CIBSE Guide D: 2025

Chapter 8 – Lift drives & controls

Principal authors
Michael Turner (Lester Control Systems Ltd.)
Acknowledgements
Lutfi Al-Sharif (University of Jordan)
Brian Preston (Magnetek UK Ltd.)
Don Vollrath (Magnetek Inc.)
Russell Walker (Atwell International Ltd.)

What does Chapter 8 do?

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MAYOR OF LONDON

THE LONDON PLAN

THE SPATIAL DEVELOPMENT
STRATEGY FOR GREATER LONDON

MARCH 2021

SafeLine EVAC

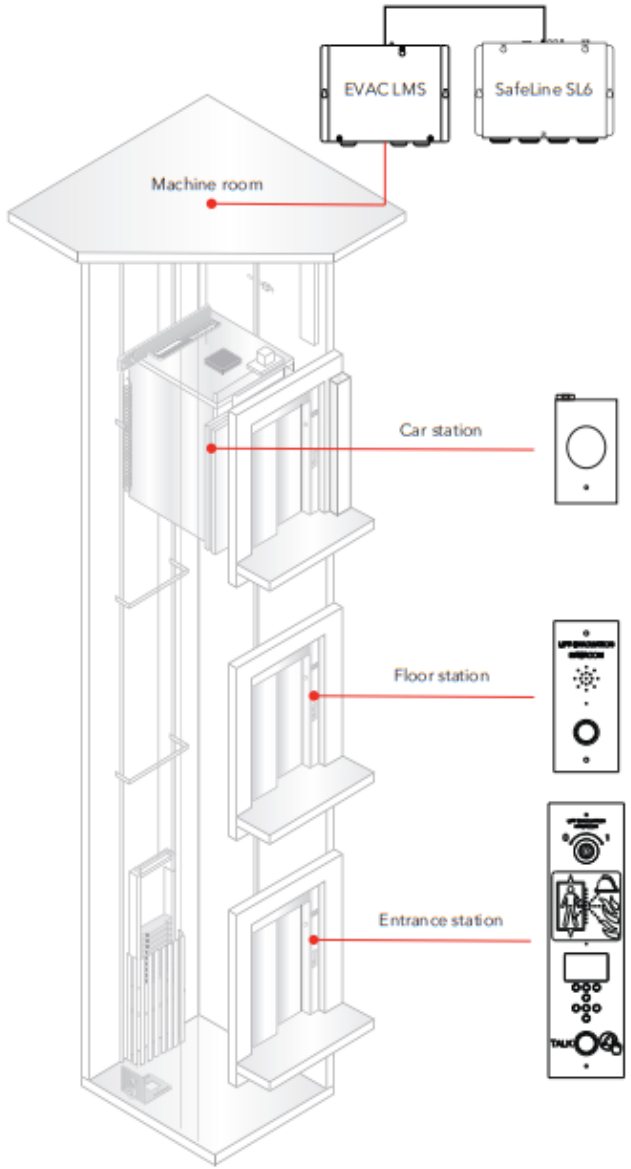
– evacuation and firefighting system for lifts

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 tell if the building is fully evacuated or not? Are there still people left on the floors or in the lift lobbies?

