

ANALYTICAL

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CLAIND

GAS GENERATORS AND PURIFIERS





## WIDE RANGING ANALYTICAL APPLICATIONS



Our Analytical line is the result of 40 years of gas generator production experience; it consists of **hydrogen, air and gas purifier generators, accompanied by a complete series of accessories and add-on components.**

The acquired know-how over the years means we can respond with **specific solutions to every analytical application:** gas chromatography, LC-MS, TOC, ICP, Sample Preparation, ELSD, Thermo Analysis and more.

Analytical line's strong point is in the **modular structure, made up of independent modules,** that have the same features:

-  FREELY MODULAR WITH EACH OTHER,
-  CAPABLE OF DISTRIBUTING DIFFERENT GASES,
-  CAN BE ASSEMBLED VERTICALLY (FOR LESS DISPLACEMENT),
-  CAN BE POSITIONED IN SEPARATE AREAS, WITH AN AIR COMPRESSOR THAT CAN BE PLACED IN A TECHNICAL AREA (NOISE REDUCTION INSIDE THE LAB),
-  CAN BE ADAPTED TO USE AS A SOURCE OF COMPRESSED AIR ALREADY IN THE LAB,
-  EQUIPPED WITH A **CPU (CENTRAL PROCESSING UNIT)** THAT ALLOWS:
  -  INTEGRATING UP TO 32 MODULES, EVEN LOCATED IN DIFFERENT PRODUCTION AREAS, INTO A SINGLE ELECTRONIC CONTROL SYSTEM,
  -  MONITORING EACH MODULE'S OPERABILITY,
  -  READING THE MAINTENANCE TIMETABLES AND OPERATING HISTORY,
  -  HAVING A SIMPLE, IMMEDIATE INTERACTIVITY THANKS TO THE 4" TOUCH SCREEN.





## WHY CHOOSE A CLAIND GAS GENERATOR

Whether talking about nitrogen, hydrogen or pure air, Claind offers a practical, economical alternative to pressurized gas cylinders and creating distribution lines.



ELIMINATE YOUR PRESENT DELIVERY, MANAGEMENT AND RENTAL COSTS, WITH AN EFFICIENT BUDGETARY MANAGEMENT THAT LETS YOU SEE PAYBACK FAST, AS WELL AS KEEPING OPERATING COSTS LOW.



THE WIDE RANGE CONSISTS OF RELIABLE, EASY-TO-USE GENERATORS, GUARANTEED LONG LIFE SPAN AND LOW MAINTENANCE COSTS.



CLAIND GENERATORS INCREASE YOUR COMPANY'S SAFETY, PRODUCING ALL THE GAS YOU NEED ONLY WHEN YOU NEED IT, ENSURING AUTONOMY AND PRODUCTIVE CONTINUITY.

While gas prices are going up, dispersion and volatility are a constant cost and delivery delays can stop your work, a Claind generator will be a trustworthy ally and a long term investment.





# SPECIFIC TECHNOLOGY FOR NITROGEN, ZERO AIR AND HYDROGEN PRODUCTION



NITROGEN

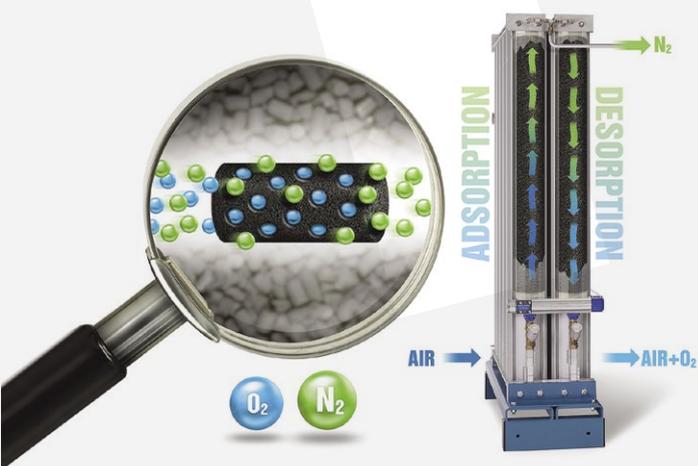
Claind solutions for producing nitrogen self-production use **PSA (Pressure Swing Adsorption) technology.**

The PSA system consists of two beds of CMS (Carbon Molecular Sieve), alternatively pressurized and depressurized. Each bed can consist of one or more columns.

