

E300 frequency inverters – re-orientation for LiftEquip

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The components used in modern lift design should not only reflect the state of the art, but also satisfy the diverse requirements of the market. Today's products must already embrace the concepts and technological needs of the future in order to accommodate future strategic developments, such as smart lifts.

LiftEquip has been serving customers for many years not only as a component supplier, but also as a leading player in the kit and end-to-end system markets. Certain market developments are also illustrating, however, that suppliers do not need to develop, manufacture and continuously update all of their components themselves. In fact, we have always attached importance to identifying partners who are capable of meeting our product and quality demands. In connection with the certification and type testing of the lift system LEA Comfort, its manufacturer decided to collaborate with the motion control manufacturer Kollmorgen, whose range includes several inverters.



Figure 1: Inverter E300 and energy recovery module M600

The springboard for the project described below was a long track record of successful cooperation between some major customers and the inverter manufacturer Control Techniques (Figure 1), whose products have been installed alongside the worm gears and gearless drives made in Neuhausen. Several critical systems, moreover, including gearless drives with 1:1 suspension and low speeds, as well as high-performance systems offering a very comfortable ride, had been commissioned in the past with inverters built by Control Techniques. In view of such favourable experiences, the new E300-series lift inverters produced by Control Techniques were selected as strategic components.

Among the compelling technical arguments supporting the decision were the inverters' ability to cover the drive portfolio's entire performance spectrum and their compliance with market requirements as regards control, load measurement, contactorless operation, and the option of energy recovery (Figs. 2 to 4). They also allow an emergency power mode (Fig. 5). The devices can be used with both synchronous and asynchronous drives without any hardware or firmware modifications.



Figure 2: Energy recovery with M600

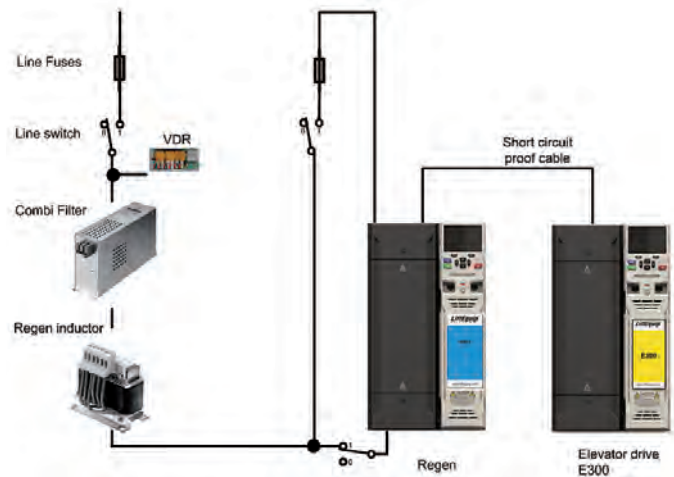


Figure 3: Full energy recovery with M600

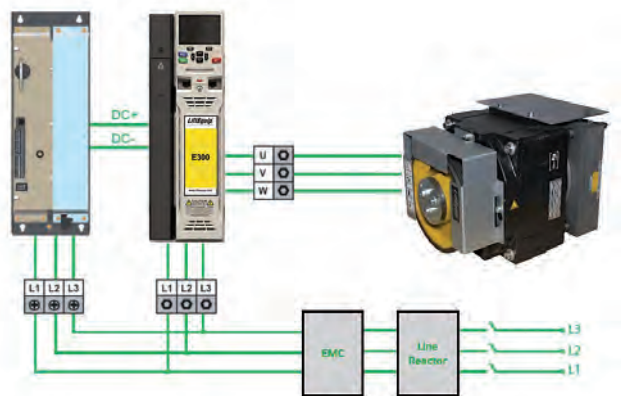


Figure 4: Partial energy recovery with SP1

1) LiftEquip GmbH
2) Control Techniques

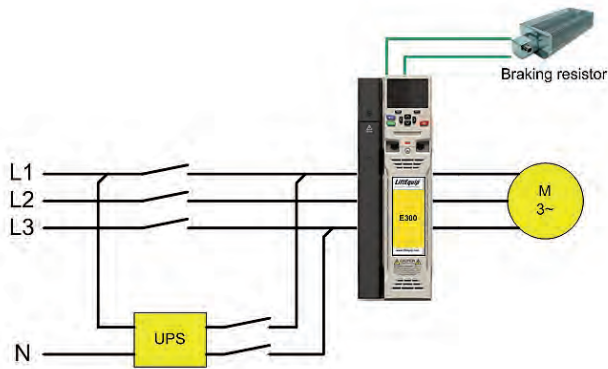


Figure 5: UPS mode

In relation to ease of use, the requirement arose to modify the data parameters so that the motor data of the LiftEquip drives are easily retrievable for commissioning purposes. Control Techniques met this requirement by storing the drive parameters on a memory card (Fig. 6) and allowing their retrieval, in combination with the LiftEquip firmware, through selection of the relevant motor. A LiftEquip label is attached to this generation of devices to set them apart visually.

