



INDUSTRY

LASER N₂ POWER

GAS GENERATORS FOR LASER APPLICATIONS

2022 ENG

Isolcell
CONTROLLED ATMOSPHERE SINCE 1958

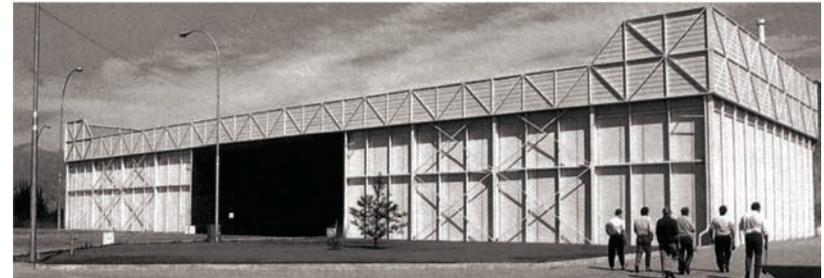


More than 60 years of experience

Isocell: from pioneers to international leaders

We have been designing and making systems based on Generated and Controlled Atmosphere technology since 1958. We were the first in Europe to develop these technologies and apply them as a way of preserving food, subsequently extending the use of controlled atmospheres as a technology that generates a benefit in terms of quality and technology in the process for various production sectors: from the pharmaceutical to the chemical industry, from plastic moulding to electromechanics, from wine making to laser cutting, from fire prevention to the protection and preservation of artworks. We are recognized global leaders and we are part of an industrial group led