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Chapter 8 – Lift drives & controls

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SafeLine EVAC - evacuation and firefighting system for lifts

SafeLine's complete state-of-the-art evacuation and fire intercom communication system for up to 99 floors - providing the safety required by European safety regulations for a building. An intelligent and highly installation-friendly system with a timeless and intuitive design.

The alarm is activated in the building - how do you evacuate people?
During an emergency, lifts normally return to the ground floor and will be out of service until the emergency situation is over. Those who are not able to walk down the stairs will be stuck within the building on different floors. How can you call if the building is fully evacuated or not? Are there still people left on the floors or in the lift lobbies?

With an EVAC intercom system, the distressed and the building's staff are able to communicate by using the intercom stations in the system. On the entrance station's intuitive display, staff can easily see on which floors there are people in need of evacuation and then, with the help of the keypad, choose which station they want to communicate with. The EVAC's distinct design in stainless steel blends into most buildings, and its functions give an intuitive and comprehensible impression - features that can potentially be life-saving in a stress-filled emergency.


A safe choice of fire communication - living up to the European lift standards in fire safety

- Can handle any building up to 99 floors
- Activate system through fireman switch
- Unique floor identities
- Automatic self-checks of floor stations
- 230 VAC supply to main unit
- Intuitive user interface
- Communication for the whole lift system
- Short installation time with little intrusions
UPS Applications

Brake Lift
- single phase 230VAC for release in the lightest loaded direction

Low speed operation
- single phase 230VAC to drive to nearest floor or further at reduced speed

Full lift operation
- three phase 415VAC for full lift operation of any duration

Note: all options have outputs to indicate UPS Healthy and Low battery status
The main supply is feeding the load directly whilst also charging the batteries.
UPS Operation – Mains Lost

With the main supply lost, the load is fed via the batteries
8.11 Control of hydraulic drives

8.11.1 General

Hydraulic lift control systems manufactured in the 1970s were generally of a simple operation whereby a motor pumped (i.e. forced) the hydraulic oil through the pipework into a hydraulic ram, therefore propelling the lift in an upward direction; valves were usually used to restrict the oil flow to slow the lift prior to the lift stopping at a floor level. In the down direction a valve or valves then allowed the oil to return to the reservoir thereby controlling the speed of the lift. There was little if any consideration given to load compensation for variations in oil viscosity due to oil temperature changes. As a result, ride quality was compromised.

Advances in modern valve and motor control technologies, combined with research into hydraulic oil performance, mean that hydraulic valve control can offer significantly improved ride quality.

Oil flow, oil pressure and oil viscosity can now be monitored to give greater stability and control over hydraulic lift performance, allowing for enhanced speed control and improved levelling accuracy with shorter levelling times. This also allows for hydraulic lifts to travel faster than previously was the case; 1 m/s is now achievable.

On modern hydraulic control valves, the oil flow is controlled by an internal hydraulic feedback valve (or pilot valve), or via an electronic oil flow sensor. Electronic oil flow sensors are generally more efficient as they have the ability to react to oil temperature changes and extremes.

8.11.2 Speed control

Traditionally, the pump motor runs only in the up (forcing) direction and raises the complete load for the entire travel of the lift. The required motor power is potentially up to 400% of the required power of an equivalent traction lift if no balance weight option is employed. The speed in the up direction is restricted by the oil flow rate that the pump can deliver (litres per minute) and the diameter of the pipework.

On smaller capacity lifts the motor may be of direct-on-line (DOL) starting and running operation. However, these demand high starting torques (current), which equates to reduced ride quality. Lift speed, acceleration and deceleration profiles are controlled by restriction of the oil flow by the valve block.

Figure 8.12 below shows direct-on-line control of a hydraulic pump motor.

Star-delta pump motors are used for small to mid-range hydraulic lifts, with reduced starting torque and current when compared to direct-on-line starting. As with the direct-on-line pump, lift speed, acceleration and deceleration are controlled by oil flow restriction of the valve block. Figure 8.13 below shows star-delta control of a hydraulic pump motor.
Questions?