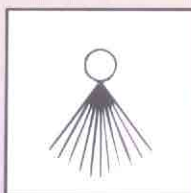


Transorfilter

Insulating Oil Treatment Units

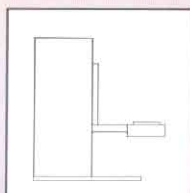


Binitron



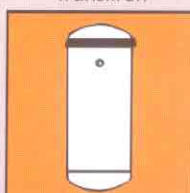
Ind. cleaning
Steamgener.

Axitron



Positioners

Transor
Transitron



EDM/Transf.
filter



TRANSORFILTER

Insulating Oil Treatment Units

Highly effective self-contained units for treatment of insulating oil in transformers and other electrical equipment.
Based on 60 years of experience.

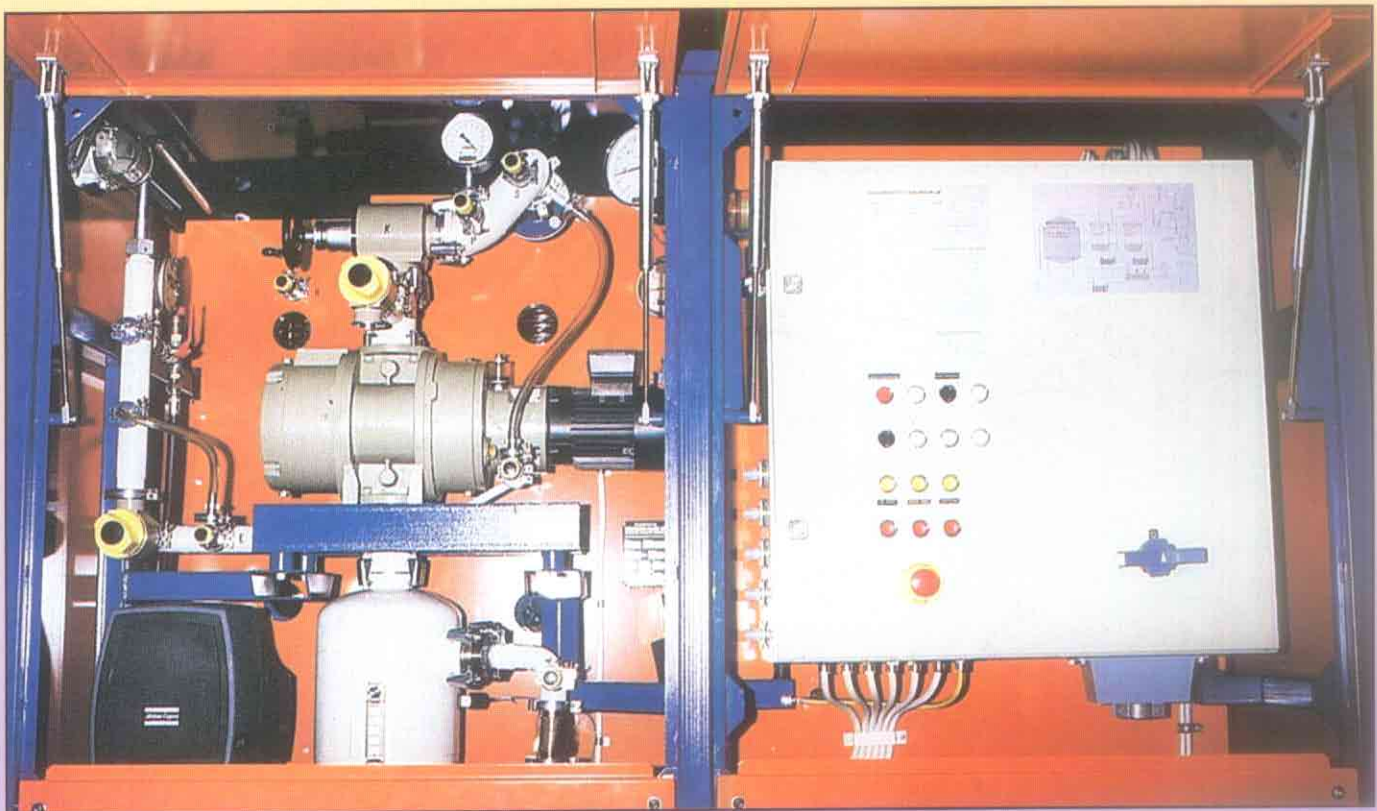
Transorfiter Treatment units

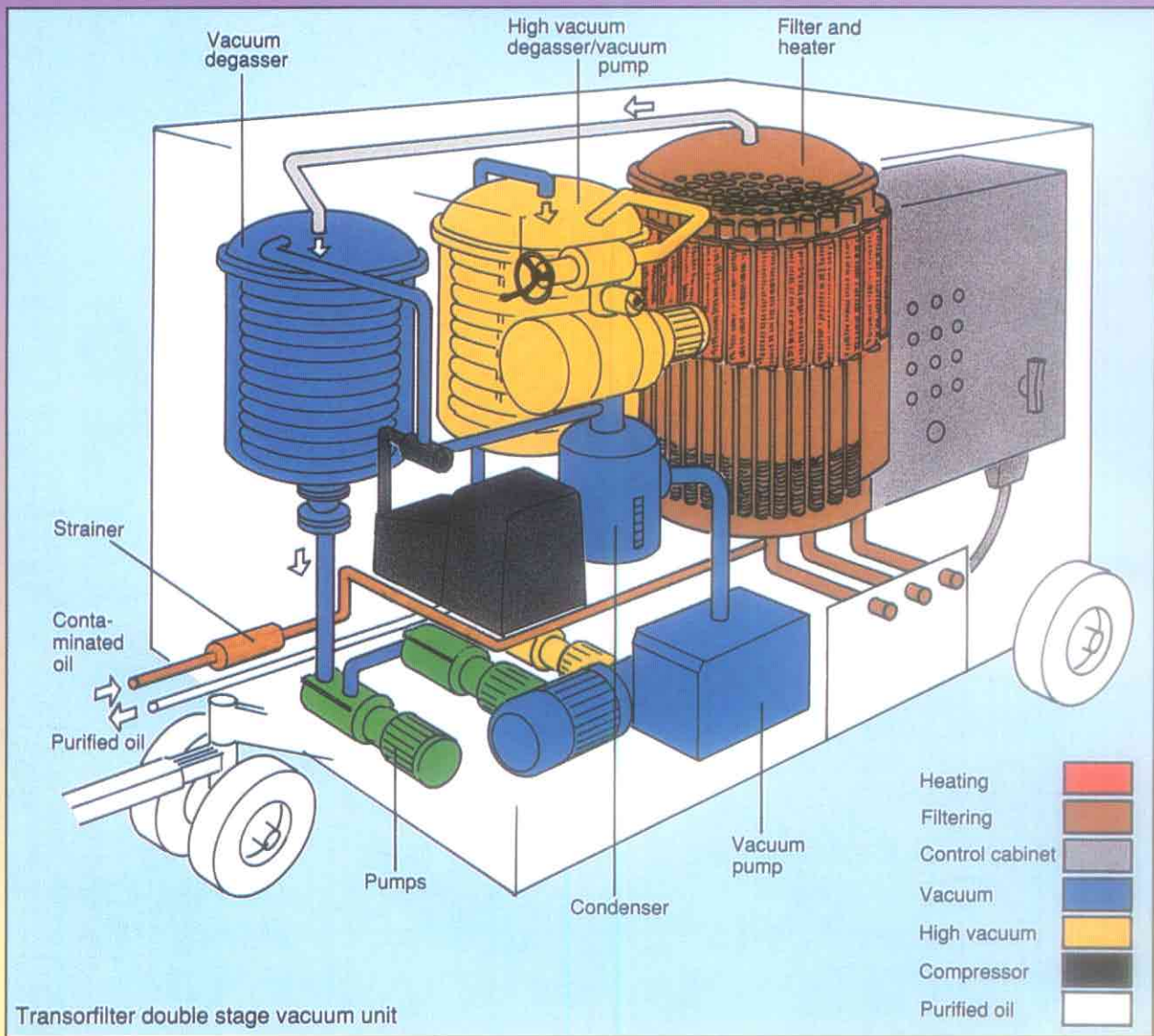
give a dielectric strength that satisfies very high demands after only one passage through the filter.

