

The information in this section has been superseded.
Please see the information in the latest product catalog at:
www.animatics.com/support/moog-animatics-catalog.html

Understanding Part Numbers

The information in this section has been superseded.
Please see the information in the latest product catalog at:
www.animatics.com/support/moog-animatics-catalog.html

OVERVIEW

SOFTWARE

D-STYLE MOTORS

D-STYLE CONNECTIVITY

PERIPHERALS

M-STYLE MOTORS

M-STYLE CONNECTIVITY

LINEAR SYSTEMS

POWER SUPPLIES & SHUNTS

GEAR HEADS

APPENDIX

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Actuator Comparison Chart

OVERVIEW

SOFTWARE

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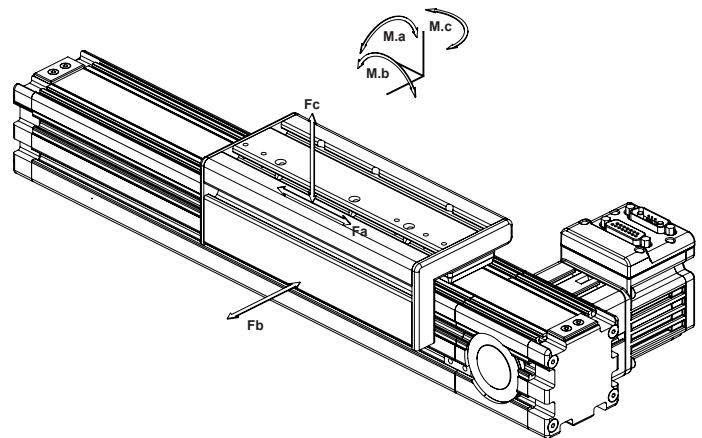
HLD60 with Internal Roller Specifications

Parameter	Value				Units
Configuration & Physical Parameters					
Motor	23 Frame SmartMotors, D and M series				-
Coupling	Flexible Jaw				-
Displacement/rev	2.5, 5, 10, 12.5				mm/rev
Position sensors	Optional Home & EOT limits				-
Stroke	100 – 600mm in 50mm steps 600 – 1000mm in 100mm steps 1000 – 2200mm in 200mm steps Custom lengths are available				mm
Overall length (L)	Stroke + 332				mm
Overtravel	25				mm
Unit mass	2.3 + 0.0031 x (stroke, mm) + (motor mass, kg)				kg
Performance					
Unidirectional repeatability	<20				µm
Bidirectional repeatability	60 – 180 (belt tension dependent)				µm
Linear Accuracy*	0.5/300				mm/mm
Displacement/rev	2.5	5	10	12.5	mm/rev
Max linear speed (no load)*	200	391	782	977	mm/s
Payload Mass**	45	42	18	13	kg
Continuous Thrust (Fa)					
SM23165D @ 48V @ 4500RPM	270	120	35	-	N
SM23165DT @ 48V @ 3800RPM	450	420	185	135	N
SM23375D @ 48V @ 4500RPM	175	70	10	-	N
SM23375DT @ 48V @ 3200 RPM	450	290	125	90	N
Load Rating, Dynamic** (Static)					
Fb	56 (110)	44 (110)	35 (110)	33 (110)	N
Fc	56 (200)	44 (200)	35 (200)	33 (200)	N
Carriage moments, Dynamic** (Static)					
M.a***	1.0 (2.4)	0.8 (2.4)	0.6 (2.4)	0.55 (2.4)	Nm
M.b***	3.2 (8)	2.5 (8)	2.0 (8)	1.9 (8)	Nm
M.c***	3.2 (12)	2.5 (12)	2.0 (12)	1.9 (12)	Nm

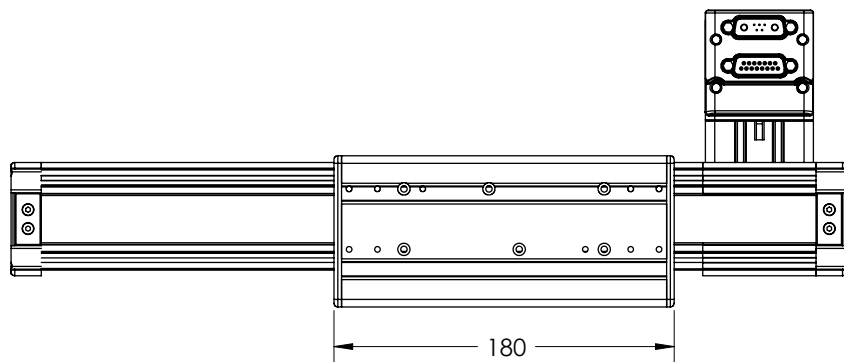
*Based on using SM23165DT @ 48V @ 4200 RPM no load.

**Based on a 15000HR service life @ 75/150/300 & 375mm/s (1800 RPM) average speed at given payload, subject to routine lubrication.

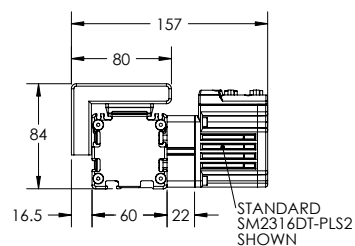
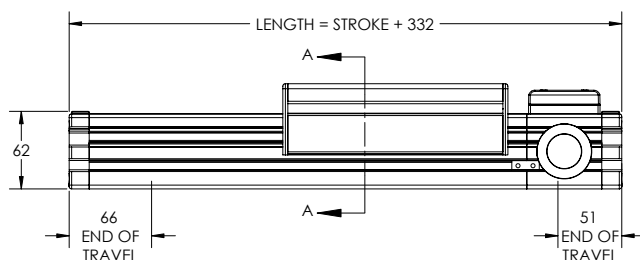
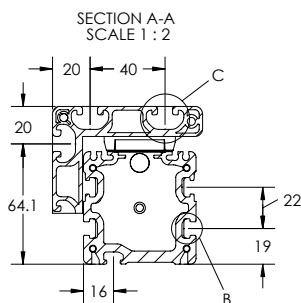
***Moment capacities given about center of carriage mounting surface.



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



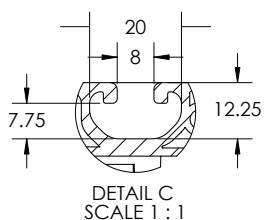
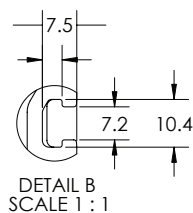
TOP VIEW



SIMPLE END VIEW

RIGHT SIDE VIEW

MOTOR END VIEW



DETAILED END VIEW

Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

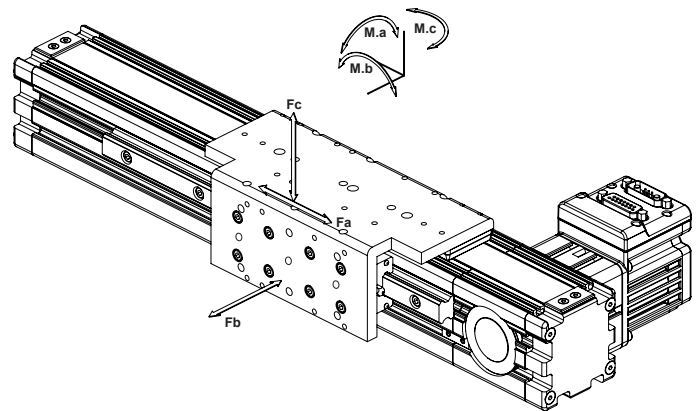
HLD60 with External Rail Specifications

Parameter	Value				Units
Configuration & Physical Parameters					
Motor	23 Frame SmartMotors, D and M series				-
Coupling	Flexible Jaw				-
Displacement/rev	2.5, 5, 10, 12.5				mm/rev
Position sensors	Optional Home & EOT limits				-
Stroke	100 – 600mm in 50mm steps 600 – 1000mm in 100mm steps 1000 – 2200mm in 200mm steps Custom lengths are available				mm
Overall length (L)	Stroke + 332				mm
Overtravel	25				mm
Unit mass	2.7 + 0.0044 x (stroke, mm) + (motor mass, kg)				kg
Performance					
Unidirectional repeatability	<20				µm
Bidirectional repeatability	60 – 180 (belt tension dependent)				µm
Linear Accuracy*	0.5/300				mm/mm
Displacement/rev	2.5	5	10	12.5	mm/rev
Max linear speed (no load)*	200	391	782	977	mm/s
Payload Mass**	45	42	18	13	kg
Continuous Thrust (Fa)					
SM23165D @ 48V @ 4500RPM	270	120	35	-	N
SM23165DT @ 48V @ 3800RPM	450	420	185	135	N
SM23375D @ 48V @ 4500RPM	175	70	10	-	N
SM23375DT @ 48V @ 3200 RPM	450	290	125	90	N
Load Rating, Dynamic** (Static)					
Fb	730 (1200)	580 (1200)	460 (1200)	430 (1200)	N
Fc	730 (1200)	580 (1200)	460 (1200)	430 (1200)	N
Carriage moments, Dynamic** (Static)					
M.a***	19 (24)	15 (24)	12 (24)	11 (24)	Nm
M.b***	72 (200)	57 (200)	45 (200)	42 (200)	Nm
M.c***	72 (150)	57 (150)	45 (150)	42 (150)	Nm

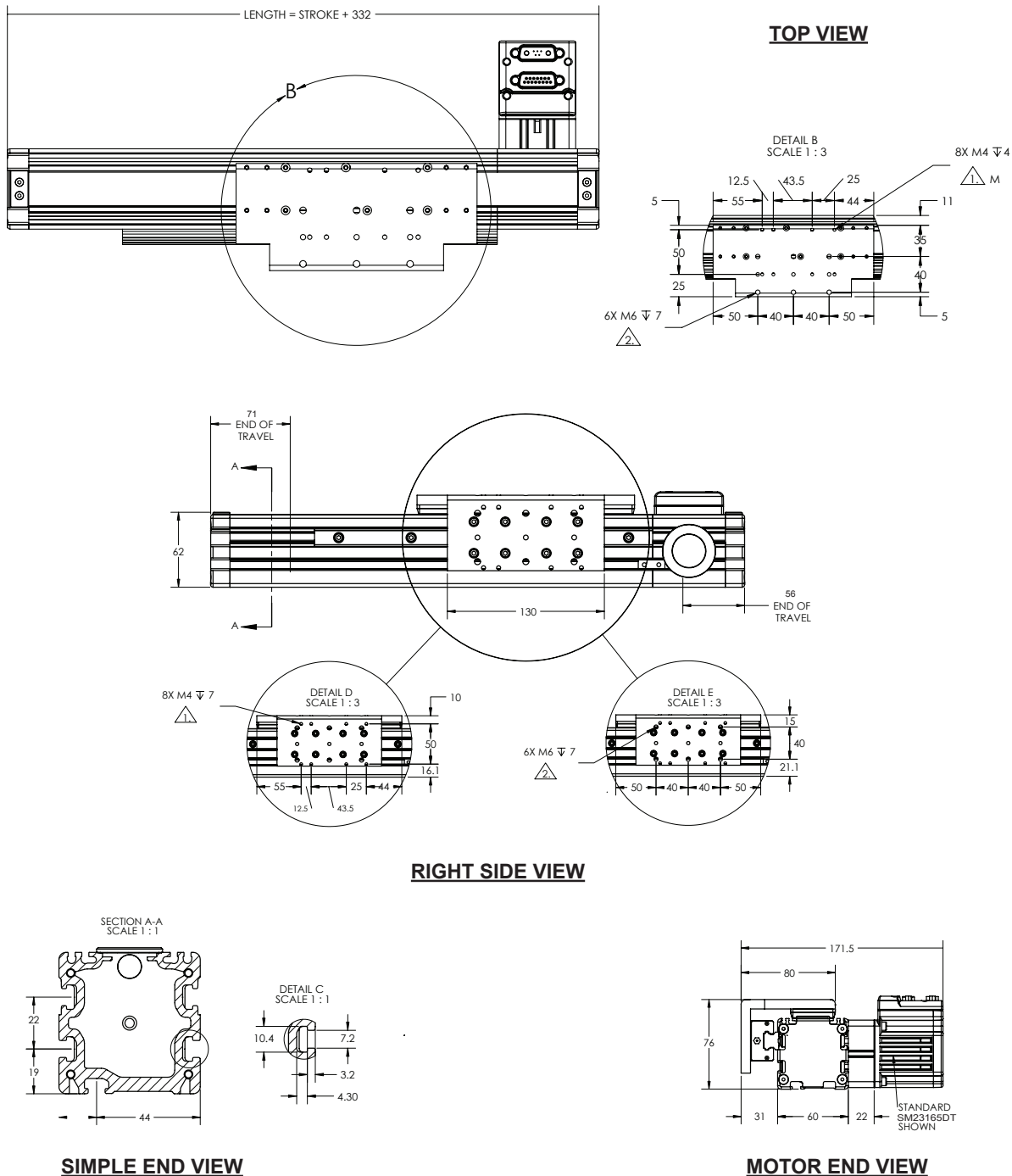
*Based on using SM23165DT @ 48V @ 4200 RPM no load.

**Based on a 15000HR service life @ 75/150/300 & 375mm/s (1800 RPM) average speed at given payload, subject to routine lubrication.

***Moment capacities given about center of carriage mounting surface.



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



NOTES:

1. M4 x 50 x 12.5 and M4 x 25 x 50 for mounting L70 actuator.
2. M6 x 40 x 40 standard bolt pattern for optional mounting accessories.

Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

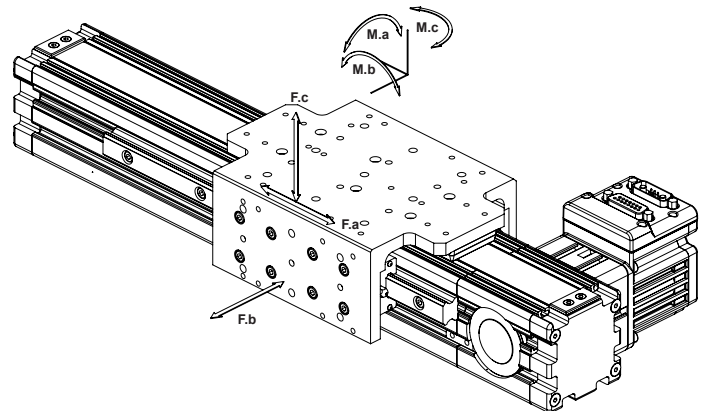
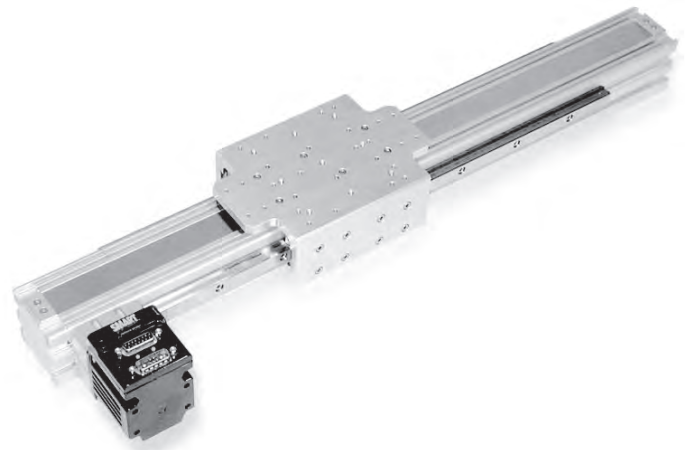
HLD60 with Twin External Rails Specifications

Parameter	Value				Units
Configuration & Physical Parameters					
Motor	23 Frame SmartMotors, D and M series				-
Coupling	Flexible Jaw				-
Displacement/rev	2.5, 5, 10, 12.5				mm/rev
Position sensors	Optional Home & EOT limits				-
Stroke	100 – 600mm in 50mm steps 600 – 1000mm in 100mm steps 1000 – 2200mm in 200mm steps Custom lengths are available				mm
Overall length (L)	Stroke + 332				mm
Overtravel	25				mm
Unit mass	3.4 + 0.0057 x (stroke, mm) + (motor mass, kg)				kg
Performance					
Unidirectional repeatability	<20				µm
Bidirectional repeatability	60 – 180 (belt tension dependent)				µm
Linear Accuracy*	0.5/300				mm/mm
Displacement/rev	2.5	5	10	12.5	mm/rev
Max linear speed (no load)*	200	391	782	914	mm/s
Payload Mass**	45	40	16	10	kg
Continuous Thrust (Fa)					
SM23165D @ 48V @ 4500RPM	260	100	-	-	N
SM23165DT @ 48V @ 3800RPM	450	400	160	135	N
SM23375D @ 48V @ 4500RPM	165	50	-	-	N
SM23375DT @ 48V @ 3200 RPM	450	275	105	65	N
Load Rating, Dynamic** (Static)					
Fb	3000 (3000)	3000 (3000)	3000 (3000)	2800 (3000)	N
Fc	3000 (3000)	3000 (3000)	3000 (3000)	2800 (3000)	N
Carriage moments, Dynamic** (Static)					
M.a***	180 (200)	144 (200)	114 (200)	106 (200)	Nm
M.b***	144 (200)	113 (200)	89 (200)	84 (200)	Nm
M.c***	144 (200)	113 (200)	89 (200)	84 (200)	Nm

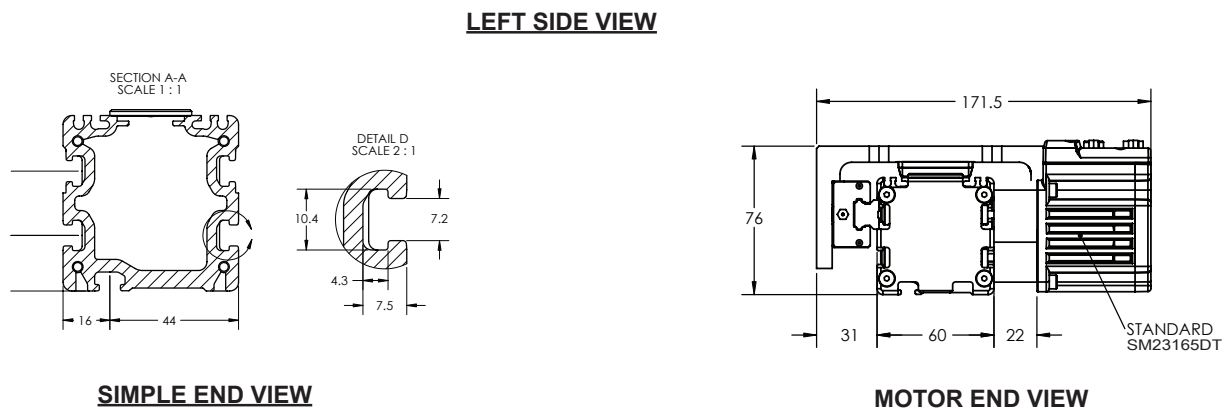
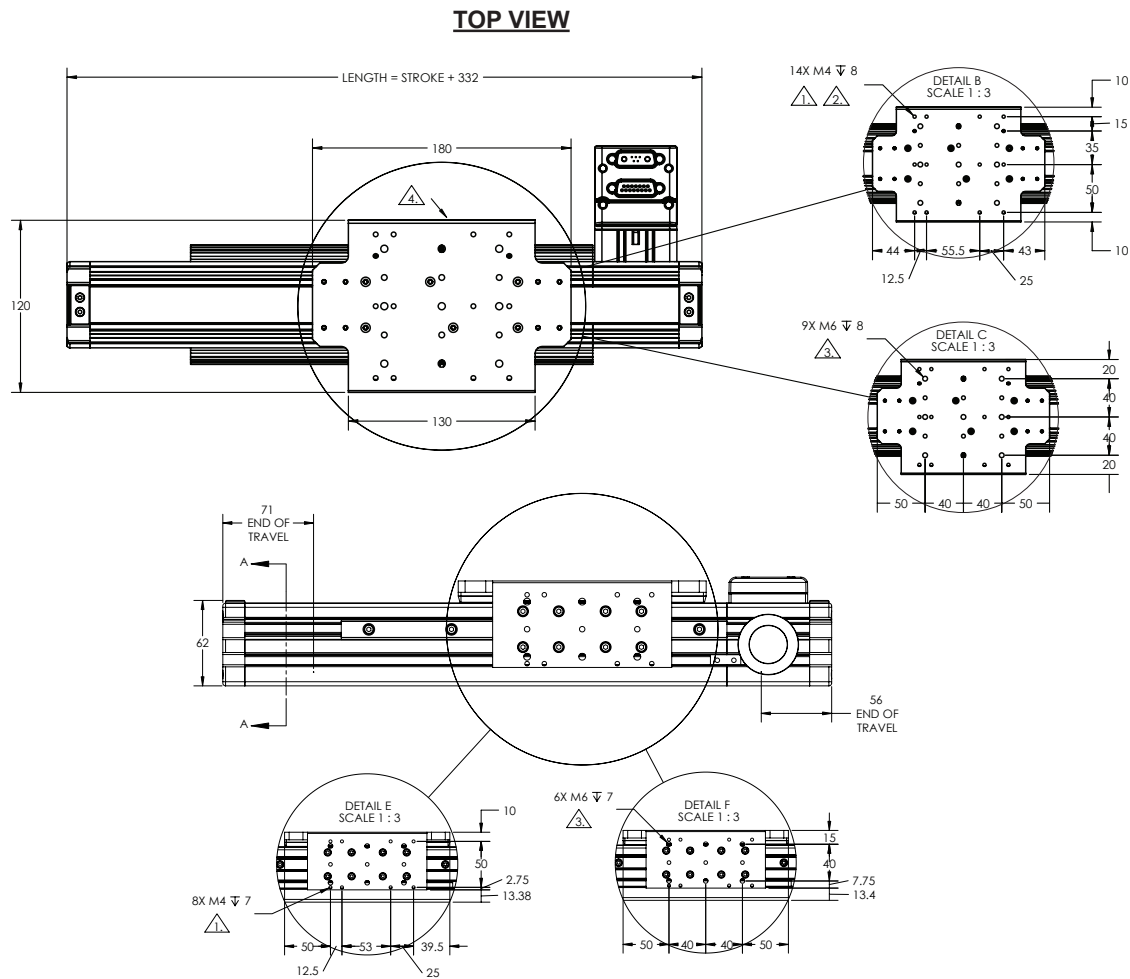
*Based on using SM23165DT @ 48V @ 4200 RPM no load.

