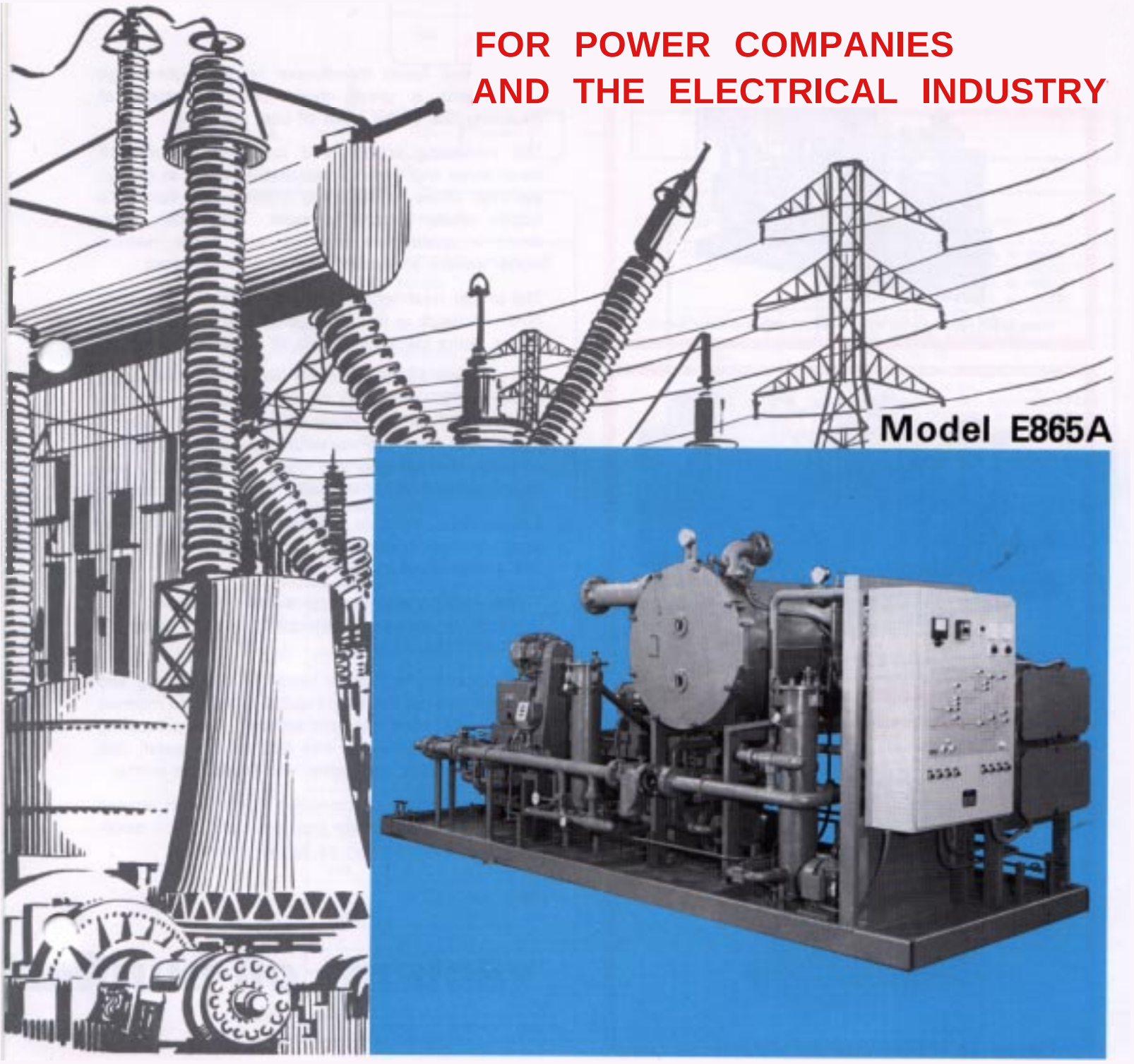
BULLETIN 6-10-000

ENERVAC
CORPORATION

Engineers and Manufacturers of

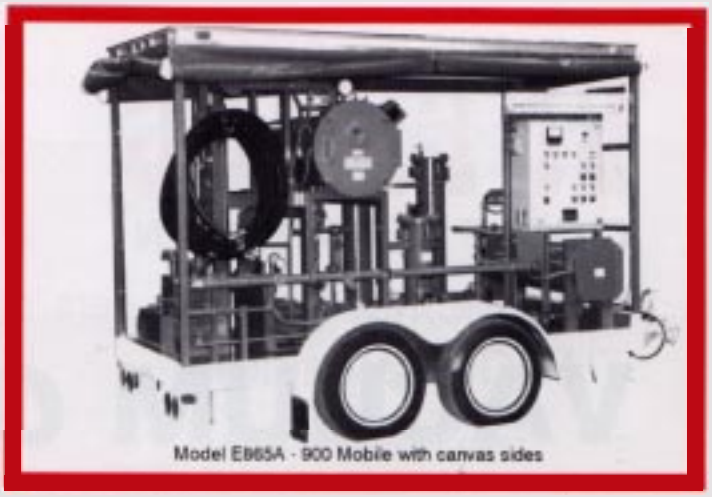
VACUUM *OIL-PURIFIERS*

FOR POWER COMPANIES AND THE ELECTRICAL INDUSTRY



Model E865A

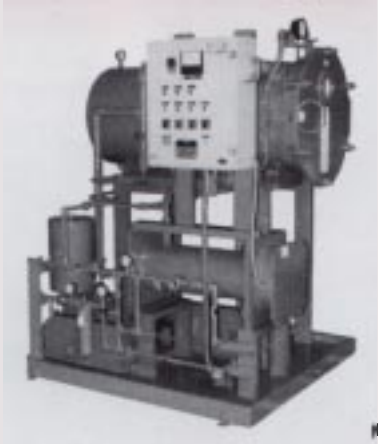
Model E865A - 600 Aluminium walk around enclosure



Model E865A - 900 Mobile with canvas sides

Model E865A - 600 complete with Prefilter, Afterfilter and Meter options

Model E865A - 2400 complete with Seal-O-Vac and Nema "4" options



Model E865A - 50

Present and future transformer ratings require high quality and a great degree of purification of insulating oils at the point of use.

The increasing voltage and rating of the modern transformer and electrical apparatus results in greater electrical stress in insulating material and fluids. To handle these greater stresses, oils with better dielectric quality are required, and lower residual water content in insulation must be maintained.

The proper treatment and upgrading of the insulating fluid will result in the improvement of the properties of the entire insulating media of power transformers.

The principal functions of the insulating liquid are to serve as a dielectric material and an effective coolant. To perform these functions, the insulating liquid must have the necessary qualities at the time of initial impregnation and filling at the factory and later maintain the same quality in the field operation.

Enervac High Vacuum Process upgrades the new or used electrical insulating liquids including transformer oils, polybutenes and silicone fluids.

These systems and equipment were developed as a result of 40 years of experience in vacuum treatment of electric insulating oils.

High Vacuum Process is used for dehydrating and degasification of electrical insulating fluids to increase and maintain their dielectric strength. The processing includes the removal of free and soluble water, free and dissolved air and gases, and particulate matter.

By the application of corrective filters which remove soluble varnishes, resins and products of oil oxidation, the oil quality can be further improved.

vacuum oil-purif

Upgrading of Electrical Insulating Fluids With

HIGH VACUUM PROCESS

Description of Process

Oil, at ambient or elevated temperature, is introduced into the vacuum chamber, where by vacuum distillation, water, dissolved air and gases, and other low-boiling-range volatile contaminants are removed.

Special chemically-inert accelerator cartridges in the vacuum chamber are employed to serve the following functions:

First, their in-depth design structure allows free water to be rapidly separated from oil by coalescence even before it reaches the evaporation stage.

Second, millions of glass fibers 3-10 micrometer diameter provide a large total surface area for exposure of the thin oil film to the vacuum.

Third, sharp points of the glass fibers promote fast release of gases and vapors from oil.

