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Hard copy product catalogues, and CDRoms have been published describing Kuhnke Pneumatics, Solenoids, Relays and Electronics; some divided into different books. A list of current publications is available on this web site or from our sales offices. Some may be available for download, but as substantially larger files.

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Important Note

The information shown in these documents is for guidance only. No liability is accepted for any errors or omissions. The designer or user is solely responsible for the safe and proper application of the parts, assemblies or equipment described.

General Hints and Reminders

Miniature Pneumatics-General

Today's industry, because of increased costs, and severe competition, is forced to find new ways of automating work tasks to maintain a competitive edge. Miniature Pneumatics provide a low cost answer for all types of automation solutions. The Kuhnke miniature pneumatic line is a broad selection of devices, from valves-to cylinders-to specialty devices that provide reliable solutions for most automation applications.

Valves

Choose a valve that provides the flow required to drive your cylinder or sub-circuit, but no need to oversize. Over sizing takes up space, and very often is more expensive. When working with miniature pneumatics, consider using flow in CFM and cylinder volume as a basis for sizing, instead of Cv value. Cv or Kv measurements have origins in heavy Hydraulic systems applications, where severe ambient conditions and fluid temperatures weigh heavily on valve sizing.

A rule of thumb worth considering-in typical applications; the valve orifice size should be about 10% of the diameter of the cylinder bore your operating.

Cylinders

Avoid side loads on piston rods; always mount cylinders on the centerline of workloads. For optimum cylinder life, use external stops whenever possible in your design. External stops take away the shock on cylinder piston and seals at the end of rod travel. Avoid running cylinders at higher pressures than actually needed.

Special Components/Logic Devices

Many miniature pneumatic components are very much like fine instruments and should be treated as such. Devices such as timers and pressure switches have fine regulators and or air motors where clean air is essential. If your designing a pneumatic circuit, try to isolate the smaller pilot devices from the main system working devices with a separate line filter, an extra precaution, but particularly useful in dirty environments or with poor preventive maintenance practice.

Fittings

Always keep a supply of fittings on hand. A supply of extra fittings saves time and money. Fittings are always the last thing to worry about (if not forgotten) when assembling a pneumatic system.

Assembling fittings to pneumatic devices can be an easy job, especially on miniature pneumatic devices. 10-32 (M5) and 1/8" fittings practically tighten themselves, and therefore caution should be used when tightening fittings with a wrench. Always use a short wrench to avoid applying high torque to fittings. Kuhnke fittings are supplied with sealing washers or O-Rings, so the use of sealant is not required. If desired, use a small amount of sealant on the male threads close to the top of the fitting, but avoid using a Teflon tape sealant, since small pieces of tape tend to break off as the fitting is tightened. These loose pieces can find their way into valve or other device mechanisms obstructing the free flow of air.

Try to use swivel or banjo type fittings whenever possible. Although more expensive, swivel fittings allow removal of fittings without disassembling tubing connections, making servicing or modifications easy.

If you use barb fittings with plastic hose, cut tubing straight and stick it in hot water for a minute, before installing it, it'll make assembly much easier.

Air Quality-Lubrication-Filtering

Compressed air quality for all pneumatic systems is essential to provide long life of components as well as to insure proper functioning of machinery at all times. When setting up a pneumatic system, consider adequate filtering, drying and lubrication devices.

Filters with 5-micron filtration capabilities are recommended. Regular cleaning or replacement of filters is recommended. Drying of air, particularly in humid or low temperature areas should be considered. Preventing condensation within the pneumatic operating system reduces chances of corrosion of components, prolonging life. Drying is essential when operating systems at the ambient temperatures close to freezing. Generally when ambient or compressed air temperatures are at 4°C (38°F), the dew point of air must be held at least 10°C (Approx. 15°F) lower than the lowest occurring temperature.

All Kuhnke components are lubricated at the factory. Therefore components can be used in lubricated or unlubricated systems. After using components in a lubricated system, do not switch to an unlubricated system. After a short period of time, the oils used in lubricated systems wash away factory grease lubrication. Switching to a dry system will then cause the components to "run dry:" increasing wear.

For lubrication, Shell Tellus Oil-C10 or equivalent should be used. Avoid over lubricating.

Safety

Compressed air and other fluids under pressure, by their nature, are dangerous, and should be treated with caution. Always observe local and National Safety Standards. Standards set by OSHA and organizations such as the Fluid Power Association provide standards and a basis for practical applications of pneumatic devices. Contact these organizations for more information.

Some basic rules to follow:

1. Don't allow the operating pressure of the system to be higher than it was designed for.
2. Design a system so that no dangerous actions or processes will occur upon a failure of system air pressure.
3. Controls should be arranged so that unwanted, inadvertent, accidental triggering of movement is prevented.
4. Control lines (air and electrical) should be placed out of the way and protected to avoid damage.
5. In automatic systems the sequencing of operations should be set up in such a way as to prevent super imposing or crossing over of processes.
6. Exhausts should be arranged so that moments of danger from escaping air are avoided (i.e. Injury to eyes from whirling chips.)
7. Cylinder and rotary actuators (working elements) should be mounted and protected according to OSHA standards.

Servicing

Set up a regular preventive maintenance schedule. Some things to consider:

1. Check air quality. Be sure air filters are cleaned or replaced regularly. If a lubrication system is used check that the correct amount of oil is being supplied. Don't let lubricators run dry. Avoid over lubricating.
2. Check wear and tear regularly. Check piston rods, mountings and rod nuts for tightness. Check shock absorbers if used. Look for worn brackets, fixtures etc.
3. Check electrical connections.
4. Check fittings.