**Based on a 15000HR service life @ 75/150/300 & 375mm/s (1800 RPM) average speed at given payload, subject to routine lubrication.

***Moment capacities given about center of carriage mounting surface.



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



- NOTES:**
1. M4 x 12.5 x 50 and M4 x 25 x 50 mounting holes for L70 actuator.
 2. M4 x 85 x 93 mounting holes for XL100 actuator.
 3. M6 x 40 x 40 standard bolt pattern for optional mounting accessories.
 4. Simple end (motor-side) has no mounting holes.

Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

L70 Product Specifications

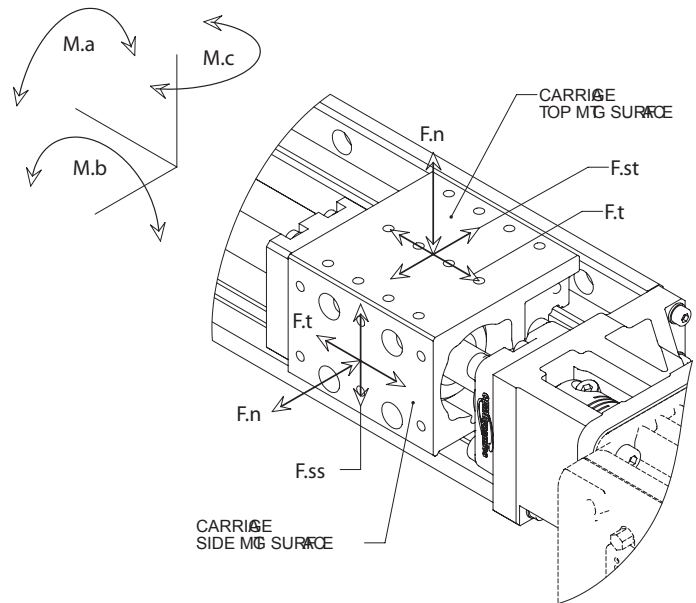
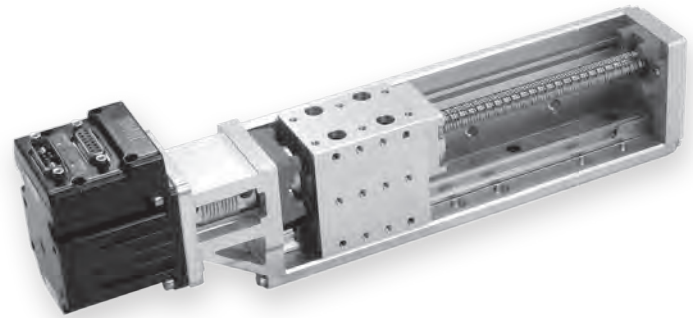
Parameter	Value	Units
Configuration & Physical Parameters		
Motor	23 Frame SmartMotors, D and M series	-
Coupling	Beam	-
Displacement/rev	5, 10	mm/rev
Position Sensors	Adjustable (3 max) NPN N/O or N/C	-
Stroke Lengths	Standard in 50mm increments to 600 Custom in 1mm increments to 600	mm
Overall Length	Stroke + 182.5 + Motor	mm
Overtravel	24.5	mm
Unit Mass	$1.29 + 0.00414 \times (\text{stroke, mm})$ + (motor mass, kg)	kg
Performance		
Unidirectional Repeatability	3	μm
Bidirectional Repeatability	16	μm
Linear Accuracy	0.21/300	mm/mm
Continuous Thrust*	587 or 294 (5 or 10 mm/rev lead)	N
Load Rating, Dynamic** (Static)		
Payload Mass	25 or 20 (5 or 10 mm/rev lead)	kg
F.t, Thrust	200 (1140)	N
F.n, Carriage Normal	200 (400)	N
F.st, Carriage Side	200 (400)	N
F.ss, Carriage Side	100 (400)	N
Carriage moments, Dynamic** (Static)		
M.a, Carriage Moment***	5 (20)	Nm
M.b, Carriage Moment***	5 (20)	Nm
M.c, Carriage Moment***	5 (20)	Nm

*Based on using SM23165DT @ 48V @ 2000 RPM. Refer to corresponding thrust curves for details.

**Based on a basic desired service life of 15,000hr (7.5yrs single shift) @ 167 mm/s and 333mm/s (2000 RPM) average speed at given payload, subject to routine lubrication.

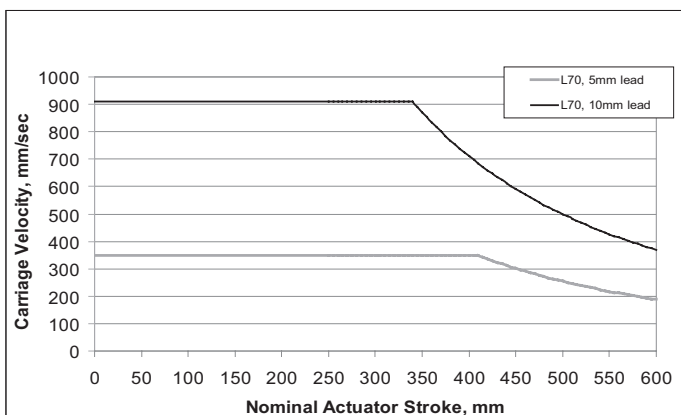
Consult the factory if your application exceeds these values.

***Moment capacities given about center of carriage mounting surface.

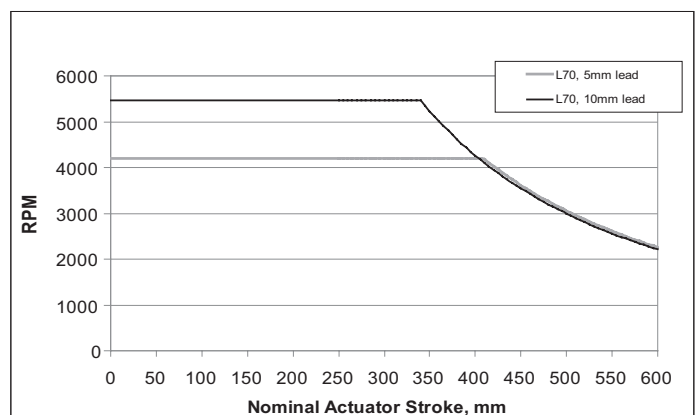


WARNING: Do not exceed these limits

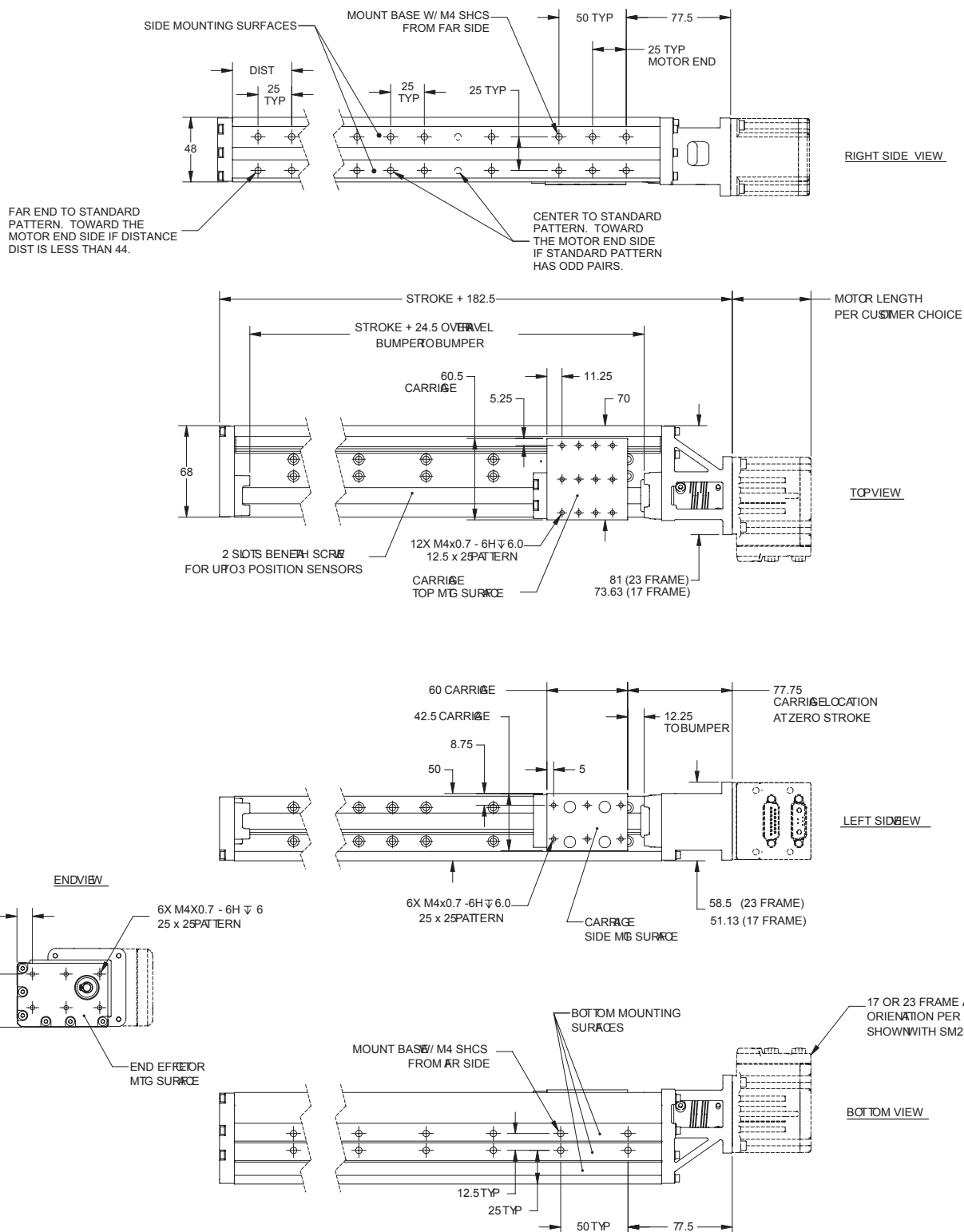
L70 - Maximum Permissible Carriage Velocity



L70 - Maximum Permissible Screw Speed



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

XL100 Product Specifications

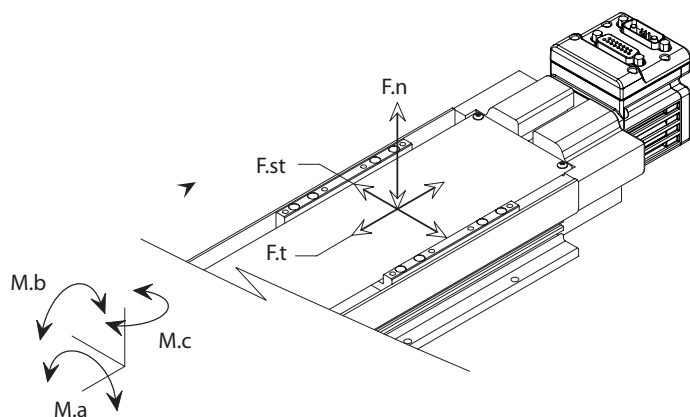
Parameter	Value	Units
Configuration & Physical Parameters		
Motor	23 Frame SmartMotors, D and M series	-
Coupling	Beam	-
Displacement/rev	5, 10	mm/rev
Position Sensors	Adjustable (3 per side - 6 max)) NPN N/O or N/C	-
Stroke Lengths	Standard in 50mm increments to 600 Custom in 1mm increments to 600	mm
Overall Length	Stroke + 223.50 + motor	mm
Overtravel	24.5	mm
Unit Mass	2.657 + 0.0049 x (stroke, mm) + (motor mass, kg)	kg
Performance		
Unidirectional Repeatability	3	μm
Bidirectional Repeatability	16	μm
Linear Accuracy	0.21/300	mm/mm
Continuous Thrust*	587 or 294 (5 or 10mm/rev lead)	N
Load Rating, Dynamic** (Static)		
Payload Mass	25 or 20 (5 or 10mm/rev lead)	kg
F. t, Thrust	200 (1140)	N
F.n, Carriage Normal	860 (15000)	N
F.st, Carriage Side	580 (1000)	N
Carriage moments, Dynamic** (Static)		
M.a, Carriage Moment***	25 (500)	Nm
M.b, Carriage Moment***	25 (500)	Nm
M.c, Carriage Moment***	25 (500)	Nm

*Based on using SM23165DT @ 48V @ 2000 RPM. Refer to corresponding thrust curves for details.

**Based on a basic desired service life of 15,000hr (7.5yrs single shift) @ 167 mm/s and 333mm/s (2000 RPM) average speed at given payload, subject to routine lubrication.

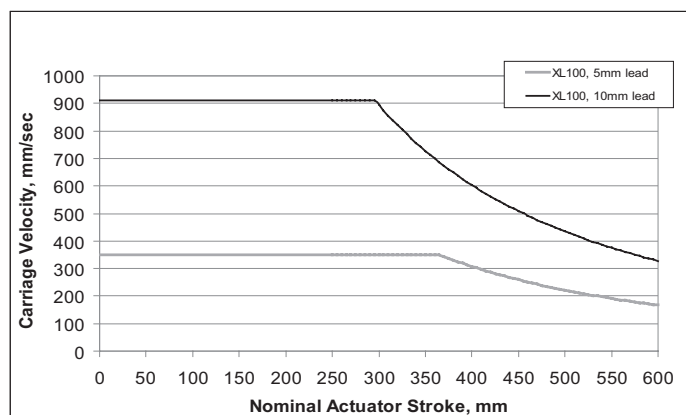
Consult the factory if your application exceeds these values.

***Moment capacities given about center of carriage mounting surface.

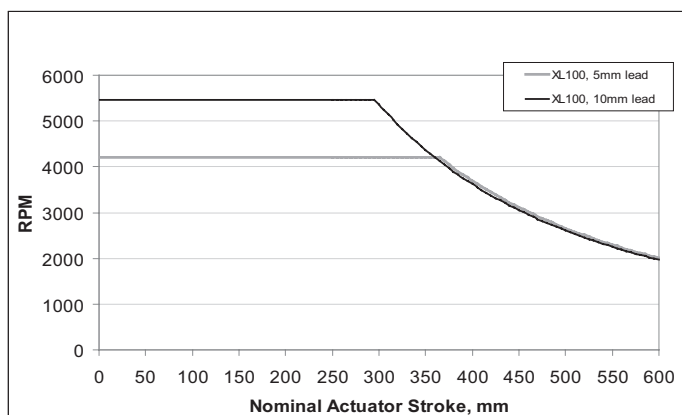


WARNING: Do not exceed these limits

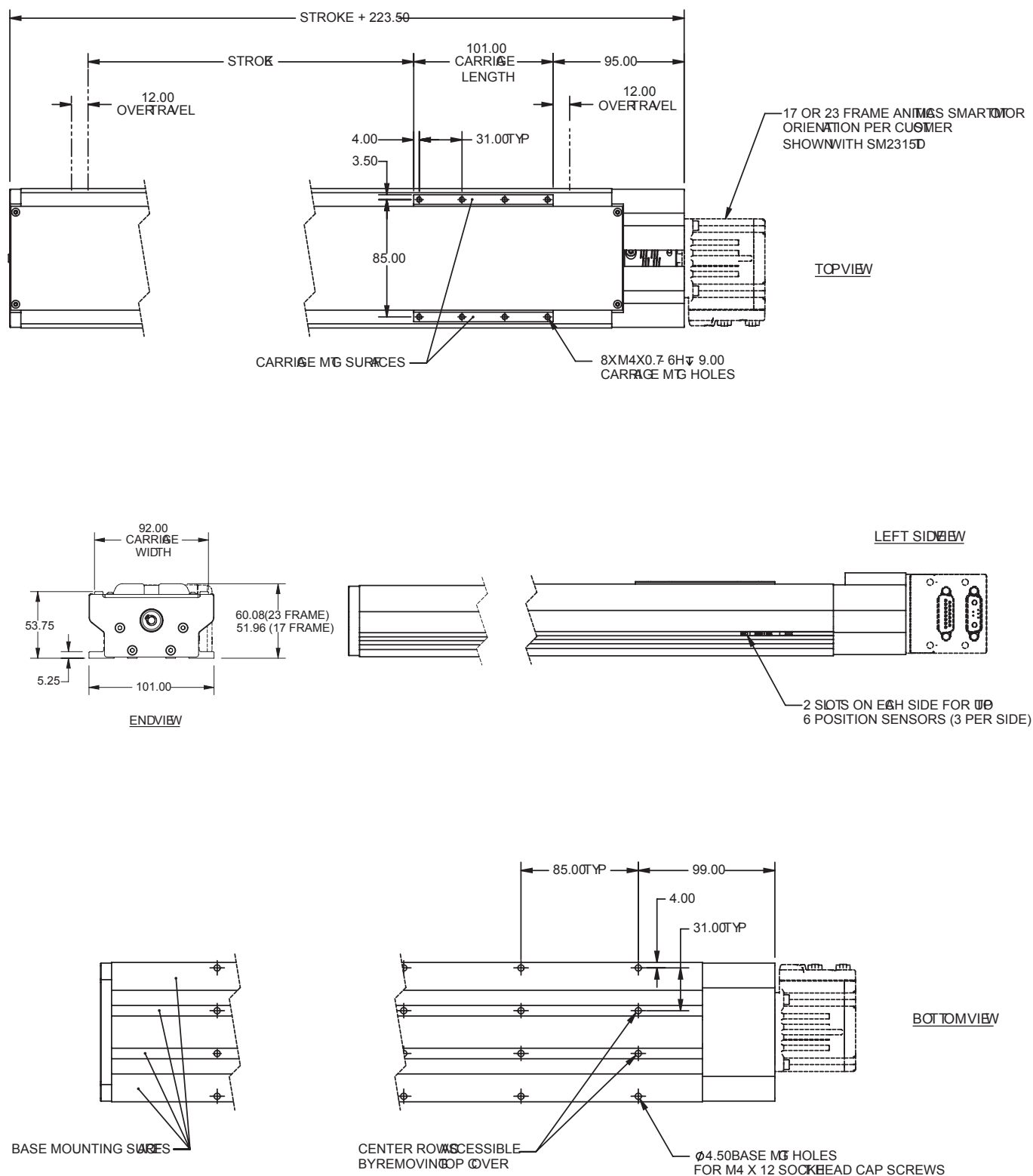
XL100 - Maximum Permissible Carriage Velocity



XL100 - Maximum Permissible Screw Speed



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

VL-ST45 Product Specifications

Parameter	Value		Units
Configuration & Physical Parameters			
Motor	23 Frame SmartMotors, D and M series		-
Coupling	Beam		-
Displacement/rev	6, 12		mm/rev
Position Sensors	Consult factory		-
Stroke Lengths	50 – 500mm in 50mm steps		mm
Overall Length	Stroke + 164 + motor		mm
Overtravel	10		mm
Unit Mass	1.38 + 0.0021 x (stroke, mm) + (motor mass, kg)		kg
Performance			
Unidirectional Repeatability	20		µm
Bidirectional Repeatability	40		µm
Linear Accuracy	0.21/300		mm/mm
Max Velocity	Up to 1000 (stroke dependent)		mm/s
Max Acceleration	0.3		G
Displacement/rev	6	12	mm/rev
Payload Mass	8	6.5	kg
Rated Velocity	200	400	mm/s
Lifetime*	15000		hr
Load Rating, Dynamic** (Static)			
Displacement/rev	6	12	mm/rev
Max Continuous Thrust	260	135	N
Max Peak Thrust	660	330	N
Carriage moments, Dynamic** (Static)			
M.a, Carriage Moment***	4.47 (31)	3.44 (31)	N*m
M.b, Carriage Moment***	1.64 (12)	1.33 (12)	N*m
M.c, Carriage Moment***	1.64 (12)	1.33 (12)	N*m

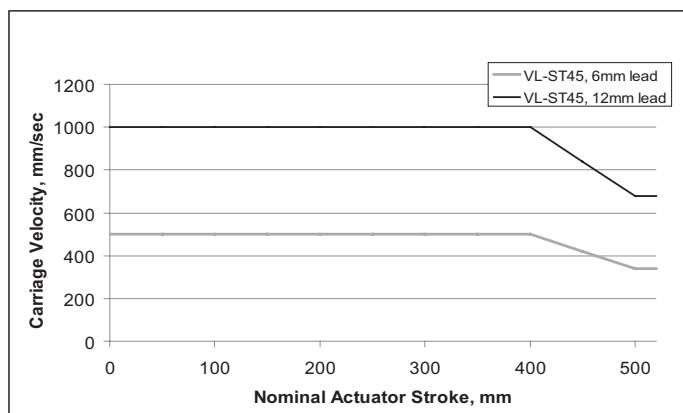
*Based on 15000 hr service life @ 200 mm/s and 400 mm/s (2000 RPM) average speed at the given payload, subject to routine lubrication.

