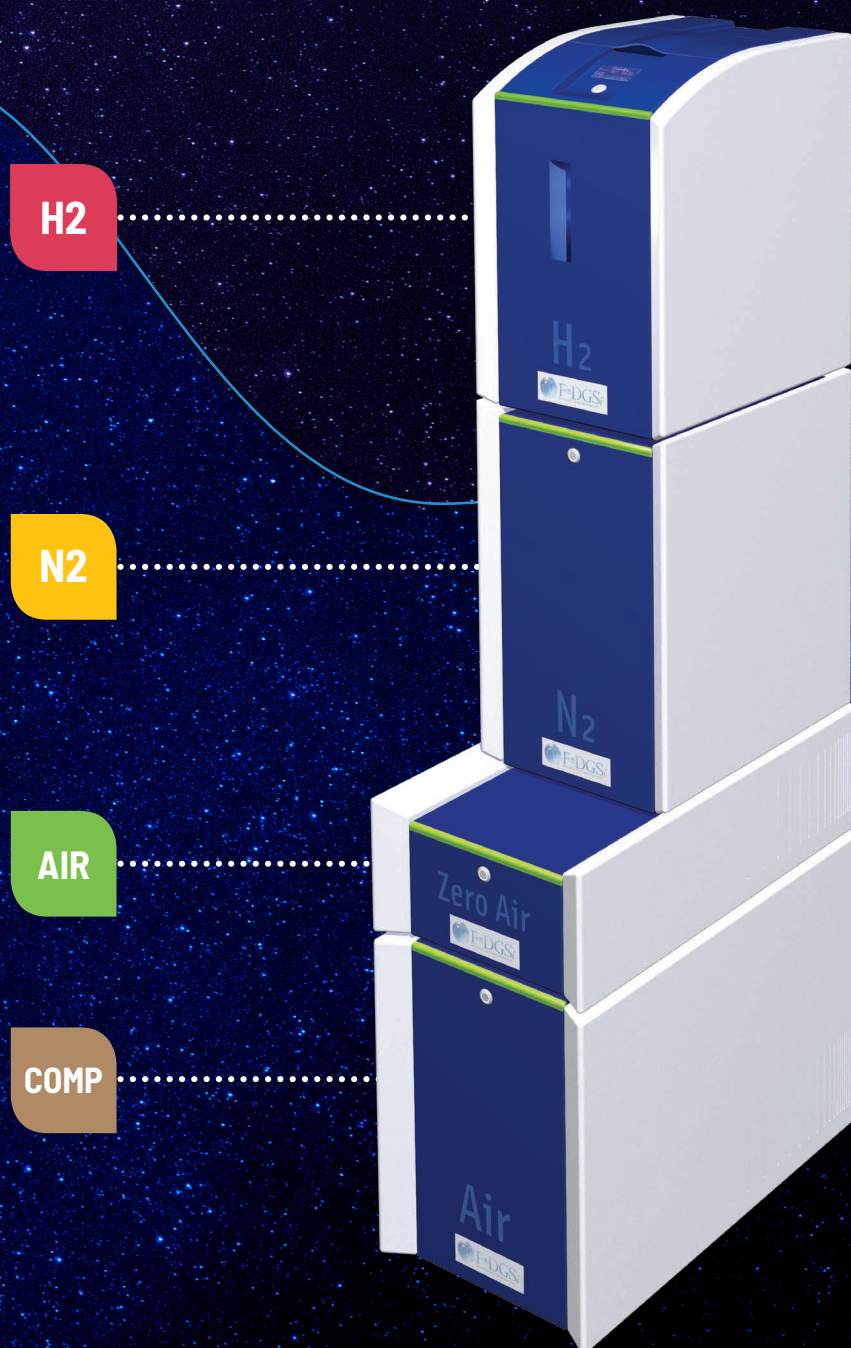


THE COSMOS SERIES

MODULAR GAS GENERATORS

FOR GC/GC-MS INSTRUMENTS



SECURE YOUR GC WORKFLOW
WITH TECHNOLOGY LIGHT
YEARS AHEAD !

