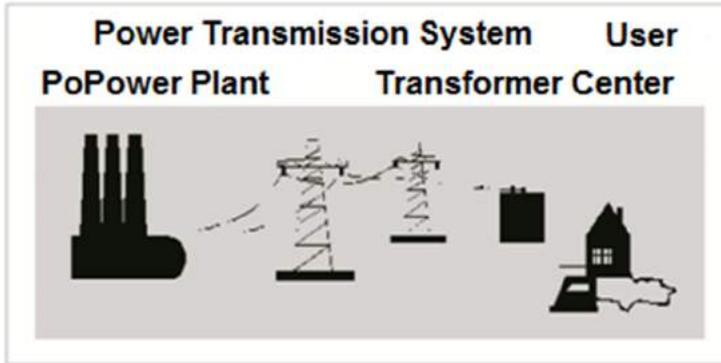




COMPRESSED AIR SYSTEM (CAS)

- Compressor Rooms
- Compressor Room Ventilation
- Ring System
- Compressors, Separator Collectors, Air Tanks, Dryers and Filters



Compressed Air With Electrical Energy In Industry And It Is The Most Important Form Of Energy Used In Workshops.

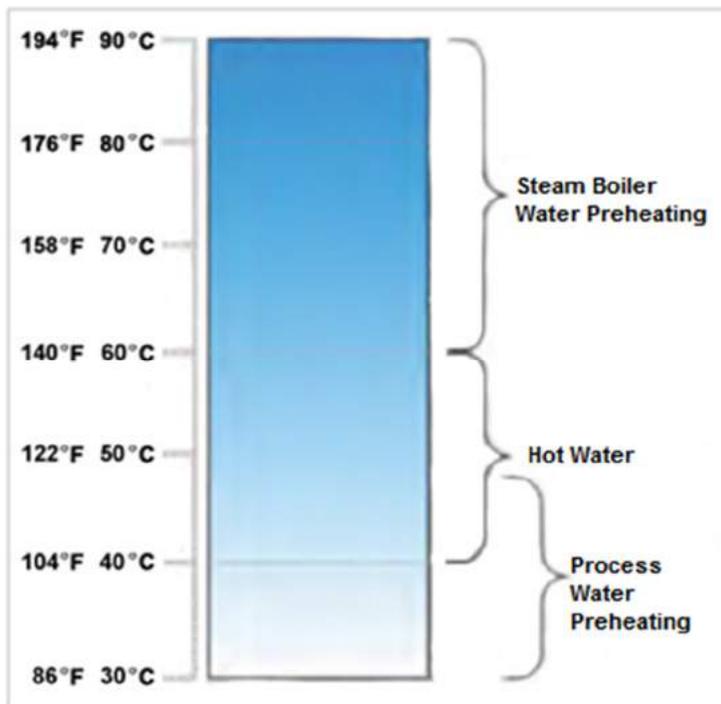
INTRODUCTION

Compressed air; it is widely used in mining, manufacturing, process engineering, environmental protection.

Compressed air knows no limits in various areas of use in order to improve the working, living conditions and standards of people.

Pneumatic systems, also known as compressed air systems, are indispensable in today's industry; These are systems that use and consume compressed air as an energy source.

Nowadays, while modern factories or facilities are being built, it is inevitable to build infrastructural installations such as electricity, water, sewage, as well as compressed air installations.



Compressed air energy is a type of energy that brings along some disadvantages as well as many advantages in its use.

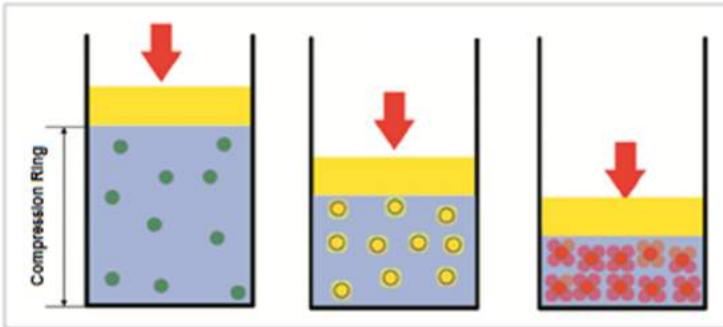
The most disadvantage of using compressed air is that the energy used per unit of work is very expensive.

