

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курган (3522)50-90-47
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Ноябрьск (3496)41-32-12

Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саранск (8342)22-96-24
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35

Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Улан-Удэ (3012)59-97-51
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

<https://gea.nt-rt.ru/> || gsg@nt-rt.ru

СУШИЛКИ И УСТАНОВКИ ДЛЯ ОБРАБОТКИ ЧАСТИЦ SMART LYO

Технические характеристики



High quality, affordable freeze dryers

GEA—a world leader in freeze drying—offers SMART LYO™, a range of high quality, technologically advanced and competitively priced pharmaceutical freeze dryers.

Standardised and

Customised Based on proven, standardised modules, SMART LYO™ pharmaceutical freeze dryers are designed according to the specific size and technology requirements of each customer. As a result, SMART LYO™ products are not only cost-effective, they also facilitate planning, validation and documentation, and significantly reduce delivery times. There's no need to compromise with SMART LYO™: every customer gets the plant they need, customised to suit their existing facility and production requirements, exactly when they need it.

Made in China, Designed in Germany

German engineering and project management, combined with GEA-controlled supply chains, make the SMART LYO™ freeze dryer a top quality product (the Quality Management System has been ISO 9001-certified since 1997). GEA's committed team of engineers and specialists all work to ensure that the freeze dryers are of a consistently high standard. It is this dedication and attention to detail that results in reliable, trouble-free pharmaceutical production and entire lifecycle economy.



SMART LYO™ SL 20



Integration of two
SMART LYO™
SL 200-D Freeze
Dryers with ALUS™

Smart features

Affordable

Standardised modules are more cost-efficient to produce and more reliable than bespoke systems, resulting in lower purchase and maintenance costs for the customer. Using prefabricated units also reduces delivery and validation times, providing a clear commercial advantage by significantly reducing time-to-market.

Reliable

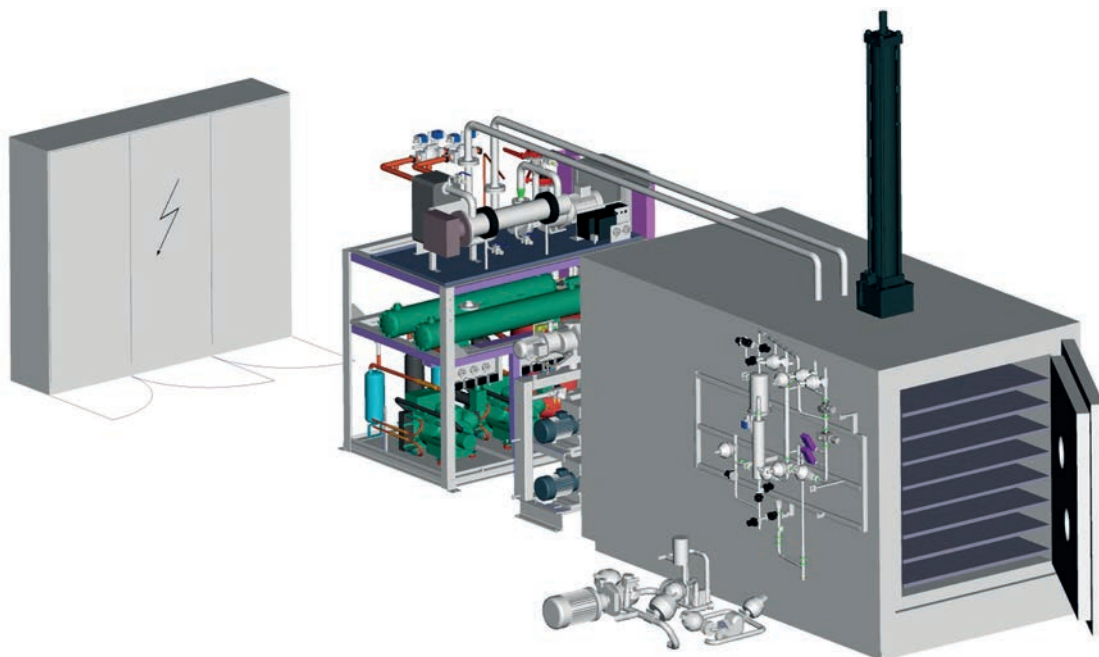
Building on GEA's reputation as a reliable supplier of equipment designed to minimise product loss for more than 50 years, SMART LYO™ freeze dryers are no exception. Extensively tested and engineered with proven process technology and the expertise of the GEA team, each plant offers trouble-free operation, smooth production and minimum downtime. And, should a problem occur, the Global Service Network is ever ready to spring into action and dispatch spare parts or a service engineer to your door.

