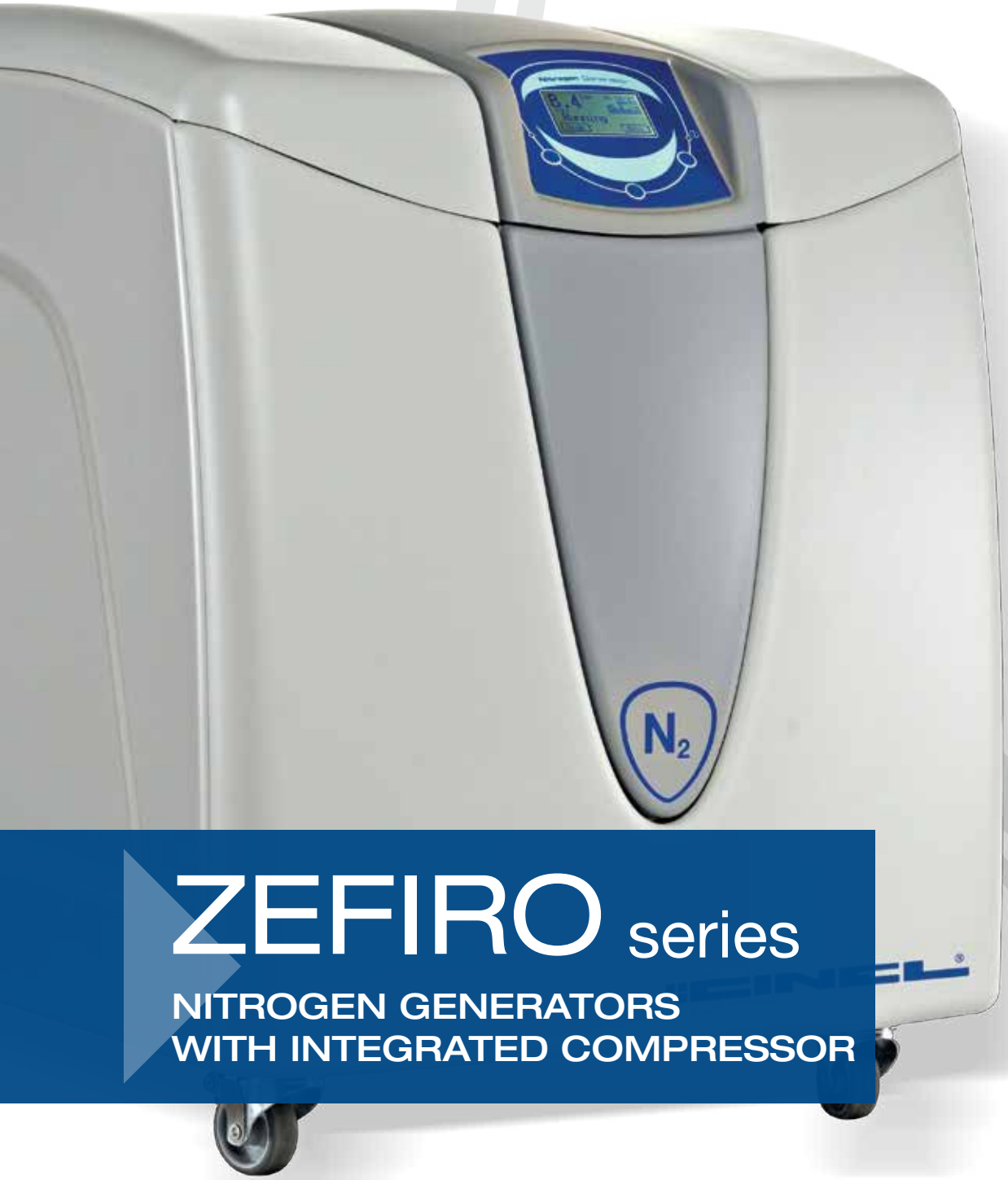
CINEL® s.r.l.
Gas Generators Technology

DESIGN AND PRODUCTION
OF LABORATORY
GAS GENERATORS



ZEFIRO series

NITROGEN GENERATORS WITH INTEGRATED COMPRESSOR

The constant and completely
autonomous supply of nitrogen flux

Nitrogen for LC-MS application

ZEFIRO LC/MS 20-25-35-40

ZEFIRO Nitrogen Generator is designed specifically as a stand-alone system to provide nitrogen to single LC/MS applications which require a constant and autonomous supply of nitrogen flux.
The Nitrogen generator uses pressure swing adsorption technology (PSA) to produce nitrogen gas. This system uses carbon molecular sieve (CMS) which selectively adsorbs oxygen and water vapor molecules under high pressure, while allowing Nitrogen to pass through. The alternation between purification and regeneration of the sieve bed pressure Vessels ensure continuous nitrogen flow production.

