

Comacchio launches a new range of drill rigs for a new era of safe exploration operations

by Comacchio's editorial team

Established in 1986 in Italy, Comacchio is one of the world's leading manufacturers of hydraulic drilling rigs. Initially focused on the production of small and medium diameter drilling rigs for geotechnical site investigation and foundation construction, the family-owned company has expanded their range throughout the years to embrace the most diversified drilling applications, meeting the needs of customers across the entire spectrum of work, including foundations, geotechnics, water well, geothermal and mineral exploration.

'From the very beginning, Comacchio stood out for the ability to meet market needs and to assimilate ideas, insights and different practices and turn them into finished products that met individual needs that vary from country to country and client to client,' explains Emanuele Comacchio, Territory Sales Manager at the company.

Based on this philosophy, Comacchio works closely with clients to identify ways to constantly enhance and improve the equipment design and adapt it to individual conditions and working methodologies. The result is a combination of innovation and pragmatism that distinguishes every Comacchio drill rig, and the constant evolution and extension of the range, counting over 80 models and a vast array of configurations.

With the launch of the new CX line (Comacchio eXploration line) Comacchio aims to further extend their presence in the mining exploration industry.

'We have long-term experience in serving customers in this industry,' says Emanuele Comacchio, 'but with the launch of our CX line we want to move our solutions to the next level, thanks to several innovations which we believe will set new standards in terms of safety and efficiency of exploration operations, just like we've done in the past in other fields.'

The CX line comprises six crawler- and four truck-mounted units, weighing from 9 to 22 tonnes (19 850 to 48 500 lb) and providing up to

30 tonnes (66 150 lb) pull up force. All drill rigs are multipurpose units, capable of both reverse circulation (RC) drilling and diamond coring. The flexible design, based on the use of highly efficient hydraulics, is supported by a comprehensive range of rotary equipment and the vast choice of accessories, meeting specific application needs, soil features and operating conditions. Most important, all CX line rigs are designed to incorporate advanced safety features complying with the strict safety regulations adopted in the industry.

'The mining industry places great emphasis on operator safety. International mining groups have developed stringent corporate health and



Comacchio CX 1515, a 15-tonnes-pull drill rig (33 100 lb) configured for remote operation diamond drilling, equipped with hands-free rod handling system

safety requirements. The design and construction of exploration drill rigs must therefore consider all relevant aspects, from exposure to respirable dust and noise protection up to the use of technologies that automate unsafe and potentially hazardous job activities. One of the objectives Comacchio has set itself for this new product line was eliminating manual handling of the drilling equipment. We can count on twenty years' experience in developing a wide range of manual, automatic and semi-automatic rod handling systems. For the concept of the CX line, we have taken all this knowledge and expertise to develop what we think is currently the most advanced package of rod-handling solutions available on the market, meeting the specific needs of the exploration drilling industry,' elaborates Mr Comacchio.

Three types of pipe handling systems

Depending on the application, the new CX line rigs feature three different types of pipe handling systems.

A true breakthrough in drilling automation is brought by the CX 2520, a unique grade control rig featuring a super-efficient fully automated feed system and a rod handling system that holds up to 192 m (640 ft) of RC pipes. The rod loader is a patented carousel-type solution that can hold up to sixty-four 3 m (10 ft) long rods. Installed on the side of the rig, the carousel works as a sort of conveyor belt that automatically slides the rods in the required pick-up position. An arm picks up the rod from the carousel and aligns it with the mast and the rotary head, while the next rod is moved in the same pick-up position. This system makes the CX 2520 the most advanced RC grade control rig currently available on the market, incorporating, along with the rod carousel, an air conditioned operator cabin, dust control and prevention system, a frame for

on-board installation of the cyclone, video cameras for monitoring, and telemetry system for performance control and data collection. With the high-capacity carousel and auto-feed making quick work of any project, on-site drilling can be accomplished by a single driller in around half the normal time, without the need for assisting operational personnel. This new generation grade-control rig is easy to load on one truck with the required drill pipe length and offers fast set-up and movement between boreholes.

Rigs that are used for diamond core drilling are equipped with a manipulator arm mounted on the rig base carrier that lifts the rods out of the side rack using two clamps and places them in the right alignment. Unlike other manipulator systems that are conceived as free-standing ancillary equipment and require the use of large rod racks or tables, taking up a lot of space in front of the rig, the new Comacchio rod handling system features a very compact design that allows for its complete integration in the machine body. This has the advantage of speeding up and simplifying transport and set-up operations and offers the benefit of reducing the overall footprint of the equipment inside the mine. 'Our on-board rod handling system leaves the operator plenty of workspace in front of the rig and it minimizes surface disturbance. In fact, we are able to offer diamond coring rigs that can be easily transported in one load including 270 m (900 ft) drill pipe, with minimum mobilization costs and environmental damage,' claims Mr Comacchio. This rod handling system is suitable for all size of drill pipes (B-size to P-size). It is designed to ensure accurate thread alignment and to be robust, efficient and low maintenance, focusing on operator comfort and user-friendliness. Like all CX line handling systems, it can be remotely controlled using radio control. 'Thanks to the total automation of the rod handling processes and the use of Comacchio proprietary radio control system, the operators can easily and effectively operate the rig from a safe distance, or even from an air-conditioned control cabin next to the machines. Our radio control system controls all machine functions, including tramming, set-up, drilling and rod handling. The remote-control interface has also been adapted to be application-specific and user-friendly.'

