FIRST COMPRESSOR MANUFACTURER IN THE WORLD ACCREDITED ISO 50001 ENERGY MANAGEMENT

ROTARY COMPRESSOR
OIL FREE AIR

METALPLAN AIRPOWER

METALPLAN IS NUMBER ONE IN ENERGY EFFICIENCY

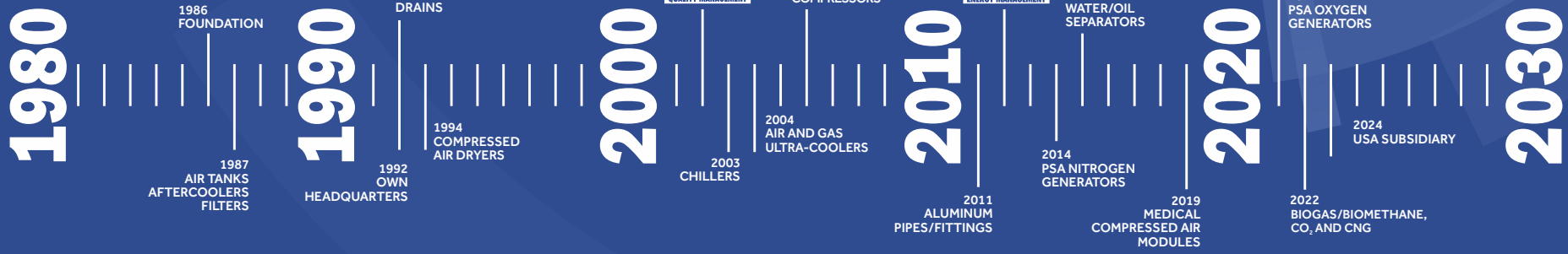
As the absolute leader in screw compressors up to 25 hp in Brazil, Metalplan is the world's first* compressor manufacturer accredited in ISO 50001 - Energy Management, demonstrating its commitment to energy efficiency, the foundation for sustainability and competitiveness of companies.

Founded in 1986, Metalplan has a production area of 6.000 m², developing innovative equipment with a high level of nationalization, exporting to over 20 countries.

Its network of authorized distributors and service centers includes over 300 highly specialized companies with extensive geographic coverage, capable of servicing over 100.000 operating equipment.

In recent years, Metalplan has been expanding its horizons to disruptive technologies in gases and renewable energies, such as on-site generation and compression of nitrogen, oxygen, biogas, biomethane, CO2 and CNG.

*in the compressed air, gases and industrial refrigeration segment.



Madero's *production line features two Metalplan* ***ScrollTech Zero Oil*** *compressors, purchased during the implementation and expansion of the hamburger factory in Ponta Grossa, Paraná.*

MADERO

OIL FREE

5 to 50 hp

SCROLL compressor

ISO CLASS ZERO

ROTARY COMPRESSOR
OIL FREE AIR

The ScrollTech Zero Oil Free compressors are compact, extremely quiet, and have no oil in any of their components, representing total safety against contamination, especially when associated with a ModuCarb CLASS ZERO* module equipped with oil sensors to prevent system contamination from oil vapors from the ambient air.

* see specific catalogue.

APPLICATIONS
- Medical and dental clinics
- Hospitals
- Research laboratories
- Food and beverage industry
- Critical purposes

