



Types of Automation in Clamping

1. **Pneumatic Automation**

It is used only for small aluminium components, due to force and space constraints. In majority of the applications, hydraulic or hydropneumatic clamping is preferred.

2. **Hydraulic Automation**

It is used in SPMs, where it need long stroke, speed, sequencing and high volumes.

3. **Hydropneumatic Automation**

It has two types

○ **Hydropneumatic Intensifier**

It is widely used on conventional machines and SPMs, where a hydraulic power unit is not available on the machine. Low cost, simpler circuit and no oil heating as compared to hydraulic power unit, are some of its advantages.

○ **Hydropneumatic Pump**

It combines advantages of hydraulic and hydropneumatic automation. Longer stroke and sequencing is possible without oil heating problem.

Another consideration is the production volume.

1. **Manual clamping** is used in prototype production or batch production where production volumes are low. As the production increases, even conventional machines are dedicated for specific operation.
2. **Hydropneumatic clamping** is generally used at this production level (50 to 200 jobs per shift).
3. **Hydraulic clamping** in SPM is preferred when the production level goes near 1 job per minute.