The main reason for this is; The fact that the machines that produce the compressed air energy, which we call compressors, work very inefficiently.

Air energy is a very expensive type of energy and it is essential to avoid unnecessary consumption and waste during use.



Using A Mechanical Energy Source In A Compressor, Atmospheric Air Is Often Converted Into High Pressure Energy.



Air Molecules Sucked In Are Compressed Together By Decreasing Their Volume, "Pressurized."

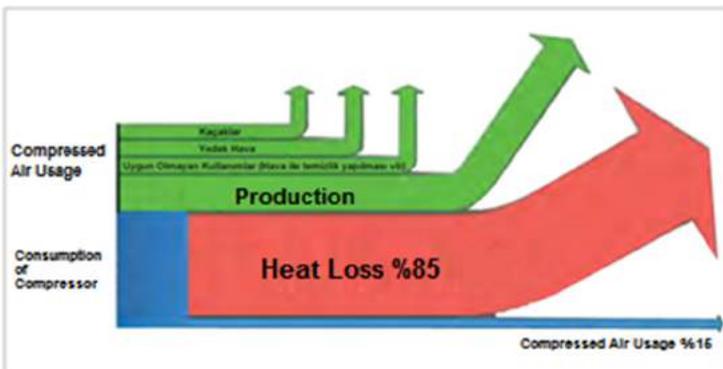
WHAT IS COMPRESSED AIR?

Compressors compress the air they absorb from the environment and load potential energy into it. Energized air is sent to the piston of the machine through pipes, enabling the machine to run.

Dust, dirt and moisture in the air that compressors absorb from the environment cause clogging and damage in the system and machinery. For this reason, the air pressed by the compressor is stored by drying and filtering. It is pressed from the warehouse to the machines according to the need.

If a 30 kW compressor is cooled after compressing atmospheric air, it condenses an average of 20 liters of water per shift.

Approximately 85% of the electrical energy consumed by compressors goes to waste hot air generation and 15% to compressed air production. This rate is only up to 20% in very high efficiency compressors. In other words, compressors work like a hot air generator.



In a compressor consuming 100 kW of electricity, 85 kW of electricity is wasted and discharged as hot air. 15 kW of electricity is used to increase the pressure of the air.



Galvanized Collectors And Compressed Air Preparation.

WHAT IS COMPRESSED AIR SYSTEM?

Choosing the appropriate system for the field of activity of every business is an indispensable requirement.

Compressed air systems are complex systems whose every stage must be carefully planned and designed. Simple errors in these systems cause great losses.

Compressed air system is the production of compressed air, passing it through some processes and delivering it to the required places ready for use.

Compressed air system consists of three parts. These;

1. Compressor Room

It consists of compressors, collectors, dryers, filters, air tanks and distribution collectors. It is the place where the compressed air produced by the compressors is processed, prepared and stored suitable for use.

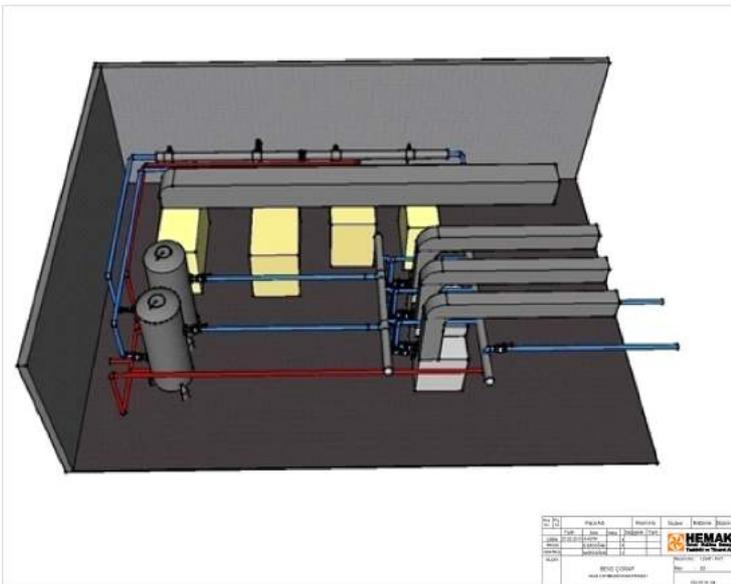
2. Compressor Room Ventilation

Air entering the compressor room from the environment; it is taken from the north facing, preferably shady, cool and dust-free environment.

