



SES321 - 600  
SES321 - 900

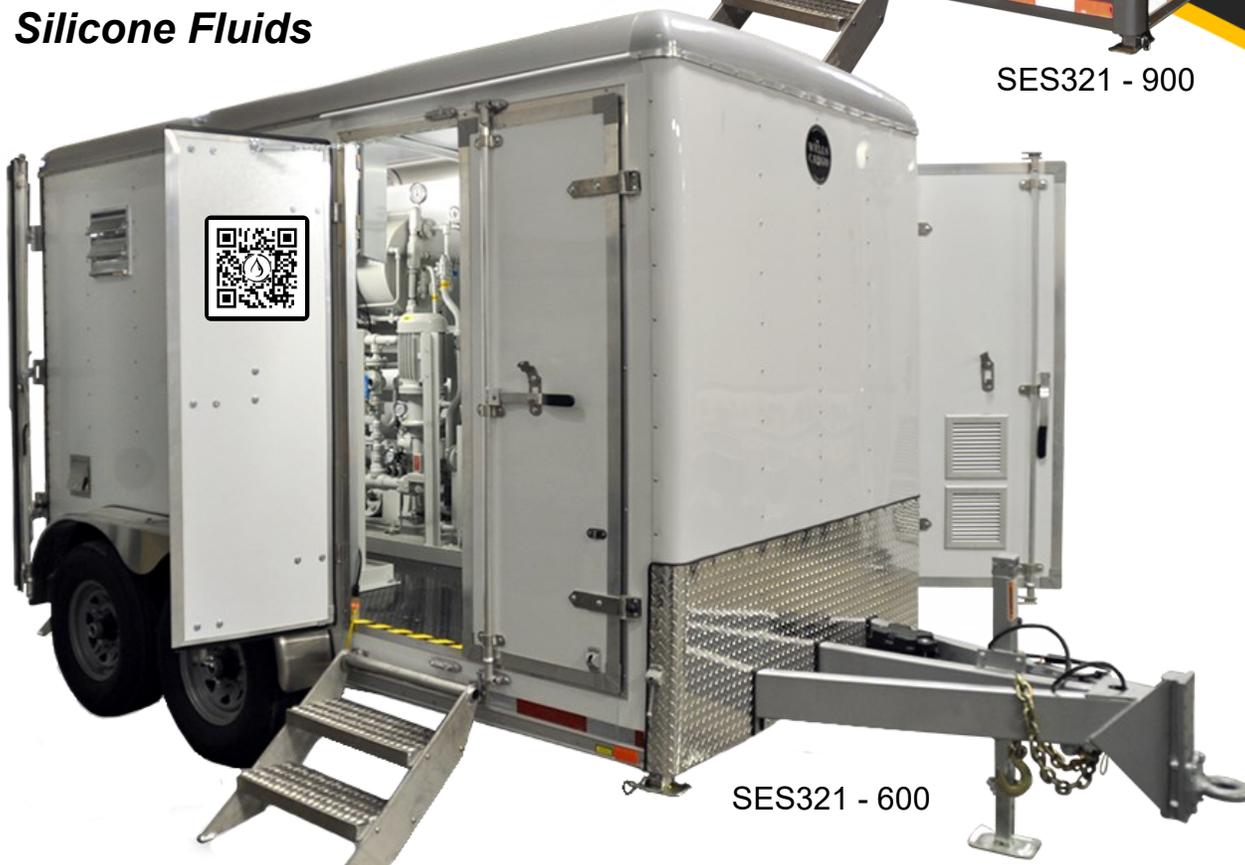
# CARGO TRAILER MOUNTED INSULATING OIL CONDITIONING SYSTEMS

**SMALL TRAILERS  
BIG PERFORMANCE**

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



SES321 - 900



SES321 - 600

**Oil Conditioning    Transformer Circulation    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 SES320-600C and SES320-900C 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

• Recondition Group 1 & 2 oils by circulating within transformer de-energized.	✓
• Recondition Group 1 & 2 oils by circulating within live transformer.	✓
• Reclaim Group 3 oils by circulating within transformer de-energized.	Requires Optional Adsorbent Treatment Stage
• Recondition Group 3 oils by circulating within live transformer.	Requires Optional Adsorbent Treatment Stage*
• Empty transformer	✓
• Evacuate transformer for dry out	✓
• Measure water extracted from transformer	Requires Optional Vacuum Line Cold Trap
• Circulate hot oil in transformer under vacuum to heat & dry core.	Requires Optional Inlet Booster Pump
• Fill transformer for circulation	✓
• Fill transformer from 100 ppm supply	✓

\* Safety Precautions required. Contact SESCO for more information



## 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>Results</b> The conditioned oil is now ready for use. Discharge flow rate and pressure are adjustable to accommodate cable requirements.

