

# GAS GENERATORS FOR THERMO SCIENTIFIC INSTRUMENTS

**ThermoFisher**  
SCIENTIFIC



THE PARTNERSHIP THAT  
KEEPS THE GAS FLOWING



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## F-DGSI, LEADER IN THE MANUFACTURE AND SALE OF GAS GENERATORS

Founded in 2006 in Evry, France, where its headquarters and research and development centre is based, F-DGSI is a family-owned, dynamic and innovative company in the gas generator sector, the benchmark in design, manufacture and technical assistance in gas generators for many years.

F-DGSI has a Global presence in the market with 1000s of installations.

F-DGSI offers a complete range of gas generators (Hydrogen, Zero Air, Nitrogen) and accessories that meet the needs of all laboratory analysers, including gas chromatography (GC / GCMS) and liquid chromatography-mass spectrometry (LC-MS).



Our compact size and innovative exclusive features include remote monitoring, diagnostics, remote start-stop through our intelligent touch screen controls.

Our primary objective is to continuously improve the services we offer our clients, just like our credo: always one step ahead of the competition.

Our asset: service is at the heart of our business, and we have you covered across the world.

Thanks to our years of experience, F-DGSI has an extensive knowledge of laboratories and their applications. Our highly qualified staff provides expert technical advice to our customers and offers them the best possible solution according to their needs.

All facets of our organization have for common goal the customers satisfaction. Our technical support provides our clients with highly specialized information and advice more than 50 countries around the world thanks to our dedicated service personnel and our wide distributors network.

Should you need it, F-DGSI's-based certified field service engineers will ensure that your F-DGSI generator will remain in top operating condition during and post-warranty. Every F-DGSI Gas Generator comes with a comprehensive one year on-site warranty. Post-warranty service contracts are available.

## OUR PRODUCTION FACILITY

Following extensive market research and technical development, the **F-DGSI range of generators** incorporates the **latest technologies available**, in a sleek and appealing design.

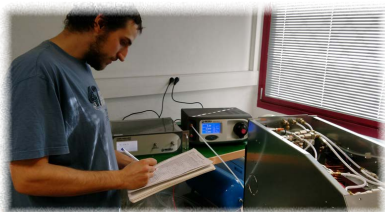
Our emphasis is on the development of turnkey solutions to provide benefits to our customers by meeting their gas supply requirements in a easy to use, safe and cost-effective manner

All F-DGSI laboratory gas generators are manufactured and tested in accordance with EC directives.

All our products comply with current EN 61326-1 (EMC) and EN 61010-1 (LVD) standards for electrical and electromagnetic laboratory equipment.

The law imposes a CE marking on products sold in the European Union.

This marking ensures full compliance of all our products with all European regulations and directives.



## PROTECTING YOUR PRODUCTIVITY

This is enhanced by our world-class **[Gold Service]** generator care, providing preventative maintenance, priority breakdown cover and on-going product upgrades. This ensures unhindered productivity and hassle-free, long life-time operation. The quality of our service is assured the world over with our partners presence in over 50 countries. Our service is regarded as exceptional within the gas generator marketplace.

## OUR PRODUCT FAMILY

**F-DGSI lab gas generators** offer the user more functionality in control than anything else on the market.

We have implemented a series of Unique features like remote monitoring, diagnostics, remote start-stop through our intelligent touch screen controls and end user benefits, making our range, the most complete and the best in the market.

### CALYPSO, STREAM and TORNADO Series nitrogen generators for LC/MS applications :

On-site nitrogen generation with the **CALYPSO and STREAM Series** replaces traditional gas sources such as cylinders, dewars, or bulk gas supply which incur on-going delivery, administrative and rental costs, all of which impact on business revenue or facility budgets.

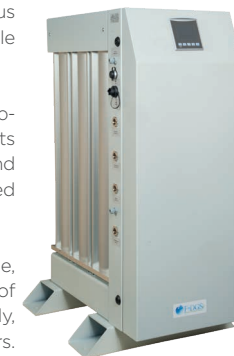
The **CALYPSO Series** is designed primarily for LC-MS applications. It is a self-contained system featuring integrated compressors that deliver laboratory-grade Nitrogen at various pressures and flow rates as required by a large spectrum of LC-MS instruments available on the market.



The **STREAM Series** are silent-running compressor-free systems for laboratories with an in-house supply of clean, dry air for LC-MS instruments including Agilent, Bruker, Perkin Elmer, Shimadzu, Thermofisher and Waters. Producing laboratory grade nitrogen using tried and tested membrane technology.

For very high N2 flow, our **TORNADO Series** offer to you a unique, innovative solution to Nitrogen gas supply. A reliable, secure source of Nitrogen can be produced from your existing compressed air supply, eliminating the need for liquid Nitrogen or high pressure gas cylinders.

All three of them deliver Nitrogen at a wide range of flow rates including models to satisfy more demanding applications such as supplying multiple LC-MS or other laboratory applications such as sample evaporation and glove boxes.



