

# INSULATING OIL CONDITIONING & REGENERATION SYSTEM

**CUSTOMIZABLE  
STATIONARY &  
MOBILE OPTIONS**



- ***Mineral Insulating Oils***
- ***Synthetic Ester Fluids***
- ***Natural Ester Fluids***
- ***Silicone Fluids***

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**Oil Conditioning**

**Optional Oil Regeneration**

**Transformer Dry-Out**

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# // INTRODUCTION

The SESCO SES320 series of insulating oil conditioning and regeneration systems have been manufactured for more than 30 years and can be found in the power generation, transmission, distribution and transformer manufacturing industries world-wide.

The SES320 family of oil purifiers are used to condition new and recondition in service insulating fluids for use in high voltage electrical equipment. The SES320R incorporates an optional adsorbent treatment stage to add oil regeneration capability.

All SES320 models are designed to “single pass” oil processing performance standards to accommodate transformer maintenance and commissioning requirements.

The SES321-600 and SES321-900 are compact, versatile, easy to tow, trailer mounted pre-configured systems with relatively few options.

The SES320-900 through SES320-3000, are fully configurable, and available in stationary skid as well as numerous mobile versions.



# // CAPABILITIES

• Prepare new and Group 2 in service dielectric fluids for transformer service	✓
• Reclaim badly degraded Group 3 in service mineral dielectric fluids for transformer service	✓ Requires optional adsorbent treatment stage.
• Remove moisture from transformer insulation via multi-pass oil circulation	✓
• Remove sludge from a transformer via multi-pass hot oil circulation	✓ Requires optional adsorbent treatment stage.
• Circulating oil within an energized transformer *	✓
• Drain transformer for maintenance	✓ Optional dry breathing air systems are available for dry air back fill.
• Heat transformer core for vacuum dry-out via multi-pass hot oil spray while under vacuum	✓ Requires optional inlet oil booster pump. Optional spray connection manifold recommended.
• Evacuate transformer for vacuum dry-out	✓
• Measure rate of water extraction during vacuum dry-out	✓ Requires optional vacuum line cold trap.
• Fill transformer while holding under vacuum **	✓

\*Safe energized transformer processing is procedure dependent and requires an experienced transformer service technician.

\*\* A redundant vacuum pump configuration is required to achieve for holding pressures < 0.5 torr while filling.

# TREATMENT STAGES

01	02	03	04	05	06
<b>Oil Heating</b> The fluid is gently heated to reduce the viscosity in preparation for the vacuum dehydration and optional adsorbent treatment stages.	<b>Polar Contaminant Adsorption (optional)</b> The heated fluid then passes through an optional (bypass included) adsorbent media process that removes acids, color bodies and other polar contaminants.	<b>Filtration (3µ β200)</b> The next treatment phase uses long life, low pressure drop, pleated synthetic filter media to remove 99.9% of all particulate > than 3 microns.	<b>Vacuum Dehydration &amp; Degasification</b> Vacuum and high efficiency thin film low temperature evaporation is used to remove dissolved water and dissolved gases.	<b>Filtration (0.5µ β75)</b> A polishing filter completes the process. Pleated synthetic filter media is used to remove 98.7% of all particulate > than 0.5 microns.	<b>Ready for Use</b> The conditioned oil is now ready for use. Discharge flow rate and pressure are adjustable to accommodate the application requirements.

# // PROCESSING PERFORMANCE & SPECIFICATIONS



Custom SES320-1800  
Conditioning System

<b>Design Flow Rate</b>	30 GPM   6813 LPH
<b>Max Flow Rate</b>	<b>33 GPM   7500 LPH</b>
<b>Vacuum Capacity @ 1 Torr</b>	1150 - 1750 CFM
<b>Processing Vacuum Range</b>	2.0 - 0.2 Torr
<b>Electric Heating Capacity</b>	128-208 kW
<b>Electric Heat Watt Density</b>	11.5 W/in <sup>2</sup>
<b>Fuel Oil Burner Heating</b>	230kW & 350kW
<b>Processing Temperature</b>	Adjustable 40-87 C°
<b>Filtration Stages</b>	2
<b>Filtration Efficiency</b>	$\beta_x \geq 1000 @ 3 \mu$ $\beta_x \geq 200 @ 0.5 \mu$
<b>Inlet Pressure</b>	7 - 25 psia
<b>Outlet Pressure</b>	75 lbf/in <sup>2</sup>
<b>Seal Material</b>	Fluorocarbon
<b>Standard Control System</b>	HMI w/ Automatic System Protection
<b>Electrical Classification</b>	NEMA, IEC
<b>Power Supply</b>	575V / 3 $\phi$ / 60Hz 480V / 3 $\phi$ / 60Hz 240V / 3 $\phi$ / 60Hz 380V / 3 $\phi$ / 50Hz
<b>Power Consumption</b>	60 - 240 kW

