Lifting Columns

Self Supporting, Compact and Versatile Linear Motion for Quicker Throughput, Minimal Downtime and No Maintenance

THOMSON®

Linear Motion. ***Optimized.***™

www.thomsonlinear.com

Meet the Thomson Lifting Column Product Family

Thomson lifting columns are self-supporting, height-adjustable lifting solutions in a compact, pre-aligned package and are perfect for medical and ergonomic applications requiring telescopic motion. Simple, one-step installation requires minimal downtime, and maintenance-free operation ensures worry-free functionality.

These columns are designed for smooth, quiet and fast operation and offer an excellent extension to retraction ratio resulting in the maximum range of motion in a minimal footprint.

Thomson lifting columns are designed to be flexible linear motion solutions based on anodized extruded aluminum profiles which slide into each other. A high moment load capacity, large holding-capacity-to-frame-size ratio and the ability to use a single unit for a center load or multiple units linked together allow for numerous design configurations.

Thomson lifting columns also can be customized for more specific requirements. The result is a self-supporting, compact and versatile lifting solution.

Features and Benefits

Three different lifting column modules are available from Thomson, all sharing the same basic design and functionality. All models feature easy installation, maintenance-free operation and a high moment load capacity. Though each model has its own unique advantages, the basic features and benefits are the same.

Common Thomson Lifting Columns Features

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

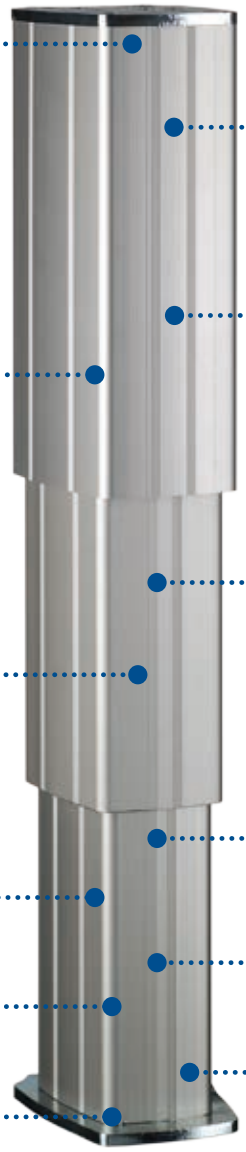
Maintenance free.
Pre-drilled mounting holes.

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 ensures 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

Model Comparison

The Thomson lifting column product family has three different models that are all made of self-supporting, extruded aluminum profiles that are easy to install and require no additional cover for protection. The type of model that is most appropriate depends on the balance that is needed among extension-to-retraction ratio, load capacity, speed and cost.

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 ball screw 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.

Applications

Thomson lifting columns feature easy installation, maintenance-free operation, high moment load capacity and extension-to-retraction ratio, making them especially suited for medical and ergonomic applications. The versatility, flexibility and customizability of these lifting columns make them ideal for numerous applications within these categories.

Medical Applications	
Hospital Equipment	Accessibility Equipment
	
• X-ray machines • Operating/examination tables • Hospital beds and patient lifts	• Wheel chair lifts • Lifting aids • Handicap adaptation of vehicles
Thomson lifting columns provide simple and effective solutions for medical lifting applications such as medical tables, wheelchairs, lifts, patient beds and similar applications.	
Simple, all-in-one solution.	
Allows for minimal table height while maintaining necessary stroke length.	
Meets material requirements for medical applications.	
Meets medical 60601 certification requirements.	
Meets audible noise requirements (CE Standards).	
Aesthetic design - no need to shroud or cover.	

Ergonomic Automation Solutions	
Furniture	Adjustable Chairs
	
• Desks and workbenches • Tables • Beds	• Dental chairs • Barber chairs • Makeup chairs
Easily install a low-cost ergonomic solution to increase operator comfort and productivity in numerous office scenarios such as adjustable tables, desks, carts, workstations and more.	
Easy, one-step install.	
Low-cost solution.	
Increase productivity and throughput.	
Reduce workplace injuries.	
Customizable solution.	
Aesthetic design - no need to shroud or cover.	