### Our Modular Gas generators series for GC/GCMS Applications :

The modular System is the right solution for your GC detector and carrier gas supply, providing Hydrogen, High purity Nitrogen, Zero Air, in a sleek and appealing design, increasing Productivity, Safety, Efficiency, Convenience

### F-DGSI stackable solution

- Allows you to add multiple generators as your gas and analysis demands change
- The system's internal self-diagnostic features, high visibility lighted display, internal/external leak detection and intelligent remote control and safety alarm capabilities increase lab safety and productivity.
- The flexibility of the F-DGSI stackable solution offers you a Standard Gas Generator as well as a Sensitive Gas Generator to suit your needs, depending on the limit of detection you are looking for in your GC results.



# INNOVATIVE GAS SOLUTION FOR THERMO SCIENTIFIC INSTRUMENTS

## LC-MS, CORONA, FT-IR, ASE, GC/GCMS INSTRUMENTS - APPLICATION LIST

F-DGSI has developed Innovative gas generators to fulfil the requirements for the Thermo Scientific's range of LC-MS & GC, FT-IR and CORONA instruments.

F-DGSI GAS GENERATORS FOR THERMO SCIENTIFIC LC-MS			
ION TRAP LCMS		SINGLE INSTRUMENTS	TWO INSTRUMENTS
LCQ fleet LTQ XL VELOS PRO DUAL	No compressor	CALYPSO.35/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.64/1 or CALYPSO.DUO.32/1
ORBITRAP LCMS		SINGLE INSTRUMENTS	TWO INSTRUMENTS
ORBITRAP FUSION ORBITRAP LUMOS ORBITRAP TRIBID	No compressor	CALYPSO.35/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.64/1 or CALYPSO.DUO.32/1
EXACTIVE / Q-EXACTIVE Q-EXACTIVE HYBRID QUADRUPOLE Q-EXACTIVE FOCUS Q-EXACTIVE PLUS Q-EXACTIVE PLUS ORBITRAP Q-EXACTIVE PLUS EMR ORBITRAP	No compressor	CALYPSO.35/0 or STREAM.40 (116 psi)	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.DUO.32/1
ORBITRAP VELOS ORBITRAP VELOS PRO HYBRID ORBITRAP ELITE MALDI LTQ LTQ ORBITRAP XL	No compressor	CALYPSO.35/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.64/1 or CALYPSO.DUO.32/1
TRIPLE QUADRUPOLE LCMS		SINGLE INSTRUMENTS	TWO INSTRUMENTS
TSQ QUANTUM TSQ ACCESS MAX TSQ QUANTUM ULTRA TSQ QUANTIVA TSQ ENDURA TSQ ALTIS TSQ QUANTIS TSQ FORTIS	No compressor	CALYPSO.35/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.64/1 or CALYPSO.DUO.32/1
SINGLE QUADRUPOLE LCMS		SINGLE INSTRUMENTS	TWO INSTRUMENTS
ISQ EC	No compressor	CALYPSO.35/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.35/1	CALYPSO.DUO.32/1
MSQ PLUS	No compressor	CALYPSO.15/0 or STREAM.40	CALYPSO.64/0 or STREAM.80
	Built in compressor	CALYPSO.15/1	CALYPSO.35/1 or CALYPSO.64/1

F-DGSI GAS GENERATORS FOR THERMO SCIENTIFIC CORONA DETECTOR			
INSTRUMENTS		SINGLE INSTRUMENTS	TWO INSTRUMENTS
CORONA Veo	No compressor	TELESTO.6/0	TELESTO.15/0
	Built in compressor	TELESTO.6/1	TELESTO.15/1
CORONA Veo RS	No compressor	TELESTO.6/0 or TELESTO.8/0	TELESTO.15/0
	Built in compressor	TELESTO.6/1 or TELESTO.8/1	TELESTO.15/1
Vanquish	No compressor	TELESTO.6/0	TELESTO.15/0
	Built in compressor	TELESTO.6/1	TELESTO.15/1

F-DGSI GAS GENERATORS FOR THERMO SCIENTIFIC FT-IR		
INSTRUMENTS		RECOMMENDATION
FT-IR	No compressor	NDC.300
	Built in compressor	DEIMOS.CO2.FREE.30/1

F-DGSI GAS GENERATORS FOR THERMO SCIENTIFIC ASE		
INSTRUMENTS		RECOMMENDATION
ASE	Built in compressor	CALYPSO.DS.HP.40/1

F-DGSI GAS GENERATORS FOR THERMO SCIENTIFIC GC/GCMS					
DETECTOR	CARRIER GAS		DETECTOR GAS		
	HYDROGEN	NITROGEN	HYDROGEN	AIR	NITROGEN
MS	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Not applicable		
	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Standard H2 Generator serie COSMOS MD.H2 or MB.H2	Zero air serie COSMOS.ZA or DEIMOS.UZA	Standard N2 Generator serie COSMOS N2 or NEZO
TCD	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Standard H2 Generator serie COSMOS MD.H2 or MB.H2	-	Standard N2 Generator serie COSMOS N2 or NEZO
ECD	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Standard H2 Generator serie COSMOS MD.H2 or MB.H2	-	Standard N2 Generator serie COSMOS N2 or NEZO
FPD	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Standard H2 Generator serie COSMOS MD.H2 or MB.H2	Zero air serie COSMOS.ZA or DEIMOS.UZA	Standard N2 Generator serie COSMOS N2 or NEZO
FTD	Ultra High purity H2 Generator serie COSMOS MF.H2	High purity N2 Generator serie COSMOS ZN2 or Z.NEZO	Standard H2 Generator serie COSMOS MD.H2 or MB.H2	Zero air serie COSMOS.ZA or DEIMOS.UZA	Standard N2 Generator serie COSMOS N2 or NEZO

## LC-MS INSTRUMENTS

### STREAM SERIES - NITROGEN FROM 40 TO 120 L/MIN

The STREAM N2 generators have been engineered for the requirements of various of Thermo Scientific LC-MS instruments, when a suitable source of external compressed air is available.