**Based on using SM23165DT @ 48V @ 2000 RPM. Refer to corresponding thrust curves for details.

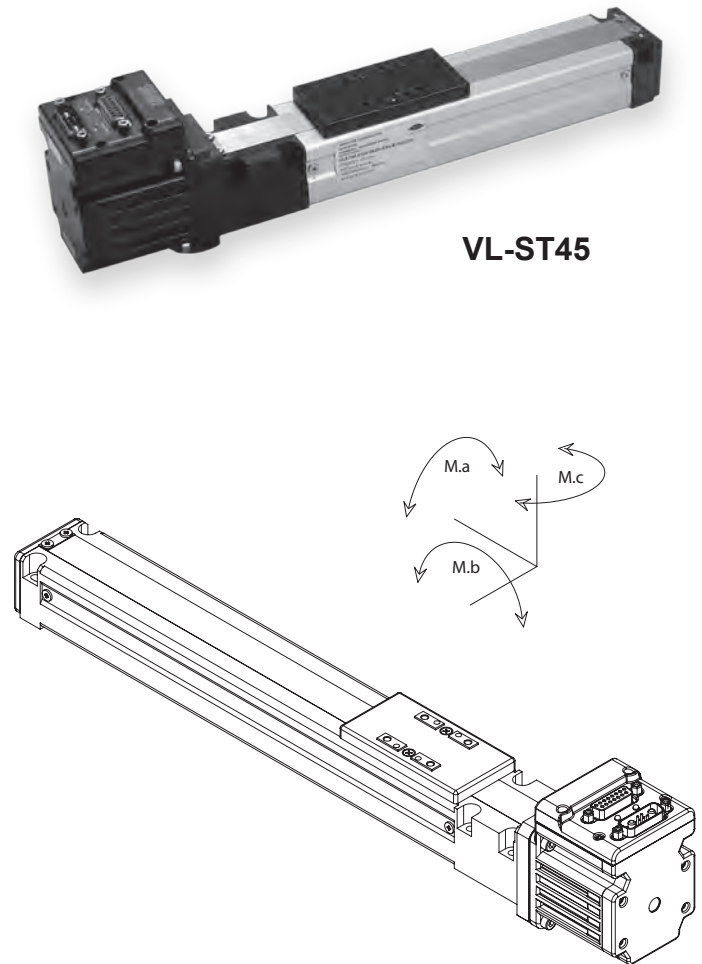
Consult the factory if your application exceeds these values.

***Moment capacities given about center of carriage mounting surface.

VL-ST45 - Maximum Permissible Carriage Velocity



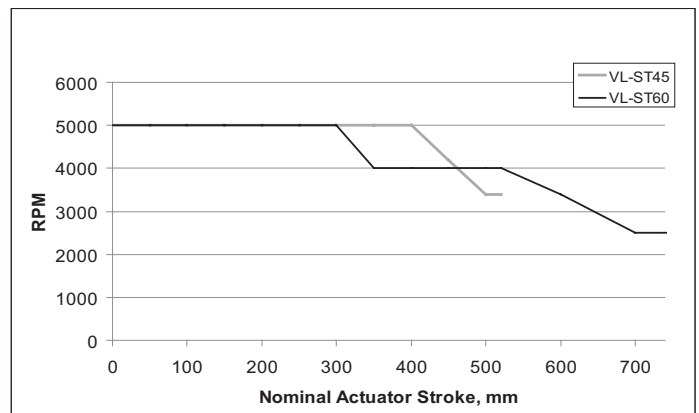
WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.

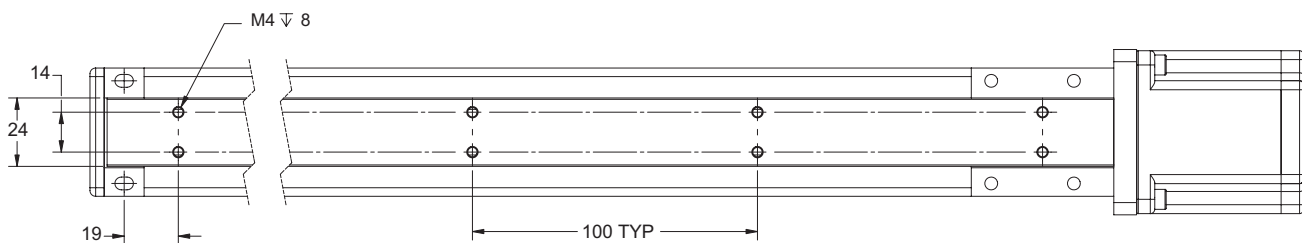
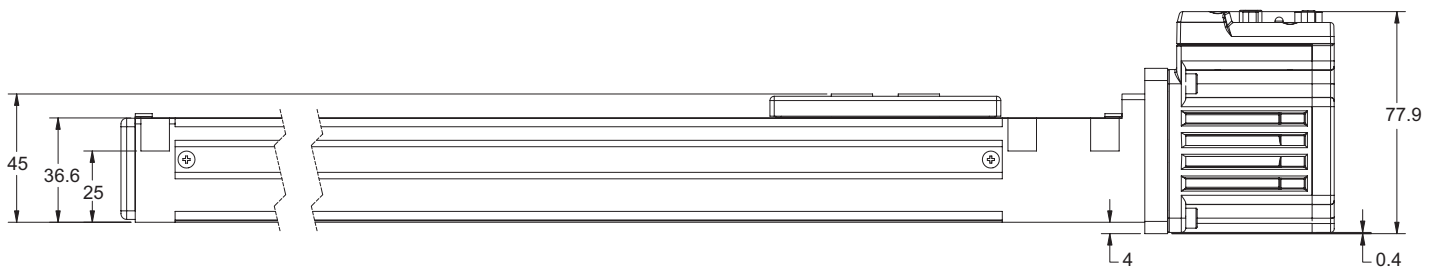
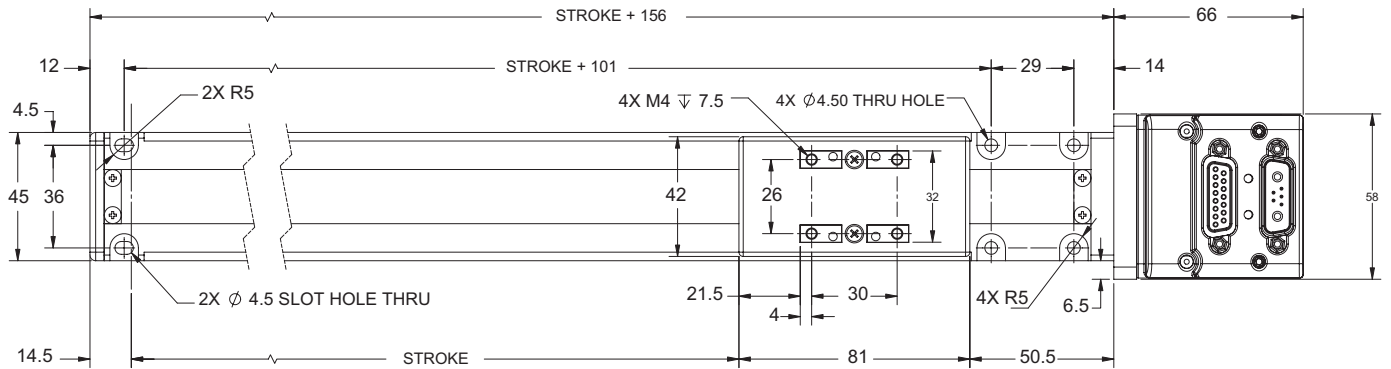


VL-ST45

WARNING: Do not exceed these limits

VL-ST series - Maximum Permissible Screw Speed





Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

VL-ST60 Product Specifications

Parameter	Value	Units
Configuration & Physical Parameters		
Motor	23 Frame SmartMotors, D and M series	-
Coupling	Beam	-
Displacement/rev	6, 12	mm/rev
Position Sensors	consult factory	-
Stroke Lengths	50 – 600mm in 50mm steps	mm
Overall Length	Stroke + 222 + motor	mm
Overtravel	10	mm
Unit Mass	$1.3349 + 0.0039 \times (\text{stroke, mm}) + (\text{motor mass, kg})$	kg
Performance		
Unidirectional Repeatability	20	μm
Bidirectional Repeatability	40	μm
Linear Accuracy	0.21/300	mm/mm
Max Velocity	up to 1000 (stroke dependent)	mm/s
Max Acceleration	0.3	G
Displacement/rev	6 12	mm/rev
Payload Mass	13 10	kg
Rated Velocity	200 400	mm/s
Lifetime*	15000	hr
Load Rating, Dynamic* (Static)		
Displacement/rev	6 12	mm/rev
Max Continuous Thrust	490 250	N
Max Peak Thrust	768 394	N
Carriage moments, Dynamic** (Static)		
M.a, Carriage Moment***	11.47 (58) 9 (58)	N*m
M.b, Carriage Moment***	3.57 (25) 2.75 (25)	N*m
M.c, Carriage Moment***	3.57 (25) 2.75 (25)	N*m

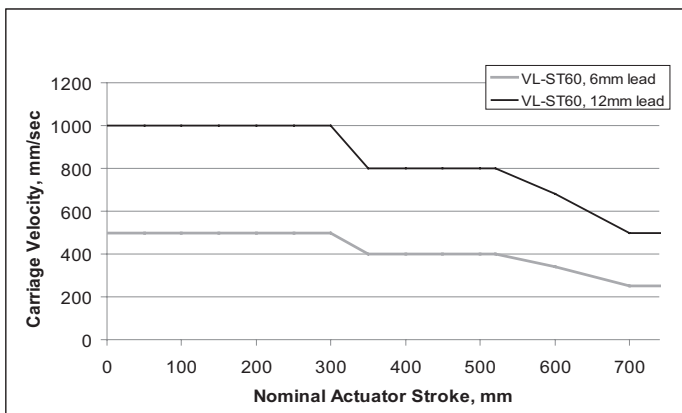
*Based on 15000 hr service life @ 200 mm/s and 400 mm/s (2000 RPM) average speed at the given payload, subject to routine lubrication.

**Based on using SM23165DT @ 48V @ 2000 RPM. Refer to corresponding thrust curves for details.

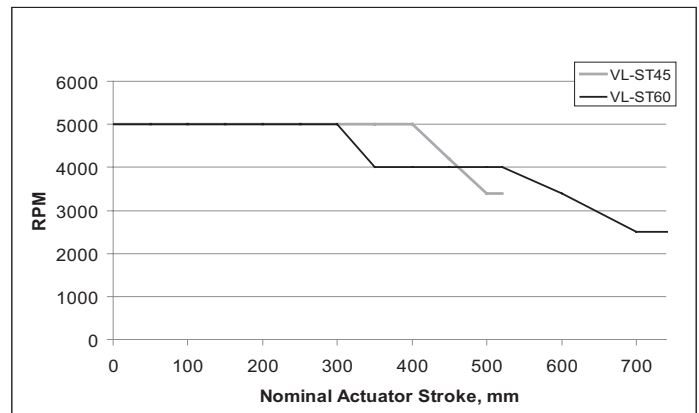
Consult the factory if your application exceeds these values.

***Moment capacities given about center of carriage mounting surface.

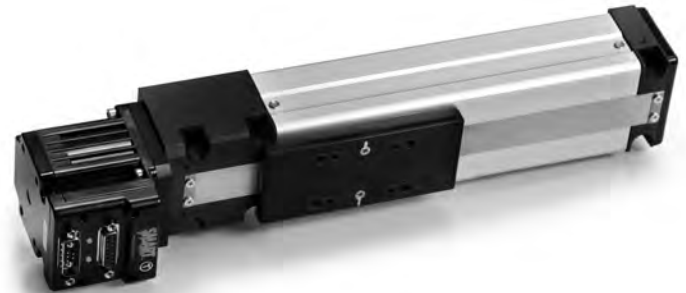
VL-ST60 - Maximum Permissible Carriage Velocity



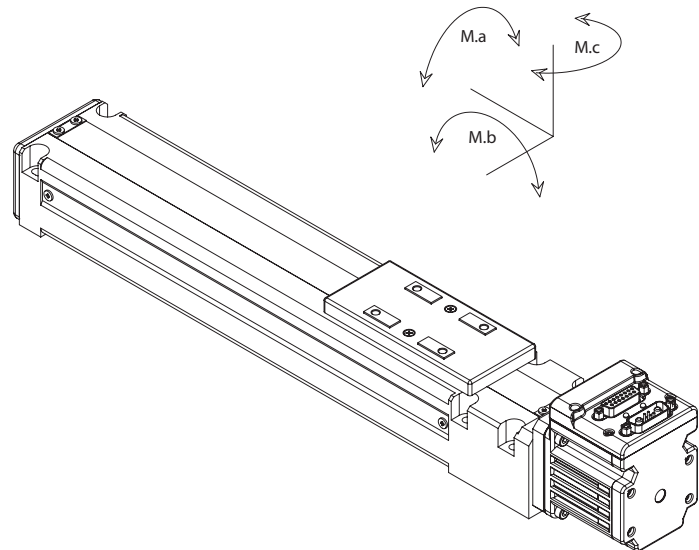
VL-ST series - Maximum Permissible Screw Speed



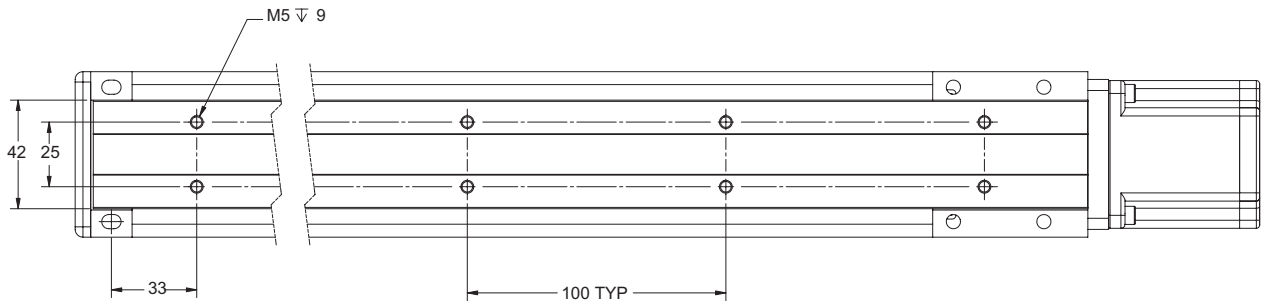
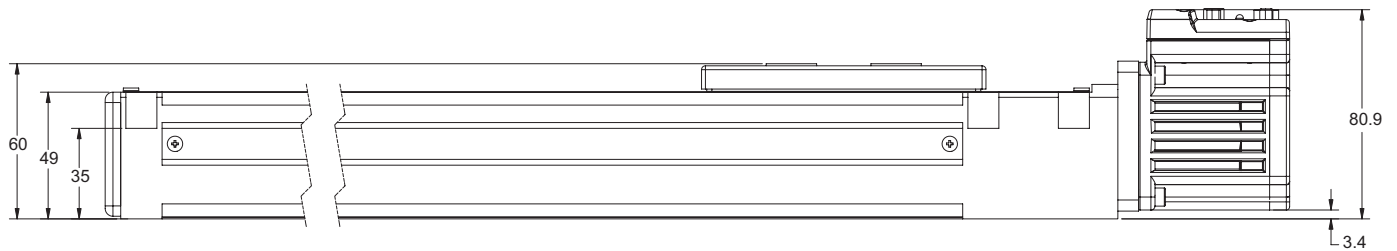
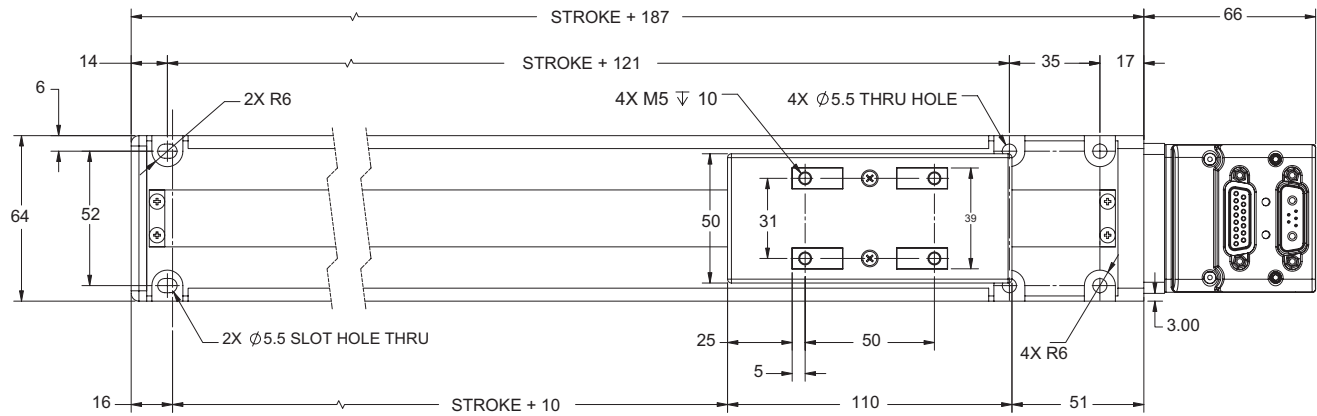
WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



VL-ST60



WARNING: Do not exceed these limits



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

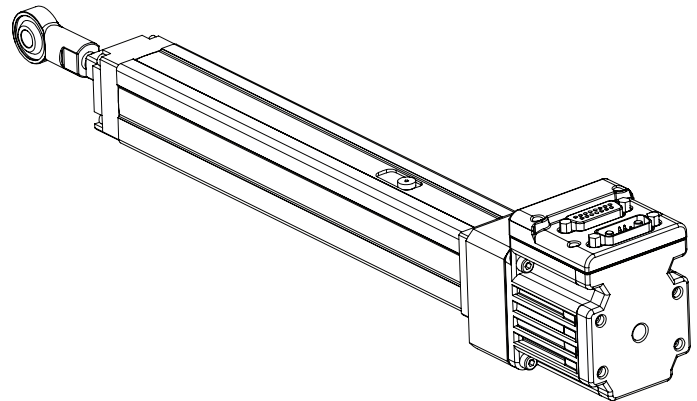
For Thrust Curve performance data, see pages 158–173.

VL-CT35 Series Specifications

Parameter	Value	Units
Configuration & Physical Parameters		
Motor	23 frame D-series SmartMotors ONLY	-
Coupling	Beam	-
Displacement/rev	6,12	mm/rev
Position Sensors	consult factory	-
Stroke Lengths	50, 100 and 150	mm
Overall Length	Stroke + 244.9 + motor	mm
Overtravel	None	mm
Unit Mass	$1.1667 + 0.003 \times (\text{stroke, mm}) + (\text{motor mass, kg})$	kg
Performance		
Unidirectional Repeatability	20	μm
Bidirectional Repeatability	40	μm
Linear Accuracy	0.21/300	mm/mm
Max Velocity	470 – 1000 (stroke dependent)	mm/s
Max Acceleration	0.3	G
Payload Mass	5.6	kg
Rated Velocity	400	mm/s
Lifetime*	15000	hr
Load Rating, Dynamic		
Using SM23165DT motor	Direct Drive	2:1 pulley**
Displacement/rev	6	12
Max Continuous Thrust	461	231
Max Peak Thrust	745	372



VL-CT35 series

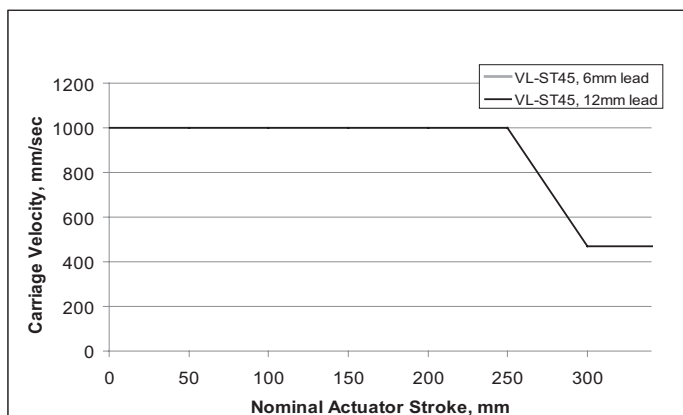


*Based on operating at an average speed of the rated velocity at the given payload. The Lifetime will be significantly reduced operating above the rated velocity and/or given payload.