Technology

SMART LYO™ freeze dryers can be supplied with filling systems, isolators and inspection services to provide a fully integrated production facility, sourced from a single supplier. Each component meets the highest possible technical requirements and the strict standards of the global licensing authorities, as well as complying with all current good manufacturing practices (cGMPs).



SMART LYO™ SL 150-D



the smart choice ...

SMART LYO™ freeze dryers are available in shelf sizes of 0.57–40 m² with a condenser capacity of up to 800 kg.

Features

- the entire system is constructed on a single-floor plant frame for fast, simple commissioning; the system includes a compact chamber/condenser unit, all system modules (hydraulics, venting system, vacuum) and options such as CIP/SIP
- the refrigeration unit can be installed remotely from the plant frame, on a different floor if necessary, enabling the installation to be adapted to fit the customer's infrastructure
- the electrical cabinet can be positioned in the freeze dryer plant or centrally in a control room
- frame mounting allows SMART LYO™ freeze dryers to be installed in the existing building architecture (the machinery room and the sterile area); installation and assembly is, therefore, very simple, only requiring the plant to be connected to the unit frame and the switch cabinet
- the GEA Global Service Network provides rapid worldwide access to original spare parts and a comprehensive repair service that minimises downtime and keeps costs under control.



SMART LYO™ SL 150-D



SMART LYO™ SL 200-D with ALUS™

Also available are

- comprehensive documentation that explains both the operation and maintenance of the freeze dryer
- a CIP system to clean the chamber and condenser
- a SIP system to steam sterilise the plant, including all the necessary re-cooling of the freeze drying chamber, including the door (constructed as a jacket for effective and rapid re-cooling of the plant following steam sterilisation)
- factory acceptance tests to demonstrate installation conformance and key performance specifications
- a standardised IQ/OQ package that allows rapid validation.

Smart options: Model SL 10 to SL 80

Features

Model	SL 10 - 80 No SIP	SL 10-D - 80D SIP
Chamber	•	•
Rectangular Chamber	•	•
Pressureless Material	•	≠
316 L	•	•
Ports 3d	•	•
Door	•	•
Full Size Door	•	•
Automatic Locking	≠	•
Condenser Rectangular Single Skid	•	•
Rear	•	•
CIP	o	•
CIP Chamber + Condenser	o	•
SIP	≠	•
PED	≠	•
ASME	≠	o
GB-150	≠	o
Chamber Re-cooling after SIP	≠	•
Hydraulic	•	•
Lift/Lower + Stoppering	•	•
Shelf Package	•	•
Bellow	•	•
Refrigeration	•	•
Piston Compressors	•	•
Vacuum	•	•
Oil Sealed Vacuum Pump	•	•

Model	SL 10 - 80 No SIP	SL 10-D - 80D SIP
Pressure Regulation	•	•
On/Off	•	•
Flow Controller	o	o
Process Sensors	•	•
Pirani	•	•
MKS	o	o
Venting System + Filter	•	•
Sterilisable	≠	•
Ports for I-Test Second	≠	•
Venting Media	o	o
Control System and Documentation	•	•
VIPA (Siemens Compatible)	•	•
Siemens	o	o
SCADA WinCC	•	•
Recorder	o	o
GAMP	o	o
Audit Trail	•	•
21 CFR Part 11	•	•
FAT/SAT	•	•
IQ/OQ Documents and Tests	o	o
Material Certificates Welding	o	o
Documentation	o	o
Technology	•	•
LYOPLUS™	o	o
ControlLy™	o	o