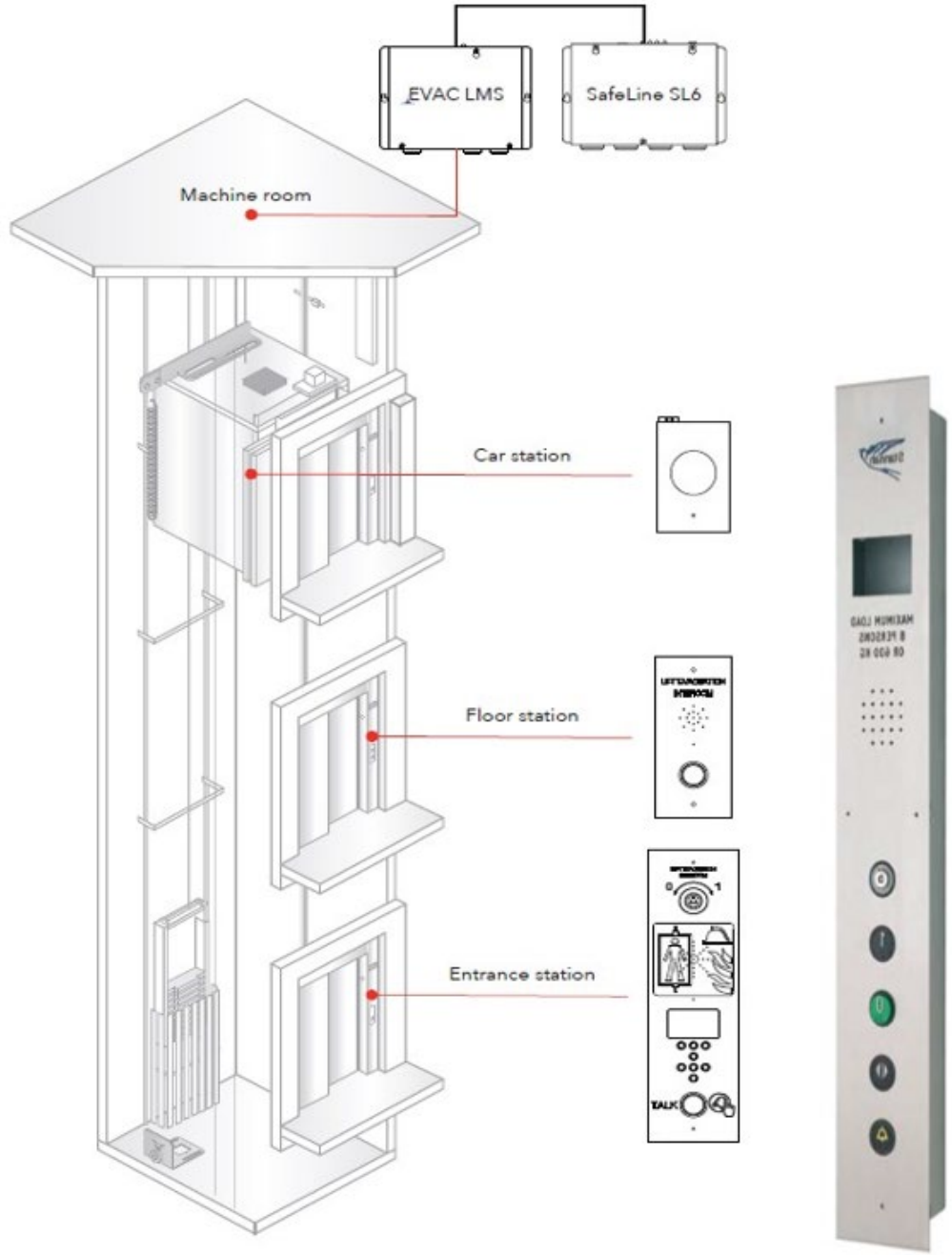
With an EVAC intercom system, the distressed and the building's staff are able to communicate by using the intercom stations in the system. On the entrance station's intuitive display, staff can easily see on which floors there are people in need of evacuation and then, with the help of the keypad, choose 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.

SafeLine EVAC meets the strict demands of the European lift standard for fire: EN81-72, and the British building standard for evacuation: BS 9999:2008.



