

CARGO TRAILER MOUNTED INSULATING OIL CONDITIONING SYSTEMS

**SMALL TRAILER
BIG PERFORMANCE**



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



Oil Conditioning Transformer Circulation Optional Oil Regeneration Transformer Dry-Out

// 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 SES321-1260 are compact, versatile, easy to tow, trailer mounted pre-configured systems with relatively few options.

The SES320-1200 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
Oil Heating The fluid is gently heated to reduce the viscosity in preparation for the vacuum dehydration and optional adsorbent treatment stages.	Polar Contaminant Adsorption (optional) The heated fluid then passes through an optional (bypass included) adsorbent media process that removes acids, color bodies and other polar contaminants.	Filtration (3μ β200) The next treatment phase uses long life, low pressure drop, pleated synthetic filter media to remove 99.9% of all particulate > than 3 microns.	Vacuum Dehydration & Degasification Vacuum and high efficiency thin film low temperature evaporation is used to remove dissolved water and dissolved gases.	Filtration (0.5μ β75) A polishing filter completes the process. Pleated synthetic filter media is used to remove 98.7% of all particulate > than 0.5 microns.	Results 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

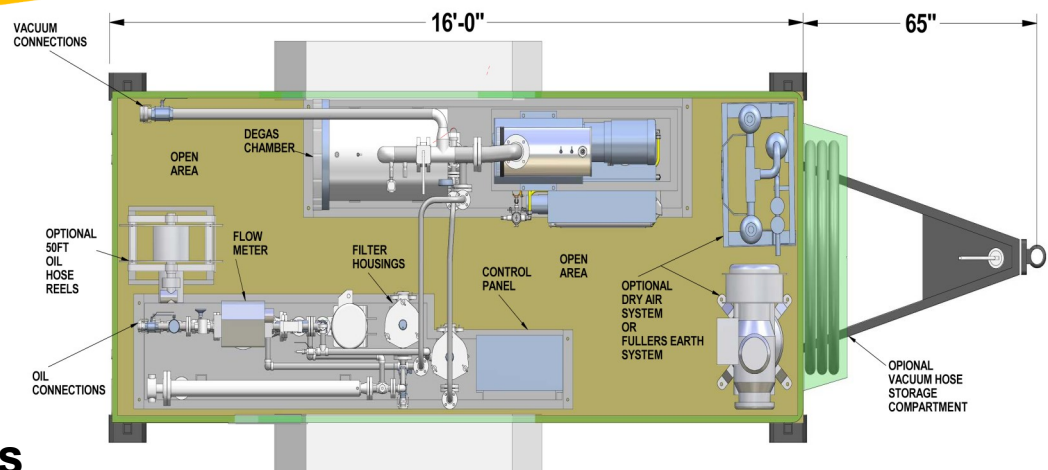
TRAILER SPECIFICATIONS

- 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	NATURAL ESTER	SYNTHETIC ESTER
Dielectric Strength (ASTM-D1816-84A) (2 mm)	> 65 kV	> 60 kV	> 60 kV
Moisture Content Single pass (ASTM-D1533-88)	60 ppm reduced to < 10 ppm	60 ppm reduced to < 30 ppm	60 ppm reduced to < 40 ppm
Moisture Content 3 Passes (ASTM-D1533-88)	100 ppm reduced to < 5 ppm	100 ppm reduced to < 20 ppm	100 ppm reduced to < 30 ppm
Total Gas Content Single Pass (ASTM-D2945)	Saturation reduced to < 0.25%	Saturation reduced to < 0.5%	Saturation reduced to < 0.35%
Total Gas Content 3 Passes (ASTM-D2945)	Saturation reduced to < 0.15%	Saturation reduced to < 0.25%	Saturation reduced to < 0.25%
Particulate Content	99.9% > 1 μ 97.8% > 1/2 μ	99.9% > 1 μ 97.8% > 1/2 μ	99.9% > 1 μ 97.8% > 1/2 μ
Processing Temperature (Adjustable)	Min 120 F° 49 C° Max Limit 190 F° 88 C°	Min 120 F° 49 C° Max Limit 190 F° 88 C°	Min 120 F° 49 C° Max Limit 190 F° 88 C°
Processing Vacuum Level	1.5 - 0.3 Torr	1.5 - 0.3 Torr	1.5 - 0.3 Torr