With no moving parts and no need of electricity, the STREAM series generators is a durable solution that can run 24 hours a day with minimal maintenance.

#### KEY FEATURES

- Flow rate available : 40, 80, 120 L/min
- Low pressure loss : max 1 bar (14 psi)
- Wall mounted installation : save space in the lab
- No noise : no mechanical parts moving
- No need of electricity supply
- Low maintenance : only to replace the filters once per year
- Gas saving mode : the unit stops automatically when Nitrogen is not required



MODELS	STREAM.40	STREAM.80	STREAM.120
Flow rate	40 L/min	80 L/min	120 L/min
Max outlet pressure	7 bar (101.5 psi)		
Air flow rate required @ 8 bar (116 psi)	140 L/min	280 L/Min	420 L/min
Dimensions (W x H x D)	38 x 120 x 22.5 cm (15" x 47" x 9")		
Application	Designed to supply various LCMS instruments		

## CALYPSO SERIES - UP TO 64 L/MIN NITROGEN

LC-MS analysers do not all share the same requirements in terms of flow rate, pressure and purity of the gases needed for their operation. The CALYPSO.35/1 is the most popular in its series as it is suitable for most LCMS instruments. The CALYPSO.64/1 is designed to supply two LC-MS instruments with a requirement for a higher Nitrogen flow of 64 L/min.

#### KEY FEATURES

- Intelligent color touch screen to provide simple and user friendly management of all functions of the unit
- Fully regenerative PSA technology
- High Nitrogen pressure up to 8 bar (116 psi)
- With integral oil free air compressor
- Quiet thanks to the Soundproofed compressor box and anti-vibration features
- Auto start
- Audible alarm display and Visual maintenance indication with history log
- Outlet flow indicator
- Energy Saving Technology (EST) :
  - Switch off the compressor when gas supply is not required
  - Allowing low energy consumption and increasing durability of the compressor
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Compact design
- Fit with wheels



MODELS	CALYPSO.15		CALYPSO.35		CALYPSO.64	
Compressor	0 (Without)	1 (With)	0 (Without)	1 (With)	0 (Without)	1 (With)
Flow rate	15 L/min		35 L/min		64 L/min	
Max Nitrogen pressure	8 bar (116 psi)					
Inlet Air flow required @ 9 bar (130.5 psi)	53 L/min	N/A	109 L/min	N/A	145 L/min	N/A
Noise level @ 1M	53 dB (A)					
Dimensions (W x H x D)	47.5 x 66.2 x 79 cm (18.7" x 26" x 31")				47.5 x 100 x 79 cm (18.7" x 39" x 31")	
Application	Suitable for MSQ PLUS LCMS instruments		Suitable for most LCMS instruments		Designed to supply 2 x LCMS instruments	

## CALYPSO DUO - UP TO 2 X 32 L/MIN NITROGEN @ HIGH PRESSURE 116 PSI

Combining the capacity of two separate CALYPSO.35/1 Nitrogen generator systems into one fully integrated system to supply two Thermo Scientific LC-MS instruments Q-Exactive.

### KEY FEATURES

- Intelligent color touch screen to provide simple and user friendly management of all functions of the unit
- Fully regenerative PSA technology
- Combines two CALYPSO units into one
- High Nitrogen pressure up to 8 bar (116 psi)
- With integral oil free air compressor
- Quiet thanks to the Soundproofed compressor box and anti-vibration features
- Auto start
- Audible alarm display and Visual maintenance indication with history log
- Outlet double flow indicator
- Energy Saving Technology (EST) :
  - Switch off the compressor when gas supply is not required
  - Allowing low energy consumption and increasing durability of the compressor
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Compact design
- Fit with wheels



MODEL	CALYPSO.DUO.32/1
Compressor	1 (With)
Flow rate	2 x 32 L/min
Max Nitrogen pressure	8 bar (116 psi)
Noise level @ 1M	53 dB (A)
Dimensions (W x H x D)	47.5 x 100 x 79 cm (18.7" x 39" x 31")
Application	Designed to supply two LCMS instruments Q-Exactive

## CORONA INSTRUMENTS

### TELESTO SERIES - UP TO 15 L/MIN NITROGEN

The TELESTO Series N2 generator produce high purity nitrogen gas at various flows and purities for CORONA application and is built in with/without air compressor.

