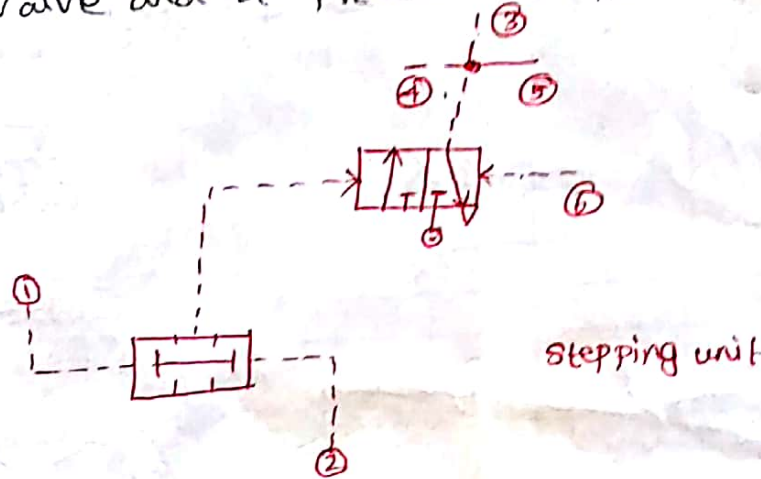


## STEP-COUNTER METHOD

A step-counter is a digital modular counter, constructed from stepping units which serve as sequence stepers.

A basic stepping unit is built from a signal out

MEMORY VALVE and a pre-switched AND valve with two inputs.



### Steps involved

**Step 1** :- Draw the position diagram. Position-step diagram is used to represent movement of drive elements. In position-step diagram the x-axis represents stops i.e., the sequence of operation is divided into a number of steps which are expressed as 1, 2, 3, 4 etc. The y-axis represents position and is indicated as  $o_1$ . The functional lines are drawn in thick lines and they determine the position of driving unit. Any change of position of a member has to start or stop at a corner of the squares.

**Step 2** :- From the position-step diagram, the no. of stepping units are decided.

**Step 3** :- Draw the cylinders and their memory valves (D.C.V.s).  
Connect the memories to the cylinders.

**Step 4** :- Draw the step-counters.

**Step 5** :- Draw the position sequence valve.

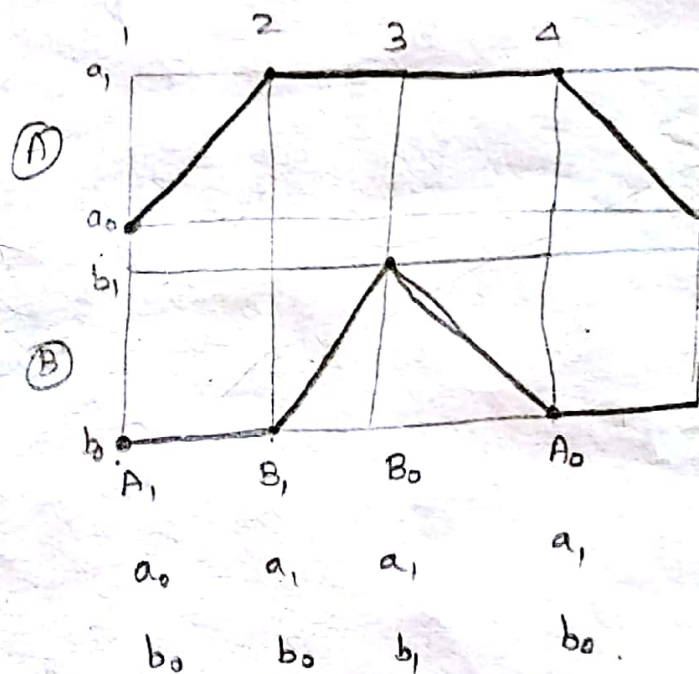
connect the stepping units and valves.

example :

considers an automatic drilling machine. The complete cycle is as follows: cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts. cylinder A then retracts to unclamp the work piece. Design a control circuit applying the step-counter method. The circuit is provided with a start value to avoid continuous cycling.

Steps :

step 1: Draw the position step diagram.



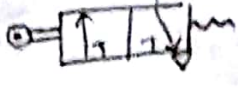
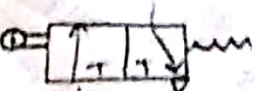
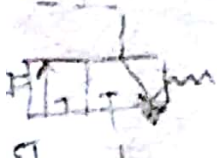
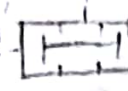
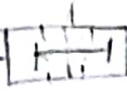
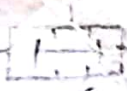
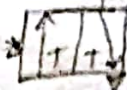
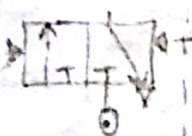
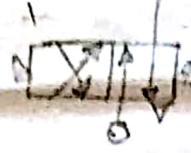
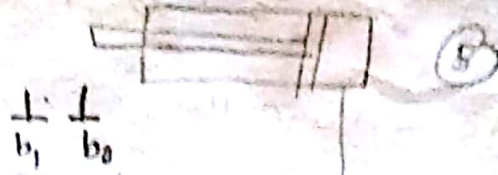
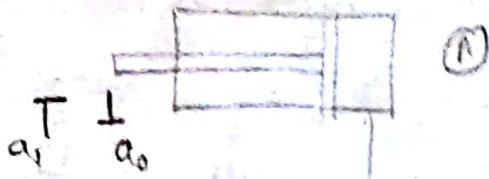
step 2: From position diagram, four stepping units.

step 3: Draw the two cylinders and their memory valves.

step 4: Draw the step-counter for the four steps, include start values.

step 5: Draw the position of sequence value.

step 6: connect the stepping units and valves.



pneumatic circuit diagram

(step counter method)

$a_1$   $b_1$   $b_0$   $a_0$