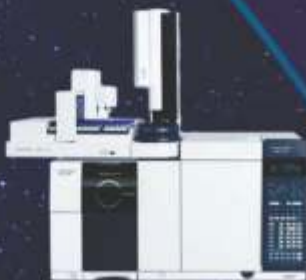


# LABORATORY GAS GENERATOR FOR GAS CHROMATOGRAPHY

We have designed a new modular solution that can fulfill the needs of any GC laboratory's needs.

Modular and Stackable

## SUITABLE TO ALL GC BRAND



**H<sub>2</sub>**

**Hydrogen Generator**

Capacity: 110 to 1350 cc/min  
Outlet pressure: up to 11 bar  
Purity: > 99.99999 %

**N<sub>2</sub>**

**Nitrogen Generator**

Capacity: 400 to 1000 cc/min  
Outlet pressure: up to 5.5 bar  
Purity: > 99.9995 %  
Technology: PSA (Pressure Swing Adsorption)

**AIR**

**Zero Air Generator**

Capacity: 1000 to 30000 cc/min  
Outlet pressure: up to 6.5 bar

**COMP**

Optional compressor to support zero air and nitrogen generator



For further information please contact :

  
info@f-dgs.com



## COSMOS MB.H2 Hydrogen Gas generator for GC

MODELS	MB.H2.110	MB.H2.170	MB.H2.260	MB.H2.300	MB.H2.400	MB.H2.500	MB.H2.600
<b>GENERALS INFORMATIONS</b>							
H2 flow rate - cc/min	110	170	260	300	400	500	600
Electrolytic cell	Long life Multilayer PEM technology						
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						

## COSMOS MF.H2 Hydrogen Gas generator for GC/GC-MS

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
<b>GENERALS INFORMATIONS</b>										
H2 flow rate - cc/min	110	170	260	300	400	500	600	1000	1200	1350
Electrolytic cell	Long life Multilayer PEM technology									
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									

## COSMOS N2 / ZN2 Nitrogen Gas generator for GC

MODELS	N2.400	N2.800	N2.1000	ZN2.400	ZN2.800	ZN2.1000	
<b>GENERALS INFORMATIONS NITROGEN</b>							
N2 flow rate L/min via O2 content	5 ppm > 99.9995%	0.4	0.8	1.0	0.4	0.8	1.0
	100 ppm (> 99.99%)	0.8	1.6	1.8	0.8	1.6	1.8
Catalyst module	N/A			< 0.05 ppm (CH4)			
Outlet pressure	5.5 bar (80 psi)						
Min/Max Air inlet pressure	6 - 8 bar / 87 - 116 psi						

## COSMOS ZA Zero Air Gas generator for GC

MODELS	ZA.1000	ZA.1500	ZA.3000	ZA.6000	ZA.15000	ZA.30000
<b>GENERALS INFORMATIONS ZERO AIR</b>						
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	
Temperature range	From 5 - 35°C (4 - 95°F) and humidity 80% to 25°C (77°F)					

## COSMOS AIR COMPRESSOR Air Supply for COSMOS Gas Generator

MODEL	AIR COMPRESSOR
<b>GENERALS INFORMATIONS</b>	
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, Stand-by, Alarm, Off



# LABORATORY GAS GENERATORS

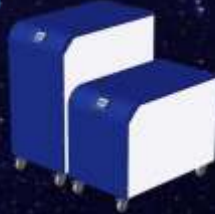
## THE NITROGEN RANGE



### CALYPSO

[LC-MS, Sample Evaporation]

Technology: PSA  
 Flow\*: 15 to 70 LPM  
 Purity: >99% to 99.99%  
 Pressure: 8 bar



### ZEPHYR

[ICP, Circular Evaporation, Turbovap, Atomic absorption]

Technology: PSA  
 Flow\*: 10 to 70 LPM  
 Purity\*: > 99.9995%  
 Pressure: 7 bar



### NESO

[GC, ICP, TOC, DSC/TGA]

Technology: PSA  
 Flow\*: 1 to 5 LPM  
 Purity: > 99.9995%  
 Pressure: 6 bar



### COSMOS.N2

[ECD, FPD, NPD, AED, TOC, TGA, DSC, GC-MS, GC-make up gas etc.]

