

Recycling & Bulk Material Handling with Lenze VFDs

Optimize your design,
improve your costs



Lenze's variable frequency drives (VFDs) are designed to control a wide range of conveying applications for transportation, weighing, dosing, etc. within processes and machines. They provide the highest torque, precise speed control in harsh environments and solve also other applications accompanied by such installations as crushers, shredders, separators, fans or pumps.

Limited performance and automation functionality?

With 200 % overloadability by design and maximum application and fieldbus parameterization flexibility Lenze is the ideal choice.

Different installation requirements?

The frequency drive series offers a wide range of solutions from 0.25 to 132 kW (0.33 to 180 HP): Available in IP20 or decentralized wall or motor-mounted VFDs for harsh environments in IP55/66 from -30 to 60 °C.

Limited power range for motor-mounted VFDs?

The i550 motec IP66 is very compact from 0.37 to 45 kW (0.5 to 60 HP) e.g., 45 kW i550 motec in IP66 with 14 kg only.

Too excessive costs for automation & drives?

Maximized integration of external functionalities in Lenze VFDs. The decentral i650 motec with integrated PLC, IO-Link Master and energy re-generation to cancel expensive electrical cabinet design.

Highest quality standards worldwide

Lenze drives are developed in Switzerland and produced in enormous quantities in Germany, the USA and China – for the respective region with local support on site.



i550 cabinet

i550 motec

i550 protec

Market Overview

Lenze products are the perfect fit for many different materials in the recycling sector or handling of gravel and stones: Domestic waste, biomass waste, construction waste, plastic waste, electronic waste, etc. That also applies to any other bulk handling machinery in the area of plastics, chemicals or food & beverage.



Conveying Equipment

Bulk material in recycling is being transported from screw conveyors to belt conveyors and asking for robust VFDs in motor control and product hardware.

Shredders, Crushers, Screening Drum, etc.

Waste, stones or other bulk material asking for VFDs with high overloadability and precise motor control to clean and shred material according to the process needs.

Fans

Ventilation equipment is applied for cleaning, drying and sorting of bulk materials for the process.

Mobile & Open Field Units

Recycling & gravel equipment is typically installed in industrial buildings but also in open fields as mobile units. This market is changing from traditional hydraulic drive equipment to electrical geared motors and VFDs from Lenze. There are multiple advantages:

- Saving up to 60 % energy
- Increase of productivity because of more precise control
- Noise reduction by 30 % (2 – 5 dB)
- Less maintenance costs and downtime



i550 cabinet benefits

- 40 % less cabinet space: Compact inverters VFDs supporting lean cabinet design with side-by-side mounting without de-rating
- 200 % overload allows selection of smaller drives
- Jerk-free operation with S-Ramps
- Support asynchronous and permanent magnet motors
- Supports IT grids for mobile installations
- Holding-brake control as built-in function

- Dynamic braking with integrated brake-chopper
- Keypad User Units (m/s)
- Switch-off Positioning parameterizable function
- Supports ATEX installation by connecting external ATEX temperature protection relay to the i550 STO Module (SIL 3/PL e)
- Generic functionality for auxiliary drives like pumps, fans, etc. functionality: PID control, power loss ride through, flying restart, etc.

i550 protec adds

- Robust design: IP66 inverters with NEMA 4X Outdoor rating to withstand harsh environmental stress 30 to 60 °C
- 60 % more compact than comparable solutions in the market.
- Optional: Adaptable Extension box for operation of lights, switches and disconnector



i550/i650 motec adds

- Integrated "global" DC power supply for holding brake, parameterizable 180 VDC/215 VDC irrespective of mains voltage
- Dynamic braking with eco-friendly and easy to use power regeneration into the grid
- Extended auxiliary supply: Internal 24 V supply up to 0.4 A; external 24 or 48 V up to 1 A
- Pluggable connectors for easy installation
- i650 motec with integrated Codesys-based PLC and IO-Link Master functionality, Extended Safety (PROFIsafe, FSoE, CIP Safety and decentral Safe I/Os), Basic Positioning



Performant & easy to apply g500/VFD package

- IE3, IE5 or IE6 geared motor solutions in standard 50/60 Hz or compact 87/120 Hz solution
- Unique IE5 motor/i500 VFD performance: Allows 200 % starting torque and sensorless positioning
- Bevel, helical or shaft-mounted helical g500 geared-motors up to 20,000 Nm
- Smart Motor m300 up to 1.36 kW with up to 5 preset speeds
- Lenze dimensioning expertise & tools for optimized design



Technical data Lenze VFDs

3-phase mains connection 400/480 V – HD with 200 % (3 s), 150 % (60 s), STO SIL3, with integrated EMC filter

P _N (HD)		I _N (HD)		i550 cabinet IP20 NEMA 250 Open Type		i510 protec IP21 NEMA 1 (North America only)		i550 protec IP66 NEMA 4X IP55 NEMA 12		i550 motec/ i650 motec IP66 NEMA 4X								
[KW]	[HP]	400 V	480 V	m (kg)	H x W x D (mm)	m (kg)	H x W x D (mm)	m (kg)	H x W x D (mm)	m (kg)	H x W x D (mm)							
0.37	0.5	1.3	1.1	0.8	155 x 60 x 130	1.29	170 x 100 x 111	1.8	190 x 140 x 117	3.2	263 x 156 x 120							
0.75	1	2.4	2.1	1.0	180 x 60 x 130			2.7	205 x 140 x 140									
1.1	1.5	3.2	3	1.35	250 x 60 x 130													
1.5	2	3.9	3.5															
2.2	3	5.6	4.8															
3	4	7.3	6.3		1.33	200 x 100 x 111	4.9	250 x 180 x 168	3.8	263 x 156 x 120								
4	5	9.5	8.2															
5.5	7.5	13	11	2.3							250 x 90 x 130							
7.5	10	16.5	14	3.7	276 x 120 x 130	2.0	290 x 180 x 173	5.1	290 x 180 x 173	6.0								340 x 202 x 155
11	15	23.5	21															
15	20	32	27			8.0		342 x 180 x 165	i550 protec in IP31/ NEMA 1		10.2	405 x 230 x 187	13.3	443 x 280 x 206				
18.5	25	40	34															
22	30	47	44.4															
30	40	61	52	46	778 x 298 x 286													
37	50	76	65					17.2			450 x 250 x 230							
45	60	89	77															
55	75	110	96	24.0	536 x 250 x 265	53			778 x 298 x 378	Not available								
75	100	150	124															
90	125	180	156					35.6						685 x 258 x 304	Not available		Not available	
110	150	212	162															

IO connections & mains voltages	Standard I/O: 5 x digital input, 1 x digital output, 1 x relay (NO/NC), 2 x analog input, 1 x analog output, Other mains voltages: 1 x 110 V; 1x 230 V; 3 x 230 V; 3 x 600 V, Light duty variants available up to 132 kW (180 HP) to safe costs.
	Keypad → Parameterization and diagnostics of the frequency drive EASY Starter PC Tool → Free of charge engineering & parameterization tool with power-free USB interface Lenze Keypad App → User-friendly diagnostics and parameterization with optional wifi module (cabinet & protec) or USB-C (motec)
Commissioning/ diagnostics	
Functional safety	Option Safety Torque OFF: STO (SIL 3 / PL "e" Cat. 4) i650 motec optionally with PROFI-safe, FSoE, CIP Safety (STO, SS1-t, SSE) and Safe IOs (4x SI; 1x SO)