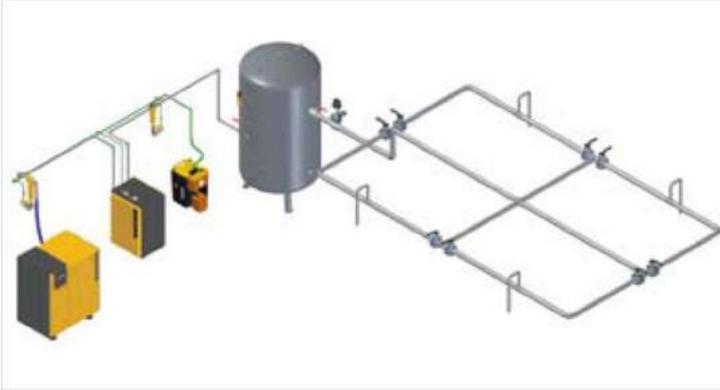
When the inlet air temperature drops below +3° C, the inlet valves are throttled and the compressor room average temperature is kept between 18-25°C. Otherwise, compressor efficiency will decrease. When the compressor inlet air is kept constant at 25°C, the compressor efficiency increases by 10%.

3. Ring System

It is where compressed air is distributed and consumed. Mainly; it consists of main distribution pipes, intermediate distribution pipes, air hoses between machines, valves and armatures, water receivers and ring manometers.



Compressor Room Layout 3D Drawing



Compressor Room And Ring System

HEMAK COMPRESSED AIR SYSTEM (CAS)

With its expertise in air technology, innovative solution habit, inventions and innovations, and more than 40 years of experience, Hemak builds challenging systems in the compressed air system worldwide.

In the Hemak compressed air system, all of the compressors are connected to the hot-dip galvanized or stainless separator collectors.

Most of the dirt, dust and water in the air are kept in the separator collector. Therefore, the dryer and filters are relieved. No dirt or rust forms in armatures, pipes and tanks. This feature provides a great advantage in industries that require hygiene and cleanliness. (Food, health, etc.).

In this way;

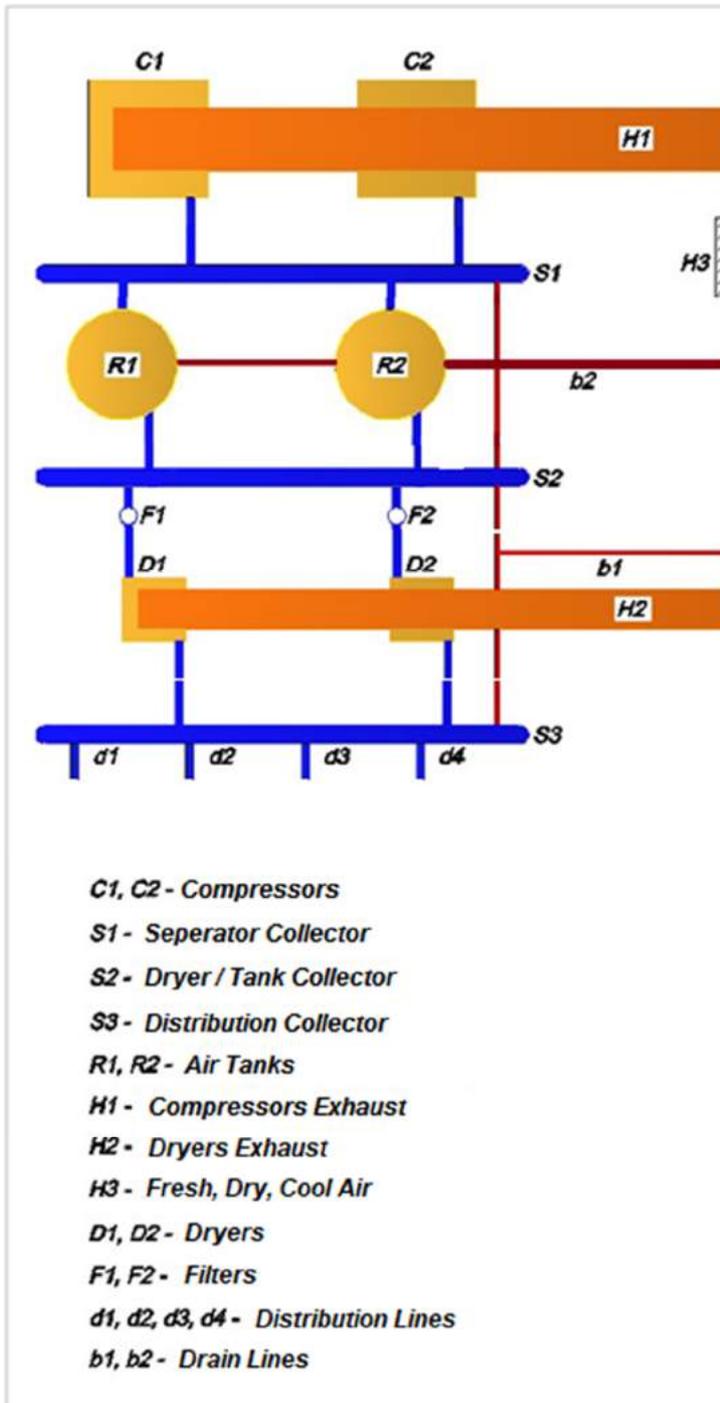
- Maximum life,
- Maximum energy saving (ENTA),
- Maximum efficiency and hygiene,
- Minimum maintenance and breakdown

