

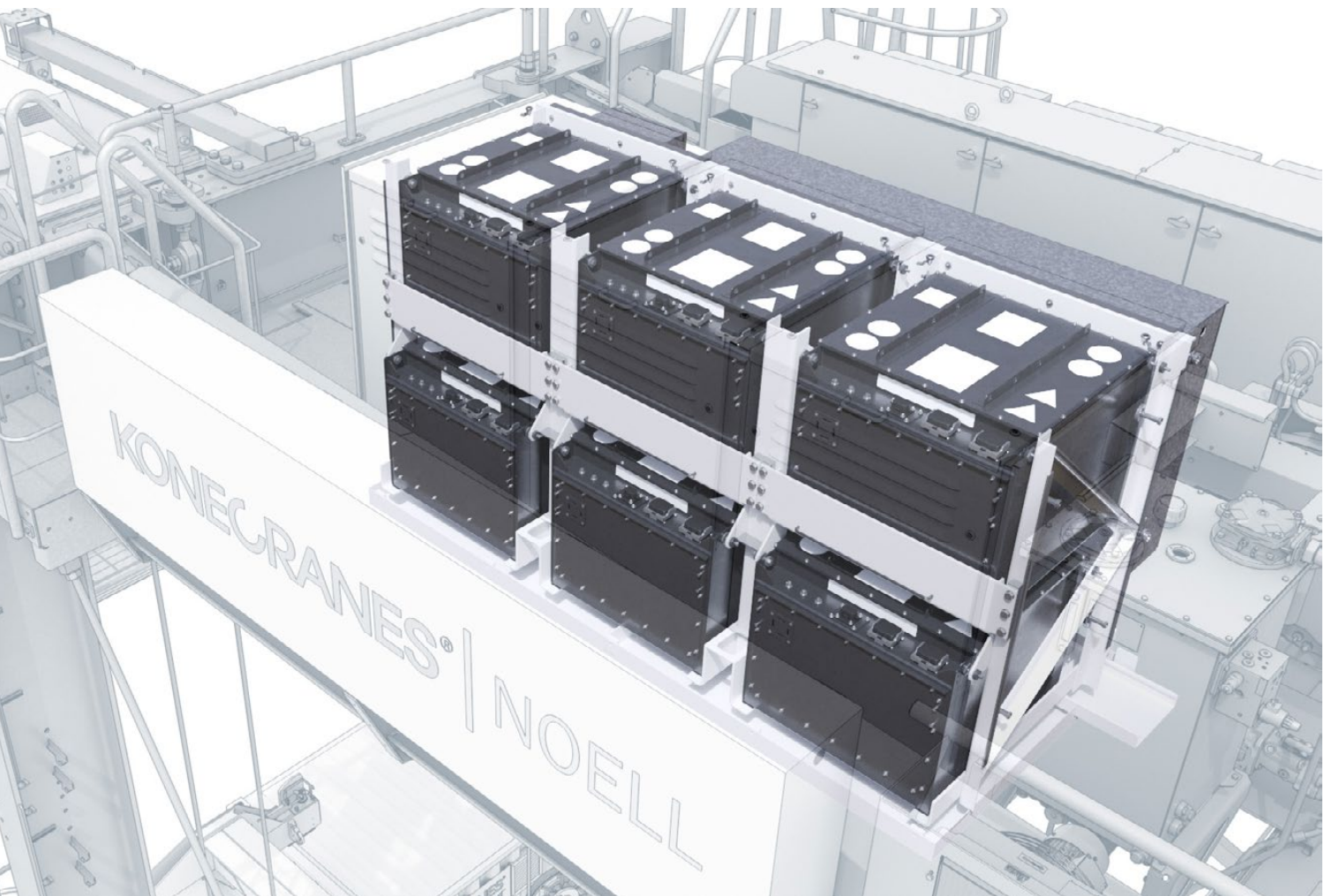
TECHNICAL DESCRIPTION

Battery Konecranes Noell Straddle Carrier



New power option! Battery

Konecranes is proud to introduce a battery power option for Konecranes Noell Straddle Carriers. If you're interested in all-electric container handling, our new battery option deserves your serious consideration. It gives the performance of diesel-powered operation without the CO₂ and noise emissions. It gives the eco-efficiency of battery operation while preserving the flexibility of straddle carrier operations.



Battery-driven straddle carrier with uncompromised performance

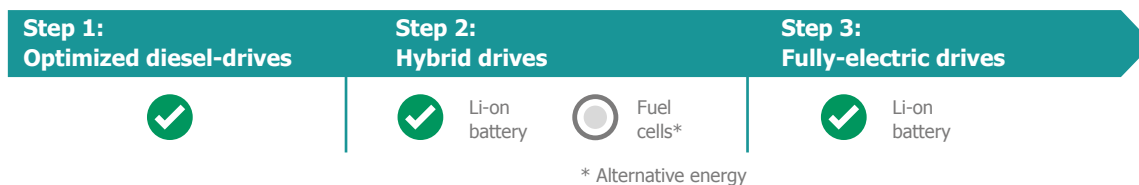
Konecranes introduced its first straddle carrier to market in 1968. It was a diesel-hydraulic machine designed around a concept that is entirely recognizable today. Since then, Konecranes has systematically improved its straddle carriers, particularly in the area of power consumption and energy management. Konecranes now offers battery-driven straddle carriers. There is a growing market demand for energy-efficient, low-emission straddle carriers and battery technology has improved immensely with Li-ion.