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


EVAC LMS
SafeLine SL6
Machine room
Car station
Floor station
Entrance station
TALK

UPS Applications

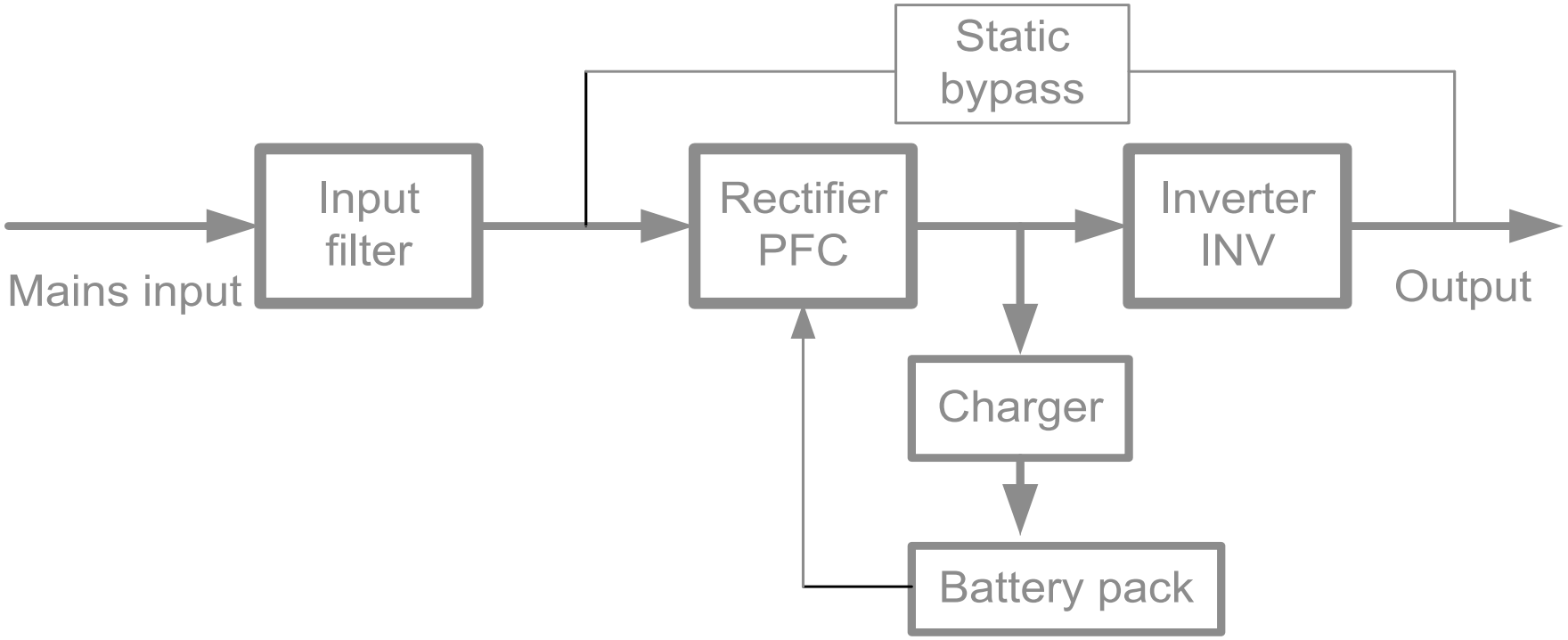
Brake Lift
– single phase 230VAC for release in the lightest loaded direction