## // STANDARD FEATURES



- Variable Speed Flow Rate
- Automatic Temperature & Chamber Level Control
- Two Stage Vacuum System
- Quiet Vane Backing Pump
- 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 (*outer diameter*) ASME Code Filter Housings
- Discharge Flow & Totaling Rate Meters
- System Full Scale Vacuum Gauge
- Color Touchscreen Control System with Data Logging
- Optional Switch and Pilot Light Control System
- Standard External Vacuum Connections
- Standard Connections for External Adsorbent Fullers Earth System
- Four Conductor Power Cable

## TRAILER SPECIFICATIONS

- 12,000 GVWR Cargo Trailer
- Pintle Ring or Ball Hitch
- Dual 6000 lbs Axles
- ALL Aluminum Frame Construction
- Radial Tires
- DOT Approved Road Lighting & Reflector Packages
- Electric Brakes
- 24 inch Stone Guard
- ½ inch Plywood Lined Interior Walls (painted white)
- Dual Rear Full Width Swing Doors
- Curbside Entry Door with Lock
- Aluminum Step Assemblies
- Ceiling LED Light Fixtures
- 120V Equipment Area Outlets
- 120V Ventilation System



# // PROCESSING PERFORMANCE

## 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 μ 97.8% > 1/2 μ
<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

# NATURAL ESTER FLUIDS

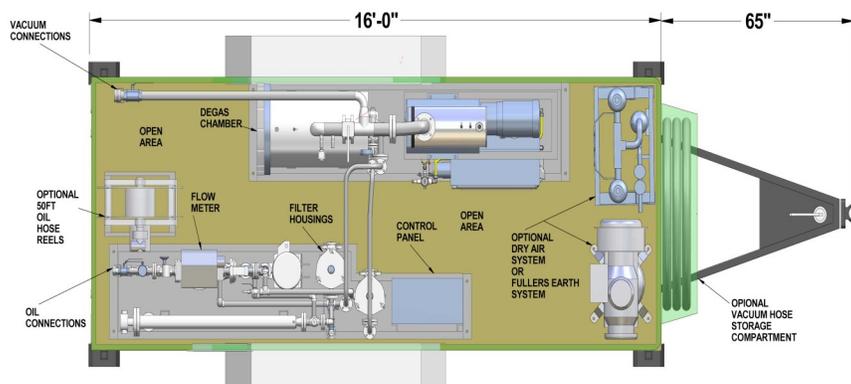
<b>Processing Rate</b>	De-rate processing rate and heating capacity by 25%
<b>Dielectric Strength</b> (ASTM-D1816-84A) (2 mm gap)	> 60 kV
<b>Moisture Content</b> Single pass (ASTM-D1533-88)	200 ppm reduced to < 30 ppm
<b>Moisture Content</b> 3 Passes (ASTM-D1533-88)	200 ppm reduced to < 20 ppm
<b>Total 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 μ
<b>Processing Temperature</b> (Adjustable)	Min 170 F°   76 C° Max Limit 190 F°   88 C°
<b>Processing Vacuum Level</b>	1.5 - 0.3 Torr

# // UNIT SPECIFICATIONS

## PHYSICAL DATA

	SES321	
	600	900
<b>Inlet Connection</b>	1.5 NPT	1.5 NPT
<b>Outlet Connection</b>	.75 NPT	1.0 NPT
<b>External Vacuum Connection</b>	2 ANSI FLG	3 ANSI FLG
<b>Length</b>	76 in   1930 mm	85 in   2159 mm
<b>Width</b>	60 in   1524 mm	60 in   1524 mm
<b>Height</b>	72 in   1828 mm	86 in   2184 mm
<b>Weight</b>	3500 lbs   1587 kg	4200 lbs   1905 kg