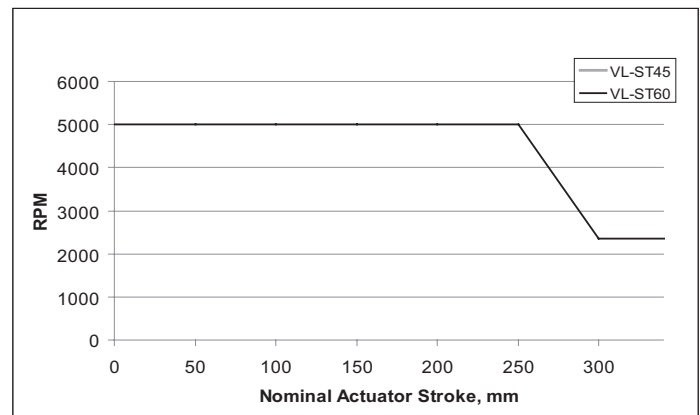
**Please see page 155 for pulley offset CAD drawings.

WARNING: Do not exceed these limits

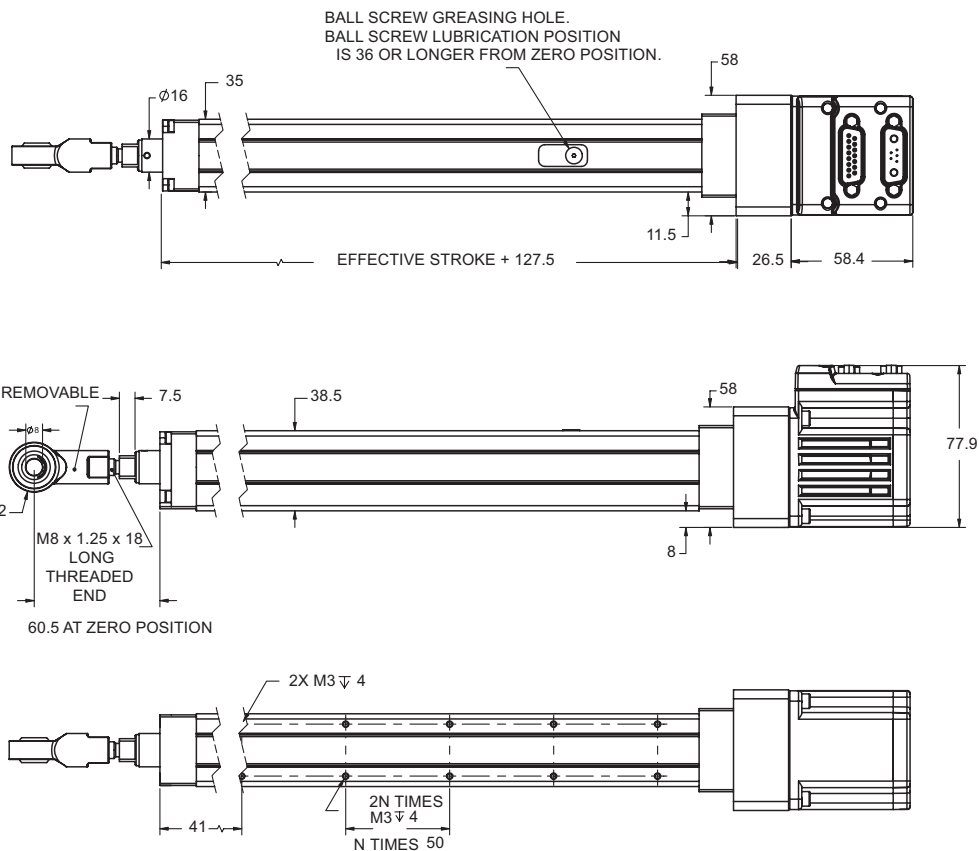
VL-CT series - Maximum Permissible Carriage Velocity



VL-CT series - Maximum Permissible Screw Speed



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

VL-CT45 Series Specifications

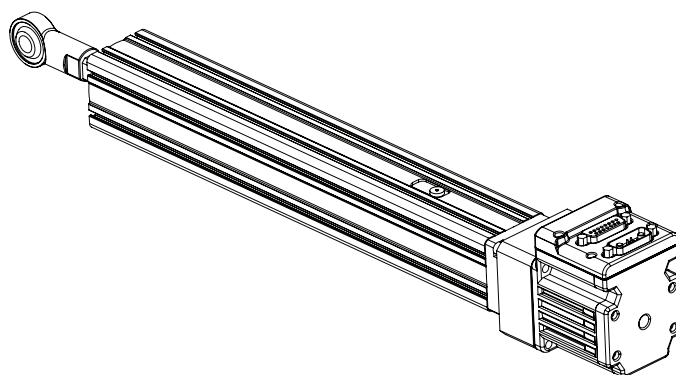
Parameter	Value	Units
Configuration & Physical Parameters		
Motor	23 frame D-series SmartMotors ONLY	-
Coupling	Beam	-
Displacement/rev	6,12	mm/rev
Position Sensors	consult factory	-
Stroke Lengths	50, 100, 150 and 200	mm
Overall Length	Stroke + 251.4 + motor	mm
Overtravel	None	mm
Unit Mass	$1.45 + 0.0052 \times (\text{stroke, mm}) + (\text{motor mass, kg})$	kg
Performance		
Unidirectional Repeatability	20	μm
Bidirectional Repeatability	40	μm
Linear Accuracy	0.21/300	mm/mm
Max Velocity	470 – 1000 (stroke dependent)	mm/s
Max Acceleration	0.3	G
Payload Mass	5.6	kg
Rated Velocity	400	mm/s
Lifetime*	15000	hr
Load Rating, Dynamic		
Using SM23165DT motor	Direct Drive	2:1 pulley**
Displacement/rev	6	12
Max Continuous Thrust	461	231
Max Peak Thrust	745	372

*Based on operating at an average speed of the rated velocity at the given payload. The Lifetime will be significantly reduced operating above the rated velocity and/or given payload.

**Please see page 156 for pulley offset CAD drawings.

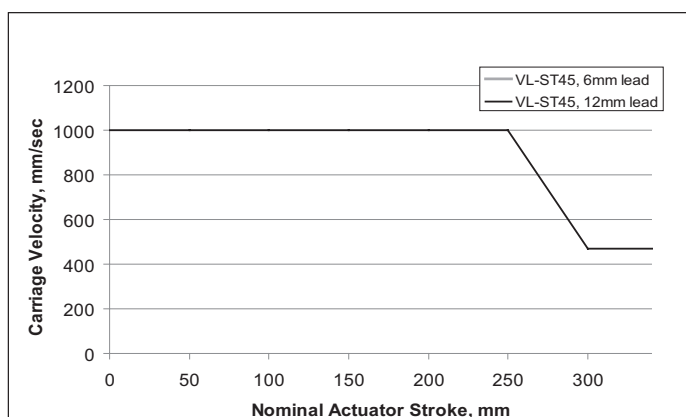


VL-CT45

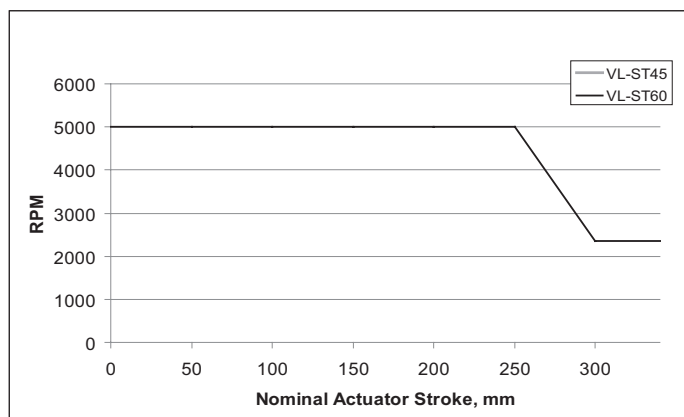


WARNING: Do not exceed these limits

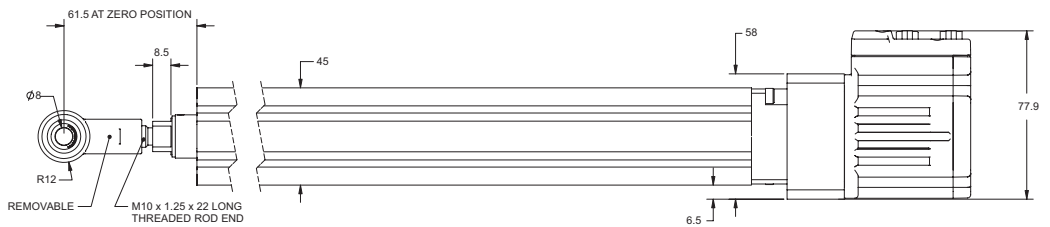
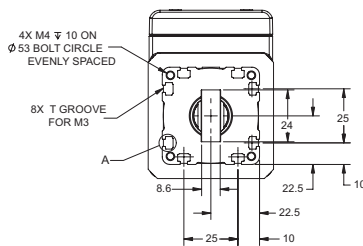
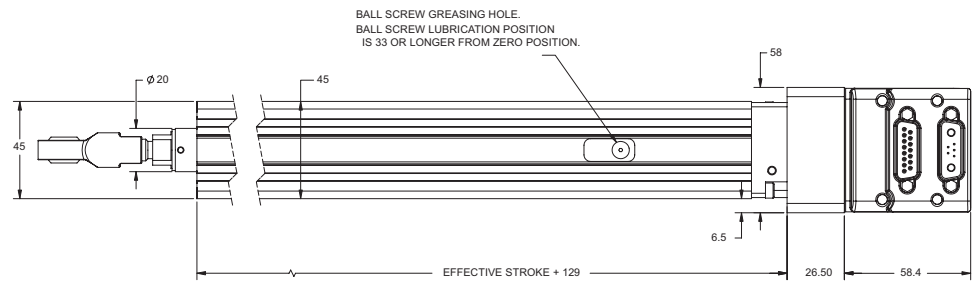
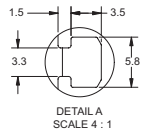
VL-CT series - Maximum Permissible Carriage Velocity



VL-CT series - Maximum Permissible Screw Speed



WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

VL-CT55 Series Specifications

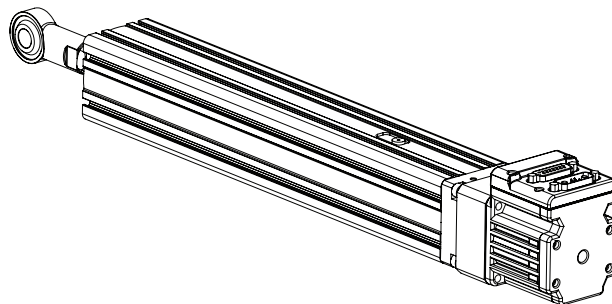
Parameter	Value	Units					
Configuration & Physical Parameters							
Motor	23 frame D-series SmartMotors ONLY	-					
Coupling	Beam	-					
Displacement/rev	6,12	mm/rev					
Position Sensors	consult factory	-					
Stroke Lengths	50 – 300mm in 50mm steps	mm					
Overall Length	Stroke + 274.9 + motor	mm					
Overtravel	None	mm					
Unit Mass	1.94 + 0.0075 x (stroke, mm) + (motor mass, kg)	kg					
Performance							
Unidirectional Repeatability	20	µm					
Bidirectional Repeatability	40	µm					
Linear Accuracy	0.21/300	mm/mm					
Max Velocity	470 – 1000 (stroke dependent)	mm/s					
Max Acceleration	0.3	G					
Payload Mass	22	kg					
Rated Velocity	400	mm/s					
Lifetime*	15000	hr					
Load Rating, Dynamic							
Using SM23165DT motor	Direct Drive	2:1 pulley**	3:1 pulley**	-			
Displacement/rev	6	12	6	12	6	12	mm/rev
Max Continuous Thrust	461	231	922	461	1383	692	N
Max Peak Thrust	745	372	1490	745	2235	1117	N

*Based on operating at an average speed of the rated velocity at the given payload. The Lifetime will be significantly reduced operating above the rated velocity and/or given payload.

**Please see page 156 for pulley offset CAD drawings.

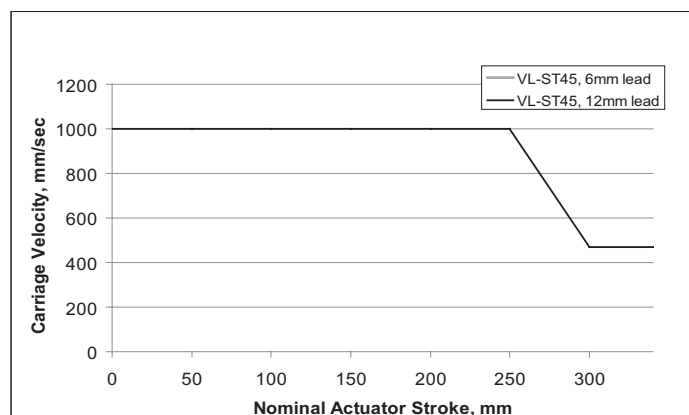


VL-CT55 series - Direct Drive

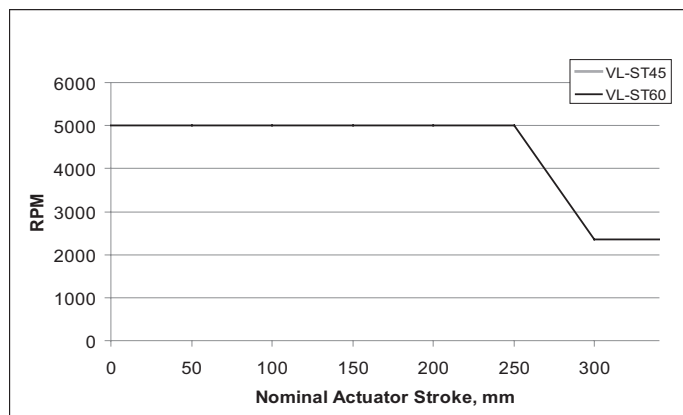


WARNING: Do not exceed these limits

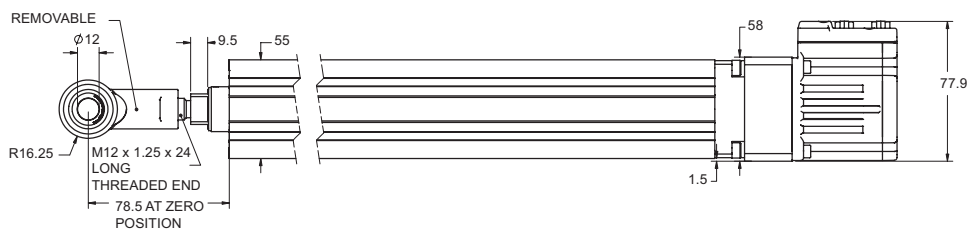
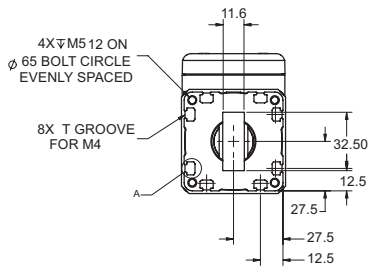
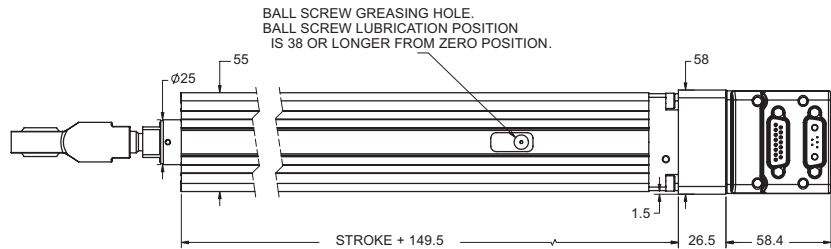
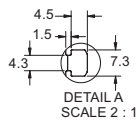
VL-CT series - Maximum Permissible Carriage Velocity



VL-CT series - Maximum Permissible Screw Speed



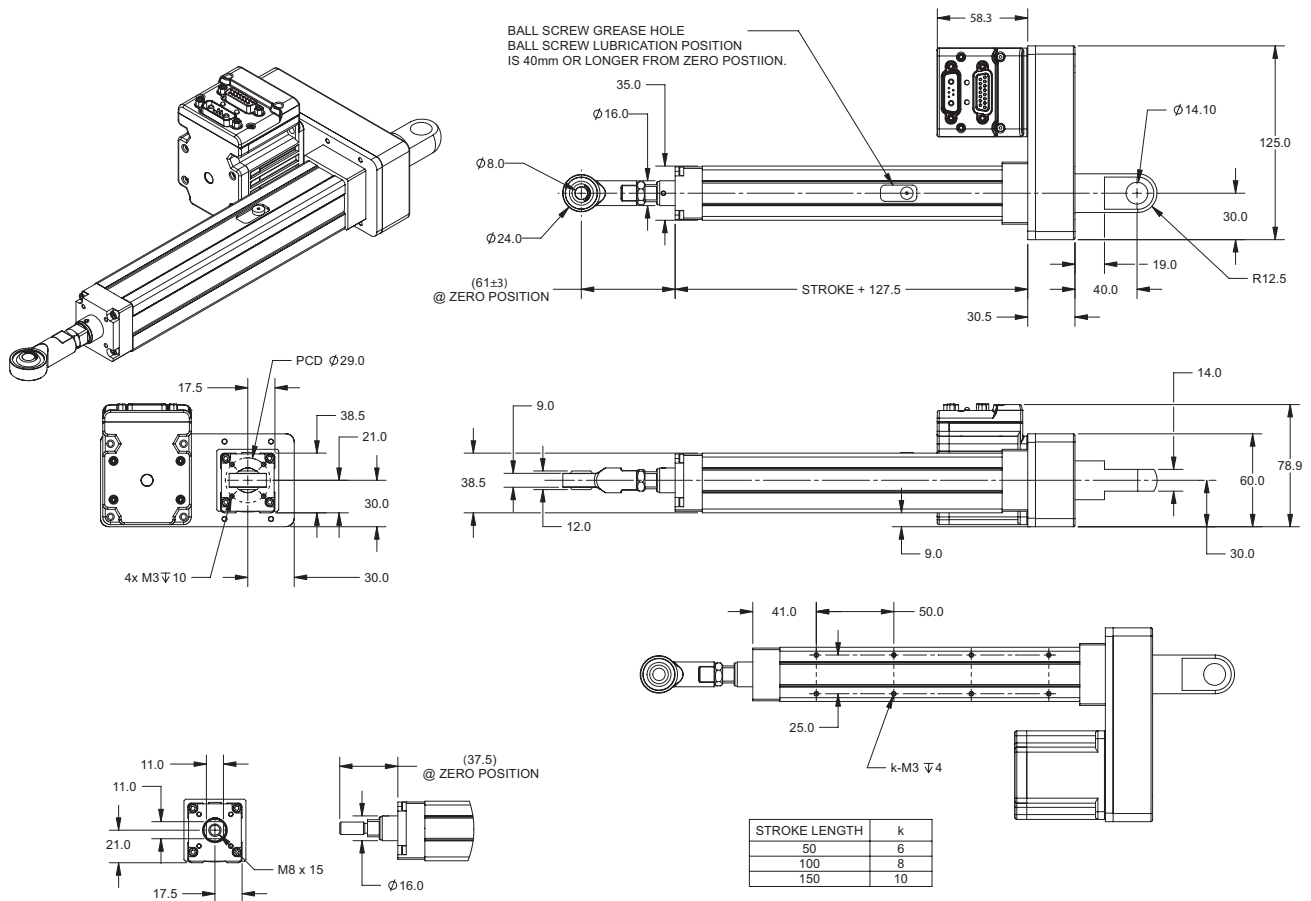
WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



Dimensions in millimeters

NOTE: For part numbers please refer to our website at www.animatics.com

For Thrust Curve performance data, see pages 158–173.