ROTARY COMPRESSOR

SCROLLTECH ZERO

OIL FREE AIR

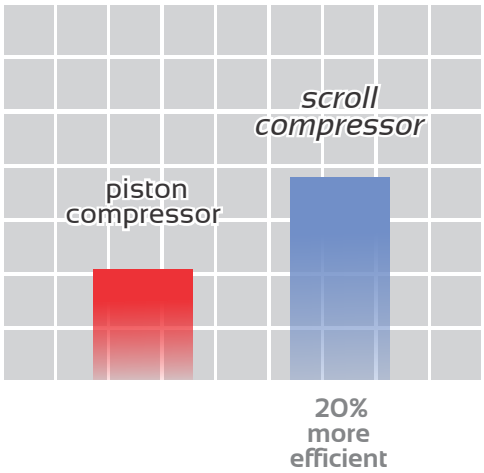
ISO 22000

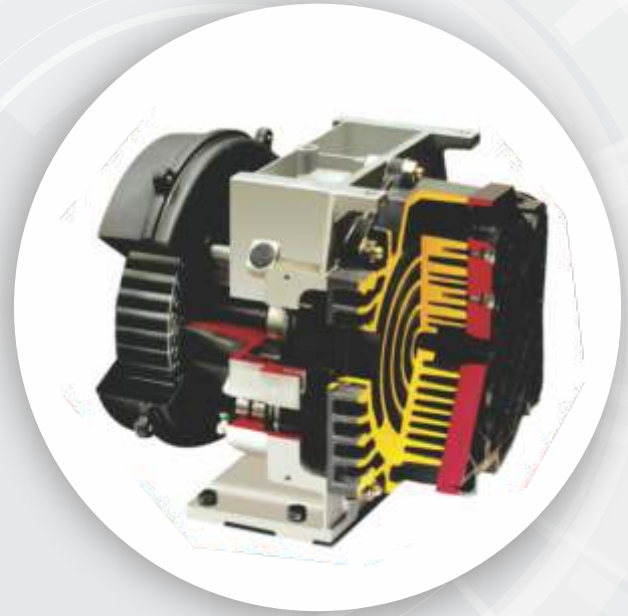
ISO 22000 is the specific standard for food and beverages, applied throughout the chain of this industry.
ISO 22000 certification ensures consumers the perfect quality of the final product, according to international standards of safety and reliability.

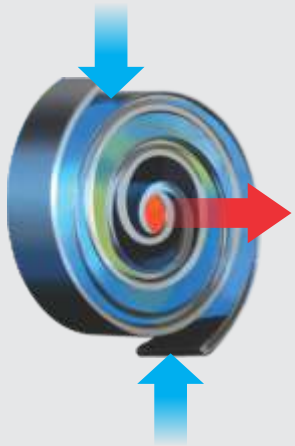
SCROLL compressor

ScrollTech Zero Oil Free compressors are suitable for sophisticated industrial processes, laboratories, medical and dental clinics, as well as for human respiration and supply of therapeutic compressed air, through specific treatment, according to RDC 50 National Health Surveillance Agency

The scroll technology in air and gas compression systems is relatively recent but has been gaining preference among users due to its reliability, efficiency, and durability, especially when compared to obsolete oil-free piston compressors.







The scroll compression chamber consists of a fixed helix and an orbital helix, whose eccentric movement progressively reduces the volume of air until the desired pressure is reached.
This operation is continuous, smooth, extremely quiet, and vibration-free.

The condensate from ScrollTech Zero Oil Free compressors is clean and oil-free, and can be freely discharged into the environment. The condensate from lubricated compressors requires proper treatment to avoid soil contamination.

TECHNICAL DATA

Model	Power	Effective Flow Rate		Dimensions (mm)			Weight
	hp	pcm	m³/h	length	height	width	(kg)
PPS-05 Zero	5	15,5	26,4	570	875	865	135
PPS-10 Zero	10	31,0	52,7	570	1260	1135	271
PPS-15 Zero	15	46,5	79,1	570	1650	1135	406
PPS-20 Zero	20	62,0	105,4	570	1060	1135	542
PPS-25 Zero	25	77,5	131,8	1000	1440	1420	678
PPS-30 Zero	30	93	158,1	1000	1440	1420	813
PPS-35 Zero	35	108,5	184,5	1000	1820	1420	949
PPS-40 Zero	40	124	210,8	1000	1820	1420	1084
PPS-45 Zero	45	139,5	237,2	1000	2150	1420	1220
PPS-50 Zero	50	155	263,5	1000	2150	1420	1355

Effective operating pressures: 8 and 10.5 bar(g) / 116 and 150 psig Flow rates referenced to 7 bar(g) / 100 psig pressure Optional frequency inverter

