



FIRST COMPRESSOR  
MANUFACTURER IN THE  
WORLD ACCREDITED

**ISO 50001**

ENERGY MANAGEMENT

INDUSTRIAL CHILLERS  
ACCURACY OF 0.1°C

**METALPLAN**  
CHILLERS 

# 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.

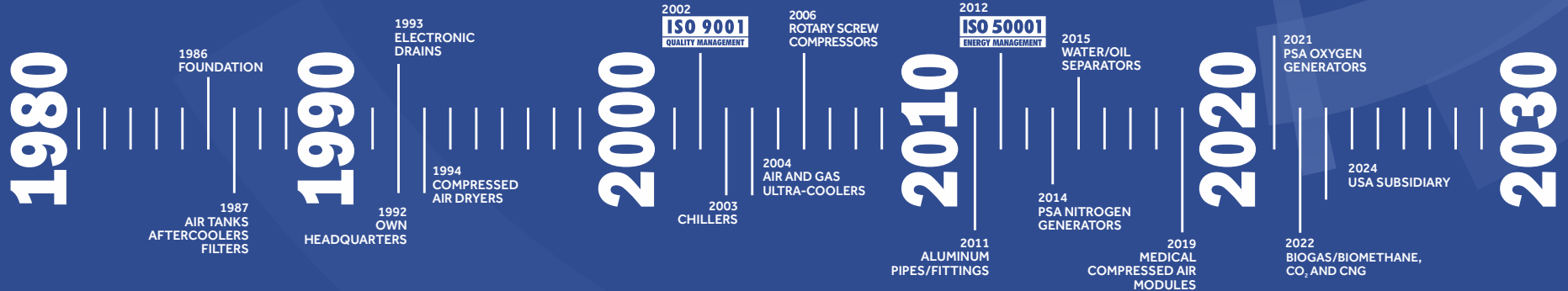
Founded in 1986, Metalplan has a production area of 6.000 m<sup>2</sup>, developing innovative equipment with a high level of nationalization, exporting to over 20 countries.

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, CO<sub>2</sub> and CNG.



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







*At Melitta, three Polar chillers support hundreds of tons of roasted, ground, and packaged coffee monthly, with extreme care in preserving their various aromas and flavors.*



## 0.1°C PRECISION IN CONTROLLING THE TEMPERATURE OF CHILLED WATER AND OTHER FLUIDS

All the technology developed by Metalplan in the field of heat exchangers and industrial refrigeration is present in the new generation of Polar, a chiller for water and other fluids of high reliability and robustness, designed to withstand continuous operation and adverse environments.

The fluid temperature is regulated directly on the Mastercontrol panel, and the control instruments keep it constant with a precision of 0.1°C, ensuring the quality of your process. Thousands of units installed in industries and institutions across various countries attest to the unbeatable quality of the Polar.

1.000 to  
720.000  
**kcal**

-45 to +25  
**°C**

gas  
ecological

EVAPORATOR

**EVAPORATOR**  
Type stainless steel plates,  
compact and efficient.



# POLAR

## HIGH-PRECISION CHILLERS





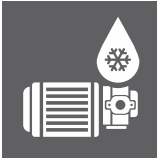
**MICROCHANNEL** aluminum condenser brazed. Withstands high temperatures environments, with low resistance to flow. It comes equipped with a dust filter.



**ELECTRONIC EXPANSION VALVE.** Allows extremely precise control of refrigerant flow in the circuit, providing significant energy savings.



**ULTRA-SILENT FANS,** high flow rate, and low energy consumption. The noise level is 60% lower than conventional fans.

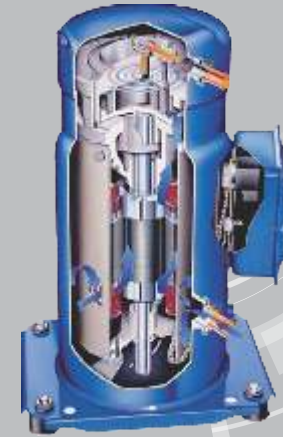


Corrosion-free hydraulic piping. 100% aluminum reservoir. Stainless steel water pump\*.

\*optional

✓ Powder-coated electrostatic paint, with anti-corrosive treatment.

✓ Level sensor and external bypass.