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

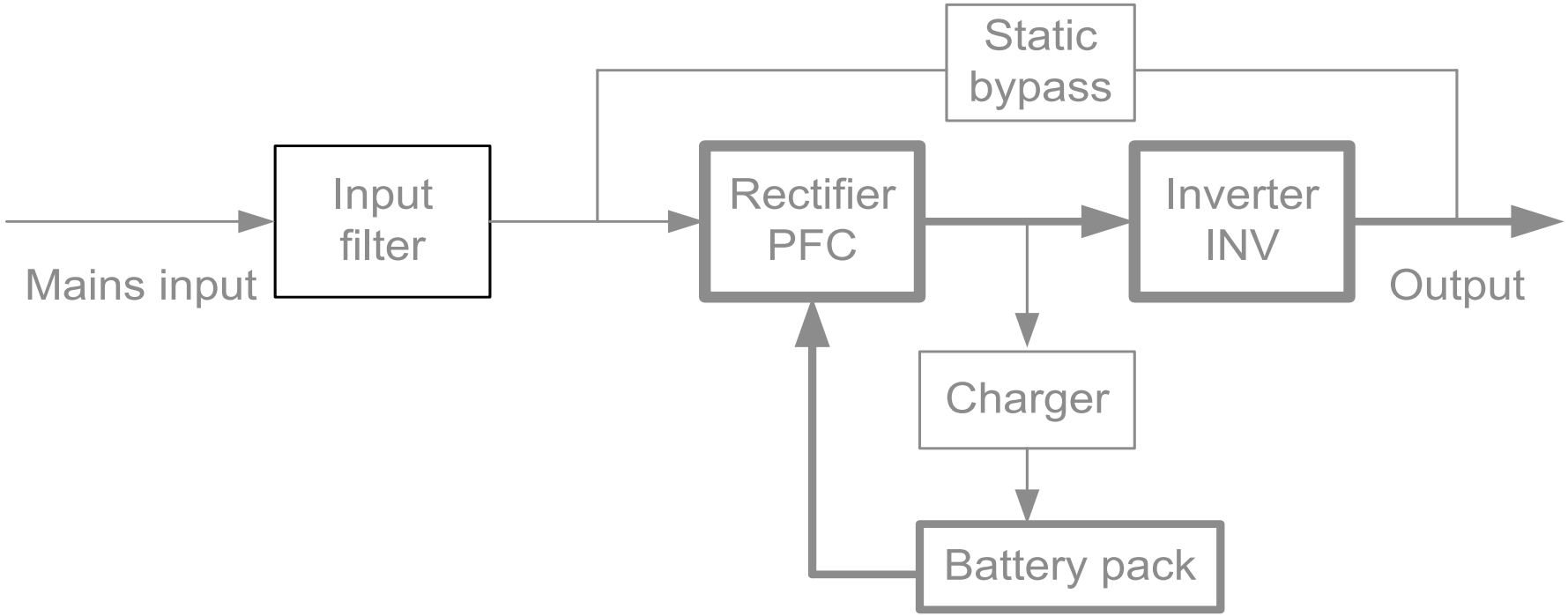
Note: all options have outputs to indicate UPS Healthy and Low battery status

