



AUTOMATIC LOADING STATION FOR LOADING LIGHT MINERAL OIL IN RAILWAY TANKS

APPLICATION

Automated loading station, produced and commissioned by CC "Energocomplekt", is designed for direct weighing and loading seven different types of mineral oil in railway tanks through loading telescopic pipes and also for removal and recuperation of vapors from the loading zone.

OPERATING PRINCIPLE

Tanks are loaded simultaneously on two tracks of the loading station. The station consists of a metal construction bridging railway tracks on top with a control room located in the middle. By means of hauling system, the tank is positioned in the loading zone under loading pipe. Horizontal moving of the loading pipe along (5 m) and across (0.2 m) the tracks allows precise putting down the pipe into the tank hatch.



The loading pipe is controlled by means of a manipulator on the control panel in the control room or from a portable board near the loading pipe. The internal pipe is lowered hydraulically, thereby the protective pipe is also lowered. Due to sealing, the internal pipe and the protective pipe by lowering create a closed system. By movement of the loading pipe from non-working position (5 m above the top edge of rails) inside the tank hatch, the exhaust outlet of the internal pipe remains closed, and a small amount of the product remaining inside the pipe does not flow down. When the sealing plate touches the tank hatch, the external pipe of 400 mm diameter comes out to be partially inside the tank. The control signal "loading pipe in the tank" is set, and the internal pipe is automatically lowered to the tank bottom. After a soft contact with the bottom, the bulk pipe is automatically lifted by 5 cm, and the loading process starts. Upon completion of loading, the process of lifting the loading pipe is carried out in the reverse order. The hauling system of the cars provides simultaneous moving of 32 tank wagons of 85 tons gross weight each. The system is provided with sound and visual signal system for warning the personnel about the train maneuvering.



The control of the loaded product quantity is carried out by continuous weighing the tank standing on a platform scale of 160 tons carrying capacity. An electronic weighing indicator allows determining tare and gross weight, and also transmits the

information of the loaded product quantity to the control system.

To provide ecological cleanness, the loading station contains a vapor recuperation system. The vapors of hydrocarbons, superseded from the tank during the loading process, go on recuperation carried out by reverse adding the vapors of hydrocarbons to absorbent, for example gasoline.

The automated control system of loading processes provides full visualization of all processes taking place on the station. By means of Loadex system, it is possible to operate any part of system (pumps, armature, etc.) both in operating and service modes. Loadex system provides recording all actions of the personnel maintaining the station. The computers of the loading station can be connected to a factory network to provide inputting cars, products and quantity data by the factory dispatcher.

All equipment located in the working zone has explosion-proof design. The loading station has the Gosgortekhnadzor sanction for application in Russia, the certificate of Gosstandart of the Russian Federation.

The equipment delivery is carried out in the form of functionally completed open blocks. At the Customer request, the station is completed with a fire fighting system, emergency top and/or bottom product draining system.

The loading station provides:

- I quantitative control of products in each car;
- I avoidance of atmosphere pollution;
- I avoidance of groundwater pollution;
- I loading safety;
- I safety for the working personnel;
- I lack of mutual pollution of several products;
- I automatic release of the loading documentation for each car.



TECHNICAL CHARACTERISTICS

Parameter	Value
Railway tank volume	60–80 tons
Annual production rate	3,000,000 tons
Daily production rate	8,000 tons
Operating regime	24 hours
Train length	30 tank wagons (12 m each)
Minimal daily throughput	150 tank wagons
Time for loading one tank	16 min
Maximal time for train removal and delivery	1 h
Working temperature - minimal - maximal	- 40 °C + 40 °C
Accuracy of platform scales weighing	50 kg
Mixing of products by transition from one type to another, not more than	100 ml
Emission level of vapor recuperation system	10 g/m ³
Production rate of vapor recuperation system	800 m ³ /h
Amount of actuated coal in two pillars	13,250 kg

The company carries out delivery, startup-setup works and maintenance personnel training.