

Technical Article

Lifting columns increase efficiency as well as patient and doctor comfort

Modern lifting columns convince by easy installation and superior performance in medical applications



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Vertical lift is required in a wide range of medical equipment where accessibility and comfort can improve care and patient outcomes. Applications such as wheelchair lifts, examination tables and dentist's chairs, or adjustable nurses' stations and optician instruments such as non-contact tonometers all require vertical lift to provide appropriate care and an optimal patient experience.

Whatever the combination of speed, range of movement or capacity loading is required; modern lifting columns need to deliver a solution that helps improve equipment performance, cost and design for doctor and patient benefit.

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Medical Applications		Ergonomic Automation Solutions	
Hospital Equipment	Accessibility Equipment	Furniture	Adjustable Chairs
 <ul style="list-style-type: none"> • X-ray machines • Operating/examination tables • Hospital beds and patient lift 	 <ul style="list-style-type: none"> • Wheel chair lifts • Lifting aids • Handicap adaptation of vehicles 	 <ul style="list-style-type: none"> • Desks and workbenches • Tables • Beds 	 <ul style="list-style-type: none"> • Dental chairs • Barber chairs • Make up chairs

Maximum extension-to-retraction ratio with exceptional speed of operation

The new Thomson LC Series offers a marketing-leading combination of speed and performance. For example, the LC2000 can significantly improve machine performance by providing high load capacity, long stroke length and exceptional speed to maintain efficiency of operation. The column uses a telescopic lead screw with a nesting three-piece extrusion to enable a surprisingly small minimum retracted length and great extension-to-retraction ratio. Ideal for use in machines such as wheelchairs or examination tables as well as ergonomic workstations, this series provides up to 2000 N loading and, as standard, can operate at between 15 and 19 mm/s. Custom designed units can also be manufactured for higher speeds, and have been proven up to 25 mm/s.

Very high load capacity models

The new LC3000 is designed for bariatric, chiropractic and other applications where high load capacity is of utmost importance. LC3000 uses a ball screw with a three-piece extrusion which has additional extrusion overlap to allow for extended-length bushings. This design provides a load capacity of up to 3000 N with high moment loading in a compact frame size. The column also has a very short retracted length and the smooth, quiet operation required for medical or home environments.

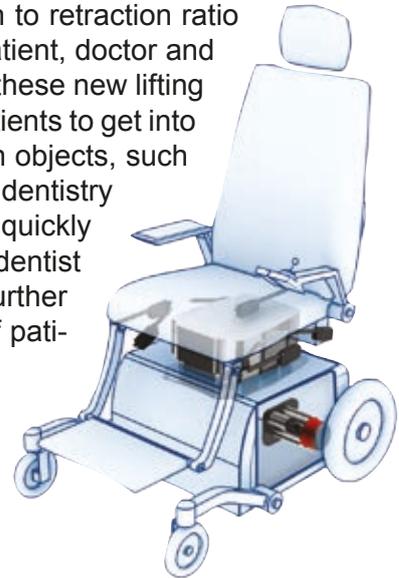
Powerfully quiet

As experts in precision engineering, all components within Thomson lifting columns are designed for low, consistent noise and smooth operation to foster a pleasant working environment and help keep patients relaxed and calm. The units use high performance linear actuators with a noise-deafening cover, making them ideal for use in medical applications without the need for any additional noise attenuation being added to the machinery. Each column uses a single motor and screw ensuring smooth operation and patient comfort, while also allowing for lower amp draw and longer life.

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Best for ergonomics

Thomson Lifting Columns are telescopic to maximize the extension to retraction ratio and give the flexibility in range of movement required to improve patient, doctor and operator ergonomics. For example, powered wheelchairs built with these new lifting columns will feature a minimal retracted height making it easy for patients to get into the chair and also offer high extension enabling users to reach high objects, such as wall cabinets. Equally, equipment such as examination tables or dentistry chairs can be adjusted to allow patients to get on easily and then quickly and smoothly be moved to the optimum height to ensure doctor /dentist comfort and reduced risk of back injuries. The rapid movement further ensures comfort and safety without compromise to the efficiency of patient throughput.



Modern, Functional and Aesthetic Design

Aesthetic design.
Anodized aluminum profiles with 20 μ anodization and surface tolerance class 3.

Benefits: Column can be visible in the end product.
No need to shroud or cover.

Results: Saves cost on overall machine design.

High Load and Speed Capability

Models for loads up to 3000 N, moment loads up to 400 Nm and speeds up to 19 mm/s.

Benefits: Ability to push and hold higher loads while still providing appropriate speed levels.

Results: Improves device functionality with higher and offset loads while still providing throughput requirements.

Easy to Install and Maintenance Free

Maintenance free.
Pre-drilled mounting holes.

Benefits: Simple to install and integrate into overall machine.

