Introduction

A well planned compressed air system is vital to efficient overall operation. Improper tool operation, higher costs per unit of compressed air and reduced component life are but a few of the many problems created by an inefficient system. This, in turn, results in the overall loss of millions of industry dollars every year.

Five key components to an efficient compressed air system are the filter, regulator, lubricator, dryer, and mechanical drain. When properly sized, installed and maintained, these units play a critical role in achieving optimum performance in the system. As a rule, no more than two devices should be serviced by a single filter, regulator, lubricator, or dryer.

Filters:

It is inevitable that impurities will make their way into the air distribution lines in any system. Pipe scale, rust, moisture, compressor oil, pipe compound and dirt are some of the contaminants that can damage valve parts and other close fitting parts of downstream devices.

A filter will remove all foreign matter and allow clean dry air to flow freely. It should be installed in the line upstream from all working devices and in such a way that it cannot be bypassed to avoid damage to those devices.

The filter capacity should be large enough to handle the required flow of air. In order to properly size a filter for a particular application, the maximum allowable pressure drop that can be caused by the filter should be established.

Regulators:

Pneumatic equipment is designed to operate properly at a certain pressure. Although most equipment will run at pressure higher than recommended, the excess force, torque and wear can shorten the equipment's life and waste compressed air. A regulator will provide a constant set flow of air pressure at its outlet, thus assessing optimum operation and life of the downstream equipment.

The size of the regulator is determined by the downstream flow and pressure requirements. While an undersized regulator will not be able to provide the required air pressure during maximum flow conditions, an oversized regulator will be more costly than necessary to do the job.

Lubricators:

Most moving parts require some form of lubrication. The high costs of inefficiently running equipment and repair expenses make the addition of an air line lubricator an economical practice. Lubricators store oil and inject a preset amount of oil mist, or fog, into the air stream which is then delivered to the downstream device.

The size of the lubricator for a particular application is determined by the downstream requirements. The charts provided for the various lubricators in the catalog will determine the pressure drop at the required flow rate and pressure. The pressure drop should be no greater than 5 PSID. A larger lubricator should be used if the pressure drop is over 5 PSID.

Special attention should be paid to the compatibility of the lubricants used in the system and the materials in the lubricator, especially where plastic reservoirs (bowls) are concerned. Should there be any question regarding their compatibility, consult the factory or use a metal reservoir.

Desiccant Air Dryers:

The presence of water or moisture in an air line system is undesirable because of the damage it can do to pneumatic tools, cylinders, valves, and other components. When air is compressed, both its temperature and capacity to hold moisture are increased. As the air moves downstream and cools to the "dew point," the moisture condenses into drops of water (liquid condensate). Although much of this liquid can be removed through the use of filters, driplegs and drain traps, water vapor and aerosols will remain in the line.

The most reliable and cost efficient method of removing this residual vapor and aerosols is with a desiccant air dryer. These units are especially effective for protecting laboratory instrumentation, spray painting operations and air lines that are exposed to freezing conditions.

Mechanical Condensate Drains:

Condensation accumulated from compressor tanks, filters, drop legs, after coolers, dryers or other devices must be drained off so it does not flood the system. As a means of eliminating the chore of manually draining this liquid build-up from numerous collection points, a mechanical condensate drain will do it automatically while minimizing air loss. As the liquid level inside the collection bowl rises, a float is lifted and opens the drain valve. The liquid accumulated inside the bowl is then discharged at line pressure.

Coilhose offers a wide and diversified line of air preparation units to satisfy the requirements of any air line system in the most efficient and economical manner.

Sizing

Determining the correct filter, regulator or lubricator to use in an application can seem complicated. A simple checklist of information can help.

- **SCFM** (Standard Cubic Feet per Minute): Also known as flow, this is the actual volume of air required.
- **Supply pressure**: What is the supply pressure from the compressor? (Note: This can vary depending on where the application is in the system.)
- **Pipe size** of the supply piping?
- **Filtration requirements**: How clean does the air have to be for the application?
- **Pressure requirements**: At what pressure will the application operate the best?
- **Pressure drop**: What is the allowable pressure drop?
- **Lubrication requirements**: Does the application require lubrication?
- **Application requirements**: Are there any special application needs?
- **System capacity**: Does the overall pneumatic system have the capacity to meet all application needs?

Necessary information for sizing filters, regulators and lubricators include:

Pipe Size
Allowable pressure drop
SCFM
Supply pressure