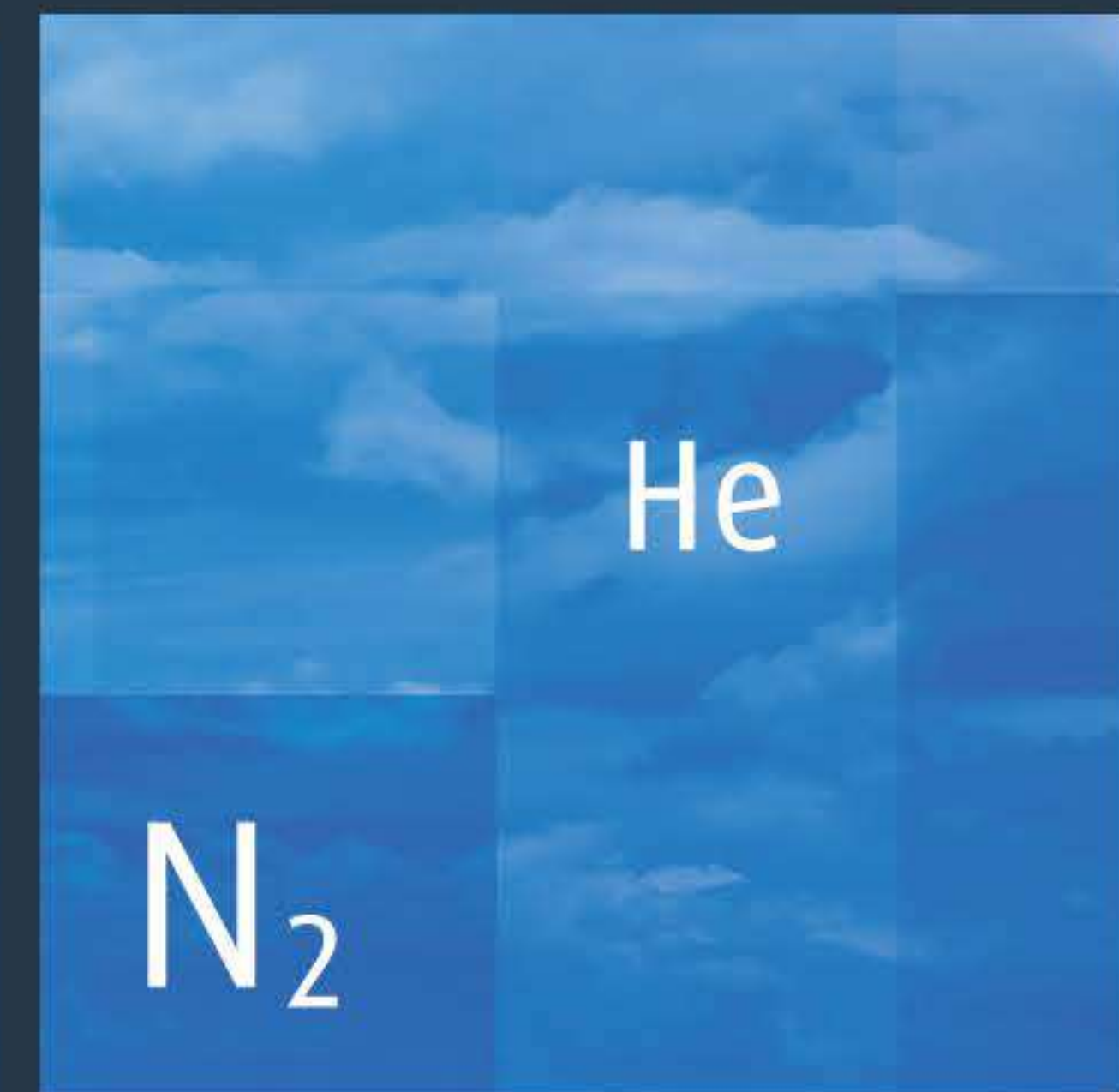
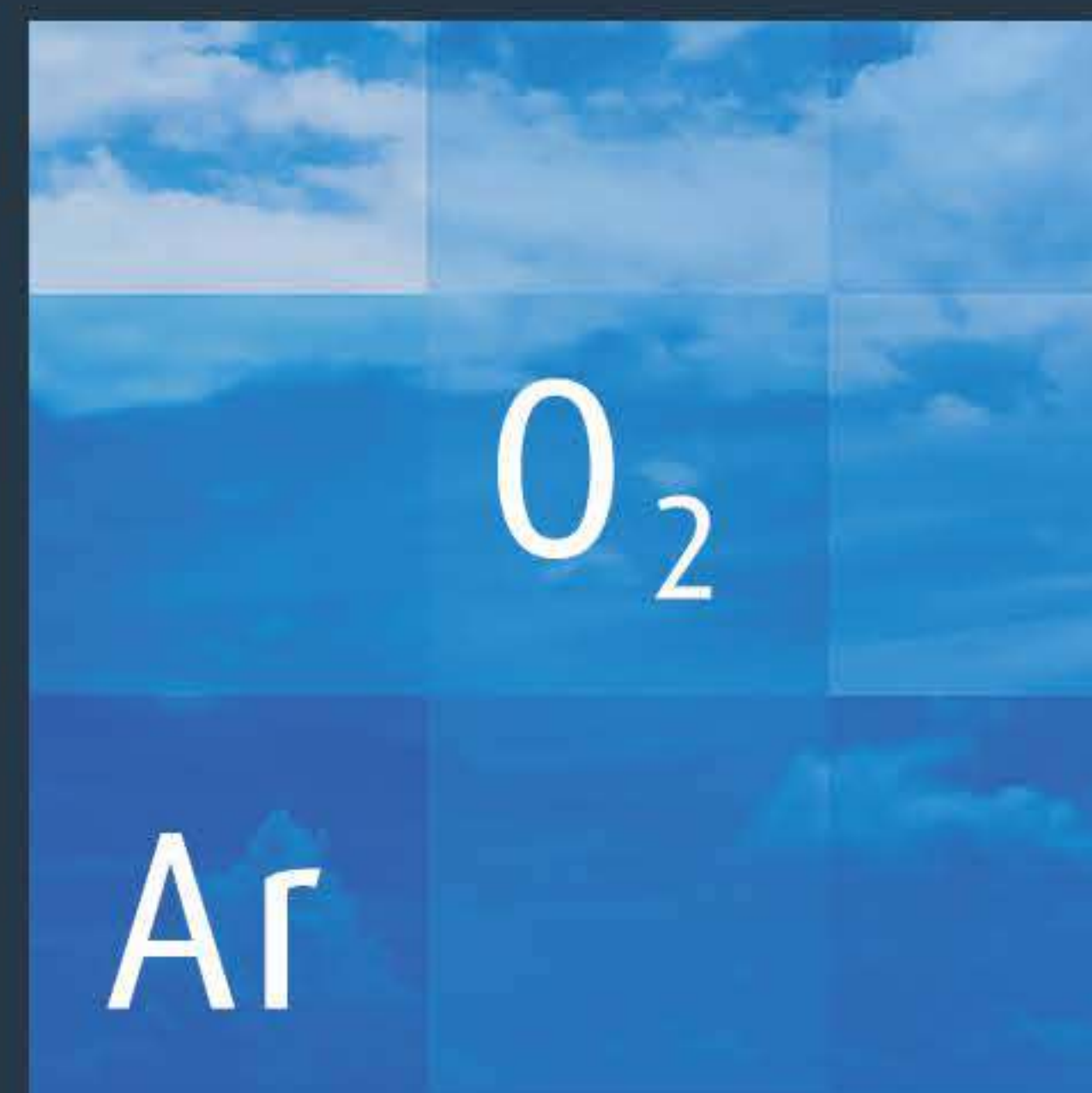