Ecolifting is Konecranes' long-term vision to reduce the CO₂ and noise emissions of its container handling equipment. Moving along from the first diesel-hydraulic Konecranes Noell Straddle Carrier, we offered diesel-electric and then hybrid versions. We learned a lot about battery management and behavior from our Automated Guided Vehicle (AGV), which is equipped with Li-ion batteries. Seeing the global "battery megatrend" gathering strength in the pursuit of carbon emissions reduction, we now offer the Konecranes Noell Straddle Carrier with battery power. In some countries, state subsidies could be won for purchasing hybrid or battery straddle carriers: the political climate is favoring port decarbonization.



Available today

 Feasible to develop



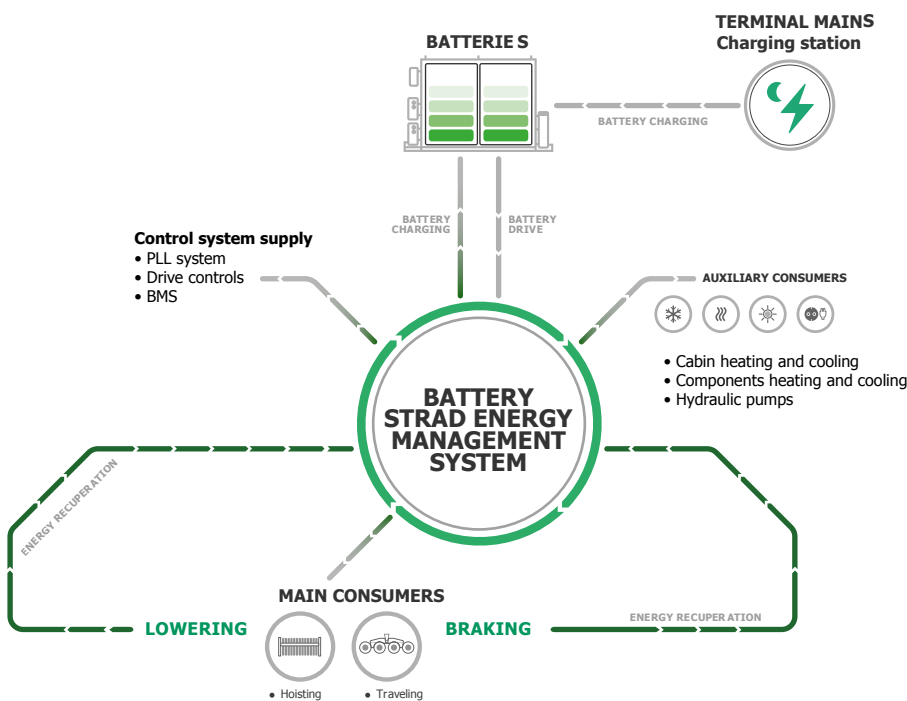
Easy to adopt

The Battery Konecranes Noell Straddle Carrier can be adopted easily by brownfield container terminals without major yard adjustments. The charging station can be placed in a maintenance area for convenient access. Charging sessions can be designed as part of smooth work cycles.

Charging to freedom

The Battery Konecranes Noell Straddle Carrier works with a charging station (seen at right) that is connected to the terminal mains. Charging strategy will depend on your work cycles and work shift arrangements. Our charging approach is "out of operation" charging, designed to keep the machines at peak work capacity when they do the hardest part of their work.