Fourth, the elements act as a fine filter removing solid contaminants. The cartridges are easily replaced and disposable.

This method is more efficient than previously used spray nozzles and baffles which required several passes to obtain the same degree of degasification.

Performance

The typical performance in a single pass through an Enervac vacuum system is as follows:

- Dehydration – At minimum oil temperatures of 80°F the water removal is from 100 ppm to less than 10 ppm.
- Degasification – Enervac vacuum oil purifiers reduce soluble air content in a single pass from full saturation of approximately 12% to less than 1/4% Other gases in solution with oil, including combustibles, are also removed.

- Particulate matter – The accelerator cartridge provides removal of particulate matter to a nominal 5 microns. The addition of a filter downstream of the chamber will remove particulate matter to sub-micronic size.

- Other contaminants such as products of oil oxidation, thermal degradation, dissolved varnishes, paints and acids can be removed by the addition of Fullers Earth filters to the system.

Applications

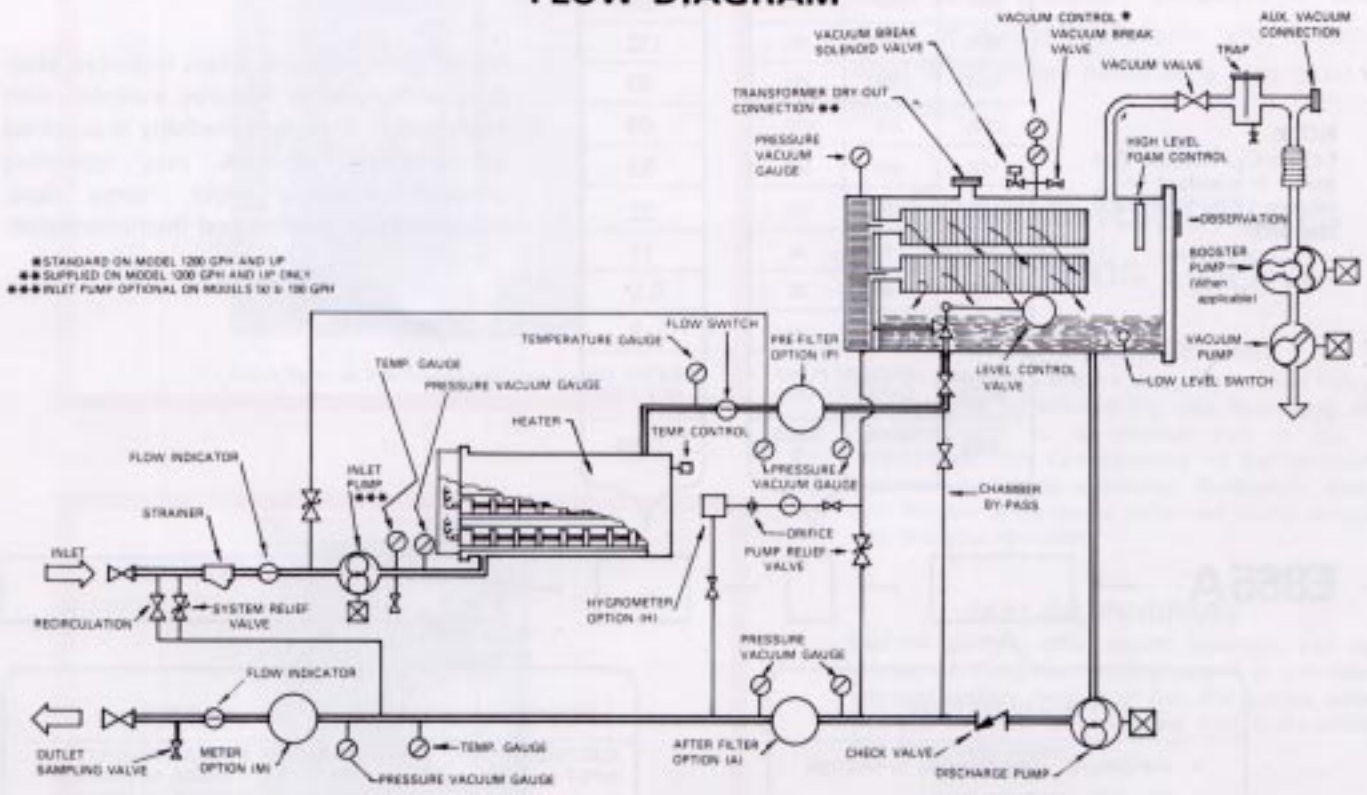
The most important applications of high vacuum degasifiers are in the field of extra high voltage transmission and in the manufacture of electrical apparatus for it. In addition, the high vacuum process is used in the degasification of cable oils including polybutenes. Outside of the electrical industry, this process is used for dehydration and degasification of oils for radar and electronic equipment, vacuum pump sealing oils, brake fluids, refrigeration oils – including phosphate esters and silicones.