LC1600 - Specifications

Standard Features and Benefits

- For medical and ergonomic automation applications
- Self-supporting column in extruded, anodized aluminum
- Low weight and extremely quiet operation
- Thomson Whispertrak™ drive technology
- High load torque capability
- Maintenance free
- Dynamic braking and load-holding brake
- Electronic limit switches and mid-stroke protection

General Specifications

Parameter	LC1600
Screw type	trapezoidal
Internally restrained	yes
Manual override	no
Dynamic braking	yes
Holding brake	yes
End-of-stroke protection	electronic limit switches (ELS)
Mid-stroke protection	yes
Motor protection	no
Motor connection	cable
Motor connector LX version NX and NE versions	 flying leads Molex 8-pin plug
Certificates	CE
Options	ELS encoder position feedback
Compatable controls (1) DCG-154 DCG-254	 operation of single unit synchronous operation of two units

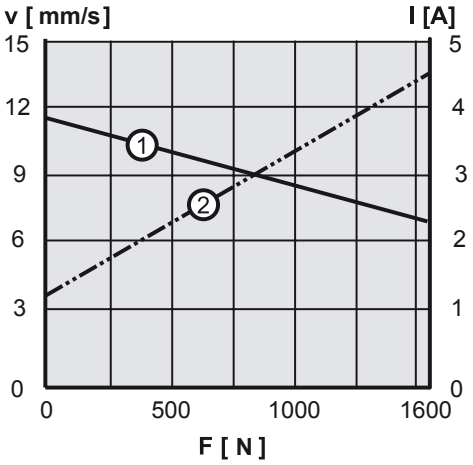
(1) See page 14 for more information.

Performance Specifications

Parameter		LC1600
Maximum load	[N]	1600
Maximum load torque, dynamic / static	[Nm]	200 / 500
Speed, at no load / at maximum load	[mm/s]	11 / 6.5
Available input voltages	[VDC]	24
Standard stroke lengths (S)	[mm]	200, 250, 300, 350, 400
Operating temperature limits	[°C]	0 to +40
Full load duty cycle @ 20°C	[%]	10
Maximum on time	[s]	60
Maximum sound level	[dB]	45
Lead cross section	[mm²]	1.5
Standard cable length LX version NX and NE versions	[mm]	 900 1900
Protection class		IP44

Performance Diagram

Speed and Current vs. Load

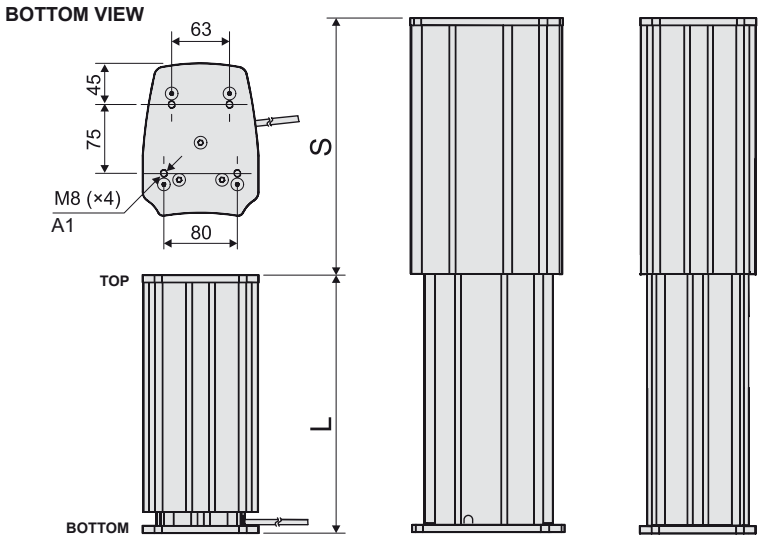


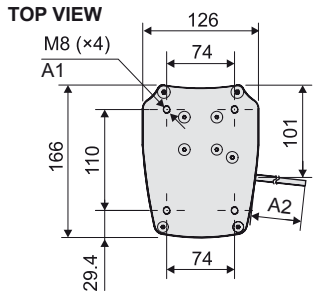
V: speed I: current F: load

1: speed
2: current

LC1600 - Dimensions and Performance

Dimensions	Projection
METRIC	





S: stroke
L: retracted length
A1: mounting screws must not enter deeper than 10 mm.
A2: LX version cable length = 900 mm, NX and NE versions = 1900 mm.

