KAESER COMPRESSORS®

More Compressed Air for Less Energy.

Air Treatment Solutions

Dryers, Filters, Drains, and Condensate Separators

kaeser.com

Air Treatment

Air quality impacts productivity

Dirt, water vapor, and other impurities enter the compressor with the atmospheric air. Oil (liquid and vapor) may also be introduced by the compressor. If not removed, these contaminants may cause costly production problems such as accelerated tool wear, equipment contamination and downtime, and product rejects. KAESER offers a complete line of air treatment products to prepare compressed air for any need—from general shop tools to CNC machining to the most sensitive applications in food, beverage, and pharmaceutical processes.

Selecting equipment

Your application and the environment should guide you regarding what level of air quality you need. Higher quality air may improve productivity, but it does increase costs—including higher equipment costs, more frequent maintenance, and higher energy consumption due to pressure drops and purge air. For applications requiring higher air quality levels, you may reduce operating costs with point-of-use air treatment rather than drying/filtering the entire system to the highest level.

Global standards

ISO 8573.1:2010 was developed by ISO (International Organization for Standardization) as a reference to help facility engineers specify compressed air quality for solid particulates, humidity, and oil.

A typical pharmaceutical plant, for example, might have a compressed air specification of ISO Quality Class 1.2.1 as shown outlined in the specifications below.

SOLID PARTICLES / DUST

If particles greater than 5µm have been measured, class 0-5 cannot be applied

Class	Maximum particle count per cubic meter of a particle size with d* (µm)		
	0.1 - 0.5 µm	0.5 - 1 µm	1 - 5 µm
0	As specified and more stringent than Class 1		
1	≤ 20,000	≤ 400	≤ 10
2	≤ 400,000	≤ 6000	≤ 100
3	---	≤ 90,000	≤ 1000
4	---	---	≤ 10,000
5	---	---	≤ 100,000
6	0 - ≤ 5 mg/m³		
7	5 - ≤ 10 mg/m³		
8			
9			
X	> 10 mg/m³		

HUMIDITY AND LIQUID WATER

Class	Pressure Dew Point	
0	As specified and more stringent than Class 1	
1	≤ -70°C	≤ -94°F
2	≤ -40°C	≤ -40°F
3	≤ -20°C	≤ -4°F
4	≤ 3°C	≤ 37°F
5	≤ 7°C	≤ 45°F
6	≤ 10°C	≤ 50°F
Class	**Concentration of liquid water***	
7	≤ 0.5 g/m³	
8	0.5 - ≤ 5 g/m³	
9	5 - ≤ 10 g/m³	
X	> 10 g/m³	