is provided.



Automatic Control And Energy Saving System With Inverter

94% of the waste energy converted by compressors into heat is recovered by heat recovery systems. This situation has become a necessity in order to decrease the constantly increasing energy costs and CO2 emissions. For this reason, compressor rooms are referred to as energy saving systems.



Compressor Room Blog Diagram

WORKING PRINCIPLE

Compressors compress the air they suck from outside and press the separator collector. Developed by Hemak, this collector captures most of the water and the dirt&dust in the air and sends it to the drainage line.

The load of dryers and filters is reduced. The air coming to the dryers has been mostly cleaned and dehydrated. The remainder of the water is concentrated in the dryers and sent to the drain line.

The water, dirt and dust of the air coming to the filters have been removed. The remainder of the dust, dirt and water is held in the second separator collector before the filters.

The air completely cleaned in the filters is stored in the reservoir tanks.

Dry and clean compressed air coming from the reservoir tanks to the distribution collector is delivered to where it is needed.

The air going to each demand unit is controlled by a valve. In case of any failure, only the valve of that line is turned off. The business continues to operate.

Moist air intake is made from the lower part of the tanks, dry air outlet from the upper part of the tanks.



Compressor Room Ventilation

PRODUCT INTRODUCTION

Compressors

Compressors are machines that produce compressed air. They compress the free ambient air by sucking it and increase its pressure. However, most of the energy consumed by compressors is used to produce hot air instead of compressed air. Therefore, it is necessary to take advantage of the exhaust hot air from the compressors.

Compressors with high efficiency, low speed of the same air, hot water, direct coupled, high efficiency motor, high efficiency oil cooling and inverter controlled compressors are preferred.

Seperator Collectors

It is a unique system developed by our company that makes a difference for the Hemak compressed air system and increases the order and efficiency of the compressor rooms.

Most of the water, dirt and dust in the compressor air are kept there, reducing the load on the dryers and providing significant energy savings.



8 " Separator Collector Assembly

Air Tanks

These are devices where uninterrupted, dry and clean air is stored and delivered to the system. Air tanks used in Hemak compressed air system; safe, long-lasting, certified, guaranteed clean and dry air is stored.



Seperator Collectors, Filters, Dryers and Tanks.

Dryers

Dryers increase the performance of compressed air systems. In some businesses, it is necessary to use a dryer.

In most businesses the air must be completely or mostly dry. In such cases, the most suitable dryer type, the type of dryer operating with refrigerant gas is selected.

Among these dryer types, Eco-Dryer types that are activated when needed and switched off when not needed are preferred.

Filters

There are approximately 190 million dust particles, viruses and bacteria in 1m³ of the air sucked by the compressor.

Compressors can retain only some of these particles and send most of them to the system with the air pressed by the compressor. This requires careful treatment of the compressor air.