Ordering Stroke, Retracted Length and Weight

The desired ordering stroke (S) will determine the minimum retracted length (L min) and the weight of the unit. The table provides the corresponding minimum retracted length (L min) and weight values to each of the available standard stroke lengths (S).

Stroke, retracted length and weight relationship						
Ordering stroke (S)	[mm]	200	250	300	350	400
Minimum retracted length (L min)	[mm]	380	430	480	581	631
Weight of unit	[kg]	9.1	9.8	10.5	11.8	12.4

LC2000 - Specifications

Standard Features and Benefits

- For medical and ergonomic automation applications
- Self-supporting column in extruded anodized aluminum
- Low weight and quiet operation
- Smooth-operating telescopic lead screw drive
- High load torque capability
- Short retracted length
- High extension to retraction ratio
- Maintenance free
- Load holding brake
- Integrated end-of-stroke limit switches
- EMC recognized for medical applications

General Specifications

Parameter	LC2000
Screw type	telescopic lead screw
Internally restrained	yes
Manual override	no
Dynamic braking	no (1)
Holding brake	yes
End-of-stroke protection	end-of-stroke limit switches
Mid-stroke protection	no (1)
Motor protection	no (1)
Motor connection	cable
Motor connector	Molex 8-pin plug
Certificates	CE EMC for medical applications (2)
Options	encoder position feedback
Compatable controls (3) DCG-180 DCG-280	 operation of single unit synchronous operation of two units

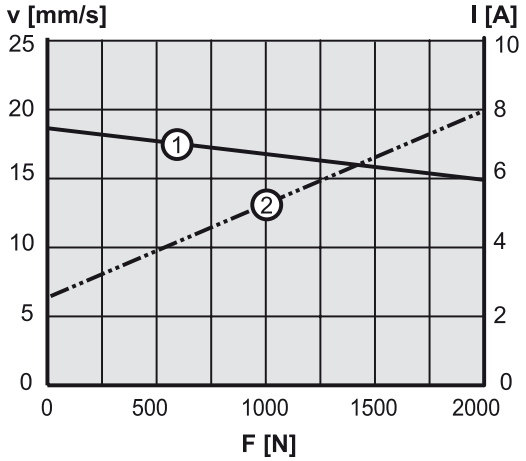
Performance Specifications

Parameter		LC2000
Maximum load	[N]	2000
Maximum load torque, dynamic / static	[Nm]	150*/ 500
Speed, at no load / at maximum load	[mm/s]	19 / 15
Available input voltages	[VDC]	24
Minimum ordering stroke (S)	[mm]	200
Maximum ordering stroke (S)	[mm]	600
Operating temperature limits	[°C]	0 to +40
Full load duty cycle @ 20°C	[%]	15
Maximum on time	[s]	60
Lead cross section	[mm²]	1.5
Standard cable length	[mm]	1900
Protection class		IP44

* Higher dynamic loads up to 400 Nm available upon request, contact customer support.