TOTAL OIL*

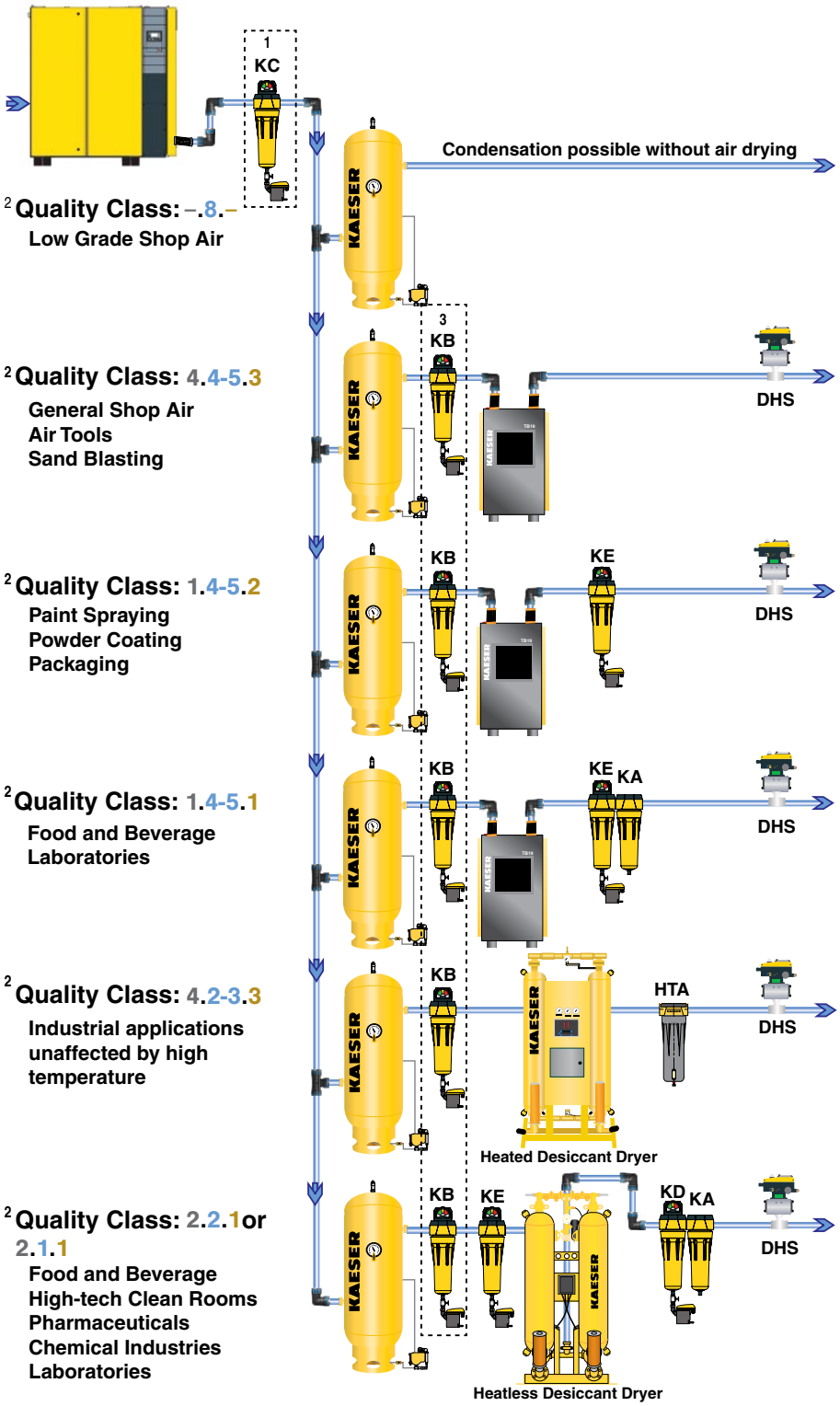
Liquid, aerosol, and vapor

Class	mg/m³	ppm w/w
0	As specified and more stringent than Class 1	
1	≤ 0.01	≤ 0.008
2	≤ 0.1	≤ 0.08
3	≤ 1.0	≤ 0.8
4	≤ 5.0	≤ 4
5		
6		
7		
8		
9		
X	> 5.0	> 4

**Reference conditions: 68°F (20°C), 14.5 psia (1 bar), 0% relative humidity*

Example Air Treatment Configurations

with ISO 8573.1:2010 quality classes shown



[1] *For compressors without an integrated moisture separator.*
[2] *Filters are tested to ISO 12500 and dryers tested to ISO 7183 Option A2.*
[3] *KB not needed if non-corrosive tank and piping are used before dryer*

The configurations above do not depict every possible dryer-filter combination. Your KAESER representative will help select the appropriate air treatment products for your application.

Filters

Filters provide additional protection from contaminants that degrade process equipment and decrease air tool performance. Filters remove solid particles, oil aerosols, moisture, and oil vapors. Adding filters to the compressed air system will save considerable costs in process downtime, cleaning tools, and repairing equipment. The right filter combination plays a key role in preventing unwanted dirt and oil from reaching end products like food and beverages. Filters up to 1130 scfm include bayonetted or screw on housings for easy element replacement. Other features include easy to read differential pressure gauges to signal element contamination, modular mounting, and internal drains. The latest filter media technology results in higher efficiencies and lower pressure drop.

Sizes up to 11,875 scfm

Filter Type	Initial Pressure Differential at Saturation	Aerosol Content at Inlet [3]	Remaining Aerosol Content at Outlet [3]	Filter Medium	Application
KC [1] ***(Cyclone)*** **Moisture Separator**	1.5 psi	-/-	-/-	-/-	Bulk liquid separation
KB [2] ***(Basic)*** **Coalescing and Particulate**	2.0 psi	10 mg/m^3	<0.1 mg/m^3	Deep pleated with support structure and polyester drainage fiber	Filters solids, liquids, aerosols, and particulates
KE [2] ***(Extra Fine)*** **Extra Coalescing and Particulate**	<2.9 psi		<0.01 mg/m^3		Same as KB, but for higher compressed air quality
KD ***(Dust)*** **Particulate (Afterfilter)**	<0.5 psi (new, dry)	-/-	-/-	Deep pleated with support structure	Exclusively for filtering particulates
KA ***(Adsorb)*** **Vapor**	0.5 psi (new, dry)			High efficiency carbon filter	Exclusively for removing oil vapor

[1] Eco-Drain 31 is standard.
[2] Float-type drain is standard. Available with optional zero-loss Eco-Drain 30 or 31 to save energy and prevent compressed air loss.
[3] Per ISO 12500-1: 06-2007

Specialty Filters and Point-of-use Dryers

Oil mist eliminators (OME)

Oil Mist Eliminators (OME) are simply large oil removal filters with a very low pressure drop. Not only do they remove both oil aerosols and water, but they can handle large slugs of liquid. The cartridge life is normally 8 to 15 years, thus requiring virtually no maintenance.