F-DGSI EXPERTISE IS DEFINED BY ALWAYS BEING ONE STEP AHEAD!

WE HAVE DESIGNED A NEW MODULAR SOLUTION THAT CAN FULFILL THE NEEDS OF ANY GC LABORATORY'S NEEDS.

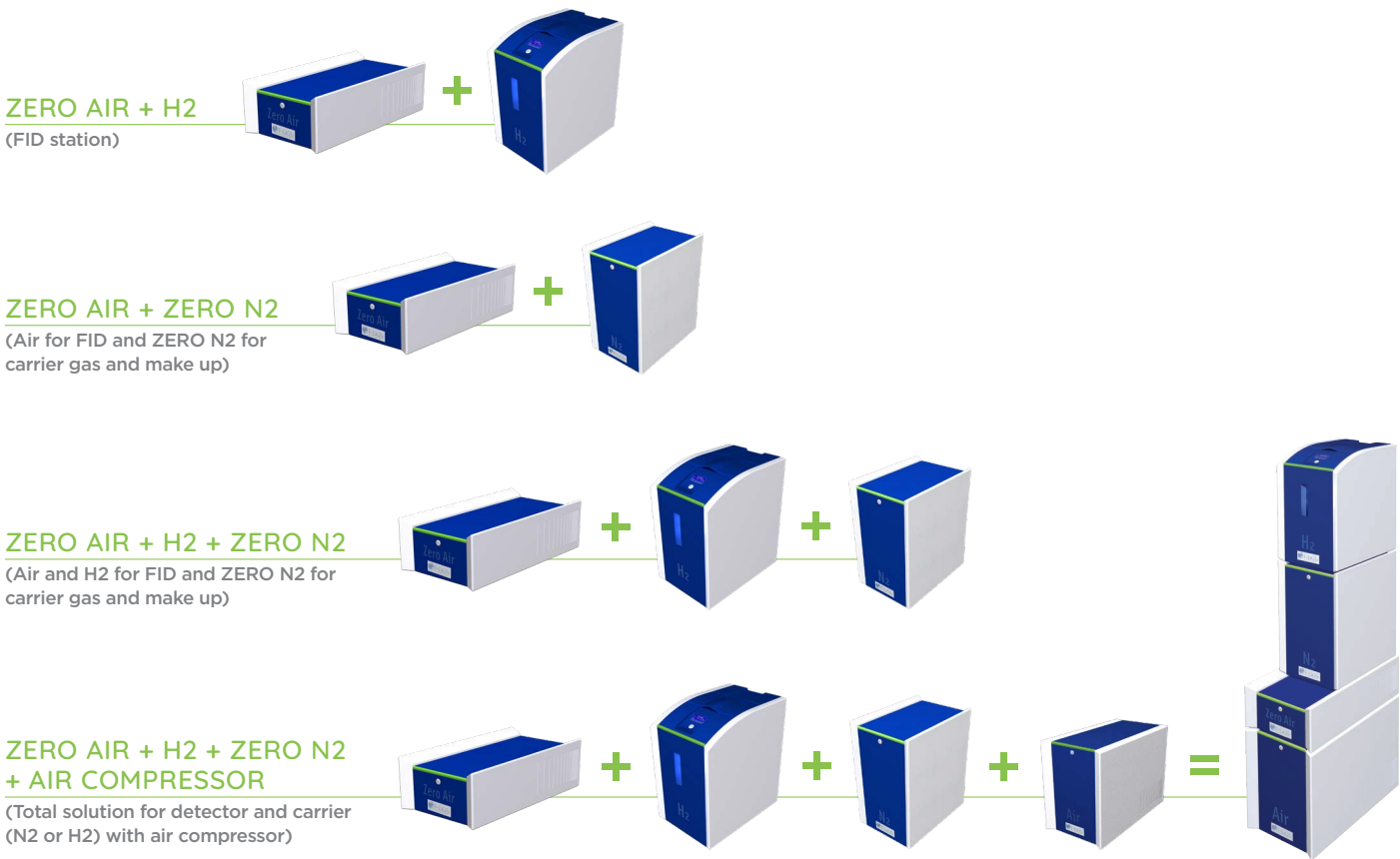
FUTURE-PROOF YOUR LAB WITH F-DGSI'S INNOVATIVE, SPACE SAVING AND STYLISH SOLUTION FOR ALL YOUR GC NEEDS.

