

GIKEN

SILENT PILER™
F112™

For 400 mm wide U Sheet Piles

Hard Ground Press-in Machine

SILENT PILER™

GIKEN GROUP

GIKEN developed and manufactures the SILENT PILER™ pile press-in and extraction machine, the world's first practical application of the press-in principle. It also proposes and implements solutions that leverage the superiority of the system. SILENT PILER™ is vibration-free, noise-free, space-saving, temporary work platform-less machinery that enables rapid construction of robust and resilient infrastructure able to withstand earthquake, tsunami, and flood. The unique value offered by press-in technology is providing solutions to construction challenges while contributing to environmental disaster mitigation. The technology is being adopted by more and more nations and regions around the world.



GIKEN

Construction Solutions Company

www.giken.com

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Ver. 1.1EN02 / 03 Mar 2026



Hard Ground Press-in Machine with a Flywheel-type Pile Auger

With a maximum torque of

roughly three times greater*

than the previous model, prevents sudden rotational speed loss of the auger when hitting hard, difficult-to-drill ground

* Maximum torque under specific conditions

F 111 40 kN·m

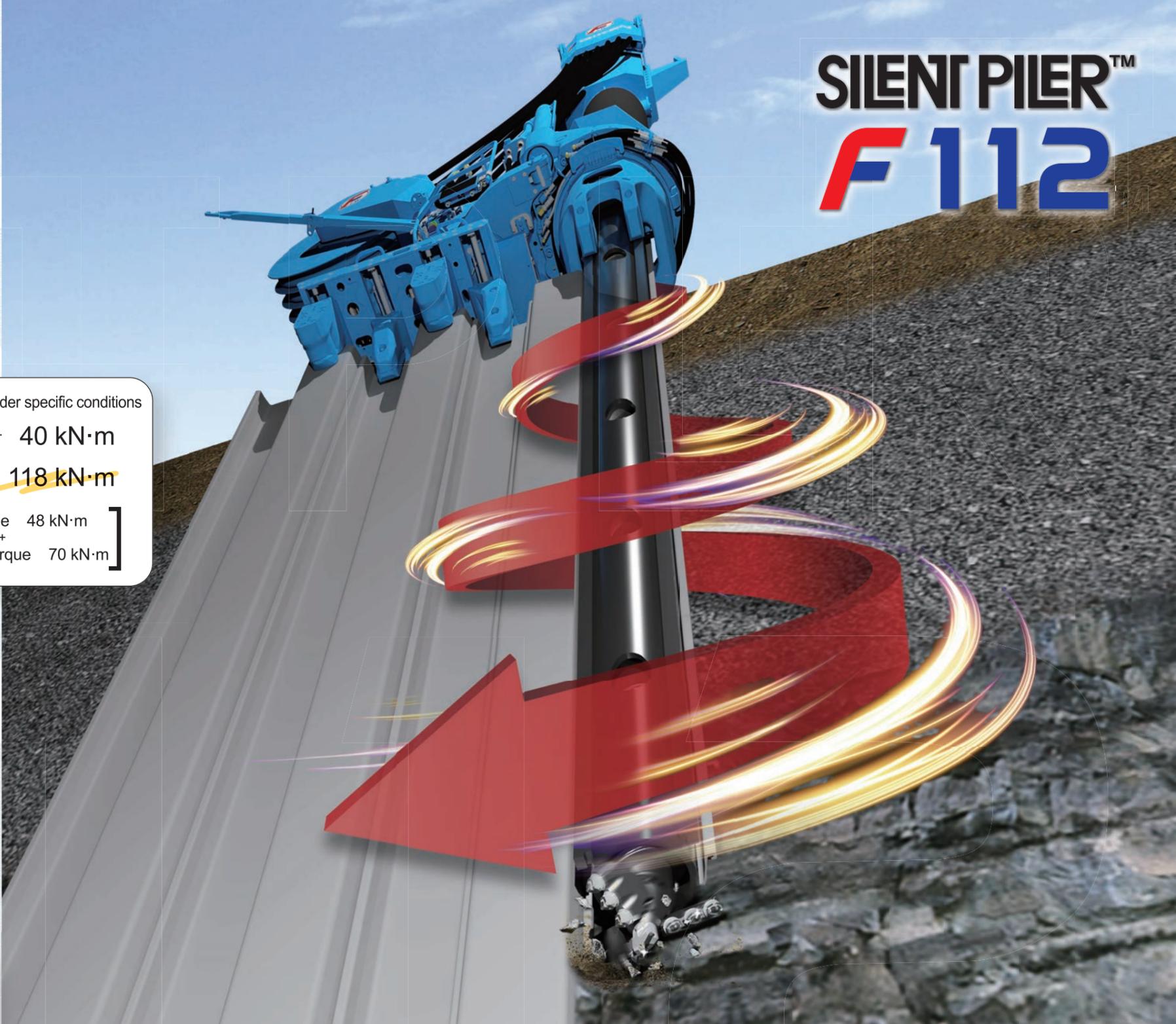
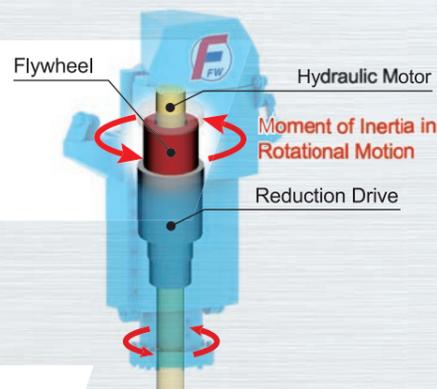
F 112 **118 kN·m**