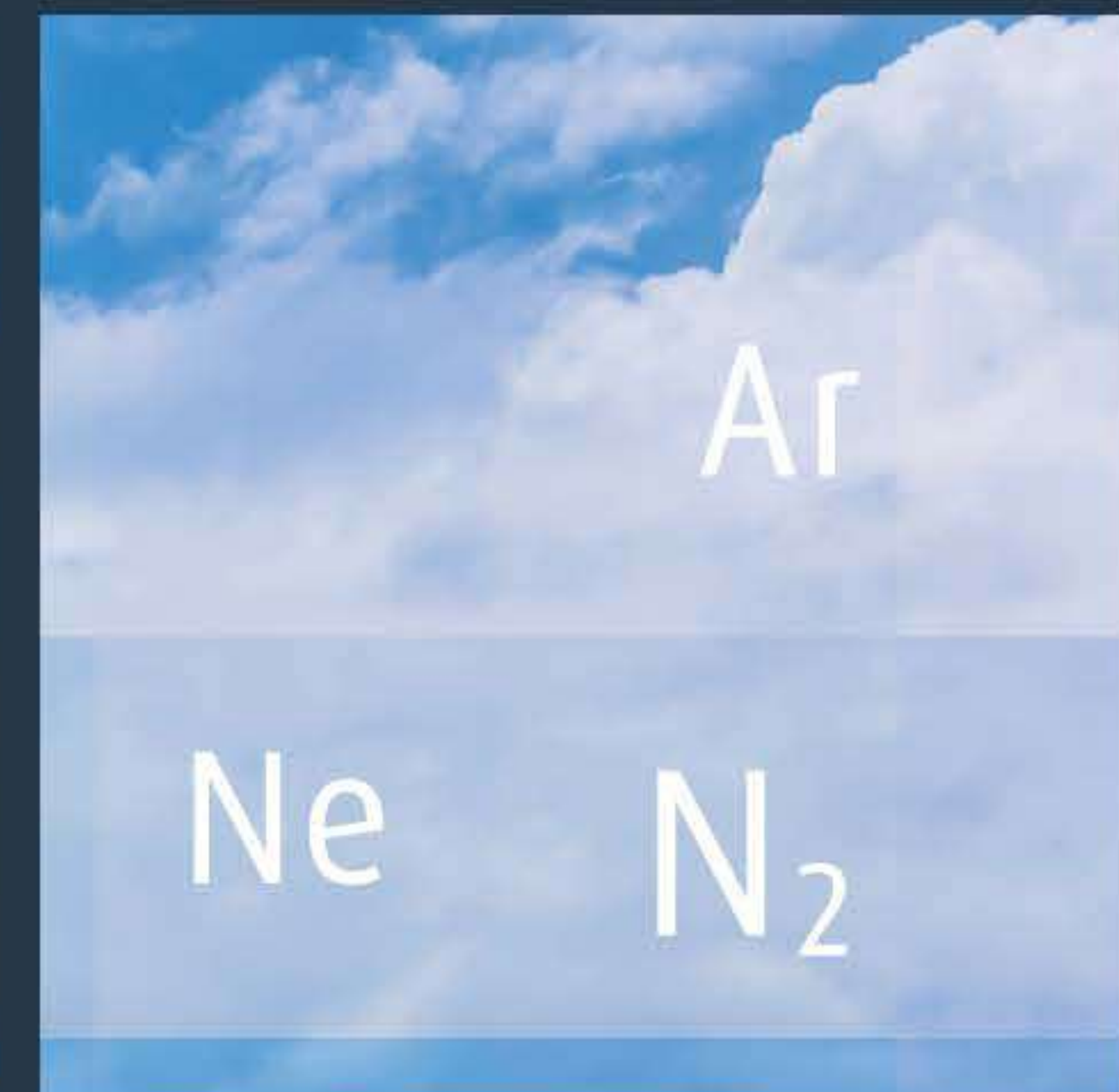
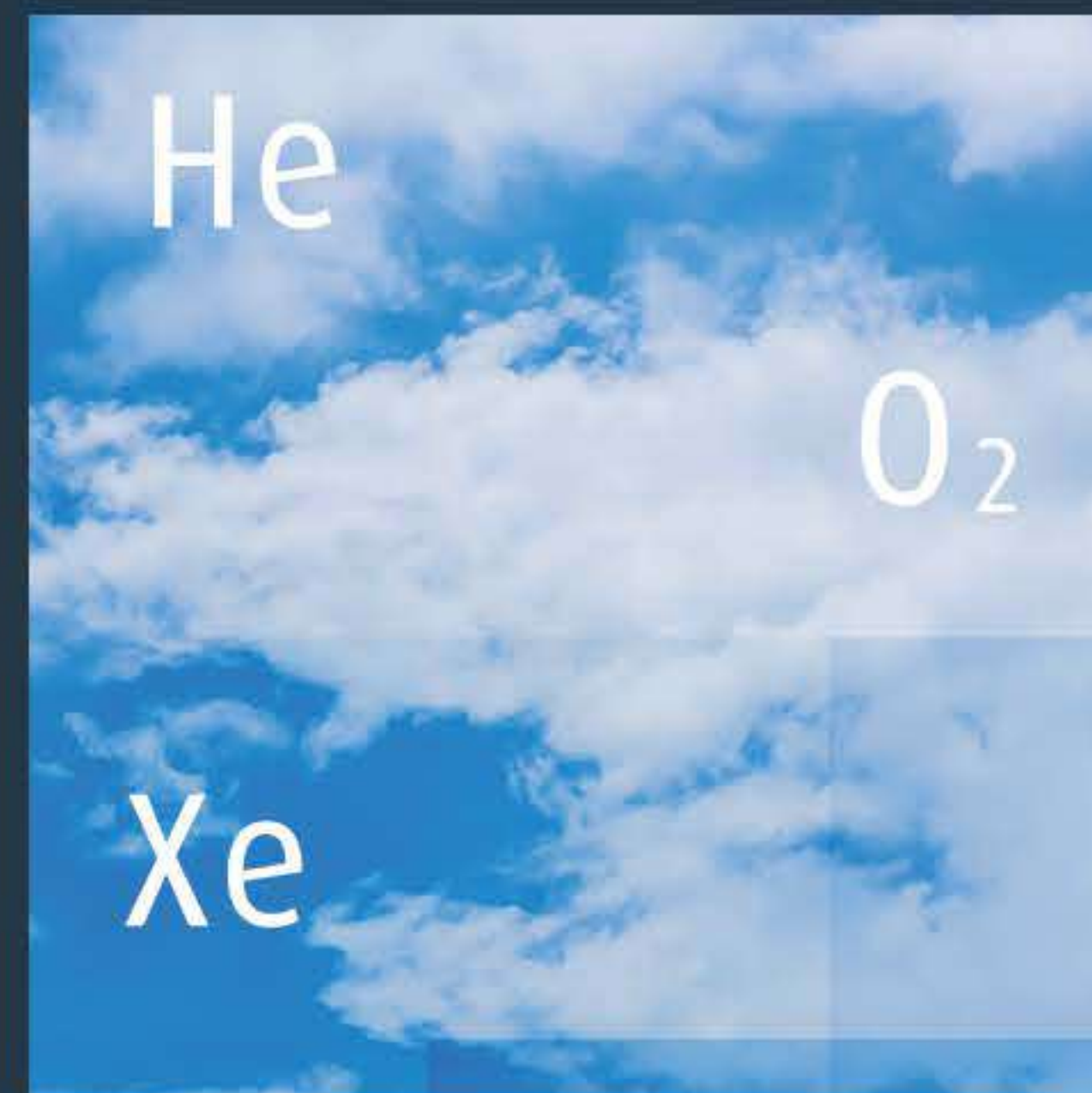