Filters are used in sizes and features suitable for the quality of the air used by the enterprises.

Quality and clean air increases the efficiency of the compressed air system and tools and extends their life. It ensures that the devices operate at maximum efficiency. It prevents clogging of valves, pipes and fittings.

Filters therefore not only reduce service and maintenance costs, but also prevent additional investment and expense.



Galvanized Air Tank 4 " Connections.



Uninterrupted And Dry Air Intake Guarantee (RING) With "Monolithic Pipe System" Developed By Hemak (Dry Air Is Taken From The Middle Of The Pipe.)

ADVANTAGES

• Maximum Efficiency with the Right Project

Minimum pressure loss is achieved with careful planning and design.

• Minimum Air Leakage with Air Bleeding Technique

Ventilation is provided to the machines with minimum fittings. In this way, air leakage is minimum.

• Smooth Operation with Correct Drainage

Water and dirt held in the collectors are immediately removed from the system. Smooth operation and uninterrupted constant air is provided.

• Maximum Life with Separator Collector

Most of the water and dirt is trapped immediately at the compressor outlet. Dryers, filters, pipe connections and tanks always work with clean air, the system is not clogged, life is increased.

• Heating with Compressor Waste Heat and Maximum Energy Savings

The hall, warehouse, office and other areas of the factory are heated with the compressor waste heat. Hot water is provided. Boiler feed water is heated.



Separator Collectors, Tanks And Connections



SAVING ON COMPRESSED AIR SYSTEMS

Choosing a single valve, filter or piping with low capacity in compressed air systems causes a great waste of energy and time.

Companies that cannot get enough compressed air as a result of these simple mistakes are investing in additional compressors with wrong directions. Therefore;

- The project and application should be done by expert and experienced engineering companies.
- Compressor waste heat (85% of the spent electricity) must be evaluated. (Water heating, space heating etc.)
- Pressure drop between compressor outlet - end consumption point:
Small and medium sized facilities $\leq 0,5$ Bar
In large enterprises $\leq 1,0$ Bar should be.
- The compressor should be run just above the operating pressure.
- The more the tank volume is kept, the more energy is saved.
- The larger the pipe diameters, the more energy is saved.
- The compressor room should be dry and cool. (18-25 ° C)
- Compressor room ventilation should be suitable for air technique.
- Compressor room air intake should be from the coolest place in summer.
- The compressor oil cooler honeycomb should be cleaned frequently.
- The compressor air inlet filter should be cleaned frequently.
- Compressors that deliver the desired flow at a lower speed should be preferred.
- Air filters should be cleaned frequently.
- Filter air capacities should be chosen more than the compressor flow.
- Dryer air flow should be chosen more than compressor flow.



REFERENCES



HEMAK

COMPRESSED AIR SYSTEM (CAS)

ISTANBUL / TURKEY

ESKİŞEHİR ÇORAP	 EREN ÇORAP SAN. VE DİŞ TİC. LTD. ŞTİ.		 Dış Ticaret A.Ş.
EKOL LTD. ŞTİ. TÜRKMENİSTAN	ECO-SOFT TEKSTİL ÖZBEKİSTAN	 MISIR	
			 Take a Big Step
	 MISIR		 TEKSTİL SAN. VE TİC. LTD. ŞTİ.
	 Socks & Seamlesswear	INSPIRATION SOCKS KAZAKİSTAN	
			KATQAL TEKSTİL ÖZBEKİSTAN
			
			
			 SIRBİSTAN
			 İÇ GİYİM & KORSE



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COMPRESSED AIR SYSTEM (CAS)