[Auger torque 48 kN·m
+
Max. inertial torque 70 kN·m]

Improved construction efficiency

The F112 includes, as standard, a pile auger equipped with a flywheel mechanism, which incorporates a weight on the rotating shaft that transmits power from the hydraulic motor. The weight increases torque through use of the rotational moment of inertia to dramatically improve maximum torque to 118 kN·m* from the 40 kN·m of the previous model.

* Maximum torque under specific conditions



SILENT PILER™ F112

Flywheel Principle (hammer throw)



- 1 While initially difficult to rotate due to its weight, the hammer will naturally continue rotating once started.
- 2 Trying to stop the rotation immediately is impossible.
- 3 Inertia continues to drive the hammer.

Application of this principle to a pile auger

Striking hard ground or boulders

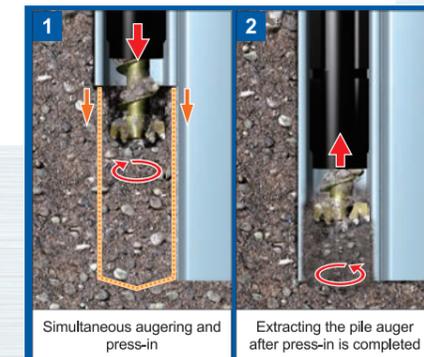


Conventional auger Stops
Flywheel-type pile auger Continues drilling

Hard Ground Press-in Method

By equipping SILENT PILER™ with a pile auger, this method employs the "Coring Theory", a unique coupling of press-in and augering (drilling) functions that enables steel sheet piles to be pressed into hard ground. It enables piles to be installed even into cobblestone and gravel layers or bedrock. With press-in and augering functions in a single machine, this method eliminates the task of

replacing existing ground with sand that other construction methods require. This not only reduces time and cost, but also makes the construction process extremely efficient. Because the level of drilling is minimized, the F112 removes only a little soil without disturbing the surrounding ground to install piles with a high bearing capacity.