Packaged Air Separation Plants

Cryogenic Technology



Breaking down air
with absolute precision
and in total safety



Welcome to HATCO!

HATCO is a company specialized in the planning, engineering, design and realization of turnkey, customized solutions for the air and gas compression and separation plants including all exclusive project's services. Since founded in 1997, HATCO brand stands for quality and reliability, but also aim to innovation and development in the future.

Thousands of compression packages operating across the country prove our reliability of products for special environments and heavy duty industries and air separation plants. Our aim is to promote a constant improvement about products and we do manufacturing, developing and enhancing, at the same time, the quality of life.

Today we are expanding our business and technology to air separation plants (ASUs) and hydrogen purifiers based on Linde technology as the world's leading industrial gas producer.

Our wealth of knowledge combined with the continuous dedication to research and experimentation allows us to constantly improve our products and develop innovative and tailor made solutions.

HATCO manufacturing factory and warehouses comprise all facilities for production and packaging all kind of compressors with highest quality and favorable delivery time.

Packaged air separation plants.

Packaged air separation plants are standard and modularly designed plants with a daily capacity of 850 tpd (approx. 25,000 Nm³/hr) of oxygen (GOX and LOX), 2,000 tpb (approx. 66,000 Nm³/hr) of nitrogen (GAN and LIN) and argon (Gar and Lar). the plant modules are pre-fabricated in the workshop to the maximum extent possible.