### KEY FEATURES

- Intelligent color touch screen to provide simple and user friendly management of all functions of the unit
- Fully regenerative PSA technology
- Without or with integral oil free air compressor
- Quiet thanks to the Soundproofed compressor box and anti-vibration features
- Auto start
- Audible alarm display and Visual maintenance indication with history log
- Outlet flow indicator
- Energy Saving Technology (EST) :
  - Switch off the compressor when gas supply is not required
  - Allowing low energy consumption and increasing durability of the compressor
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Compact design
- Fit with wheels



MODELS	TELESTO.6		TELESTO.8		TELESTO.15	
	0 (Without)	1 (With)	0 (Without)	1 (With)	0 (Without)	1 (With)
Compressor						
Flow rate	6 L/min		8 L/min		15 L/min	
Max Nitrogen pressure	6 bar (87 psi)					
Nitrogen purity	99.5%					
Inlet Air flow required @ 8 bar (116 psi)	21 L/min	N/A	28 L/min	N/A	52 L/min	N/A
Noise level @ 1M	25 dB (A)	50 dB (A)	25 dB (A)	52 dB (A)	25 dB (A)	52 dB (A)
Dimensions (W x H x D)	47.5 x 66.2 x 65 cm (18.7" x 26" x 25.6")			47.5 x 66.2 x 79 cm (18.7" x 26" x 31")		
Application	CORONA instruments					

## FT-IR INSTRUMENTS

### NDC SERIES - AIR DRYER, CO2 REMOVAL

The CO<sub>2</sub>-free air dryer Series NDC purifies a suitable supply of compressed air to provide a continuous supply of clean, dry (-70°C (-94°F) PDP) and CO<sub>2</sub>-free (< 1 ppm) air, protecting sensitive optics and air bearings from moisture for techniques such as FT-IR.

#### KEY FEATURES

- Air quality obtained
  - Water Dew Point less than -70°C (-100°F)
  - CO<sub>2</sub> < 1ppm
  - Particles < 1 μ
- Compact, lightweight design
- Patented PSA Technology
  - Operation and regeneration fully automatic
  - Complete repressurization which means that there is no pressure fluctuation
- Quiet operation
  - The new exhaust silencers significantly reduce the sound level of the dryer (< 60dB (A)).
- Easy maintenance
  - Single cartridge containing filtration and desiccant which can be easily exchanged without the need for special tools
  - Less than 15 minutes
- PLC screen
  - Dryer status, maintenance indication with alarm display



MODELS	NDC.140	NDC.300
Max CO <sub>2</sub> Free Air Flow rate	14 L/min	30 L/min
Min - Max CO <sub>2</sub> Free Air pressure	4 bar (58 psi) - 16 bar (232 psi)	
CO <sub>2</sub> level	< 1 ppm	
H <sub>2</sub> O Dew Point	-70°C (-94°F)	
Particles	1 μ	
Dimensions (W x H x D)	24.1 x 44.7 x 16 cm (9" x 18" x 6")	24.1 x 64.7 x 16 cm (9" x 25" x 6")
Application	FT-IR instruments	

### DEIMOS CO<sub>2</sub>.FREE - DRY, CLEAN, CO<sub>2</sub> FREE AIR

F-DGSI's DEIMOS CO<sub>2</sub>.FREE Purge Gas generators is specifically designed for use with FT-IR spectrometers to provide a purified purge and air bearing gas supply from compressed air. The unit provides instruments with CO<sub>2</sub> free compressed air at less than -70°C (-94°F) dewpoint with no suspended impurities larger than 0.01 micron 24 hours/day, 7days/week.

#### KEY FEATURES

- Intelligent color touch screen to provide simple and user friendly management of all functions of the unit
- With integral oil free air compressor
- Quiet thanks to the Soundproofed compressor box and anti-vibration features
- Auto start
- Audible alarm display and Visual maintenance indication with history log
- Outlet flow indicator
- Energy Saving Technology (EST) :
  - Switch off the compressor when gas supply is not required
  - Allowing low energy consumption and increasing durability of the compressor
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Compact design
- Fit with wheels



MODEL	DEIMOS.CO <sub>2</sub> .FREE.30/1
Compressor	1 (With)
Max Purge Air Flow rate	30 L/min
Max Purge Air pressure	6 bar (87 psi)
CO <sub>2</sub> level	< 1 ppm
H <sub>2</sub> O Dew Point	-70°C (-94°F)
Particles	0.1 μ
Dimensions (W x H x D)	47.5 x 66.2 x 79 cm (18.7" x 26" x 31")
Application	FT-IR instruments

## ASE INSTRUMENTS

### CALYPSO DS.HP - NITROGEN HIGH PRESSURE UP TO 11 BAR (159 PSI)

The CALYPSO DS.HP Nitrogen generator has been specifically designed to meet the gas flow, purity and pressure requirements of ASE instruments.

