KOKS ESOT-SYSTEM

Robotic system for storage tank maintenance

The KOKS ESOT-system is designed for heavy industrial applications and is suitable for no-man entry tank maintenance in order to eliminate the need for personnel to enter a hazardous environment. ESOT is the acronym for equipment set for oil tank cleaning. The ESOT-system is utilized in combination with a vacuum truck for discharging and transporting fluid and hazardous substances, such as liquids, sludge, fats, oils, fuels and chemicals. Specially developed for working with hazardous and contaminated substances, the robot is certified for ATEX (Ex) zone 0. The transportable, vented cabin (TVC) is available in an ATEX (Ex) zone 1 and zone 2 version and built in accordance with all applicable safety standards.

Usage

The KOKS ESOT-system enables its user to clean the ATEX zone 0 without a human entry of the ATEX zone 0 itself. Commonly used for the cleaning of black and white oil storage tanks, the health, safety environment and quality improvements are undeniable.

Characteristics

The powerful patented, abrasive, magnet tracks of the ATEX certified robot enable this versatile system to move with ease through the contaminated tank. From the vented cabin every movement of the robot can be controlled and seen on a HD television screen. The robot, which is connected to the vacuum truck, will enable large quantities of (fluid) substances to be processed in a short time and then be transported in accordance with current ASME/ADR (CEOC) regulations. The user benefits from significant time savings and a huge reduction in cost.

Versions

The KOKS ESOT-robotic system can be fitted with various option kits that are appropriate for your needs and/or for industrial applications.

Benefits

- *Cost saving.*
- *Undeniable improvement for health, safety, environment and cleaning quality.*
- *Easy control.*
- *Ergonomic.*
- *Built to the latest environmental and safety standards.*
- *First robot being certified for ATEX zone 0.*
- *No VOC in the ventilated cabin, providing safe conditions for the crew to operate without any need for additional protective gear.*
- *Patented TVC cabin for ATEX zone 1 or 2.*
- *Increase of operational efficiency.*
- *Maximum grip on the floor by patented, abrasive, magnetic tracks.*
- *Strong hydraulic power source.*
- *Heavy duty hydraulically operated arm, creating 2,000 Nm in any direction.*
- *Versatile robotic movements which enable it to move with ease through dense sludge.*
- *Complete robot made of the highest grade of stainless steel, AISI 316 grade; material no. 1.4404.*
- *Compact.*
- *Easy set up.*
- *Able to work continuously, 24/7.*

Technical characteristics

Designed and certified for:

- a 20 ft container.
- operation in ATEX zone 0, 1G, IIB, T4 (robot).
- international protection class IP 66 (robotic system).
- working in ATEX zone 1 or 2 environment (TVC-cabin).

CE 1026 Ex II 1G IIB T4

Robot	
Type	: ADEX robot.
Material	: stainless steel AISI 316 grade; material no. 1.4404.
Certification	: ATEX zone 0, 1G, IIB, T4.
Standards	: EN 13463-1:2009; EN13463-3:2005; EN13463-5:2011; EN13463-6:2005; EN13463-8:2003.
Max. range	: 100 m.
Traction force	: 3,000 N, measured on Fe plate, thickness 10 mm, covered in oil.
Speed in ATEX zone 0	: 1-3 m/min.
Operational depth	: 250 mm.
Ambient temperature	: -10°C to 50°C.
Tracks	: stainless steel, reinforced with magnets and patented abrasive tracks.
Arm motion	: 35° in any direction.
Arm force	: 2,000 Nm.

Dimensions robot	
Length	: approx. 1,800 mm.
Width	: approx. 545 mm.
Height	: approx. 400 mm.
Height with elevated cameras	: approx. 900 mm.
Manhole	: 24"/600 mm.
Weight	: 420 kg.

Cameras	
Type	: image transfer system.
Certification	: ATEX zone 0; ATEX directive 2014/34/EU, EMC. directive 2014/30/EU
Standards	: EN 50303:2000, EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007.
Resolution	: 520 lines, analogue.
Lights	: integrated LED lighting, max. 235 lux.

Transportable, vented cabin (TVC)	
ATEX basic TVC	: ATEX zone 2 basic, Ex II 3G IIB T3.
Ambient/storage temperature	: -20°C to 40°C/-20°C to 50°C.
Max. wind force	: 6 Beaufort.
Dimensions for transport (l x w x h)	: 6,058 x 2,591 x 2,438 mm (without suction chimney).
Dimension at work (l x w x h)	: 6,058 x 2,438 x 6,910 mm (with suction chimney).
Weight	: approx. 7,500 kg (incl. robot and all accessories).
Amount/ ventilated and conditioned rooms : 3/2.	
ATEX fluorescent lighting	: in each room.
Supply voltage/rated current	: 3~400 V, TN-S, 50 Hz/40 A without residual current circuit breaker.
Max./average power consumption with ADEX robot : 11,5 / 7,5 kW.	
Directives/norms	: EN 60079-0:2012+A11:2013, EN 50381:2004.
DVR recording system	: for 4 camera feeds, 1 TB storage.
Control system	: industrial computer enabling semi-automated cleaning program.
Additional accessories	: full HD TV screen, 1,080 px, 32" (80 cm).
	: air conditioning and ventilation unit.
	: sensors for door, overpressure, air flow and fire emergencies.
	: control panel for robot.
	: steel safety plates to cover the windows during transport.

Hydraulic power pack	
Hydraulic power unit	: HAH120-2x1,6-2x9-2x100/a.
Pressure	: 70-100 bar.
Max. power supply	: 5 kW.
Aggregate connection	: 3x 400 V 50 Hz.
Directive	: machinery directive 2006/42/EG, EN ISO 12100, EN ISO 614-1+A1, EN ISO 4413, EN 60204-1ED.2.
Noise level (decibels)	: max. 80 dB(A).

Options