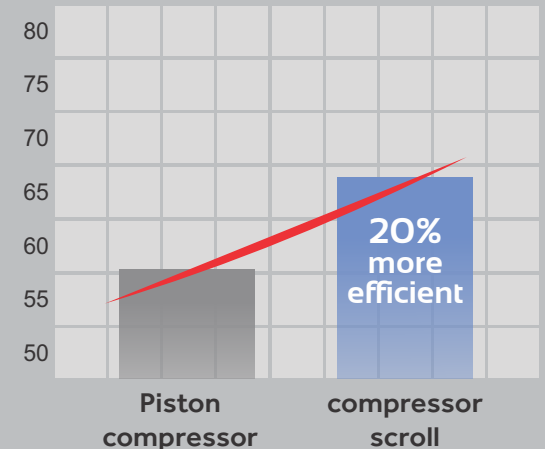


**SCROLL REFRIGERATION COMPRESSOR**

- Quiet and vibration-free operation.
- Permanent balancing.
- Supports higher liquid return rates.
- Dispenses with suction and discharge valves.
- Volumetric efficiency ~100%.
- Much more compact.
- Compresses under any pressure condition.



*A Metalplan Polar chiller was essential for improving the dimensional quality and production speed of injected caps, mainly due to the stability of water flow and temperature, maintained within very strict limits.*





## TEMPERATURE CONTROL PRECISION

Temperature control is essential in various industries, especially in the plastics processing sector. Several devices perform this task with precision, but only the Polar chiller is suitable for all applications.



APPLICATIONS	COOLING SOLUTIONS			
	POLAR CHILLER	DryCooler	Thermoregulator	Thermo-chiller
Thermoforming	✓		✓	
Cutting and welding	✓			
Lamination	✓		✓	
Tube extrusion	✓			
Sheet extrusion	✓		✓	
Flexography	✓		✓	
Blowing	✓	✓	✓	✓
Balloon extrusion	✓			
Injection	✓	✓	✓	✓

*Jacto is focused on innovative solutions that provide significant productivity and quality gains to its users. For several years, Jacto has introduced the Polar chiller, associated with the SubZero ultra-chiller (both from Metalplan), into its plastic packaging blowing line. Currently, Jacto has sixteen of these units, which contribute significantly to the production of parts ranging from 5 to 200 liters.*





## MASTERCONTROL

MASTERCONTROL controls and monitors the main functions of the Polar chiller to ensure total reliability. Additionally, it has an automatic shutdown function for the refrigeration compressors when the water temperature reaches the set point, resulting in significant energy savings.

### HUMAN/MACHINE INTERFACE TOUCHCONTROL

- Outlet water temperature
- Inlet water temperature
- Pump operation indication
- Fan operation indication
- Refrigeration compressor operation indication
- Circuit diagram
- Superheat
- Percentage of expansion valve opening and closing
- Refrigeration circuit pressures
- Fault alerts
- Audible and visual fault alarms



### GENERAL DIAGNOSTICS & SPECIAL FUNCTIONS

- History of alerts and faults from the last 50 events:
  - High pressure in the refrigeration circuit
  - Low pressure in the refrigeration circuit
  - Phase inversion or lack of phases
  - Overcurrent in the pump
  - Overcurrent in the refrigeration compressor
  - Overcurrent in the fan
  - Water insufficiency
  - Sensor errors
- Temperature sensor calibration
- Remote start/stop (via cable)
- Remote fault signal
- Serial communication (modbus)
- Unit conversion
- Local date and time adjustment



# TECHNICAL DATA

## REFRIGERATION CAPACITIES UP TO 720,000 kcal/h

The Polar chiller can meet industrial and commercial refrigeration applications with a maximum capacity of up to 240 TR.