#### KEY FEATURES

- Intelligent color touch screen to provide simple and user friendly management of all functions of the unit
- Fully regenerative PSA technology in Two Step (DS-PSA)
- High Nitrogen pressure up to 11 bar (159 psi)
- With integral oil free air compressor
- Quiet thanks to the Soundproofed compressor box and anti-vibration features
- Auto start
- Audible alarm display and Visual maintenance indication with history log
- Outlet flow indicator
- Energy Saving Technology (EST) :
  - Switch off the compressor when gas supply is not required
  - Allowing low energy consumption and increasing durability of the compressor
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Compact design
- Fit with wheels



MODEL	CALYPSO.DS.HP.40/1
Compressor	1 (With)
Max Nitrogen Flow rate	40 L/min
Max Nitrogen outlet pressure	11 bar (159 psi)
N2 purity	> 99%
Noise level @ 1M	< 55 dB (A)
Dimensions (W x H x D)	47.5 x 66.2 x 79 cm (18.7" x 26" x 31")
Application	Designed to supply ASE instruments



## GC/GCMS, GC-FID, GC-FPD, GC-TCD, GC-FTD, ECD INSTRUMENTS

### UNIQUE COSMOS MODULAR DESIGN FOR HYDROGEN, NITROGEN, ZERO AIR GENERATORS

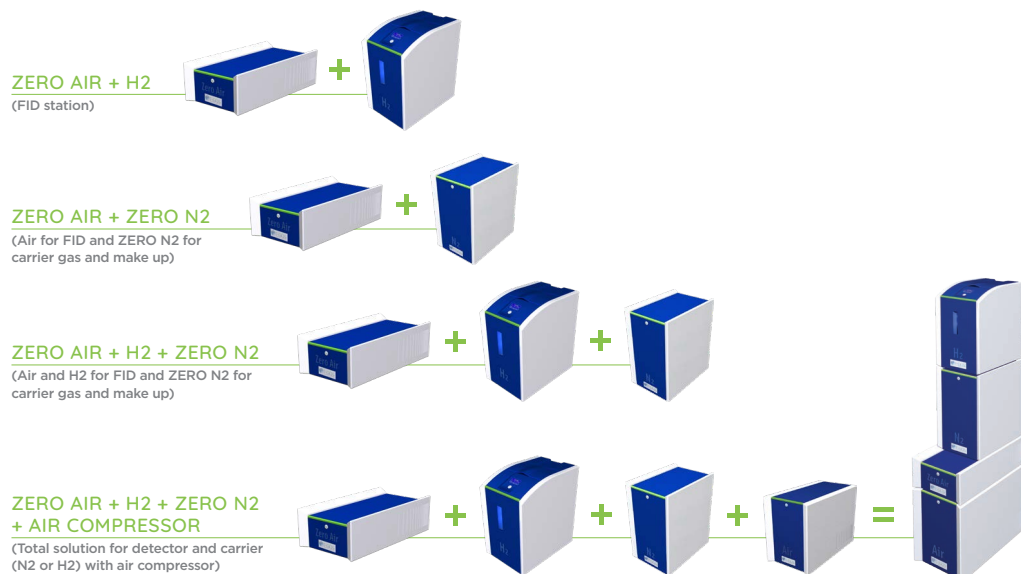
The COSMOS Modular design system is a self contained solution for your GC detector and carrier gas supply, providing Hydrogen, Nitrogen, Zero Air, in a sleek and appealing Modular design for bench space saving, increasing :

- Productivity
- Safety
- Efficiency
- Consistency
- Convenience

#### F-DGSI COSMOS Modular design solution

- Allows you to add multiple generators as your gas and analysis demands change
- The system's internal self-diagnostic features, high visibility lighted display, internal/external leak detection and intelligent remote control and safety alarm capabilities increase lab safety and productivity.
- The flexibility of the F-DGSI COSMOS Modular solution offers you a **Standard Gas Generator** as well as a **High purity Gas Generator** to suit your needs, depending on the limit of detection you are looking for in your GC results.

#### POSSIBLE COMBINATIONS



#### SMART SOLUTIONS WITH GEN-SECURE TECHNOLOGY

The COSMOS Generators are **Secure**, **Modular**, have **Advanced** technology, have **Remote control** capability and are **Trusted** by thousands of users.



SECURE



MODULAR



ADVANCED



REMOTE CONTROL



TRUSTED

## COSMOS HYDROGEN GENERATORS - CARRIER, DETECTOR GAS

As Helium prices increase, many labs are switching over to Hydrogen for their GC carrier gas. Safety is always of utmost concern and Hydrogen Generators produce Hydrogen only on-demand with minimal storage within the unit itself and offer automatic shut-down upon leak detection.

The **COSMOS MF.H2 Series** provide a higher purity grade of hydrogen and can be used for GC/GC-MS carrier gas application.

The **COSMOS MB.H2 and COSMOS MD.H2 Series** are ideal for supplying hydrogen for FID, FPD, FTD, TCD.

#### KEY FEATURES

- Suitable for Carrier Gas with purity 99.99999% (MF.H2) and Flame Gas with purity 99.9996% (MB.H2 / MD.H2)
- Unique 100% Titanium cell (PEM) Technology to generate Hydrogen safely, reliably, with better purity and longer life than any others cells in the market
- Exclusive cold dual regeneration dryer to ensure high level of purity for MF.H2
- Unique drying membrane, maintenance free for MB.H2
- Dessicant cartridge to replace or refill when saturated for MD.H2
- Maintenance limited to replacing deionizer bag for MF.H2 and MB.H2 deionizer bag/desiccant sieve refill for MD.H2
- Creates Hydrogen on demand so minimal storage of Hydrogen in the system
- Internal/external leak detection with automatic shutdown features
- Cascading option to combine multiple units for higher flow requirements
- LED indicators status (Ready, Stand-by, Alarm, Off)
- Remote PC monitoring and diagnostic analysis via USB to interface the unit with customer's PC software (allow to carry out checks and maintenance effectively, only via a remote connection)
- Hydrogen sensor available as option to work in safety mode when using H2 as carrier gas.