Performance Diagram

Speed and Current vs. Load



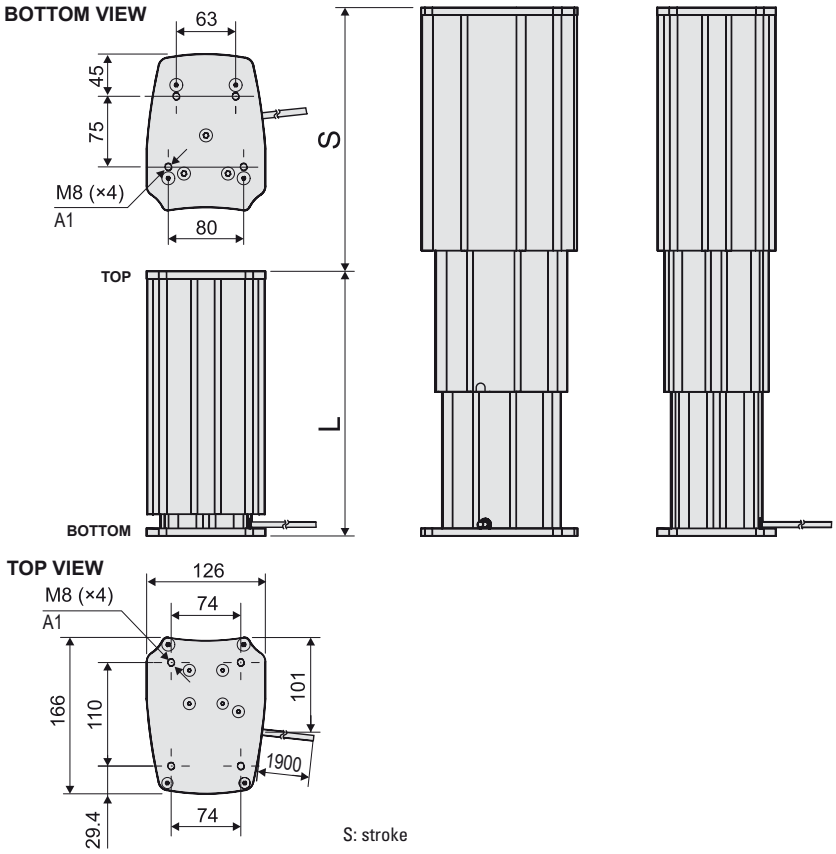
V: speed I: current F: load

1: speed
2: current

(1) Dynamic braking, mid-stroke protection and motor protection are provided when used with DCG control.
(2) Emission: EN 61000-6-3:2001, EN 60601-1-2:1993, EN 55011 Class B
Immunity: EN 61000-6-2:2001, EN 61000-4-2, EN 61000-4-3
(3) See page 14 for more information.

LC2000 - Dimensions and Performance

Dimensions	Projection
METRIC	



S: stroke
L: retracted length
A1: mounting screws must not enter deeper than 10 mm.

Ordering Stroke, Retracted Length and Weight

The desired stroke (S) will determine the minimum retracted length (L min) and the weight of the unit. Units can be built with a retracted length (L) between the calculated L min value and maximum retracted length.

Stroke, retracted length and weight relationship			
		Minimum	Maximum
Stroke (S)	[mm]	200	600
Retracted length (L)	[mm]	250 or L min	441
Min. retracted length (L min) based on stroke (S)	[mm]	L min = (S + 282) / 2	
Weight of unit based on stroke (S)	[kg]	Weight = 3.4 + L [mm] × 0.0203 + S [mm] × 0.001	

The table below provides examples of stroke lengths and their corresponding minimum retracted length (L min) values.

Examples of strokes and the resulting minimum retracted length and weight										
Stroke (S)	[mm]	200	250	300	350	400	450	500	550	600
Minimum retracted length (L min)	[mm]	250	266	291	316	341	366	391	416	441
Weight	[kg]	8.7	9.1	9.7	10.2	10.8	11.3	11.9	12.4	13

LC3000 - Specifications

Standard Features and Benefits

- For medical and ergonomic automation applications
- Self-supporting column in extruded anodized aluminum
- Low weight and quiet operation
- Smooth-operating ballscrew drive
- High load torque capability
- Short retracted length
- Maintenance free
- Load holding brake
- Integrated end-of-stroke limit switches

General Specifications

Parameter	LC3000
Screw type	ball screw
Internally restrained	yes
Manual override	no
Dynamic braking	no (1)
Holding brake	yes
End-of-stroke protection	end-of-stroke limit switches
Mid-stroke protection	no (1)
Motor protection	no (1)
Motor connection	cable
Motor connector	Molex 8-pin plug
Certificates	CE
Options	encoder position feedback
Compatible controls (2) DCG-180 DCG-280	 operation of single unit synchronous operation of two units