## MINERAL OIL

<b>Dielectric Strength</b> (ASTM-D1816-84A) (2 mm gap)	> 65 kV
<b>Moisture Content</b> Single pass (ASTM-D1533-88)	100 ppm reduced to < 10 ppm 50 ppm reduced to < 5 ppm
<b>Moisture Content</b> 3 Passes (ASTM-D1533-88)	100 ppm reduced to < 2 ppm
<b>Total Gas Content</b> Single Pass (ASTM-D2945)	Saturation reduced to < 0.25%
<b>Total Gas Content</b> 3 Passes (ASTM-D2945)	Saturation reduced to < 0.15%
<b>Particulate Content</b>	99.9% > 1 $\mu$ 97.8% > 1/2 $\mu$
<b>Processing Temperature</b> (Adjustable)	Min 120 F°   49 C° Max Limit 190 F°   88 C°
<b>Processing Vacuum Level</b>	1.5 - 0.3 Torr

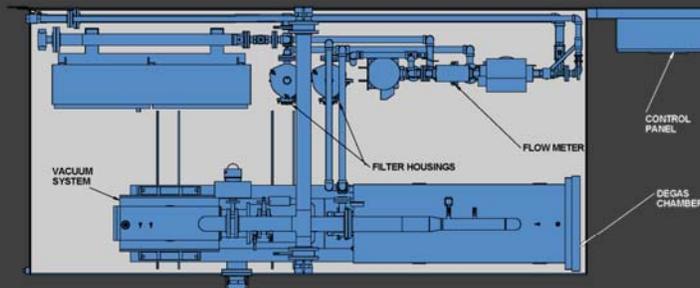
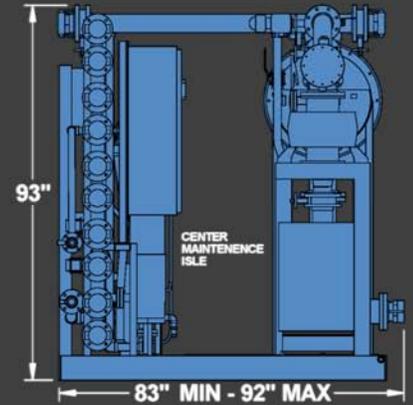
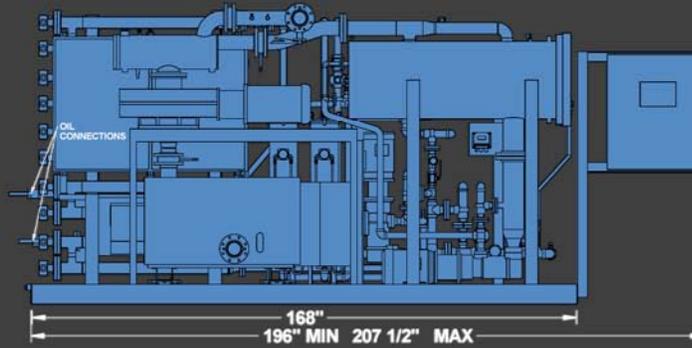
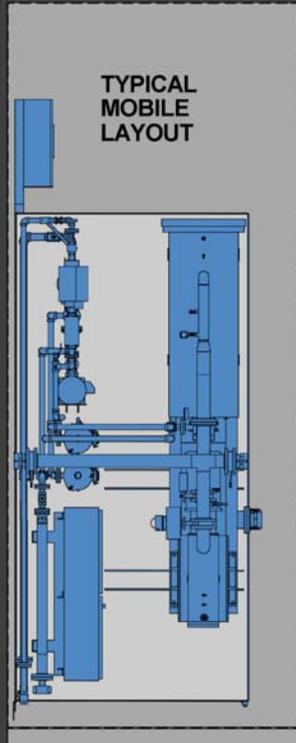
## SYNTHETIC ESTER FLUIDS

<b>Processing Rate</b>	Derate processing rate by 25% (Multiple Passes Recommended)
<b>Dielectric Strength</b> (ASTM-D1816-84A) (2 mm gap)	> 60 kV
<b>Moisture Content</b> Single pass (ASTM-D1533-88)	200 ppm reduced to < 100 ppm
<b>Moisture Content</b> 3 Passes (ASTM-D1533-88)	200 ppm reduced to < 60 ppm
<b>Total Gas Content</b> Single Pass (ASTM-D2945)	Saturation reduced to < 0.25%
<b>Total Gas Content</b> 3 Passes (ASTM-D2945)	Saturation reduced to < 0.15%
<b>Particulate Content</b>	99.8% > 1 $\mu$
<b>Processing Temperature</b> (Adjustable)	Min 170 F°   76 C° Max Limit 190 F°   88 C°
<b>Processing Vacuum Level</b>	1.5 - 0.2 Torr

## NATURAL ESTER FLUIDS

<b>Processing Rate</b>	Derate processing rate by 25% (Multiple Passes Recommended)
<b>Dielectric Strength</b> (ASTM-D1816-84A) (2 mm gap)	> 60 kV
<b>Moisture Content</b> Single pass (ASTM-D1533-88)	100 ppm reduced to < 40 ppm
<b>Moisture Content</b> 3 Passes (ASTM-D1533-88)	200 ppm reduced to < 30 ppm
<b>Total Gas Content</b> Single Pass (ASTM-D2945)	Saturation reduced to < 0.25%
<b>Total Gas Content</b> 3 Passes (ASTM-D2945)	Saturation reduced to < 0.15%
<b>Particulate Content</b>	99.8% > 1 $\mu$
<b>Processing Temperature</b> (Adjustable)	Min 170 F°   76 C° Max Limit 190 F°   88 C°
<b>Processing Vacuum Level</b>	1.5 - 0.2 Torr