Model	Nominal capacity <sup>1</sup> kcal/h	Dimensions (mm)			Process pump		Water reserv. <sup>4</sup> liters	fluid <sup>3</sup> condenses m³/h	Energy	Piping BSP		Weight kg	
		length	height	width	m³/h	mca				process	condenser		
PA-1	1000	760	700	432	0,8	25	20	1050	220/1/60	3/4"	-	50	
PA-2	2000	760	700	432	0,8	25	20	2100		3/4"	-	50	
PA-3	3000	810	910	690	0,8	25	25	3600		3/4"	-	60	
PA-5	5000	810	910	690	2,4	30	25	3600	220/1/60 or 380/3/60	3/4"	-	65	
PA-9	9000	770	1270	790	2,2	30	50	4500		1"	-	280	
PA-15	15000	1060	1400	850	3,7	30	40	6000	220/3/60 380/3/60 440/3/60	1¼"	-	400	
PA-22	22000	1130	1600	850	5,5	30	65	8700		1½"	-	570	
PA-30	30000	1680	1850	850	7,5	30	75	13800		1½"	-	600	
PA-45	45000	1680	1850	850	11,2	30	95	17000		2"	-	800	
PA-60	60000	1680	1850	850	15	30	145	25600		2"	-	900	
PA-75	75000	2550	2300	1040	18,7	30	175	33800		2"	-	1250	
PA-90	90000	2550	2300	1040	22,5	30	215	39100		2"	-	1350	
PA-120	120000	3526	2238	1720	30	30	350	52800		3"	-	1800	
PA-150	150000	3526	2238	1720	37,5	30	350	68000		3"	-	1850	
PA-180	180000	3526	2238	1720	45	30	350	68000		3"	-	2050	
PA-240	240000	3526	2238	1720	60	30	350	102000	3"	-	2230		
PA-300	300000	3526	2238	1720	75	30	350	135200	4"	-	2450		
WATER CONDENSATION <sup>3</sup>	PW-9	9000	770	1200	790	2,2	30	50	2,4	220/3/60 380/3/60 440/3/60	1"	1½"	280
	PW-15	15000	1060	1100	850	3,7	30	40	3,6		1¼"	1½"	400
	PW-22	22000	1130	1260	850	5,5	30	65	5,0		1½"	1½"	570
	PW-30	30000	1680	1510	850	7,5	30	75	7,1		1½"	1½"	600
	PW-45	45000	1680	1510	850	11,2	30	95	10,0		2"	1½"	800
	PW-60	60000	1680	1510	850	15	30	145	15,9		2"	2"	900
	PW-75	75000	2550	2100	1040	18,7	30	175	19,8		2"	2"	1250
	PW-90	90000	2550	2100	1040	22,5	30	215	23,5		2"	2"	1350
	PW-120	120000	3526	2070	1720	30	30	350	30,9		3"	3"	1610
	PW-150	150000	3526	2070	1720	37,5	30	350	38,8		3"	3"	1650
	PW-180	180000	3526	2070	1720	45	30	350	47,0		3"	3"	1800
	PW-240	240000	3526	2070	1720	60	30	350	61,8		3"	3"	1970
	PW-300	300000	3526	2070	1720	75	30	350	77,5		4"	4"	2150

1 - Capacities valid for water temperature at 10°C  
2 - Air-cooled, ambient temperature below 35°C

3 - Water-cooled, tower water temperature below 30°C and minimum pressure of 2 kgf/cm²  
4 - Valid only for equipment with internal reservoir

Check the availability of some of these items in the offered model.

Other capacities and engineered equipment available upon request.



*"The Institute of Physics at University of São Paulo hosts the Laboratory of Solid State and Low Temperatures, founded in 1962 and a pioneer in Brazil. Here, research is conducted under extreme conditions of low temperatures (down to 0.01 K) and high magnetic fields (up to 20 T). The heart of this laboratory is the Cryogenic Plant that produces liquid helium, a basic input for obtaining low temperatures and keeping the superconducting coils cooled, which generate the magnetic fields. Since 2009, the cooling system for the helium liquefaction compressors has been based on a Polar chiller from Metalplan, which has operated with high reliability, ensuring the laboratory's operation."*