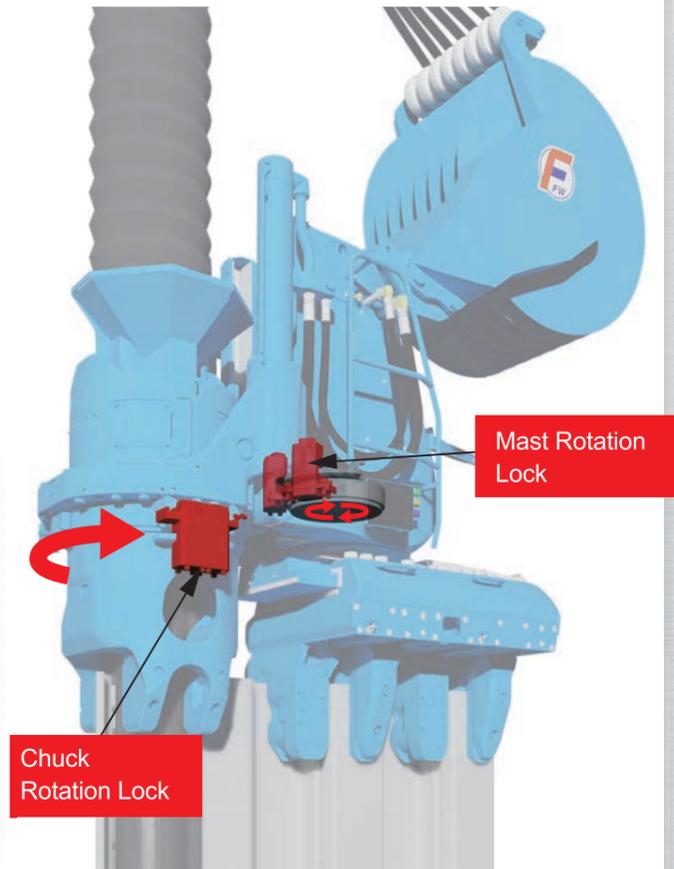
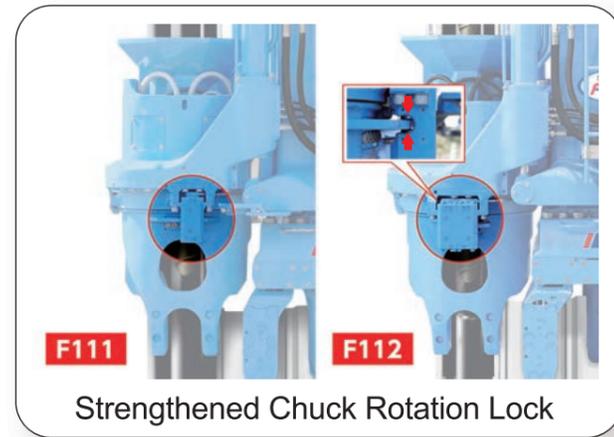


Modified piling machine maximises the benefits of increased torque

Strengthened leader mast lock chuck lock

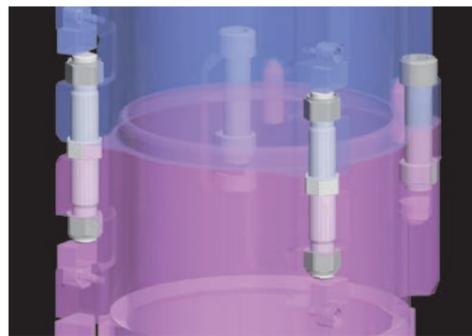
The F112 offers a strengthened leader mast*¹ lock and chuck*² lock to firmly maintain the position of the press-in machine when the auger is drilling. Supported by this solid reaction base, the machine is able to fully transmit rotational torque to achieve excellent drilling capability and construction precision.

*1 A press-in machine mechanism used to guide press-in and extraction, and centre the piles
*2 A press-in machine mechanism used to grip piles



Improved efficiency during PPTS™ Autonomous Operation*

* Optional



The new model includes a pile auger with an improved method of casing connection. This connector also enables the chuck to grip the casing for more efficient automated operation.

Improved visibility with multifunction LCD monitor

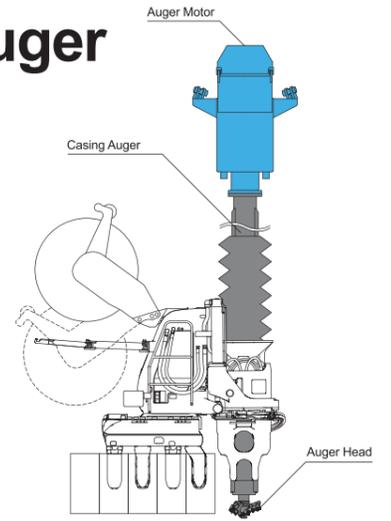


Equipped with a high-visibility LCD monitor, this new model provides optimal information that enables the operator to concentrate on the pile head.