by Finanziaria Unterland Spa. Isocell has a worldwide presence with a network of distributors and retailers. We operate in accordance with the highest quality standards: we are ISO 9001, ISO 14001 and OHSAS 18001-certified and our product range complies with the strictest European and international directives.

Our strong suit is our ability to provide highly customized and reliable solutions that reflect and sometimes anticipate the state of the art in available technology.



A natural bent for improvement and evolution

1950 > 1960 > 1970 > 1980 > 1990 > 2000 > 2022 >

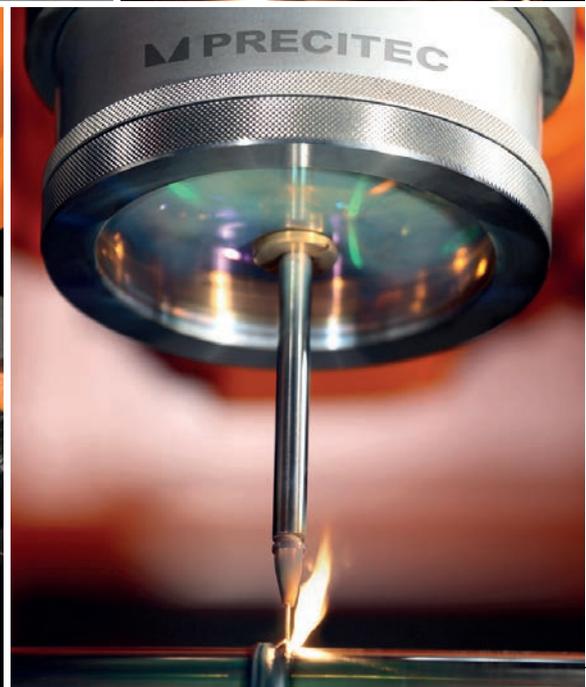
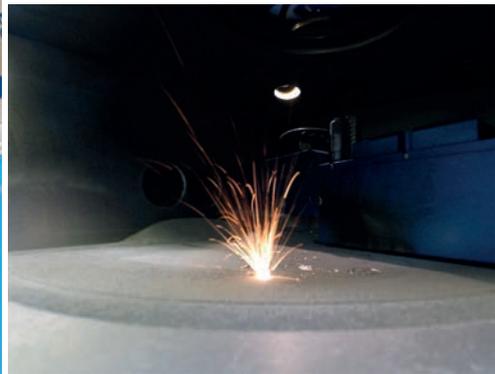
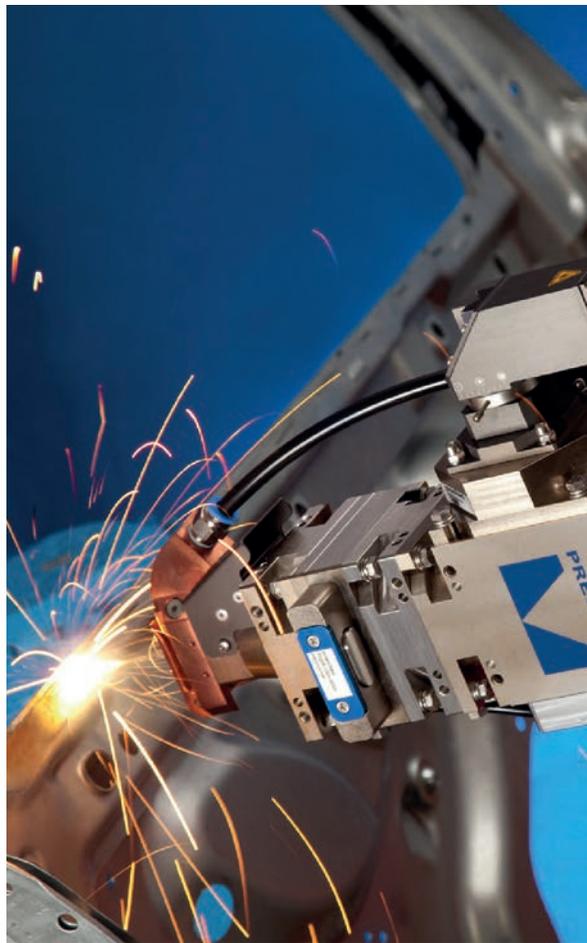
Our history is closely connected to the development of controlled atmosphere technologies. We believe in constant innovation and in capitalising on our experience to design innovative technologies in any sector.