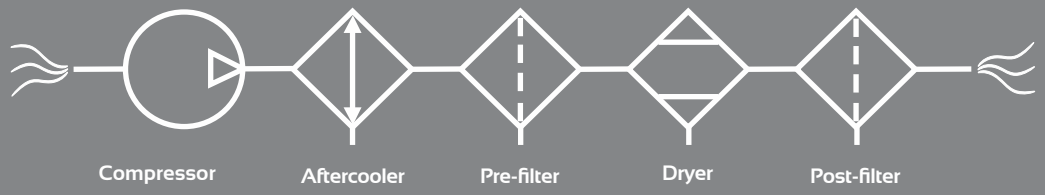
Consult about the technical characteristics and availability of TotalPack versions with integrated dryers and filters Noise level: 45 ~ 50 dBA

Available in
60 Hz /3 /220, 380, 440 V
50 Hz/ 3 /380 V

MASTER CONTROL TOUCH CONTROL

COMPRESSED AIR FUNDAMENTALS

ISO 8573 STANDARD INSTALLATION



CONTAMINANTS & QUALITY CLASSES

class	SOLID PARTICLES maximum number of particles per m³ (d = particle size) 0,1µm < d ≤ 0,5µm	0,5µm < d ≤ 1µm	1µm < d ≤ 5µm	class	WATER moisture dew point (°C)	class	OIL - total concentration (liquid/aerosol/vapor) (mg/m³)
0	CLASS ZERO - as specified by the user or equipment supplier and stricter than Class 1						
1	≤ 20.000	≤ 400	≤ 10	1	-70	1	≤ 0,01
2	≤ 400.000	≤ 6.000	≤ 100	2	-40	2	≤ 0,1
3	-	≤ 90.000	≤ 1.000	3	-20	3	≤ 1
4	-	-	≤ 10.000	4	+3	4	≤ 5
5	-	-	≤ 100.000	5	+7	5	-
	Mass concentration - C_p (mg/m³)			6	+10	6	-
6	$0 < C_p \leq 5$				Liquid Water C_w g/m³)		
7	$5 < C_p \leq 10$			7	$C_w \leq 0,5$	7	-
8	-			8	$0,5 < C_w \leq 5$	8	-
9	-			9	$5 < C_w \leq 10$	9	-
X	$C_p > 10$			X	$C_w > 10$	X	> 5

ISO 8573 COMPRESSED AIR FOR GENERAL USE

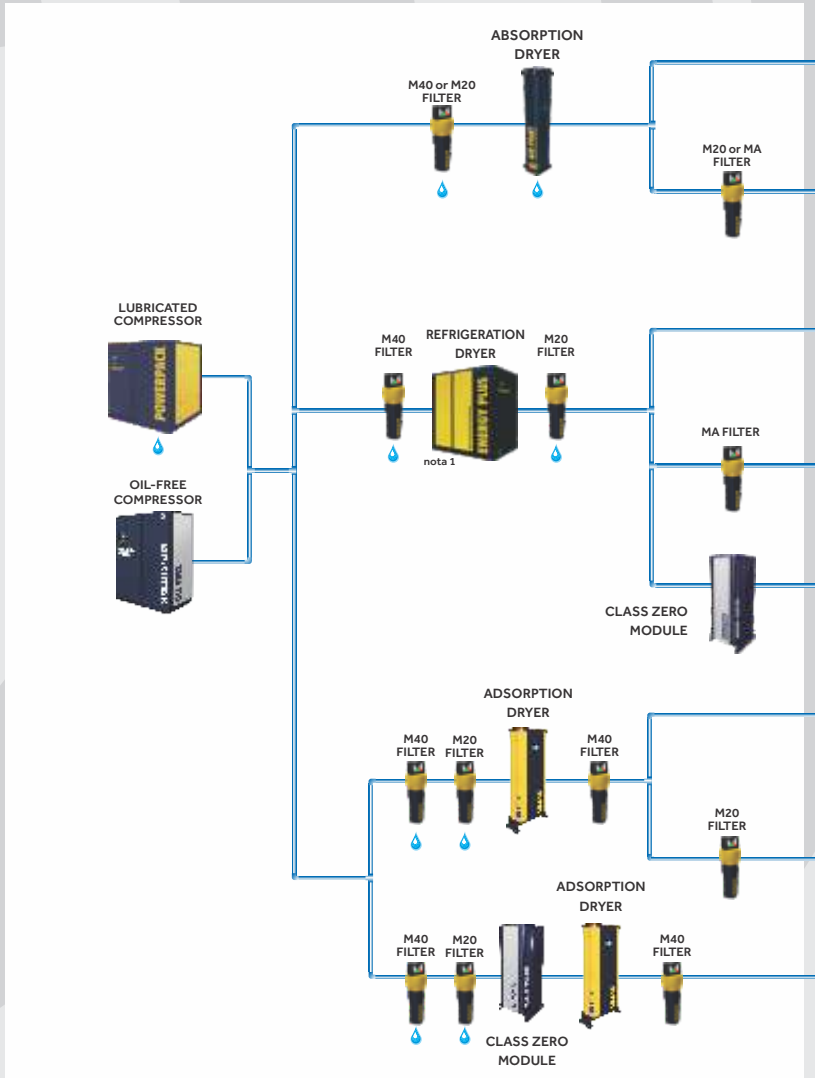
ISO 8573 is the international reference for compressed air systems, focusing on contamination levels.

