

Terminal Series™

Vapour Recovery Solutions



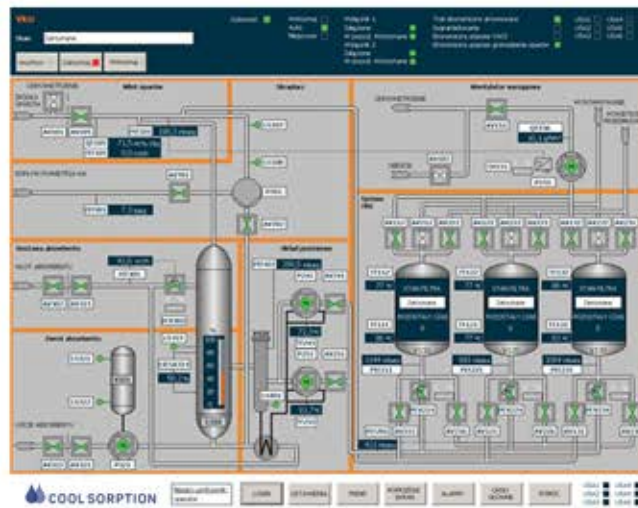
The Terminal Series™ from Cool Sorption is a range of pre-engineered VRUs, especially designed for continuous operation with large capacities. These units are ideal for ship and storage tank loading as well as larger truck or rail terminals:

- Modular concept, resulting in flexible VRU design and fast installation
- High reliability and easy to maintain, ensuring low operational costs
- Innovative 3-bed technology, ensuring minimal VRU footprint
- Superior lifetime for components and carbon
- High level of safety and functionality

Cool Sorption Terminal Series™

Based on more than 35 years of experience with Vapour Recovery and over 320 vapour recovery units installed world-wide, the Terminal Series VRUs are designed for optimal performance at an attractive price and with short delivery time.

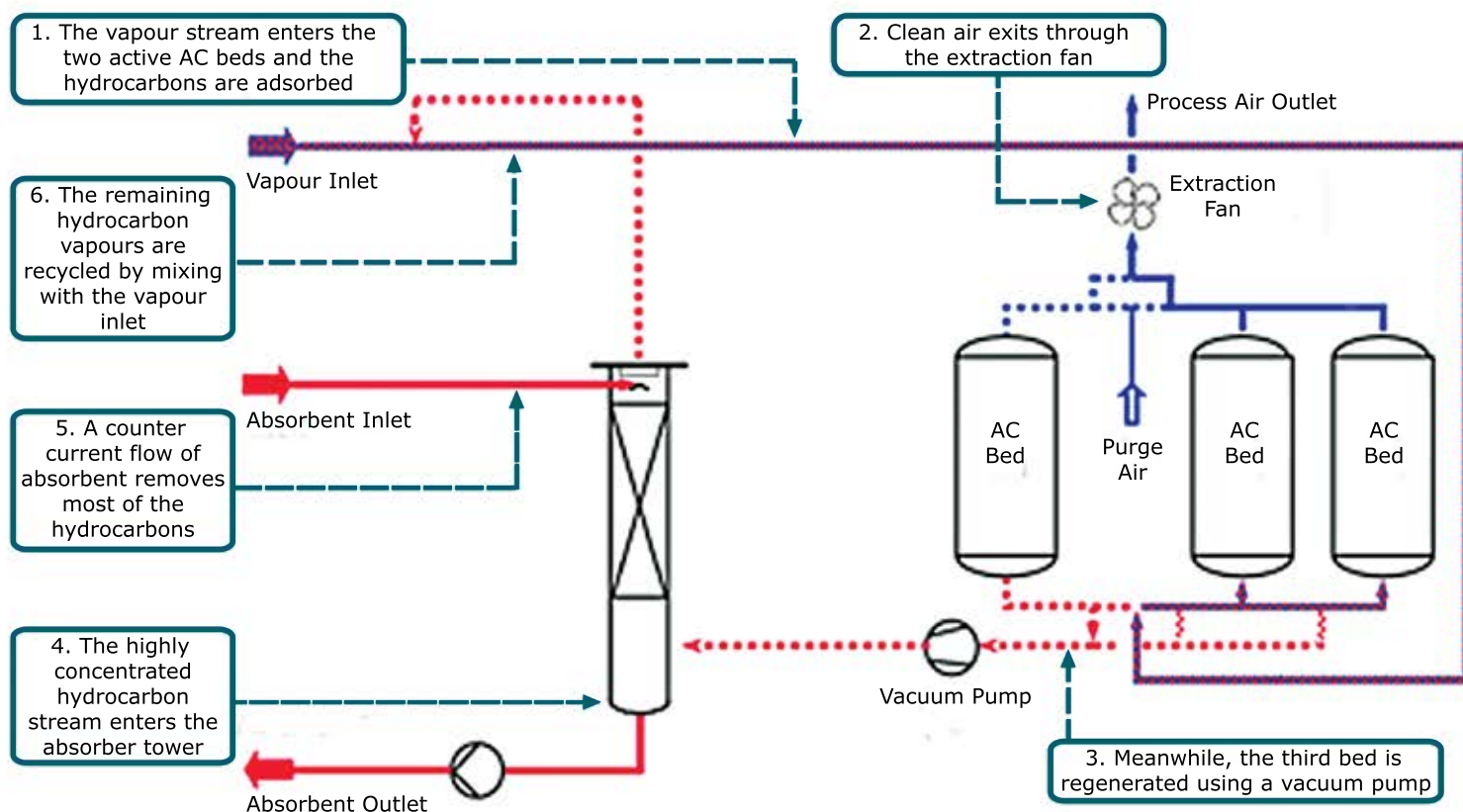
- Designed with extreme flexibility for variations in vapour flow and hydrocarbon concentration
- Complies with emissions from 35 g/Nm³ to 150 mg/Nm³
- Addition of a second stage ensures compliance with TA-Luft demand of 50 mg/Nm³
- Uses rotary vane vacuum pumps for high reliability and low power consumption and maintenance
- VRUs manufactured for all climate conditions, from desert to arctic
- All systems are constructed in accordance with internationally recognised standards and codes