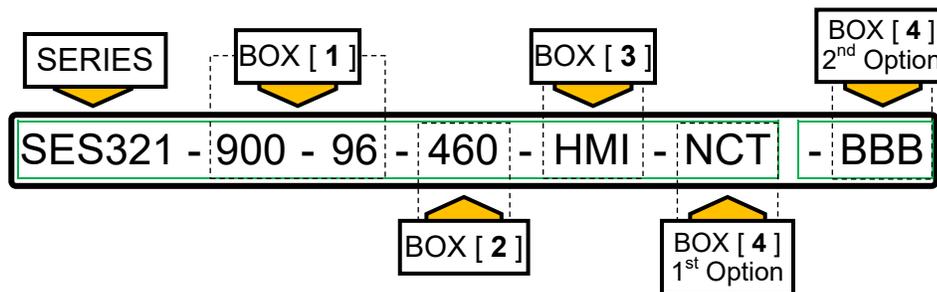
\* Dimensions and weight will vary with options



	SES321-600	SES321-900
<b>Design Flow Rate</b>	10 GPM   2271 LPH	15 GPM   3407 LPH
<b>Max Flow Rate</b>	<b>12 GPM   2725 LPH</b>	<b>20 GPM   4542 LPH</b>
<b>Max Dielectric Strength</b> (ASTM D-1816-2)	> 65 kV	
<b>Vacuum Capacity</b>	375 CFM	750 CFM
<b>Processing Vacuum Range</b>	2.0 - 0.2 Torr	
<b>Standard Heating Capacity</b>	64 kW	96 kW
<b>Oil Heater Watt Density</b>	11.5 W/in <sup>2</sup>	
<b>Processing Temperature</b>	Adjustable 40-87 C°	
<b>Filtration Stages</b>	2	
<b>Filtration Efficiency</b>	β <sub>x</sub> ≥ 1000 @ 3 μ   β <sub>x</sub> ≥ 200 @ 0.5 μ	
<b>Inlet Pressure</b>	7 - 25 psia	
<b>Outlet Pressure</b>	75 lbf/in <sup>2</sup>   520 kPa	
<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 / 3φ / 60Hz   480V / 3φ / 60Hz	240V / 3φ / 60Hz   380V / 3φ / 50Hz
<b>Standard Power Consumption</b>	80 kW	110 kW

## // HOW TO ORDER SES321 - 600 & 900

Construct a custom model number by placing desired options into the corresponding fields as shown in the example below.



	Flow Rate	Heating Capacity	
600 - 64 →	10 GPM / 38 LPM	64 kW / 3φ	[ 1 ]
900 - 96 →	16 GPM / 61 LPM	96 kW / 3φ	

Power Options		
230* →	230V / 3φ / 60Hz	[ 2 ]
380 →	380V / 3φ / 50Hz	
460 →	460V / 3φ / 60Hz	
575 →	575V / 3φ / 60Hz	
SPV* →	Special Voltages	

\*Consult Factory

Control System		
HMI →	Color Touchscreen Control Interface NEMA 4 interface used for control and alarm indication.	[ 3 ]
SPI →	System Switch & Pilot Light Control Interface 30mm push button and LED pilot light control system interface. <i>(Replaces HMI interface)</i>	

[ 4 ]

### ADDITIONAL OPTIONS

Vacuum System Options	
BPV →	Vacuum Booster Pump Upgrade
	600      325 CFM → 475 CFM
	900      750 CFM → 950 CFM
RGV →	Panel Mounted Remote Transformer Vacuum Gauge
AVV →	Fail Safe Transformer Vacuum Valve

Oil Purifier Options	
FEP →	Adsorbent Media System Adsorbent Media System.
FPP →	Provisions for Future Inlet Oil Booster Pump
PIP →	Portable Inlet Low NPSH Oil Booster Pump A portable, lightweight pump used to assist with circulation of oil through a partially filled evacuated transformer.

Instrumentation Options	
IMM →	Local Inlet Moisture & Temperature Monitor
OMM →	Local Outlet Moisture & Temperature Monitor
VDM →	Local Vacuum Line Dew Point Monitor
CNM →	Inline Local ISO Discharge Contamination Monitor
RCM →	Remote Monitoring for HMI Control Package Web and app based system remote monitoring <i>(Requires customer cellular data account)</i>

Filtration System Options	
DAF →	Dirty Filter Alarms

Hose Storage Options	
MRS →	50' Manual Rewind Live Hose Reels with Hose
ERS →	50' Electric Rewind Live Hose Reels with Hose
MCS →	Trailer Tongue Mounted Vacuum Hose Storage Cabinet Stores (3) 3" x 15 FT hose assemblies

Mounted Trailer Options	
ELC →	Exterior Lighting Aluminum side wall, flush mounted LED flood lights.
AOC →	Exterior 120V/AC Outlets , 15A 120V duplex GFCI outlet w/ weather tight enclosure.
AHC →	Heating A forced air 3 phase 5000 BTU ceiling heater.