The standard has various quality classes that serve multiple applications in industry and services, excluding human breathing and medicinal use.

Published in 1991, it was translated by Metalplan in 1992, positioning Brazil at the forefront of its utilization.

Its 3rd edition is from 2010, when Class Zero was introduced, with purity levels stricter than those found in Class One.

COMPRESSED AIR FUNDAMENTALS

ISO 8573 TYPICAL SYSTEMS	quality class	APPLICATIONS
	[1:6:1] [2]	Dry air, with dew point between 5°C and 15°C. Ideal for low flows and protection of valves, cylinders, pneumatic tools, automation, blasting, painting, etc.
	[1:6:1] [2] [1:6:0] [2]	Activated carbon filter eliminates odors, with residual oil of 0.003 mg/m³, suitable for dental clinics and similar applications, except for human breathing.
	[1:4:1]	This is the most used treatment system in the industry. Its level of protection meets various sectors such as automotive, plastic, textile, paper, mechanical, metallurgical, etc.
	[1:4:0]	Quality similar to the previous system, with odor elimination and lower residual oil (0.003 mg/m³), important in N2 and O2 generation and in the food, chemical, pharmaceutical industries, etc.
	[1:4:0]	Quality similar to the two previous systems, in terms of "water" and "solid particles". Meets Class Zero for the "oil" contaminant with total safety.
	[1:2:1] [1:1:1]	Prevents vapor absorption when air comes into direct contact with hygroscopic materials (cement, resins, powdered or freeze-dried foods and pharmaceuticals). Prevents freezing when air is subjected to negative temperatures. Applied in the generation of gases of very high purity.
	[1:2:1] [1:1:1]	Low dew point and maximum particle retention are essential in the manufacture of optical fibers, chips, critical instrumentation, steelmaking, nuclear reactors, etc.
	[1:2:0] [1:1:0]	Quality similar to the two previous systems, in terms of "water" and "solid particles". Meets Class Zero for the "oil" contaminant with total safety.

1 Energy Plus and Titan Plus dryers have integrated pre and post-filters
2 only if the compressed air inlet temperature is < 25°C

Install an AQUA + condensate treatment system.

DECIPHERING CLASS ZERO

When drafting Class Zero, ISO 8573 **failed to adopt the necessary clarity**. See the original text:

"Class 0: as specified by the equipment user or supplier and **more stringent than Class 1**"*

The standard requires that the contamination levels of Class Zero be **lower** – "more stringent" – than the levels of Class One, meaning, **the maximum levels of Class Zero must be below the lowest levels of Class One**. However, the standard does not establish the limit between these levels. When referring to the oil contaminant, we know that the most sophisticated instruments can detect up to 0.003 mg of oil in each m³ of compressed air. Therefore, this is the value that should be adopted as the minimum level of Class One and the maximum of Class Zero.