INCORPORATING THE LATEST TECHNOLOGIES, THE «COSMOS» MODULAR GAS GENERATOR STACK ALLOWS YOU TO ADD MULTIPLE GAS GENERATORS AS YOUR AND GAS USAGE REQUIREMENTS CHANGE.

WHY COSMOS GAS GENERATORS MODULAR DESIGN ARE THE COMPLETE SOLUTION FOR GC/GCMS LABS.

- Modular system offering a GC gas supply solution specific to your lab
- Stackable design allowing you to save space in the lab
- Combinations available for Single and Multiple GC applications
- Very low maintenance throughout the range without opening any covers
- Touch screen display showing the status of the system with auto-diagnostics in case of alarms
- Exclusive cold dual regeneration dryer to ensure high H2 purity
- 100% titanium PEM cell technology : guaranteed better H2 purity and longer life than any other cells in the market
- PSA fast purity for High Purity Nitrogen
- Unique Remote access via USB port, to carry out checks and maintenance effectively (only via a remote internet connection)
- Optional Hydrogen sensor to work in safety mode when using H2 as a carrier gas

POSSIBLE COMBINATIONS



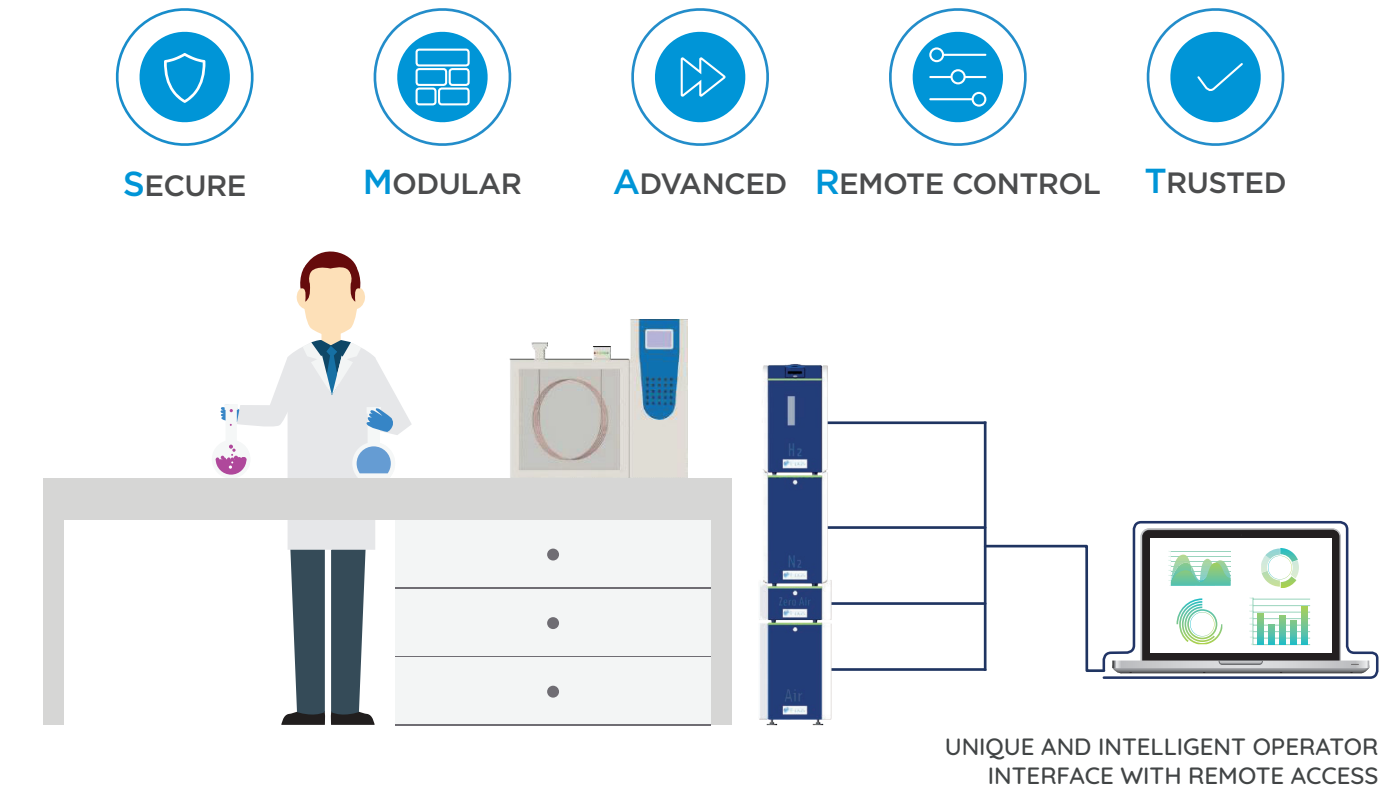
MORE COMPACT, CONVENIENT, SAFE, ECONOMIC, PURE, GREEN THAN GAS CYLINDERS, DEWARDS OR BULK STORAGE