Our solutions have often anticipated market demand and have sometimes become the benchmark for new quality and technological standards.





NITROGEN AS PRIMARY GAS FOR CUTTING, WELDING, 3D PRINTING AND ADDITIVE MFG





| NITROGEN FOR LASER APPLICATION



Thanks to the experience gained in over 60 years of R&D in atmosphere control and treatment technologies, Isocell has designed its LASERPOWER line, developed to produce nitrogen with 3 purity levels, 100, 50 and 10 ppm.

The dimensions of the generators are designed to adapt to the consumption of our customers' laser machines. There are applications both for individual machines and for specialised centres with several laser machines. Our autoproducer plants have various solutions that are also suitable to offset consumption peaks through storage in 300 bar cylinder sets.

For instance, with 2 cylinder sets we are able to store 480 m³, a solution that for many users covers a whole day of laser cutting.

Our system is completely:

AUTOMATIC

MODULAR

EASILY EXTENDABLE

AND CUSTOMISABLE FOR ANY KIND OF NEED





HUNDREDS OF SYSTEMS SOLD WORLDWIDE ARE THE GUARANTEE OF OUR TECHNOLOGICAL LEVEL.

PURITY GUARANTEE BY ADVANCED ANALYSIS AND PROTECTION SYSTEMS.

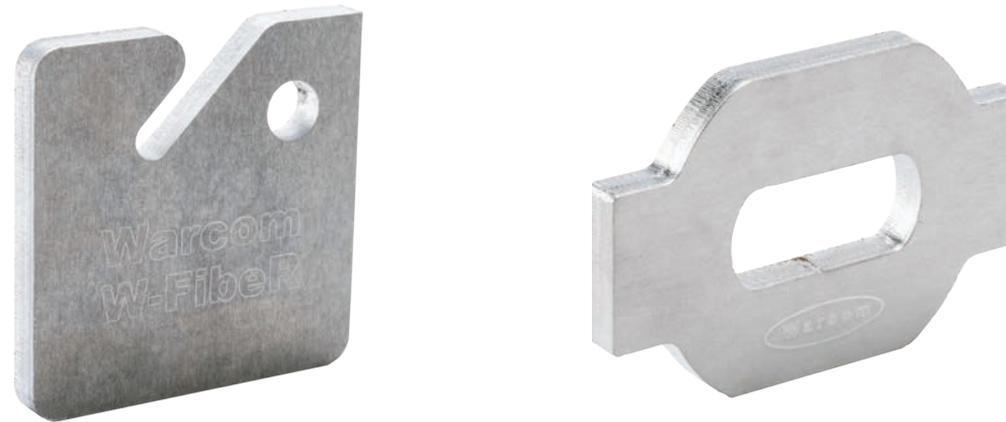


Laser Cutting

Optic fibre technology effectively revolutionised the laser sector, leading nitrogen to become the main supporting gas in laser cutting processes.

Oxygen has therefore become less important and is now only used in laser cutting for extra-thick carbon steels and to cut copper.





Fibre laser technology has introduced on the market laser sources with truly high power levels (8-10-12 kW). They are now included in the catalogues of almost all manufacturers and 20 kW sources, which are currently being tested, are expected to be sold on the market in a few years. Having high power means laser machines can cut at high pressure, i.e. using nitrogen, and reach incredible performance levels. These laser machines allow for truly high cutting speeds, in some cases even 7/8 higher than CO₂ lasers, though this only applies to the high pressure nitrogen cutting process.

A complete revolution is therefore underway in the laser cutting sector. Except for the extra thicknesses of carbon steel, all other materials are processed by using nitrogen as a process gas. Where once carbon steel was cut using oxygen at pressure values from 0.5 to 2 bar, nowadays cutting is carried out with nitrogen from 8.5 to 18 bar. This means there is clearly the need to keep the cost of cutting gas provisioning under control.

By cutting carbon steel with nitrogen, you obtain a white cut and completely eliminate the light blue film on the cutting surface, which was a serious inconvenience at the welding and painting stage.

Nitrogen as a primary gas in laser cutting

With far more powerful fibre laser sources, now using nitrogen to also cut carbon steels is a strategic choice.





BENEFITS

BENEFITS OF NITROGEN IN LASER CUTTING ON CARBON STEELS

ELIMINATION OF THE BLUE FILM ON THE CUTTING SURFACE
CUTTING EDGE SUITABLE FOR PAINTING
REDUCTION OF THE THERMALLY ALTERED AREA
AVERAGE CUTTING SPEEDS INCREASED BY 300%
LASER PERFORATING TIME REDUCED UP TO 400%
NO CONTAMINATION WHATSOEVER ON THE CUTTING EDGE