The filter elements can easily be cleaned by backflushing without being removed and thus have a long life.

The treatment units are self-contained needing only electrical supply.

- Separate vacuum degassers of a patented very effective design with a large evaporation area and a 2-stage vacuum pump system in the double stage vacuum versions.
- Filter elements of patented design.
- High capacity oil heaters with low power density (Watt/cm^2) and individually thermostat controlled heating groups.
- Air-cooled pumps. No water supply needed.
- All parts are easily accessible thus improving the reliability of service.
- All units are available stationary or mobile on site. On request they can easily be assembled on a road worthy trailer.





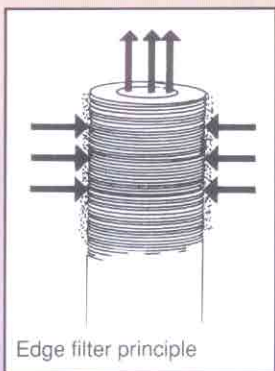
Description

The treatment units consist of a filtration part and a degasser part. The oil is first filtered and then dehydrated and degassed.

The filtration part is of the well known edge-filter type of specially prepared paper discs, stacked on top of each other and kept under spring loading. The oil is forced to pass from the outside between these paper discs. Solid particles down to less than 1 micron are stopped on the outside, where they can accumulate and form a cake which easily can be removed through backflushing with compressed air from the built-in compressor.

The life of the filter elements depends on the kind of contamination and can for transformer oil be up to 10 years if backflushing is carried out regularly. The Transorfilter arrangement is patented.

After passing the filter elements the oil enters the separate vacuum degasser which consists of a container with a number of plates spreading the oil into



thin layer on a large surface giving a very effective dehydration and degassing. The Transorfilter degasser is patented.

Single- and double stage vacuum units

The transorfilter oil treatment units are available in two basic types:

One where the oil is treated in a single degasser and another where the oil is treated in two interconnected degassers of which one is a high vacuum degasser.

The edge filter principle in combination with a vacuum degasser has for many years been the best equipment obtainable for removing solids and moisture from insulating oil. When larger transformers with high voltage were made, the requirements on the oil quality was increased. To meet these demands the Transorfilter double stage vacuum filter was designed by placing a high vacuum degasser and a vacuum pump with higher performance, a Roots pump, working on that degasser.

Applications and Performance

The single stage vacuum units are suitable for most normal applications such as the treatment of oil in transformers in factories and substations.

The filter will remove 99.9 % of all particles larger than 1 micron. The water content of the oil is reduced to < 5 ppm. Gas content of the oil is reduced to < 0.2 % by volume. The low vacuum degasser has a working pressure below 5 mbar.

The double stage vacuum units meet the requirements for the treatment of insulating oil in high-voltage transformers, where the water content is required to be less than 5 ppm and the gas content less than 0.1 % by volume, after only one passage through the unit. The high vacuum degasser has a working pressure of less than 1 mbar. Its 2-stage high vacuum pump system can come down to 0.05 mbar and has a suction capacity which makes it possible to evacuate the transformer separately and during the oil filling.

The above specified values are obtained after only one passage if the contaminated oil has a water content less than 50 ppm and a gas content less than 10 % by volume.

Principle of operation

The principle diagram shows a double-stage treatment unit. The oil is drawn in through the inlet valve I, then passes a strainer, an inlet pump controlling the rate, an electric heater, the filter, the vacuum degasser with its outlet pump 1 and float regulating valve and comes out, as with the single stage unit, fully cleaned through the outlet valve O. In the double stage

unit it has to pass the high vacuum degasser and its outlet pump 2 and regulating valve before the outlet O.

By throttling or shutting the outlet valve, the oil will recirculate inside the unit which is utilised while starting up and if the oil is very cold or contains free water.

The temperature is controlled by thermostats. The first stage vacuum pump is a rotary vane pump and in case of a double stage unit the second stage vacuum pump is a Roots pump. Both pumps are air cooled.

A manometer connected across the filter shows if the pressure becomes too high, meaning that the filter is contaminated. Then the filter vessel is drained into a container and the filter elements are cleaned by means of backflushing with compressed air from the built-in compressor.