- **Compact** : Can be located either on the bench or on the floor next to your GC instrument
- **Convenient** : No cylinder changes
- **Safer** : Removes the risk of leaks, need for long gas lines from cylinders and the risk of high pressure cylinders
- **Economic** : No gas contract administration, low and stable ongoing gas costs
- **Purity** : The gas purity is constant - no need to add extra gas filters
- **Green** : No repeated gas deliveries, energy efficient



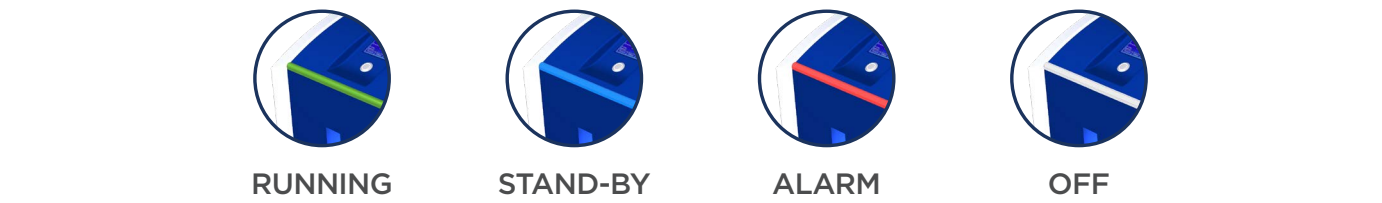
SMART SOLUTIONS WITH GEN-SECURE TECHNOLOGY

The COSMOS Generators are **S**ecure, **M**odular, have **A**dvanced technology, have **R**emote control capability and are **T**rusted by thousands of users.



SECURE YOUR GC WORKFLOW WITH LED TECHNOLOGY

With LED technology, the generator will indicate its colour coded status.



STANDARD OR HIGH PURITY GAS GENERATORS TO SUIT YOUR NEEDS

F-DGSI WILL PROPOSE YOU THE RIGHT MODEL FOLLOWING
THE 'LIMIT OF DETECTION' YOU ARE LOOKING FOR
IN YOUR GC RESULTS.

AT THE LOWER EXTREMES OF DETECTION ACCURATE RESULTS
CAN ONLY BE OBTAINED WITH THE LOWEST POSSIBLE BASELINE.

CREATING SUCH A BASELINE REQUIRES
THE USE OF ULTRA PURE GASES.

THIS IS WHY F-DGSI OFFERS A "STANDARD GAS GENERATOR" AS WELL AS A
"HIGH PURITY GAS GENERATOR" FOR HIGH PURITY GRADE ANALYSIS
SOLUTION.

THE H2 AND N2 GENERATORS ARE AVAILABLE IN TWO SOLUTIONS
(STANDARD AND HIGH PURITY GRADE PURITIES).

FOR MOST GC DETECTORS LIKE FID, THE STANDARD PURITY GAS IS SUFFICIENT
BUT FOR CARRIER GAS USE, HIGH PURITY GRADE GAS IS RECOMMENDED.

