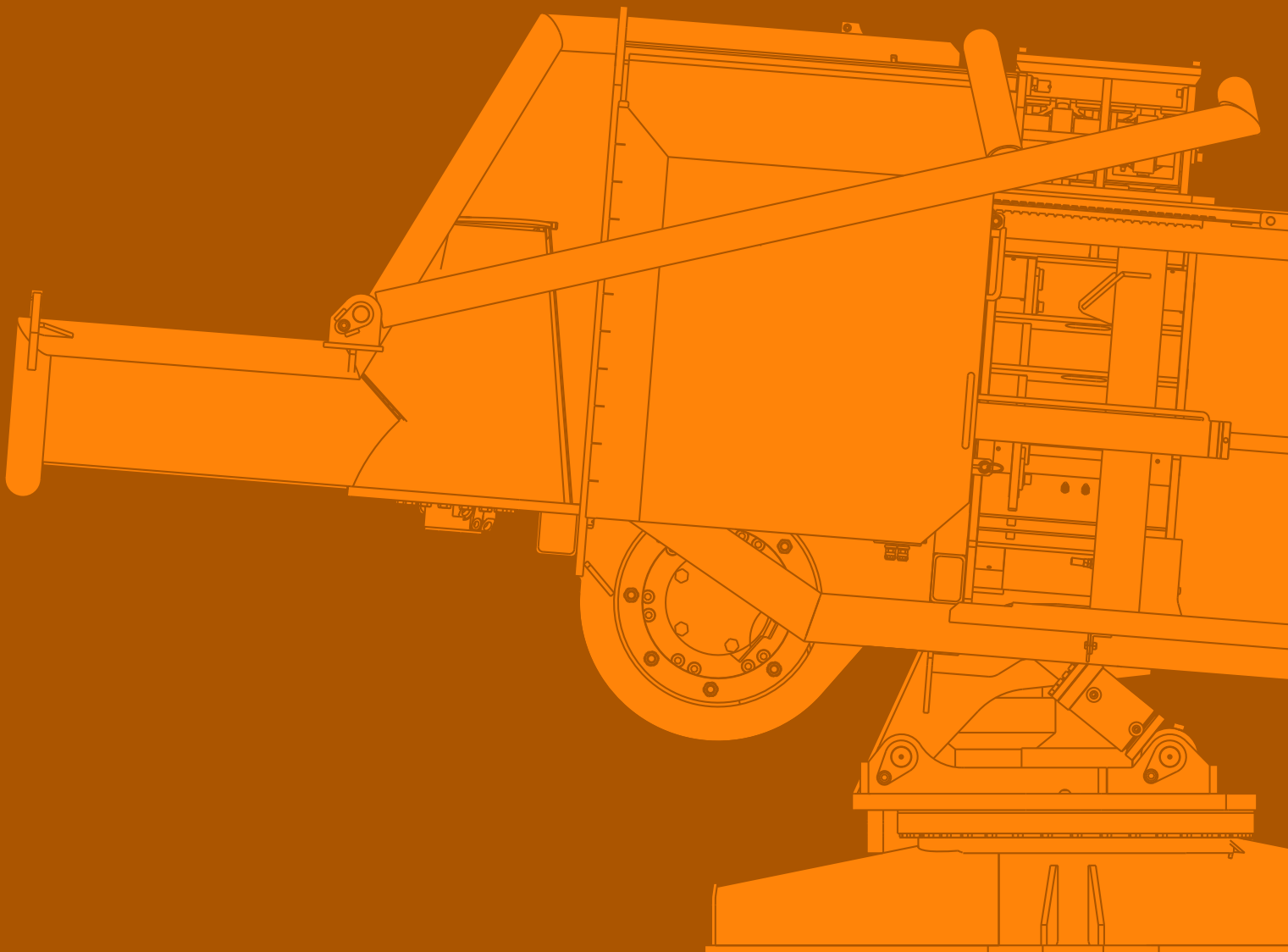


Monra ENFO 2000

Forest Biomass Compactor



We were born repairing machines.

We grew by designing them so they don't fail.

CONTEXT OF USE

Modern forestry operations generate large volumes of plant residues after felling and processing: branches, tops, bark, and wood remains scattered across the terrain.

At the same time, the demand for biomass as an energy source continues to grow. There is a market for this material. The problem is not demand: in its natural state, this waste is almost impossible to move efficiently.