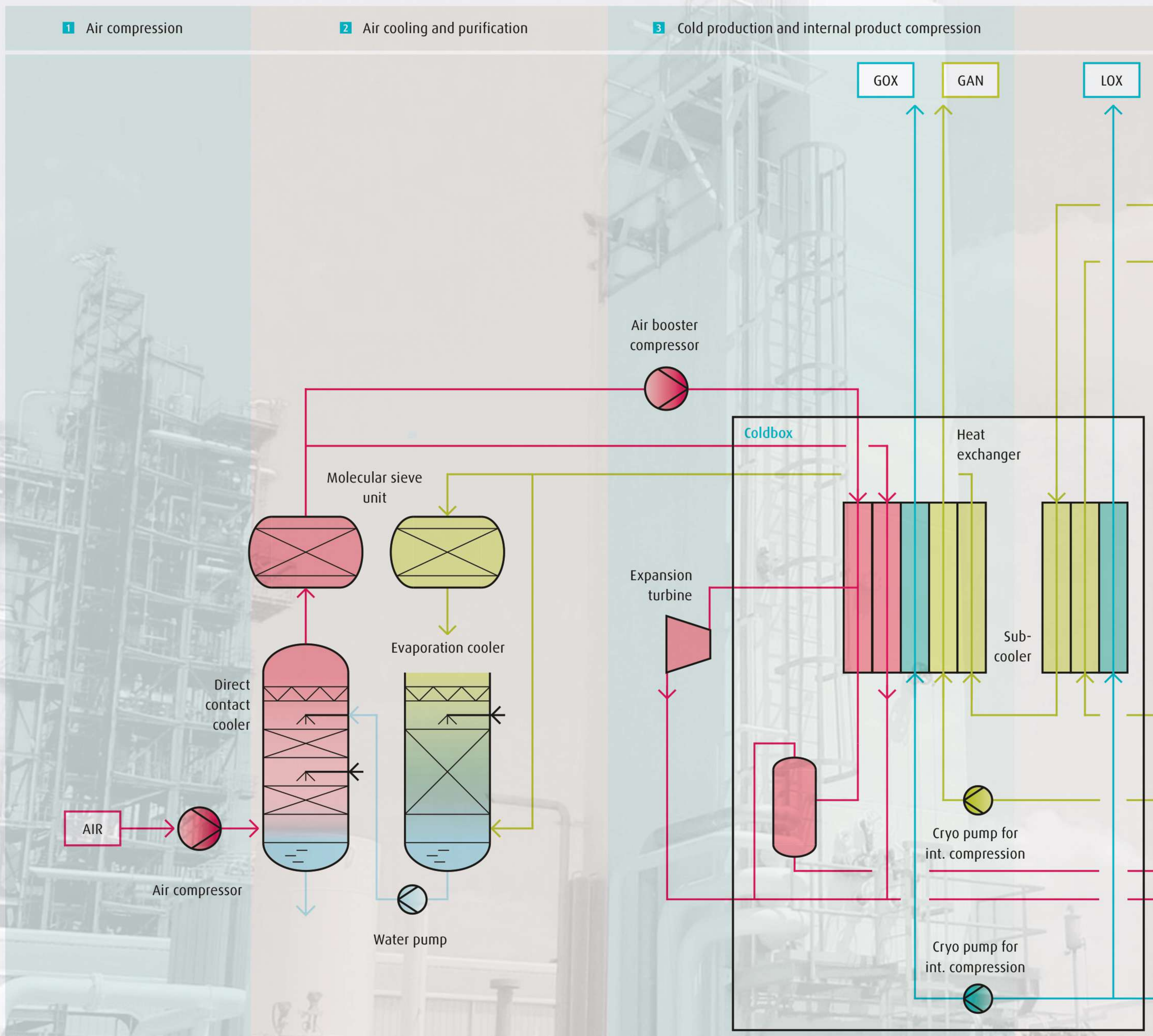
Air Separation Unit (ASU) management

HATCO has always been committed to providing support to ensure maximum performance of its products. We can guarantee the following advantages:

- Peace of mind: the customer can count on the continuous support of the ASU owner for any aspect linked to the process;
- energy savings of up to 5% on the total, thanks to optimization of the ASU operating parameters;
- Improvement of the management of the rotary machines with a subsequent increase in useful life of the machine (Meantime Between Failures "MTBF" and Meantime Between Maintenance "MTBM");
- Reduction in consumables;
- Greater capacity to make use of the flexibility of the ASU in product terms;
- Customers' technicians are continuously updated on processes and hardware.

The Process.

Typical process configuration of a packaged air separation plant



1-Air compression

- Compression of ambient air by a multi-stage turbo compressor with intercoolers at a supply pressure of approx. 6 bar.
- Removal of dust particles by a mechanical air filter at the inlet of the compressor.