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 N₂), 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

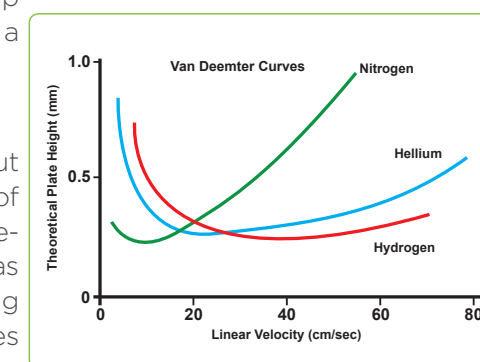
Hydrogen has the flattest Van Deemter curve. Compared to helium and nitrogen, hydrogen needs the lowest plate number to achieve the same resolution over a large range of linear velocity.

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 H₂ generator was designed to have a high level of operator safety

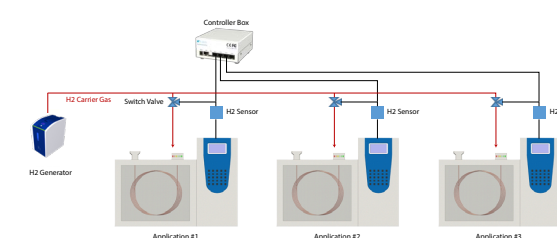
- Unique 9 stage, fail safe, explosion protection system.
- Automatic internal/external H₂ leak detection.
- Unique 100% titanium cell
- Very small stored volume of H₂
- H₂ gas is only generated on demand

If still worried,

- H₂ 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 H₂ 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 H₂), 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.





FOR GC CARRIER GAS AND GCMS APPLICATIONS

HIGH PURITY HYDROGEN SERIE COSMOS MF.H2

KEY FEATURES

- Suitable for Carrier Gas and Flame Gas at low detection limits :
Purity > 99.99999 %
- Unique 100% titanium PEM Cell technology to generate Hydrogen safely and reliably
- Exclusive cold dual regeneration dryer to ensure high level of purity
- Maintenance limited to replacing deioniser bag
- Creates Hydrogen on demand, 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
- USB port in series to remote the system by internet anywhere in the world for diagnostic purpose
- Hydrogen sensor available as option to work in safety mode when using H2 as



MODELS	MF.H2. 110	MF.H2. 170	MF.H2. 260	MF.H2. 300	MF.H2. 400	MF.H2. 500	MF.H2. 600	MF.H2. 1000	MF.H2. 1200	MF.H2. 1350
GENERALS INFORMATIONS										
H2 flow rate - cc/min	110	170	260	300	400	500	600	1000	1200	1350
H2 purity	> 99.99999% (O2 < 0.1 ppm, dewpoint H2O < -75°C (-103°F))									
Delivery pressure	1 - 11 bar (14 - 160 psi)									
H2 dryer	Exclusive cold dual regeneration dryer (PSA dryer)									
Cold Palladium Catalyst (Option)	Reduces O2 < 0.01 ppm and moisture < 1 ppm									
Touch screen	Touch screen (operating parameters, system status, alarms) with LED indicators (Power on/off; ready or errors)									
Dimensions (W x H x D)	27 x 44 x 38 cm (10.5" x 17" x 15")									
Weight (kg/lbs)	17 / 37.5				18 / 29.6			20 / 44	21 / 46	
Power consumption	100 W	120 W	165 W	205 W		220 W	255 W	385 W	440 W	
Electrical supply	110 - 120 V 60 Hz / 220 - 240 V 50 Hz									
COMMUNICATION										
USB/PC Control	In series									
RS232/RS485	Option									
SPECIAL FUNCTION										
Cascading mode	Option									
Automatic water tank refill	Option									



- Suitable for Flame Gas at standard detection limits :
Purity > 99.9996 %
- Unique 100% titanium PEM Cell technology to generate Hydrogen safely and reliably
- Static membrane dryer : maintenances-free, to ensure high level of H2 purity
- Maintenance limited to replacing deioniser bag
- USB port in series to remote the system by internet anywhere in the world for diagnostic purpose

