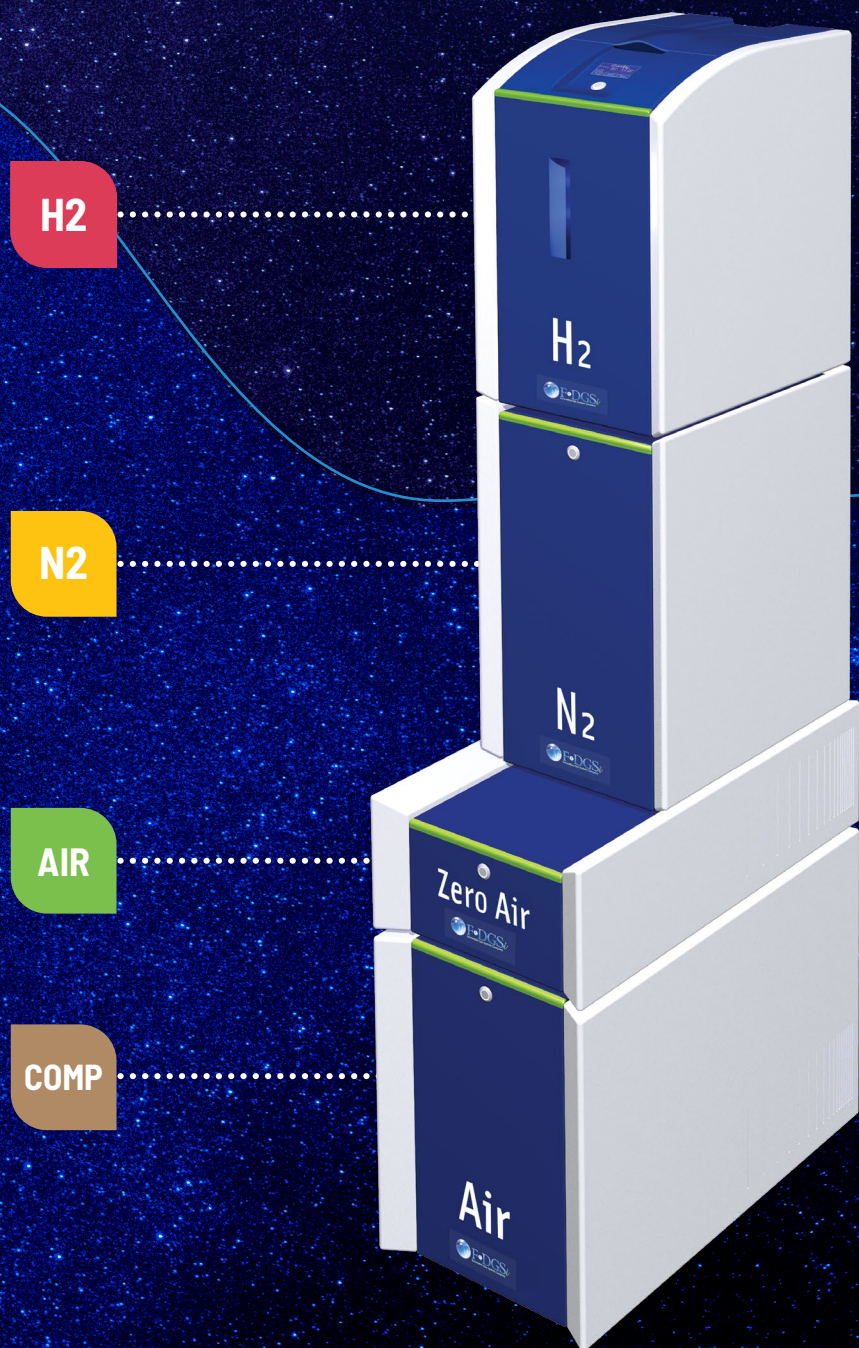


THE COSMOS SERIES

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.

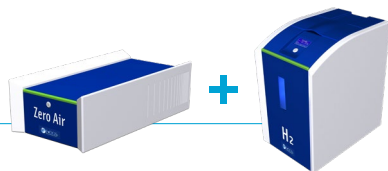
WHY COSMOS GAS GENERATORS MODULAR DESIGN ARE THE COMPLETE SOLUTION FOR GC/GCMS LABS.

- 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

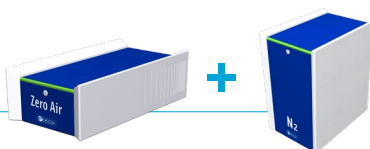
ZERO AIR + H₂

(FID station)



ZERO AIR + ZERO N₂

(Air for FID and ZERO N₂ for carrier gas and make up)



ZERO AIR + H₂ + ZERO N₂

(Air and H₂ for FID and ZERO N₂ for carrier gas and make up)



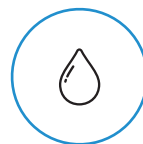
ZERO AIR + H₂ + ZERO N₂ + AIR COMPRESSOR

(Total solution for detector and carrier (N₂ or H₂) with air compressor)