UPS Operation – Mains Available

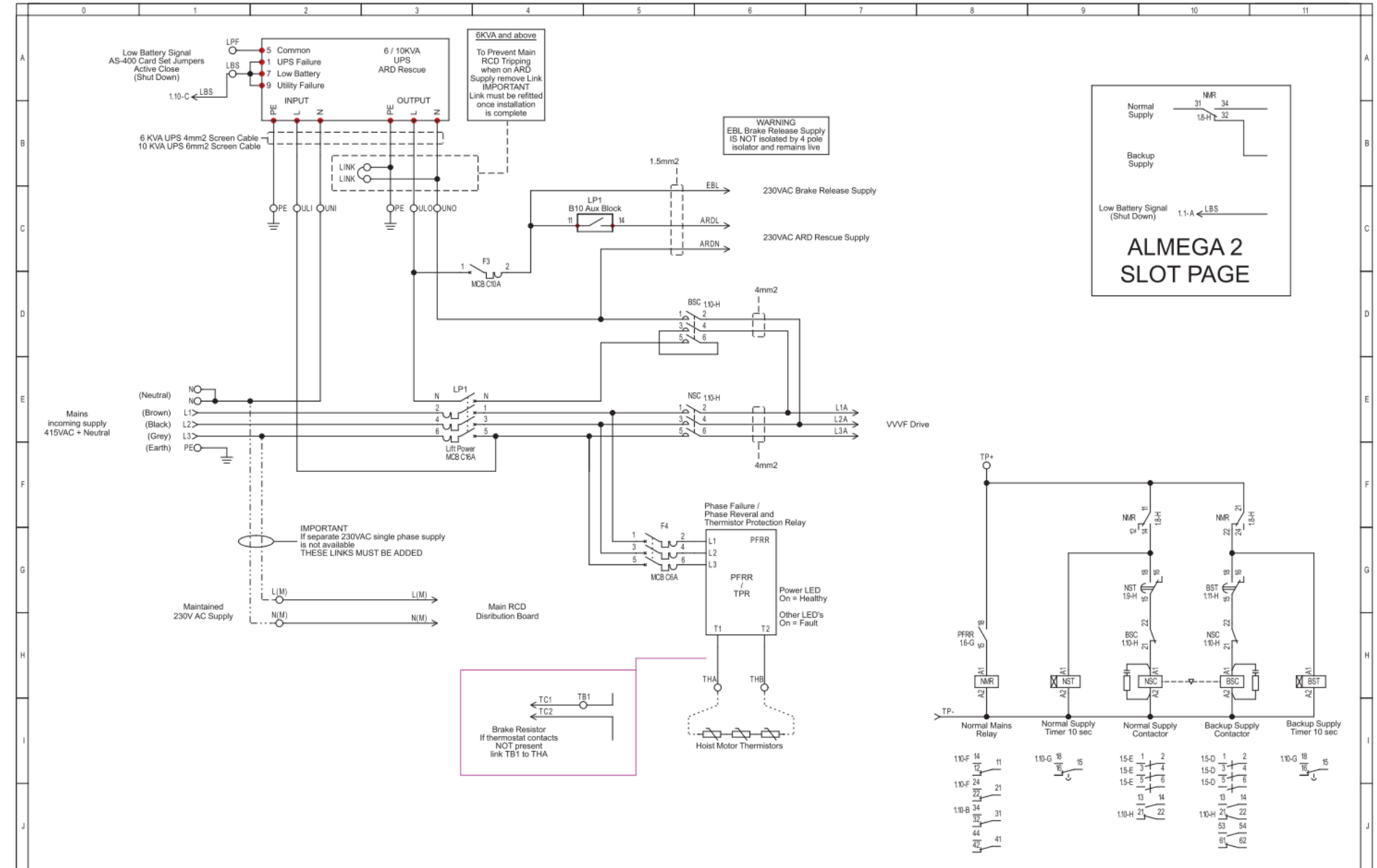


The main supply is feeding the load directly whilst also charging the batteries

UPS Operation – Mains Lost



With the main supply lost, the load is fed via the batteries



DATE:	13/11/2020
COMPANY:	Lester Control Systems Ltd
SITE NAME:	Lutterworth
WORKS NO:	0000
LC NO:	00000
PAGE:	1 of 1

