

BASICS OF AIR PREPARATION (FRL)

Treating compressed air at the application point delivers a better-quality compressed air, regulates pressure to the right level, and lubricates pneumatic tools and equipment. Air preparation at the point of use involves three elements, known as FRL.: Filtration (**F**) removes impurities and much of the water still found in the air system. Regulation (**R**) adjusts the air pressure based on application requirements. Lubrication (**L**) injects a controlled amount of lubricant (oil mist or fog) into the compressed air system to reduce premature wear of tools and equipment.

FILTRATION

Even when air is treated at the compressor outlet using water separators, refrigerated air dryers, filters, water/oil separators or drains, a compressed air system can still contain traces of water vapor and impurities. These vapors cool down and condense into water. This water requires filtration and must be eliminated at the point of application to prevent premature wear of air tools and equipment, lubricants from losing their efficiency, and pipes from freezing as temperatures drop.

Although new filters will provide proper airflow, saturated filters will cause pressure drops. Adopting a preventive maintenance program that involves periodically changing filter components will increase the air piping system efficiency.



REGULATOR

An air regulator is a control valve designed to regulate upstream pressure (at the valve inlet) to a downstream pressure level (at the valve outlet). This ensures a constant and accurate pressure, even if there are variations in upstream pressure or flow rate through the valve.

Since the required working pressure of pneumatic tools and equipment may be higher or lower than the system's pressure, it is critical that the pressure is regulated at the point of use. When compressed air tools and equipment are used at a pressure beyond the recommended level, energy is wasted, safety is jeopardized, and equipment is subject to premature wear. When a system operates at pressures below the recommended levels, it will not deliver the performance it is designed for. Controlling air pressure levels will optimize the efficiency of each pneumatic tools and equipment of a compressed air system.

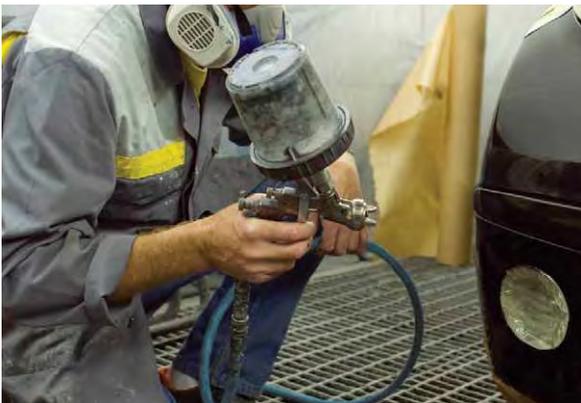


Where should a filter be installed?

- Install the filter at the furthest point from the compressor to allow the compressed air to be cooled and vapors to condense. It's easier to remove water in its liquid form than as vapor
- Install the filter as close to the tool as possible and before the lubricator and regulator
- Always install the filter with the arrows pointing toward the tool or application (the arrows show the airflow direction)

Where should a regulator be installed?

- Regulators should be installed on the pipe leading to each outlet that service applications and tools which require a working pressure different than the main system
- Always install the regulator downstream from a filter and upstream from a lubricator
- Always install the regulator with the arrows pointing toward the tool or application (the arrows show the airflow direction)
- Regulators can be installed vertically or horizontally



Paint application requires ultra-clean, dry air



Every tool and equipment have its own specifications for air pressure

LUBRICATION

Many components of a compressed air system and most air tools require lubrication to work properly and last longer.

Every air tool has its own specifications for lubrication. Too little oil can cause excessive wear and premature breakage, while too much is wasteful, can pollute, and lead to clogged pipes and equipment.

Lubricators properly adjusted prevent excessive wear and premature breakage as well as limit waste and prevent clogged pipes and equipment. A small amount of oil is released with each use.

Where should a lubricator be installed?

- Oil-mist lubricators should be installed within 5 meters of the application
- Micro-fog type lubricators should be installed within 30 meters of the application
- Always install downstream from a filter and a regulator
- Always install the lubricator with the arrows pointing toward the tool or application (the arrows show the airflow direction)
- Make sure the lubricator is accessible for replenishment. (check out Topring's series 69 air tool oils)



Lubricated air tools work more efficiently and last longer

FRL COMBINED UNITS

Filters, regulators and lubricators are usually installed in combination, near the application. Filter and regulator can be combined into one unit and precede either a lubricator (for air tools) or a coalescing filter (for paint applications).

These combinations are designed to provide the exact level of air treatment required, in a compact format. Their choice must be made according to the flow capacity of the most restrictive unit and according to the needs of the application.



TECH TIP

Regardless of the assembly, FRL units will only be able to hold using pipes and fittings. The addition of mounting brackets will prevent leakage to the intake threads.