Technology: PSA  
 Flow\*: 400 cc to 1800 cc/min  
 Purity: > 99.9995%  
 Pressure: 5.5 bar



### STREAM

[LC-MS, Sample Evaporation, Turbovap etc.]

Technology: MEMBRANE  
 Flow: 40 to 220 LPM  
 Purity: > 99%  
 Pressure: 7 bar



- Saves money
- Remote Connectivity
- Smart and Compact
- Reliable to run 24 \* 7
- Speedy analysis

For more information contact :



info@f-dgs.com  
 www.f-dgs.com

## WHY A GAS GENERATOR ?

- ECONOMICAL & ENERGY EFFICIENT
- REMOTE PC MONITORING
- ON DEMAND GAS
- INTELLIGENT COLOR TOUCH SCREEN
- SMART TRIPLE FILTRATION
- SAFE & CONSISTENT
- DIAGNOSTIC ANALYSIS
- INTEGRAL OIL-FREE AIR COMPRESSOR



### CONTACT US FOR:

LIQUID NITROGEN GENERATORS  
 HIGH FLOW NITROGEN FOR MULTIPLE LCMS



SUITBALE TO ALL  
LC-MS BRANDS



## LABORATORY GAS GENERATORS FOR LIQUID CHROMATOGRAPHY

Presenting you  
The **CALYPSO** with:

PSA TECHNOLOGY  
INTEGRAL OIL FREE AIR COMPRESSOR  
SMART TRIPLE FILTRATION  
INTELLIGENT COLOR TOUCH SCREEN  
OUTPUT FLOW INDICATOR  
REMOTE PC MONITORING  
DIAGNOSTIC ANALYSIS



Calypso comes with Heat distribution management via a special tunnel to avoid overheat of the compressor box with adequate fans above and below the compressors

For further information please contact :



E: [info@f-dgs.com](mailto:info@f-dgs.com)  
W: [www.f-dgs.com](http://www.f-dgs.com)



Saves money



Remote Connectivity



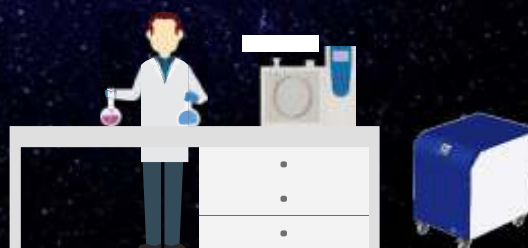
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Reliable to run 24 \* 7



Speedy analysis



MODELS	CALYPSO.15/1	CALYPSO.25/1	CALYPSO.35/1	CALYPSO.64/1	CALYPSO.70/1
COMPRESSOR	YES (without air compressor models are also available)				
Technology	PSA				
Max Nitrogen flow rate	15 L/min	25 L/min	35 L/min	64 L/min	70 L/min
Max Nitrogen pressure	8 bar (116 psi)				
Nitrogen purity	99% - 99.99%				
Temperature range	From 5 - 35°C (41 - 95°F)				
Dimensions (W x H x D) cm or inches	47.5 x 66.2 x 79 or (18.7" x 26" x 31")				47.5 x 100 x 79 or (18.7" x 39" x 31")
Weight (kg/lbs)	118 / 260		160 / 353		172 / 379

# TORNADO Nitrogen Gas generator

## Applications

- LCMS
- Sample evaporation
- RMN
- ICP
- Food Packaging
- Laser cutting
- Oil and gas
- Electronic assembly/soldering
- Wine making and brewing