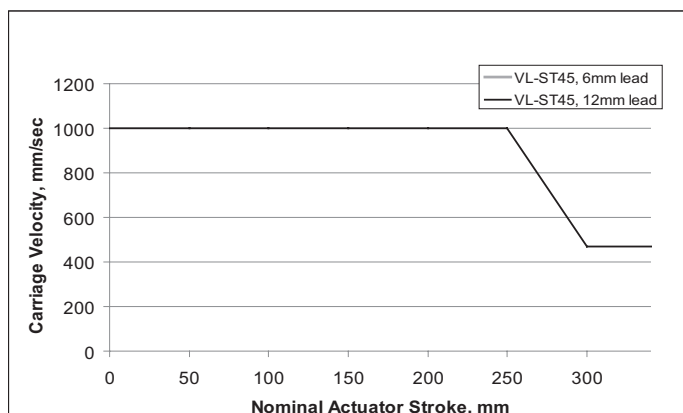


VL-CT35 with SM23165DT

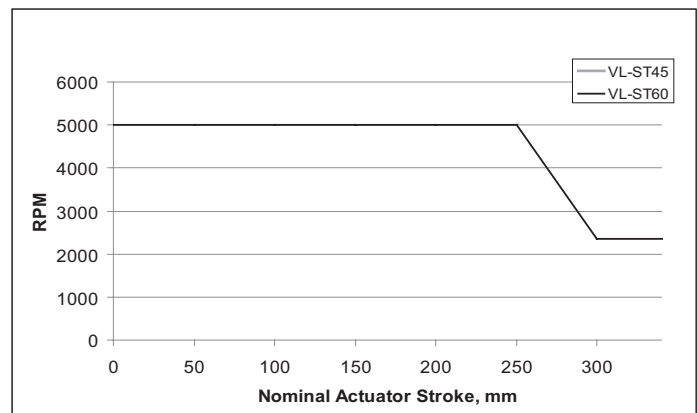
*Tie rods are available.

WARNING: Do not exceed these limits

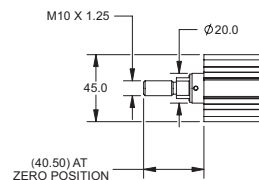
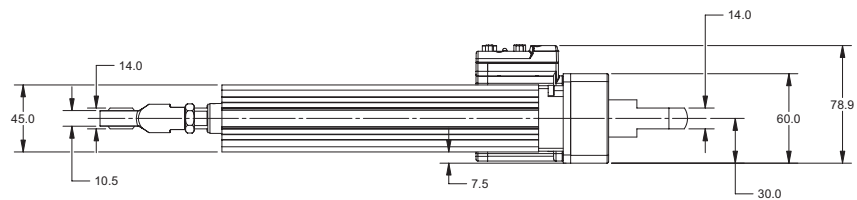
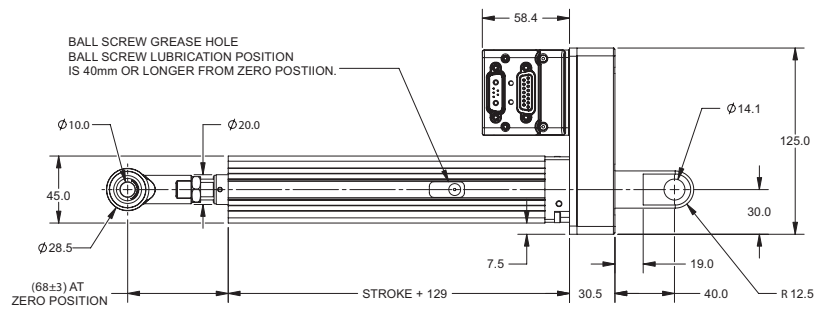
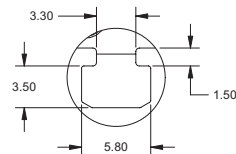
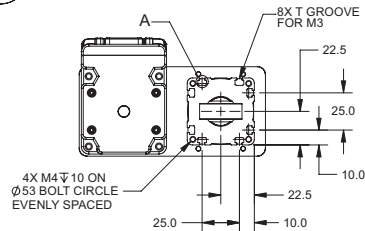
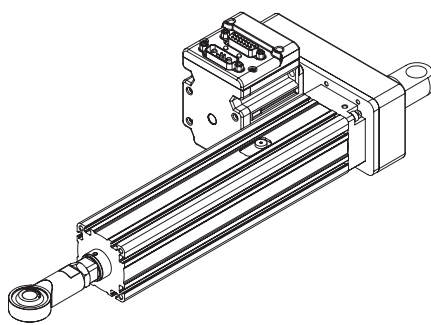
VL-CT series - Maximum Permissible Carriage Velocity



VL-CT series - Maximum Permissible Screw Speed

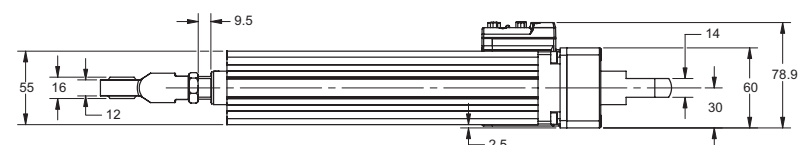
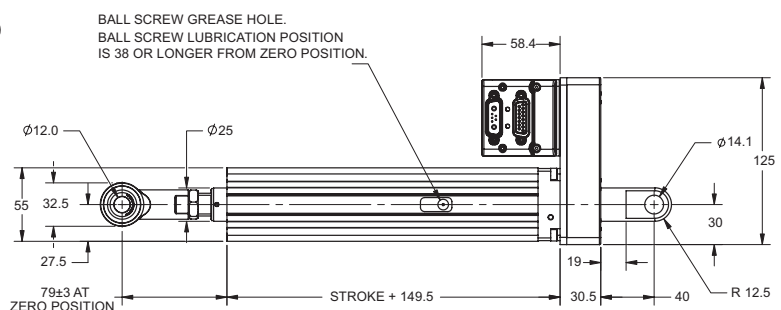
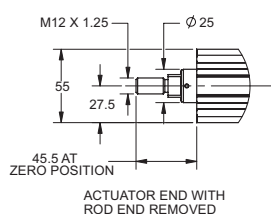
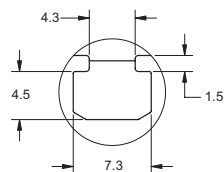
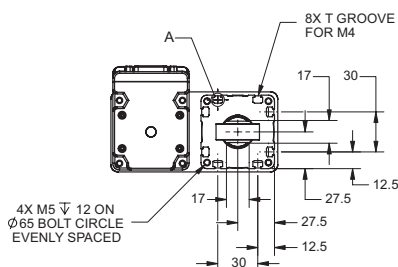
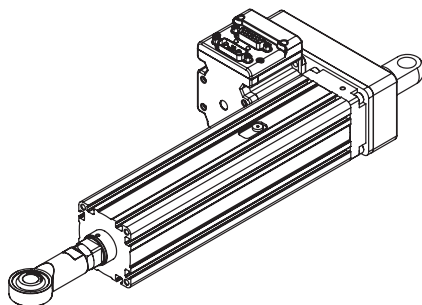


WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.



VL-CT45 with SM23165DT

*Tie rods are available.



VL-CT55 with SM23165DT

*Tie rods are available.

Understanding Actuator Loading

Considerations for Actuator Loading

Forces acting upon actuators consist of a combination of axial forces on any axis and a twisting force that may be applied due to offset loads.

Direct forces placed on the actuator

F.t. : Thrust force operating in the direction of travel.

Mechanically limiting factor: For lead screw actuators, this is typically the thrust bearings and/or lead nut.

For harmonic belt drives, the limiting factor is typically the belt. It may be based on shear strength of the belt teeth or on the actual tensile strength of the belt itself. In a welded belt, it would most likely be based on the weld strength of that belt.

F.st. : Side thrust force, acts upon the carriage from one side or the other.

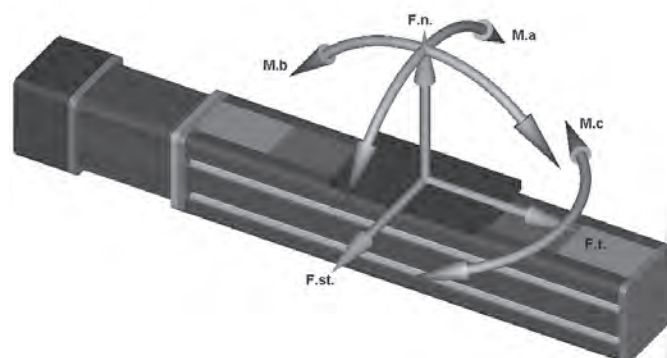
The bearing support is typically the limiting factor. The choice of bearings and their orientation will greatly affect the maximum permissible force.

F.n. : Normal force downward.

Similar to side force, the limit is based on the bearings and their orientation. It is very common to have a much higher normal downward force capacity than a side force capacity. Since gravity typically plays a role in horizontal applications, most actuators are designed to deal with downward force effectively.

Moment Loading Forces:

This is the twisting force similar to a moment arm force applying a torque to the supporting bearings.



To ensure long life of the actuator it is imperative to not exceed the Moment loading specifications.

In the above diagram, three moment loads are depicted.

All three moment loading forces may exist on a given application. It is important to remember that any offset load from the center surface of the actuator carriage will induce one or more of these Moment forces.

While accelerating, that moment load may increase drastically.

For example: Suppose in the above diagram, you place a load offset from the center of the carriage in upward direction. Any time the load is accelerated, the M.b. moment loading will increase.

If the load is placed horizontally offset to one side or the other, dynamic motion will increase the M.c. component of moment loading of that actuator.

The M.a. component is the only moment loading that will not typically change with the dynamics of load motion. However, offset side loading is the greatest contributor to the M.a. component.

Accessories for L70, XL100, HLD60 Only		
Part Number	Description	
SEN-NO-1M	NPN magnetic sensor Normally Open with flying leads	
SEN-NC-1M †	NPN magnetic sensor Normally Closed with flying leads	
SEN-NO-5M	NPN magnetic sensor Normally Open with flying leads	
SEN-NC-5M †	NPN magnetic sensor Normally Closed with flying leads	
HLD60-TC3	Toe Clamp for HLD60 - 3 holes	
HLD60-TC2	Toe Clamp for HLD60 - 2 holes	
HLD60-TN12M	T-nuts for HLD60, 2 holes (M4) with 12 mm spacing	
HLD60-TN60M	T-nuts for HLD60, 2 holes (M4) with 60 mm spacing	
HLD60-TN12M-10PCS	T-nuts for HLD60, 2 holes (M4) with 12 mm spacing	
HLD60-TN60M-10PCS	T-nuts for HLD60, 2 holes (M4) with 60 mm spacing	

Accessories for VL-CT Series Only		
Part Number	Description	
VLCT35-BB	Bracket Base, CT-35	
VLCT45-BB	Bracket Base, CT-45	
VLCT55-BB	Bracket Base, CT-55	
VLCT35-F	Flange for CT-35	
VLCT45-F	Flange for CT-45	
VLCT55-F	Flange for CT-55	

†Use normally closed sensors for pos. and neg. travel limits.

*Please see www.animatics.com/products/actuators
Pricing subject to change without notice. All sales subject to Moog Animatics standard sales terms and conditions.

WARNING: Exceeding thrust, speed, or moment loading specifications could result in immediate damage to the actuators. Doing so will void the warranty.

Understanding Thrust Curves

Actuator thrust curves are very similar to servo torque curves, but relate to linear motion performance instead of shaft rotation performance. All thrust curves show continuous and peak performance based on the coupled system of Servo and Actuator together. The following examples show the 2 exceptions to the previous statement, where the actuators limitations are taken into account.

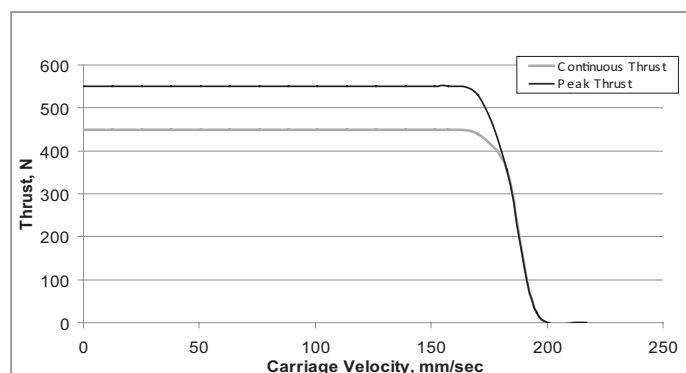
NOTE: The continuous thrust region is where the system should be operated, except for short hard accelerations required in your motion profile. Sustained operation outside the continuous region will reduce the rated life on the actuator/integrated motor system. Please check the specifications of each actuator for limiting factors such as mechanical critical speed and thrust limits.

Limitation on Thrust Output Example

The curve to the right shows that there is a maximum amount of thrust the actuator can put out continuously and peak. That is why the curve abruptly flattens out (horizontal line) at speeds less than 150 mm/sec. This curve shows that the motor can provide more input torque than the actuator can handle at speeds less than 150 mm/sec.

NOTE: In this example, the maximum allowable thrust is limited to 550 N. Exceeding that could potentially damage the actuator even if the motor limits are not exceeded.

HLD60 Single Rail/Internal Rollers
SM23165DT @ 48V, 2.5mm/rev

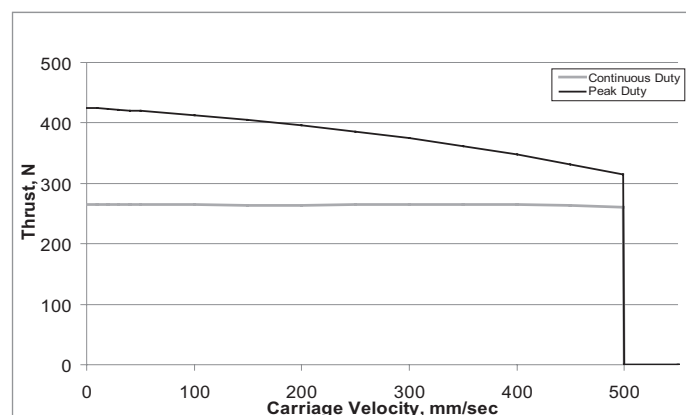


Limitation of Actuator's Speed Example

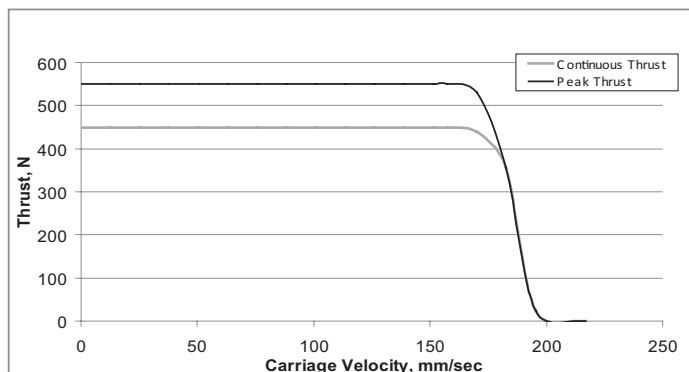
The curve to the right shows that at 500 mm/sec, the thrust abruptly goes to zero (the vertical line). This means that the actuator has a maximum carriage velocity of 500 mm/sec usually due to ball screw limitations.

NOTE: This speed limitation is mechanically based. It is possible to command a servo speed in excess of the critical speed limits of the actuator. Doing so increases risk of damage and will shorten the life of the actuator.

VL-ST45 - SM2316D @ 48V, 6mm/rev lead ball screw

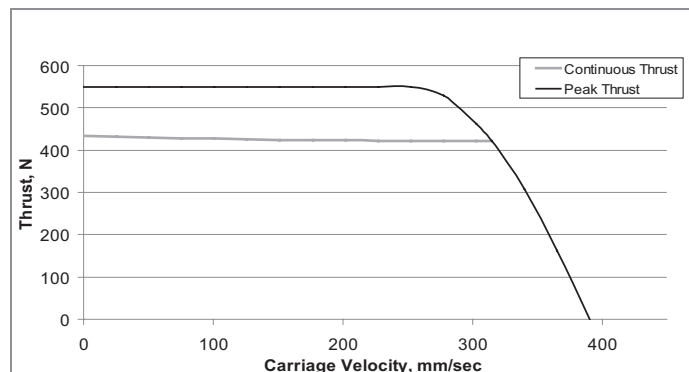


HLD60 Single Rail/Internal Rollers SM23165DT @ 48V, 2.5mm/rev



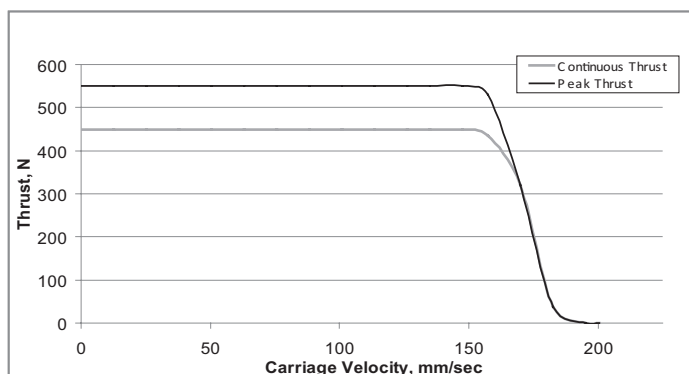
*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165DT @ 48V, 5mm/rev



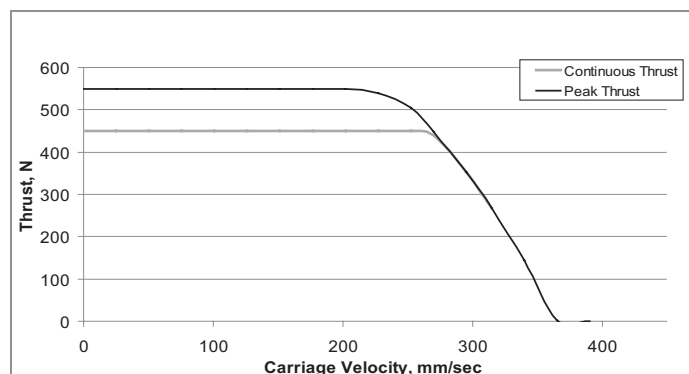
*420 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165DT @ 42V, 2.5mm/rev



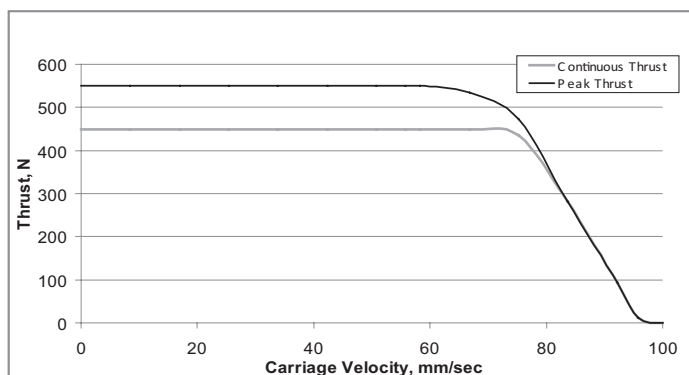
*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165DT @ 42V, 5mm/rev



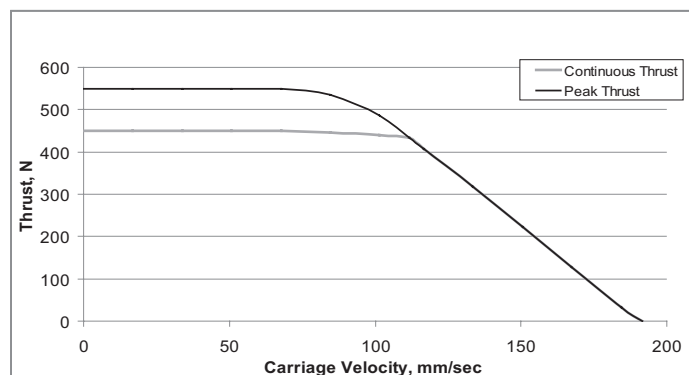
*420 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165DT @ 24V, 2.5mm/rev