Capacities and basic forms

The Transorfilter oil filtering plants are available with capacities:

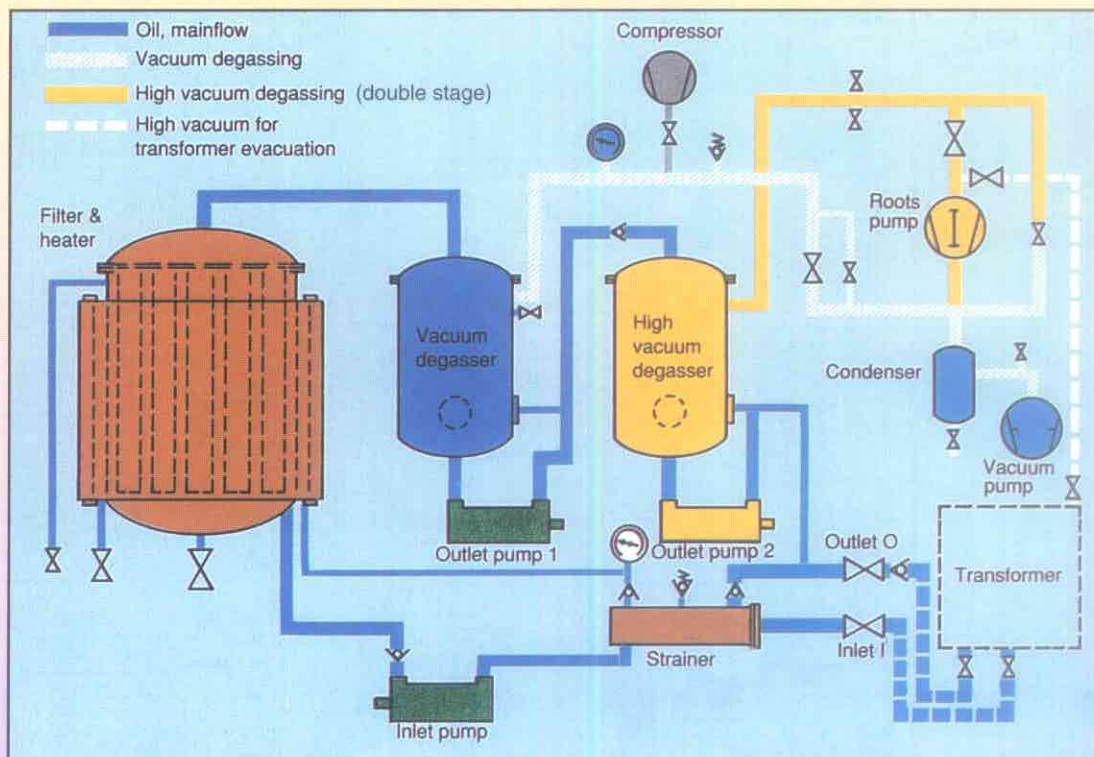
1100-6000 litres/hour (290-1585 US gals/hour).

To be able to fill oil into transformers even in cold climates the larger models, TF-75, can be equipped with an extra preheater.

All sizes can be delivered as either stationary or low-speed mobile units. On request, all units can be assembled on a road worthy trailer to be towed after a suitable car at higher speeds. Adaptation to national traffic regulations is done on request.

All units are fully enclosed by sheet metal panels and doors and equipped with an eye-bolt for loading.

The standard voltage is 380 volts 3-phase, 50 Hz. Other voltage specifications on request.



