

# 9300 vector *frequency inverters*

0.37 ... 400 kW



**Flexible, precise, powerful**

A close-up photograph of a blue perforated metal surface, likely a cooling fan or heat sink, with a grid of square holes. The image is slightly blurred, emphasizing the texture and color of the material.

**Lenze**

## 9300 vector | Flexible, precise, powerful

Lenze frequency inverters are used in many industrial sectors and applications for electronic speed control of drives. We offer standard products with flexible application possibilities, easy and quick commissioning, reliability and, of course, high quality. The 9300 vector is a vector-controlled frequency inverter that is best suited for demanding applications as for example material processing, dosing and feeding systems, as well as winding drives. Excellent drive behaviour – even

without speed feedback – and undreamt-of possibilities for solving control tasks are only a few outstanding features provided by this frequency inverter.



# Technology | Powerful, versatile, reliable

## Excellent drive behaviour

ensures stable, safe and accurate processes

- ▶ Overload capacity of max. 180 % torque
- ▶ Speed setting range 1 : 100 (1 : 1000 with feedback)
- ▶ Excellent speed stability
- ▶ Fast speed corrections to changing loads
- ▶ Torque setting range up to 1 : 10 (1 : 20 with feedback)
- ▶ Rapid response times – cycle time for digital inputs 1 ms



**Plug-in stations for communication**  
(e.g. keypad)



**System bus interface (CAN)**

(e.g. for networking several inverters or connecting them to a higher-level host system; also operation is possible via this interface)

**Digital/analog inputs and outputs**  
(pluggable terminal blocks)

**Incremental encoder input**

(connection of a feedback system)

**Digital frequency input/output**

(e.g. for precise, speed-synchronous control of multi-motor drives)

**PTC input**

(motor protection through PTC thermistors or thermal contacts)



# Implement ideas | Flexible, comfortable, quick

## More flexibility through function blocks

The almost indefinitely flexible application of the 9300 vector is made possible because of function blocks which are stored in the software of the 9300 vector and can be linked freely. More than 100 function blocks, comparators, delay elements, logic and mathematical function can only give an impression of the varied possibilities.

## Free control features

Due to the freely connectable function block structure the 9300 vector can carry out additional control functions besides

the drive task – similar to a PLC. Higher-level control systems can have their loads reduced or even become superfluous – without any additional costs for you.

## User-friendly

Function blocks are operated, analysed and connected using the comfortable and easy-to-understand operating software “Global Drive Control”. Even inexperienced users can intuitively operate a system with this software. The 9300 vector can be connected with a PC via an RS232/485-interface or a PC system bus converter.

The screenshot displays the 'FB editor - DIGIN' window. The main area is titled 'DIGIN - Dig. input E1 - E6' and shows a ladder logic diagram with six digital input channels (X5/E1 to X5/E6) and a common neutral (CNH). Each channel is connected to a specific output: X5/E1 to R/LQ-R, X5/E2 to R/LQ-L, X5/E3 to NSET-J, X5/E4 to MCTRL-... (partially obscured), X5/E5 to MCTRL-... (partially obscured), and X5/E6 to ASW1-S. A toolbar at the top includes icons for selection, deletion, and linking. On the left, a list of function blocks is shown, with 'DIGIN' selected. Below the list, there are options for 'Function blocks' (all available, only used) and 'Sortierung' (alphabetical, process). Overlaid on the main window is the 'Global Drive Control' parameter menu, which lists various drive parameters such as 'Delay shut stop', 'Delay Diagnostics', 'Delay Terminal (diagn.)', 'Delay Terminal Linking', 'Delay Signal Configuration', 'Code bit', 'Level / Slip', 'Diagnosis', 'Motor stop', 'Main function block', 'Terminal ID', 'Encoder', 'Motor Feedback', 'Motor speed', 'Feedback', 'Monitoring', 'LECCManual', and 'Control bus'. Below the parameter menu is an 'Oscilloscope' window showing a list of digital signals with their current states: ASW1-OU (ON), MCTRL-N (ON), MCTRL-A (ON), MCTRL-M (ON), and MCTRL-4 (ON). At the bottom of the screenshot, there are six monitoring widgets: 'MCTRL-ASET2' (79.0), 'MCTRL-MSET2' (4.0), 'Heatsink Temp' (35.0), 'MCTRL-AACT' (2390.0), 'Actual motor current' (0.5), and 'Utilization' (28.0).