*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165DT @ 24V, 5mm/rev

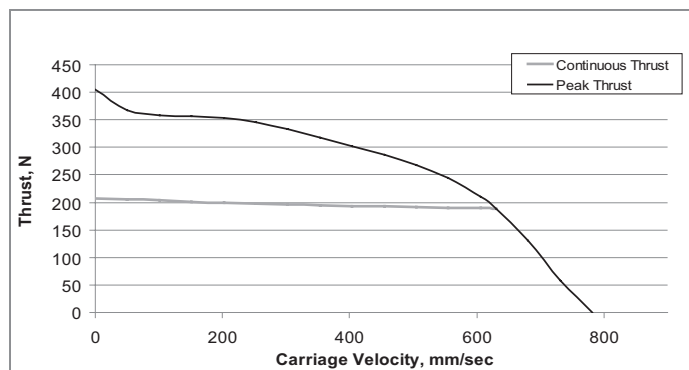


*420 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

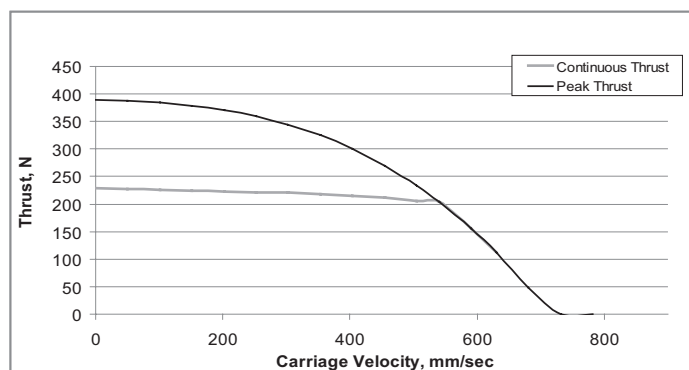
Thrust Curves HLD60 Single Rail/Internal Rollers • SM23165DT

**HLD60 Single Rail/Internal Rollers
SM23165DT @ 48V, 10mm/rev**



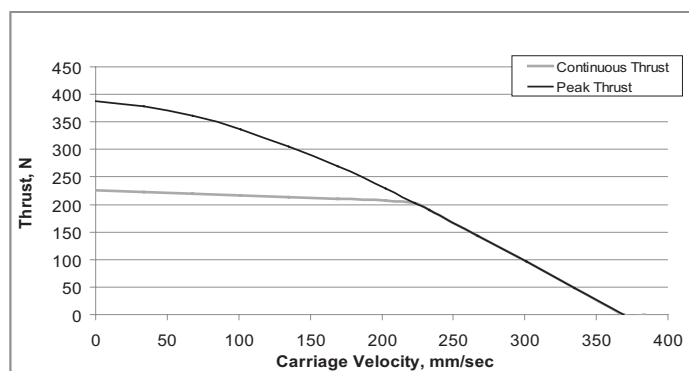
*185 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165DT @ 42V, 10mm/rev**



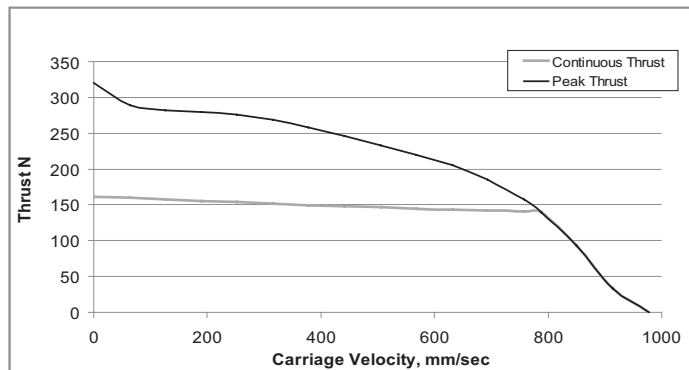
*185 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165DT @ 24V, 10mm/rev**



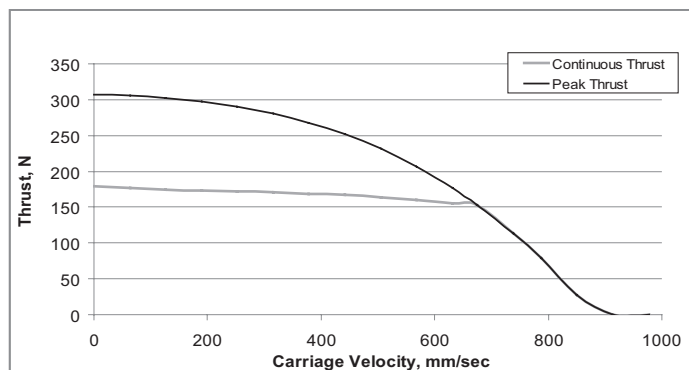
*185 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165DT @ 48V, 12.5mm/rev**



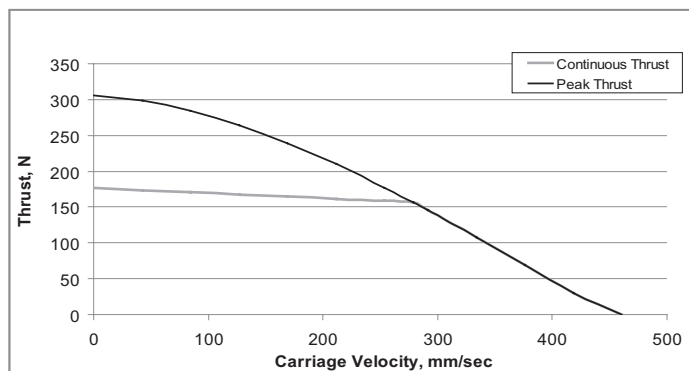
*135 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165DT @ 42V, 12.5mm/rev**



*135 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

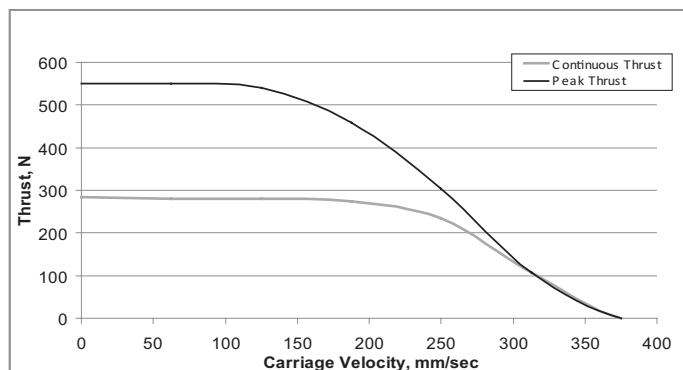
**HLD60 Single Rail/Internal Rollers
SM23165DT @ 24V, 12.5mm/rev**



*135 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

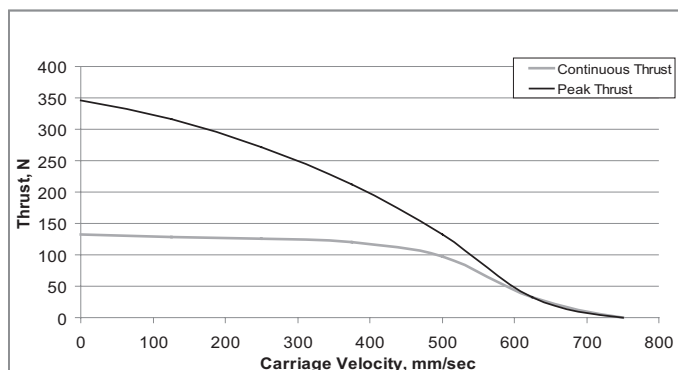
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

**HLD60 Single Rail/Internal Rollers
SM23165D @ 48V, 2.5mm/rev**



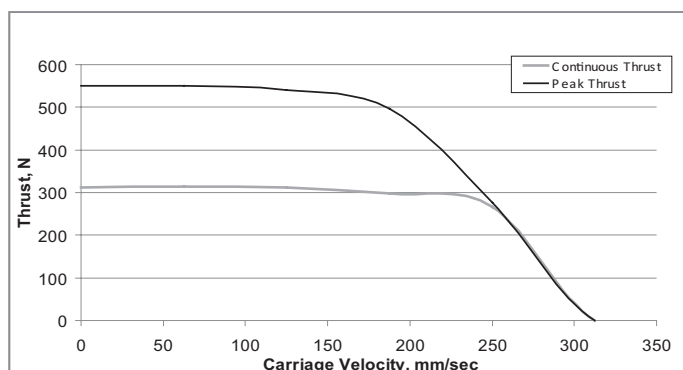
*284 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165D @ 48V, 5mm/rev**



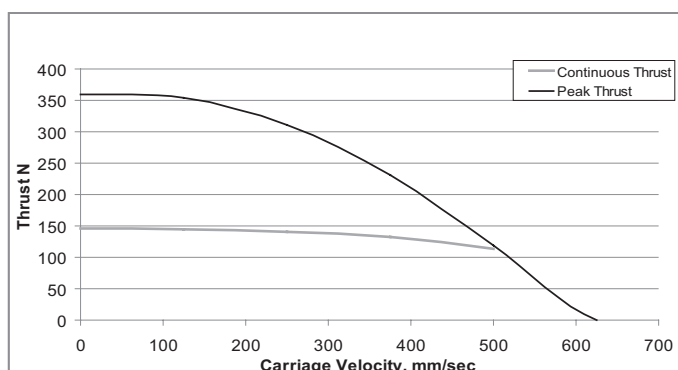
*132 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165D @ 42V, 2.5mm/rev**



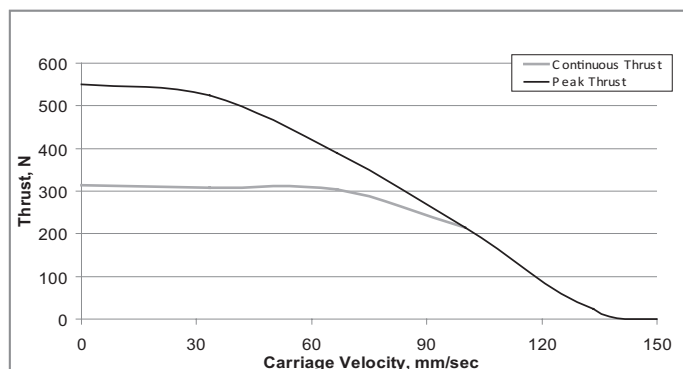
*284 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165D @ 42V, 5mm/rev**



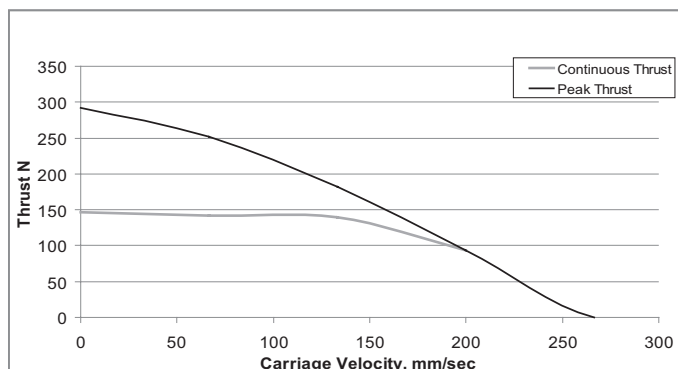
*132 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

**HLD60 Single Rail/Internal Rollers
SM23165D @ 24V, 2.5mm/rev**



*284 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

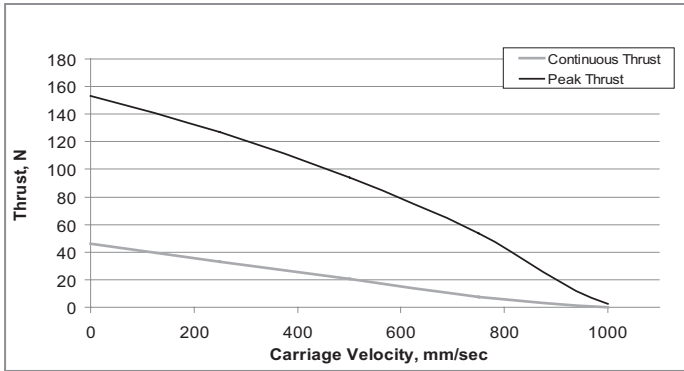
**HLD60 Single Rail/Internal Rollers
SM23165D @ 24V, 5mm/rev**



*132 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

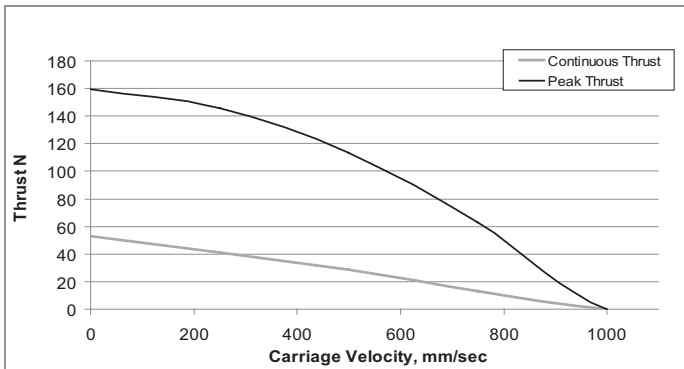
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

HLD60 Single Rail/Internal Rollers SM23165D @ 48V, 10mm/rev



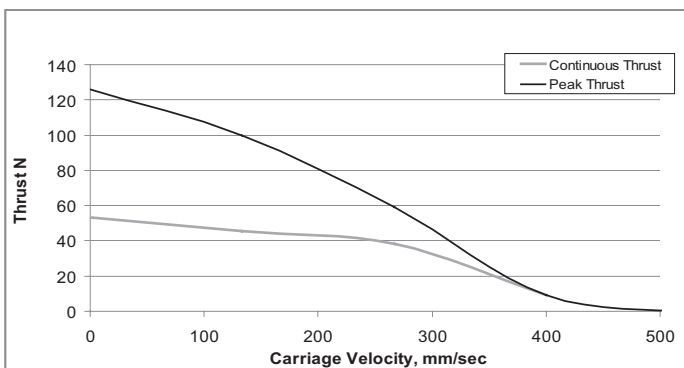
*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Single Rail/Internal Rollers SM23165D @ 42V, 10mm/rev



*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

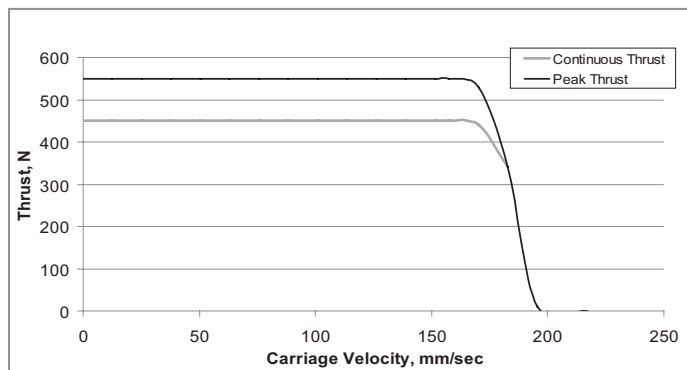
HLD60 Single Rail/Internal Rollers SM23165D @ 24V, 10mm/rev



*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

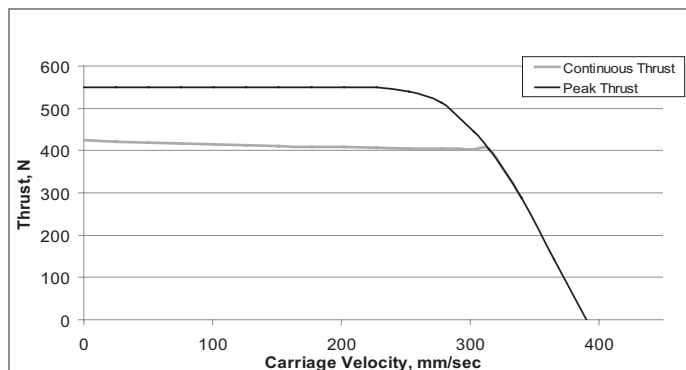
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

HLD60 Twin Rails - SM23165DT @ 48V, 2.5mm/rev



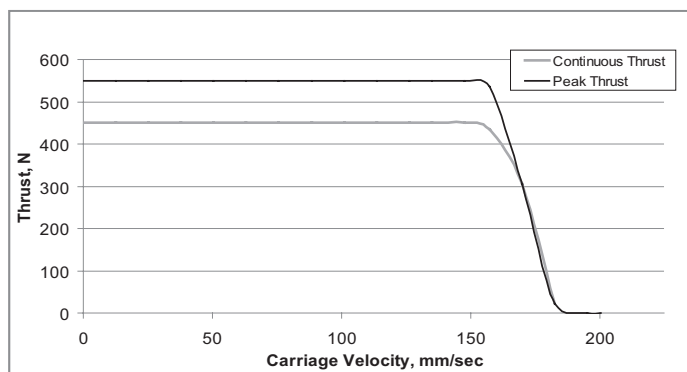
*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 48V, 5mm/rev



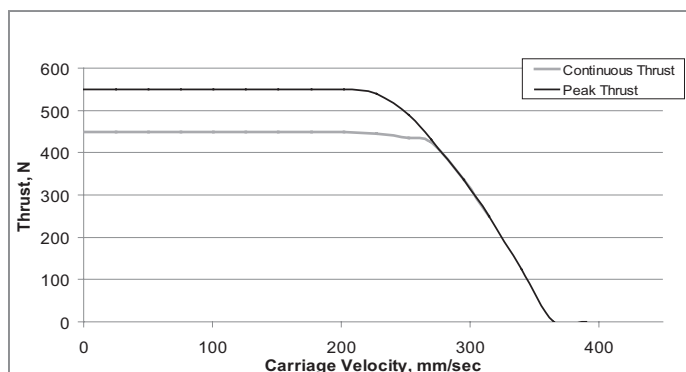
*400 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 42V, 2.5mm/rev



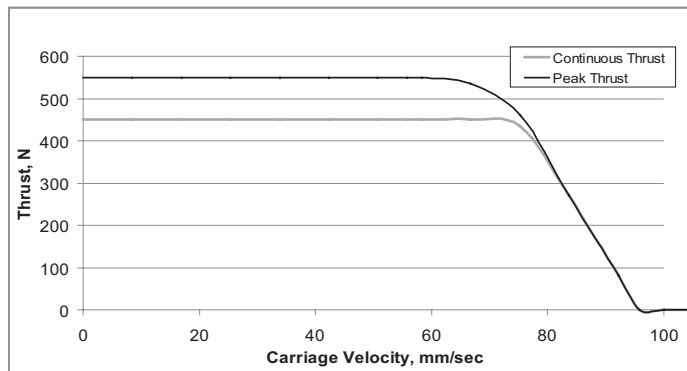
*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 42V, 5mm/rev



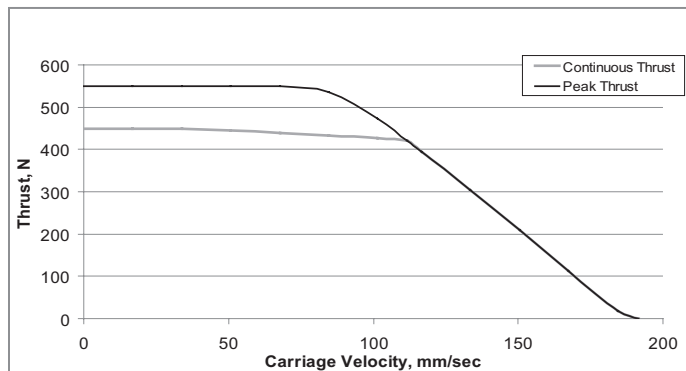
*400 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 24V, 2.5mm/rev



*450 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

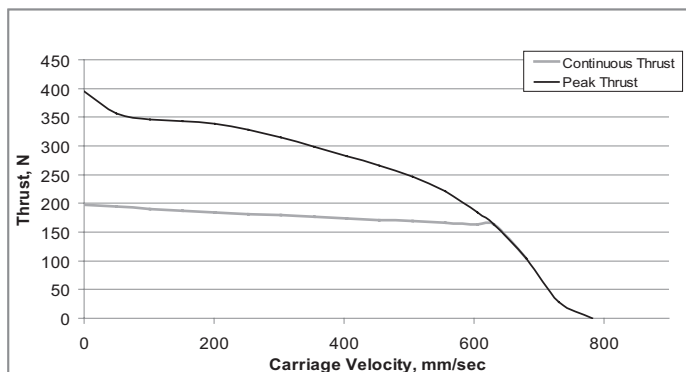
HLD60 Twin Rails - SM23165DT @ 24V, 5mm/rev



*400 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

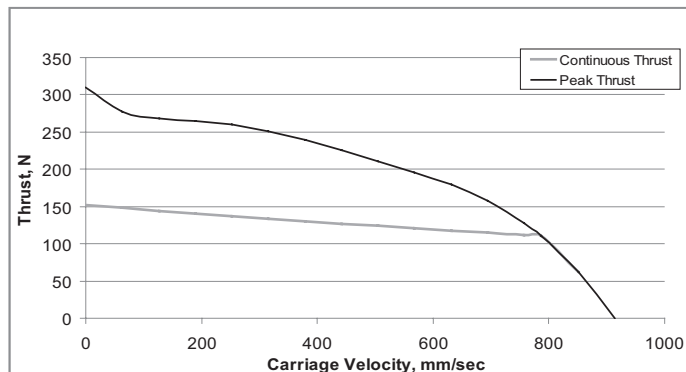
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