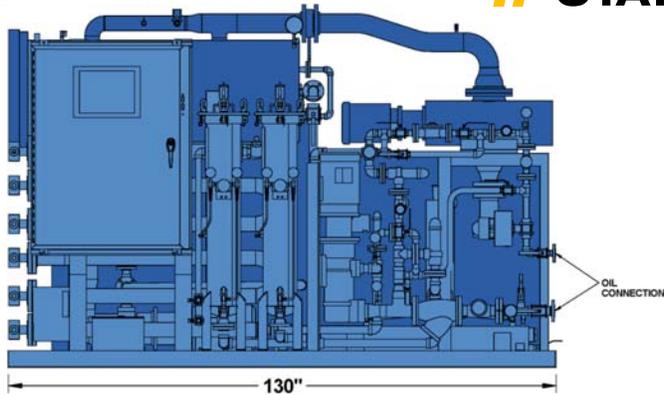
# // MOBILE APPLICATION



<b>Inlet Connection</b>	2.0" NPT
<b>Outlet Connection</b>	1.5" NPT
<b>External Vacuum Connection</b>	4" ANSI FLG
<b>Length</b>	196 - 207.5 in
<b>Width</b>	83 - 92 in
<b>Height</b>	93 in
<b>Weight</b>	7250 lb

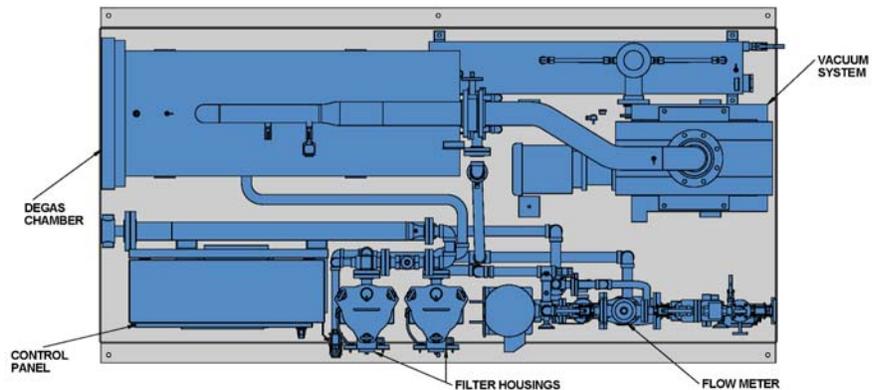
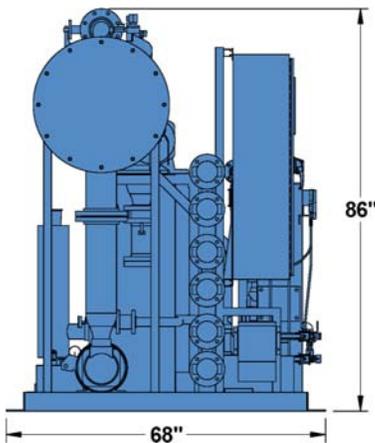
\* Dimensions and weight will vary with options

# // STATIONARY APPLICATION



<b>Inlet Connection</b>	2.0 NPT
<b>Outlet Connection</b>	1.5 NPT
<b>External Vacuum Connection</b>	4 ANSI FLG
<b>Length</b>	130 in
<b>Width</b>	68 in
<b>Height</b>	86 in
<b>Minimum Weight</b>	6990 lb

\* Dimensions and weight will vary with options



# // STANDARD FEATURES

- **Completely Customizable**
- **Numerous Mobile Options**
- **Variable Speed Flow Rate**
- **Automatic Temperature & Chamber Level Control**
- **Two Stage Vacuum System**
- **Vane, Piston, & Dry Screw Backing Pump Options**
- **Low Maintenance Vacuum Booster Pump**
- **Multi-Stage Degasification System**
- **Automatic Foam Control System**
- **Positive Displacement Low Speed Inlet & Discharge Oil Pumps**
- **Low Watt Density Oil Heating System**
- **7 Inch ASME Code Filter Housings (outer diameter)**
- **Discharge Flow & Totaling Rate Meters**
- **System Full Scale Vacuum Gauge**
- **Color Touchscreen Control System with Data Logging**
- **Optional Switch and Pilot Light Control System**