MODELS	10 ppm	100 ppm	0.10%	0.5%	1.0%	2.0%	3.0%	4.0%	5.0%	Dimensions (W x H x D)	Weight (kg/lbs)
<b>N2 FLOW RAT NM3/H VIA O2 PURITY</b>											
TORNADO-102	1.0	2.75	4.5	7.1	8.95	11	12.95	14.55	16.15	40 x 175 x 69 cm (16" x 69" x 27")	210 / 463
TORNADO-104	1.98	5.5	9	14.2	17.9	22	25.9	29.1	32		250 / 551
TORNADO-106	2.96	8.5	13.5	21.3	26.7	32.9	38.8	43.6	48.4	40 x 175 x 80 cm (16" x 69" x 31")	370 / 815.7
TORNADO-108	3.94	11	18	28.4	35.6	43.9	51.7	58.1	64.5	40 x 175 x 95 cm (16" x 69" x 37")	465 / 1025
TORNADO-110	4.93	14	22.5	35.4	44.5	54.8	64.6	72.6	80.5	40 x 175 x 109 cm (16" x 69" x 43")	558 / 1230
TORNADO-112	5.91	16.5	26.9	42.5	53.4	65.8	77.5	87.2	96.6	40 x 175 x 121 cm (16" x 69" x 48")	662 / 1459
TORNADO-116	7.98	21	34.1	53.8	67.6	83.3	98.2	110.4	122.4	40 x 175 x 152 cm (16" x 69" x 60")	870 / 1918
TORNADO-120	9.84	25.3	41.3	65.1	81.8	100.8	188.8	133.6	148	40 x 175 x 235 cm (16" x 69" x 92")	1100 / 2425
Air/N2 ratio	12	6.4	3.4	2.8	2.6	2.4	2.2	2.1	2		

TECHNICAL DATA	
Temperature range	5 - 45°C (41 - 113°F)
Air Inlet Pressure	6 to 18 bar (87 to 261 psi)
Air Inlet quality requirement	Dewpoint : -40°C (-40°F)
	Particulate : < 0.1 micron
	Oil : < 0.01 mg/m <sup>3</sup>
Inlet/Outlet connections	G 1/2 (BSP) F

FACTOR OF CORRECTION					
Pressure (bar)	7.5	8	8.5	9	9.5
Pressure (psi)	109	116	123	130	138
Factor of correction	1.14	1.21	1.29	1.36	1.43



# CRYOGEN Liquid Nitrogen Generator

## Description

The CRYOGEN is a range of stand-alone Liquid Nitrogen Generators.

Utilising a reliable 'Cryo-refrigerator' design of cold head technology and helium compressor, the nitrogen gas is then produced using the PSA technology which is cooled to 77K (-196°C) to produce liquid nitrogen.

The Generators are controlled using the latest in HMI touch screen technology to display the process in real-time, showing the liquid level of the dewar, PSA nitrogen production giving a fully automated system at the touch of a button with remote access for diagnostic control.



UNIQUE AND INTELLIGENT OPERATOR INTERFACE WITH REMOTE ACCESS

MODELS	CRYOGEN.10	CRYOGEN.20	CRYOGEN.30	CRYOGEN.40	CRYOGEN.60
<b>GENERALS INFORMATIONS</b>					
Max L/Day	10	20	30	40	60
Max L/Hour	0.42	0.83	1.25	1.70	2.50
Dewar Capacity (L)	35	100		160	210
N2 Gas (L/min)	5.5	11	13	20	33
Cooling Water (L/min @ 27°C)	2.8	4.5	6.0	6.0	7.6
Temperature range	7 - 38°C (45 - 100°F)				
Dimensions (W x H x D)	120 x 180 x 60 cm (47" x 71" x 24")				
Weight (kg/lbs)	150 / 330	200 / 441	300 / 661	320 / 705	350 / 771
Electrical supply	220 - 240 V ac / 1 ph / 50 - 60 Hz 110 - 120 V ac / 1 ph / 50 - 60 Hz				
Power consumption (Kw)	2.2	3.4		5.5	7.5
<b>CONNECTIONS</b>					
Inlet/outlet	G 3/8				
<b>COMMUNICATION</b>					
USB/PC Control	In series				