The ENFO 2000® exists to solve this mismatch.

OPERATIONAL CHALLENGES



High volume and low density

Forestry residues, mainly composed of branches and small logs, occupy a very large volume relative to their weight. This means that even when transporting large volumes, the payload capacity is not fully utilized.



Dispersion across the terrain

After felling and processing operations, residues are irregularly distributed across the working area. This forces machinery to make multiple movements to collect the material, increasing time and reducing overall productivity.



Complex handling

Loose material tends to become disorganized during loading, transport, or storage, reducing load stability and increasing handling time at each stage of the logistics process.



Low logistical efficiency

When forestry residues are transported without compaction, they are difficult to stack and require more time for loading, transport, and unloading. This reduces the economic viability of biomass as an energy resource.

The ENFO 2000® is a biomass baler designed to collect forestry residues and compact them into homogeneous, transportable bales.

The system collects residual material generated after felling, compacts it, and cuts it using a patented shear system, producing bales that can be handled with conventional machinery and transported efficiently within the biomass logistics chain.

Transport optimization

Compaction reduces the volume of loose biomass, allowing more material to be transported per load.

Heavy-duty mechanics

Built with high-resistance materials to withstand intensive work cycles in forestry environments.

Higher operational efficiency

The system enables continuous collection and processing of forestry residues during harvesting operations.

Operation in complex environments

The design allows operation on steep slopes and in hard-to-access areas.

Compatibility with forestry machinery

The generated bales can be handled with forwarders, cranes, or standard machinery in the sector.



20% more efficient cycles than direct competitors.

48–50 bales per hour vs 26 bales per hour means that in an 8-hour working day around 120 additional bales can be produced. Over a 180-day operating season, this represents more than 21,600 additional bales per year.



ENFO 2000®

- Measured productivity of 20.95 ton/h in productive time
- 48–50 bales per working hour (≈60 s per bale)
- Higher loading efficiency: 2.39 grabs/cycle
- Higher bale density: average weight per bale 419 kg
- Cutting by hydraulic shear. Does not require maintenance. Less sensitivity when cutting residues with stones, soil or thick branches
- Achieves up to 80% biomass reduction

20,95 ton/h

Other brands

*The study is based on a comparison with other solutions from competing companies.

- Measured productivity of 9.50 ton/h in productive time
- 26 bales per working hour (3 min per bale)
- Lower loading efficiency: 3.63 grabs/cycle
- Lower bale density: average weight per bale 364 kg
- Cutting by chain saw. Requires numerous maintenance operations, and repeated cuts on residues with stones, soil or thick branches