**SES320-1800 PART NUMBER MATRIX**

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
<b>SES320-1800</b>																																		
1	Oil Regeneration Capacity	None - Oil conditioning only Provisions for External (FE) treatment stage is provided Adsorbent (FE) treatment stage provided for oil regeneration	C P R																															
2	Purifier Mounting	Stationary - Open skid Stationary - Enclosed skid Mobile - Center isle skid (See SES951-954 mobile options) Mobile - Center isle skid w/ hose storage (See SES953 & 954 options)	S E M H																															
3	Power Supply	240V/3PH/60HZ 380-415V/3PH/50HZ 460V/3PH/60HZ 575V/3PH/60HZ	A B C D																															
4	Inlet Heating System	128KW, (70°F   38°C) 144KW, (90°F   50°C) 160KW, (98°F   55°C) 176KW, (107°F   60°C) 192KW, (116°F   65°C) 195KW, Indirect Fuel Oil (118°F   67°C) 230KW, Indirect Fuel Oil (116°F   65°C)		128																														
5	Discharge Heating System	None 32KW, (15°F   8°C) 48KW, (23°F   13°C) 64KW, (34°F   19°C) 48KW, Fuel Oil Dual Zone (23°F   13°C)			X																													
6	Vacuum System Configuration	One vacuum pump with one vacuum booster Dual vacuum pumps with one vacuum booster. (optional for transformer service) Dual vacuum pumps with dual vacuum boosters. (optional for transformer service)	A B C																															
7	Vacuum System Type & Capacity	1150 CFM, Vane (170) CFM - 1450 CFM booster - 8 torr cut-in 1150 CFM, Piston (180) CFM - 1450 CFM booster - 8 torr cut-in 1250 CFM, Vane (288) CFM - 1450 CFM booster - 20 torr cut-in 1250 CFM, Dry Screw Pump (340) CFM - 1450 CFM booster - 30 torr cut-in 1650 CFM, Vane (288) CFM - 1950 CFM booster - 10 torr cut-in 1750 CFM, Vane (444) CFM - 1950 CFM booster - 15 torr cut-in 1750 CFM, Piston (340) CFM - 1950 CFM booster - 20 torr cut-in 1750 CFM, Dry Screw Pump (340) CFM - 1950 CFM booster - 20 torr cut-in				7	1	2	3	8	4	5	6																					
8	Vacuum Booster Control	Cut In @ safe pressure VFD for atmospheric start. (Recommend for transformer evacuation)	C V																															
9	External Vacuum Connection	None (Oil processing only) Single (Transformer service) Dual (Transformer service -Mobile applications- both sides of trailer)						X	1	2																								
10	Automatic Valve Control (Pneumatic spring return)	None External Vacuum Only (Automatic close to preserve transformer vacuum) HMI Valve Control Package (HMI Oil & vacuum valve configuration)								X	E	A																						
<b>Regeneration Treatment Phase (Required for regeneration only)</b>																																		
11	Earth System Housings	None Single Dual								X	S	D																						
12	Earth Housing Capacity	None 500 # 800#									X	5	8																					
13	Inhibitor Injection & Sampling System	None Oxidation inhibitor mixing injection & sampling system Sample sink only										X	I	S																				
<b>Control System &amp; Instrumentation</b>																																		
14	Control System Adders	Standard HMI Control Interface (NEMA 4 touch screen operator interface) Add remote monitoring to standard control interface Add redundant HMI to standard control Interface Add remote monitoring & redundant HMI to standard control Interface Adder for Switch and Pilot Light Control Interface													H	R	Z	Y	S															
15	Moisture (ppm) & Temperature Monitors	None Inlet Outlet Inlet & Outlet													X	1	2	3																
16	External Vac Line Dew Point & Temperature Monitor	None Provided w/ local & HMI display													X	D																		
17	Contamination Monitor (ISO Classification)	None Provided w/ local & HMI display														X	C																	
18	Total Dissolved Gas Monitor (%)	None Provided w/ HMI display only															X	G																
19	Chamber Level Transmitter	None Provided w/ HMI display																X	L															
20	Dirty Filter Alarms	None Provided w/ HMI display																	X	F														
21	Additional Vacuum Gauges	None Dual Gauges - System & external connection Dual Gauges- Common system & remote transformer Three Gauges Degas chamber, external connection & remote transformer																			X	2	3	4										
<b>Hose Reels &amp; Loose Storage</b>																																		
22	Oil Hose Reels (2) (Includes Hose & bypass) (Isolation Valves 7 cams)	None Live reel w/ electric rewind Live reel w/ manual rewind Storage reel only																						X	E	M	S							
23	Reel Capacity	None 50FT 75FT 100FT (May not be available on all mounting options)																							X	5	7	1						
24	Suction & Discharge Hose (20FT Sections)	None 120FT 160FT 200FT																								X	1	2	3					
25	Vacuum Hose (4") (20 ft FT Sections)	None 60FT 80FT 100FT																								X	1	2	3					
<b>Integrated Oil Storage (Mobile Applications Only)</b>																																		
26	Oil Storage Capacity	None 125 Gallons 225 Gallons																									X	1	2					
27	Oil Storage Processing Control	None Manual valve processor integration Automatic actuated valve integration and reservoir processing mode logic																													X	M	A	
28	HMI Reservoir Level Display	None Provide reservoir level transmitter w/ HMI display																												X	L			
<b>Misc.</b>																																		
29	Skid Lifting Provisions	None Fork lift pockets Crane lifting provisions Crane & fork lift lifting provisions																													X	P	C	B
30	Spare Parts Kit	None Include																																

# // CUSTOMIZABLE MOBILE APPLICATIONS



- SESCO offers a wide variety of mounting options to address specific operational requirements and/or restrictions.
- All mobile packages can be upgraded with oil processor accessories to extend or enhance the package transformer service capabilities.
- Each mobile application can be upgraded with options designed for increased practicality and comfort in order to further accommodate your needs.

