HARNESSING THE LATEST TECHNOLOGY FOR THE HIGHEST SAFETY STANDARDS

High level real-time communication is one of the key success factors for future fail-safe operations on tank farms. This requires interlinkage between individual electronical devices as well as quick data transfer with the host control system of the tank farm. The newest generation overfill prevention controller puts future technology into practice with bus system interconnectivity specifically for use in hazardous areas.

APPLICATION OF OVERFILL PREVENTION CONTROLLERS

Bottom loading technology for tank trucks has proven to be a reliable and efficient process for more than 20 years. Worldwide loading gantries for bottom loading tank trucks are mostly standardised according to either EN 13922 (European standard) or API RP 1004 (American standard). Bottom loading technology enables high-speed filling with typically up to 2500 l/min of various products simultaneously, it increases work safety for truck drivers and protects the environment by attaching a vapour recovery hose. Essential to bottom loading applications is the overfill prevention system with the main processing unit, the overfill prevention controller.

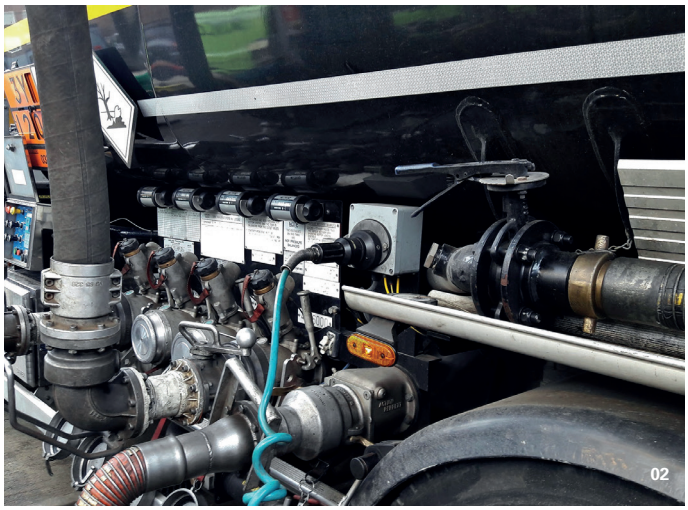
This system monitors the safe filling of liquid fuels into tank trucks, conducts electrostatic grounding and assures the proper connection of the vapour recovery hose at the same time during the whole loading process. Level sensors inside the compartments on top of the truck are connected to the overfill prevention controller, which monitors the filling by a standard plug and socket connection between truck and stationary controller located directly at the filling gantry. The level sensors inside the compartments are positioned in such a way that once a sensor gets activated, product flow stops before a compartment gets overfilled with liquid, which then creates the risk of spilling of the liquid into the environment or even worse, causing the compartment to burst. When a sensor senses liquid, the controller automatically shuts down the filling process for all compartments to prevent possible hazards or any harm to the truck and the loading bay.

The existing standards require the overfill prevention controller to be wired to the overall loading control system by simple binary contact outputs stating ‘permissive’ or ‘non-permissive’ for the loading process.

The requirements by tank farm operators have progressed towards more networked operations according to industry standard 4.0, which not only improves the management of the facility, but also make loading bay operations easier.

NETWORKED DATA COMMUNICATION

In order to achieve the highest levels of safety and efficiency in loading areas, overfill prevention controllers need to be interlinked with a suitable data communication interface.



01 Bottom loading skid with overfill prevention controller EUS-2

02 Connected bottom loading equipment

03 Dual junction box with two park position detectors for barrier control

04 Overfill prevention controller EUS-2 can be opened in hazardous areas

The data interface must be explosion proof for gas hazardous areas. The interface eases process integration and enables intelligent central regulation. Operational state commands can be transmitted to external process control systems, which allows for remote diagnosis and process visualisation.

The analysis of different control units can determine whether a filling process got interrupted by a correctable error, such as a missing vapour recovery hose connection, or an actual overfilling.

The total number of tank compartments (there is a maximum twelve compartments) can be transmitted, as well as the particular number of the overfilled tank compartment. The connection by a data bus follows a pioneering trend by which various single electronical devices are operable centralised and remote controllable. Therefore it is necessary to have an overfill prevention controller that is capable to interconnect directly with other overfill prevention controllers, but also with other devices like card reader systems or data terminals at the same time.