RC drilling rigs are equipped with a more 'conventional' type of rod handling system based on the use of a loading arm that picks the rod from a rod table in front of the rig and aligns it with the rotary head and the mast. The pipe handling arm is a heavy-duty proven solution to handle double wall RC drill pipes of 4 in (101 mm) to 4.5 in (114 mm) diameter, up to 6 m (20 ft) length. It can also handle common diamond coring rods in a range of diameters from 45 to 220 mm (1.75 to 8.75 in) (B- to P-size). The pipe loading arm was specially designed and configured so that it can prevent the fall of any pipes due to thread breakage.

Telemetry system

The innovation brought by the Comacchio CX line is also in the software and data analysis technology powering the rigs. 'With the launch of the CX line we have introduced a unique fleet control system that was tailored to the needs of exploration drilling. Our ComNect™ system gives clients a complete overview of the equipment status and operations in real time, 24/7, from anywhere in the world, from a PC, phone or tablet,' says Mr Comacchio. ComNect™ collects and communicates vital equipment data to the client via a web portal. If no Internet connection is available, the data is stored in the device memory and can be exported on a USB-key. All the information can be viewed on a touch-screen display installed on the rig, which makes data access much more user-friendly.

Thanks to the use of state-of-the-art sensor technology, ComNect™ gives clients a full overview of the efficiency and performance of their machines. At the same time, the ComNect™ system ensures accurate drilling parameters recording, thus allowing to monitor the progress of the

drilling project. ‘The ComNect™ software focuses on the acquisition of data that is critical for exploration applications,’ explains Mr Comacchio, ‘ensuring a more complete and accurate dataset and meeting reporting requirements set by the mine.’

The economic advantages that are plain to see: ComNect™ highlights peak performance levels and warns of problems. If calculated and interpreted correctly, this data can significantly maximize production and reduce downtime and repair costs. The availability of data gathering and the use of analysis tools helps predict when problems will likely appear. With the use of these modern artificial intelligence tools, clients can create a truly proactive and more cost-effective maintenance schedule, custom-made for each machine.

‘The proactive approach is not just limited to maintenance and preventing downtime. One of the most critical and costly aspects in exploration drilling is the drilling tools wear. Our ComNect™ system offers valuable insights into the use and life of the drilling equipment. Tests have shown that thanks to our software and data analytics, the bit life can be considerably extended. Fixing minor issues before they become worrisome keeps the equipment working in prime condition. And this just the beginning. We are confident that the insights yielded through this advanced telemetry system will be the basis for further research and development activities that are already underway and that will allow us to further optimize equipment operation and drilling processes,’ continues Emanuele Comacchio.



The CX 2520 grade control rig featuring Comacchio's patented rod carousel and automatic feed system



The Comacchio CX 2030 performing diamond drilling for greenfield exploration with hands free rod handling system

Out in the field

The development of these new generation drill rigs allowed Comacchio to sign a contract with the mining services group Rosond for the supply of a total of 32 machines that will be used for greenfield and brownfield exploration work and grade-control drilling in the Northern Cape, South Africa. The drilling contract is one of the largest on the continent. The mining giant, who has awarded this contract, described it as part of a broader initiative to ‘modernize its geoscience operations, and extend the life-of-mine of two major iron ore mines in the Northern Cape, as well as to elevate safety standards, and improve productivity’. The first units that were introduced in the Northern Cape within this project have been in operation for five years. The tests conducted have proved that the rigs were able to perform core drilling up to 800-meters deep (2630 ft) using P-size rods, achieving the drilling outcome in 40% less time, due to both the higher efficiency of the rigs and reduced downtime. ‘Drawing from the latest technological developments across various disciplines, we have achieved the combined effect of a rig that gets the job done effectively and efficiently and offers the operator and those around the rig enhanced safety,’ concludes Mr Comacchio. ‘We are confident that with the new CX line we will be able to make a substantial contribution to consolidating the safety performance of our clients specializing in exploration drilling’.

With the new CX line of exploration drilling rigs, Comacchio is well positioned to meet the increased demand for safety and automation in the mining exploration industry. 

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