Sizes up to 3000 scfm

High pressure filters (HP)

High Pressure filters (HP) are available for applications requiring pressures up to 1000 psig. They include seam welded stainless steel cores for greater durability and corrosion resistance. The HP filters are well suited for PET bottling systems and should be installed downstream of high pressure compressors or boosters and dryers. They are also available in all filter grades except HTA.

Activated carbon towers (KAT)

KAESER Activated Carbon Towers (KAT) remove oil vapor, taste, and odor of oil. They are used where oil vapor and odor may contaminate end products such as food, drugs, and chemicals. The carbon beds are designed for a long life of up to 30,000 hours.

Sizes up to 5500 scfm

Single tower desiccant dryer (KDF)

KAESER single tower desiccant air dryers (KDF) provide dew points as low as -40°F and are ideal for small volume air applications with intermittent needs. They are excellent for point of use drying where low dew points are required. No electrical power is required and regeneration is achieved by offline purging or desiccant replacement.

Sizes up to 30 scfm

High temperature afterfilters (HTA)

High Temperature Afterfilters (HTA) are particulate filters designed for temperatures up to 450°F. They are commonly placed after heated desiccant dryers to take out the desiccant fines and handle the high temperatures induced by the heaters.

Sizes up to 11,400 scfm

Membrane dryers (KMM)

KAESER Membrane Dryers (KMM) provide dew point suppression without requiring any external power or regular maintenance. These dryers are well suited for point of use applications and are easy to install, requiring simple piping connections. They are lightweight and available with mounting brackets and prefilters for easy installation. Proper filtration includes a particulate/oil removal filter combination to prevent oil from contaminating the membrane.

Refrigerated Air Dryers

Refrigerated dryers serve most compressed air applications. KAESER has a very wide range of refrigerated dryers from 10 to 3,355 scfm for a variety of applications. All KAESER dryers use environmentally friendly refrigerant.

Small dryers

KAESER offers TX and KRYOSEC® dryers for smaller systems or point of use applications. These non-cycling designs combine consistent dew points with simplicity and reliability.

Sizes from 10 to 159 scfm

Cycling dryers

KAESER SECOTEC® cycling dryers offer energy savings by using cold storage and the SECOTEC control system. The layout is designed for easy maintenance, accessibility, and minimal floor space. A precooler/reheater provides increased cooling efficiency. Their simple design and top quality construction make them extremely reliable.

Sizes up to 3070 scfm

High inlet temperature dryers

Our HTRD's are designed for use with piston compressors with higher operating temperatures. They combine a separate aftercooler, separator, dryer, and filter and are ideal for facilities with 5 to 30 hp piston compressors. HTRD's are lightweight and have a small footprint for convenient installation.

Sizes up to 145 scfm

High pressure dryers (HT)

High pressure applications are also subject to the threat of contaminants and harmful moisture. KAESER offers its HT line of dryers for PET bottling systems and other applications from 230-725 psig.

Sizes up to 3000 scfm


KAESER
SECOTEC TF 340
KAESER

Desiccant Air Dryers

Desiccant dryers provide extremely dry air for processes that are very moisture sensitive or applications where the compressed air system is exposed to very low ambient temperatures. Dew points may be as low as -94°F. The desiccant material adsorbs moisture from the compressed air until it reaches its maximum saturation point and then must be regenerated. The method of regeneration is what differentiates the lifecycle costs of desiccant dryer types.

Heatless desiccant dryers (DC-HF and KAD)

Also called “pressure swing” desiccant dryers, these dryers regenerate without added heat. At rated conditions, up to 15% of flow is used to purge moisture and regenerate the saturated tower (purge volume and target dew point can be adjusted with onboard controls). Heatless dryers can reach lower pressure dew points and are initially less expensive than heated dryers, but typically consume more energy due to the purge air used.

Sizes: 7 – 5400 scfm

KAESER heated purge dryers (KED)

These dryers use only 7% of air flow for regeneration. Dried air passes through a heater and then into the wet desiccant bed to purge the moisture. An external heater enables better temperature control within the desiccant bed. This extends desiccant life by preventing hot spots that could accelerate the decay of desiccant material. KED dryers are typically less costly to operate than heatless dryers for larger flows.

