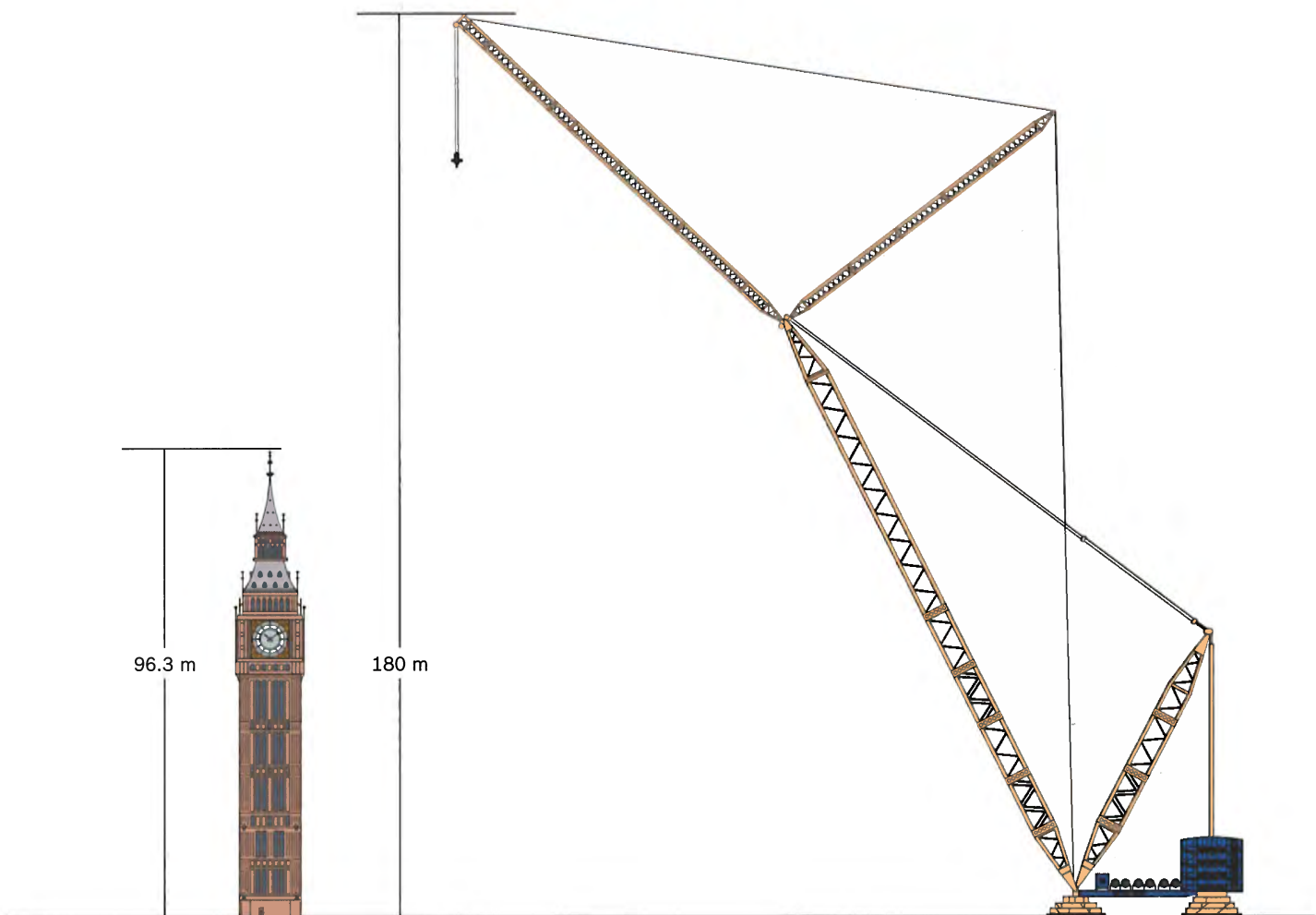


Big Benny in the ring

A pioneering technical innovation: One of the biggest cranes in the world positions loads accurate down to the millimeter



▲ Big Ben versus Big Benny: The ring lifter is almost twice as tall as London's best-known landmark.