CHOOSE THE MOST SUITABLE CLASS FOR YOUR APPLICATION

When specifying the quality of compressed air, never go beyond the user's needs, avoiding high costs and inconveniences.

An example is the increasing demand for "100% oil-free/Class Zero" compressed air, even when there is no basis for it. There are specifications that opt for excessive caution, without considering that it is easy to eliminate the risk of contamination with very affordable devices.

It is up to the user, with the support of experts, to define the necessary and sufficient technical requirements for their application.

For situations where even the slightest presence of oil is not tolerable, a synthetic, non-toxic, colorless, and odorless lubricant can be used, of the food-grade type, approved and recommended by : National Health Surveillance Agency

OIL RESIDUE - ISO 8573

CASE STUDY

COMPRESSOR POWER	100 hp
TOTAL FLOW OF COMPRESSED AIR	7.7 million m³/year
TOTAL MASS OF COMPRESSED AIR	10 thousand tons/year
OIL RESIDUE IN CLASS ONE	86 grams/year
OIL RESIDUE IN CLASS ZERO	26 grams/year

OIL-FREE COMPRESSED AIR: DEBUNKING MYTHS

Air compressors draw in ambient air and all contamination around them: water vapor, oil vapor, and solid particles.

"Oil vapor" is the generic term for the combination of oil vapors, hydrocarbon vapors, and volatile organic compound (VOC) vapors present in the ambient air[1].

The concentration of oil vapors in the atmosphere is typically between 0.05 mg/m³ and 5 mg/m³ but can reach even higher levels in dense industrial or urban areas.
According to the UN, the ambient air in certain regions may contain a level 100 thousand times higher than Class Zero[2] of ISO 8573 Standard allows.

Conclusion: regardless of the type of compressor – **lubricated or oil-free** – the presence of oil in compressed air is inevitable, requiring appropriate treatment immediately after compression. Effectively, when using an oil-free compressor, achieving Class Zero is easier, while a lubricated compressor will require more safety devices.

THE AMBIENT AIR CAN CONTAIN UP TO 100 THOUSAND TIMES MORE OIL VAPORS THAN CLASS ZERO PERMITS

SOURCE	OIL CONCENTRATION – C	ISO 8573
CAGI – Compressed Air and Gas Institute (USA)	0.05 mg/m³ ≤ C ≤ 0.5 mg/m³	Classes 2 and 3
OSHA – Occupational Safety and Health Administration (USA)	C ≤ 5 mg/m³	Class 4
MTb – Ministry of Labor (Brazil)	C ≤ 5 mg/m³	Class 4
UN – United Nations Industrial Development Organization	C ≤ 300 mg/m³	Class X

GLOSSARY

[1] **Hydrocarbon**: organic compound formed by hydrogen and carbon atoms.
Oil: mixture of hydrocarbons formed by six or more carbon atoms (C6+).
Volatile Organic Compound: carbon compounds with a high vaporization rate (benzene, ethanol, acetone, formaldehyde, etc.)