## ISO CONTAINER



SES953

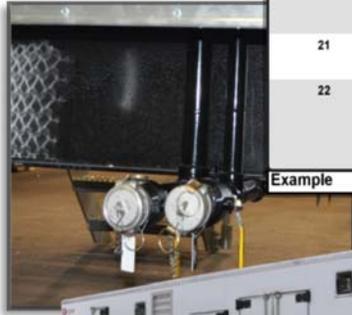
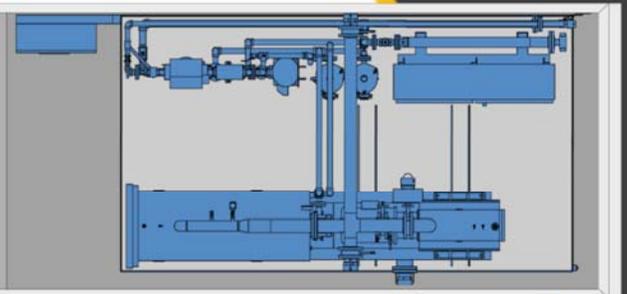
SES953 - ISO Container Mounting Matrix		1	2	3	4	5	6	7	8	9	10	11		
		SES953 -												
1	Container Type	None	1											
		20' ISO Standard	2											
		40' ISO Standard High Cube	3											
		Custom Length High Cube (ft)	#											
2	Chassis	None		X										
		Standard Spring Suspension		S										
		Air Ride Suspension		A										
3	Condition	New			N									
		Used Once			U									
		Used - Restored			R									
4	Oil Connections	None				X								
		Single Rear				R								
		Dual Rear				2								
5	Vacuum Connections	None					X							
		Single Rear					R							
		Single Side					1							
		Dual Driverside & Curbside					D							
6	Ventilation	None						X						
		Factory Installed						V						
		Kit for Customer Installation						K						
7	Lighting Package	None							X					
		Interior							I					
		Interior & Exterior							E					
		Interior Kit for Customer Installation							K					
		Interior & Exterior Kit for Customer Installation							C					
8	120V Package	None								X				
		Interior								I				
		Interior & Exterior								E				
		100A Load Center Only								L				
9	HVAC	None									X			
		Forced Air Heater									H			
10	Vacuum Hose Storage	None										X		
		Vertical Wall Mounted Storage Tube Assembly										V		
		Ceiling Mounted Storage Tube Assembly										C		
11	Loose Oil Hose Storage	None										X		
		Interior Wall Hangers										W		
		Vertical Wall Mounted Storage Tube Assembly										V		
Example			SES953 -	1	S	U	2	R	V	E	E	H	V	X