MATERIALS FOR LASER CUTTING WITH N₂

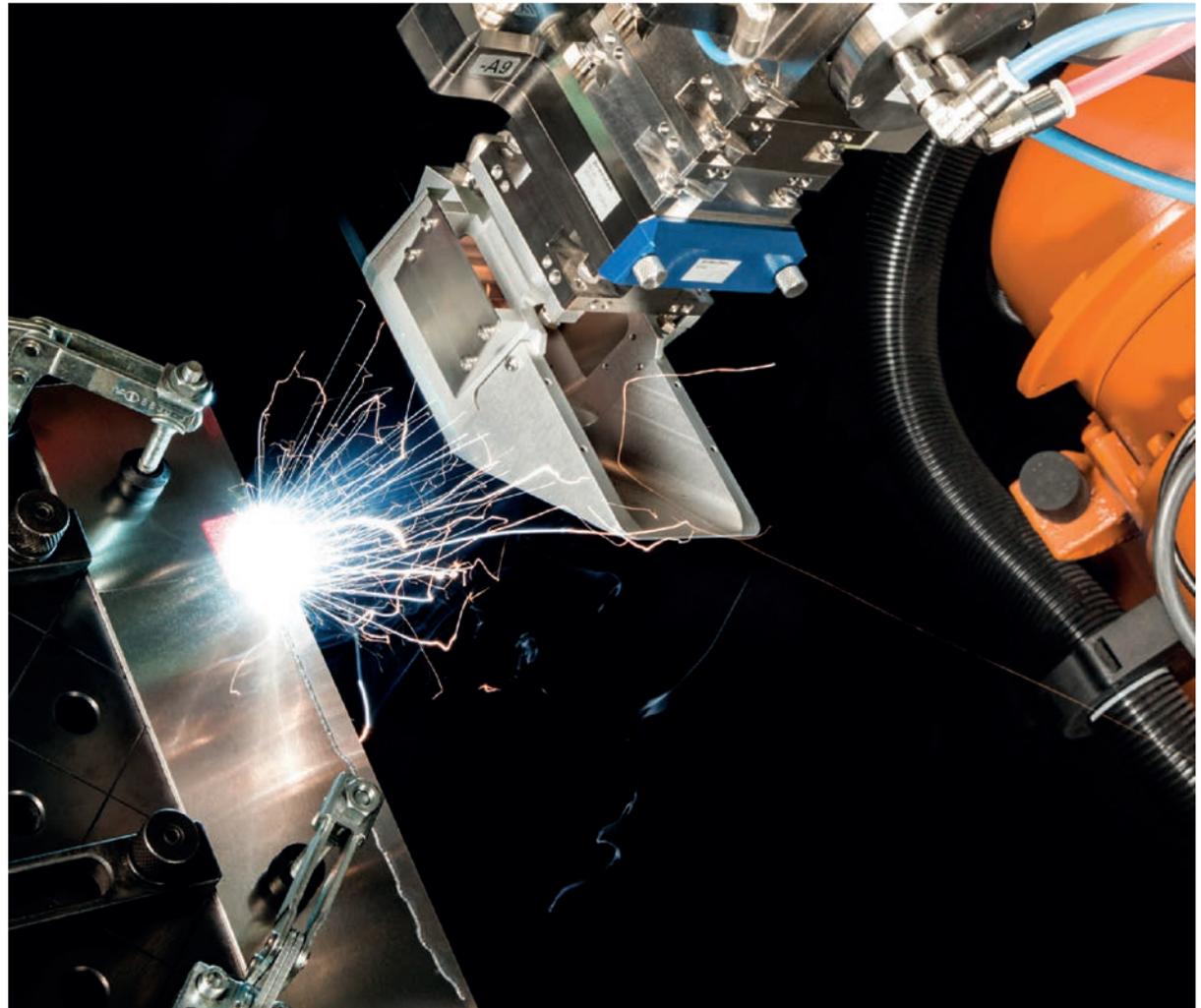
Stainless Steel - Duplex - Carbon Steel
Galvanized and Pre-painted Sheet Metal
Aluminium - Titanium - Brass



Laser welding

Nitrogen is an inert gas used in many welding processes, as it offers both savings and technological benefits.

Applications on austenitic stainless steels, ferritic and duplex stainless steels are by far favouring Nitrogen compared to Argon, as it reduces or eliminates welding porosity.





