valve Sizing

The universal method of valve sizing is by the Kv or Cv method. Both these flow coefficients give an indication of valve's capacity to handle flow. Each MINIMATIC valve size has a single fixed Kv valve shown on the relevant datasheet.

For practical purposes Northvale uses simplified sizing formulas. More complex formulas for steam and gas will give only minor variations and are only appropriate for severe service conditions.

Having calculated the Kv valve required from the following formula the appropriate valve size can be selected from the graphs, taking into account the maximum and minimum flow requirements. MINIMATIC valves have modest turndown ratios and it is good practice to select a valve size which is 80-90% of its full stroke at max Kv

requirement and not less than 10% at minimum Kv requirement

Note: The flow rating of a valve is expressed as the Kv, a coefficient established experimentally. It corresponds to the flow of water in m<sup>3</sup>/hr for a pressure differential of 1 bar with the valve fully open.

Kv can be related to the US coefficient Cv, which is USgpm with a 1psi differential pressure as follows:

$$Cv = 0.866 \times Kv$$

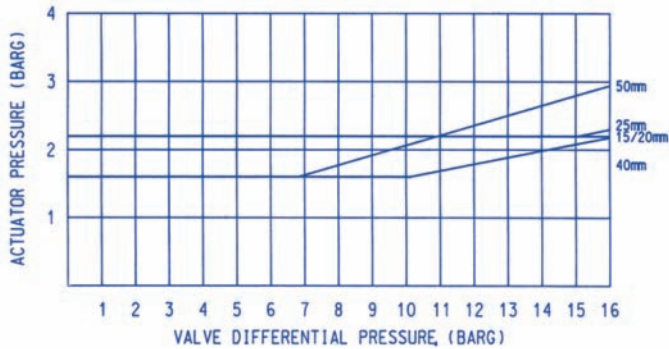
$$\text{Liquid Kv} = \frac{Q\sqrt{SG}}{\sqrt{\Delta p}} \quad \begin{array}{l} Q = \text{m}^3/\text{hr} \\ \Delta p = \text{bar} \end{array}$$

$$\text{Steam Kv} = \frac{W}{22.4 \sqrt{\Delta p \times P_2}} \quad \begin{array}{l} W = \text{kg}/\text{hr} \\ \Delta p = \text{bar} \\ P_2 = \text{Outlet} \\ \text{Pressure Bar A} \end{array}$$

## Actuator Pressure

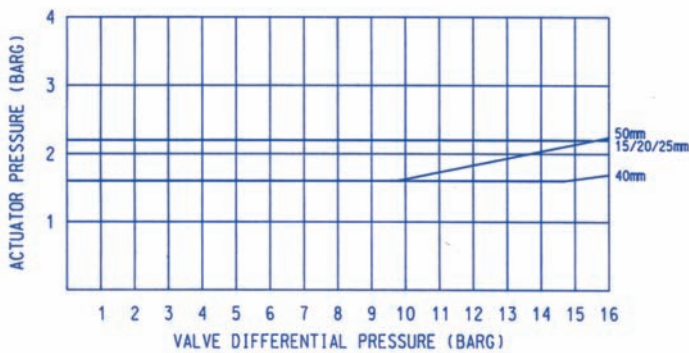
The actuator pressure required to operate the valve can be determined from the graphs below. The straight line portion of the graph shows the minimum actuator pressure required to compress the valve spring.

ACTUATOR OPERATING PRESSURE ON/OFF VALVES



3-Way On/Off Valve (Diverting Duty) Subject to the following limiting breakaway line pressures		
1/2" 3/4"		16 bar g
1"		13.2 bar g
1 1/2"		11.2 bar g
2"		6.9 bar g

ACTUATOR OPERATING PRESSURE MODULATING VALVES



3-Way Linear Valve are Subject to the following limiting breakaway line pressure		
1/2" 3/4" 1"		16 bar g
1 1/2"		12 bar g
2"		7.3 bar g

Note: For the three sizes of stainless steel valve at max pressure rating of 25 bar you would require a higher actuator air pressure.

	Soft Seated	Metal Seated
1/2", 3/4"	2.4 bar	2.2 bar
1"	3.3 bar	2.5 bar

## Valve Positioner

### AK Positioner

**General Description:** In the AK model, a positive positioner pneumatic relay is used to accurately position an actuator stroke with respect to signal pressure from the controller. The unit makes automatic correction for deviations from the true valve position, caused by factors such as stem friction or valve loading. The correcting action is affected by sensing the true stem position through the feedback lever.

The positioner is constructed of non-corrodable materials, with the housing being "Polysultone", and the diaphragm "Neoprene".

**Adjustments:** The AK performs the control functions outlined under the General Description. The positioner is calibrated and bench set up during assembly in our factory, however, if after installation it is necessary to reset the positioner to match a controller signal you may carry out the following adjustments.

- With the signal pressure at the required start point, turn the start point adjusting screw until the valve just begins to move Screw (b)
- Vary the signal pressure over the range and position the "Span adjusting slide screw" until the valve stroke gives the required span - Screw (a)

### Air Pressures:

- Main air: 2.5 bar  
Min-Max set
- Instrument signal 0,2 to 1,0 bar or split ranges.

### Field Adjustments

Both start point and the proportional band can be adjusted over the range of 0.14 to 0.86 bar (2 to 13psi).

Maximum Air Consumption 0.0493m<sup>3</sup>/hr (1.7 scfh)

### Maintenance & Repair

Do not field repair the positioner. It should be replaced if not operating correctly

### Environment

Not suitable for external installations. Environmental range is 0 to 40°C continuously and -20° to 60°C for unsustained periods.