2-Air cooling and purification

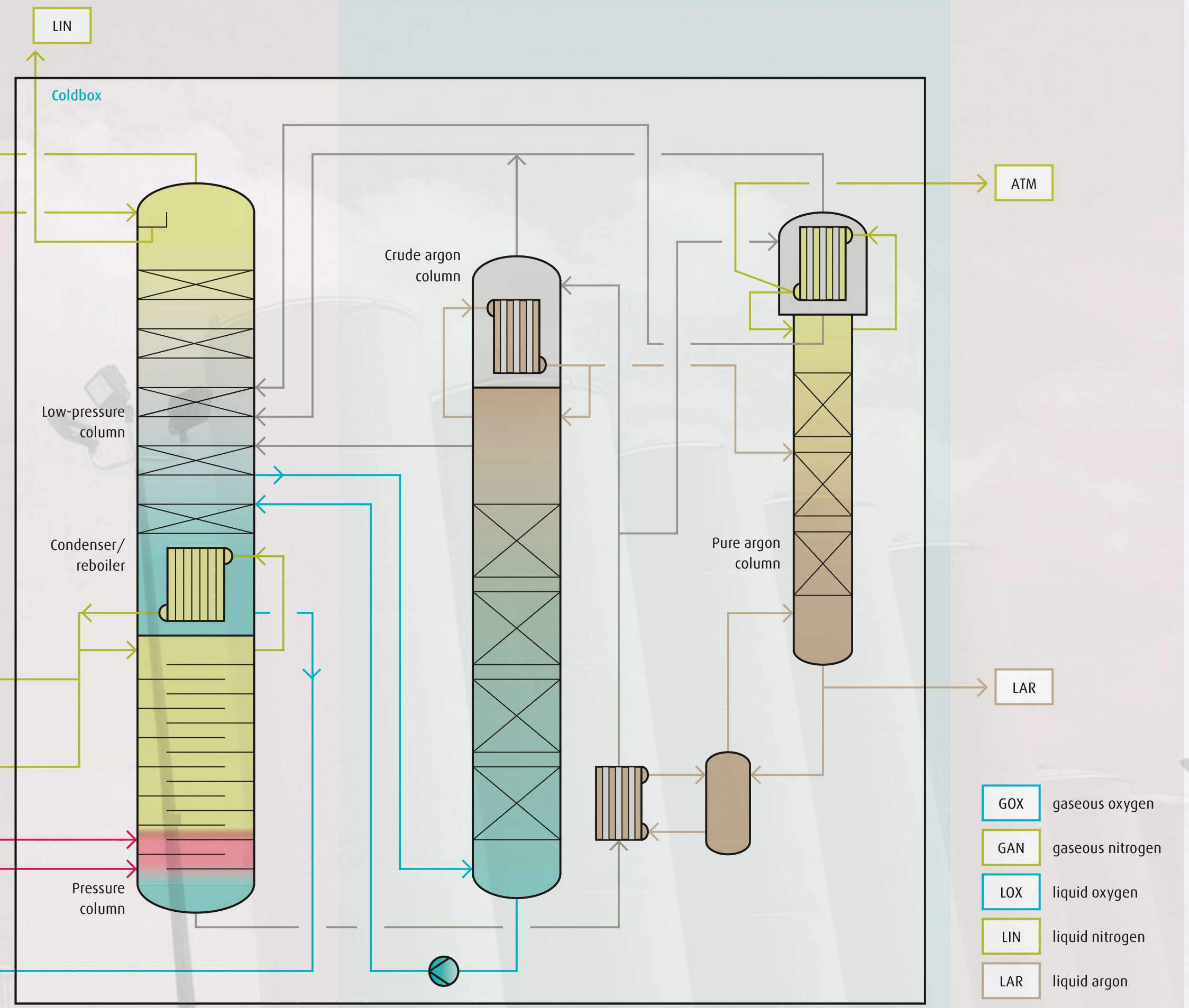
- Cooling of process air with water in a direct contact cooler and removal of water soluble air impurities.
- Chilling of cooling water in an evaporation cooler against dry nitrogen waste gas from the rectification process.
- Removal of CO_2 , water and hydrocarbons from the process air in periodically loaded/regenerated molecular sieve adsorbers.

3-Cold production and internal product compression

- Cooling of process air in heat exchangers down to nearly liquefaction temperature by means of countercurrent with gas streams from the rectification process.
- Further compression of a sidestream of process air by an air booster compressor. Expansion and cold production of the boosted air stream in an expansion turbine.
- Expansion and liquefaction of a sidestream of the boosted air in a liquid separator.
- Evaporation and warming to ambient temperature of the pumped oxygen and nitrogen product in high-pressure heat exchangers.

4 Cryogenic rectification of air

5 Cryogenic rectification of argon



4-Cryogenic rectification of air

- Pre-separation of the cooled and liquefied air within the pressure column into oxygen-enriched liquid in the column sump and pure nitrogen gas at the column top.
- Liquefaction of the pure nitrogen gas in the condenser/reboiler against boiling oxygen in the sump of the low-pressure column. Liquefied nitrogen provides the reflux for the pressure column and (after sub-cooling) for the low-pressure column.
- Different types of condenser are available. Further separation of the oxygen-enriched liquid within the low-pressure column into pure oxygen in the sump and nitrogen waste gas at the top.

5-Cryogenic rectification of argon

- Argon-enriched gas from the low-pressure column is transformed into oxygen-free crude argon by means of separation within the crude argon column.
- Pumping back liquid oxygen from the crude argon column sump into the low-pressure column. Removal of the remaining nitrogen in the pure argon column.

Features of packaged plants

Plants designs are created with the use of advanced engineering tools including process calculation and modelling with a special developed OPTISM simulation program. 3D CAD modelling is also employed as well as isometric and material list generator for plants design and model review.

Control equipment is ready installed in containers equipped with plug and play functionality.

The highest quality standards are achieved through their application of a stringent quality system in accordance with ISO 9001 for engineering design and manufacturing.

Erection and start-up time is minimized through the delivery of completely free packaged and tested units like the air compressor, refrigeration units, molecular sieve valve skid and cold box units. Electrical and control equipment are ready installed in containers featuring plug and play operation.

Sophisticated interlock functions protect the plant against unforeseen failures or weak operation and keep the plant in a safe condition in the event of power failure. Highly developed and proven control philosophy and software ensure reliable, convenient and economic plant operation.