Application

LC/MS

Technical data

	ZEFIRO LC/MS 20-25	ZEFIRO LC/MS 35-40
STANDARD NITROGEN FLOW RATE	20 l/min at STP 25 l/min at STP	35 l/min at STP 40 l/min at STP
OUTLET PRESSURE	up to 8 bar (116 psi)	up to 8 bar (116 psi)
STANDARD PURITY	99,0% at STP	99,0% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz	230 V - 50 or 60 Hz
WEIGHT	140 Kg	140 Kg
POWER CONSUMPTION	1800 W	1800 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20	IP20
TEMPERATURE	5°C to +30°C	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing	0-80%, non condensing
SOUND PRESSURE LEVEL	50 dB(A)	50 dB(A)
OUTPUT PORT	G 1/4	G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm	width 48 cm, height 70 cm, length 84 cm

Nitrogen for LC-MS application

ZEFIRO LC/MS 65

ZEFIRO Nitrogen Generator is designed specifically as a stand-alone system to provide nitrogen flux to single LC/MS applications which require a high nitrogen consumption or allows two standard LC/MS to be supplied contemporaneously.
The Nitrogen generator uses membrane Technology to produce nitrogen gas at specific purity required.

Application

LC/MS

Technical data

STANDARD NITROGEN FLOW RATE	up to 65 l/min at STP
OUTLET PRESSURE	up to 7.0 bar (102 psi)
STANDARD PURITY	98,5% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz
WEIGHT	120 Kg
POWER CONSUMPTION	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20
TEMPERATURE	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing
SOUND PRESSURE LEVEL	55 dB(A)
OUTPUT PORT	G1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm

STP: Standard Temperature and Pressure (20°C, 1 bar)

Nitrogen for LC-MS application

ZEFIRO LC/MS DUAL-PURITY

ZEFIRO Nitrogen Generator LC/MS DUAL PURITY is specifically designed to meet the gas flow, purity and pressure requirements of AGILENT LCMS instruments.
The system supplies simultaneously Nitrogen for LC/MS & ultra high purity nitrogen for the collision cell.

Application

AGILENT LC/MS

Technical data

	ZEFIRO LC/MS DUAL PURITY	ZEFIRO LC/MS DUAL PURITY S
STANDARD NITROGEN FLOW RATE	LC/MS N2: 35 or 65 l/min at STP Collision Cell N2: 200 ml/min at STP	LC/MS N2: up to 35 l/min at STP Collision Cell N2: 1100 ml/min at STP
OUTLET PRESSURE	7 bar at STP (102 psi) 2,5 bar at STP (36 psi)	7,2 bar at STP (105 psi) 6,5 bar at STP (95 psi)
STANDARD PURITY	99.0% at STP 99,999% at STP	98.0% at STP 99,999% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz	230 V - 50 or 60 Hz
WEIGHT	130 Kg	125 Kg
POWER CONSUMPTION	1800 or 1900 W	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20	IP20
TEMPERATURE	5°C to +30°C	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing	0-80%, non condensing
SOUND PRESSURE LEVEL	50 or 55 dB(A)	55 dB(A)
OUTPUT PORT	G 1/4 + quick connection for 1/4" LC/MS G 1/4 + 1/8" swagelock for Collision Cell	G 1/4 + quick connection for 1/4" LC/MS G 1/4 + 1/8" swagelock for Collision Cell
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm	width 48 cm, height 70 cm, length 84 cm

STP: Standard Temperature and Pressure (20°C, 1 bar)

Nitrogen and Air for LC-MS application

ZEFIRO COMBINED

ZEFIRO COMBINED Nitrogen-Air Generator is specifically designed to supply Nitrogen & Dry Air for all ABI SCIEX LC/MS.
The Nitrogen generator uses membrane Technology to produce nitrogen gas at specific purity required.
The internal oil free air compressor which is firstly pre filtered provide also to the exhaust air flow which is treated by a drying filter.

