AMADA MIYACHI AMERICA, INC.

Pneumatics in AMYA Systems

Amada Miyachi America (AMYA) Engineers are frequently asked about safety regarding pneumatics in laser systems. The handling of pneumatics is different depending on the type of system and the nature of potential pneumatic hazards. With AMYA systems in general, pressures are relatively low and forces generated are extremely unlikely to cause serious injury.

Systems with pneumatic (up/down) doors:

All AMYA Systems with pneumatic doors have a pressure sensitive safety strip connected in the door controls. When contacting an object with sufficient force, the contact switch will close. The controls sensing this will control the door to open at slow speed.

Pneumatic doors are typically configured to stay up on power shut off and E-stop. This is for safety so that a door will not slam down on an operator in the event of power / pneumatic fluctuations.

When requested by customers, AMYA can insert a solenoid valve connected to system 24 VDC power supply. This will allow the door to close slowly (bleed off) on power shut off. Unfortunately, the door safety switch is bypassed when power is off. This switch would normally keep the door from closing on the operator in an unsafe fashion.

Other Pneumatic Options:

AMYA can also put high flow check valves in the door control pneumatics to allow for dump valves to be incorporated. The check valves isolate door pneumatics from a rapid exhaust at the pressure inlet. When system looses pressure, the door would still stay open – or drop very slowly. A dump valve can be incorporated to the rest of the systems pneumatics. This will allow all the pneumatics, excluding door control, to relieve rapidly when power or pressure is shut off.

3-position valves can also be used for safe operation. These allow bleed off of pneumatic pressure in center position (power shut off). Another option is to put a simple valve connected to 24 volt power that will bleed pressure on power shut off. We have done both of these in the past for customers. Be aware that tooling operation may be affected during power/pneumatic shut off. Tooling must be designed so that clamps will not be damaged on shut down.

Soft start/exhaust valves:

Soft start/exhaust valves are also commonly referred to as pneumatic dump valves. These valves control the start up and shut down of pneumatic air supply. When pressure is connected, the valve will quickly control the air pressure to eliminate the hammering effect of sudden air pressure to pneumatic equipment. This allows the pressure to build slowly and helps prevent damage or injury. When pressure drops, the exhaust valve blocks the inlet air supply and exhausts the downstream air. This allows very quick safe shut-down of system with pneumatic cylinders de-energized.

Dump valves are not typically utilized in AMYA systems with pneumatic doors. They can be implemented on manual door or Class IV systems upon request. They are not recommended for systems with pneumatic doors. Upon special request, we can implement dump valves on these systems, but design details must be reviewed by AMYA and a waiver must be signed.