• included o option ≠ not available

Smart types and sizes: Model SL 10 to SL 80

Types and sizes

Model	Units	SL 10	SL 20	SL 40	SL 60	SL 80
Shelves						
Shelf Area	m ²	0.6/0.7	1.1/1.4	1.9/2.2	2.8/3.3	4,2 / 5
No. of Vials (Ø 16 mm)	Quantity	3080	6020	9678	14628	22038
No. of Vials (Ø 22 mm)	Quantity	1600	3100	5022	7614	11562
No. of Vials (Ø 30 mm)	Quantity	800	1670	2694	4098	6198
No. of Shelves	Quantity	4/5 + 1	4/5 + 1	5/6 + 1	5/6 + 1	5/6 + 1
Shelf Size	mm	460 x 310	460 x 610	610 x 610	610 x 914	914 x 914
Clearance	mm	120/90	120/90	120/100	120/100	130/110
Shelf Temperature	°C	-55 ... +70	-55 ... +70	-55 ... +70	-55 ... +70	-55 ... +70
Condenser						
Condenser Capacity	kg/24h	10	20	40	60	80
Condenser Temperature	°C	-75	-75	-75	-75	-75
Unit Dimensions						
Length (B)	mm	2600	2800	3500	4000	4200
Width (A)	mm	1400	1400	2100	2300	2300
Height	mm	2400	2400	2400	2400	2400
Weights						
Unit	t	2	3.5	4.5	6	7.5

Technical information

Model	Units	SL 10	SL 20	SL 40	SL 60	SL 80
Utilities						
Pure Steam	barg	1.5	1.5	1.5	1.5	1.5
	°C	126	126	126	126	126
CIP Water	barg	3–4	3–4	3–4	3–4	3–4
	°C	80	80	80	80	80
Cooling Water Electrical	m ³	1.5	2	2.5	3	3.5
	°C	<25	<25	<25	<25	<25
	m ³ /h (peak)	2.4	5.5	6.5	10.6	10.6
Power Supply	kW	10	25	50	60	65

Smart options:

Model SL 100 to SL 800

Features

Model	SL 100 - 800 No SIP	SL 100-D - 800D SIP	Model	SL 100 - 800 No SIP	SL 100-D - 800D SIP
Chamber	•	•	Vacuum	•	•
Rectangular Chamber	•	•	Oil Sealed Vacuum Pumps + Blower Redundancy (Second Pump Set) •	•	•
Pressureless Material	•	≠	Dry Pumps + Blower	o	o
316 L	•	•	Pressure Regulation	•	•
Ports 3d	•	•	On/Off	•	•
Door	•	•	Flow Controller	•	•
Full Size Door	•	•	Process Sensors	•	•
Automatic Locking	•	•	Pirani	•	•
Pizza Door (Constant Loading Level)	o	o	MKS	o	o
Door in Door	o	o	Venting System + Filter	•	•
Condenser Rectangular	•	•	Sterilisable	≠	•
Rear	•	•	Ports for I-Test Second	≠	•
Side	o	o	Venting Media Second	•	•
Bellow	•	•	Venting Filter Automatic	≠	o
CIP	o	•	WIT Test	≠	o
CIP Chamber + Condenser	o	•	Control System and Documentation	•	•
Recirculation	o	o	VIPA (Siemens Compatible)	•	•
Second Cleaning Media	o	o	Siemens	o	o
SIP	•	•	SCADA WinCC	•	•
PED	≠	•	Recorder	o	o
ASME	≠	o	GAMP	o	o
GB-150	≠	•	Audit Trail	•	•
Chamber Recooling after SIP	≠	•	21 CFR Part 11	•	•
Hydraulic	•	•	FAT/SAT	•	•
Lift/Lower + Stoppering	•	•	IQ/OQ Documents and Tests	o	o
Shelf Package	•	•	Material Certificates Welding	o	o
Without Rails	•	≠	Documentation	o	o
With Rails and Fully Collapsible	o	o	Technology	•	•
Bellow	•	•	ALUS™	o	o
Interface for ALUS™	o	o	LYOPLUS™	o	o
Refrigeration	•	•	ControlLy™	o	o
Piston Compressors	•	•			
Screw Compressors	o	o			