[2] **Class Zero**: oil residue ≤ 0.003 mg/m³

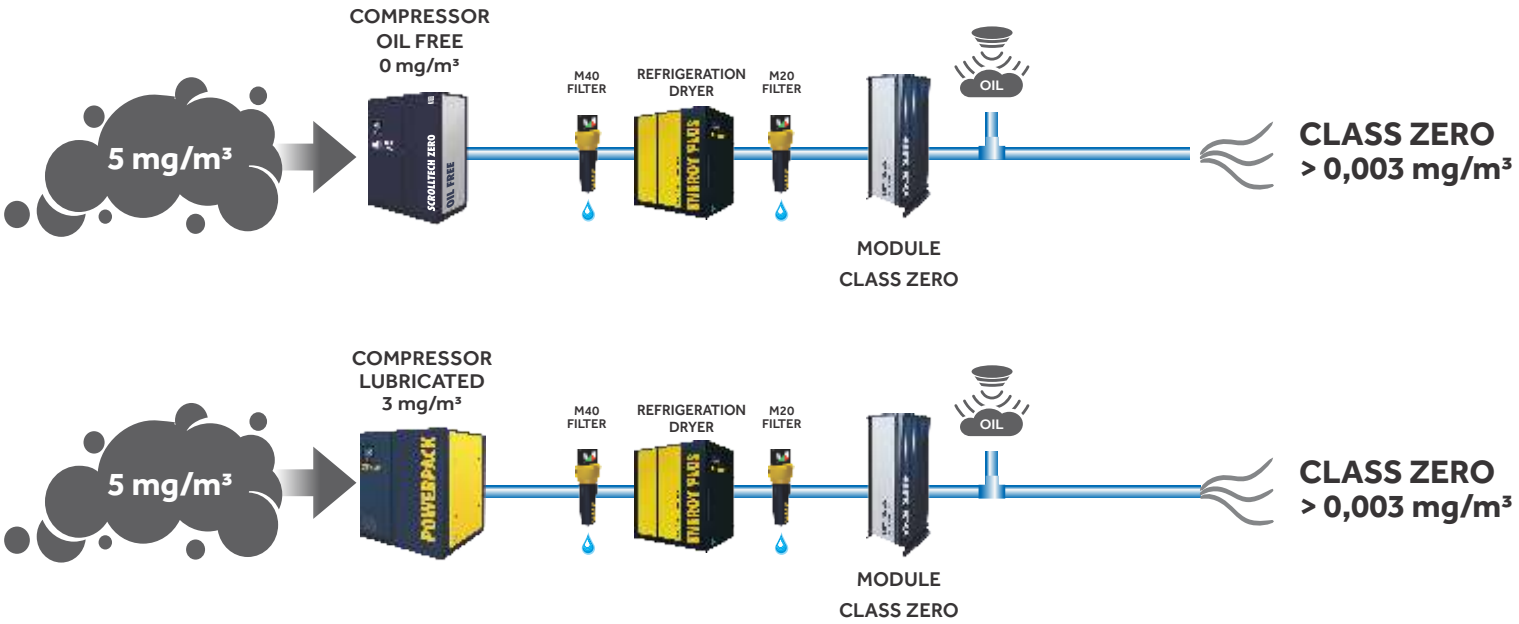
ACHIEVING ZERO CLASS WITH ZERO RISK

It is important to note that the presence of oil in the ambient air prevents any claims of "zero contamination risk" in a compressed air system, even when using oil-free compressors.

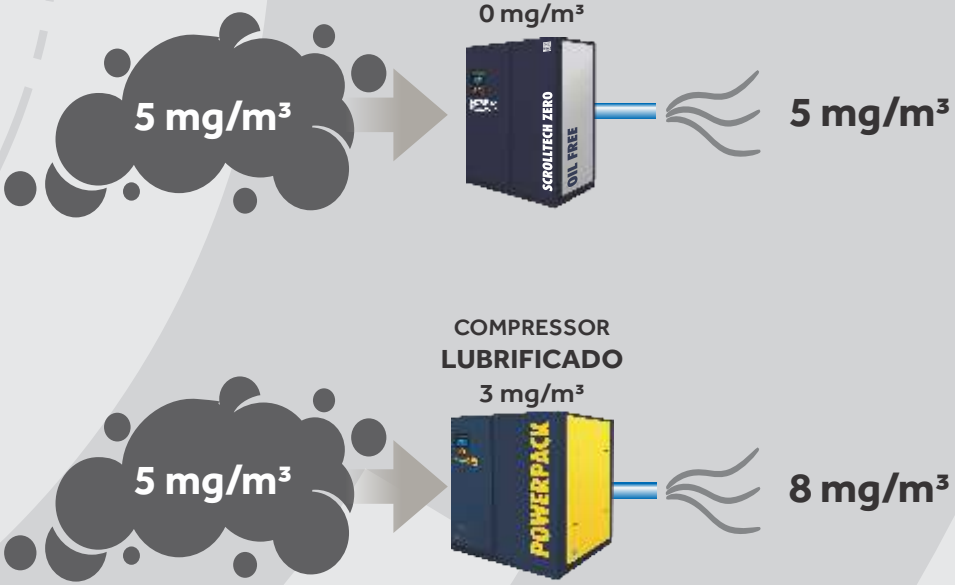
To fully mitigate this risk, there are devices[1] that ensure the retention of all oil, whether in liquid or gaseous form. These devices are monitored by oil sensors and equipped with backup and redundancy systems, ensuring a continuous supply of Zero Class compressed air.