- Suitable for Flame Gas at standard detection limits :
Purity > 99.9996 %
- Unique 100% titanium PEM Cell technology to generate Hydrogen safely and reliably
- Dessicant catridge to replaced or refill when saturated, to ensure high level of H2 purity
- Maintenance limited to replacing deioniser bag and refill dessicant cartridge
- USB port in series to remote the system by internet anywhere in the world for diagnostic purpose

- Creates Hydrogen on demand, 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
- Automatic water refill available

MODELS	MB.H2.110	MB.H2.170	MB.H2.260	MB.H2.300	MB.H2.500	MB.H2.600
GENERALS INFORMATIONS						
H2 flow rate - cc/min	110	170	260	300	500	600
H2 purity	> 99.9996 % (O2 < 1 ppm, Dew Point < -20°C (-4°F))			> 99.9996 % (O2 < 1 ppm, Dew Point < -30°C (-22°F))		
Delivery pressure	1 - 7 bar (14 - 101.5 psi)			1 - 11 bar (14 - 160 psi)		
H2 dryer	Static membrane dryer, maintenance free					
Touch screen	Touch screen (operating parameters, system status, alarms) with LED indicators (Power on/off; ready or errors)					
Dimensions (W x H x D)	27 x 44 x 38 cm (10.5" x 17" x 15")					
Weight (kg/lbs)	18 / 39				19 / 42	
Power consumption	75 W	95 W	140 W	180 W	190 W	230 W
Electrical supply	110 - 120 V 60 Hz / 220 - 240 V 50 Hz					
COMMUNICATION						
USB/PC Control	N/A			In series		
RS232/RS485	N/A			Option		

MODELS	MD.H2.110	MD.H2.170	MD.H2.260	MD.H2.300	MD.H2.400	MD.H2.500	MD.H2.600
GENERALS INFORMATIONS							
H2 flow rate - cc/min	110	170	260	300	400	500	600
H2 purity	> 99.9996 % (O2 < 1 ppm, Dew Point < -55°C (-67°F))						
Delivery pressure	1 - 7 bar (14 - 101.5 psi)						
H2 dryer	Dessicant catridge to refill or replaced when saturated						
Touch screen	Touch screen (operating parameters, system status, alarms) with LED indicators (Power on/off; ready or errors)						
Dimensions (W x H x D)	27 x 44 x 38 cm (10.5" x 17" x 15")						
Weight (kg/lbs)	18 / 39					19 / 42	
Power consumption	75 W	95 W	140 W	180 W		190 W	230 W
Electrical supply	110 - 120 V 60 Hz / 220 - 240 V 50 Hz						
COMMUNICATION							
USB/PC Control	In series						
RS232/RS485	Option						

STANDARD PURITY GRADE ANALYSIS SOLUTION FOR MAKE UP AND SAMPLE PREP (HEADSPACE)

STANDARD NITROGEN SERIE COSMOS N2

KEY FEATURES

- Suitable for Make Up and Sample Prep (Headspace) Gas at standard detection limits: Purity > 99.9995 %
- 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
- Unique modular to save bench space
- Dedicated COSMOS Air Compressor available



HIGH PURITY GRADE ANALYSIS SOLUTION FOR GC CARRIER GAS AND GCMS APPLICATIONS

HIGH PURITY ZERO NITROGEN SERIE COSMOS ZN2

KEY FEATURES

- Suitable for Carrier Gas and Make Up Gas at low detection limits : Purity > 99.9995 %
- Generates Zero Nitrogen on demand from external compressed air
- Regenerative CMS columns remove Oxygen and moisture
- Catalyst chamber to remove Hydrocarbons (as methane) to < 0.05 ppm
- 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
- Unique modular design to save bench space
- Dedicated COSMOS Air Compressor available