Application

ABI SCIEX LC/MS

Technical data

	ZEFIRO COMBINED	ZEFIRO COMBINED S
STANDARD NITROGEN FLOW RATE STANDARD DRY AIR FLOW RATE	up to 15 l/min at STP* up to 35 l/min at STP*	up to 20 l/min at STP* up to 55 l/min at STP*
OUTLET NITROGEN PRESSURE OUTLET DRY AIR PRESSURE	4,2 bar (60 psi) at STP* up to 7,2 bar (105 psi) at STP*	4,2 bar (60 psi) at STP* up to 7,2 bar (105 psi) at STP*
STANDARD NITROGEN PURITY	up to 99,0% at STP*	up to 99,0% at STP*
INPUT VOLTAGE	230 V – 50/60 Hz	230 V – 50/60 Hz
WEIGHT	130 Kg	130 Kg
POWER CONSUMPTION	1800 W	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20	IP20
TEMPERATURE	5°C to +30°C	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing	0-80%, non condensing
SOUND PRESSURE LEVEL	55 dB(A)	55 dB(A)
OUTPUT PORT	N° 02 G 1/4	N° 02 G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm	width 48 cm, height 70 cm, length 84 cm

Nitrogen and Air for LC-MS application

ZEFIRO Q

ZEFIRO Q Nitrogen-Air Generator is specifically designed to supply Nitrogen & Dry Air for Bruker EVOQ Triple Quadrupole Mass Spectrometer. The Nitrogen generator uses membrane Technology to produce nitrogen gas at specific purity required.
The internal oil free air compressor which is firstly pre filtered provide also to the exhaust air flow which is treated by a drying filter.

Application

Bruker LC/MS

ZEFIRO QS

ZEFIRO QS Nitrogen-Air Generator is specifically designed to supply Nitrogen & Dry Air for Perkin Elmer QSight triple quad LC/MS/MS systems. The Nitrogen generator uses membrane Technology to produce nitrogen gas at specific purity required.
The internal oil free air compressor which is firstly pre filtered provide also to the exhaust air flow which is treated by a drying filter.

Application

Perkin Elmer LC/MS

Technical data

	ZEFIRO Q	ZEFIRO QS
STANDARD NITROGEN FLOW RATE STANDARD DRY AIR FLOW RATE	up to 32 l/min at STP* up to 50 l/min at STP*	up to 18 l/min at STP* up to 70 l/min at STP*
OUTLET NITROGEN PRESSURE OUTLET DRY AIR PRESSURE	5,5 bar (80 psi) at STP* 5,5 bar (80 psi) at STP*	5,5 bar (80 psi) at STP* up to 7,2 bar (105 psi) at STP*
STANDARD NITROGEN PURITY	up to 99,0% at STP*	up to 99,0% at STP*
INPUT VOLTAGE	230 V – 50/60 Hz	230 V – 50/60 Hz
WEIGHT	130 Kg	130 Kg
POWER CONSUMPTION	1800 or 1900 W	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20	IP20
TEMPERATURE	5°C to +30°C	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing	0-80%, non condensing
SOUND PRESSURE LEVEL	55 dB(A)	55 dB(A)
OUTPUT PORT	N° 02 G 1/4	N° 02 G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm	width 48 cm, height 70 cm, length 84 cm

STP: Standard Temperature and Pressure (20°C, 1 bar)

Nitrogen and Air for LC-MS application

ZEFIRO 8050

ZEFIRO 8050 Nitrogen-Air Generator is specifically designed to supply Nitrogen & Dry Air for Shimadzu LC/MS 8045, 8050, 8060, 9030.
The Nitrogen generator uses membrane Technology to produce nitrogen gas at specific purity required.
The internal oil free air compressor which is firstly pre filtered provide also to the exhaust air flow which is treated by a drying filter.