Sizes: 300 – 3200 scfm

KAESER heated blower purge dryers (KBD)

Blower purge dryers further reduce purge loss using heated ambient air, which lowers the relative humidity, increasing its ability to hold moisture. The hot, dry ambient air regenerates the desiccant with little or no compressed air. While the initial price is higher, the KBD design results in lower overall lifecycle costs for larger flows by eliminating the energy associated with producing extra compressed air for purging.

Sizes: 500 – 4300 scfm

Breathing air purifiers

KAESER Breathing Air Purifiers (KBS) provide air for applications where workers cannot safely breath ambient air. KBS purifiers include filters to remove contaminants and oil, a desiccant air dryer to remove moisture, and catalytic materials to reduce carbon monoxide concentrations to a level safe for continuous breathing. The KBS delivers OSHA’s Grade D breathing air.

Sizes up to 940 scfm

Condensate Removal

Compressed air condensate is a mixture of water, compressor lubricant, particulates and ambient hydrocarbons that have been concentrated during the compression process. KAESER's Eco-Drain and Automatic Magnetic Drain (AMD) are automatic demand drains that reliably remove condensate from receiver tanks, liquid separators, dryers, filters, and drip legs. They conserve air by only activating when condensate is present. In most locales, condensate is classified as hazardous waste and cannot be discharged into municipal wastewater systems unless the oil and contaminants are removed. The KAESER Condensate Filters offer a low cost, convenient way to safely and responsibly dispose of condensate.

Eco-Drain

The Eco-Drain series is ideal for filters including our liquid separators (KC), particulate filters (KB), and oil removal filters (KE). It employs a capacitance sensor for actuation and a patented 3/2 way valve ensures that pilot air is contaminant free.

Automatic magnetic drain (AMD 6550)

The AMD 6550 is a heavy-duty drain designed for very large liquid loads and severe conditions. Its float and magnetic actuator are completely isolated from the condensate for high reliability and it requires no electricity.

AQUAMAT condensate filters

Our AQUAMAT condensate systems effectively separate oil and other contaminants from the water in compressor condensate. This promotes more economical and environmentally responsible disposal.

Sizes up to 3300 scfm

KAESER condensate manifold (KCM)

The KCM is a small vessel that collects condensate from multiple sources and safely diffuses residual air pressure to maximize separation effectiveness in the KAESER Condensate Filter (or any oil/water separator).

Aftercoolers and Separators

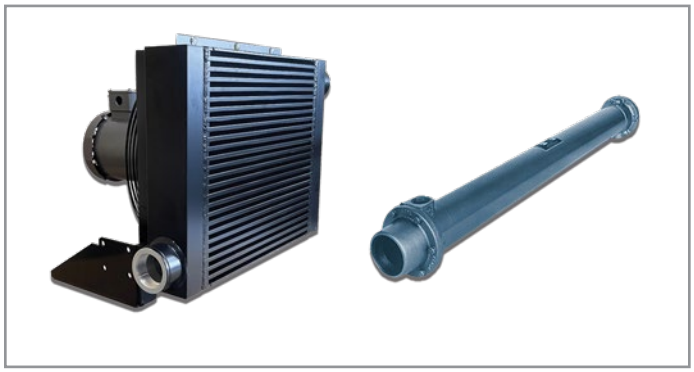
Atmospheric air entering a compressor contains water vapor, and when air leaves the compressor it is saturated with water vapor and also carries condensed liquid. As the air cools in the piping and tank, more moisture condenses. It is a best practice to install a liquid separator after the compressor's aftercooler and before a tank, dryer or filter.

While all major brands of rotary screw compressors have built-in after-coolers, there are times when supplemental cooling is recommended. If the compressors are running hot, additional cooling may be necessary in order for the air treatment to function to specification. Further, additional cooling can increase the amount of moisture removed from liquid separators and tanks, and it can enhance the performance of heated desiccant dryers.

KAESER liquid separators (KC)

KAESER separators remove bulk liquid loads including water droplets and aerosols. Water is forced out of the air stream and falls to the bottom for collection. They are typically placed immediately after the compressor discharge (or supplemental aftercoolers if used), but can be used in any number of applications where large amounts of liquid must be removed. KAESER KC liquid separators include the Eco-Drain automatic condensate drain.

Sizes up to 11,875 scfm



Air-cooled (KAC) and water-cooled (KWC) aftercoolers

The KAC and KWC are recommended mainly for compressors with discharge temperatures above 110°F. Aftercoolers provide an economical way to remove as much as 70% of the water vapor in compressed air. KAESER air-cooled models can cool compressed air down to 5°F above the ambient temperature. If cost effective cooling water is readily available, our shell-and-tube water-cooled aftercoolers can cool air within 10°F of the cooling water temperature.