“Nothing’s too heavy, nothing’s too high.” Sarens NV, the Belgian specialist for transporting and handling heavy loads, lives up to its bold motto. The family enterprise forged an ambitious plan last year: setting new standards in lifting super heavyweight loads with a ring-mounted crane of hitherto unseen dimensions. With “Big Benny”, a real giant, the Sarens Group breaks new ground as it spectacularly rounds off the top end of its crane fleet - 1,400 units with capacities of between 50 and 3,000 tons. You need powerhouses like this for heavy lifting purposes - at refineries, in the petrochemicals

sector, when installing oil drilling rigs, and during power station construction.

In only 15 months Sarens brought the SGC-120 (Sarens Giant Crane) from the initial concept to reality, working in close cooperation with Rigging International in Alameda, California, which has been part of the group since 2009. Rexroth in Belgium, acting as development partner and systems consultant, was responsible for the drives and controls. The regional subsidiary was the lead contractor, charged with project management, commissioning, testing and acceptance. It also handled

diagnosis and condition monitoring. The synchronization control departments, responsible for the MAC-8 and secondary-control drives, provided support from Lohr. This is a fine example of international cooperation at Rexroth.

Completing this 5,200-ton colossus in just over a year was a genuinely Herculean task. With 3,200 tons of lifting capacity and a reach of 120 meters, it is currently among the biggest cranes in the world. And it's capable of positioning its gigantic loads with millimeter precision.

The ring design, with an outside diameter of 40 meters, makes for stability and reliable operating parameters, on the one hand. Only minimal preparation of the subsoil is necessary, on the other hand. The concept includes a hook that, with its deadweight of over 100 tons, weighs as much as a fully loaded Boeing 757 and is designed for a maximum load of 3,200 tons. The entire ring-mounted lifter is of a modular design, enabling transport in 160 stackable 40-foot containers. After four weeks of on-site assembly, those containers are filled with locally sourced material and then serve as a 3,600-ton counterweight.

Rexroth's contribution to Sarens' 25 million euro project is substantial and encompasses the complete drive and control concept. Sixty-four A2FM hydraulic motors power the enormous slewing gear of the SGC-120, which takes an entire hour for one revolution. In spite of the gigantic dimensions, however, the slewing gear can be positioned precisely, down to a fraction of a degree, and the six secondary-controlled winches for crane and boom down to a millimeter. At the same time the hydraulic motors are synchronized via a secondary-controlled drive system incorporating HNC100-SEK and MAC-8 control electronics. Six containerized power units, each with two 280-kilowatt diesel engines and A4VSO axial piston pumps, supply the necessary hydraulic power. The Rexroth IndraLogic PLC handles all the control and monitoring functions for the giant crane.

In mid-March Hendrik Sarens, Heavy Lift Department manager, presented the SGC-120 to the general public in the port of Ghent. His cousin, technical director Benny Sarens (after whom the colossus was named), and Benny's son Carl were responsible for development and construction.

In July Big Benny was packed in containers in Ghent, ready for its acid test, under the roughest of conditions, in a steel engineering project in the U.S. state of Arizona. "We want to gather further experience in this project," explains Hendrik Sarens, "which will then benefit future efforts." ◀

Facts about Sarens NV

The Belgian family enterprise headquartered in Wolvertem (province of Flemish Brabant) was established in 1955 and now has sites in 33 countries. The 2,700 employees worldwide are committed to the firm's main objectives: leasing and deploying cranes and working out the associated solutions. They earn annual sales of over 370 million euros.

Facts on the SGC-120

- Design principle: ring-mounted lifter, 40 meter diameter
- Total weight: 5,200 tons
- Lifting capacity: 3,200 tons
- Three boom lengths, between 90 and 120 meters
- Maximum load: 120,000 tm (ton meters – the factor derived from lifting capacity and radius, which provides a better comparison of crane performance capabilities than the lifting capacity alone)
- Initial successful tests showed
 - 3,000 tons with a radius of 48.5 meters
 - 637 tons with a radius of 120 meters – this corresponds to sixteen fully loaded 40-ton trucks
- Six compact, secondary-controlled winches with an operating speed of 22.4 meters per second can be positioned uniformly and precisely down, to the millimeter, and operated synchronously.



▲ A total of sixty-four type A2FM hydraulic motors drive the slewing mechanism for this giant.