COMMON INFORMATIONS

GENERALS INFORMATIONS NITROGEN/ZERO NITROGEN

Outlet pressure	5.5 bar (80 psi)
Min/Max Air inlet pressure	6 - 8 bar / 87 - 116 psi
Min inlet Air quality	ISO8573 - 1:2010 1.4.1
Start-Up time for purity	1 hour
Outlet particule	< 0,1 µ
LED indicators status	Ready, Warm up, Standby, Alarm, Off
Dimensions (W x H x D)	27 x 47 x 38 cm (10.5" x 18.5" x 15")
Electrical supply	110 - 120 V 60 Hz / 220 - 240 V 50 Hz

COMMUNICATION

USB/RS232/PC Control	In series
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OPERATING/STORAGE CONDITIONS

Temperature range	From 5 - 35°C (41 - 95°F) and humidity 80% to 25°C (77°F)
Noise	< 45 db
IP Rating	IP20

MODELS		N2.400	N2.800	N2.1000
GENERALS INFORMATIONS NITROGEN				
N2 flow rate L/min via O2 content	5 ppm > 99.9995%	0.4	0.8	1.0
	100 ppm (> 99.99%)	0.8	1.6	1.8
Catalyst module		N/A		
Weight (kg/lbs)		35 / 77		35.5 / 78
Power consumption		40 W		

MODELS		ZN2.400	ZN2.800	ZN2.1000
GENERALS INFORMATIONS ZERO NITROGEN				
N2 flow rate L/min via O2 content	5 ppm > 99.9995%	0.4	0.8	1.0
	100 ppm (> 99.99%)	0.8	1.6	1.8
Catalyst module		< 0.05 ppm (CH4)		
Weight (kg/lbs)		37 / 81.5		37.5 / 82.5
Power consumption		240 W		

ZERO AIR GENERATOR FOR GC FUEL GAS APPLICATIONS

ZERO AIR SERIE COSMOS ZA

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
- Status indicative lighting features
- USB/RS232 port in series to remote the system anywhere in the world
- Compatible with COSMOS Air compressor



AIR COMPRESSOR FOR ZERO AIR AND NITROGEN COSMOS GENERATOR

COSMOS AIR COMPRESSOR

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



MODELS	ZA.1000	ZA.1500	ZA.3000	ZA.6000	ZA.15000	ZA.30000
GENERALS INFORMATIONS ZERO AIR						
Zero air flow rate (L/min)	1.0	1.5	3	6	15	30
HC/CO outlet content	< 0.05 ppm					
Zero air pressure outlet	Maximum 6.5 bar (94 psi)					
Starting time	40 min		45 min		50 min	
LED indicators status	Ready, Warm up, Standby, Alarm, Off					
Dimensions (W x H x D)	30 x 15 x 54 cm (12" x 6" x 21")					
Weight (kg/lbs)	13 / 28.5		14 / 31		19 / 42	21 / 46.3
Fuse	2 A (5 x 20 mm)					
Power consumption	240 W (280 V ac)					
Electrical supply	90 - 240 V ac / 50 - 60 Hz					

GENERALS INFORMATIONS FOR INLET AIR						
Water Dew Point at the inlet	< -20°C (-4°F)					
HCS concentration Max. at the inlet	100 ppm					
Maximum inlet air temperature	40°C (104°F)					
Inlet air pressure (min/max)	4.5 - 10 bar (65 - 145 psi)					

COMMUNICATION						
USB/RS232/PC Control	In series					

MODEL	AIR COMPRESSOR
GENERALS INFORMATIONS	
Flow rate	26 L/min
Max outlet pressure	8 bar (116 psi)
Outlet air Dew Point	- 20°C (- 4°F)
Air tank capacity	4 L
LED indicators status	Ready, Standby, Alarm, Off
Automatic Stand by mode	Yes
Particles filtration	0.1 microns
Electrical supply	110 - 115 V ac / 50 - 60 Hz 10 A 208 - 230 V ac / 50 - 60 Hz 2.45 A
Power consumption	510 - 1150 W
Noise level	< 50 dB(A)
Dimension (W x H x D)	30 x 40 x 54 cm (12" x 15.8" x 21.3")
Weight (kg/lbs)	35 / 77

COMMUNICATION	
USB/RS232/PC Control	In serie

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/

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

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CONCEPTION : MARINE SOYEZ
IMPRESSION : DÉFICOM : 01 69 05 99 99