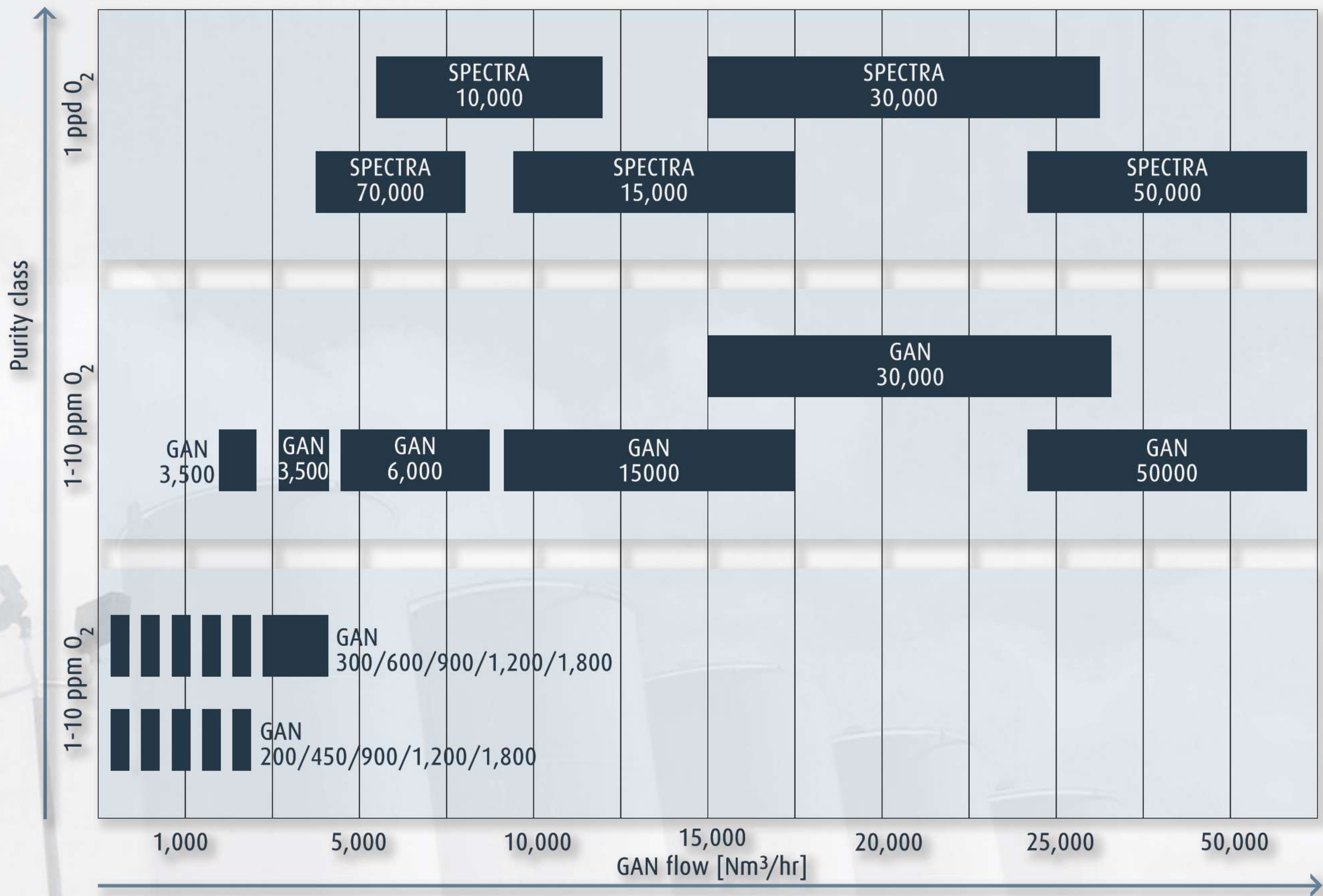
Protection measures are applied wherever the safety of operating personnel maybe jeopardized by the process, rotating machinery or exposure to extreme temperatures.

Plants are shipped in modular section for easy and low cost installation. The equipment is installed as enlarged modules, which are then connected during installation on site with their minimum number of interfaces on prefabricated foundations.

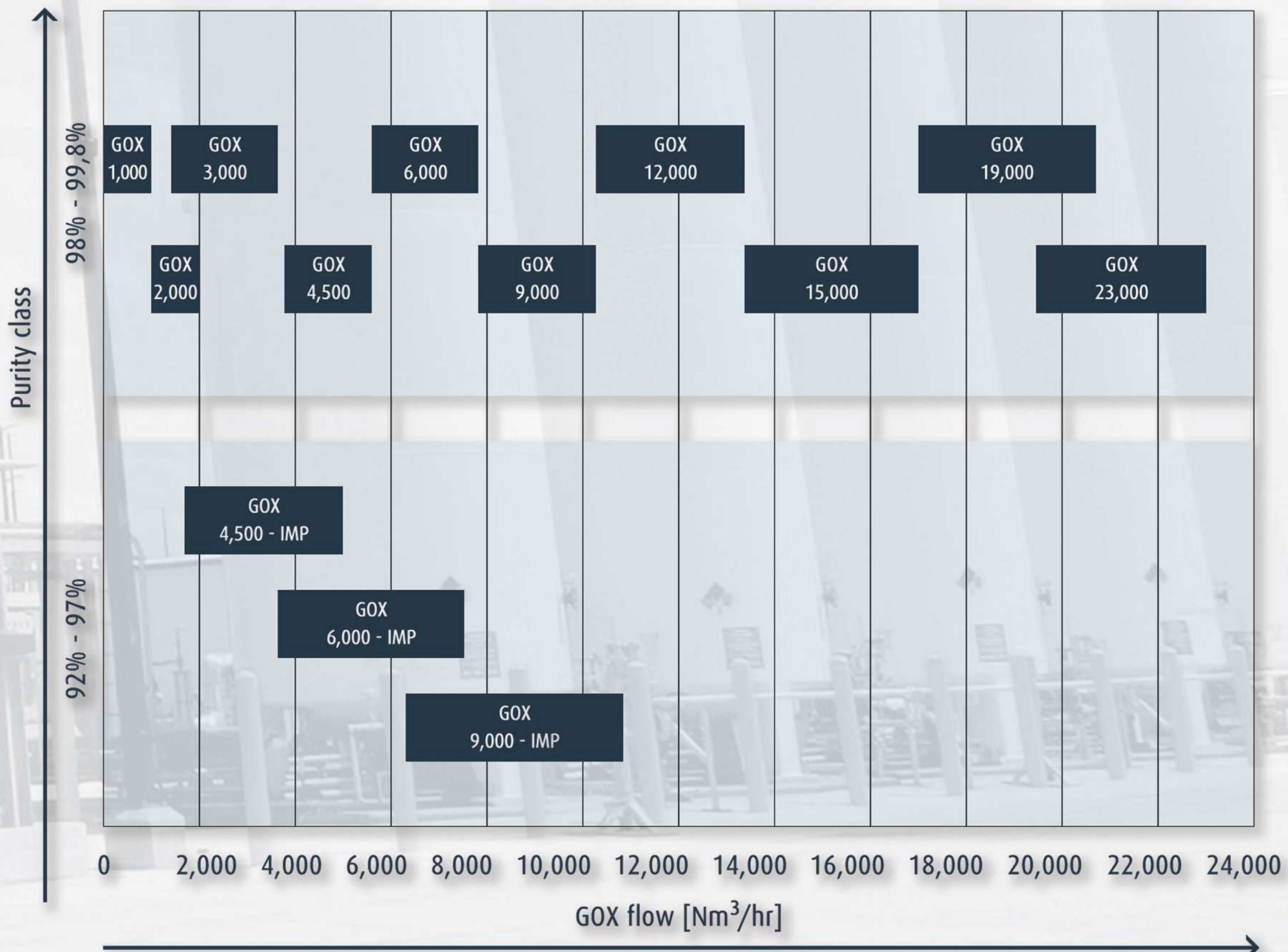
As a consequence, there is a reduction in the cost of installing and commissioning.