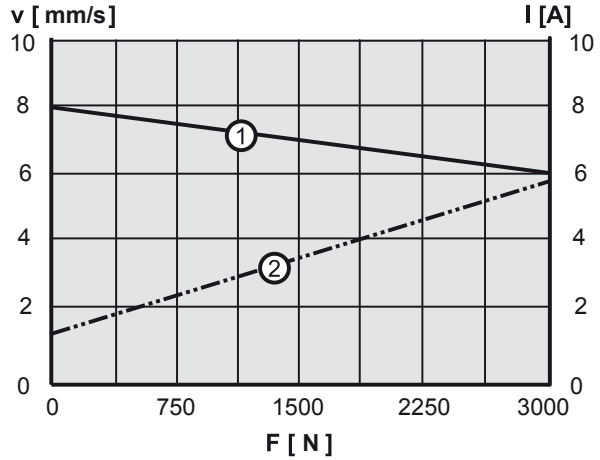
(1) Dynamic braking, mid-stroke protection and motor protection are provided when used with DCG control.
(2) See page 14 for more information.

Performance Specifications

Parameter		LC3000
Maximum load	[N]	3000
Maximum load torque, dynamic / static	[Nm]	400 / 500
Speed, at no load / at maximum load	[mm/s]	8 / 6
Available input voltages	[VDC]	24
Minimum ordering stroke (S)	[mm]	200
Maximum ordering stroke (S)	[mm]	400
Operating temperature limits	[°C]	0 to +40
Full load duty cycle @ 20°C	[%]	10
Maximum on time	[s]	60
Lead cross section	[mm²]	1.5
Standard cable length	[mm]	1900
Protection class		IP44

Performance Diagram

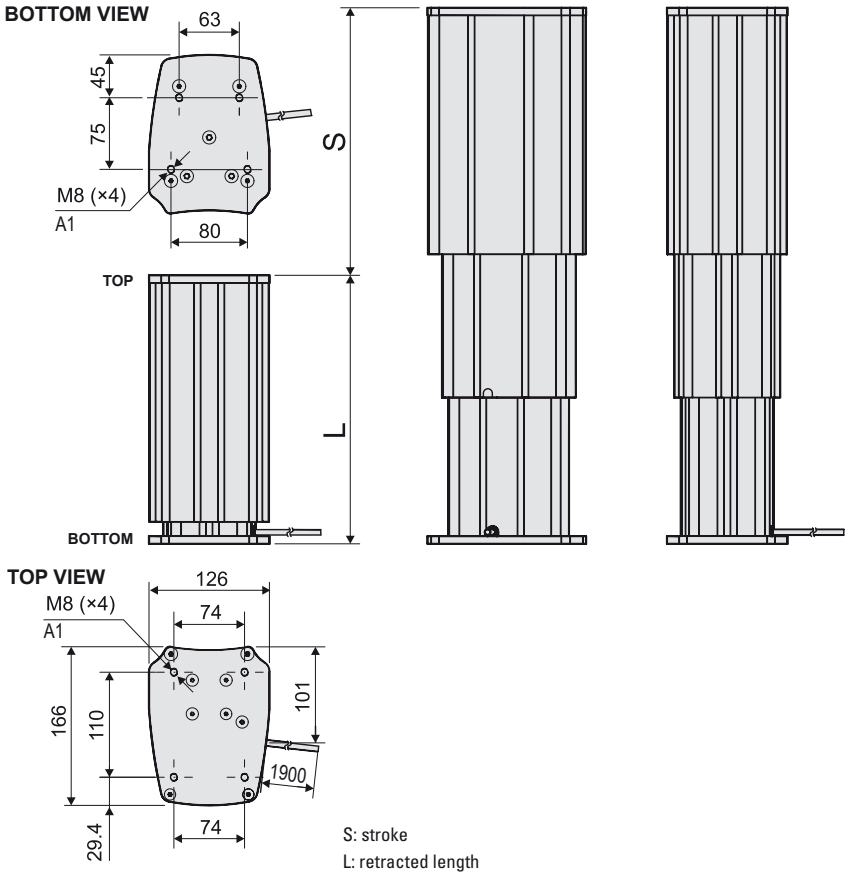
Speed and Current vs. Load



V: speed I: current F: load
1: speed
2: current

LC3000 - Dimensions and Performance

Dimensions	Projection
METRIC	



S: stroke
L: retracted length
A1: mounting screws must not enter deeper than 10 mm.