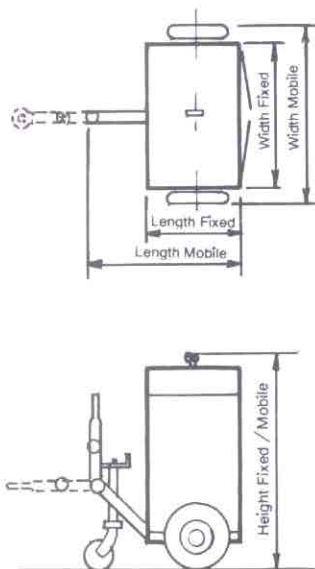
Technical Data

	Type	Flow rate		Heater kW	Appr. Temp. Incr/ pass C	Motor Oil pumps kW	Vacuum pump capacity				Hoses		Oil in unit	
		US gals/h	Litres/hour				kW	cfm	m3/h	Vacuum mbar	In	Out	US gals	litres
Single Stage	TF 18-1	290	1100	36	60	0.75	1.1	23	40	0.5	1"	1"	42	160
	TF 40-1	630	2400	72	60	2.2	2.2	59	100	0.5	1 1/2"	1"	79	300
	TF 75-1	1200	4500	84	40	3.0	4.0	94	160	0.5	2"	1 1/2"	132	500
	TF 75-1-A	1200	4500	132	60	3.0	4.0	94	160	0.5	2"	1 1/2"	137	520
	TF 100-1	1600	6000	180	60	3.0	5.5	176	300	0.5	2"	1 1/2"	142	540
Double Stage	TF 40-2	630	2400	72	60	3.75	3.0	147	250	0.05	1 1/2"	1"	93	350
	TF 75-2	1200	4500	84	40	4.1	3.0	147	250	0.05	1 1/2"	2"	145	550
	TF 75-2-A	1200	4500	132	60	4.1	3.0	147	250	0.05	1 1/2"	2"	150	570

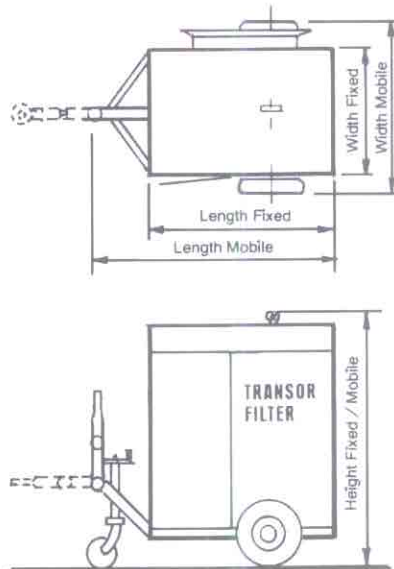
Main dimensions

	Type	Net weight		Length		Width		Height		Pneum. tyres	
		lb	kg	ft-in	mm	ft-in	mm	ft-in	mm		
Single Stage	TF 18-1	fixed	1670	790	2'-7 1/2"	800	4'-3"	1300	5'-11"	1800	2x6.00-9
		mobile	1775	840	4'-3"	1300	5'-1"	1550	5'-11"	1800	
	TF 40-1	fixed	3015	1370	6'	1830	3'-9"	1150	6'-5"	1960	2x6.00-9
		mobile	3125	1420	7'-5"	2250	4'-7"	1400	7'-1"	2160	
	TF 75-1	fixed	4410	2000	7'-10"	2400	4'-6"	1370	6'-5"	1960	4x6.00-9
		mobile	4620	2100	8'-10"	2700	5'-11"	1800	7'-1"	2160	
	TF 75-1-A	fixed	4840	2200	7'-10"	2400	4'-6"	1370	6'-5"	1960	4x6.00-9
		mobile	5060	2300	8'-10"	2700	5'-11"	1800	7'-1"	2160	
TF 100-1	fixed	6160	2800	8'-8"	2650	4'-6"	1370	7'-9"	2350	4x6.00-9	
	mobile	6380	2900	10'	3050	5'-11"	1800	8'-1"	2460		
Double Stage	TF 40-2	fixed	4190	1900	7'-10"	2400	4'-6"	1370	6'-5"	1960	4x6.00-9
		mobile	4410	2000	8'-10"	2700	5'-10"	1770	7'-1"	2160	
	TF 75-2	fixed	5280	2400	7'-10"	2400	4'-6"	1370	6'-5"	1960	4x6.00-9
		mobile	5510	2500	8'-10"	2700	5'-10"	1770	7'-1"	2160	
	TF 75-2-A	fixed	5720	2600	7'-10"	2400	4'-6"	1370	6'-5"	1960	4x6.00-9
	mobile	5960	2700	8'-10"	2700	5'-10"	1770	7'-1"	2160	4x6.00-9	

VACUUM UNITS
TF 18-1



VACUUM UNIT
TF 40-1



VACUUM UNITS
TF 40-2, TF 75-1, TF 75-1-A
TF 75-2, TF 75-2-A, TF 100-1

