IPA News Letter

Report

The Latest Model of Silent Piler

Mr. Toru Matsuoka

GIKEN LTD.

1. Outline

The Silent Piler "F series" is the next-generation model with not only an environmentally-friendly design and the same informatization-piling technology as the previous machines but also a new modular design in which all the component parts are standardized.

All parts have been properly adjusted after a thorough review of structures, shapes and materials. Moreover, the latest control system has been introduced, which can reduce any surplus load from the machine's main body. As a result, high reliability and a long-life for the component parts has been achieved.

The Silent Piler "F series" can install a variety of pre-fabricated piles, sheet piles, tubular piles with/without interlocks and GIKEN Combi-Gyro walls (Picture 1). The use of the Silent Piler "F series" is currently expanding for oversea, river and bridge constructions due to the demand of "GIKEN Implant Structure", which is a tenacious wall installed by the Press-in method, the necessary for disaster prevention and/or mitigation.



Picture 1

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2. Features of production

1) Modular design

The Silent Piler "F series" is standardized and optimized based on the "modular design" reviewing all the component parts of each functional unit (Picture 2).

The standardization of all the parts contribute to the efficiency of development and production as well as the diversity of the production.

2) Optimising Work Efficiency with Modular Design

The Silent Piler "F series" is applicable to standard, water jetting, and super crush press-in works by changing the chuck and chuck frame, and adding attachments (Picture 3). The machine can be utilised more efficiently because it is adjustable to various soil conditions and working conditions.





Picture 2

Picture 3

3) Longer Operational Life and Higher Functionality due to New Control System

The new control system manages the position of the press-in machine and controls load generation from press-in work during operation, maximising the durability of each part. Also, control of the machine is remarkably improved by the Press-in Force Control System and the Phase-less Linear Auger Torque Control System.

4) Pile Installation into Hard Ground

A) The "Directional Coring Theory", GIKEN's original theory, makes the Hard Ground Press-in Method able to install sheet piles into difficult ground conditions such as gravelly soil and cobble or boulder mixed soil without losing the advantages of the Press-in Method. The augering area can be reduced to assist pile installation, minimising the volume of spoil and disturbance to the soil strata. Hence, high bearing capacity is available for sheet piles which are installed by the Hard Ground Press-in Method.(Picture4)



Picture 4

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B) Locking Function

Lock functions in the leader mast, chuck and clamps secure the Silent Piler against drilling torque and increase drilling efficiency and the accuracy of pile installation.

5) Outstanding Environmentally-Friendly Design

A) Low Emission Engine

The latest Power Unit is a new generation model and has environmentallyfriendly specifications.

It is designed with strict concepts for clean emissions with high combustion efficiency and GIKEN's original hydraulic control technologies.

B) Design of Ultra-Low Noise Level (Picture5)

It clears allowable construction noise levels in many industrialised countries.

- Super Eco Mode : 61.8 db (A)
- Eco Mode : 62.7 db (A)
- Power Mode : 64.3 db (A)

*Noise Level at 16m

*dB(A):A-weighted Decibel

C) Standard Application of Biodegradable Oil



Picture 5

The latest Silent Piler uses bio-degradable Piler Eco Oil and Piler Eco Grease. Hence, if hydraulic oil or grease is spilled into soil or water, there will be no environmental damage to the surrounding ecosystem. In addition, the machines are painted with TX-Free non-leaded paint*.

*Environmentally-friendly paint which does not contain toluene, xylene and lead based pigment.

6) Scientific Execution of Press-in Work & Advanced IT Functions

A) GIKEN IT System

GIKEN's engineers can monitor individual Silent Pilers, such as their operating condition, maintenance records and location. Quick advice for any technical troubles is available promptly and appropriate information can also be provided to prevent problems.

B) Press-in Monitoring and Data Logging System *Optional(Picture6)

Based on the accumulated ground data during the operation, the latest Silent Piler can automatically install the sheet piles with the PPTS which can select the suitable operation parameters (i.e. Press-in force, Extraction force, Stroke, Speed and Auger torque). It enables the standard operation to be reduced by 45 percent* in Press-in duration, which is expected to enable the elimination of labour, the accuracy of pile installation and safe operation.

*The reduction ratio was substantiated at the GIKEN test field.



Picture 6