



Vapor recovery system (VRS)

PURPOSE

Vapor recovery system (VRS) is intended for catching and returning of light hydrocarbons into oil products. VRS are used at oil refining factories, tank farms, automobile and railway loading racks for oil product filling, and on sea terminals.

PRINCIPLE OF OPERATION

Mix of hydrocarbons and air existing inside bulk tank is expelled with filled in oil product. This mix goes via steam pipe into VRS through input line with flame arrester. Built-in fan (gas blower) provides compulsory movement of air-steam mix through VRS and creates necessary negative pressure in steam receiver before VRS.

The vapor recovery process is based on adsorption on hydrocarbons vapors by activated carbon and its desorption with vacuum and subsequent adsorption of concentrated hydrocarbons with liquid absorbent (gasoline, diesel fuel, etc.).

VRS comprises two adsorbers operating in turn for provision of the process continuity. When one adsorber is on line at adsorption mode, the other is disconnected from the line and works in regeneration mode – desorption with vacuum.

Activated carbon saturated with hydrocarbons that is out of work cycle of adsorber is regenerated. With this purpose, vacuum is created by vacuum pump inside the adsorber. After desorption ending, atmospheric air is supplied into adsorber to relieve vacuum in adsorber. After this step, the regeneration process is over.

Continuous control over degree of adsorbent saturation is carried out using hydrocarbons concentration control sensor at VRS output. Cleaned air (residual contents of hydrocarbons are less than 35 g/m³) is poured into atmosphere via plug.

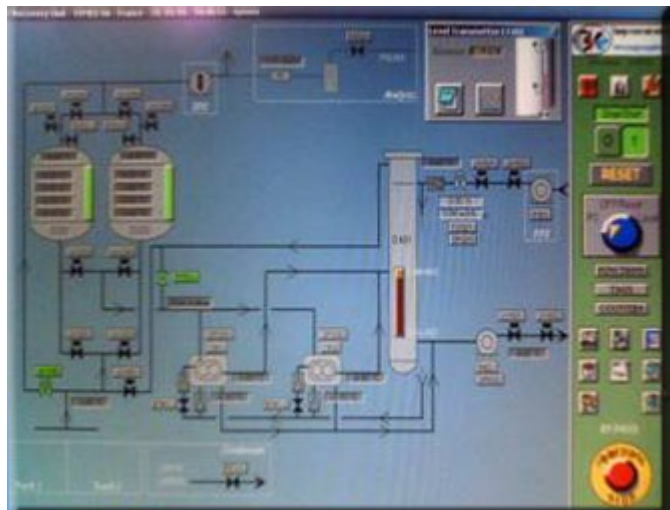
Vapors with high concentration of hydrocarbons go from vacuum pumps to secondary adsorption column; vapors directly contact sprayed stream of adsorption oil product from the top (gasoline, kerosene, diesel fuel, oil), then it is adsorbed and goes into vat section, and then it is lead out to reservoir via pump.

Basic mode of operation VRS is the automatic mode, manual mode is the additional one. The automated control system of processes provides full visualization of the system functioning process. It allows operating any part of installation (pumps, armature etc.) in the basic and additional modes. The automated control system of processes provides recording all actions of the personnel providing service of the system. It can be connected to the enterprise local network for transmitting the data on VRS functioning to the company control system.

All the equipment has explosion-proof embodiment and accompanied with necessary certificates (conformity, explosion-proof, measurement means type).

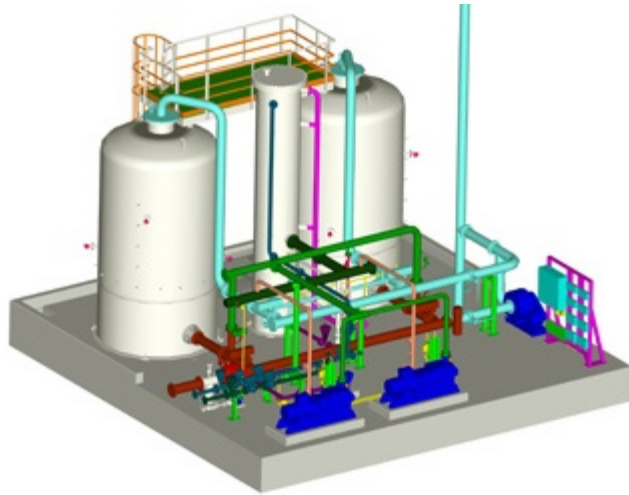
The system has permit for application issued by the Federal Service of Ecological, Technical, and Nuclear Supervision (RosTechNadzor).

Delivery of the equipment is performed as functionally completed open blocks. The company performs delivery, start-up and commissioning, and training of the service personnel. Delivery term is 8 months.



VRS provides:

- | High efficiency,
- | High degree of hydrocarbons vapors catching,
- | Simplicity and safety of operation,
- | Low operational costs,
- | Absence of atmosphere and subsoil waters pollution.



SPECIFICATIONS

Parameter	Value
Productivity of VRS	500, 1000, 2000 m ³ /h (VRS-500, VRS-1000, VRS-2000)
Level of emission of VRS	10 - 35 g/m ³
Power consumption	65 kW (VRS-1000 UHL1)
Degree of hydrocarbons vapors catching	Up to 98%
Working temperature	According to climatic conditions of location from -55 °C up to +40 °C
Overall dimensions of site for VRS locations	10 x 10 m