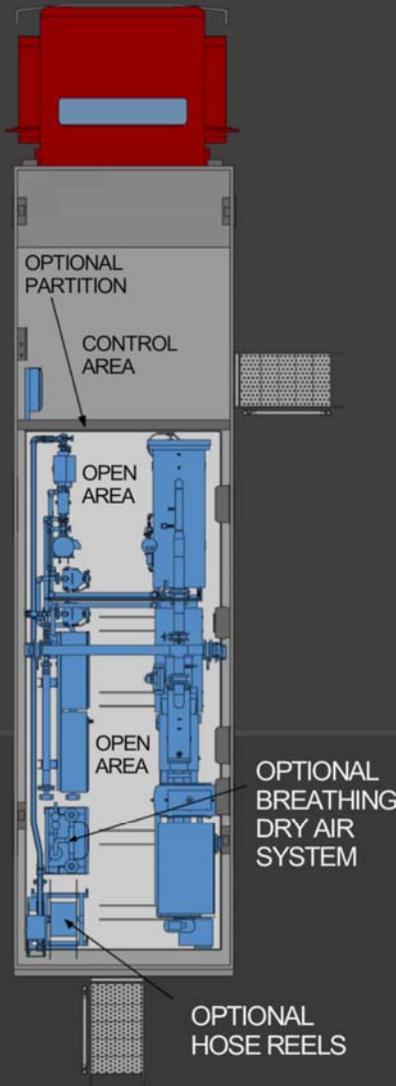
20' Container Option

# // DECK OVER CARGO TRAILER

SESS951 - DECK OVER CARGO TRAILER MOUNTING MATRIX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
SESS951-																							
1	Hitch Type	Rear Ball Hitch	1																				
		Rear Pintal Ring Hitch	2																				
		Gooseneck Ball Hitch	3																				
		Gooseneck Fifth Wheel Hitch	4																				
4	Wall Lining	None		X																			
		½" White Plywood or FRP	L																				
5	Mounted Spare Tire	None			X																		
		Tongue Mounted Spare Tire	T																				
6	Oil Connections	None				X																	
		Single Rear				1																	
		Dual Rear				2																	
		Dual Exterior Belly Mounted				3																	
7	Vacuum Connections	None					X																
		Single Rear					R																
		Single Side Wall				1																	
		Dual Driverside & Curbside Side Wall				D																	
8	Side Man Door	None						X															
		Trailer Grade FRP w/ Cam Lock						P															
		SS Commercial Grade with SS Lockset						S															
9	Side Access Doors	None							X														
		Gooseneck Area Access Doors							G														
10	Control Area Length	Minimum Amount Required									M												
		Custom Length (36" Min - 76" Max)										#											
11	Control Area Partition	None									X												
		Solid Framed Wall with Man Door										S											
		Clear Hinged Sliding Partition										T											
12	DO Trailer Entry Stairs	None									X												
		Rear										R											
		Side											S										
		Rear & Side												B									
13	Entry Stair Railings	None									X												
		Single										S											
		Dual											D										
15	Interior Lighting Package	None												X									
		Equipment & Control Area													A								
		Equipment, Control, & Gooseneck Area													B								
16	Exterior Lighting Package	None													X								
		Curbside & Driverside Flush Mount Flood Lights (2)														2							
		Curbside & Driverside Flush Mount Flood Lights (4)														4							
17	Interior 120V/1 Package	None														X							
		Equipment & Control Area															A						
		Equipment, Control, & Gooseneck Area																B					
18	Exterior 120V/1 Package	None															X						
		Curbside & Driverside Receptacles (2)																2					
19	HVAC	None																		X			
		Forced Air Heater																			H		
		Nose Wall Mount Air Conditioner																				A	
20	Vacuum Hose Storage	None																			X		
		Vertical Wall Mounted Storage Tube Assembly																				V	
		Trailer Frame Integrated Storage Tube Assembly																					T
21	Loose Oil Hose Storage	None																				X	
		Interior Wall Hangers																					W
22	AL Belly Storage Box (18" W x 14" H x 48" L)	None																				X	
		Curbside																				C	
		Roadside																					R
		Both																					B
Example			SESS951-	1	L	T	2	R	S	X	76	T	B	S	A	2	A	2	B	T	X	C	


**SES951**

**(34" deck height, no wheel wells, 96" - 102" width)**

# Box Truck



SES952 - BOX TRUCK MOUNTING MATRIX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SES952-																							
1	Chassis Mfg	International	I																				
		Freightliner	F																				
2	Generator(s)	None		X																			
	(See Generator PN Matrix)	Secondary Only		G																			
3	Isolated Control & Lab Area	Do not isolate the control area			X																		
		Use a clear sliding partition to isolate the control area and allow degas chamber observation. Provide a curbside control area entry door			T																		
		Use a solid partition with a hinged entry door with window to isolate the control area. Provided a curbside control area entry door			S																		
4	Attic Storage Area	None			N																		
		36" deep attic storage area			A																		
5	Oil Connections	Dual Rear				1																	
		Dual Exterior Belly Mounted (both sides)				2																	
6	Vacuum Connections	None					0																
		Single interior rear					1																
		Dual interior upper side wall					2																
		Dual exterior belly mounted (both sides)					3																
7	Side Man Door	304 SS exterior door & frame w/ observation window & SS lockset			S																		
		FRP door w/ exterior cam lock & interior latch & observation window			F																		
8	Control Area Side	None					0																
		Aluminum stairs with single removable railing					1																
		Aluminum stairs with dual removable railings					2																
9	Rear Entry Stairs	None						X															
		Aluminum stairs per control area railing arrangement on rear						R															
10	Belly Stair Storage	None								X													
		Provide lockable aluminum belly mounted dual stairs storage assembly								S													
11	Side Windows	None									X												
		Control room roadside observation window									W												
12	Interior Lighting Package	None										X											
		Area LED ceiling mounted lighting with individual load center control										F											
		Area LED ceiling mounted lighting with wall switch control											W										
13	Exterior Lighting Package	None											X										
		Curbside & Driver side Flush Mount LED Flood Lights with dual load center control (2 lights)											2										
		Curbside & Driver side Flush Mount LED Flood Lights with dual load center control (4 lights)											4										
14	Interior 120V/1 Package	None												X									
		STD PKG - 15A GFCI Outlets Equipment area (4), Control area(6)												F									
		STD PKG plus two additional dedicated 15A GFCI appliance outlets												A									
15	Exterior 120V/1 Package	None													X								
		Curbside & Driver side GFCI Receptacles (2)													E								
16	Control Area Heating	None														X							
		Control area 5KW ceiling forced air heater w/ wall thermostat														1							
		Control & Equipment area 5KW ceiling forced air heaters w/ wall thermostats														2							
17	Control Area Cooling	None															X						
		Wall mounted 18K BTU A/C														W							
18	Loose Hose Storage	None															X						
		Skid integrated vacuum & oil straight length hose storage. (100 Ft 4" vacuum hose. 160 FT 2" oil hose)															S						
19	Power Cable Provisions	None																			X		
		(4) conductor 15FT pigtail / 50FT cable set with high amperage quick connectors w/ access door																			1		
		(4) conductor exterior high amperage twist lock connection box & 50FT cable set w/ mating twist connectors																			2		
20	Belly Storage	None																			X		
		Propose belly storage to fit the available space																			F		
21	Control Area Furniture	None																				X	
		Propose control area furniture to fit the available space																				F	
22	Waste Oil Storage Tank	None																					X
		Provide a 40 GAL aluminum belly mounted waste oil tank with exterior level gauge & 3" fill connection																					T
Example		SES952- N X T N 3 3 S 1 A S W F 4 F E 2 W S 2 F F T																					