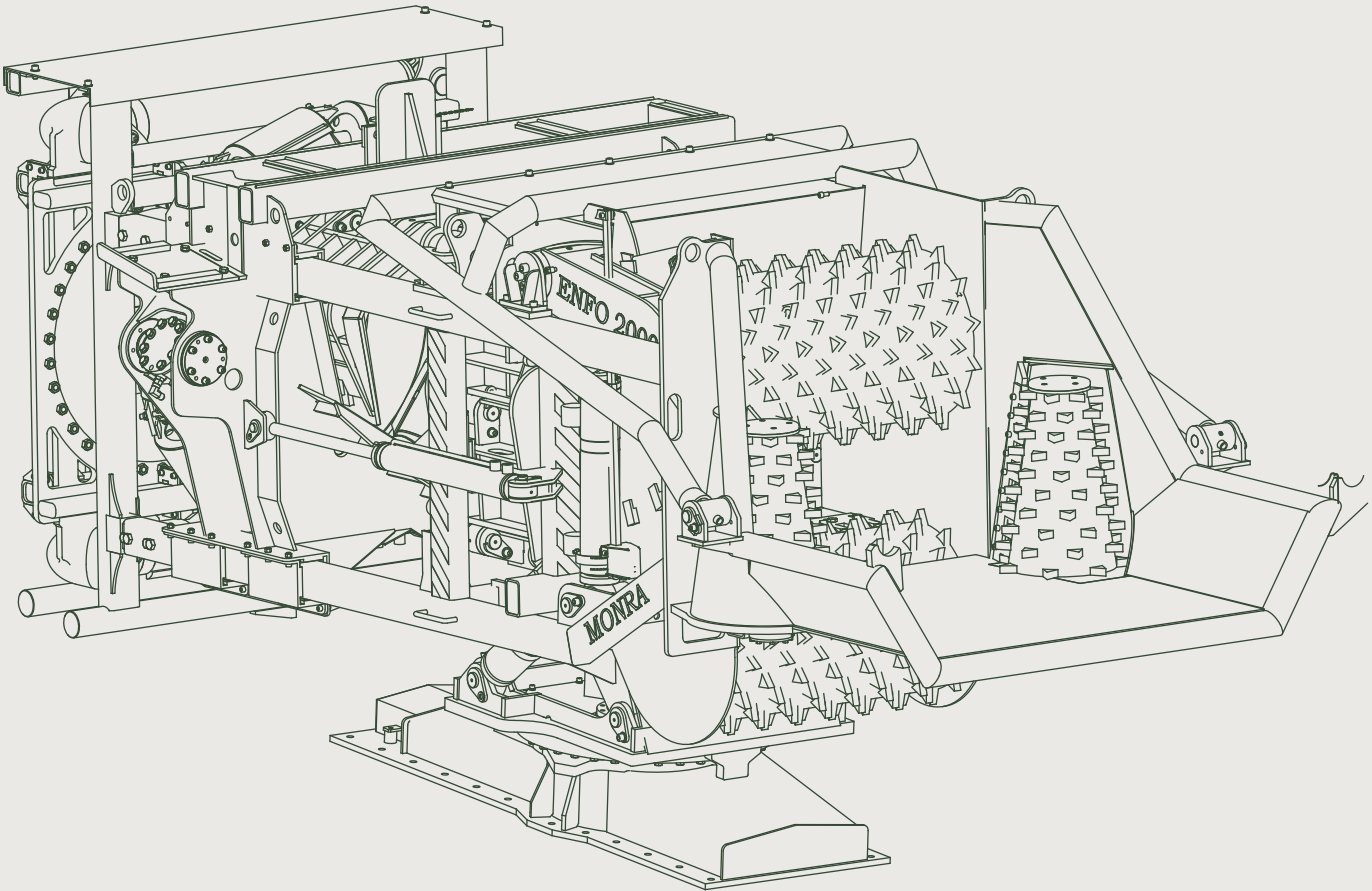
9,50 ton/h

Weights and dimensions

Weight	9,500 kg
Length with feeding arm	5,555 mm
Length with folded arm	7,020 mm
Width	2,387 mm
Height	2,312 mm

Bale dimensions

Diameter	40 to 80 cm
Length	Programmable
Weight	Variable depending on settings



Levelling unit

Tilt angle	+ - 6°
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Hydraulic system	Load-sensing (LS) variable displacement pump
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Maximum pressure	255 kg/cm ²
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Minimum flow rate	175 L/m
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Tying system	Programmable number of ties and wraps
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Tying twine capacity	9 rolls
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Grease reservoir capacity for tying ring	14,5 L
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Electrical control system	Consists of two modules
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Base machine modules	Designed for operator interaction, they comprise a machine-status input acquisition module, the operator control commands, and a 7" capacitive touchscreen terminal for programming, monitoring and production management.
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Baler control module	Processing control unit equipped with closed-loop control outputs for precise solenoid management, high-speed digital inputs for position sensor reading, and analogue inputs for pressure value monitoring
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Both parts of the system communicate through two communication systems: one via a fieldbus network and the other via radio.

Electrical power supply system	24 V
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STANDARD EQUIPMENT

Compaction unit

Consisting of a fixed press where the initial compaction is carried out, and a moving carriage (moving press + tying unit), where the final compaction, bale transport, tying and bale length control are performed.

Hydraulic system

Built with high-quality components and designed for easy maintenance, it works together with the electronic control system to ensure fast, reliable and precise operation.

Feeding unit

Equipped with 4 rollers (2 horizontal and 2 vertical) and scrapers to prevent material blockages, providing excellent traction performance.

Slewing system

Continuous rotation system, featuring a two-stage slewing gearbox and a negative brake integrated in an oil bath.

Levelling unit

Two powerful hydraulic cylinders control the levelling of the compactor on steeply sloping terrain.

Electronic system

Specifically designed for machine management and operation. Once the parameters have been entered, the process runs automatically and the touchscreen displays the operations being carried out.