The motors can be supplied with various encoder systems at the customer's request. The lift systems can also be operated with a variety of controllers. The non-standard inverter and controller interface can be modified with the smartcard (Figure 6) by way of optional macros.



Figure 6: Smartcard

The product is only as good as the support offered to the controller engineers and installers. The familiar hotline number is therefore to be retained as a source of technical support in case of any problems. Members of the LiftEquip technical support team will be available to answer controller engineers' questions and resolve problems that are beyond the scope of the hotline. Control Techniques will also be on standby to provide advice as necessary.

An installation video accessible from the homepage www.liftequip.de describes the modular design as well as the inverter's installation and commissioning.

To cater for installation in the headroom or wall mounting in the machine room (Figure 7), a shaft installation kit (SIK) with integrated choke and EMC filter for device sizes up to 22 kW has been developed. These device versions are similar to the existing devices in the series MFC 30/31. At pre-



Figure 7: Inverter E300 for wall mounting

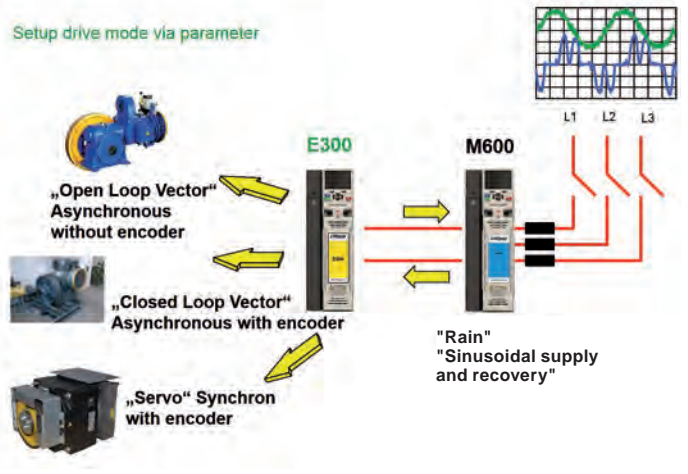


Figure 8: E300 control modes

sent the brake control still has to be implemented externally in the controller. The various controls and control modes are illustrated in Fig. 8.

As regards UCM monitoring (Fig. 9), the functionality of the inverter is also important – if a speed threshold is exceeded, a fast shutdown has to be implemented to disconnect the lift from the power supply and bring it to a standstill.

Our training centre offers customers tailored inverter courses that allow them to practise inverter installation, commissioning and ride quality optimisation using a model of a lift.

Thanks to its modular design, the inverter can be configured for the necessary interfaces and ports (Fig. 10) according to the customer's wishes. Parameterisation (Fig. 11) can be performed by way of the display on the inverter. The display is detachable, which allows the parameters to be entered outside the shaft by way of a cable. The most elegant option, however, is to perform parameterisation from the controller by way of the interface.