Compressed air, which has been pre-treated to eliminate dust and humidity, enters the base of the first active bed and flows through the CMS. Oxygen, carbon dioxide and other polluting substances in the air are trapped, but the nitrogen moves through the bed and exits at the top of the column towards a storage tank. After a certain time has elapsed, the by-now-saturated active bed is depressurized to be regenerated, while the cycle resumes symmetrically on the second bed.

In order to provide our customers with top of the line solutions and innovation, we have further improved the PSA technology, designing and registering the exclusive **FAST PURITY®** international patent that guarantees:

-  MAXIMUM NITROGEN PURITY WITHIN A FEW MINUTES AFTER TURNING ON,
-  INCREASE IN THE GENERATOR'S LIFE SPAN,
-  LESS MECHANICAL STRESS,
-  GREATER OUTPUT,
-  LESS AIR AND ELECTRICAL ENERGY CONSUMPTION.





ZERO AIR

**Claind has developed a catalytic reactor specifically for air filtration that is ideal for eliminating impurities.**

As a matter of fact, the Platinum Palladium HC system, found in most purifiers, allows the hydrocarbons (HCT < 0.1 ppm) to be completely removed at low catalysis temperatures for a stable, noise-free base line.



HYDROGEN

The technology Claind uses for electrolysis is:

- **PEM WITH SOLID ELECTROLYTE:**  
 THE MOST RECENT TECHNOLOGY WHICH IS NORMALLY USED IN GENERATORS FOR LAB APPLICATIONS THAT REQUIRE THE PUREST HYDROGEN;
- **MULTI-LAYER ELECTRODES:**  
 PRIOR TO PEM BUT VERY STABLE AND LESS DEMANDING IN TERMS OF WATER SUPPLY PURITY; IT IS USUALLY USED TO PRODUCE HYDROGEN FOR APPLICATIONS ON GC FID IN ENVIRONMENTAL OR PROCESS ANALYSES.



## HYDROGEN AS OPPOSED TO HELIUM

Helium has always been used and considered as the main choice for an analytical carrier gas.

However, helium's current natural resources are running out and such large demand is no longer possible.

As a matter of fact, many labs have been having more frequent problems finding it. Suppliers can no longer provide helium in sufficient time and for reasonable costs.

Using hydrogen instead of helium is less well-known but **its advantages are consistent:**

-  MORE ECONOMICAL,
-  EASY TO FIND,
-  CAN BE USED AT LOWER TEMPERATURES,
-  GREATER COLUMN DURATION,
-  FASTER SEPARATION,
-  LESS ANALYSIS TIMES.



## CHOOSE THE RIGHT PRODUCT FOR YOUR APPLICATIONS



### GAS CHROMATOGRAPHY

**The natural configuration for gas chromatography is the “tower”:** four generators (hydrogen, nitrogen, zero air and compressor) are stacked one on top of the other, allowing a reduction in displacement.

The generators can also be used individually as independent modules or combined in 2 or 3 module versions.

