REPRINT
Specialist article

"Rightsizing" optimises the value creation chain

8400 Inverter Drives responsible for process optimisation from delivery through to service

For some years now, the machine-building and systems engineering sector, while constantly striving for innovation, has been facing the challenge of reducing the costs in its own value creation chain. Instead of simply focussing on component prices, the remit has extended to all processes. In this context, that is in relation to drive and automation technology, topics such as ease of selection and commissioning, intuitive operation, rapid service and suitable remote maintenance concepts play a defining role.

Lenze's new 8400 Inverter Drives series of frequency inverter drives follow this trend; i.e. the inverters are more than merely new drive components. The new member of the L-force drive and automation platform is instead more designed to offer precisely fitting solutions being a series of devices that is graduated in functionality and drive behaviour. The inverters support the machine building and process engineering value creation chain in all its phases. The functional scaling of the BaseLine, StateLine and HighLine variants enables. Rightsizing to establish the basis for selecting the optimum 8400 Inverter Drive for the application concerned.

Directly and clearly defined

The functions and equipment level of the inverters are clearly graduated and build consistently on one another as you go up through the product line – from BaseLine to HighLine. At the same time, Lenze has paid particular attention to the consistency of the features. For example, all the variants can be used in the same ambient conditions, are configured through the same diagnostics interface and use the same configuration software. This makes them significantly easier to use in engineering, during commissioning and in service, the more so since the series fits seamlessly into the L-force system.

BaseLine, StateLine, HighLine: The 8400 Inverter Drives 8400 have a graduated scope of functions

Simple handling, that's what its all about. So even when it comes to the design of the 8400 Inverter Drives, the emphasis is clearly on the usability side. No visual adornments to hinder clean wiring, clear reference edges and straight lines for tidy control cabinet construction. Good usability continues in configuration and programming, with the L-force Engineer software used throughout, and reduces training and planning costs, for instance.

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Central memory module

In this context, the memory module is amazingly useful. This pluggable memory unit contains all the inverter's parameters. This makes parallel working possible, a particular benefit in series production machine building. User-friendly offline configuration of the frequency inverter becomes possible. For its part, the data can be copied to modules as many times as you like. In this way the separation of software and hardware makes setting up quicker. The inverter is ready for use directly the fully programmed module is plugged in.

In addition, this concept accelerates servicing times and thus increases the availability of production lines. If a drive needs to be replaced, there is no need for time-consuming reconfiguration or download of settings to the inverter. Motor data, controller settings and the configuration of fieldbuses are immediately available. The existing module is simply plugged into the replacement unit - job done. This is a task that could even be undertaken by the production company's maintenance staff, without having to remember important settings.

Faster in operation

Lenze states that it has tested out user navigation – whether by keypad on or the PC – down to the last detail and has refined it and refined it. The focus was to make it as easy and as intuitive as possible to set up the drives. The 8400 Inverter Drives have now rounded off the L-force concept for drives. The keypad, that was introduced with the 9400 servo-inverter series, is used for the two series of the drives. This makes both setting up and operation easier. The robust, plug-in unit has a plain text display, context-sensitive keys and Start-Stop buttons, and uses an intuitive menu structure familiar from mobile phones. The backlighting improves legibility, particularly in a dark environment. Where inverters are installed in less accessible places, the keypad may be combined with a shock-proof hand-held unit, including a protective cover and a 2.5 m long connecting cable. The hand-held unit is also suitable for installation into an IP 54 control cabinet door. The protective cover keeps out dirt and is easily cleaned.

The unit is operated from the PC using the L-force Engineer PC software. This provides simple configuration of the inverter – from the free of charge StateLevel version. With the HighLevel version it is possible to design and commission complete machines, including all axes and their bus configuration. By comparison with working with different software tools, this across-the-range tool prevents compatibilty issues and speeds up familiarization.

Ready to **Rightsize!**

Practice Plus

Identical look & feel reduces costs in practically all the steps in the machine builder's and operator's value creation chain. Lenze's 8400 frequency inverter series thus represents a full product range for the OEM business — with the emphasis on scalability in price, function and drive performance. Standardized handling and equipment configuration, working with just one software tool for engineering are further advantages with a beneficial effect on the value creation chain.

Three inverter variants

The BaseLine inverter is available as a single-phase drive rated at 0.25 to 2.2 kW and as a three-phase drive rated from 0.37 to 3 kW. StateLine and HighLine cover single-phase outputs from 0.25 to 2.2 kW. Five outputs are available as a three-phase drive ranging from 0.37 to 11 kW. The inverters from the StateLine and HighLine ranges are supplied with the preinstalled shield plates for the motor and control cables. This makes installation intuitive and safe, and even when servicing you only need to undo one screw. The wiring remains completely unchanged, even if a unit needs to be replaced.

Robust and communicative: The 8400 StateLine is recommended for applications in production and conveying engineering

In respect of functionality and drive performance, the 8400 BaseLine inverter represents the base model in the series and comes into its own when solutions need to be put in place for simple applications, for instance conveyors or pumps. The integrated keyboard with a four-position seven-segment display makes rapid diagnosis and configuration possible, even on the fly. The integrated diagnostics interface can be used to connect the inverter to the PC, for the purposes of configuration, for instance. In addition to functions such as sensorless vector control or i^2t motor monitoring, the unit shares features with the other members of the 8400 series. These include the high permissible ambient temperature of 45 °C without limitation of the

The 8400 BaseLine is the entry level model for the new series

operating characteristics and standardized operation using the L-force Engineer software.

The functional characteristics of the BaseLine inverter are included in full in the 8400 StateLine and complemented by further functions. For instance, connecting incremental encoders allows closed control loops to be set up. It relieves higher-level control units and enhances the precision and speed of the process. In addition to use in BaseLine applications with more demanding requirements, the 8400 StateLine is recommended for extruder, line and travelling drives, high-speed rolling doors and simple lift tables or variable speed drives. For example, the integrated flying restart circuit offers

optimum pick-up of freely running motors and avoids rejects in the event of mains failures during production. The integrated brake chopper allows the direct connection of brake resistances which can be monitored over a wide temperature range by means of a software function. This ensures overheating protection without the need for additional wiring.

When used in machines in which the mains supply for the inverter is frequently switched on and off, the 8400 StateLine comes into its own. The integrated self protection function protects the inverter from damage by over-frequent switching on and off. This reduces the complexity of monitoring functions internal to the machine and additional machine documentation. Sensorless vector control in conjunction with high overload behaviour of up to 200 % makes this version particularly capable of handling varying loads. As standard, the StateLine is fitted with a CANopen interface for communication or diagnostics. An interface for expansion to typical fieldbus or industrial Ethernet systems such as PROFIBUS, EtherCAT, Powerlink or PROFINET is also provided.

The third step in the range, the HighLine 8400 Inverter Drives have, in addition to the functional range of the StateLine, a fully functioning, integrated positioning control and integrated hardware for low-wear activation of electromagnetic brakes. The units are hence recommended as efficient drives for applications such as rotary feeders, filler systems, roller and sliding doors or for positioning tasks in warehousing systems.

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Functionality uniformly and consistently scaled, operation always the same: Lenze's new 8400 Inverter Drives