An advanced and user-friendly interface allows the operator to get a clear overview of the VRU

Vapour Recovery Process Description

The Terminal Series™ uses our proprietary 3-bed Carbon Vacuum Adsorption (CVA) solution with three Activated Carbon (AC) beds to recover hydrocarbons. The diagram below shows a simplified flow diagram of the cyclic process:



Unique Features of the Terminal Series™

Pre-Engineered Solution

A pre-engineered and modular design allows a fast and flexible design of the VRU. The modular solution also ensures easy shipment and minimises assemble time on site. Well proven design results in high quality VRU with long lifetime (generally 25+ years), high availability (>98%) and low maintenance and lifecycle cost.

Proprietary 3-Bed Solution

Our unique and innovative 3-bed design uses two AC beds running in series, while the third is regenerated. This solution reduces the total carbon volume and the pressure drop over the AC bed, resulting in a much more compact unit with smaller footprint, lower fabrication & transportation cost and easier installation. A system for internal pressure equalisation during AC regeneration also reduces need for purge air, giving more efficient vacuum pumps and lower internal recycle of hydrocarbons, thus reducing overall power consumption of the VRU.

Zero Pressure Loss

An extraction fan at the AC vessel outlet compensates for all pressure losses in the VRU system, avoiding overpressure in the system and often reducing the necessary vapour inlet pipe size. In most cases the extraction fan excludes the need for a certified Zone 0 vapour transport blower in the vapour header.

Superior Carbon Lifetime

Extremely high duty activated carbon with excellent adsorption and regenerative properties is used in all Cool Sorption VRUs. The use of pelletized, mineral-based carbon, with much higher physical stability than granular carbon, minimises dust tendency, resulting in longer lifetime of the carbon and vacuum pumps, as well as long term compliance with emission demands.

Advanced Activated Carbon Vessel Design

An unique "hold down" arrangement prevents movement of the carbon bed during pressure changes. Formation of dust from friction as well as uneven distribution of the activated carbon is thereby prevented, resulting in long-lasting processing capacity of the unit.

Safety History

No recorded incidents in over 20 years. All pressure vessels and piping are designed to withstand high pressure, ensuring optimal safety even in the highly improbable case of a runaway temperature increase in the activated carbon beds.

Standard Energy Saving Mode and VOC Measurement

Highly advanced energy saving mode utilising loading signal and VOC measurement at vent outlet to control the system and to strongly reduce energy consumption during low operational activities. The VOC measurement system can also be used for emission logging.

Remote Access (Optional)

Connection via secure modem to Cool Sorption service department for easy diagnostics.

Technical Specifications*

MODEL	TS-2500	TS-3000	TS-4500	TS-6000	TS-7500	TS-10000	TS-11500	TS-13500
Absorbent flow, m ³ /h	97	117	176	234	293	410	466	544
Vapour inlet header	8"	8"	10"	10"	12"	14"	16"	16"
Power installed, kW	200	235	350	470	580	820	840	1000
Power Consumed, kW	180	210	315	420	520	735	755	900
Continuous capacity, m³/h								
Emission limit: 10 g/Nm ³	1486	1783	2675	3566	4458	6241	7201	8268
Emission limit: 150 mg/Nm ³	1112	1335	2002	2670	3337	4672	5403	6276

* Capacities in table correspond to VRUs with inlet vapour concentration of 40 vol% and emission limits of 10 g/Nm³ and 150 mg/Nm³, excluding methane. All units can comply with TA-Luft 50mg/Nm³ using a second stage vapour polishing. Data may vary depending on local conditions and requirements. Always consult our sales team to determine the appropriate VRU for your operations as parameters such as product load, HC concentration, type of absorbent and others will dictate the sizing of the unit.

Service and Maintenance

Cool Sorption has a Service and Maintenance Department comprised of highly experienced service engineers. We are available to support both Cool Sorption and third party VRU customers. Our service concept includes:

Breakdown Services

- 24/7 hotline service
- Call-out with guaranteed response time

Preventive Maintenance Services

- Periodic preventive maintenance
- Remote online supervision
- Emission measurement & reporting

Life Cycle Services

- Upgrade and revamp
- Carbon test & exchange
- Consultancy



Cool Sorption A/S, Smedeland 6, DK-2600 Glostrup, Denmark

T: +45 43 45 47 45 | coolsorption@coolsorption.com | www.coolsorption.com