It is thanks to these surveillance and protection mechanisms that, for example, gas oxygen plants (both medicinal and industrial) safely use lubricated compressors.

1 - Activated carbon modules or catalytic converters



COMPRESSED AIR FUNDAMENTALS



DOES A "ZERO CLASS COMPRESSOR" EXIST?

The ISO 8573 standard allows for the claim that "compressed air samples meet Zero Class," if these samples are collected and tested with the frequency required by the user.
However, there is no part of the standard that contains the term "Zero Class Compressor." This is self-evident, as no compressor can eliminate the oil present in the ambient air.
Whether lubricated or oil-free, any compressor will draw and compress the surrounding air, including the oil contained in it.

In installations with oil-free compressors, 100% of the oil in the compressed air will come from the surrounding environment.

In installations with lubricated compressors, the oil in the compressed air will be a combination of the oil present in the atmosphere and the oil released by the compressor itself, which is typically around 3 mg/m³ (*).

In both cases, the resulting contamination far exceeds Zero Class, requiring stringent treatment to meet the standard.

This treatment will also eliminate particles and moisture, which are inherent in any type of compressor.

In summary, the term "Zero Class Compressor" is a rhetorical construct with no real basis, regardless of how it is presented.

*Standard residual for oil-injected screw compressors.

IMPRINTS OF OUR HISTORY

AFTER-SALE SERVICES

★★★★★

96% OF CUSTOMERS FULLY SATISFIED

In an Annual ISO 9001 Audited Survey, we achieved a 96% customer satisfaction rate for Technical Assistance. This percentage corresponds to the evaluations above 7 (seven), on a scale of 0 (zero) to 10 (ten).

This success is due to over 70 authorized workshops and 200 accredited technicians throughout American continent, supported by an exclusive partnership with National Service for Industrial Training for mechanic training, making our After-Sales Service the most acclaimed in the market.

SAM
Metalplan Authorized Service

Typical facade

COMPREHENSIVE INVENTORY OF ORIGINAL PARTS

MAXIMUM EFFICIENCY IN AFTER-SALES SERVICE

70 CERTIFIED WORKSHOPS

200 SPECIALIZED TECHNICIANS

OUR SOLUTIONS

COMPRESSED AIR

- COMPRESSORS
- DRYERS AND FILTERS
- RESERVOIRS
- 100% ALUMINUM PIPING

OXYGEN & NITROGEN

- OXYGEN GENERATORS PSA / VSA ON SITE
- NITROGEN GENERATORS PSA ON SITE

INDUSTRIAL REFRIGERATION

- WATER CHILLERS
- ULTRA AIR AND GAS COOLERS (-35°C)
- THERMOCHILLERS
- DRY COOLERS

BIOGAS & CNG

- COMPRESSORS FOR BIOGAS, BIOMETHANE AND CNG
- BOOSTERS
- CHILLERS
- DISPENSERS

e-line

ROTARY SCREW COMPRESSORS

4 to 25 hp

REFRIGERATION DRYERS

20 to 250 pcm

ABSORPTION DRYERS

6 to 32 pcm

COALESCING FILTERS

25 to 300 pcm

AUTOMATIC DRAIN VALVES

electronic & magnetic

METALPLAN

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