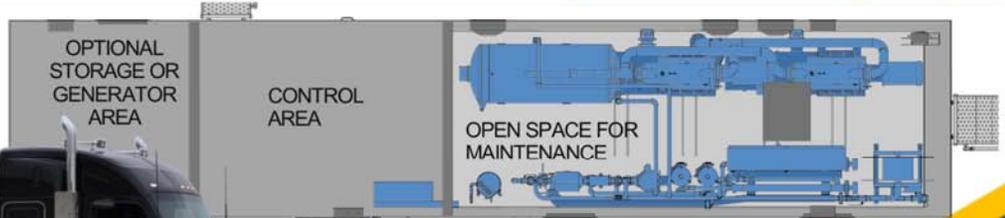


SES952

# DRY VAN TRAILER



SES954



SES954 - DRY VAN SEMI TRAILER MOUNTING MATRIX		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1	Dry Van Type	Straight	N																											
		Step Deck	S																											
2	Max Length	Minimum Amount Required		48																										
		Custom Length (29' Min - 48' Max)	#																											
3	Max Height	Standard 13.5 FT		13																										
		Custom 12.5 FT		12																										
4	Installed Equipment Type	SES320 Conditioning System									C																			
		SES320R Conditioning & Regeneration System (FE)									R																			
5	Generator(s)	None									X																			
	(See Generator PN Matrix)	Primary - Full Load Diesel Tier IVF									G																			
		Secondary Only									A																			
		Primary & Secondary									B																			
6	Isolated Control & Lab Area	None									X																			
		96" Min w/ side door w/ clear observation sliding partition									T																			
		96" Min w/ side door w/ solid wall partition whinged man door									S																			
7	Isolated Storage Area	None									N																			
		Yes w/ solid room partition access door									P																			
		Yes w/ solid partition and curbside exterior man door									C																			
8	Oil Connections	Dual Rear									1																			
		Dual Exterior Belly Mounted both sides									2																			
		Dual Exterior Belly Mounted w/ enclosures both sides									3																			
9	Vacuum Connections	None									0																			
		Single Interior Rear									1																			
		Dual Interior Upper Side Wall									2																			
		Dual Exterior Belly Mounted both sides									3																			
		Dual Exterior Belly Mounted w/ enclosures both sides									4																			
10	Side Man Door Construction	304 SS exterior door & frame w/ observation window & SS lockset									S																			
		FRP door w/ exterior cam lock & interior latch & observation window									F																			
11	Control Area Side Entry	None									0																			
		Aluminum stairs with single removable railing									1																			
		Aluminum stairs with dual removable railings									2																			
		Belly mounted pull out landing wire/removable stair and railing assemblies									3																			
12	Additional Entry Stairs	None									X																			
		Aluminum stairs per control area railing arrangement on rear only									R																			
		Aluminum stairs per control area railing arrangement for all entry doors									A																			
13	Belly Stair Storage	None									X																			
		Provide lockable aluminum belly mounted dual stairs storage assembly									S																			
14	Side Windows	None									X																			
		Control room roadside observation window									W																			
		Equipment area egress window (rear door access)									E																			
15	Ventilation	Factory standard									F																			
		Power intake louvers									P																			
16	Interior Lighting Package	None									X																			
		Area LED ceiling mounted lighting with individual load center control									F																			
		Area LED ceiling mounted lighting with wall switch control									W																			
17	Exterior Lighting Package	None									X																			
		Curbside & Driver side Flush Mount LED Flood Lights with dual load center control (2 lights)									2																			
		Curbside & Driver side Flush Mount LED Flood Lights with dual load center control (4 lights)									4																			
18	Interior 120V/1 Package	None									X																			
		STD PKG - 15A GFCI Outlets Equipment area (4), Control area(6), Front Area(4)									F																			
		STD PKG plus two additional dedicated 15A GFCI appliance outlets									A																			
19	Exterior 120V/1 Package	None									X																			
		Curbside & Driver side GFCI Receptacles (2)									E																			
20	Area Heating	None									X																			
		Control area 5KW ceiling forced air heater w/ wall thermostat									1																			
		Control & Equipment area 5KW ceiling forced air heaters w/ wall thermostats									2																			
21	Area Cooling	None									X																			
		Wall mounted 18K BTU A/C									W																			
		Exterior nose mounted commercial duty 24K BTU A/C									N																			
22	Loose Hose Storage	None									X																			
		Skid integrated vacuum & oil straight length hose storage. (100 F14" vacuum hose. 160 FT 2" oil hose)									S																			
		Full width belly compartment vacuum and oil hose storage									B																			
23	Power Cable Provisions	None									X																			
		(4) conductor 15FT pigtail / 50FT cable set with high amperage quick connectors w/ access door									1																			
		(4) conductor exterior high amperage twist lock connection box & 50FT cable set w/ mating twist connectors									2																			
24	Belly Storage	None									X																			
		Propose belly storage to fit the available space									F																			
25	Control Area Furniture	None									X																			
		Propose control area furniture to fit the available space									F																			
26	Waste Oil Storage Tank	None									X																			
		Provide a 40 GAL aluminum belly mounted waste oil tank with exterior level gauge & 3" fill connection									T																			
27	Belly Pull Out Table	None									X																			
		48" x 36" deep pull out aluminum work table with lower storage drawer assembly.									P																			
28	Testing Power Supplies	None									X																			
		230V/3PH - 30A - with receptacle and 50FT cable									3																			
		220V/1PH - 30A - with receptacle and 50FT cable									1																			
		Both									B																			
Example			SES954-N	48	13	C	X	T	N	3	3	S	1	A	S	W	F	F	4	F	E	2	W	S	2	F	F	T	P	X