Product rang of nitrogen plants



Product rang of oxygen plants



In-house manufacturing of key components

The in-house capability to manufacture essential plant components is a contributing factor to why HATCO is regarded as a first class supplier and preferred vendor for air separation plants.

Decade of experience in the field of cryogenic process plant design are the basis for state-of-the-art technology in the Assembly of packaged air separation plants.

Company manufactured key components such as plate-fin heat exchangers, packing and columns are the foundation for long-term trouble-free operation plant.

Aluminium plate-fin heat exchanger



Tray columns packing



Packaged purifier unit ready for transport



Pre-fabricated piping units



Pre-fabricated control substation container



Packaged unit coldbox ready for transport



Prefabricated equipment

In-house manufacture components such as plate-fin heat exchangers and columns are installed in self-supporting steel case casings. The size of the cold boxes are designed for road transportation which also eases site handling.

Other modular such as molecular sieve valves and cryogenic pumps are installed into skids to the maximum degree possible for pre-fabrication and testing.

The plant control system together with operator the session(s) and analyzing equipment are supplied in and air-conditioned container ready-cable and shop-tested with configuration of the DCS already installed.

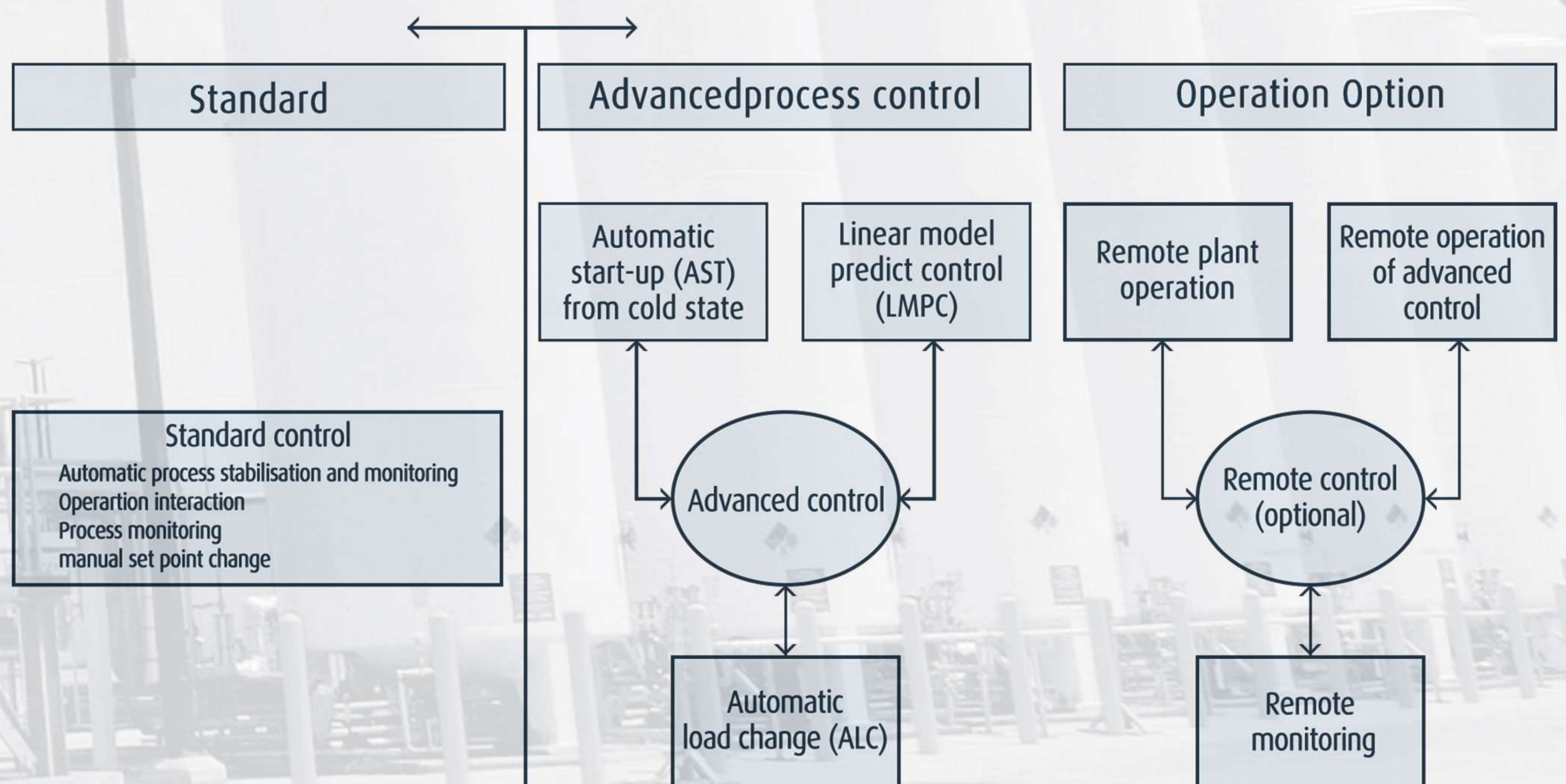
A separate shop-assembled container is supplied for all electrical medium-voltage switchgear, step-down transformers and low voltage switchgear including VFDs four pumps and other electrical equipment.

