COMPRESSED AIR

and it's importance

IAC
INDUSTRIAL ACCESSORIES COMPANY

Trouble - free, maintenance - free operation is largely dependent on providing compressed air to the dust collector at the proper pressure and quality.

I. Compressed Air Consumption

The amount of compressed air required for your collector is given on the engineering drawing in standard cubic feet per minute (SCFM). In specifying SCFM requirements, IAC bases its calculations on the following:

- Number of Diaphragm Valves
- Size of Diaphragm Valves
- Final Delivery Pressure
- Timer "on" and "off" times
- Application of Equipment

II. Compressed Air Pressure

For most applications, compressed air at 90 to 100 psig is adequate for proper cleaning of the filter elements. Pressures between 100 and 120 psig may be recommended for some critical applications. Operation at pressures above 100 psig must be checked with IAC for approval and recommendations. Compressed air pressures below 80 psig require special considerations in the design and sizing of the dust collector and also must be checked with IAC.

III. Compressed Air Quality

The importance of clean, dry, oil free compressed air cannot be over emphasized. Dirt, rust, and scale can prevent diaphragm valves from operating properly. Moisture can cause valves to freeze in cold weather. Moisture and oil can cause deterioration of the valve diaphragms, and if the interior of the filter bags become coated with moisture and/or oil, eventual plugging of the filter media will occur.

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A. Clean Compressed Air

1. A simple dirt leg installed at the point where the air line connects to the compressed air header is usually sufficient to trap small amounts of dirt, rust, and scale.

2. An inline filter or a centrifugal separator is required where large amounts of dirt, rust, and scale are present especially when there is a possible shutdown of the system.

B. Dry Compressed Air

1. Liquid Moisture Traps

a. An automatic moisture drain must be installed on the compressed air receiver. These automatic drains come in a variety of float, piston, and pilot operated types.
b. Small amounts of moisture can be handled by inline air filters with automatic drains.
c. Large amounts of moisture require a centrifugal separator followed by a chemical dryer (consumable desiccant requiring replacement) to filter out the water droplet carry over. The dew point of the moisture in the line is dependent on the temperature of the cooling water used at the after cooler on the compressor.

2. Compressed Air Dryers

a. In applications where the compressed air piping is indoors or in a warm to moder ate climate, the following types of equipment are available if the compressed air dew point is sufficient to prevent moisture condensation in the pipelines. (Usually +35 to +50 degrees F.)

1. Deliquescent desiccant non-regenerative type for small to medium volumes of air.
2. Mechanical refrigeration type with or without an after-warmer for large volumes of air.

b. In applications where the compressed air piping is outdoors or when the installation is in a cold climate, the following types of equipment are available if the compressed air dew point is sufficient to prevent moisture condensation in the pipeline. (Usually -10 to +40 degrees F.)

1. Inline desiccant type with manual regeneration for small volumes of air.
2. Desiccant type with heat-less automatic regeneration for medium volumes of air.
3. Dual tower desiccant type with automatic heat regeneration for large volumes of air.

Always consult the compressor manufacturer for the appropriate type and size of the dryer.

C. Oil Free Compressed Air

1. Much of the above mentioned equipment used to remove moisture can also be used to remove oil and oil mist.
2. For installations where oil and oil mist are the major problem, inline filters are available that use desiccant absorptive elements or packed beds of an oil absorbing granular organic polymer.

IV. Compressed Air Piping

The compressed air header at the dust collector must be connected with at least a 1" diameter pipe for 3/4" and 1" diaphragm valves, and a 2" diameter pipe for 1-1/2" diaphragm valves. The air piping of large paneled single units as well as for multiple units must be sized in relation to air consumption. The following table is offered as a guideline in selecting the proper pipe size and is based on 100 psig air.

TOTAL FREE AIR CONSUMPTION

Pipe Length (feet)	0 to 49 SCFM (in. diameter)	50 to 99 SCFM (in. diameter)	100-149 SCFM (in. diameter)	150 to 199 SCFM (in. diameter)
0-99	1	1 1/4	1 1/2	1 1/2
100-499	1 1/4	1 1/2	2	2
500-1000	1 1/2	2	2 1/2	2 1/2

The degree to which a compressed air system must be provided with safeguards to eliminate dirt, scale, moisture, and oil will depend on the following factors:

1. Type of compressor, after-coolers, receivers, and accessories.

2. Piping material used.

3. Piping layout between the compressor and the dust collector compressed air header.

4. The lowest temperature to which the piping will be exposed.

5. Type of process and process conditions encountered.

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