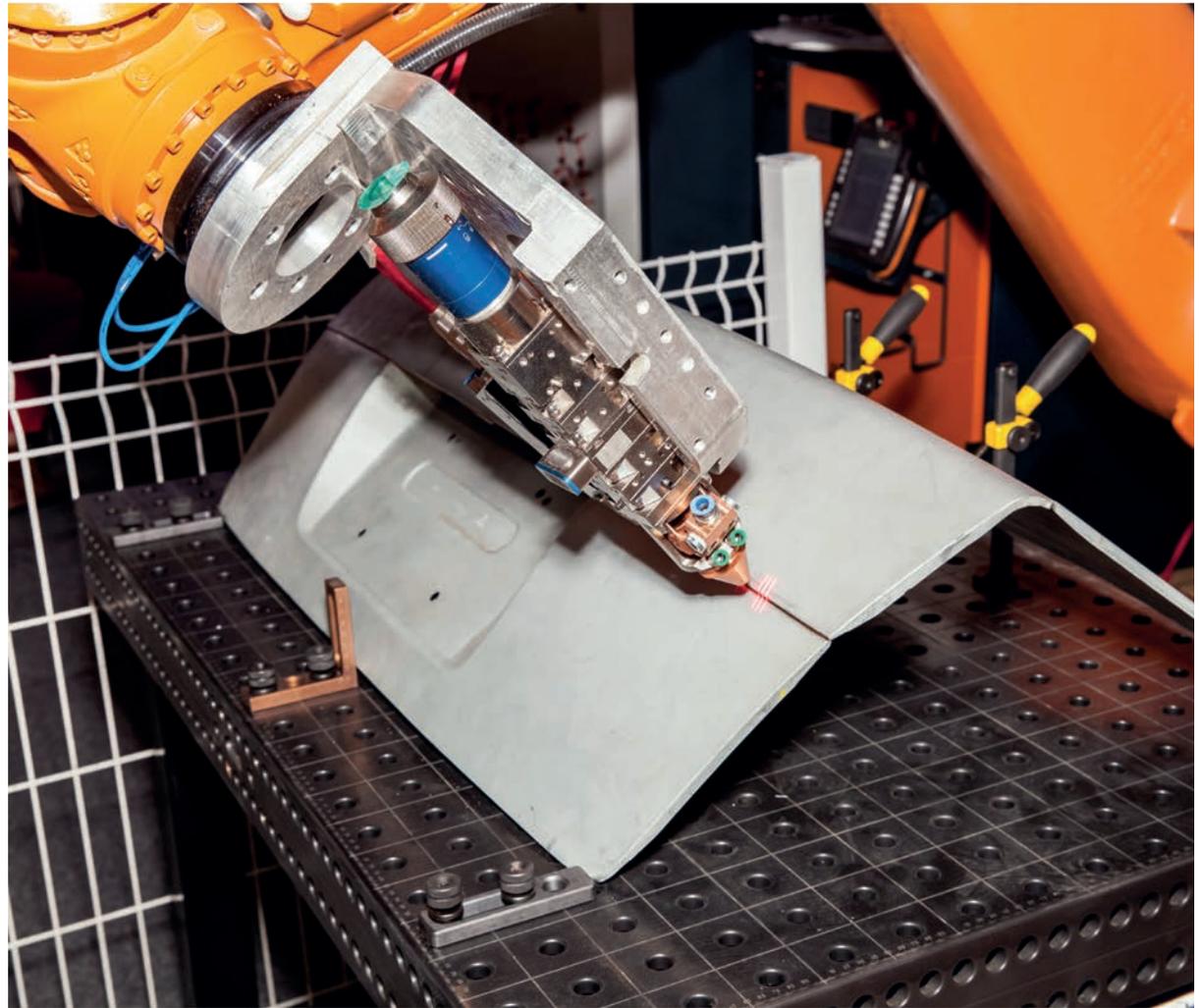
Laser welding is carried out with many types of materials, pure argon or mixed with other gases is used on some, while nitrogen is used on others. Nitrogen has a central role on laser welding applications on noble materials, including austenitic stainless steels, ferritic stainless steels and austenitic-ferritic steels (Duplex).

With the appearance of optic fibre, manufactures of laser sources and welding systems have developed applications where Argon and Helium are effectively replaced with nitrogen, thereby allowing for considerable savings, in some cases also from a technical point of view.

Top technological applications have been carried out in the steel pipe welding sector. Some pipe manufacturers have decided to adopt this technology to increase their production output and limit energy consumption. Nitrogen was chosen for its ability to reduce or even eliminate porosity in the welded area, effectively creating a technological innovation.

Nitrogen as inert gas in laser welding

An increasing number of welding applications are being designed to operate with nitrogen.