SES320 Accessory Matrix		SES320A				
<b>Inlet Oil Booster Pump</b> Enables partially filled transformer oil circulation under full vacuum.	<b>None</b> <b>Centrifugal (Recommended)</b> 36" Oil head @ 40GPM / 20" @ 20 GPM Small, easy to store, carry to position (135 lb) Low pressure drop suction hose provided. <b>Positive Displacement</b> 30" Oil head @ 40 GPM / 20" @ 20 GPM VFD controlled Low speed gear pump Two wheel cart mounted (475 lb) Storage provisions required	X				
<b>Transformer Vacuum Manifold</b> PRV Mounted	<b>None</b> <b>Evacuation</b> Aluminum construction 4", 2", & 1" Isolated vacuum hose connections PRV replacement flange (2) 1/8" isolated gauge connections <b>Hot Oil Spray</b> Aluminum construction 4" Vacuum & 2" Oil isolated connections Adjustable oil spray splash plate <b>Provide Evacuation &amp; Hot Oil Spray Manifolds</b>	X				
<b>Vacuum Line Cold Trap</b>	<b>None</b> Portable 9.2L Liquid Nitrogen Trap Integrated 9.2L Liquid Nitrogen Trap Integrated Cascade Refrigerated Trap	X	P	N	C	
<b>Dry Air System</b>	<b>None</b> <b>25CFM / Single Stage / -60° to -70°F Output</b> 100°F @ 90% RH Supply Not Breathing Certified (No CO or order treatment) <b>25CFM / Two Stage / -70° to -90°F Output</b> 110°F @ 100% RH Supply Not Breathing Certified (No CO or order treatment) <b>25CFM / Single Stage / -60° to -70°F Output</b> 100°F @ 90% RH Supply Class "D" Breathing Certified <b>25CFM / Two Stage / -70° to -90°F Output</b> 110°F @ 100% RH Supply Class "D" Breathing Certified	X	1	2	3	4
<b>Dry Air Dew Point Monitor</b>	<b>None</b> Local display (°F/°C) HMI display and logging (°F/°C) with adjustable threshold alarm	X	L	H		
<b>Dry Air CO Monitor</b>	<b>None</b> Local out of range (ppm) audible alarm Local & HMI out of range (ppm) audible alarm	X	L	H		
<b>Dry Air Hose</b> (85FT SS Braid w/ cover)	<b>None</b> Dry Air Hose Only Dry Air Hose & Spring Return Reel	X	H	R		

TRANSFORMER VACUUM  
PRV MANIFOLDS



SES425-E



SES425-HOS

LIQUID NITROGEN  
COLD TRAP



SES327

(9.25 L)



SES329

DRY AIR SYSTEM

INLET OIL  
BOOSTER PUMPS



SES330SPD



SES330S



SES327

(9.25 L)

STANDARD SPARE PARTS KIT

- First Stage Filter Elements (4)  
Pleated Synthetic Media (5 μ β200 Efficiency)
- Second Stage Filter Elements (4)  
Pleated Synthetic Media (1/2 μ β75 Efficiency)
- Vacuum Chamber Dispersal Elements (1 set)
- Vacuum Pump Oil (20 L)
- Gasket Kit

(Fuses are not required)

# CUSTOM SES320-1800 PACKAGE

To request a quotation for your customized SES320 -1800 package, fill in the three categories below with the numbers that correspond to your desired options. Use the tables shown on previous pages as guides for generating each number.

## // Processor Configuration (Page 5)

SES320 -1800

1	2	3	4	5	6	7	8	9	10	11	-	12	13	14	-	15	16	17	18	19	20	21	-	22	23	24	-	25	26	27	28	-	29	30
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## // Mobility Options (Pages 6 - 9)

SES 95

SES953

SES951

SES952

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
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## // Accessories (Page 9)

SES320A

1	2	3	4	5	6	7
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