Comparison with Conventional Auger

Auger Motor			F112 (PA25)	F111 (PA22)
Applicable sheet piles			U sheet pile: 400 mm-width (II, III, IV)	U sheet pile: 400 mm-width (II, III, IV)
Drive Device	Torque	Low Speed	48 kN·m	40 kN·m
		High Speed* ¹	-	28 kN·m
	Rotation Speed	Low Speed	10 - 30 min ⁻¹	10 - 30 min ⁻¹
		High Speed* ¹	-	40 min ⁻¹
	Maximum Inertial Torque		70 kN·m* ²	-
Maximum Torque		118 kN·m* ²	40 kN·m	
Mass			2,000 kg	1,850 kg

*1 No rotational speed change due to design changes on hydraulic circuit which is unique to the flywheel-mechanism.
*2 Maximum torque under specific conditions.



Casing Auger		F112 (PA25)	F111 (AM122N)
Casing	Outer diameter	φ324 mm	φ319 mm
Auger Screw	Shaft diameter	φ169 mm	φ146 mm
Standard (24 m)	Total Mass including the auger motor	12,000 kg	10,900 kg



The test result of augering on bedrock

Bedrock Layer
Unconfined Compressive Strength (UCS) = 24 to 35 N/mm² (MPa)
Sandstone

F111

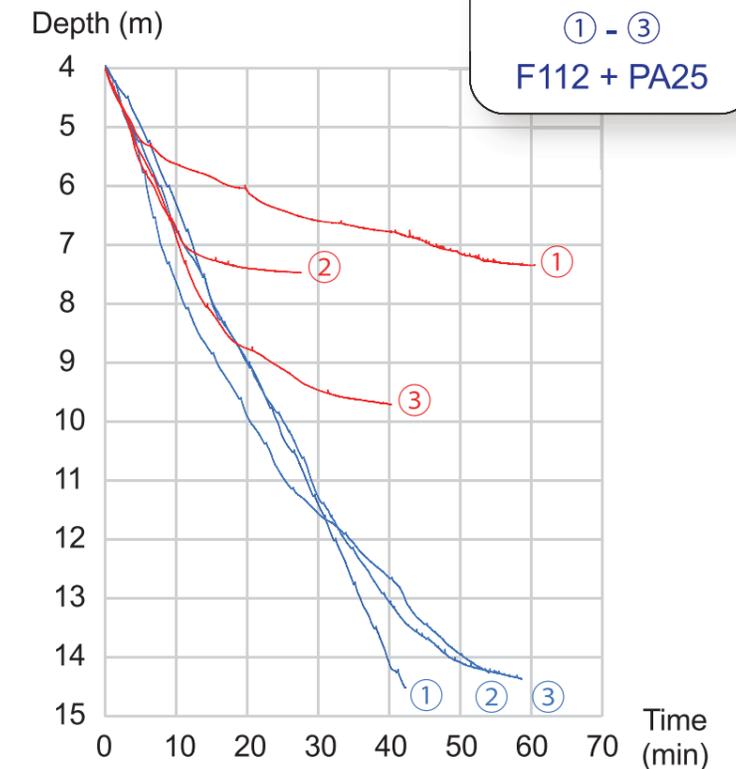
Press-in force 250 kN
Rotation torque 30 kN·m