Ordering Stroke, Retracted Length and Weight

The desired stroke (S) will determine the minimum retracted length (L min) and the weight of the unit. Units can be built with a retracted length (L) between the calculated L min value and maximum retracted length.

Stroke, retracted length and weight relationship			
		Minimum	Maximum
Stroke (S)	[mm]	200	400
Retracted length (L)	[mm]	330 or L min	530
Min. retracted length (L min) based on stroke (S)	[mm]	L min = S + 130	
Weight of unit based on stroke (S)	[kg]	Weight = 4.065 + ((0.01774 × L [mm]) - 0.6031) + (S [mm] + 70) × 0.0012)	

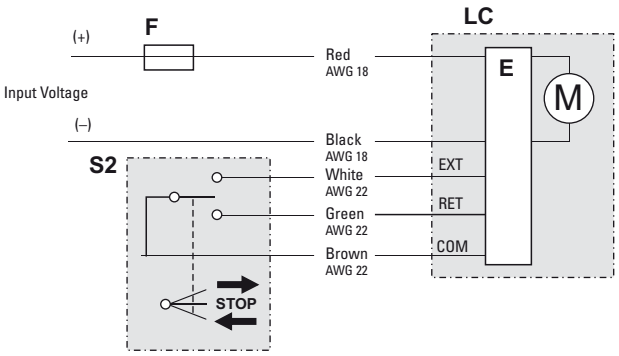
The table below provides examples of stroke lengths and their corresponding minimum retracted length (L min) values.

Examples of strokes and the resulting minimum retracted length and weight						
Stroke (S)	[mm]	200	250	300	350	400
Minimum retracted length (L min)	[mm]	330	380	430	480	530
Weight	[kg]	9.7	10.6	11.6	12.5	13.5

Wiring Diagrams

LC1600

With electronic limit switches (LX)



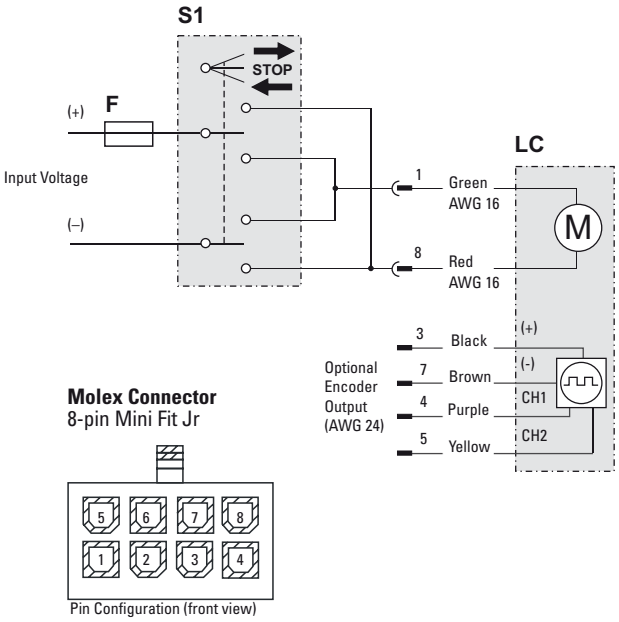
The direction of the extension tube travel is controlled by switching the COM (common) output to the EXT (extend) or RET (retract) inputs.

The actuator will automatically switch off when reaching the ends of stroke or a mid-stroke overload.

With encoder feedback (NE) or with no feedback options (NX)

LC2000 and LC3000

Standard (NX) or with encoder feedback option (NE)



LC Lifting column
M Lifting column motor
E Electronic limit switches
S1 Double-pole double throw (DPDT) switch (provided by the customer)
S2 Single-pole double throw (SPDT) switch
F Fuse (provided by the customer)

Connect the green lead (pin 1) to positive and the red (pin 8) to negative to extend the lifting column. Change polarity to retract the lifting column.