BENEFITS

BENEFITS OF NITROGEN IN STEEL LASER WELDING

LESS POROSITY AND FEWER DEFECTS
AFFORDABLE GAS
REDUCED WELDING OXIDATION
INCREASED WELDING SPEED

MATERIALS FOR LASER WELDING WITH N₂

Austenitic Stainless Steels

Ferritic Stainless Steels - Duplex Steels

A technical assessment is required for other materials



Additive MFG 3D laser printing

In the mechanical and laser sectors, there is ever increasing talk of new applications such as 3D Metal Printing and Additive Manufacturing.

All these processes require an inert gas, in some cases Argon and in many other cases Nitrogen. The gas is used to keep the superficial layer of metals unaltered.





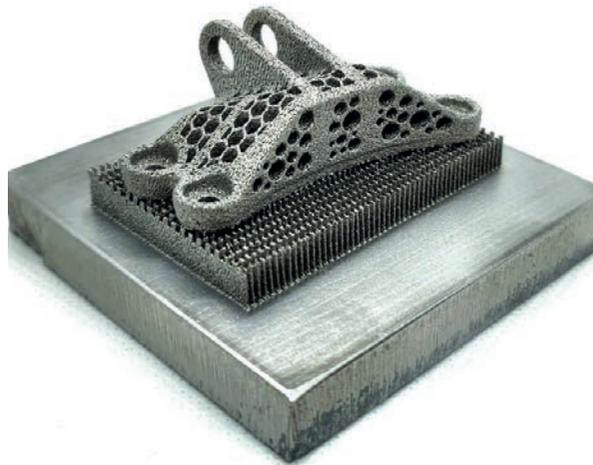
BENEFITS OF NITROGEN IN 3D METAL PRINTING AND ADDITIVE MANUFACTURING

In recent years we are witnessing an actual industrial revolution, both in the field of prototyping and in mechanics.

A laser sintering process for metals performed by a sophisticated 3D laser printer can reproduce extremely complex metal elements and this is often impossible to achieve even with NC machine tools. With this industrial process one can pass from the design to the finished piece in a very short time, hours for simple pieces and a couple of days for more complex ones.

The mechanical strength of the pieces made is comparable to elements that have been mechanically forged and machined. These are not experimental materials or lab tests, but industrial productions that fully meet the needs of sectors such as spare parts, pharmaceuticals, medical prostheses, automotive, space components, sports competitions, etc.

Isolcell nitrogen generators meet the needs of this sector, making users independent from gas suppliers.



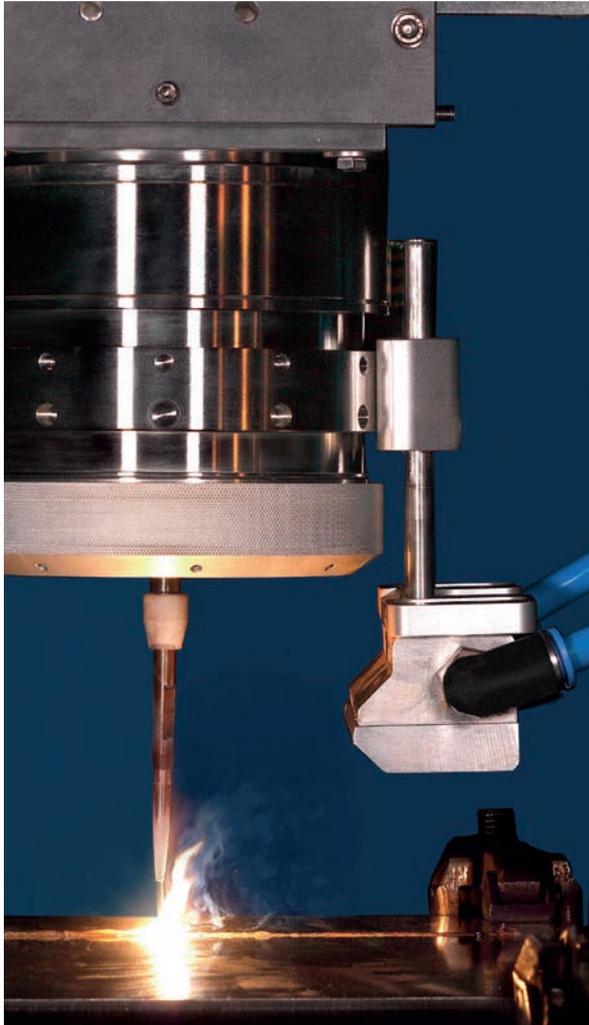
*Images on page 17 courtesy of Sharebot Srl



Nitrogen as an ally gas in additive manufacturing

Nitrogen is one of the main gases in additive manufacturing processes and in 3D laser printing with sintered materials.