	Description	Int	Date
Rev 1			
Rev 2			
Rev 3			
Rev 4			

PAGE TITLE

Emergency Power
Supply Controls

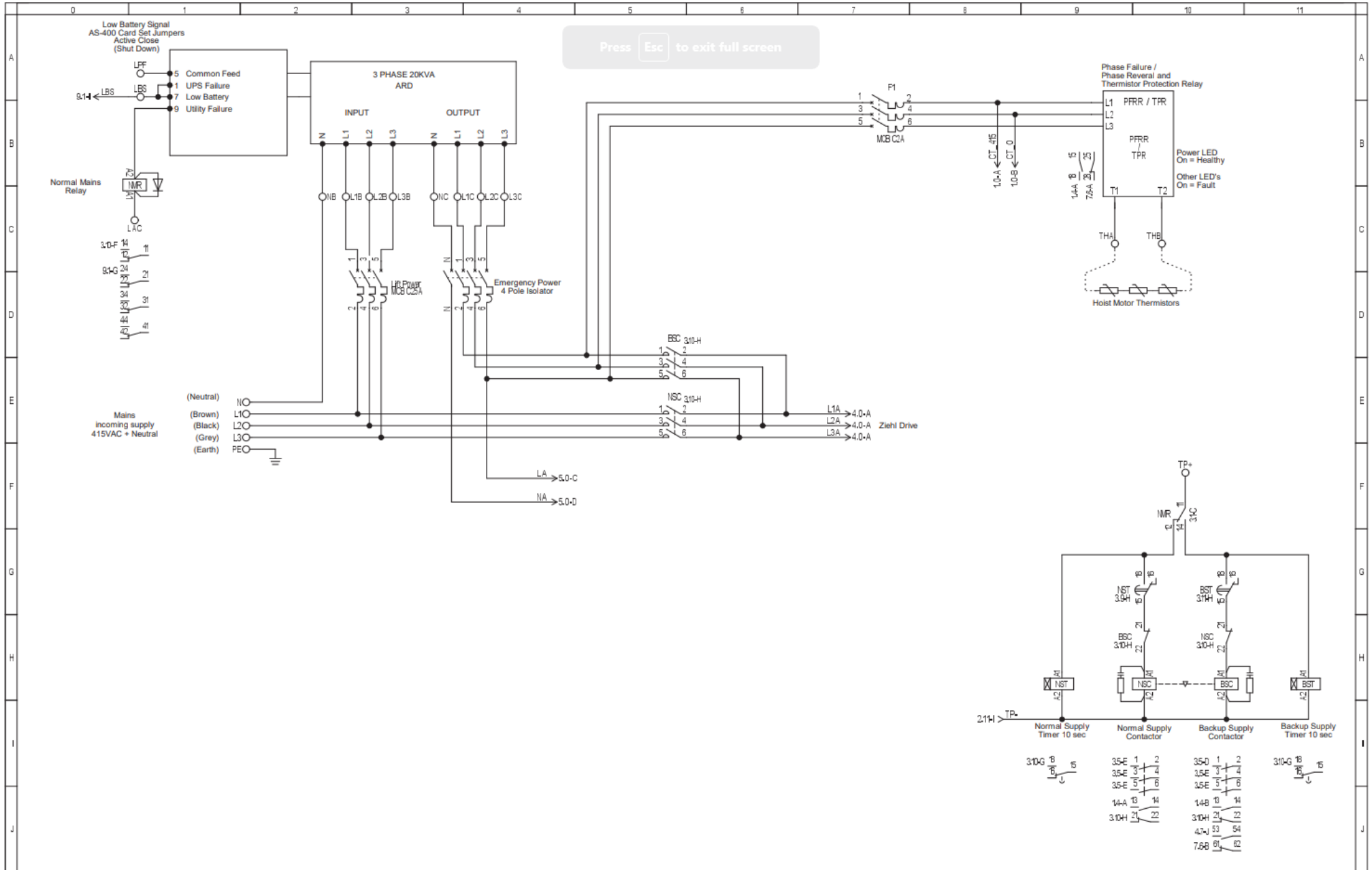
LESTER CONTROL SYSTEMS LTD

59 Imperial Way
Croydon, Surrey
CR0 4RR

TEL: 020 8288 0668
FAX: 020 8288 0667
EMAIL: info@lestercontrols.co.uk

NOTES

To prevent emergency rundown, First switch off
4 pole isolator in control panel before isolating incoming mains supply



DATE: 20/06/2023
COMPANY: Specialists Lift Sevices
SITE NAME: 20 Penn Street
WORKS NO: 21216
LC NO: 37566
PAGE: 3 of 17

	Description	Int	Date
Rev 1			
Rev 2			
Rev 3			
Rev 4			

PAGE TITLE

Mains Supply
ARD Rescue System

LESTER CONTROL SYSTEMS LTD
Unit D, 18 Imperial Way
Croydon, Surrey
CR0 4RR
TEL: 020 8288 0668
FAX: 020 8288 0667
EMAIL: info@lestercontrols.co.uk

NOTES

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. * 1m/s has been available since 1978 with the first Kuchen HRV - enhanced speed control with modern ones improves the levelling accuracy

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. The latest generation of valves monitor oil flow, pressure & temperature to provide the best travel times & comfort.

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. Lowering down direction

On smaller capacity lifts the motor may be of direct-on-line (DOL) starting and running operation. However, these demand high starting torque (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?