MODELS		Flow rate	Purity	Pressure	Dimensions (W x H x D)	Application
COSMOS MF.H2	MF.H2.110	110 cc/min	> 99.99999% (O2 < 0.1 ppm, Dew Point < -75°C (-103°F))	1 - 11 bar (14 - 160 psi)	27 x 44 x 38 cm (10.5" x 17" x 15")	GC & GC-MS Carrier & Detector Gas
	MF.H2.170	170 cc/min				
	MF.H2.260	260 cc/min				
	MF.H2.300	300 cc/min				
	MF.H2.400	400 cc/min				
	MF.H2.500	500 cc/min				
	MF.H2.600	600 cc/min				
	MF.H2.1000	1000 cc/min				
COSMOS MB.H2	MB.H2.110	110 cc/min	> 99.9996% (O2 < 1 ppm, Dew Point < -20°C (-4°F))	1 - 7 bar (14 - 101.5 psi)	27 x 44 x 38 cm (10.5" x 17" x 15")	GC Detector Gas
	MB.H2.170	170 cc/min				
	MB.H2.260	260 cc/min				
	MB.H2.300	300 cc/min				
	MB.H2.400	400 cc/min				
	MB.H2.600	600 cc/min				
COSMOS MD.H2	MD.H2.110	110 cc/min	> 99.9996% (O2 < 1 ppm, Dew Point < -55°C (-67°F))	1 - 7 bar (14 - 101.5 psi)	27 x 44 x 38 cm (10.5" x 17" x 15")	GC Detector Gas
	MD.H2.170	170 cc/min				
	MD.H2.260	260 cc/min				
	MD.H2.300	300 cc/min				
	MD.H2.500	500 cc/min				
	MD.H2.600	600 cc/min				

## COSMOS HIGH PURITY NITROGEN GENERATORS - CARRIER, DETECTOR GAS

The COSMOS Modular Nitrogen generators are available in both Standard and Sensitive models and generate nitrogen on demand from external COSMOS Air Compressor or another external oil-free compressed air source - sold separately), avoiding the need to use traditional bottles that are often difficult to change.

The **COSMOS N2** Standard Nitrogen Generator is suitable for make-up gas and sample prep (Headspace). The **COSMOS ZN2** Sensitive Nitrogen is suitable for GC and GC-MS carrier gas supply for producing 'zero-nitrogen' from a compressed gas source.

### KEY FEATURES

- All models offer purity > 99.9995 %
- Sensitive model (COSMOS ZN2) has a catalyst chamber to remove Hydrocarbons (as methane) to < 0.05 ppm to generate zero nitrogen
- Generates Nitrogen on demand from external compressed air
- Regenerative CMS columns remove Oxygen and moisture
- Ultra fast start-up time, quick to reach operating purity
- Minimum maintenance with an annual filter change
- USB/RS232 port in series to remote the system by internet anywhere in the world for diagnostic purpose
- LED indicators status (Ready, Stand-by, Alarm, Off)
- Unique modular design to save bench space
- Dedicated COSMOS Air Compressor available



MODELS		N2 flow rate L/min via O2 content		Outlet Pressure	Min/Max Air inlet pressure	Dimensions (W x H x D)	Application			
		5 ppm (> 99.9995%)	100 ppm (> 99.99%)							
COSMOS N2	N2.400	0.4	0.8	5.5 bar (80 psi)	6 - 8 bar (87 - 116 psi)	27 x 47 x 38 cm (10.5" x 18.5" x 15")	Make-up & Sample prep (Headspace)			
	N2.800	0.8	1.6							
	N2.1000	1.0	1.8							
COSMOS ZN2	ZN2.400	0.4	0.8				5.5 bar (80 psi)	6 - 8 bar (87 - 116 psi)	27 x 47 x 38 cm (10.5" x 18.5" x 15")	GC / GC-MS carrier gas
	ZN2.800	0.8	1.6							
	ZN2.1000	1.0	1.8							

## COSMOS ZERO AIR GENERATORS - GC DETECTOR GAS

The COSMOS Zero Air generators produce dry and hydrocarbon-free air to be used as flame support gas for GC, from external COSMOS Air Compressor or built in with air compressor), thus avoiding the need to use traditional bottles that are often complex to change.

### KEY FEATURES

- Generates Zero Air on demand from clean and dry external compressed air
- Catalyst chamber to remove Hydrocarbons (as methane) to < 0.05 ppm
- Minimum maintenance with an annual filter change
- Small and stackable
- USB/RS232 port in series to remote the system anywhere in the world
- LED indicators status (Ready, Stand-by, Alarm, Off)
- Compatible with COSMOS Air compressor



MODELS		Flow rate	HC/CO outlet content	Outlet Pressure	Dimensions (W x H x D)	Application
COSMOS ZA	ZA.1000	1.0 L/min	< 0.05 ppm	Maximum 6.5 bar (94 psi)	30 x 15 x 54 cm (12" x 6" x 21")	GC Detector Gas
	ZA.1500	1.5 L/min				
	ZA.3000	3 L/min				
	ZA.6000	6 L/min				
	ZA.15000	15 L/min				
ZA.30000	30 L/min					

## COSMOS AIR COMPRESSOR - CLEAN, DRY AIR SUPPLY FOR ZERO AIR AND NITROGEN COSMOS GENERATOR

The F-DGSI COSMOS Air Compressor module produces continuous, high quality oil-free, pre-dried air from an internal compressor. The compressor module is the ideal solution for providing compressed air to a Zero Air and Nitrogen COSMOS Generator, and for powering pneumatic valves or other applications in the lab.