HLD60 Twin Rails - SM23165DT @ 48V, 10mm/rev



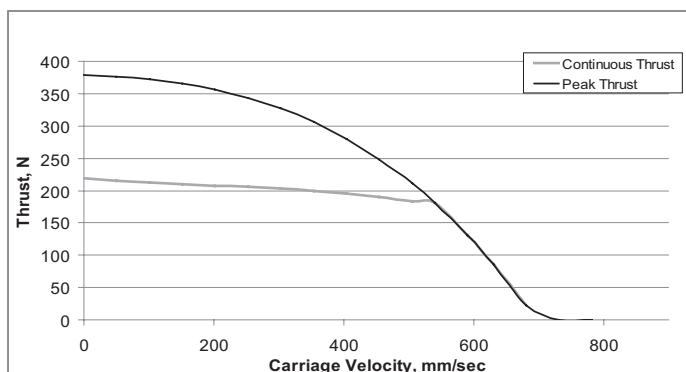
*160 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 48V, 12.5mm/rev



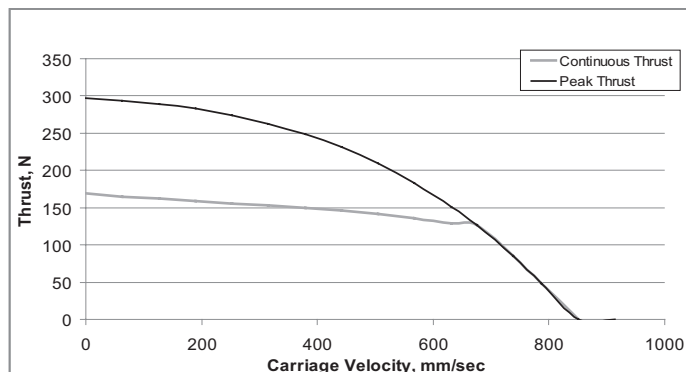
*105 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 42V, 10mm/rev



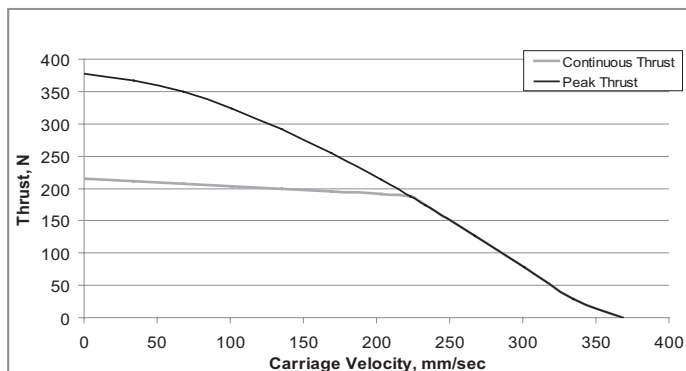
*160 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 42V, 12.5mm/rev



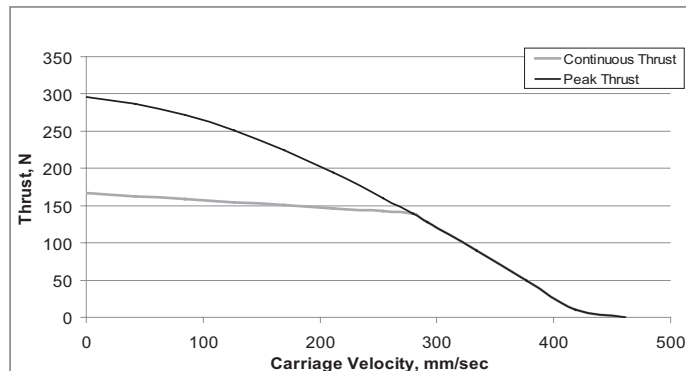
*105 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165DT @ 24V, 10mm/rev



*160 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

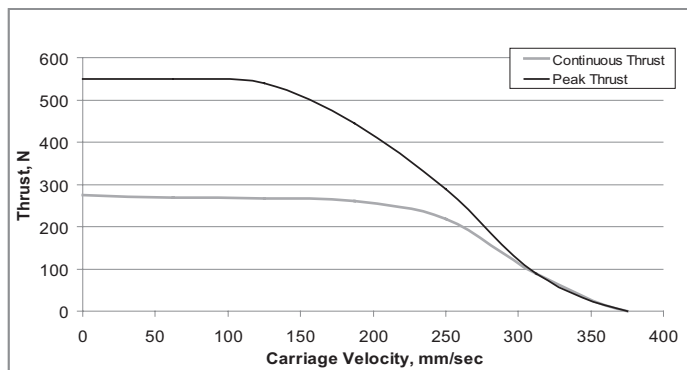
HLD60 Twin Rails - SM23165DT @ 24V, 12.5mm/rev



*105 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

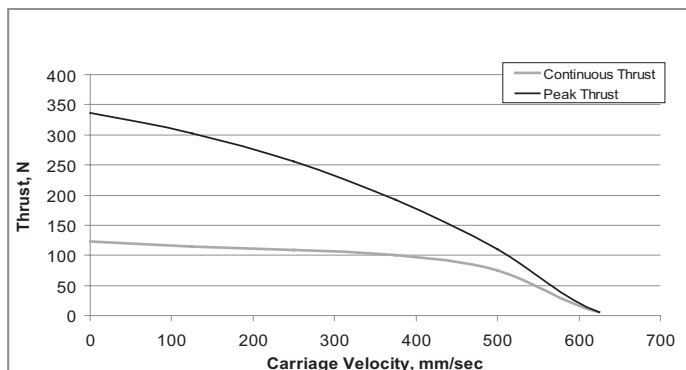
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

HLD60 Twin Rails - SM23165D @ 48V, 2.5mm/rev



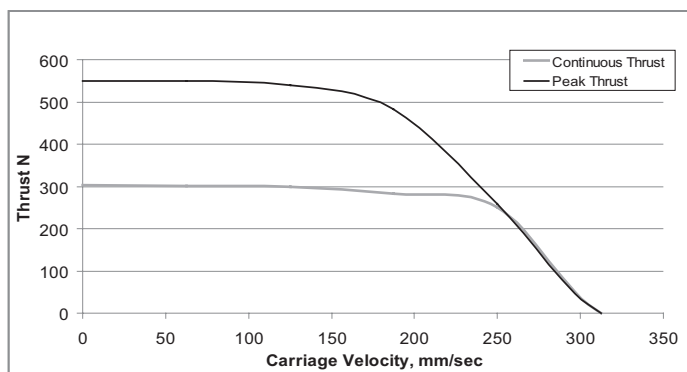
*274 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165D @ 48V, 5mm/rev



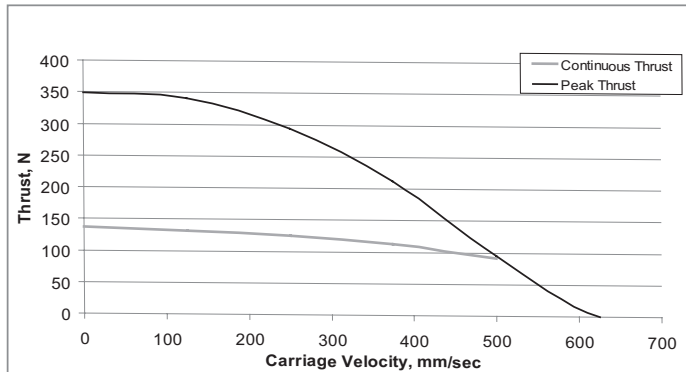
*122 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165D @ 42V, 2.5mm/rev



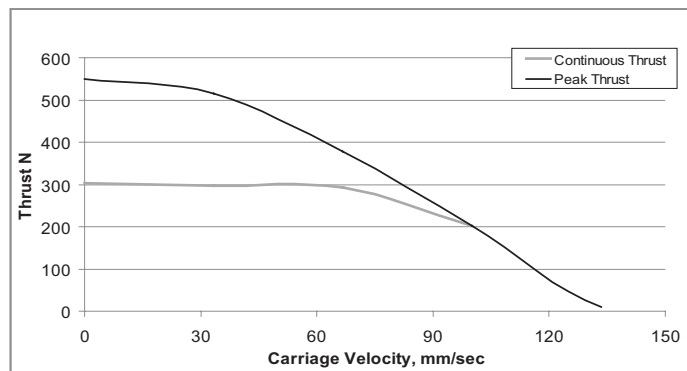
*274 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165D @ 42V, 5mm/rev



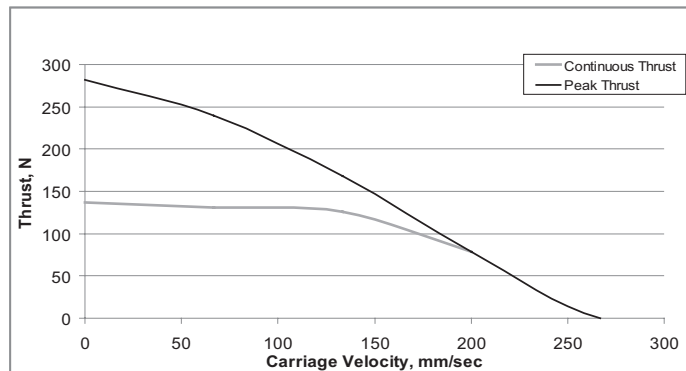
*122 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165D @ 24V, 2.5mm/rev



*274 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

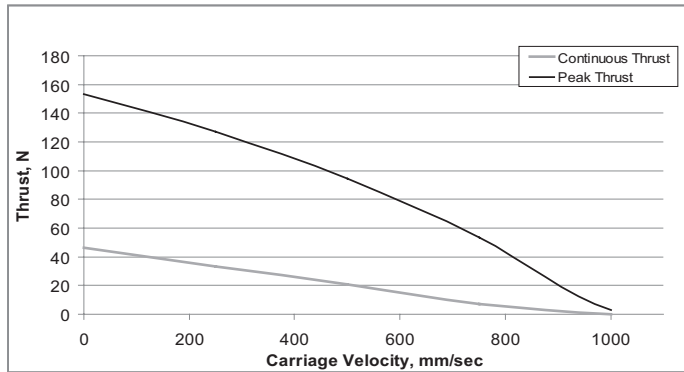
HLD60 Twin Rails - SM23165D @ 24V, 5mm/rev



*122 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

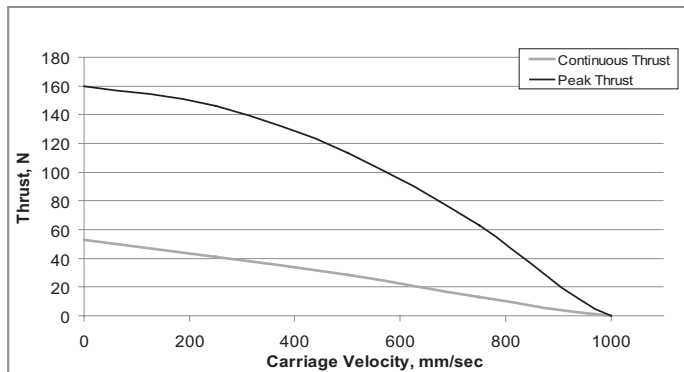
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

HLD60 Twin Rails - SM23165D @ 48V, 10mm/rev



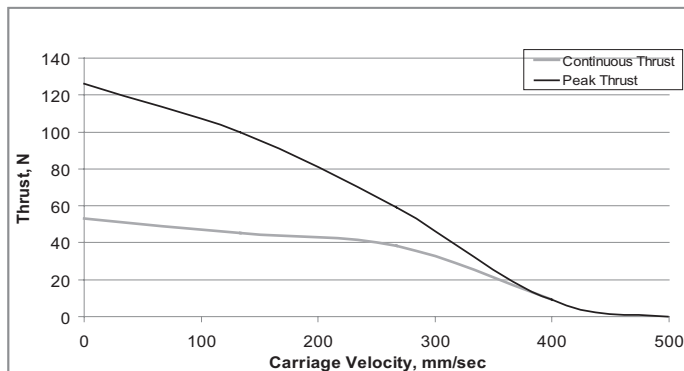
*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

HLD60 Twin Rails - SM23165D @ 42V, 10mm/rev



*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

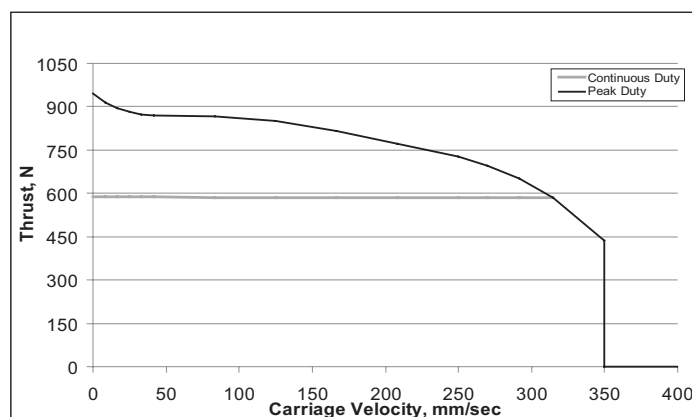
HLD60 Twin Rails - SM23165D @ 24V, 10mm/rev



*45 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

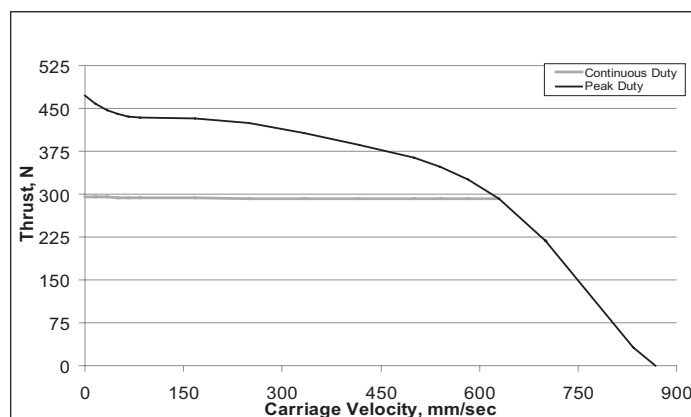
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

L70/XL100 - SM23165DT @ 48V, 5mm/rev lead ball screw



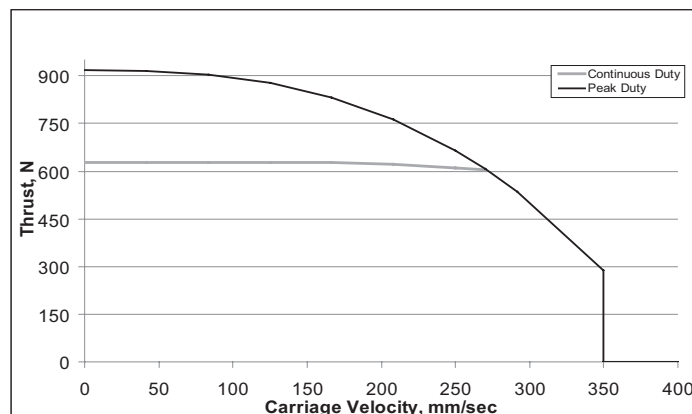
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165DT @ 48V, 10mm/rev lead ball screw



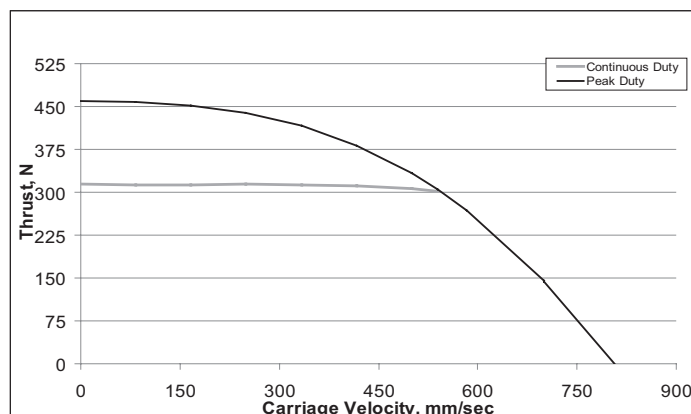
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165DT @ 42V, 5mm/rev lead ball screw



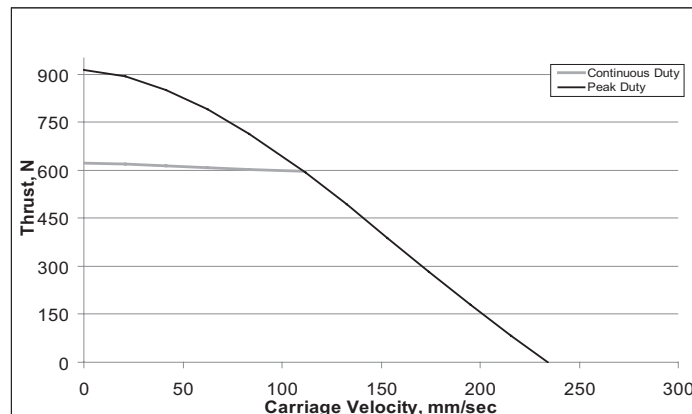
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165DT @ 42V, 10mm/rev lead ball screw



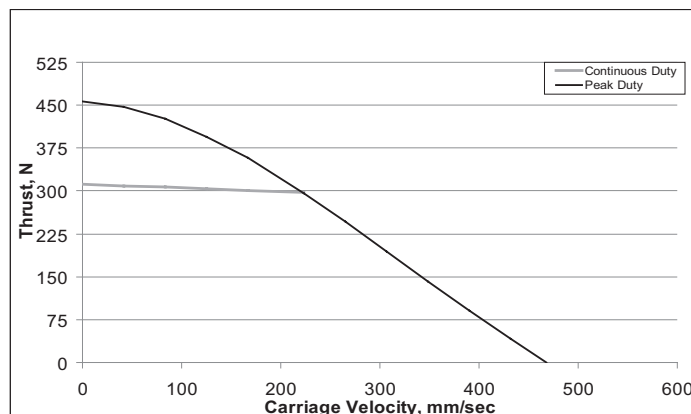
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165DT @ 24V, 5mm/rev lead ball screw



*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

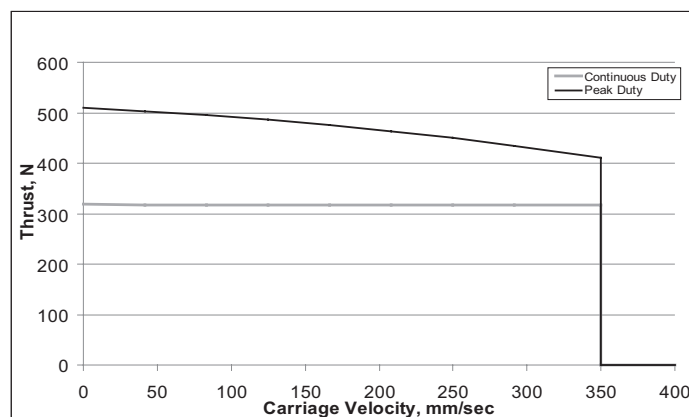
L70/XL100 - SM23165DT @ 24V, 10mm/rev lead ball screw



*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

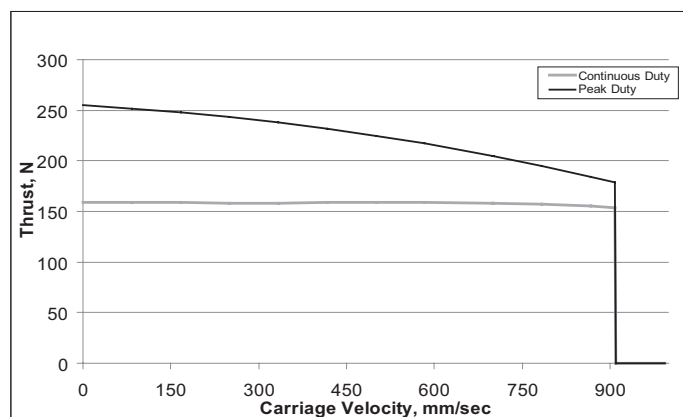
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

L70/XL100 - SM23165D @ 48V, 5mm/rev lead ball screw



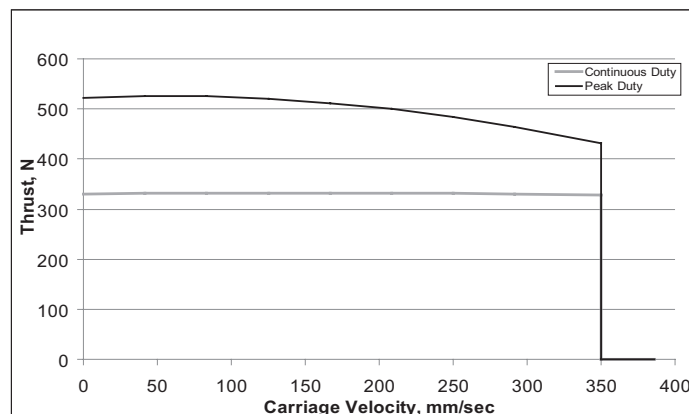
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165D @ 48V, 10mm/rev lead ball screw