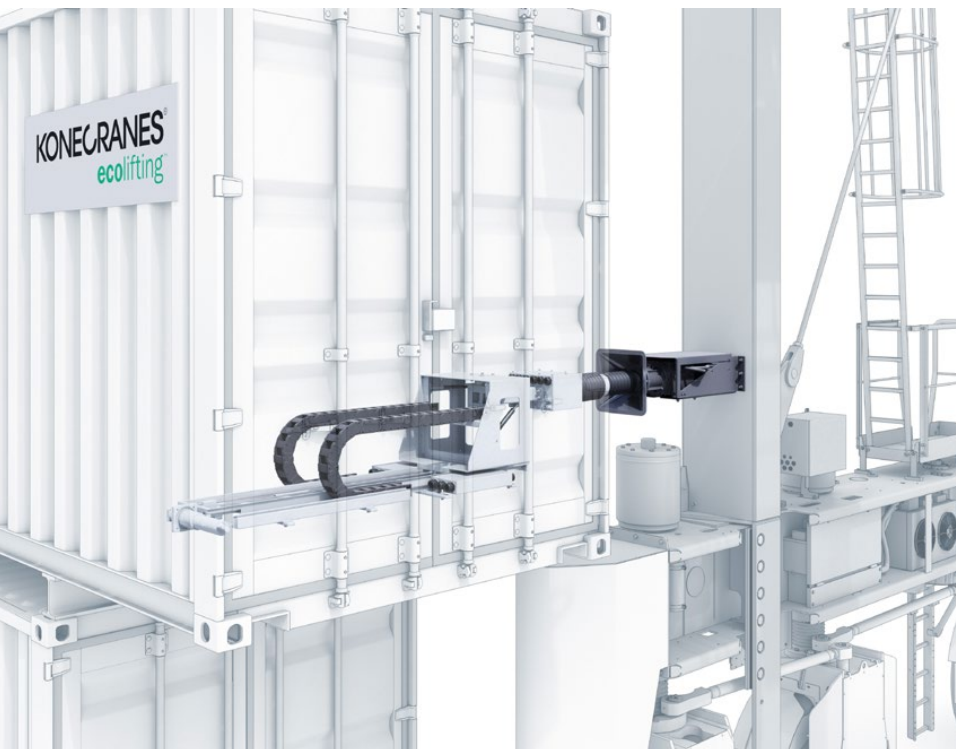
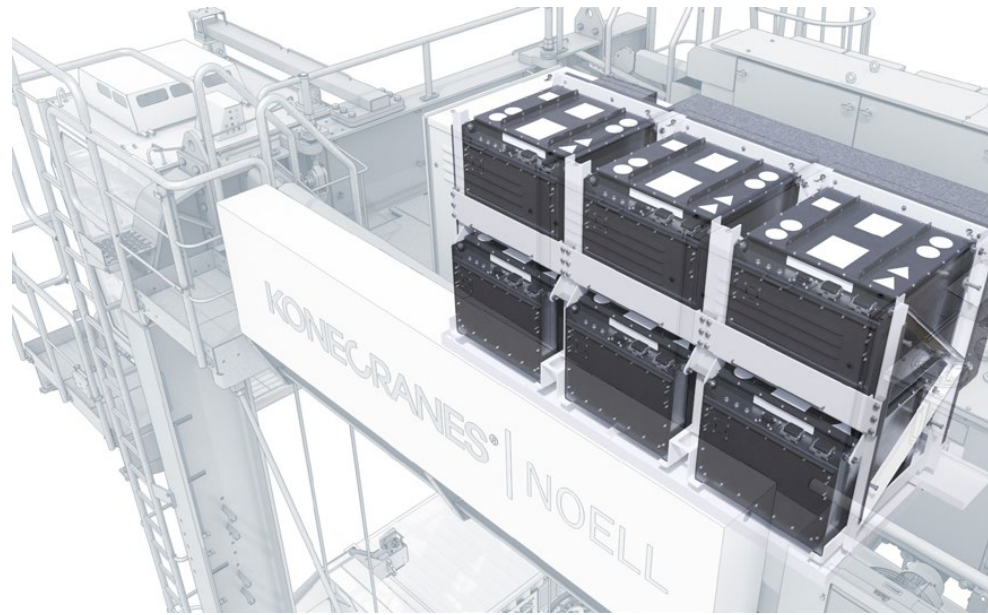
The charging station can be placed almost anywhere but a parking area in a maintenance area is recommended, which can be accessed easily by the straddle carriers from their work routes. The charging station is connected to the harbor mains via high-voltage cables. It is recommended that a transformer station be located nearby.



The Battery Konecranes Noell Straddle Carrier utilizes Li-ion battery technology that is field-proven in Konecranes Gottwald Automated Guided Vehicle (AGV) systems, Konecranes Noell hybrid straddle carriers and Konecranes hybrid RTGs. The performance track record is excellent. At left you see an illustration of the energy management system.

Battery enclosure and charging

The Li-ion batteries are housed in the battery enclosure, seen at right. It is located on the top platform, carefully placed so as to ensure excellent stability.



Docking at the charging station is a simple matter of driving the Battery Konecranes Noell Straddle Carrier to the station, where the charging connection is made. This can be done in automated mode, in automated straddle carrier operation, or in manual operation.

Battery Konecranes Noell Straddle Carrier

Technical information

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| Battery type | There are 6 battery modules, for total 4-hr capacity. |
| Battery life | The design life of the battery pack is 8 years. The limit of design life is specified as 70% of the remaining battery capacity. Battery life is dependent upon the straddle carrier's work load in relation to work shift. More detailed information can be given in discussion with the customer about work processes involving charging and discharging* cycles. |
| Battery pack modularity | The battery packs are entirely modular for easy access, maintenance and replacement. |
| Running time | Depends on the work cycles of the container terminal in question. More detailed information is given in discussion with the customer about work processes and work cycle requirements. |
| Charging time | The 4-hr battery packs are charged in 1 hr at the full rated charging power with a charging rate of 1C. |

* The number of cycles describes the sum of all full charge cycles over the battery lifetime. One full charge cycle is reached when the usable capacity under consideration of the State of Health (SOH) is discharged and charged. This process can be divided into subcycles.

Konecranes is a world-leading group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2021, Group sales totaled EUR 3.2 billion. The Group has around 16,600 employees in 50 countries. Konecranes shares are listed on the Nasdaq Helsinki (symbol: KCR).

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