Application

Shimadzu LC/MS

Technical data

STANDARD NITROGEN FLOW RATE STANDARD DRY AIR FLOW RATE	up to 30 l/min at STP* up to 25 l/min at STP*
SET NITROGEN PRESSURE OUTLET DRY AIR PRESSURE	up to 7,2 bar (105 psi) at STP* up to 7,2 bar (105 psi) at STP*
STANDARD NITROGEN PURITY	up to 99,0% at STP*
INPUT VOLTAGE	230 V – 50/60 Hz
WEIGHT	130 Kg
POWER CONSUMPTION	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20
TEMPERATURE	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing
SOUND PRESSURE LEVEL	55 dB(A)
OUTPUT PORT	N° 02 G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm

High Purity Nitrogen

ZEFIRO 5 HP & mini-ZEFIRO 1 HP

The model HP (High Purity) Nitrogen Generator is designed specifically for use as make up and carrier gas for GC Applications, which require ultra high purity nitrogen for operation.
The HP nitrogen generator series is also suitable for ICP.
The Nitrogen generator use pressure swing adsorption technology (PSA) combined with a pressure management in two steps (DP PSA) to produce pure nitrogen gas with ultra high purity.

Application

Carrier gas for GC ICP

Technical data

	mini-ZEFIRO 1 HP	ZEFIRO 5 HP
STANDARD NITROGEN FLOW RATE	1 l/min at STP	5 l/min at STP
OUTLET PRESSURE	5 bar (72.5 psi)	up to 6 bar (86 psi)
STANDARD PURITY	99.999% (O2 < 10 ppm) at STP	99.999% (O2 < 10 ppm) at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz	230 V - 50 or 60 Hz
WEIGHT	60 Kg	140 Kg
POWER CONSUMPTION	600 W	1800 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP2	IP2
TEMPERATURE	5°C to +30°C	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing	0-80%, non condensing
SOUND PRESSURE LEVEL	50 dB(A)	50 dB(A)
STANDARD OUTPUT PORT	Swagelok 1/8”	G1/4
CASE DIMENSIONS	width 55 cm, height 42 cm, length 51 cm	width 48 cm, height 70 cm, length 84 cm

STP: Standard Temperature and Pressure (20°C, 1 bar)

Special Unit

ZEFIRO 10 ELSD

ZEFIRO Nitrogen Generator ELSD series is specifically designed to meet the gas flow, purity and pressure requirements of Evaporative Light Scattering Detectors. The Nitrogen generator uses pressure swing adsorption technology (PSA) to produce nitrogen gas.
This system uses carbon molecular sieve (CMS) which selectively adsorbs oxygen and water vapor molecules under high pressure, while allowing Nitrogen to pass through.

Application

ELSD

Technical data

STANDARD NITROGEN FLOW RATE	10 l/min at STP
OUTLET PRESSURE	up to 5.5 bar at STP (80 psi)
STANDARD PURITY	99,9% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz
WEIGHT	110 Kg
POWER CONSUMPTION	800 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20
TEMPERATURE	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing
SOUND PRESSURE LEVEL	50 dB(A)
OUTPUT PORT	G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm

Special Unit

ZEFIRO HIGH PRESSURE

The HIGH PRESSURE nitrogen generator has been specifically designed to meet the gas flows, purity and pressure requirements of the Accelerated Solvent Extraction System (ASE®), the technique for the extraction of solid and semisolid sample matrices using common solvents at elevated temperatures and pressures. The Nitrogen reach the maximum pressure of 11 bars.

Application

ASE
Sample Preparation

Technical data

STANDARD NITROGEN FLOW RATE	Up to 40 l/min at STP
OUTLET PRESSURE	Up to 11 bar (160 psi)
STANDARD PURITY	99,0% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz
WEIGHT	140 Kg
POWER CONSUMPTION	1800 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP20
TEMPERATURE	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing
SOUND PRESSURE LEVEL	50 dB(A)
OUTPUT PORT	G1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm

* All LC/MS brands can be suppliend combining max 30 l/min of N2 or max 70 l/min of AIR

Special Unit

ZEFIRO MP

ZEFIRO Nitrogen Generator “MP” series is specifically designed to supply Nitrogen & Exhaust Air for the AGILENT MP-AES.
The Nitrogen generator uses pressure swing adsorption technology (PSA) to produce nitrogen gas at specific purity required > 99,5%.
This system uses carbon molecular sieve (CMS) which selectively adsorbs oxygen and residual water vapor molecules under high pressure, while allowing Nitrogen to pass through. The internal oil free air compressor which is firstly pre filtered provide also to the exhaust air flow which is treated by a drying filter.