Sizes: Air-cooled, up to 4800 scfm
Sizes: Water-cooled, up to 3170 scfm

Pressure Holding Valves

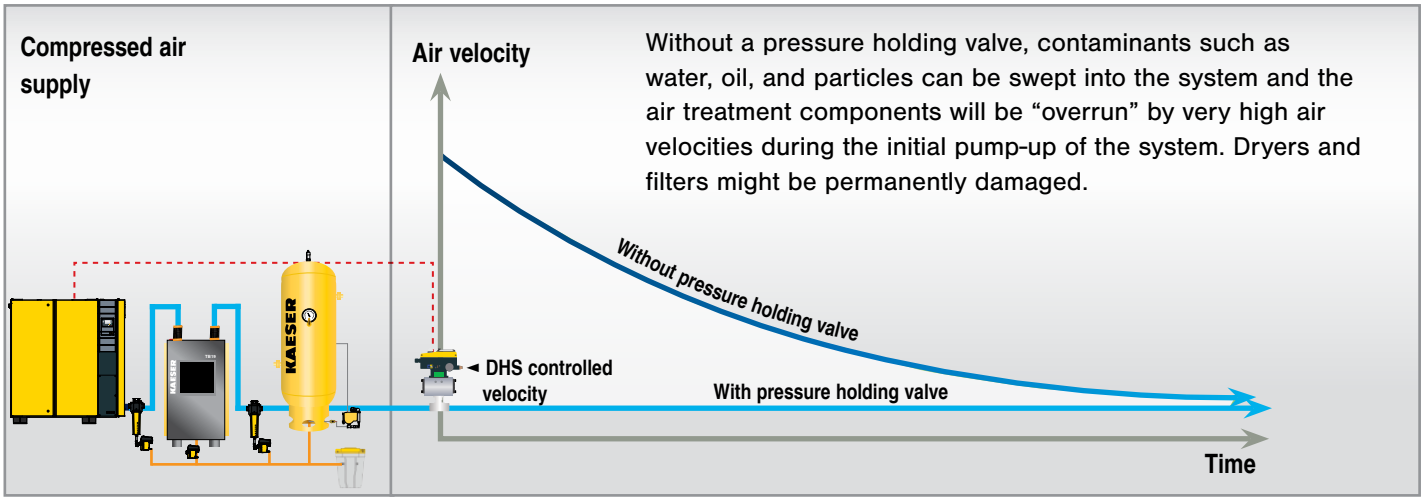
Air quality protection

Compressed air dryers and filters are designed to treat specified volumes of air at specific conditions. Refrigerated dryers, for example, are often rated to achieve a specified dew point for a particular volume (scfm) at 100 psig. When line pressure drops, air velocity will increase. This negatively impacts moisture removal in dryers and can damage filters.

If compressors are shut down overnight, weekends or holidays, the system pressure will drop as air escapes through leaks. When the compressors are restarted, air will flow at very high velocity until the whole system reaches target pressure. During that time dryers and filters may not work to specification and contaminants may be swept downstream.

The DHS pressure holding valves prevents high velocity air flowing through air treatment equipment while the air system is being pressurized. The DHS also prevents possible overflow conditions caused by leaks, artificial demand, and unregulated uses. The DHS is also able to isolate the treatment line in the event that an air treatment component malfunctions. This assures consistent air quality and safeguards the pipe distribution network and production equipment from moisture and contaminants.

Velocity profile



Without a pressure holding valve, contaminants such as water, oil, and particles can be swept into the system and the air treatment components will be “overrun” by very high air velocities during the initial pump-up of the system. Dryers and filters might be permanently damaged.

The world is our home

As one of the world's largest compressed air systems providers and compressor manufacturers, KAESER COMPRESSORS is represented throughout the world by a comprehensive network of branches, subsidiary companies and factory trained partners.

With innovative products and services, KAESER COMPRESSORS' experienced consultants and engineers help customers to enhance their competitive edge by working in close partnership to develop progressive system concepts that continuously push the boundaries of performance and compressed air efficiency. Every KAESER customer benefits from the decades of knowledge and experience gained from hundreds of thousands of installations worldwide and over ten thousand formal compressed air system audits.

These advantages, coupled with KAESER's worldwide service organization, ensure that our compressed air products and systems deliver superior performance with maximum uptime.

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More Compressed Air for Less Energy.

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
ISO 50001:2018
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