Hose Options	
OSH →	Oil Hose (Suction) 1-1/2"x 20FT hose assembly w/ Cams, caps & plugs.
ODH →	Oil Hose (Discharge) 1"x 20FT hose assembly w/ Cams, caps & plugs.
AVH →	Vacuum Hose 3"x 15FT vacuum rated hose assembly w/ cams, caps & plugs.

ACCESSORIES AND PART OPTIONS ON NEXT PAGE →

## // ACCESSORIES



Dry Air Breathing System

### DRY AIR SYSTEM OPTIONS

**-70°F Non-Breathing Air System 28 CFM**  
Single stage dual tower regenerating desiccant

**-90°F Non-Breathing Air System 28 CFM**  
Two stage dual tower regenerating desiccant with refrigerated pre-dryer

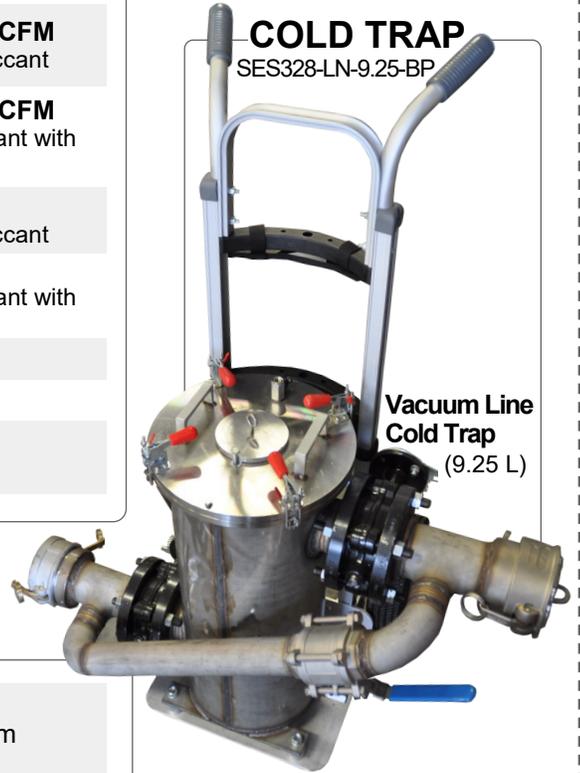
**-70°F Breathing System 28 CFM**  
Single stage dual tower regenerating desiccant

**-90°F Breathing System 28 CFM**  
Two stage dual tower regenerating desiccant with refrigerated pre-dryer

**Discharge Dew Point Monitor**

**CO Monitor with Alarm**

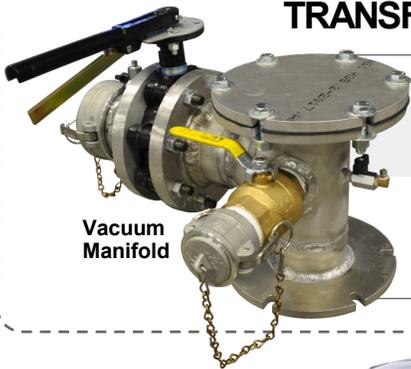
**Dry Air Hose & Spring Return Reel**  
85 ft, stainless steel



### COLD TRAP

SES328-LN-9.25-BP

Vacuum Line Cold Trap  
(9.25 L)



Vacuum Manifold

### TRANSFORMER VACUUM PRV MANIFOLDS

**Vacuum Manifold**  
Qualitrol relief flange mounted vacuum manifold

**Vacuum Hot Oil Spray Manifold**  
Qualitrol relief flange mounted hot oil spray & vacuum manifold



## // CONSUMABLES & SPARE PARTS

**First Stage Filter Elements**  
Pleated Synthetic Media (5  $\mu$   $\beta$ 200 Efficiency)

**Second Stage Filter Elements**  
Pleated Synthetic Media (1/2  $\mu$   $\beta$ 75 Efficiency)

**Vacuum Chamber Dispersal Elements**

**Vacuum Pump Oil (20 L)**

**Gasket Kit**