Application

AGILENT
MP-AES

Technical data

STANDARD NITROGEN FLOW RATE STANDARD DRY AIR FLOW RATE	26,5 l/min at STP 25 l/min at STP
OUTLET NITROGEN PRESSURE OUTLET DRY AIR PRESSURE	up to 5.5 bar (80 psi) up to 5.5 bar (80 psi)
STANDARD NITROGEN PURITY	≥ 99,5% at STP
INPUT VOLTAGE	230 V - 50 or 60 Hz
WEIGHT	150 Kg
POWER CONSUMPTION	1900 W
PRESSURE ACCURACY	0.1 bar (± 0.5 %)
MICROPROCESSOR CONTROLLED DISPLAY	Graphic display, 128 x 64 px
INDEX OF PROTECTION	IP2
TEMPERATURE	5°C to +30°C
RELATIVE HUMIDITY	0-80%, non condensing
SOUND PRESSURE LEVEL	55 dB(A)
OUTPUT PORT	N. 02 G 1/4
CASE DIMENSIONS	width 48 cm, height 70 cm, length 84 cm

STP: Standard Temperature and Pressure (20°C, 1 bar)

CINEL GROUP

SCIENTIFIC INSTRUMENTS CINEL®

CINEL® s.r.l. Gas Generators Technology

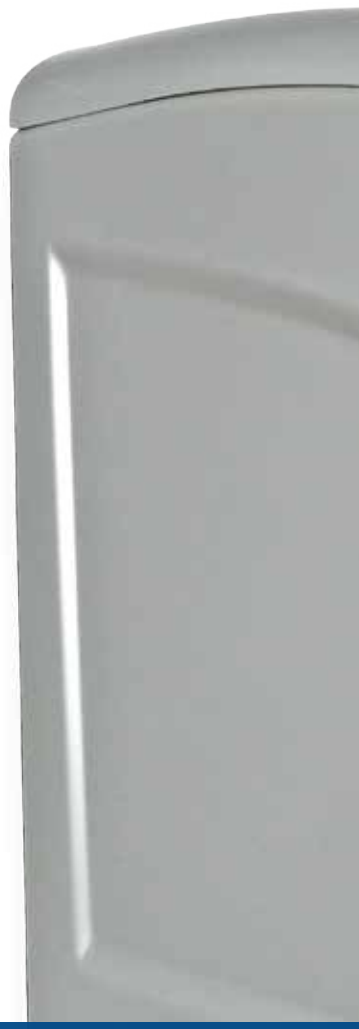
HYSTORY

Cinel Strumenti Scientifici was founded in Padua in the 70's with a technical partnership of INFN LNL Legnaro Laboratory on particle accelerator projects and since then has been involved in some of the most challenging projects all over Europe.

Nowadays, CINEL has reached a long experience on mechanical design and manufacture of apparatuses in several scientific and research fields such as Synchrotron Light Sources (monochromators, fully integrated front ends and beam lines, experimental chambers), as well as accelerator components (vacuum chambers, accelerating cavities, radiofrequency quadrupole cavities). Cinel has acquired skilled experience in the field of cryogenics, superconductivity, astrophysics and bio-mechanics collaborating with well-known institutions as a qualified partner in the mechanical, thermal and control system design and it can now propose turnkey solutions with high level standardization.

A new activity branch has been started in 2005 profiting from the expertise gained in years of R&D programs finalized to high precision mechanics in several research fields; a complete range of analytical gas supply generators has been devolved (nitrogen, hydrogen and zero air) widening the business area to the laboratory analytical instrumentation. Since the beginning the new division has been devoted to the design and production of analytical gas generators which have been rapidly renowned in Italy first than in Europe and outside Europe.

Thanks to the positive impact and to the very promising results on the market, the analytical gas generators branch activity in the end of 2014 was separated from the main company "Strumenti Scientifici Cinel" and the new company "CINEL SRL Gas Generators Technology" has been founded.



PATENT

ITALIAN PATENT
Number 0001397254

INTERNATIONAL PATENT
Application Number EP10814714.1

CERTIFICATIONS

ISO 9001 BUREAU VERITAS Certification

Azienda con sistema di qualità certificato ISO 9001:2008

"Design and production of laboratory gas generators"

N_2 H_2 AIR

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