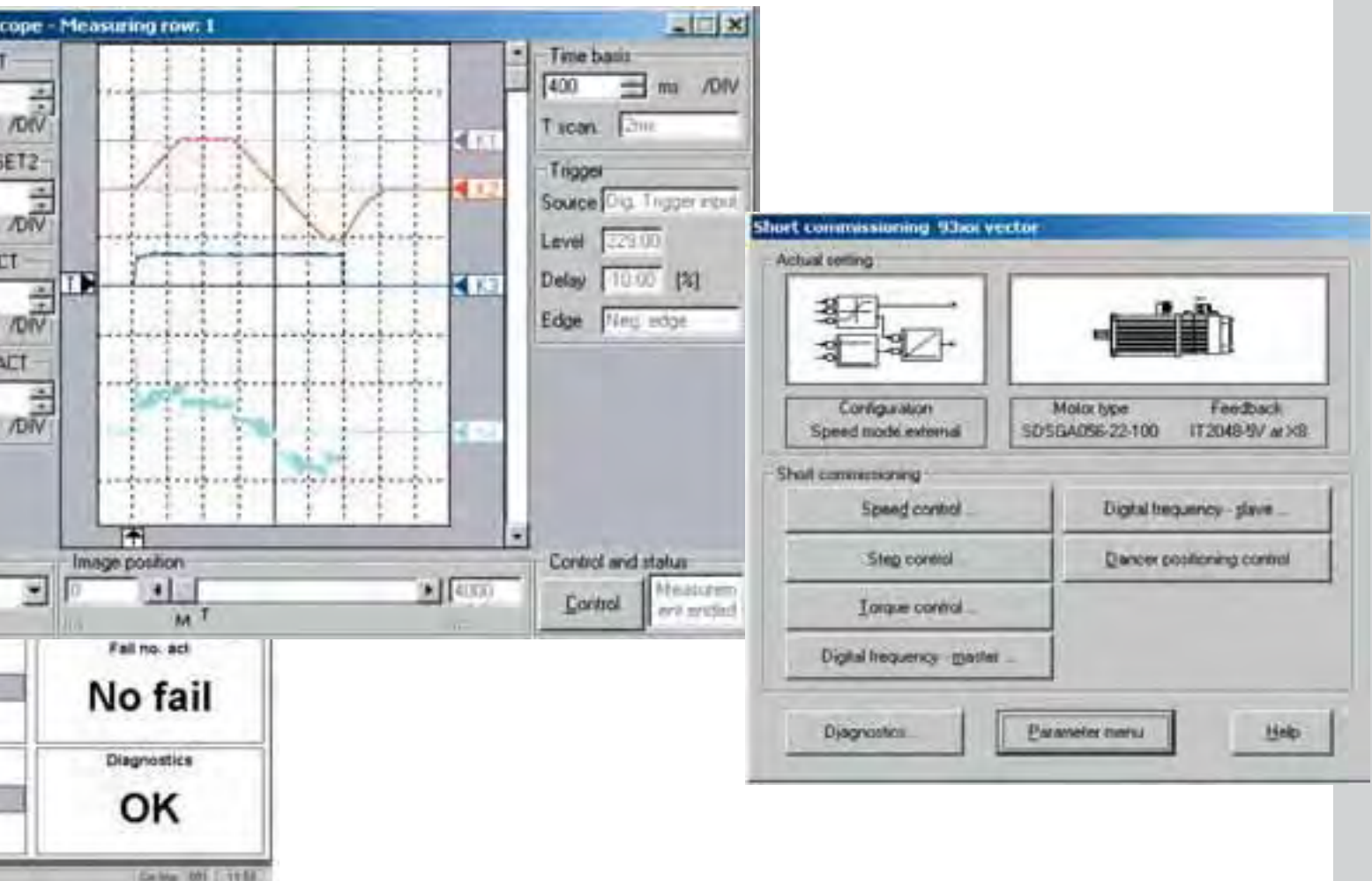
Operation and diagnostics are made even easier by the following features