#### HYGEN 200, 400 E 600

- ✓ AVAILABLE IN THREE MODELS FOR 200-400-600 NML/MIN FLOWS WITH > 99.9999% PURITY
- ✓ DESIGNED FOR CARRIER GAS IN GC, GC-MSD AND “FAST GC”
- ✓ SAFETY SYSTEM WITH ACOUSTIC ALARMS, SCREEN MESSAGES AND AUTOMATIC PRODUCTION STOPPAGE IN CASE OF GAS LEAKS
- ✓ AUTOMATIC SWITCH WITH INERT GAS AVAILABLE IN CASE OF PRODUCTION STOPPAGE
- ✓ REMOVABLE WATER TANK FOR EASY CLEANING AND WATER CHANGE
- ✓ MAINTENANCE: LOW COST CONSUMABLES WITH EASY REPLACEMENT
- ✓ HYDROGEN PRODUCTION IN PROPORTION TO CONSUMPTION, WITH MINIMUM GAS STORAGE INSIDE THE INSTRUMENT
- ✓ PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY THAT CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWING MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS





#### NIGEN GC/HC

- ✓ AVAILABLE IN BASIC AND HC VERSION SO THE HYDROCARBONS CAN BE COMPLETELY REMOVED USING THE PT/PD CATALYZER
- ✓ CAPABLE OF DISTRIBUTING 500NML/MIN WITH > 99.9995% PURITY
- ✓ CAPABLE OF SUPPORTING UP TO 12 MAKE UP FID/ NPD, UP TO 7 ECD OR 5 S/S
- ✓ READY TO BE CONNECTED TO THE DEDICATED AIRCOMP COMPRESSOR
- ✓ PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY, WHICH CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWS MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS

#### NIGEN HF-1

- ✓ CAPABLE OF DISTRIBUTING 6000 NML/MIN WITH 99.9995% PURITY
- ✓ INTEGRATED OIL FREE COMPRESSOR, WITH 50 LITER AIR AND NITROGEN RESERVES
- ✓ HIGH COMPRESSOR RELIABILITY WITH MAINTENANCE REQUIRED AFTER ONLY 16,000 HOURS OF WORK
- ✓ 2 GAS OUTLETS AVAILABLE: NITROGEN UHP AND OIL FREE AIR
- ✓ TOUCH SCREEN DISPLAY, WHICH ALLOWS MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS
- ✓ EQUIPPED WITH FULL TURN WHEELS FOR EASY MOVING



### AIRGEN GC

- ✓ CAPABLE OF DISTRIBUTING 3000NML/MIN
- ✓ COMES WITH A PSA DRYER AND Pt/Pd CATALYTIC REACTOR
- ✓ PLATINUM PALLADIUM HC SYSTEM TO COMPLETELY REMOVE THE HYDROCARBONS (HCT < 0.1 PPM)
- ✓ EXCELLENT FOR NPD AND FID FOR AN ABSOLUTELY STABLE, NOISE-FREE BASE LINE
- ✓ ADAPTED TO SUPPORT UP TO 8 FID
- ✓ READY TO BE CONNECTED TO THE DEDICATED AIRCOMP COMPRESSOR
- ✓ PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY, WHICH CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWS MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS

### ZEROAIR 5 AND 20

- ✓ AVAILABLE IN THE DOUBLE VERSION FOR 5 AND 20 NL/MIN
- ✓ EXCELLENT FOR FID AND FPD, GUARANTEES A CLEAN BASE LINE WITH NO FLUCTUATIONS
- ✓ DOUBLE INSTALLATION CAPABILITY: ON WORKBENCH OR WALL
- ✓ HIGH EFFICIENCY PLATINUM PALLADIUM HC SYSTEM FOR COMPLETE HYDROCARBON (HCT < 0.1 PPM) REMOVAL AT LOW CATALYSIS TEMPERATURES FOR A STABLE, NOISE-FREE BASE LINE
- ✓ ADAPTED TO SUPPORT FROM 14 UP TO 55 FID
- ✓ CAN BE INTEGRATED WITH THE DEDICATED AIRCOMP COMPRESSOR
- ✓ CATALYZER TEMPERATURE INDICATOR



## LCMS

The LC-MS analyzers on the market now often require functional parameters (type, capacity, gas pressure and purity) dissimilar to each other.