LC2000 and LC3000 are provided with internal limit switches. No external wiring is required for these switches.

The encoder version (NE) is optional and would be used when feedback is required or when synchronization of multiple units is necessary. If in use it should be supplied with 5 - 18 Vdc on black (pin 3) and brown (pin 7) leads, and the two encoder channels are generated on purple (pin 4) and yellow (pin 5).

Encoder Option Data	
Supply Voltage	5-18 VDC
Pulses per mm/stroke	6.62
Output Type	Open collector
Output Current	Isource ≤ 400 uA; Isink: ≤ 2 mA
Output Voltage	Uout: ≥ Usupply x 0.7; Uout: ≤ 1.5 V

Ordering Keys

LC1600 Ordering Key

Position	1	2	3	4	5
Example	**LC1600**	**N**	**24**	**-300480**	**NX**

1. Lifting column model
LC1600 = LC1600

2. Type
N = standard

3. Supply voltage
24 = 24 VDC

4. Stroke and retracted length
-200380 = 200 and 380 mm
-250430 = 250 and 430 mm
-300480 = 300 and 480 mm
-350580 = 350 and 581 mm
-400630 = 400 and 631 mm

5. Connection, electronic limit switches and encoder options
LX = Cable (L = 900 mm), flying leads, electronic limit switches
NE = Cable (L = 1900 mm), Molex connector, encoder feedback (1)
NX = Cable (L = 1900 mm), Molex connector, no encoder feedback (2)

(1) Encoders are used when synchronizing multiple units. This option may only be used in conjunction with the DCG-254 control.
(2) This option may only be used in conjunction with the DCG-154 control.

LC2000 Ordering Key

Position	1	2	3	4	5
Example	**LC2000**	**N**	**24**	**-400341**	**NX**

1. Lifting column model
LC2000 = LC2000

2. Type
N = standard

3. Supply voltage
24 = 24 VDC

4. Stroke and retracted length
-400341 = 400 and 341 mm (1)

5. Connection and encoder options
NE = Cable (L = 1900 mm), Molex connector, encoder feedback (2)
NX = Cable (L = 1900 mm), Molex connector, no encoder feedback

(1) This is just an example, see section Ordering Stroke, Retracted Length and Weight on page 9 for directions on how to calculate this number.
(2) Encoders are used when synchronizing multiple units.

LC3000 Ordering Key

Position	1	2	3	4	5
Example	**LC3000**	**N**	**24**	**-400530**	**NX**

1. Lifting column model
LC3000 = LC3000

2. Type
N = standard

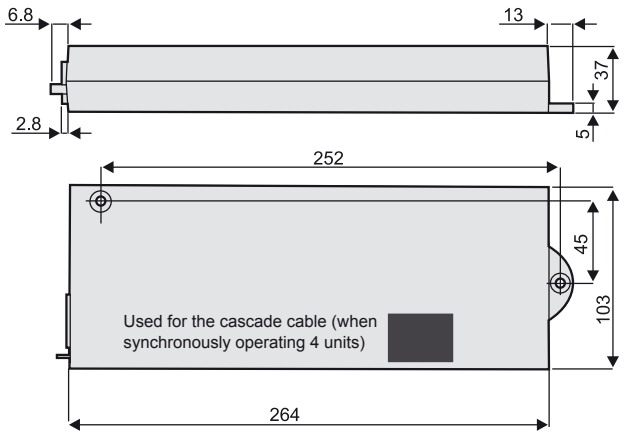
3. Supply voltage
24 = 24 VDC

4. Stroke and retracted length
-400530 = 400 and 530 mm (1)

5. Connection and encoder options
NE = Cable (L = 1900 mm), Molex connector, encoder feedback (2)
NX = Cable (L = 1900 mm), Molex connector, no encoder feedback

1) This is just an example, see section Ordering Stroke, Retracted Length and Weight on page 11 for directions on how to calculate this number.
(2) Encoders are used when synchronizing multiple units.

