



Product

Brakes, Clutches, Limit Switches and Couplings

Application

Stage Scenery Winches

Highlights

Warner Electric

FENIX Brakes

electrically released brakes provide extremely quiet operation

Stromag

Limit Switch and Tooth Clutch Assemblies

are a very popular combination for theater applications

Huco

Flex Ni Couplings

provide high torsional stiffness with high misalignment capabilities

BC Caire, a leading French manufacturer of stage equipment needed reliable and quiet powertrain components for use on new scenery winches at the Théâtre du Chatelet in Paris. The 2500-seat theater has undergone many restorations and upgrades since its original construction in 1862. In mid-2019 the theater re-opened after a major 2-1/2 year, 31 M€ renovation. The extensive effort included artwork and wall covering restorations, accessibility improvements, and energy-efficient electrical and HVAC system replacement throughout the building.

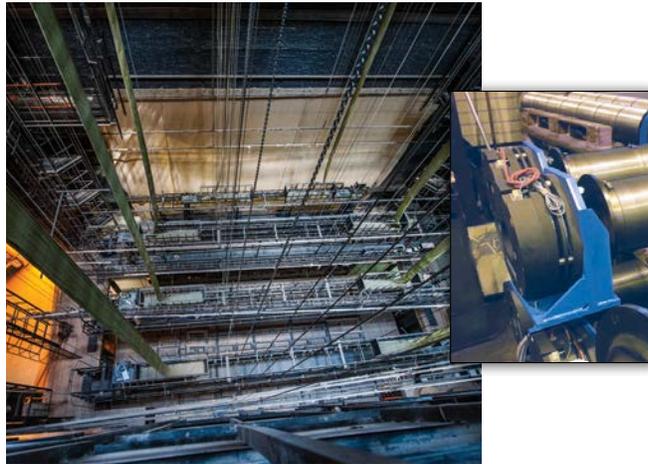
Special attention was given to the backstage areas where completely new lighting systems and faster scenery moving systems were installed to bring the theater up to current standards. The elaborate mechanical systems were needed to allow much more creative freedom to production designers and directors.

Larger capacity motors and winches were installed to lift heavier set decorations and large video screens at speeds from 1.20 m/s to 1.60 m/s to accommodate faster scenery changes. Advanced electronic controls allow a single operator to maneuver 14 individual scenery lifts simultaneously, at full speed and full load.

The exceptional acoustics in the theater's large auditorium amplify the slightest sounds. So, it was critical that the new winch systems were quiet so as not to distract from the performance on stage. The largest concern was selecting a winch braking solution that provided static holding and emergency stopping with no audible noise when braking.

To meet the challenge, extremely quiet Warner Electric ERS FENIX 10 electrically-released brakes, specifically designed for lift/elevator applications were specified. Other Altra Motion products were also supplied, including Stromag combination limit switch/tooth coupling assemblies and Huco Flex Ni couplings.

Continued



The following Altra components were incorporated into the theater's stage scenery winch drive assemblies:



Warner Electric FENIX Brakes

ERS FENIX 10 electrically released brakes provide dynamic braking to prevent ascending winch overspeed and also prevent unintended movement in static park mode. The brakes provide extremely quiet operation throughout their entire life, which was a critical factor for this theater application. Units feature a single magnet and dual friction discs. The 10 12-1600 models supplied have a max. torque rating of 1600 Nm with a diameter of 274 mm.



Stromag Series 51 Limit Switch and EZX Tooth Clutch Assemblies

Combination Series 51 limit switches and EZX tooth clutch assemblies were installed on each winch drive. These conveniently packaged products are very popular for theater applications worldwide.

Series 51 limit switches feature a modular design and utilize a patented planetary gear. Units offer a wide range of gear ratios (up 16,000 turns), a large number of switching contacts, and easily adjustable cam discs.

The Stromag electromagnetic spring-applied EZX toothed clutch has been specifically developed for use on stage hoisting applications. Units are typically mounted directly to Stromag limit switch housings. The backlash-free units feature a form-fit crown gear. In the open condition, the clutch acts as a brake for the geared cam limit switch.



Huco Flex Ni Couplings

Huco Flex Ni nickel bellows couplings were also supplied. Units were mounted to encoders to eliminate misalignment problems experienced by the customer. Flex Ni couplings provide exceptional rotation position integrity. This is achieved through high torsional stiffness while still accommodating large amounts of lateral and angular misalignment due to low spring rates in these directions.

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