- ▶ Short commissioning
- ▶ Monitor window
- ▶ Oscilloscope function
- ▶ Numerous help functions
- ▶ “Soldering iron” for building function block connections
- ▶ “Scissors” for disconnecting function blocks
- ▶ Copying and transferring settings to the next 9300 vector
- ▶ Automatic detection of the motor parameters with self-optimisation

All operation options are also available when you use the plug-in keypad.

### Start immediately

- ▶ Often standard applications only require the default settings. Further configurations are not necessary.
- ▶ The connections of function blocks for more demanding applications are already stored in predefined basic configurations (e.g. dancer-position control, torque control, traversing control, digital-frequency connection). Select the basic configuration suitable for your application and, if necessary, “refine” it with an operating module or PC – now the system is ready for operation.



# System | as complete solution

The 9300 vector cannot only be connected to common bus systems via communication modules, but interconnect several Lenze controllers to a self-sufficient bus connection. This is possible thanks to the system bus (CAN) which is included in the

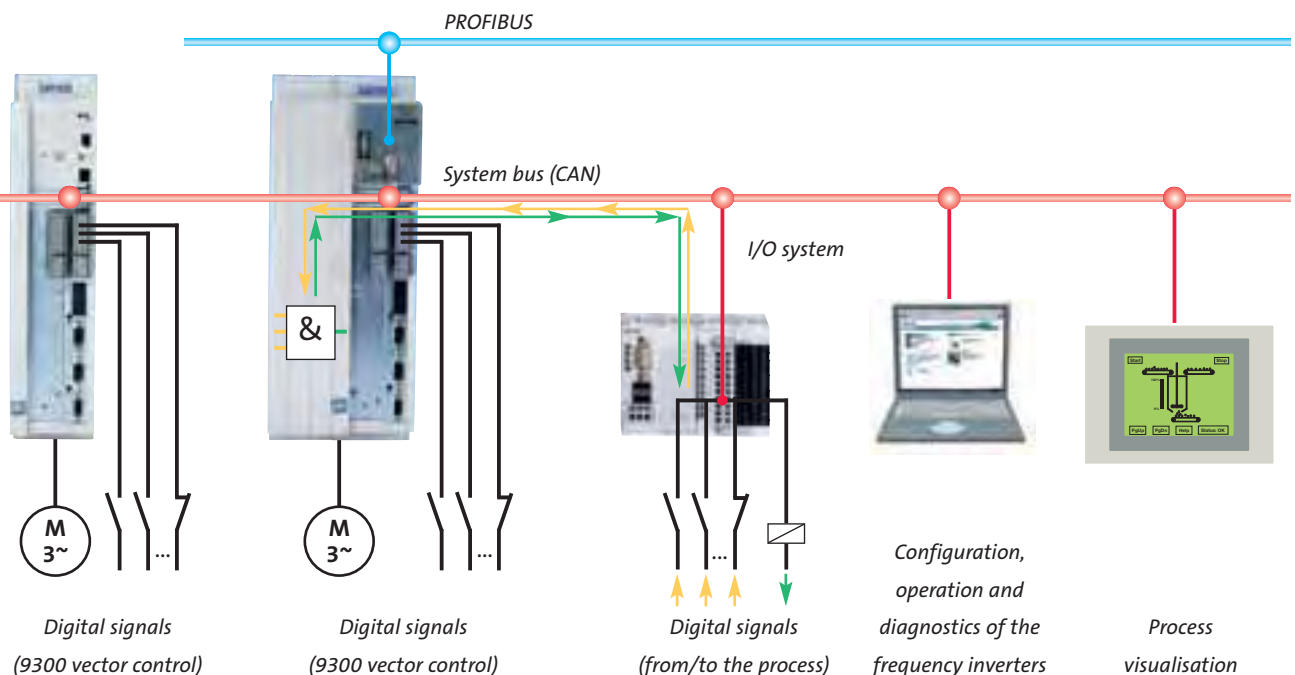
9300 vector as standard. Lenze also offers matching system bus-compatible components for a consistent implementation of automation concepts, e.g. I/O systems and operating/display units (human machine interface).