Thanks to a unique compressor mounting system, the COSMOS Air Compressor module also benefits from low noise and vibration making it relatively quiet in operation within a typical laboratory.

### KEY FEATURES

- Suitable oil free air compressor for a variety of "Modular COSMOS" zero air and N2 Generator combinations
- Minimal noise emission due to insulated compressor compartment
- Minimal vibration through especially developed compressor anti-vibration mounts
- Automatic drain fit in standard
- Automatic stand-by-mode, when no compressed air is required, ensures long compressor life
- USB/RS232 port in series to remote the system anywhere in the world
- LED indicators status (Ready, Stand-by, Alarm, Off)



MODELS	AIR COMPRESSOR
Flow rate	26 L/min
Outlet air Dew Point	-20°C (-4°F)
Max outlet pressure	8 bar (116 psi)
Dimensions (W x H x D)	30 x 40 x 54 cm (12" x 15.8" x 21.3")
Application	To supply in clean and dry air the Zero Air or Nitrogen COSMOS generator

## GET ALL THE BENEFITS OF THE H2 GENERATOR AS CARRIER GAS

..... INSTEAD OF HE

### Eliminate the risks in using Hydrogen as a Carrier Gas in GC Analysis

Hydrogen has long been considered as the best carrier gas for gas chromatography. In many cases hydrogen has become the carrier gas of choice since it results in faster analysis, higher efficiency, reduced costs, and prolonged column life.

### Fast analysis

The diffusion rate of hydrogen and helium are roughly the same (both 3-4 times faster than N<sub>2</sub>), but hydrogen is half as viscous as helium and therefore the linear gas velocity is higher and retention times are shorter in isothermal analysis.

### High efficiency

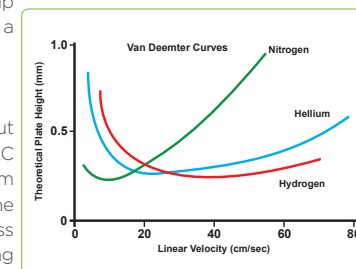
Hydrogen has the flattest Van Deemter curve. Compared to helium and nitrogen, hydrogen needs the lowest plate number to achieve the same resolution over a large range of linear velocity.

### Prolonged column life

For some applications, a temperature program can be used to speed up the analysis when using helium as a carrier gas, but this may result in a shorter lifetime of the column due to higher temperatures.

### Reduced costs

Helium, a rival to Hydrogen has its advantages as a carrier gas for GC; but it also has key disadvantages which are cost and availability. A tank of GC quality hydrogen is approximately 3 times less expensive than its helium equivalent. The price disparity between the two will not improve as the existing helium reserves are drying up and the demand is increasing across different industries. The use of a hydrogen generator also provides long term cost savings. A hydrogen generator allows for the production of the gas on an as needed basis; which avoids the costs associated with storing gas.



..... WITHOUT ANY RISK !

The F-DGSI H<sub>2</sub> generator was designed to have a high level of operator safety

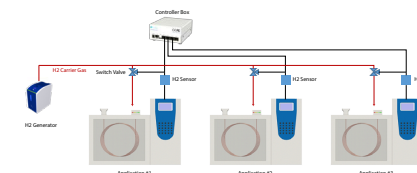
- Unique 9 stage, fail safe, explosion protection system.
- Automatic internal/external H<sub>2</sub> leak detection.
- Unique 100% titanium cell
- Very small stored volume of H<sub>2</sub>
- H<sub>2</sub> gas is only generated on demand

If still worried,

- H<sub>2</sub> sensor in option for carrier gas use

The sensor can work as standalone mode by using an external box and a gas switching valve. The sensor is installed in the GC oven for continuous monitoring of H<sub>2</sub> concentrations in the oven. The measured gas concentration is shown on the LCD screen of the external controller. When the hydrogen concentration reaches the user defined level, typically between 25% and 50% LEL (equal to 1% -2% by Vol H<sub>2</sub>), the LCD screen starts flashing, an acoustic signal is transmitted and the carrier gas will automatically be switched to an inert gas.

A SMS alarm text message can be sent as well. The external box is able to support up to 4 sensors.



## GOLD SERVICE, A CUSTOMER SERVICE OF EXCELLENCE !

BY INVESTING IN A F-DGSI GAS GENERATOR, YOU BUY MORE THAN JUST A GENERATOR AND START A LONG PARTNERSHIP WITH F-DGSI.

F-DGSI IS PROUD TO OFFER A VERY HIGH QUALITY CUSTOMER SERVICE, WHEREVER YOUR LABORATORY IS LOCATED.