In order to respond to these requirements, Claind has developed **specific solutions capable of facing any commercial analyzer model, thereby eliminating any incompatibility issue between the analyzer and the nitrogen generator.**



### NIGEN LCMS 40-1 AND 100



- ✓ AVAILABLE IN 2 MODELS:
  - THE NIGEN LCMS 40-1 MODEL FROM 40 NL/MIN WITH COMPRESSOR
  - THE NIGEN LCMS 100 MODEL FROM 100 NL/MIN WITHOUT COMPRESSOR
- ✓ CAPABLE OF SUPPLYING UP TO 4 LC-MS ANALYZERS
- ✓ THE NIGEN LCMS 40-1 EQUIPPED WITH AN INTEGRATED FULL OIL FREE COMPRESSOR
- ✓ EQUIPPED WITH SPECIAL SOUNDPROOF AND ANTI-VIBRATION DEVICES
- ✓ 2 INTERNAL AIR AND NITROGEN TANKS, 50 LITERS EACH, THAT ALLOW FEWER INTERNAL AIR COMPRESSOR INTERVENTIONS, REDUCING BOTH NOISE AND MAINTENANCE
- ✓ COMPRESSOR MAINTENANCE REQUIRED AFTER ONLY 16,000 HOURS OF WORK
- ✓ TOUCH SCREEN DISPLAY THAT ALLOWS MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS





### NITRO 35 AND 70

- ✓ AVAILABLE IN 2 MODELS WITH DIFFERENT CAPACITIES:
  - NITRO 35 MODEL  
WITH CAPACITY UP TO 35 NL/MIN
  - NITRO 70 MODEL  
WITH CAPACITY UP TO 70 NL/MIN
- ✓ 24 LITER INTERNAL TANK THAT LENGTHENS THE STAND-BY PERIODS
- ✓ PURITY UP TO 99.99% (H<sub>2</sub>O < - 55°C DEW POINT AND HCT < 0.01 PPM)
- ✓ MEMBRANE KEYBOARD FOR MAKING FAST, EASY COMMANDS
- ✓ EQUIPPED WITH FULL TURN WHEELS TO FACILITATE MOVING

## TOC

Determining carbon in liquids, muds and solids requires air with a high degree of purity.

**Claind's answer consists of ultra-pure air generators to analyze the TOC.**



### AIRGEN TOC

- ✓ CAPABLE OF PROVIDING 1500 NML/MIN, WITH HYDROCARBON REMOVAL < 0.1 PPM AND CARBON DIOXIDE < 1 PPM
- ✓ PLATINUM PALLADIUM HC SYSTEM TO COMPLETELY REMOVE THE HCT FOR AN ABSOLUTELY STABLE, NOISE-FREE BASE LINE
- ✓ HIGH EFFICIENCY END FILTER TO REMOVE RESIDUAL CO<sup>2</sup>
- ✓ READY TO BE CONNECTED TO THE DEDICATED AIRCOMP COMPRESSOR
- ✓ POSSIBLE PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY THAT CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWING MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS





## ENVIRONMENTAL AND PROCESS ANALYSES

The numerous installations aimed at monitoring fumes, BTX and HTC air quality, hydrocarbons in the process, extraction gases and the environment have allowed Claind to build a consolidated experience in this area and to produce **highly reliable generators, specifically for environmental and process analyses.**

### HG2200R

- ✓ DEDICATED TO THC AND ANALYZERS FOR MONITORING FUMES
- ✓ PURITY GREATER THAN 99.999% WITH MAXIMUM O<sub>2</sub><0.1 PPM CONTENT WHEN USED WITH ADDITIONAL PURIFIERS
- ✓ OUTPUT PRESSURE: 1 – 6 BAR
- ✓ CAPACITY 200NML/MIN





## OTHER ANALYTICAL APPLICATIONS

(ICP, ELSD, THERMO-ANALYSIS, SAMPLE PREPARATION, GLOVEBOX, CIRCULAR DICHROISM)



### NIGEN MICRO

- ✓ CAPABLE OF DISTRIBUTING 4000 NML/MIN
- ✓ PURITY UP TO 99.5%
- ✓ READY TO BE CONNECTED TO THE DEDICATED AIRCOMP COMPRESSOR
- ✓ PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY, WHICH CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWS MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS



## COMPRESSED AIR FOR THE LABORATORY

The **AirComp** series consists of **two compressed air generators specifically designed for the lab**; in fact they were created to be connected inside it.