ISTANBUL / TURKEY

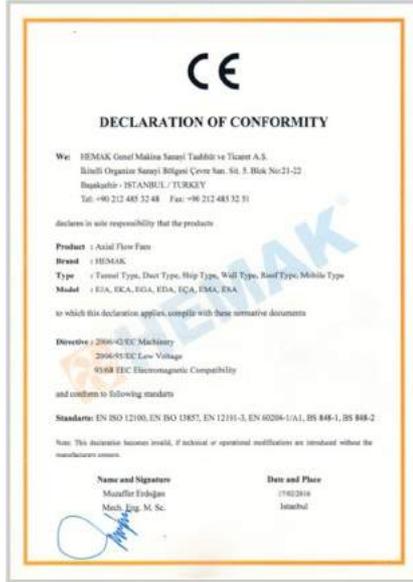
 OZANTEKS	 OKYANUS ÇORAP "Ayağınızdaki Güzellik"	ORSHAH TEKSTİL ÖZBEKİSTAN	 Öztaş ÇORAP
 ÖRMA TEKSTİL	ÖZGÜN METAL TEKSTİL	 PAKKENS®	 PAKTAS
 Penti	PEKUNYA TEKSTİL	 Pier lone Socks ÖZSEVGİ TEKSTİL	 PRO ÇORAP
 K.a.m.â.L You desire and we shape it into reality PAKİSTAN	 Rapsodi®	 Roshan SEAMLESS WOMENWEAR	 sior çorapları
 sm seamless	SİMART TEKSTİL	 SOCKS FACTORY	SHAH TEKSTİL ÖZBEKİSTAN
 Şerif Çorap "1957 den beri"	 ŞİMŞEK ÇORAP	 Tekstüre ÇORAP SANAYİ VE TİCARET A.Ş.	 tutku BODUR ANIT TEKSTİL LTD. 000
 TUTER	 TEMPO	 teksan	 TUTER FORT PAKİSTAN
 tekser	 ULTRA SOCKS	 UZTEX EAG ÖZBEKİSTAN	 VARİTEKS® ORTOPEDİ SANAYİ A.Ş.
 Vela Socks & Seamlesswear	 Vip Socks	 VİZYON ÇORAP DOĞADAN AYAĞINIZA İRAN	 YAYLA SOCKS
 Yıldırım Çorap	 YÜKSEL ÇORAP	 YOSUN socks	 ZARİF ÇORAP TEKSTİL



CERTIFICATES



QUALITY MANAGEMENT SYSTEM CERTIFICATE



CE CERTIFICATE



TRADEMARK REGISTRATION CERTIFICATE



TURKISH LLOYD CERTIFICATE



GERMANISCHER LLOYD CERTIFICATE



ABS CERTIFICATE

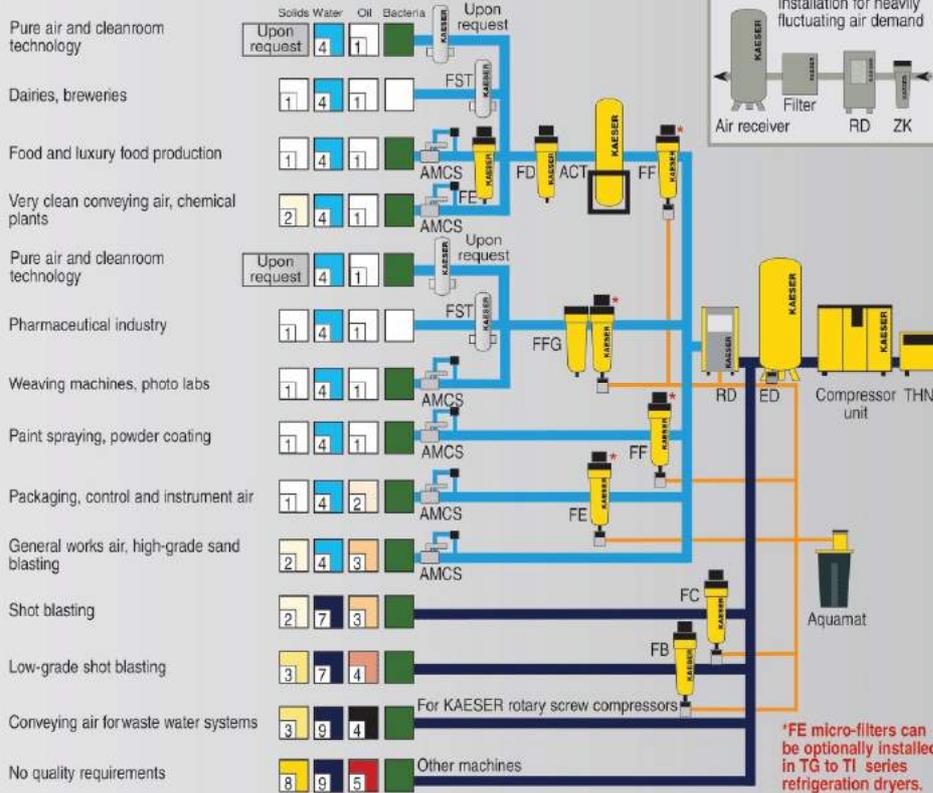


SELECTING THE COMPRESSED AIR SYSTEM

Choose the required grade of treatment according to your field of application:

Air treatment using a refrigeration dryer (pressure dew point + 3 °C)

Examples: Selection of treatment classes to ISO 8573-1¹⁾



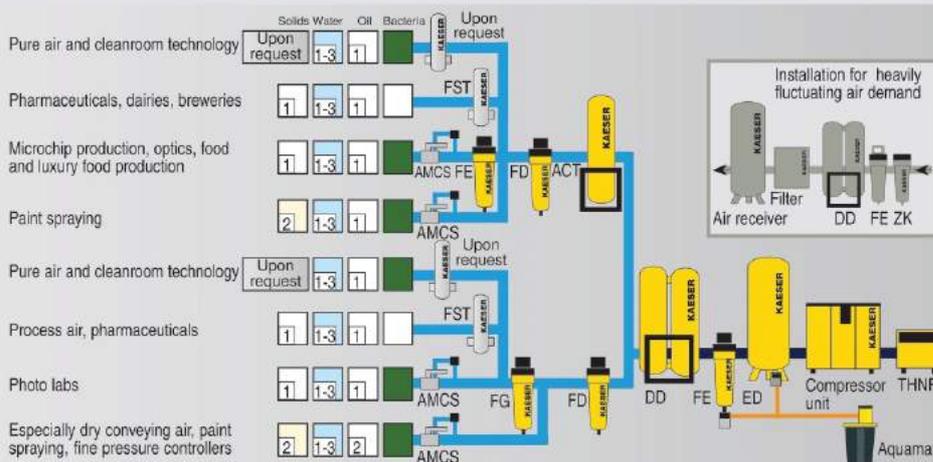
Explanation:

- THNF = Bag filter**
Cleans dusty and heavily contaminated intake air
- ZK = Centrifugal separator**
Separates accumulating condensate
- ED = Eco-drain**
Electronic level-controlled condensate drain
- FB = Pre-filter**
- FC = Pre-filter**
- FD = Particulate filter (attrition)**
- FE = Micro-filter**
Separates aerosol oil and solid particles
- FF = Micro-filter**
Separates aerosol oil and solid particles
- FG = Activated carbon filter**
For adsorption of oil vapours
- FFG = Activated carbon and micro-filter combination**
- RD = Refrigeration dryer**
For drying compressed air, pressure dew point to +3°C
- DD = Desiccant dryer**
For drying compressed air, pressure dew point to -70°C
- ACT = Activated carbon adsorber**
For adsorption of oil vapours
- FST = Sterile filter**
For sterile compressed air
- Aquamat = Condensate treatment system**
- AMCS = Air main charging system**

Contaminants:

Contaminant	Color
Solids	Yellow
Water/Condensate	Blue
Oil	Red
Bacteria	Green

For air mains subject to sub-zero temperatures: Compressed air treatment with a desiccant dryer (pressure dew point to -70 °C)



Degree of filtration:

Class ISO 8573-1	Solid particles ¹⁾		Humidity ²⁾	Total oil content ³⁾
	Max. particle size µm	Max. particle concentration mg/m ³	Pressure dew point (x = Liquid water in g/m ³)	mg/m ³
0	e.g. Consult KAESER regarding pure air and cleanroom technology			
1	0.1	0.1	≤ -70	≤ 0.01
2	1	1	≤ -40	≤ 0.1
3	5	5	≤ -20	≤ 1
4	15	8	≤ +3	≤ 5
5	40	10	≤ +7	-
6	-	-	≤ +10	-
7	-	-	x ≤ 0.5	-
8	-	-	0.5 < x ≤ 5	-
9	-	-	5 < x ≤ 10	-

¹⁾ As per ISO 8573-1:1991 (The specification for particle content is not measured as per ISO 8573-1:2001, as the limits defined therein for Class 1 are to be applied to 'Cleanrooms').
²⁾ As per ISO 8573-1:2001



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