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



MODULAR



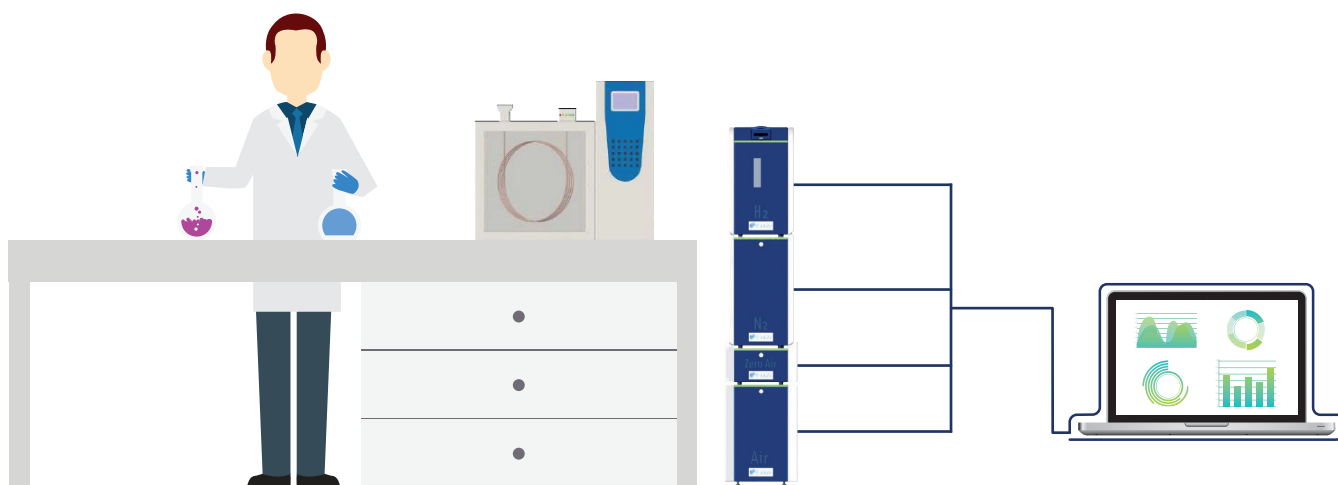
ADVANCED



REMOTE CONTROL



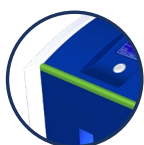
TRUSTED



UNIQUE AND INTELLIGENT OPERATOR
INTERFACE WITH REMOTE ACCESS

SECURE YOUR GC WORKFLOW WITH LED TECHNOLOGY

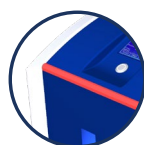
With LED technology, the generator will indicate its colour coded status.



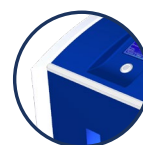
RUNNING



STAND-BY



ALARM



OFF



**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

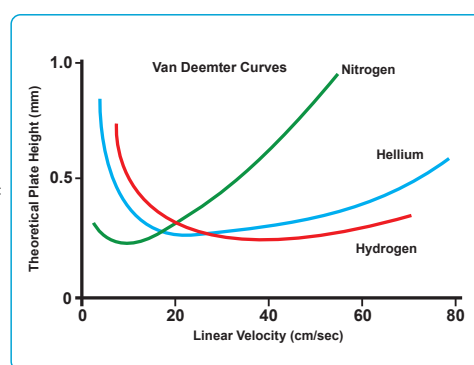
Hydrogen has the flattest Van Deemter curve. Compared to helium and nitrogen, hydrogen needs the lowest plate number to achieve the same resolution over a large range of linear velocity.

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

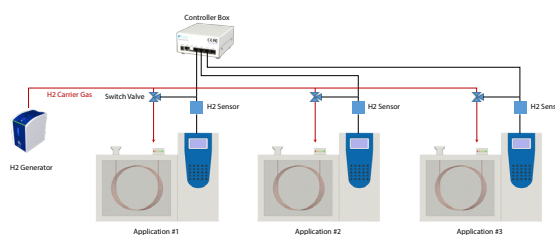
- Unique 9 stage, fail safe, explosion protection system.
- Automatic internal/external H₂ leak detection.
- Unique 100% titanium cell
- Very small stored volume of H₂
- H₂ gas is only generated on demand

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.



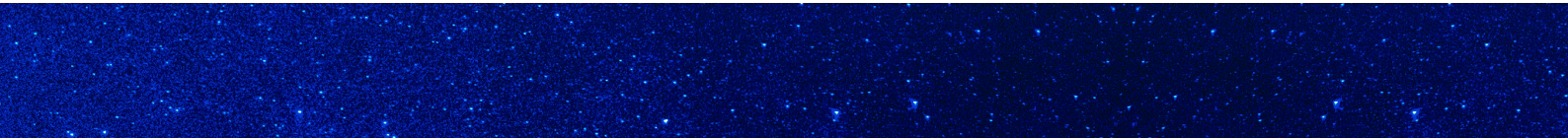


HIGH PURITY GRADE ANALYSIS SOLUTION FOR GC CARRIER GAS AND GCMS APPLICATIONS

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 carrier gas



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	MF.H2. 1500
GENERAL INFORMATION											
H2 flow rate cc/min	110	170	260	300	400	500	600	1000	1200	1350	1500
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	22 / 48		
Power consumption	100 W	120 W	165 W	205 W		220 W	255 W	385 W	440 W		700 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										