With the linkage of the intrinsically safe bus-system within the hazardous area to any non ex-proof bus system, the transferred data can be used by regular terminal management software (for example OpenTAS by Implico), to optimise processes with regards to time, safety, transparency and cost. The additional information gained can also be integrated into merchandise management systems in the future.

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COMPATIBILITY

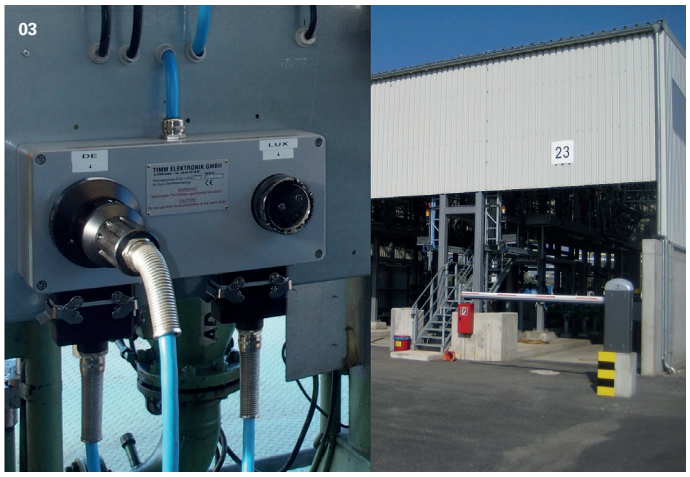
When connected to a tank truck, current control unit versions detect the type of level sensors (optic/thermistor), the sensor installation (five-/two-wire) as well as the way of ground verification (resistance/ground bolt) and activate automatically the required operating mode. According to EC directive 94/63/EG, a single overfill prevention controller fits to all variants of related truck equipment.

ADVANCED FUNCTIONS OF MODERN EQUIPMENT

Overfill prevention controllers are equipped with a clearly visible bright multicolor LED light to signal the release status. In addition modern controllers can clearly indicate to the operator the actual operating status with auto-diagnosis information as plaintext message on a large graphic display. The display also offers effective direct help to the operator in case of failure to ease root cause analysis in case loading is not possible.

Different customisations can be set directly at the device. With data bus linkage it is possible to set the display language individually and automatically correct for the respective needs of the individual operator. The displayed text messages in mother tongue will help truck drivers to resolve problems or errors on site by themselves without additional support.

Moreover, modern overfill controllers enable the instant evaluation of a park position detector for the truck connection plug. This allows a signal light installation or a barrier control in a very simple way. This is recommended to prevent unintentional premature departure of a tank truck while the overfill connection cable is still attached, which typically results in damage on the truck as well as on the filling gantry.



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SYSTEM SOLUTION

The desire to harness technology to elevate safety standards to the next level and improve operating and managing tank farms has led to the development of a completely new generation overfill prevention controller EUS-2, which was brought to market by Timm Elektronik in 2014.

The large display unit offers opportunities for the simplification of commissioning at the installation site. The EUS-2 overfill prevention controller features a unique joystick control inside the housing. Easily accessible on the backside of the front cover, it allows an intuitively configuration with a concurrent view to a graphic display for simple handling and easy setting of the configuration. Character-sets are available for all required languages, depending on region of installation in the world.

The overfill prevention controller EUS-2 is designed under the intelligent explosion protection concept (IEPC). This includes an intelligent combination of various protection methods. With no flame proof enclosure required, the housing can be opened in hazardous areas during operation for easy access to the internal joystick for configuration, but also to be able to quickly execute maintenance measures within a safe environment.

RANGE OF APPLICATION

The type of explosion protection makes the control unit applicable to gas group IIB (ethanol). Furthermore, with its extended temperature range from -40°C up to +60°C, the device provides reliable operation under severe environmental conditions.

The EUS-2 controller is designed in full compliance with the latest editions of European ATEX and EMC standards. It is approved for operation in Australia and Oceania under IECEx registration. The ATEX equivalent approval for India CCOE/PESO certification and the Russian TRCU certification will be achieved within 2017.

FOR MORE INFORMATION

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