BENEFITS

LESS POROSITY AND FEWER DEFECTS
PROCESS STABILISATION
AFFORDABLE GAS

MATERIALS FOR ADDITIVE MFG AND 3D PRINTING CON N₂

Austenitic Stainless Steels

Ferritic Stainless Steels - Duplex Steels

A technical assessment is required for other materials





NITROGEN GENERATORS FOR LASER APPLICATIONS

The importance and affordability of having self-produced nitrogen always available

LaserPower is a solution designed to diffuse systems to produce support gas intended for processing and cutting metals. This is a cost-effective and safe choice that can be adapted to your needs.

NITROGEN FULLY AVAILABLE WHEN NEEDED
THE HIGH PURITY OF THE GAS CAN BE ADJUSTED
LOW RUNNING COSTS

LP 300 Series

With gas stored in cylinder sets, up to 300 bar

LP 40 series

With gas stored in tanks, up to 40 bar





LONG-LIFE
high energy efficiency,
minimum wear and maintenance



LP 300 series

The LP 300 series has been designed for laser cutting, the application for which the availability of high pressure nitrogen is always required. The sets of cylinders, filled up at 300 bar, guarantee long operation, even more than 1000 m³. In this case, they are able to cover variable consumption rates throughout the whole working day.

LP 300 is an expandable series with which the system can be set up with several nitrogen generators in parallel and with multiple cylinder sets according to the customer's needs.



COMPRESSED AIR SYSTEM

**LP 300 SERIES SKID LASERPOWER
NITROGEN GENERATOR**

CYLINDER SET





LP 40 series

The LP 40 series was designed for laser cutting applications with constant consumption on average or with moderate peaks.
In this case, storage is at 40 bar in tanks from 500 to 5000 L.

LP 40 is an expandable series with which the system can be set up with several nitrogen generators in parallel and with multiple cylinders according to the customer's needs.



COMPRESSED AIR SYSTEM

**LP 40 SERIES SKID LASERPOWER
NITROGEN GENERATOR**

NITROGEN TANK



CONTROL SYSTEM AND ACCESSORIES

The LaserPower systems come in two different configurations, LP300 and LP40. Both series can be fitted with optimised drying and filtering systems. Moreover, there are tailor-made solutions with supplies in containers which also have a compressed air system.

OXYGEN ANALYSER

All models have a system to analyse the gas produced. The analyser uses a zirconium oxide sensor to continuously measure residual oxygen and ensures the set nitrogen purity is maintained. The control system is modular and can be fitted with a number of communication interfaces (4-20mA current transmission, MODBUS, CAN). The optional modules are used to interface the nitrogen generator with the wide variety of remote monitoring and control systems on the market.

WEB SERVER XL - INDUSTRY 4.0

Our response to the fourth industrial revolution.

Nitrogen self-production systems with smart connections, with reliable remote control over the operating parameters of the whole generation system, from the compressed air supply to the final storage of inert gas. Management and analysis of historical data. Option to receive email alerts of any alarms.



CHOOSE ALL THE BENEFITS OF OPERATING RENTAL



QUICK AND EASY TO REQUEST



AFFORDABLE



SMALL AND SIMPLE INSTALMENTS



IMMEDIATE AVAILABILITY

1

Choose the ideal
LaserPower system
for your business.

2

Request the **operating
rental** service as an
alternative to purchase.

3

Authorised in **just
a few hours.**

4

Pay with **fully
deductible, customised
instalments**



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