// UNIT SPECIFICATIONS

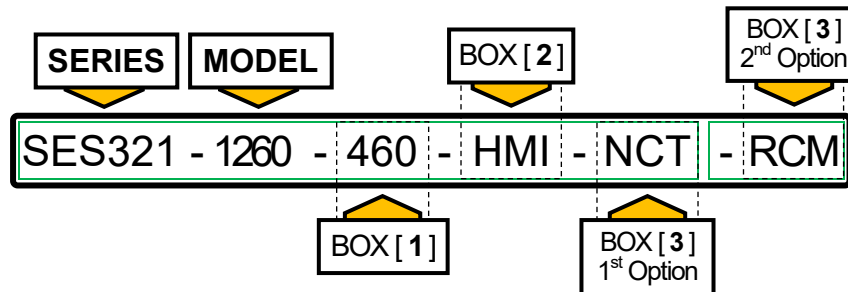
Design Flow Rate	20 GPM 4542 LPH
Max Flow Rate	22 GPM 4996 LPH
Max Dielectric Strength (ASTM D-1816-2)	> 65 kV
Vacuum Capacity	850 CFM
Processing Vacuum Range	2.0 - 0.2 Torr
Standard Heating Capacity	96 kW
Oil Heater Watt Density	11.5 W/in ²
Processing Temperature	Adjustable 40-87 C°
Filtration Stages	2
Filtration Efficiency	$\beta_x \geq 1000 @ 3 \mu$ $\beta_x \geq 200 @ 0.5 \mu$
Inlet Pressure	7 - 25 psia
Outlet Pressure	75 lbf/in ² 520 kPa
Seal Material	Fluorocarbon
Standard Control System	HMI w/ Automatic System Protection
Electrical Classification	NEMA, IEC
Power Supply	240V / 3 ϕ / 60Hz 380V / 3 ϕ / 50Hz
Standard Power Consumption	110 kW

PHYSICAL DATA

Inlet Connection	1.5 NPT
Outlet Connection	1.0 NPT
External Vacuum Connection	3 ANSI FLG
Length	85 in 2159 mm
Width	60 in 1524 mm
Height	86 in 2184 mm
Weight	4200 lbs 1905 kg

* Dimensions and weight will vary with options

// HOW TO ORDER SES321-1260



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

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

*Consult Factory

Control System [2]	
HMI →	Color Touchscreen Control Interface NEMA 4 interface used for control and alarm indication.
SPI →	System Switch & Pilot Light Control Interface 30mm push button and LED pilot light control system interface. <i>(Replaces HMI interface)</i>

[3] ADDITIONAL OPTIONS

Vacuum System Options				
BPV →	Vacuum Booster Pump Upgrade			
	<table border="1"> <tr> <td>600</td> <td>325 CFM → 475 CFM</td> </tr> <tr> <td>1260</td> <td>750 CFM → 950 CFM</td> </tr> </table>	600	325 CFM → 475 CFM	1260
600	325 CFM → 475 CFM			
1260	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

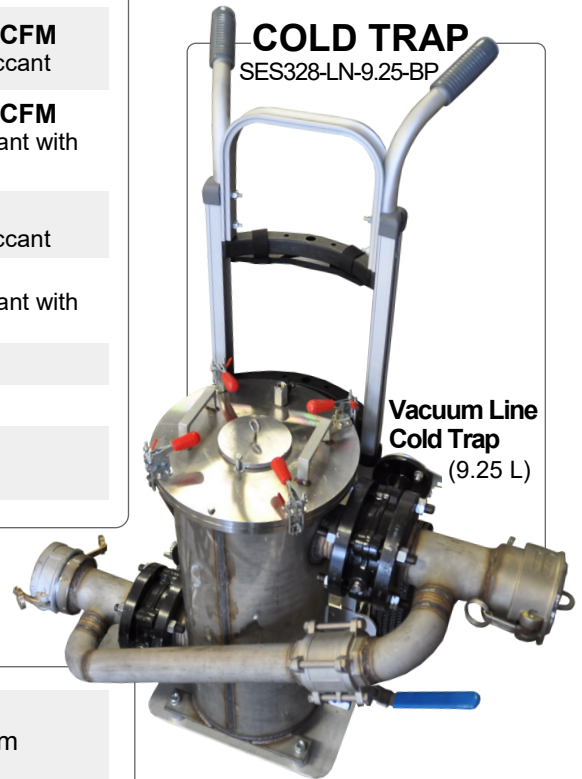
-70°F Breathing System 28 CFM
Single stage dual tower regenerating desiccant

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

Discharge Dew Point Monitor

CO Monitor with Alarm

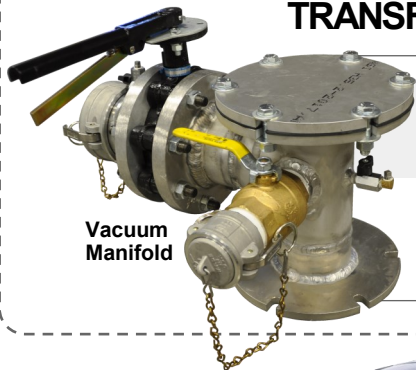
Dry Air Hose & Spring Return Reel
85 ft, stainless steel



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 μ β 200 Efficiency)

Second Stage Filter Elements
Pleated Synthetic Media (1/2 μ β 75 Efficiency)

Vacuum Chamber Dispersal Elements

Vacuum Pump Oil (20 L)

Gasket Kit