THE F-DGSI GOLD SERVICE AFTER-SALES SERVICE NOT ONLY KEEPS YOUR GENERATORS IN GOOD WORKING ORDER, IT ALSO GUARANTEES OUTSTANDING PERFORMANCE THROUGHOUT THEIR LIFE CYCLE.

WITH GOLD SERVICE, YOU ARE ENTITLED TO AN ANNUAL REVIEW OF ALL YOUR DEVICES AND PRIORITY ACCESS TO THE SERVICES OF CERTIFIED ENGINEERS CAPABLE OF IMMEDIATE REPAIR 9 TIMES OUT OF 10 AND WITHIN 48 HOURS. \*

IN CASE OF MALFUNCTION OF YOUR GENERATOR, F-DGSI IS NEVER FAR AWAY. THANKS TO OUR NETWORK OF AUTHORIZED DISTRIBUTORS DEPLOYED IN MORE THAN 50 COUNTRIES, WE CAN QUICKLY ATTEND YOUR LABORATORY TO CARRY OUT REPAIRS SO THAT YOU CAN RESUME YOUR ACTIVITIES AS SOON AS POSSIBLE.

WITH PRIORITY ON-SITE REPAIRS AND SCHEDULED MAINTENANCE ARRANGED TO SUIT YOU, OUR GOLD SERVICE 48H CONTRACT HELPS YOU REDUCE INTERRUPTIONS IN LAB OPERATIONS AND IMPROVE EFFICIENCY AND PRODUCTIVITY WITH NO HIDDEN OR UNFORESEEN COSTS.

## GOLD SERVICE BENEFITS

THE "GOLD SERVICE" SERVICE CONTRACTS OF F-DGSI OFFER YOU :

### PEACE OF MIND

- Prompt on-site intervention guaranteed within 48 hours
- Discounted original F-DGSI parts
- F-DGSI service engineers able to solve up to 97% of problems first time
- Access to the full history of interventions
- Your equipment is integrated in our database so maintenance can be carried out at the same time each year

### REDUCED DOWNTIME

- One preventive maintenance visit per year (or more) based on the number of hours per year. This is planned in advance at a convenient time to reduce the risk of breakdowns and downtime
- Priority customer status for all calls concerning curative repairs with intervention in 48 hours maximum
- 24-hour priority access to the hotline support team for remote troubleshooting
- A program of upgrading and technical improvement to increase the life and performance of the devices

### COST CONTROL

- Say goodbye to unexpected expenses and control the cost of use over the life of the device
- No additional fees for interventions, travel, labor and repair parts
- 15% discount on all the preventive parts included in the contract
- A reduction in hourly rate for maintenance activities
- Improved efficiency and reduced energy consumption costs
- Integral management of interventions, freeing up valuable time for your team
- Different payment methods

Register your equipment on our website to benefit from the guarantee on the date of installation and not on the date of delivery.

[www.f-dgs.com/en/guarantees/](http://www.f-dgs.com/en/guarantees/)

You have up to three months after the delivery date to register your hardware warranty so that it can start on the date of installation.

Note that for H2 generators, it is imperative that it is installed within three months after the delivery date, or the hardware warranty may be cancelled.

In the case of a problem under warranty, our team of Service Engineers and / or our network of authorised distributors in the world.

## INSTALLATION & RELOCATION

### INSTALLATION

F-DGSI has its own Authorized Service Engineers and more than 50 distributors worldwide to install our gas generators in your environment.

During the installation process, we will ensure that the product works as designed to meet your needs.

Contact us for more information.

### RELOCATION

We can help with relocation for all instruments that it has installed or provided.

Occasionally, clients move to expand and / or reduce their lab ; F-DGSI can support uninstallation, re-installation and performance.

### VERIFICATION

We can also advise you on the specifications required for the design of your new laboratory, e.g. space to be allocated, gas supply, gas filtration, power outlets, environmental conditions and consumables. Call us directly to discuss your needs and receive a quote.

## FOUR Q VALIDATION

F-DGSI can offer you the delivery of a 4Q certificate to prove compliance on all its devices.

It is specific to each gas generator and this document validates the device, its installation, operation and performance on the device of the client on which it is connected.

This certificate is established by performing a series of tests on the gas generator using calibrated measuring devices with a certificate of calibration.

Conception Qualification (CQ)  
Installation Qualification (IQ)  
Operational Qualification (OQ)  
Performance Qualification (PQ)

## RENTAL

F-DGSI, offers the rental of a wide range of equipment. .If you need equipment over a short period or if you do not have the investment budget rental is a good solution, or we can provide long term rental avoiding depreciation or capital budget expenditure.

Contact us for more information.



## LAB GAS GENERATORS

[www.f-dgs.com](http://www.f-dgs.com)

Email : [info@f-dgs.com](mailto:info@f-dgs.com)

F-DGSi France

8, 10 rue du Bois Sauvage, bat Q18 - 91000 Evry, France  
Tel. : +33(0)1 64 98 21 00 - Fax. : +33(0)1 64 98 00 43

F-DGSi Inc. USA

385 Alewife Brook Parkway, Suite 210 - MA 02138 Cambridge, Boston, USA  
Tel. : +1(617) 576-2005 - Fax. : +1(617) 576-2001

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CONCEPTION : MARINE SOYEZ  
IMPRESSION : DEFICOM : +33(0)1 69 05 99 99