Prof. Dr. Valdir Bindilatti  
INSTITUTE OF PHYSICS - USP

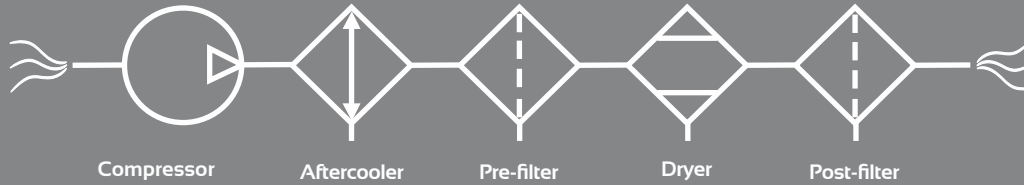




# COMPRESSED AIR FUNDAMENTALS



## ISO 8573 STANDARD INSTALLATION



Compressor

Aftercooler

Pre-filter

Dryer

Post-filter

## CONTAMINANTS & QUALITY CLASSES

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

## 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.

# FUNDAMENTOS DO AR COMPRIMIDO



SISTEMAS TÍPICOS ISO 8573	classe de qualidade	APLICAÇÕES
<p>COMPRESSOR LUBRIFICADO</p> <p>FILTRO M40 ou M20</p> <p>SECADOR POR ABSORÇÃO</p> <p>FILTRO M20 ou MA</p>	<p>[1:6:1]<sup>2</sup></p>	<p>Ar seco, com ponto de orvalho entre 5°C e 15°C. Ideal para pequenas vazões e proteção de válvulas, cilindros, ferramentas pneumáticas, automação, jateamento, pintura, etc.</p>
<p>COMPRESSOR LUBRIFICADO</p> <p>FILTRO M40</p> <p>SECADOR POR REFRIGERAÇÃO</p> <p>FILTRO M20</p> <p>FILTRO MA</p> <p>nota 1</p>	<p>[1:6:1]<sup>2</sup> [1:6:0]<sup>2</sup></p>	<p>O filtro de carvão ativado elimina odores, com residual de óleo de 0,003 mg/m<sup>3</sup>, adequado para clínicas odontológicas e aplicações similares, exceto respiração humana.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>SECADOR POR REFRIGERAÇÃO</p> <p>FILTRO M20</p> <p>FILTRO MA</p>	<p>[1:4:1]</p>	<p>Este é o sistema de tratamento mais utilizado na indústria. Seu nível de proteção atende a diversos setores, como o automobilístico, plástico, têxtil, papelero, mecânico, metalúrgico, etc.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>SECADOR POR REFRIGERAÇÃO</p> <p>FILTRO M20</p> <p>MÓDULO CLASSE ZERO</p>	<p>[1:4:0]</p>	<p>Qualidade similar ao sistema anterior, com eliminação de odores e menor residual de óleo (0,003 mg/m<sup>3</sup>), importante na geração de N<sub>2</sub> e O<sub>2</sub> e nas indústrias alimentícias, químicas, farmacêuticas, etc.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>SECADOR POR REFRIGERAÇÃO</p> <p>FILTRO M20</p> <p>MÓDULO CLASSE ZERO</p>	<p>[1:4:0]</p>	<p>Qualidade similar aos dois sistemas anteriores, em termos de "água" e "partículas sólidas". Atende a Classe Zero para o contaminante "óleo", com total segurança.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>FILTRO M20</p> <p>SECADOR POR ADSORÇÃO</p> <p>FILTRO M40</p> <p>FILTRO M20</p>	<p>[1:2:1] [1:1:1]</p>	<p>Previne a absorção do vapor quando o ar tem contato direto com materiais higroscópicos (cimento, resinas, alimentos e fármacos em pó ou liofilizados). Evita o congelamento, quando o ar é submetido a temperaturas negativas. Aplicado na geração de gases de altíssima pureza.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>FILTRO M20</p> <p>SECADOR POR ADSORÇÃO</p> <p>FILTRO M20</p>	<p>[1:2:1] [1:1:1]</p>	<p>Baixo ponto de orvalho e máxima retenção de partículas é essencial na fabricação de fibras óticas, chips, instrumentação crítica, siderurgia, reatores nucleares, etc.</p>
<p>COMPRESSOR ISENTO DE ÓLEO</p> <p>FILTRO M40</p> <p>FILTRO M20</p> <p>SECADOR POR ADSORÇÃO</p> <p>FILTRO M40</p> <p>MÓDULO CLASSE ZERO</p>	<p>[1:2:0] [1:1:0]</p>	<p>Qualidade similar aos dois sistemas anteriores, em termos de "água" e "partículas sólidas". Atende a Classe Zero para o contaminante "óleo", com total segurança.</p>

1 os secadores Energy Plus e Titan Plus possuem pré e pós-filtros integrados  
2 somente se a temperatura de entrada do ar comprimido ≤ 25°C

instale um sistema de tratamento de condensado AQUA +

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.



Typical facade

# COMPREHENSIVE INVENTORY OF ORIGINAL PARTS



MAXIMUM EFFICIENCY IN AFTER-SALES SERVICE



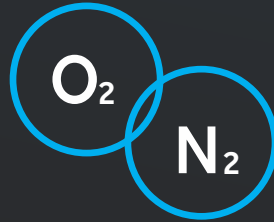
**70** WORKSHOPS CERTIFIED  
**200** SPECIALIZED TECHNICIANS

# OUR SOLUTIONS



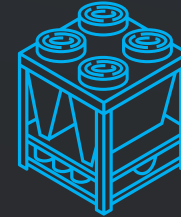
## COMPRESSED AIR

- 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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 ENERGY MANAGEMENT