Augering stopped due to the bit wear at 10 m depth

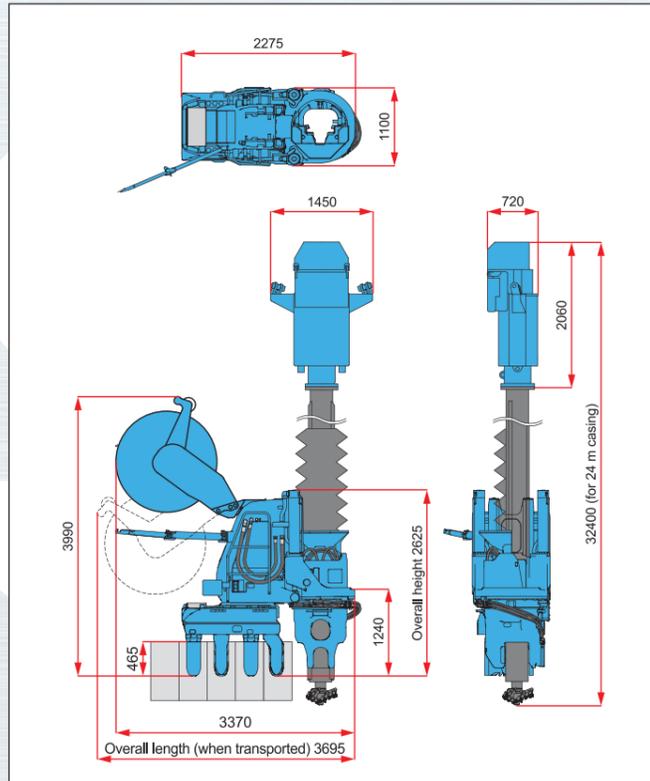
F112

Press-in force 300 kN
Rotation torque 40 kN·m

Augering continued for 49.3 minutes on average



Dimensions & Specifications



Press-in Machine Main Body SILENT PILER™ F112	
Applicable Sheet Piles	400 mm wide U Sheet Piles (II, III, IV)
Press-in Force	800 kN
Extraction Force	900 kN
Chuck Vertical Stroke	850 mm
Press-in Speed	0.5 - 4.5 m/min
Extraction Speed	1.1 - 9.4 m/min
Mass (Press-in Machine Main Body)	7,950 kg
Mass (HOSE REEL HR18F)	2,850 kg *Including mounting brackets
Total Mass	10,800 kg

Flywheel-Type Pile Auger (PA25)	
Length of Applicable Sheet Piles	24 m or less (standard)
Auger Torque	48 kN·m
Max. Inertial Torque	70 kN·m*
Max. Torque	118 kN·m*
Mass (Auger Motor)	2,000 kg
Mass (Casing Auger)	10,000 kg
Total Mass	12,000 kg (standard 24 m length)

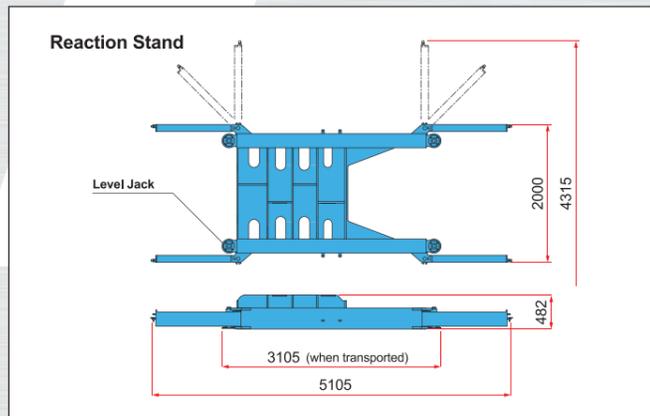
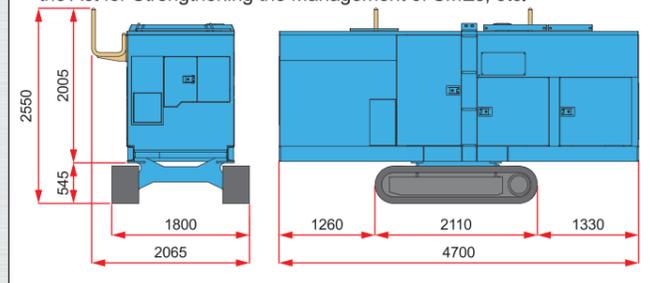
* Maximum torque under specific conditions

Power Unit EU300L5	
Power Source	Diesel Engine
Rated Output	255 kw / 1,800 min ⁻¹
Fuel Tank Capacity	500 L
Hydraulic Reservoir	490 L (PILER ECO™ OIL)
AdBlue/DEF Tank Capacity	57 L
Total Mass (Engine Unit and Crawler)	7,400 kg (with 20 m Super Crush hose)

Reaction Stand (with a level jack)	
Mass	1,400 kg

Compliant with Japan's Act on Regulations for Emissions from Non-Road Vehicles (2014) and European Stage V Non-Road Emission Standards

Falls under the categories of "equipment, etc. for enhancing management capabilities" and "cutting-edge equipment, etc." under the Act for Strengthening the Management of SMEs, etc.



Low Emission Engine



Ultra Low Noise Level



Standard Application of Biodegradable Oil



New GIKEN IT System

Basic Accessories



*Radio Controlled Safety Shackle is not available in the countries where authorisation for usage cannot be acquired.