Cutting unit

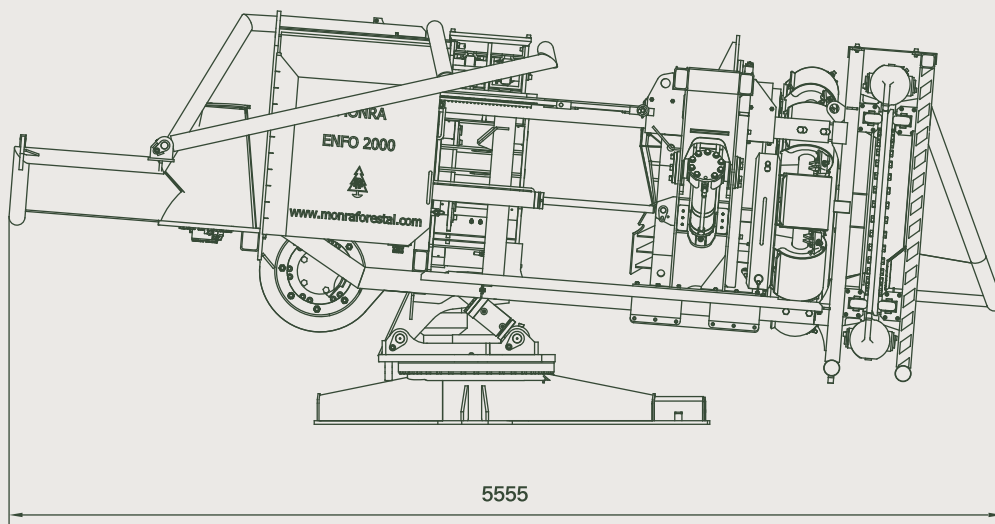
Scissor-type cutting system with high cutting power.

Quick coupling kit

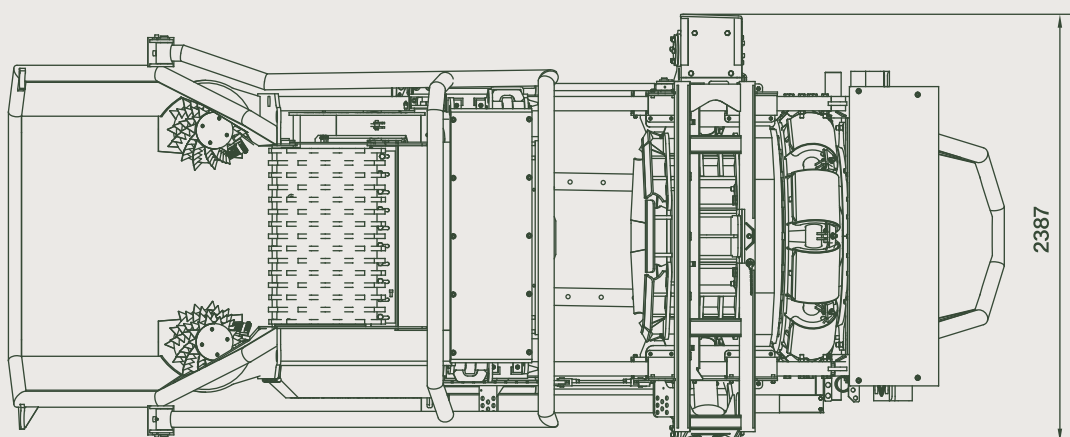
Operated from the compactor base control valve. It enables the machine to be coupled and uncoupled by means of a hydraulic cylinder and a system of four support jacks. Consists of:

- 1 hydraulic assembly cylinder
- 1 five-spool control valve
- 1 hose kit
- 4 hydraulic support cylinders

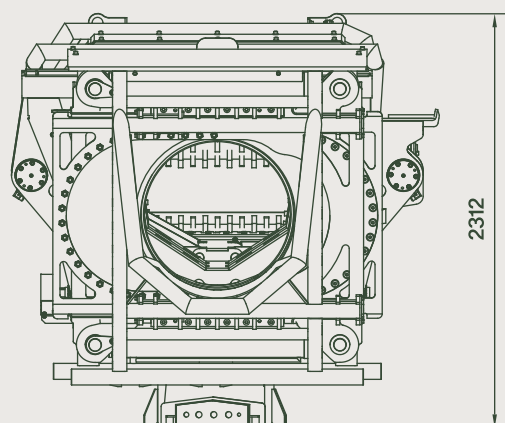
FRONT VIEW



TOP VIEW



SIDE VIEW





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LL-C (Certification)

Our company implements ISO 9001 quality control standards, ensuring strict quality procedures throughout the entire manufacturing process.



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