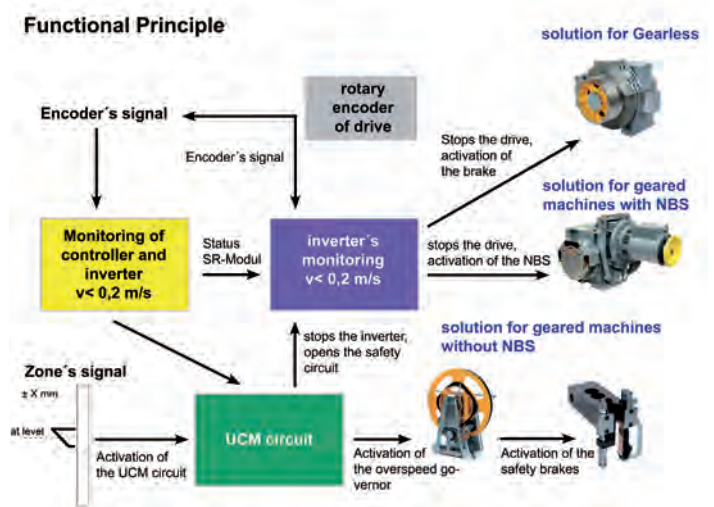


Figure 9: UCM shutdown

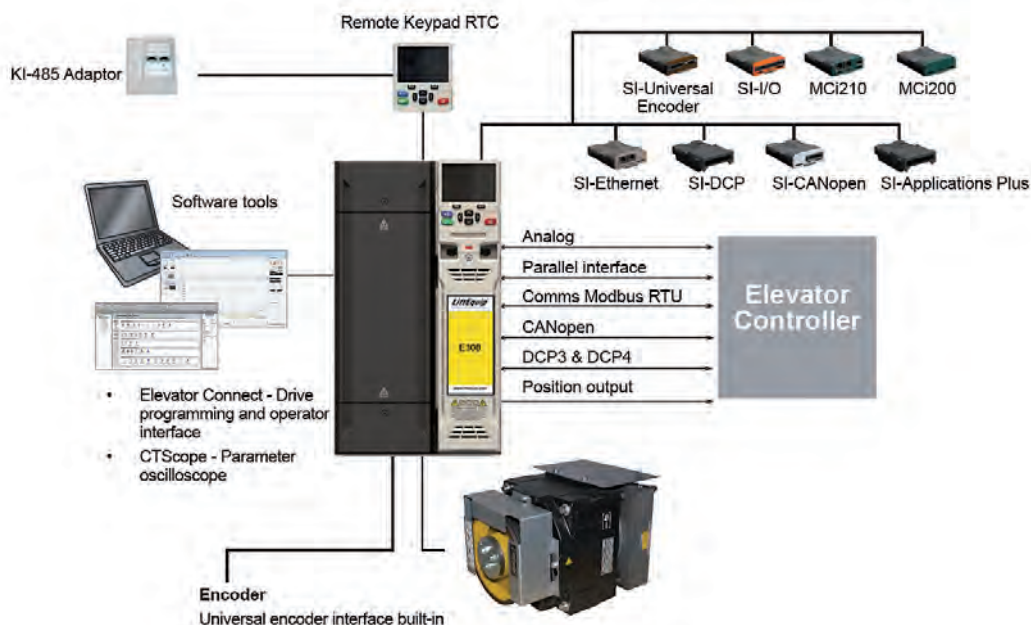


Figure 10: Flexible Integration

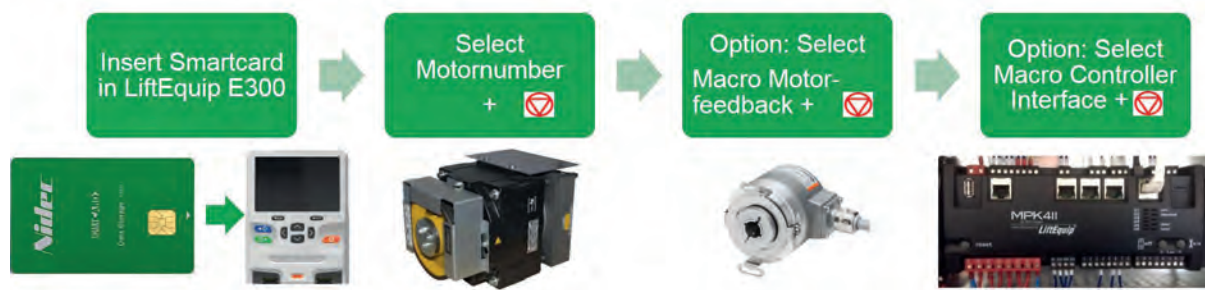


Figure 11: Commissioning and parameterisation

The E300-series inverters are the successors to the LiftEquip MFC range. In this connection they have been integrated in the configurator LEKalk 3.0 to allow users to configure the drive design, specify the desired scope of supply and produce the associated documentation as before.

Replacement devices and modernisation

MFC inverters are to remain available as replacements for old models. With an eye to the future, the E300 is a conversion set that allows the new model to replace existing MFC 20/21 devices in the

controller or serve as a wall-mounted replacement for the MFC 30/31. Adaptation work is in progress for each of these variants which will allow the existing connectors to remain in use.

Conclusion and outlook:

This E300 series, with its diverse interfaces and options, is capable of implementing practically all customer wishes. It can be installed as a new system, replace an existing MFC inverter, or form part of a comprehensive modernisation project. Energy recovery where necessary and appropriate, and emergency operation with UPS or a diesel

generator, can easily be accommodated. LiftEquip is thus already well positioned to respond to future needs, including automated emergency evacuation. In addition to its collaboration with Kollmorgen, which was initiated in the context of type testing the LEA Comfort, LiftEquip has added another system component to its range by adopting the E300 series of inverters. By working together with two capable partners, LiftEquip is able to fulfil the demand of planners and operators for a free choice of components, kits and systems in every category.