

Date of Issue:	Course code: IPS	Sheet ref #: FS-IPS-0290	Module title: Industrial Pneumatic Systems
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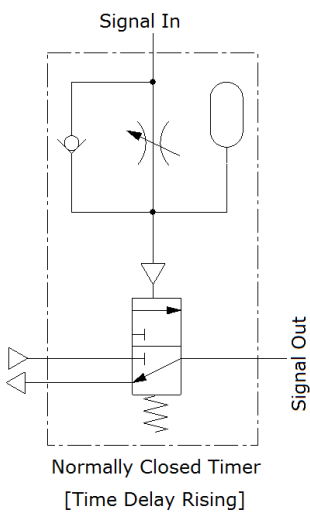
Pneumatic Timers

Pneumatic timers come either as *normally closed* or *normally open* versions. They consist of a variable restrictor, a check valve, a reservoir and a 3-port valve that is either normally open or normally closed depending on the timer type.

If a *signal in* is applied to the normally closed type, then there will be an air output after the time base passes.

If a *signal in* is applied to the normally open type, then air will cease to flow from the output after the time base passes.

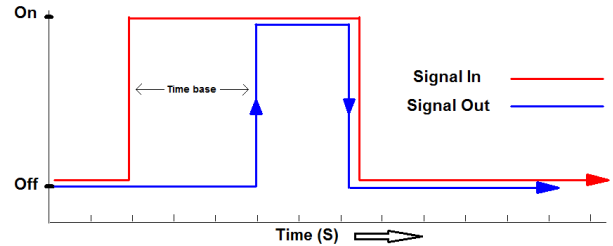
Let's look at the normally closed type:



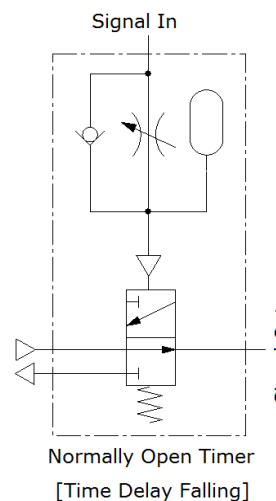
When a signal in is applied air will flow towards the variable restrictor and the check valve. It cannot pass the check valve and so has no choice but to flow on through the restrictor. The setting of the restrictor will determine how many seconds it takes for the reservoir to fill to create enough pressure to switch the 3-port valve – normally about 40psi. When the 3-port valve switches then the connected supply air will pass across the top envelope to make a *signal out*. If the signal in is released, the 3-port valve will revert to its spring position immediately as the contents of the reservoir will discharge through the easier path of the check valve rather than having to go through the restrictor.

The purpose of the reservoir is to allow sufficient volume downstream of the restrictor to create a time base. The

range of time bases, for example 0-10 seconds, 0-30 seconds, 0-60 seconds etc. can be accommodated by varying the size of the reservoir volume.

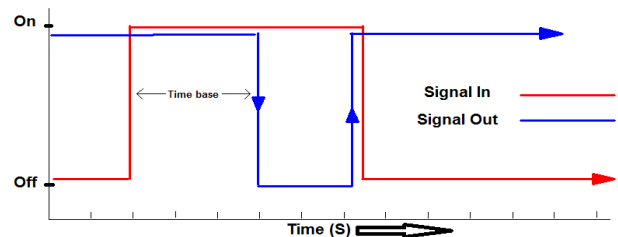


Below is the other type of timer, the Normally Open or Time Delay Falling:



With this Timer the operating principal is much the same. You can see that in the rest position with no signal in applied that mains air is creating a signal out. If a signal in is applied then after a pre-set period of time the reservoir becomes sufficiently charged

to overcome the spring in the 3-port valve and the valve switches to the pilot envelope and the output is directed to exhaust. Likewise when the signal in is released then the timer immediately reverts to its normal open condition as dictated by the spring envelope.



Timers are calibrated for accuracy by stopwatch. Note with some timers, changes to air pressure of the signal in control line will affect the time base!