DCG Control Series



Standard Features and Benefits

- Controls available for single lifting column operation or synchronous operation of two lifting columns equipped with encoders
- Small and lightweight control operated via a control pendant (ordered separately)
- Built-in electronic limit switches (ELS) stop the lifting column automatically at end of stroke or mid-stroke stall
- No wiring is necessary to the control as all connections are done through plugs

Compatibility

Control	Lifting Column
DCG-154	Single operation of one LC1600 (1)
DCG-180	Single operation of one LC2000 or LC3000 (1)
DCG-254	Synchronous operation of two LC1600 (2) (3)
DCG-254C	Synchronous operation of four LC1600 (2) (3)
DCG-280	Synchronous operation of two LC2000 or LC3000 (2) (3)
DCG-280C	Synchronous operation of four LC2000 or LC3000 (2) (3)

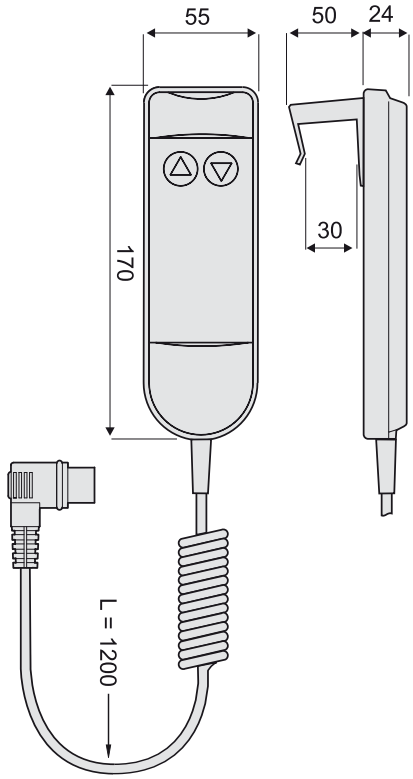
(1) The lifting column should be equipped with the no encoder (NX) option.
(2) Lifting columns used in synchronous operation must be equipped with encoder (NE) option.
(3) Synchronous operation of six units is also available. Contact Thomson customer support for details.

Performance Specifications

Parameter		DCG-154	DCG-180	DCG-254	DCG-254C	DCG-280	DCG-280C
Input voltage	[VAC]	1 × 230 ± 6% or 1 x 115 ± 6%					
Input frequency	[Hz]	50/60					
Output voltage	[VDC]	24					
Output current, max. up/down	[A]	4	8	2 × 4	4 × 4	2 × 8	4 × 8
Operating temperature limits	[°C]	+0 to +30					
Max. duty cycle @ 25°C (1)	[%]	10					
Maximum on time	[s]	60					
Weight of control	[kg]	0.5					
Protection class		Class 1 (not for outdoor use)					
Electronic limit switches		yes (2)					
Included control pendant		no					
Certificates		CE					

(1) Control will shut off if duty cycle is exceeded and automatically reset when cooled off.

DCG Control Pendant



Standard Features and Benefits

- Handy and lightweight control pendant
- 1.2-meter-long spiral cord cable
- Connects to the DCG control with a plug

Specifications

Parameter		DCG14-1H
Weight	[kg]	0.4
Cable length	[mm]	1200
Certificates		CE
Part number		DCG14-1H

DCG Actuator Controls Ordering Key

1	2	3	4	5
DGC	24	-1	M	-0180

1. Type of control
DCG = actuator control type DCG

2. Output voltage
24 = 24 VDC

3. Type of operation
-1 = operation of a single actuator
-2 = operation of two parallel synchronous actuators
-4 = operation of four parallel synchronous actuators

4. Input voltage
M = 230 Vac
U = 115 Vac

5. Matching actuator
-0154 = single drive of LC1600
-0180 = single drive of LC2000, LC3000
-0254 = parallel synchronous drive of two LC1600 actuators with encoder feedback
-0254C = parallel synchronous drive of four LC1600 actuators with encoder feedback
-0280 = parallel synchronous drive of two LC2000 or LC3000 actuators with encoder feedback
-0280C = parallel synchronous drive of four LC2000 or LC3000 actuators with encoder feedback

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