## Example

- ▶ 9300 vector frequency inverter networked with automation components in the system bus (CAN)
- ▶ Control of the frequency inverter via digital inputs
- ▶ Configuration, operation and diagnostics of the frequency inverters through a PC
- ▶ Process visualisation with operating/display unit
- ▶ „Collection“ of signals from the process via the I/O system, processing of the signals through the frequency inverter and return of the corresponding control signals to the process via the I/O system
- ▶ Process-overriding signal exchange with the host (speed setpoints, messages, ...) via PROFIBUS

## Advantages

- ▶ Less installation required (no parallel wiring)
- ▶ Operation/diagnostics during operation (quick commissioning, easier setting-up operation)
- ▶ Combination of drive and automation technology to form a clear and independent (sub) system
- ▶ Complete and matching drive, control and automation solutions



# Details | Technical data and features

## Drive features

- ▶ Power range:  
0.37 ... 90 kW, 400 V / 480 V  
110 ... 400 kW, 400 V / 500 V
- ▶ Overload capacity:  
Depending on the type up to 180 %  
rated torque for 60 s
- ▶ Control methods: Vector control,  
V/f-characteristic control (linear and  
square)

## Input and output terminals

- ▶ 2 bipolar analog inputs
- ▶ 2 bipolar analog outputs (freely  
assignable)
- ▶ 7 digital inputs (6 of them freely  
assignable) with changeable logic
- ▶ 4 digital outputs (freely assignable)  
with changeable logic
- ▶ Input for external supply of the control  
electronics (back-up operation in the  
event of a mains failure)

## Communication interfaces (optional)

- ▶ RS232/485 interfaces, optionally as  
optical fibres
- ▶ Connection to common fieldbus  
systems (PROFIBUS, INTERBUS,  
DeviceNet, CANopen)

## Protection

- ▶ Protective function against uninten-  
tional start-up (safe standstill to  
EN954-1) as option
- ▶ Adjustable current limitation, error  
messages in the event of overcurrent
- ▶ Overvoltage and undervoltage  
protection
- ▶ Warnings and error messages in the  
event of overtemperature of the  
frequency inverter
- ▶ Input for PTC and thermal contact
- ▶ Motor-phase failure detection
- ▶ Mains failure control

## Standard functions (selection)

- ▶ 2 PID controllers
- ▶ Slip and mains voltage compensation
- ▶ Smooth starting and stopping along  
S ramps
- ▶ DC braking
- ▶ Electronic motor potentiometer
- ▶ 4 freely configurable parameter sets
- ▶ 3 frequencies to skip mechanical  
resonances
- ▶ Freely connectable function blocks

## Operation and diagnostics

- ▶ Menu-guided keypad with clear-text  
display
- ▶ Copying and transfer of inverter  
settings using the keypad
- ▶ Password protection
- ▶ Predefined basic configurations
- ▶ Fault history
- ▶ Comfortable operating software  
“Global Drive Control” with  
oscilloscope function