This is why we call them compressed air generators and not compressors, because they originate from an idea much more akin to that of lab generators than to that of industrial compressors.

### AIRCOMP

- ✓ PROVIDES 20 NL/MIN OF COMPRESSED FROM AN 8 BAR OIL FREE COMPRESSOR
- ✓ QUIET: NOISE LEVEL REDUCED TO A MINIMUM THANKS TO SPECIAL SOUNDPROOF AND ANTI-VIBRATION DEVICES
- ✓ POSSIBLE PARALLEL CONNECTION UP TO 4 STACKABLE TOWER CONFIGURATION GENERATORS
- ✓ CPU WITH TOUCH SCREEN DISPLAY THAT CAN BE LINKED TO THE GENERATORS WITH CAN-BUS, ALLOWING MONITORING OF THE OPERATING STATUS AND MENU READING WITH THE MAINTENANCE STATUS, THE ALARM REPORT AND FUNCTIONAL PARAMETERS

### AIRCOMP 200

- ✓ PROVIDES UP TO 190 NL/MIN OF COMPRESSED WITH 9.5 BAR PRESSURE
- ✓ QUIET: NOISE LEVEL REDUCED TO A MINIMUM THANKS TO SPECIAL SOUNDPROOF AND ANTI-VIBRATION DEVICES
- ✓ SCROLL OIL FREE COMPRESSOR
- ✓ SPEED CONTROLLED ELECTRONICALLY FROM THE COMPRESSOR HEAD TO SAVE ENERGY AND REDUCE MAINTENANCE
- ✓ MONOPHASE POWER SUPPLY 230 VAC 50/60 HZ
- ✓ OUTPUT DEW POINT UP TO - 60°C
- ✓ INTERNAL TANK AND POSSIBILITY OF ADDING AN EXTERNAL ONE
- ✓ ALL CONTROL DEVICES ARE COMPACT AND COMPLETE
- ✓ INTEGRATED WITH MOD-BUS AND MQTT COMMUNICATION PROTOCOLS THAT ALLOW REMOTE CONTROLS FROM PC OR SMART PHONE, AND MONITORING OF THE GENERATOR'S FUNCTIONAL PARAMETERS IN REAL TIME



## ACCESSORIES

A complete, outstanding series of accessories included in the Analytical series, such as:

- UHP PURIFIERS TO PURIFY O<sub>2</sub>, CO<sub>2</sub>, HCT, H<sub>2</sub>O FROM THE INPUT GASES
- PRESSURE AND FLOW REGULATORS, FROM WALL OR WORKBENCH
- AIR FILTERS WITH AUTOMATIC CONDENSATION EXHAUST
- AUTOMATIC SWITCHES FOR 2 BACK UP POWER SUPPLY SOURCES
- CONNECTION FITTINGS AND GAS LINES



## ALL OUR SERVICES TO ALWAYS OFFER YOU OUR VERY BEST

In addition to our product range, we also offer many services, including:



### PRE-SALE

- ASSISTANCE IN CHOOSING THE MODEL
- PAYBACK CALCULATION
- TECHNICAL AND COMMERCIAL INSPECTIONS



### CUSTOMER CARE

- SPARE PARTS AND CONSUMABLES
- IDENTIFYING AND SOLVING ANOMALIES



### TECHNICAL SUPPORT

- INSTALLATION
- MAINTENANCE (PREVENTIVE AND SCHEDULED)
- REPAIRS



### ADDITIONAL SERVICES

- IQ/OQ CERTIFICATIONS





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