• included o option ≠ not available

Smart types and sizes:

Model SL 100 to SL 800

Types and sizes

sizes		Units	SL 100	SL 200	SL 300	SL 400	SL 600	SL 800
Shelves								
Model								
Shelf Area	m²	6.7	10	14.9	20.4	30.2	41.2	
No. of Vials (Ø 16mm)	Quantity	29496	44244	65690	90530	133913	182865	
No. of Vials (Ø 22mm)	Quantity	15498	23247	34340	47360	70356	96585	
No. of Vials (Ø 30mm)	Quantity	8142	12213	18400	25520	37700	51750	
No. of Shelves	Quantity	6 + 1	9 + 1	10 + 1	11 + 1	13 + 1	15 + 1	
Shelf Size	mm	914 x 1219	914 x 1219	1219 x 1219	1219 x 1524	1524 x 1524	1524 x 1803	
Clearance	mm	120	120	120	120	120	120	
Shelf Temperature	°C	-55 ... +70	-55 ... +70	-55 ... +70	-55 ... +70	-55 ... +70	-55 ... +70	
Condenser								
Condenser Capacity	kg/24h	100	200	300	400	600	800	
Condenser Temperature	°C	-75	-75	-75	-75	-75	-75	
Unit Dimensions								
Length (B)	mm	5000	5600	6000	6500	Depending on Layout		
Width (A)	mm	3000	3000	3400	3400			
Height	mm	3500	4000	4200	4300			
Weights								
Unit	t	7.5	9	12.5	15	17.5	19	

Technical information

Model	Units	SL 100	SL 200	SL 300	SL 400	SL 600	SL 800
Utilities							
Pure Steam	barg	1.5	1.5	1.5	1.5	1.5	1.5
	°C	126	126	126	126	126	126
CIP Water	barg	3–4	3–4	3–4	3–4	3–4	3–4
	°C	80	80	80	80	80	80
Cooling Water Electrical	m ³	4	4.5	5.5	6	6.5	7
	°C	<25	<25	<25	<25	<25	<25
	m ³ /h (peak)	10.6	16	20	30	40	40
Power Supply	kW	80	120	140	200	250	280

Technical Data

General Technical Data for All Models

System Requirement	Data
Chamber	
Surface Finish	Ra ≤0.8µm
System Leak Rate (Applicable to the Total Freeze Condenser, Piping etc.)	≤0.008 mbar*l*s-1
Shelves	
Flatness in the Usable Area	≤1 mm/m
Surface Finish on Top Side	Ra ≤0.8µm
Surface Finish on Bottom Side	Ra ≤0.8µm / Ra = 1.0 to
Shelf Cooling Rate from +20 to -40 °C	1.6µm 60 minutes (no load)
Shelf Heating Rate	>1.5 K per minute (no load)
Temperature Range	<-95 °C to +123 °C
Regulating Temperature Range During Drying	-50 °C to +60 °C
Condenser	
Nominal Ice Capacity	> xyz kg in 24 hours at 0.4 mbar drying
Inner Surface Finish of the Condenser	pressure Ra ≤0.8µm
Surface Finish of the Condenser Coils	cold drawn
Final Temperature (Measured at the Pipe Surface)	≤-75 °C
Cooling Time from +20 to -40 °C	≤40 minutes (no load)
Defrosting of Ice	40-60 minutes at maximum ice capacity
Ratio Evaporator Area/Shelf Area	≥0.8
Vacuum	
Final Vacuum of the Vacuum Pump Set	<0.005 mbar
Final Vacuum of the Freeze Dryer Pump	<0.01 mbar (cold condenser)
Time from 1000 to 0.1 mbar	≤30 minutes (cold condenser)
Sterile Piping and Valves	
Surface Finish	Ra ≤0.5µm



По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курган (3522)50-90-47
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Ноябрьск (3496)41-32-12

Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саранск (8342)22-96-24
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35

Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Улан-Удэ (3012)59-97-51
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

<https://gea.nt-rt.ru/> || gsg@nt-rt.ru