Soilmec at Geofluid 2023

At the 24th edition of Geofluid Soilmec is showing the SM-13e and the SR-45 MP, the company's latest development in the field of micropiles and consolidations machines.

Soilmec

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Comments

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Soilmec's SM-13e is the first model of the new 'E tech' range, the next-generation, zero-emissions line that represents the constant research and forward-looking of nature of Soilmec.

The second machine, the SR-45 MP is the result of over 50 years of experience on jobsite. A drilling rig fitted with a micropiling kit underlines one of the ever-distinguishing characteristics of Soilmec products: the multi-functionality.

Indeed, the application of a kit dedicated to micropile and jet-grouting technologies, installed on a large diameter pile machine base, is a project first developed by Soilmec in the '90s.

SR-45 MP

The brand-new SR-45 MP is the evolution of two Soilmec's well-known models: the CM-40 JM and the R-312/200 MP. These historical models have already been appreciated in numerous and demanding projects, among them: the Diavik mine in Canada, the DomAquarée in Berlin and the Anse du Portier in Monaco.

The SR-45 base machine grants solid and powerful support. A large diesel engine is capable of generously feeding the drilling group and the mast, whose design is derived from previous models, which is characterised by the possibility of exploiting a very long stroke and special technological kits.

The power needs are entrusted to the latest generation Cummins B6.7 engine, boasting high performance, up to 209kW. Compliant with Stage V regulations, the engine is also fitted with the 'start and slow' system and the automatic radiator control system for better combustion and cooling efficiency, resulting in a reduction in consumption and noise pollution.

H-Cab

The Soilmec 'H-Cab' cabin offers a comfortable and ergonomic workplace and is fitted with a sliding door and large windscreens, air conditioning system, automotive seat with lumbar support, camera control system complete with dedicated 7in multiscreen screen and an adjustable touchscreen DMS monitor.

The controls in the cab allow the assembly manoeuvres on jobsite, turret rotation, tramming and pile positioning. The machine also features one radio control dedicated to unloading/loading onto trucks and another radio control, complete with monitor, for drilling, rods assembly and handling, rotary and kinematic mechanism.

The mast is connected through a parallelogram system which allows a quick set-up of the rig and a simple pile positioning. It is designed to support vertical micropiles and jet grouting, for which it can also be provided with a lattice boom extension.

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The drilling performance is entrusted to an HT-3700 rotary head with a torque value of 3661daNm, a rotation speed of 122rpm and a lateral cradle slide of 600mm. The 15m rotary stroke allows the installation of a long rods battery directly under the rotary, the crowd system has a force of 237kN and the rods loader is capable of easily handling two rods up to 14m long.

The jet grouting version offers the maximum technological performance for this model, allowing the execution of very deep columns in a single treatment passage, guaranteeing a better grouting result and a higher production. The SR-45 MP offers three possible setups using the lattice booms extension capable of reaching a jet treatment depth between 31.5m and 34.7m in a single passage. Furthermore, thanks to the two-rod loaders it is possible to reach the remarkable maximum depth of 62.7m.

Soilmec's sustainable approach

The SM-13e represents the first step of a range of electrified Soilmec machines that are known as 'E tech', zero-emission equipment and represent Soilmec's commitment to sustainability and to protect the health and safety of all those who work with it and live in the communities where its machines operate.

The new line of e-tech machines, from micropiles, piles and cranes, responds to the increasingly frequent demands of the market in terms of reducing polluted and acoustic emissions, increasing efficiency and reducing operating costs (maintenance costs reduced by over 50% compared to an equivalent endothermic machine). It is no longer a simple case of engine replacement where the diesel engine is replaced by an electric motor, but a real electric rig in which the main drilling functions (rotary and crowd system) have been electrified, using electric motors with control inverters instead of hydraulic motors.

The SM-13e features four synchronous permanent magnet motors. Two motors are installed on the rotary head, another one in the crowd system and the latest set inside the base machine to feed the pump that powers the remaining non-electrified functions: undercarriage, kinematic mechanism, and clamp and breaker group.

The machine's electrical power needs can be satisfied in different ways. Wired (plug-in to the grid), via battery (full battery - unplugged) or using both solutions. The cable configuration requires a constant electrical supply, which is the simplest and cheaper solution but places limits on movements and distances on the job site. The batteries are LFP (lithium-iron-phosphate) type, rechargeable, and offer the performance of an electric rig with the same freedom of movement as the diesel version of the rig.

Battery packs

The battery pack allows working with high performance for more than four hours and can be fast charged in one hour and 40 minutes, using an external charging station. Removing the battery pack is easier with Soilmec's innovative system and no additional external means are required for this operation (patent-pending on battery swapping)'

The machine equipped with two batteries guarantees a 24/7 operational solution, without any interruption and the replacement of the battery pack can be made during shift changing, end of the shift, or during lunch break.

The SM-13e has an additional auxiliary battery which allows one hour of extra operating time to comfortably carry out the battery swapping and to avoid any machine main battery downtime.

Permanent magnet electric motors have several advantages, such as high efficiency and superior performance thanks to the constant availability of the full torque regardless of speed, characteristic of the electric motors. Furthermore, when the rig is working but the manoeuvres are not active the electric motors are turned off which brings benefits in maintenance and significantly reducing noise pollution and energy consumption.

Particularly in periodic maintenance, it is possible to check the operating time of the single motor and manage the maintenance intervals on the actual time of use, neglecting all periods of inactivity.

Operating modes

The SM-13e has been designed with three operative modes: Normal, Eco (elongated battery life), and Boost (increased performances). Normal mode is set to standard operating performance, while Eco mode saves energy when less power is required and extends battery life. Boost mode ensures maximum performance for short periods of time.

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