STANDARD PURITY GRADE ANALYSIS SOLUTION FOR GC FUEL GAS APPLICATIONS

STANDARD HYDROGEN SERIE COSMOS MB.H2

KEY FEATURES

- 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



STANDARD HYDROGEN SERIE COSMOS MD.H2

KEY FEATURES

- Suitable for Flame Gas at standard detection limits :
Purity > 99.9996 %
- Unique 100% titanium PEM Cell technology to generate Hydrogen safely and reliably
- Dessicant cartridge to be replaced or refilled 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



COMMON FEATURES

- 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.H2.400	MB.H2.500	MB.H2.600
GENERAL INFORMATION							
H2 flow rate - cc/min	110	170	260	300	400	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
GENERAL INFORMATION							
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						

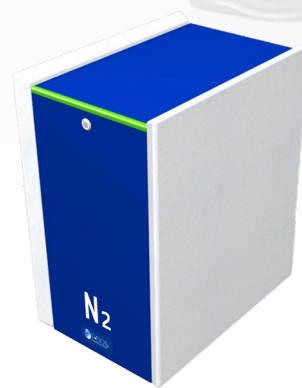


STANDARD PURITY GRADE ANALYSIS SOLUTION FOR MAKE UP AND SAMPLE PREP (HEADSPACE)

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 design to save bench space
- Dedicated COSMOS Air Compressor available

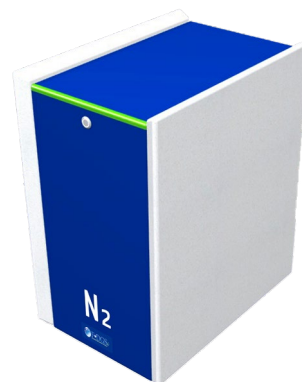


HIGH PURITY GRADE ANALYSIS SOLUTION FOR GC CARRIER GAS AND GCMS APPLICATIONS

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

GENERAL INFORMATION 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
GENERAL INFORMATION 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 <math><0.05\text{ ppm}</math>
- 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
GENERAL INFORMATION 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					
GENERAL INFORMATION 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					
GENERAL INFORMATION						
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					

ALL BENEFITS

WORLD-CLASS BENEFITS IN ORDER TO MAINTAIN YOUR GAS SUPPLY

With F-DGSI generators, it is a new partnership that begins. Whether it is for an installation, an unforeseen breakdown or any other service, our teams of engineers and technical assistants are at your disposal to answer your questions related to our generators, wherever you are in the world.

F-DGSI expertise: What do we cover?

In order to be as close as possible to our customers, we have a wide range of services and benefits to meet your expectations. Installation, maintenance and qualification of your products, we strive to help and advise you in the implementation of your F-DGSI products. For special requests other than the one below, please contact us, we will be happy to find solutions.



Installation

Installing the products to meet your needs



Re-location

Relocation service for your products



Rent or lease sale

Rental of a wide range of equipment



Advice

Your expert in gas supply by your side



Parts Service / Consumables

A hotline to guarantee you a 48h deadline



Maintenance

Service plans and maintenance contracts



Repairs

Repair on customer site or F-DGSI office



4Q Qualifications

CQ / IQ / OQ / PQ Qualifications



Customized training

Training by our technical experts F-DGSI

Learn more on www.f-dgs.com/benefits

[F-DGSi Care]

GET PEACE OF MIND WITH OUR WORLD-CLASS GAS GENERATOR SERVICE PLANS

When you invest in an F-DGSi gas generator, you're buying more than just a generator, you're starting a longterm partnership. The after sales service department not only keeps your generators in good working conditions, but also guarantees outstanding performance throughout their life cycle.

5 types of service plans for your gas generator

With on-site repairs and regularly scheduled maintenance, our various contracts will help you to reduce disruptions to your laboratory operations and to improve efficiency and productivity, with no hidden or unexpected costs.

■ Hotline Contract Do the maintenance yourself	■ Day Ticket Contract Peace of mind for your maintenance budget	■ Basic Preventive Contract Includes travel and labor without parts
■ Silver Preventive Contract Includes preventative maintenance parts	■ Gold Contract Contract Premium: Total peace of mind	

The benefits to take one of our FrenchCare Contracts

Cost Control

Preventive maintenance by experienced professionals of F-DGSi will reveal any wear and tear at an early stage. This avoids unexpected expenses and allows you to better control the costs of using the device.

Priority

With a Service Contract, you are our priority. We guarantee a quick maintenance response in case of emergency.

Reduced downtime

Reduce your risk of breakdowns and unscheduled downtime! Remote access to your equipment allows to analyze critical equipment parameters and identify pending failures before they affect your lab operations.

Flexibility

At the point of equipment sale, different payment options are available (Annual, Bi-annual, Quarterly, ...)

Get more details for contracts on www.f-dgs.com/service-plans



LAB GAS GENERATORS

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