Results: Saves costs on install and device maintenance.

Built In End of Stroke Stop

Dynamic Braking

Holds Load at Stand Still

Favorable Extension/Retraction Ratio

Compact design provides favorable ratio between stroke and retracted length.

Benefits: Provides more device flexibility with low retracted height while still providing necessary stroke length.

Results: Improves patient, doctor, operator or other end-user ergonomics.

Quiet and Smooth Operation

Quiet operation suitable for domestic use.

Benefits: Noise levels are appropriate for medical and office use.

Results: No attenuation of the sound needed.

CE approved

Rigorous testing ensure a safe and reliable product.

Benefits: The device is documented safe.

Results: Save on testing and integration costs into end device.

Compact Low Weight Design

Self Supporting Aluminum Cover

IP 44 Protection Class



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Bearing the load

Thomson Lifting Columns are stand-alone actuators that provide lifting force while also handling potential moment loads of up to 400 Nm. The robust design across the range uses engineered polymer slide bushings to provide column moment loading capability. These bushings slide along the extrusion as the column telescopes and are keyed to enable up to 40% more moment load than alternate designs. A loading brake also ensures the load is held even on power failure, to provide complete safety for the user.

In applications where there is too much side load for a single column, two or even four units may be easily synchronized together either using a combination of the Thomson encoder and DCG control or any suitable third-party controller.



The resulting system will offer more stability, more load capacity and more moment load capacity as required, while still being easy to install and integrate into the overall machine.

Reducing overall machine and lifetime costs

The outside of the columns are made with an aesthetically pleasing aluminum extrusion which is designed to be visible. The attractive exterior means that no additional covers or shrouds are required, simplifying the machine design and reducing manufacturing costs. Pre-drilled mounting holes and an end of stroke limits which require no external limit switches further ensure an easy to mount, cost effective solution..

The fully enclosed columns use high viscosity grease to prolong life and they provide 10,000 cycles at full load, giving reliable lifetime performance with no ongoing maintenance or greasing requirements.

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Getting the best for your application and budget

There are three models of Thomson Lifting Columns, each with unique features and benefits to provide the right balance between extension-to-retraction ratio, load capacity, speed and cost for any given application.

Model Comparison			
	LC1600	LC2000	LC3000
Model			
Description	Two-piece extrusion with 1600 N loading capacity ideal for cost-sensitive applications where extension-to-retraction ratio is not as critical.	Three-piece extrusion with 2000 N loading capacity and a telescoping leadscrew mechanism to provide an ideal extension-to-retraction ratio.	Three-piece extrusion with ballscrew drive mechanism to allow for 3000 N loading capacity and high moment loading.
Screw type	Trapezoidal screw	Telescopic lead screw	Ball screw
Weight	Best	Good	Good
Quiet operation	Best	Good	Good
Extension/retraction ratio	Good	Best	Better
Minimum retracted length	Good	Best	Better
Load capacity	Good	Better	Best
Load torque capacity	Good	Good	Best
Duty cycle	Good	Best	Good
Speed	Better	Best	Good
Mid stroke overload protection	Yes	No *	No *

* Mid-stroke overload protection available with use of DCG Control.

All columns have quiet, smooth operation; are easy to install; are maintenance free, and provide a self-supporting, compact vertical lifting solution.

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Light weight, quiet operation for cost-sensitive applications

For applications such as baby incubators, optician testing machines and mobile carts where the extension-to-retraction ratio is not as critical, the LC1600 uses a two-piece extrusion to provide stroke lengths of up to 400mm. With a loading capacity of up to 1600 N, it has exceptionally quiet operation and is very competitively priced.

Summary

Thomson Lifting Columns are self-supporting, surprisingly compact and produce a smooth, quiet lifting motion for patient peace of mind. They are designed to give the flexibility in height required to avoid back injuries as well as meeting high load and extension requirements. All units come as a complete system with an attractive housing, making installation and machine design simpler. In addition, the columns provide rapid movement for the amount of loads they can lift to give required performance without compromise to productivity. Innovative design further means that a single, central column can handle significant moment loads or, if required, multiple columns can be easily synchronized into an overall machine design.

New Thomson Lifting Columns ensure that machine builders can get the features they need for their particular application in a solution which is cost-effective and easy to install, while providing a better overall machine performance and user experience.

Thomson has production facilities in Europe and USA. Regional operations and precision manufacturing produces lifting columns which are readily available at competitive prices.

As with most of their components, Thomson lifting columns can be readily customized to meet precise application requirements where necessary. Provision for higher retracted lengths, mounting plates with customer specific mounting arrangements, special cable lengths and double or extended bushings to provide greater moment load can all be produced with good lead times.

Get more technical details on Thomson's website:

<http://www.thomsonlinear.com/website/com/eng/products/columns.php>