All above-mentioned plant modules and skid are equipped with remote I/O materials for easy bus connection. This high degree of pre-fabrication and testing results in short erection periods with minimized start-up times.

Sophisticated plant control.

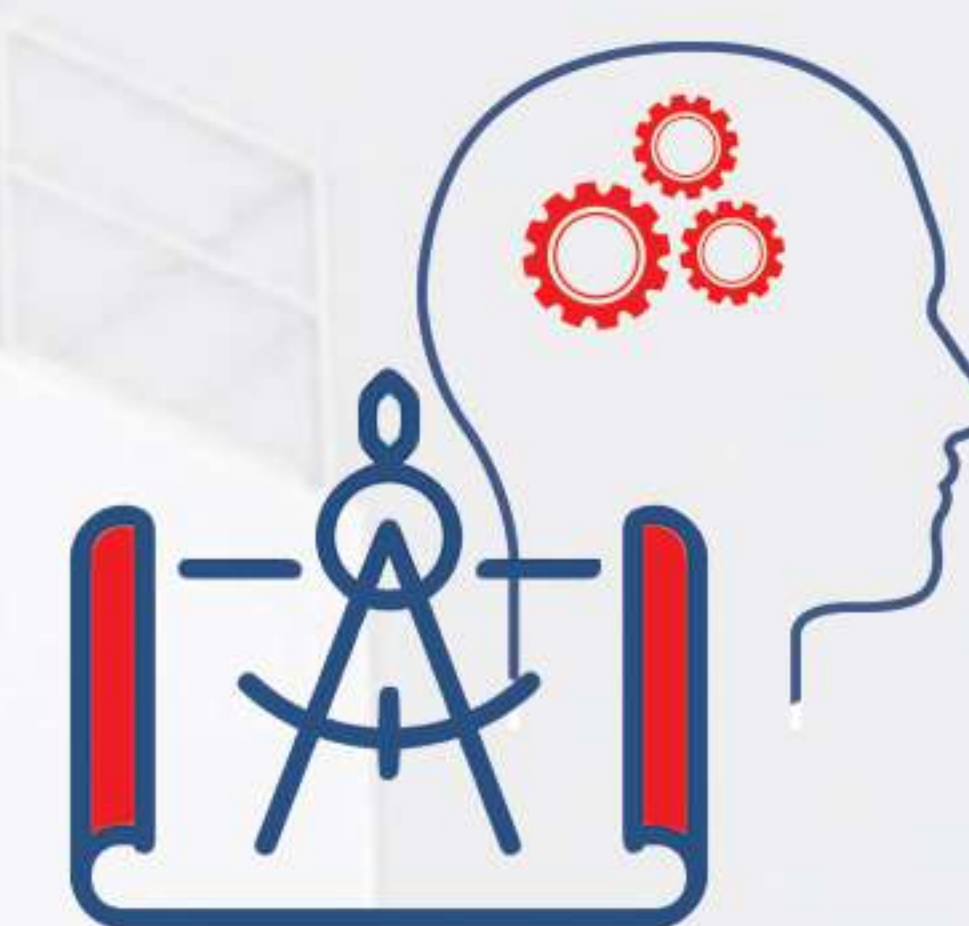
Instrumentation is selected from quality standards and product reliability. The instrumentation is connected to a safe and sophisticated process control system using the latest proven design in digital control technology to ensure optimal reliability and allow for easy and economic operation of a HATCO air separation plant.

Advanced control function allow fully unattended operation, automatic start-up from cold condition, automatic load changes and product adaptation. Finally, the remote operation function fully meets the need of a state-of-the-art separation plant.



Project execution

Quality, safety, health and environmental protection (QSHE) have critical importance in our work. Customers expect us to supply safe and economical plants equipped with the latest technology. The engineering and projects management divisions fully respond to this, expectation in all project and in all details.



Our QSHE management and policy is in line with the following:

- ISO 9001
- ISO 45001
- ISO 14001
- PED 97/23/EC (Module H)
- SCC checklist
- Work safety and environmental protection legislation

Customer Service Division:

To reduce operating costs and to maintain the high efficiency of its Air Separation Units, HATCO offers its customers a complete range of services, together with a network of Certified Service centers in five continents, operated by skilled technicians.

- ASU maintenance and supply of spare parts:
 - Supply of spare parts
 - Maintenance work
 - Preventative maintenance
 - Predictive maintenance
- Remote assistance for ASU management:
 - Remote monitoring/parameter checks
- On-site support:
 - Commissioning and start-up supervision
 - Support for unit stop, restart and tuning
- Training courses:
 - On-site theoretical and practical courses
 - Theoretical and practical courses at the HATCO works



HATCO is "Where Complexity Becomes Simplicity."



HATCO

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