Enervac offers the Vacuum-Purifier System designed for maximum efficiency in your operations ... performance tested by experts, requiring minimum maintenance, and providing long, trouble-free service.

Backed by the full resources of Enervac Corporation's technical specialists, plus "know-how" and thorough research, your Vacuum-Purifier System is unique. Designed for unattended operation and suitable for operation on energized equipment – complete monitoring equipment is also available.

tion system AND TRANSFORMER DRYING EQUIPMENT for

FLOW DIAGRAM



Capacities

Capacities: Standard units range from 50 GPH to 3600 GPH. Larger capacities or special models on application.

Performance

	Effluent:	
Standard Performance with New Oils with 100 PPM Water Content and fully saturated with air to 12% by volume.	—Total Water Content	Max. 10 PPM by ASTM Method D-1533
	Total Gas Content	Max. 0.25% by ASTM Method D-2945
	Dielectric Breakdown	Min. 40 KV by ASTM Method D-877
Optional Performance with New Oils with 50 PPM Water Content and fully saturated with air to 12% by volume.	—Total Water Content	Max. 5 PPM by ASTM Method D-1533
	Total Gas Content	Max. 0.15% by ASTM Method D-2945
	Dielectric Breakdown	Min. 60 KV by ASTM Method D-877

Special Options

By-Pass valving; Closed loop cooling and heating for Vacuum Pump; 70°F rise inlet heaters; Rate of flow indicators; Fuller's Earth adaptor; Outlet heater; Vacuum Pump Oil Mist separator; Instrumentation.

Fuller's Earth Filters as separate units available. Stationary or trailer mounted.

ating, deaerating, and conditioning transformers and insulating fluids

MODEL NOMENCLATURE CHART

3600	1620	1325	198
2400	1100	700	132
1800	1100	410	99
1200	700	410	66
600	305	128	33
400	260	110	22
200	110	46	11
100	46	26	5.5
50	26	26	3
FLOW RATE	VACUUM PUMP CAPACITY CFM		HEATER KW 45°F RISE
SIZE	CODE 1	CODE 2	CODE

NOTE:
Option C_1, Vacuum Controller, is standard on models 1200, 1800, 2400 and 3600.

Model Nomenclature Chart indicates standard and optional features available with each model. Complete flexibility is provided by selection of flow rate, operating pressure, electrical input, Nema class, miscellaneous options and instrumentation.

E865A - - -

STANDARD FEATURES

- AUTOMATIC - UNATTENDED OPERATION
- OIL LEVEL CONTROLLER
- FOAM CONTROL
- TEFC ELECTRIC MOTORS
- MECHANICAL SEALED OIL PUMPS
- LOW WATT DENSITY HEATERS
- NEMA 12 CENTRAL CONTROL PANEL
- INLET AND OUTLET FLOW INDICATORS
- BALL VALVES
- WELDED STEEL PIPING
- EXCLUSIVE EV PROCESSING CHAMBER
- PERFORMANCE TESTED

OPTIONAL	CODE	FEATURES
ELECTRICAL INPUT	22	220 VOLTS, 3 PHASE, 60 HERTZ
	38	380 VOLTS, 3 PHASE, 50 HERTZ
	46	460 VOLTS, 3 PHASE, 60 HERTZ
	57	575 VOLTS, 3 PHASE, 60 HERTZ
FILTERS	P	5 MICRON PREFILTER
	A	0.5 MICRON AFTERFILTER
INSTRU-MENTATION AND ALARMS	M	FLOW METER
	H_1	HYGROMETER, OUTLET PROBE
	H2	OPT. HI PLUS INLET PROBE
	H3	OPT. H_2PLUS VAC. CHAMBER PROBE
	CI	VACUUM CONTROLLER, 1 PROBE
	C2	OPT. CI WITH 2 PROBES
	C3	OPT. CI WITH 3 PROBES
MISC.	W	CASTERS
	B	CIRCUIT BREAKERS
	V	VITON GASKET & SEALS
	PI	INLET PUMP MODELS 50 & 100 gph ONLY
	X	SPECIAL ENGINEERING

Model Size	Oil Flow USGPH	Oil Flow Lit./Hr.	Height	Length	Width	Vacuum Conn.	Inlet	Outlet	Total Power kw	Lbs. / Kgs.
50	50	—	78"	48"	42"	2"	3/4"NPT	½"NPT	5	1500
	—	189	1981 mm	1219 mm	1067 mm					680
100	100	—	78"	48"	42"	2"	3/4"NPT	½"NPT	7½	1800
	—	378	1981 mm	1219 mm	1067 mm					816
200	200	—	84"	112"	60"	3"	1" NPT	3/4" NPT	17	5000
	—	757	2133 mm	2845 mm	1524 mm					2268
400	400	—	84"	112"	60"	3"	1" NPT	3/4" NPT	30	5700
	—	1514	2133 mm	2845 mm	1524 mm					2585
600	600	—	84"	112"	60"	3"	1 ½" NPT	3/4" NPT	42	6500
	—	2271	2133 mm	2845 mm	1524 mm					2949
1200	1200	—	99"	180"	72"	4"	1 ½" NPT	1" NPT	80	8500
	—	4542	2514 mm	4572 mm	1828 mm					3855
1800	1800	—	99"	180"	72"	4"	2" NPT	1 ½" NPT	120	9300
	—	6813	2514 mm	4572 mm	1828 mm					4218
2400	2400	9084	2514 99" mm	4572 180" mm	1828 72" mm	4"	2" NPT	1 ½" NPT	155	9900
										4490
3600	3600	13626	2514 99" mm	5486 216" mm	1828 72" mm	4"	2"NPT	1 ½"NPT		11200 5080

tion

Fullers Earth tilt type towers trailer mounted.

Interior of 40 ft. mobile unit showing oil fired indirect heating system and auxiliary vacuum pump.

Mini Degasifier

ENERVAC produces a wide range of specialty products and systems, most of which are based on a high order of technology.

Solving Tomorrow's Problems TODAY

SF_6 GAS SERVICE CART

SF_6 Gas Service Carts are designed to meet today's requirements for efficient SF_6 gas Reclaiming and Handling with no or minimal loss of gas to atmosphere. The Cart performs all the necessary functions to service a breaker. Purification, drying and filtration of the gas is performed during removal and charging operation.

SEAL-OIL PURIFIERS

Seal oil purifiers offer proper treatment and upgrading of compressor sealing oils in a completely enclosed system, removal of free and soluble water, free and dissolved air and gases, light hydrocarbons and particulate matter.

LUBE SYSTEMS

Oil circulating lubrication systems including pumps, tanks, filters, coolers, indicators and other accessory equipment in either packaged or component systems are available.

AIR AND GAS DRYERS AND FILTERS

Enervac dryers and filters are designed for removal of moisture from process air and gases, eliminating condensation and freezeup, moisture corrosion, protecting pneumatic instruments and extending the life of pneumatic tools.

VACUUM DEHYDRATORS

Low vacuum units are available from Enervac Corporation for the continuous maintenance of the original chemical and physical qualities of lubricating, insulating, cooling, hydraulic and synthetic oils.

INDUSTRIAL FILTERS

Industrial filtration equipment utilizing pleated paper, and other media to provide the exact degree of filtration and flow rate for virtually any application.

Representative

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