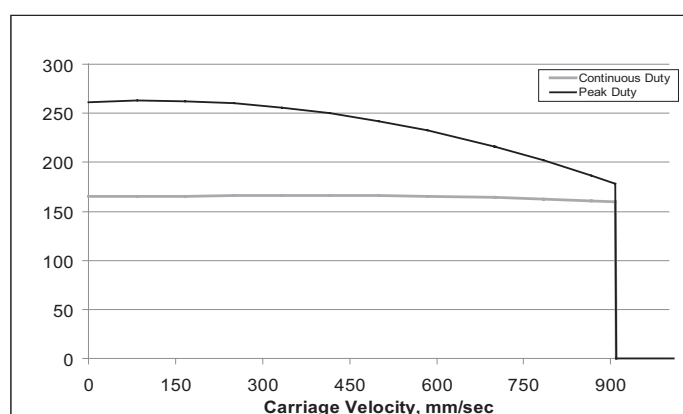
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165D @ 42V, 5mm/rev lead ball screw



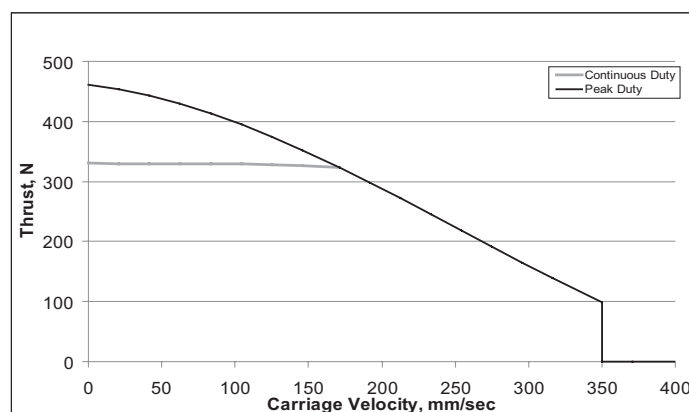
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165D @ 42V, 10mm/rev lead ball screw



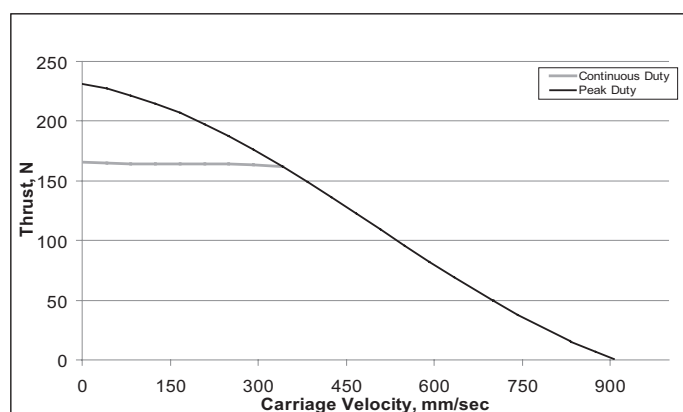
*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

L70/XL100 - SM23165D @ 24V, 5mm/rev lead ball screw



*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

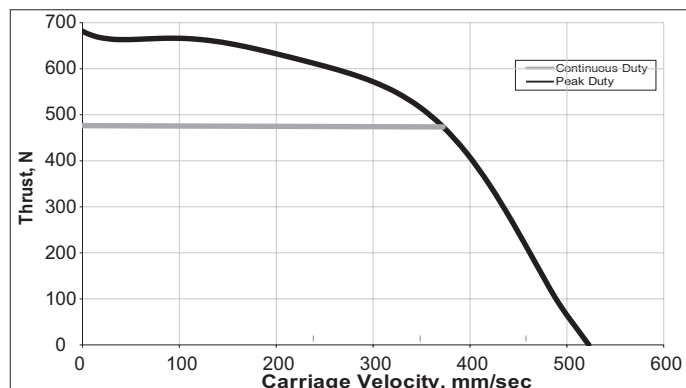
L70/XL100 - SM23165D @ 24V, 10mm/rev lead ball screw



*200 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits. **Please see pages 135–153 for lifetime information.

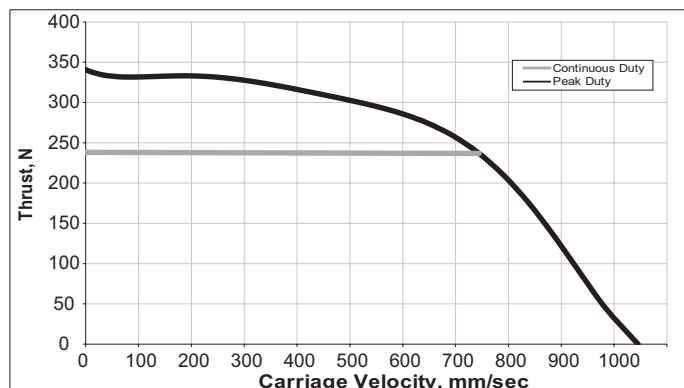
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

**VL-CT series - SM23165DT @ 48V, 10A Switching,
1:1 Direct Drive, 6mm Pitch**



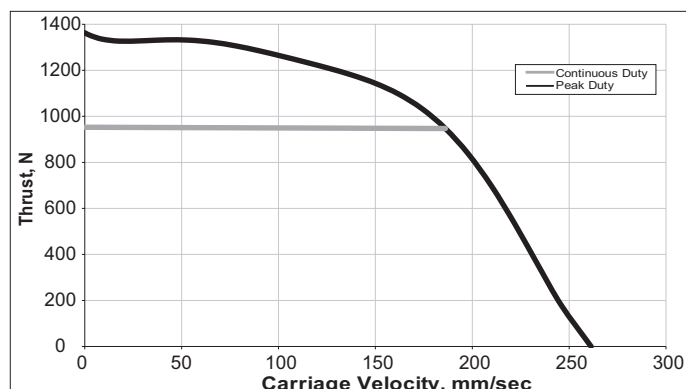
*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

**VL-CT series - SM23165DT @ 48V, 10A Switching,
1:1 Direct Drive, 12mm Pitch**



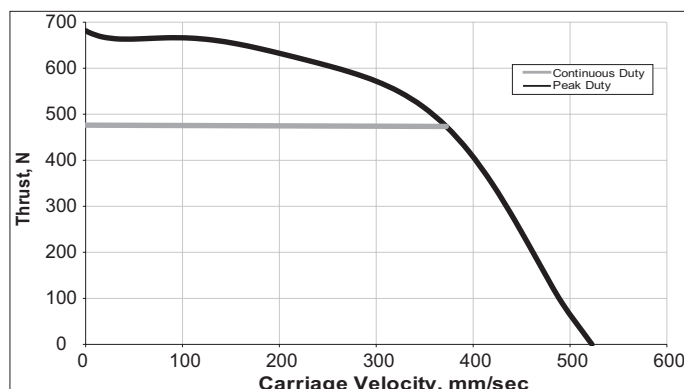
*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

**VL-CT series - SM23165DT @ 48V, 10A Switching,
2:1 Pulley Offset, 6mm Pitch**



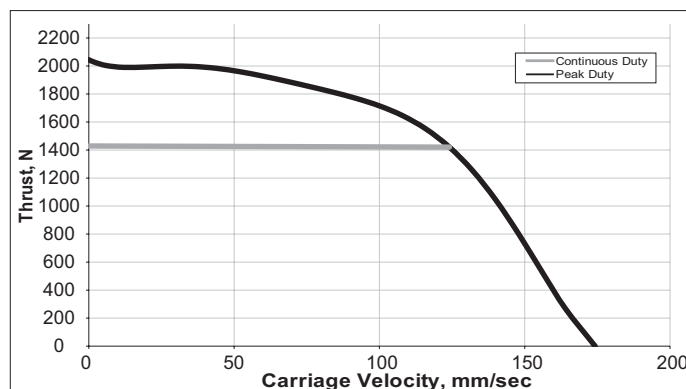
*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

**VL-CT series - SM23165DT @ 48V, 10A Switching,
2:1 Pulley Offset, 12mm Pitch**



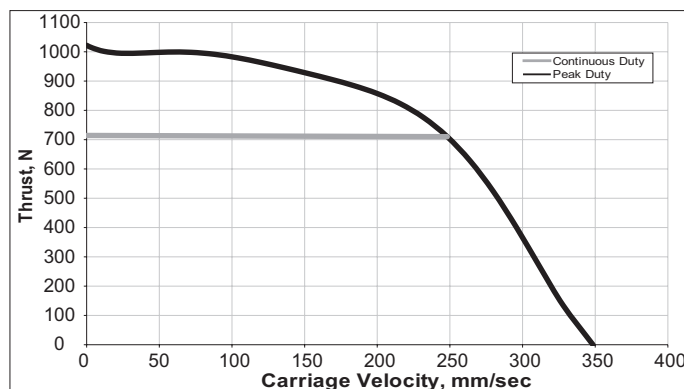
*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

**VL-CT series - SM23165DT @ 48V, 10A Switching,
3:1 Pulley Offset, 6mm Pitch**



*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

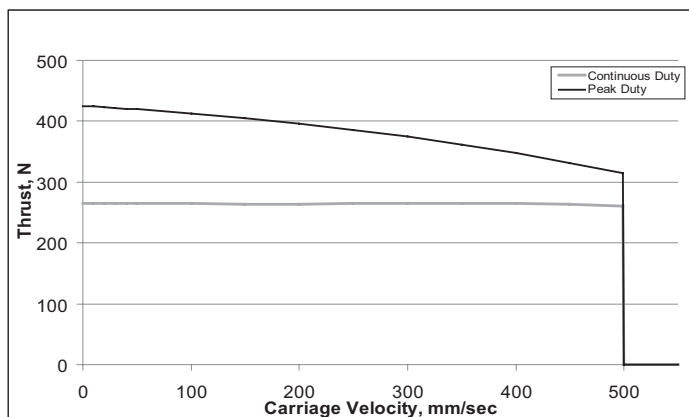
**VL-CT series - SM23165DT @ 48V, 10A Switching,
3:1 Pulley Offset, 12mm Pitch**



*Basic Service Life of 15000 hours when operated within continuous duty and payload ratings, and below critical speed limits. Please see page 149 –153 for full VL-CT actuator specifications.

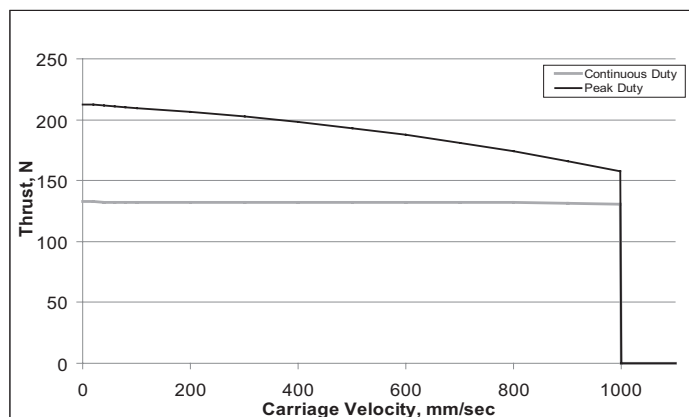
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

VL-ST45 - SM23165D @ 48V, 6mm/rev lead ball screw



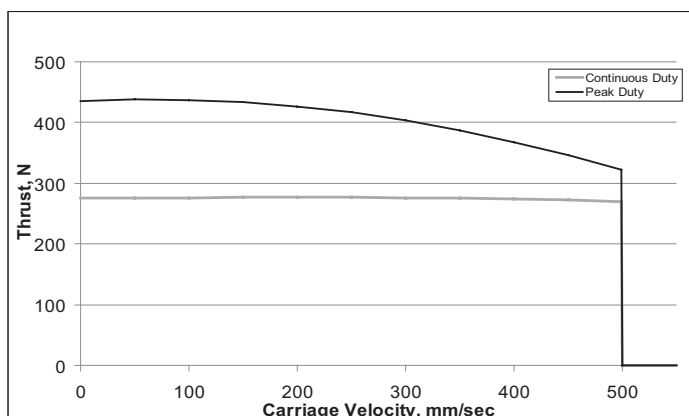
*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 48V, 12mm/rev lead ball screw



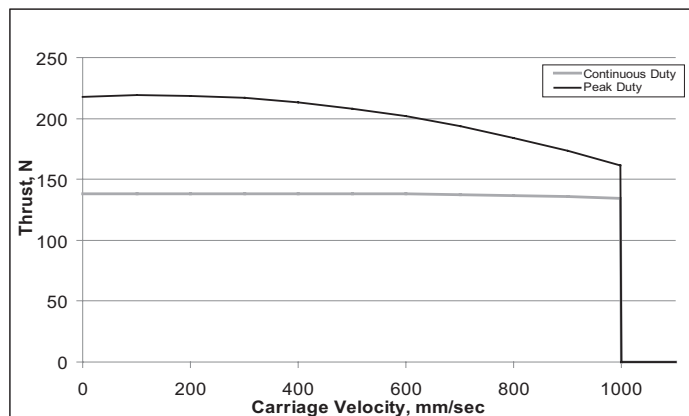
*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 42V, 6mm/rev lead ball screw



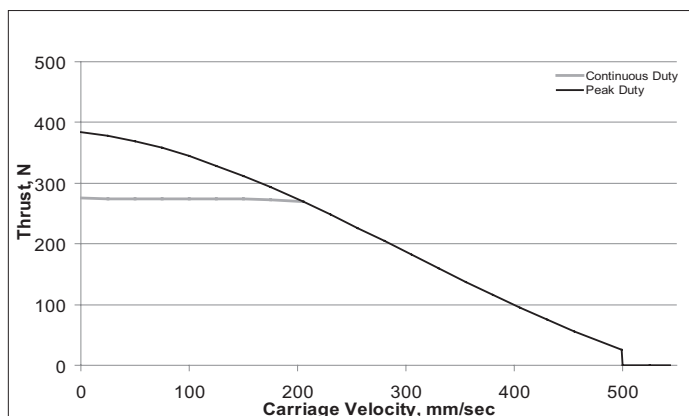
*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 42V, 12mm/rev lead ball screw



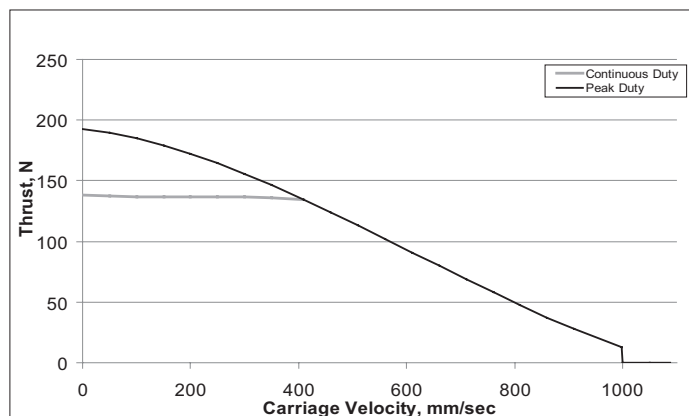
*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 24V, 6mm/rev lead ball screw



*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

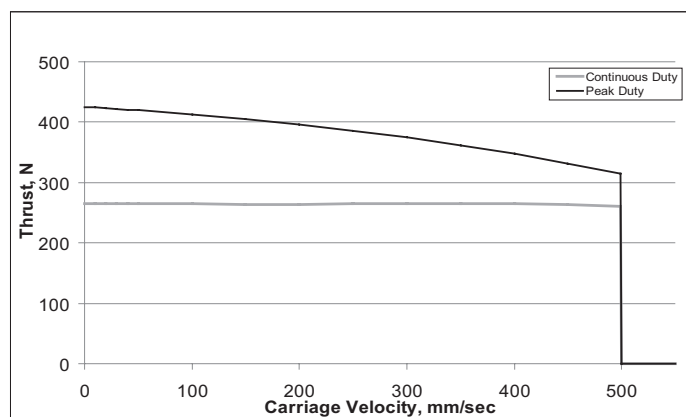
VL-ST45 - SM23165D @ 24V, 12mm/rev lead ball screw



*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

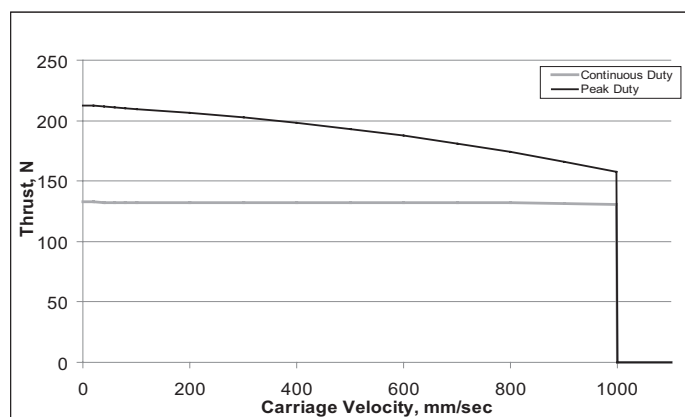
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

VL-ST45 - SM23165D @ 48V, 6mm/rev lead ball screw



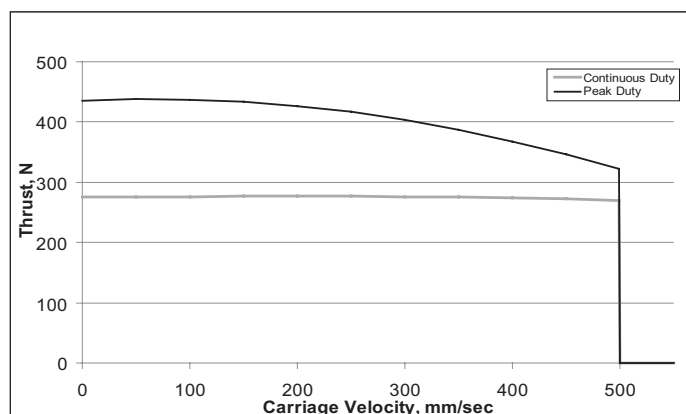
*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 48V, 12mm/rev lead ball screw



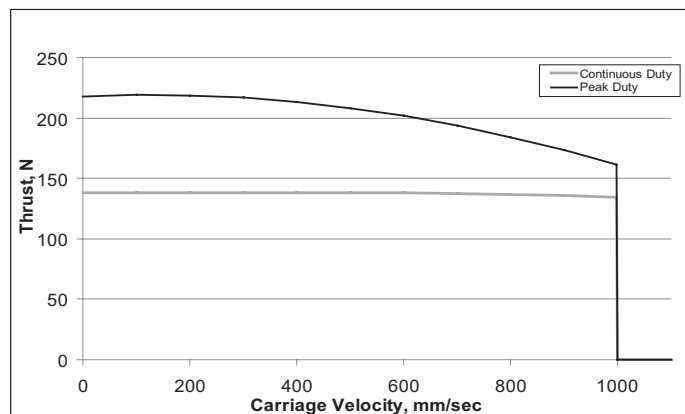
*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 42V, 6mm/rev lead ball screw



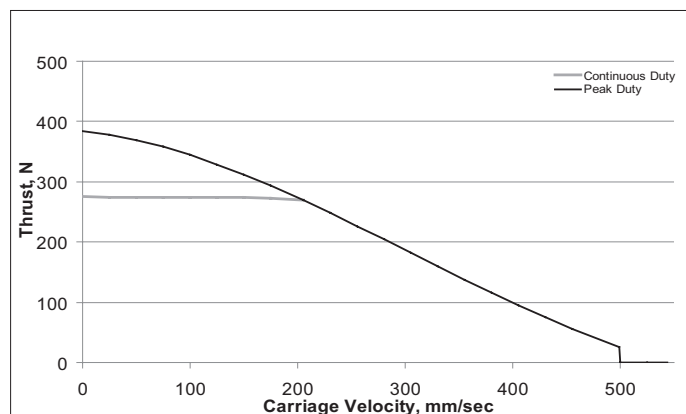
*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 42V, 12mm/rev lead ball screw



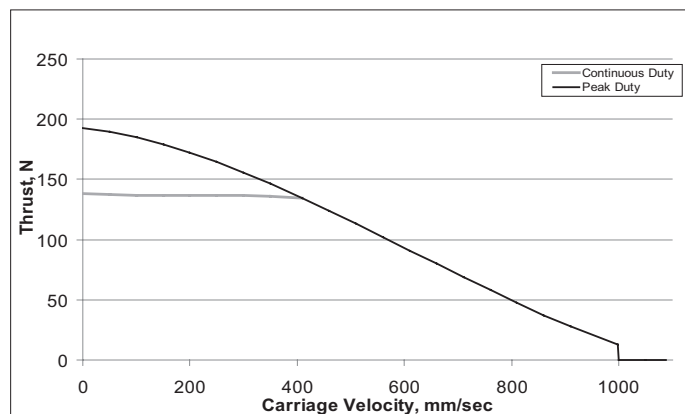
*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST45 - SM23165D @ 24V, 6mm/rev lead ball screw



*80 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

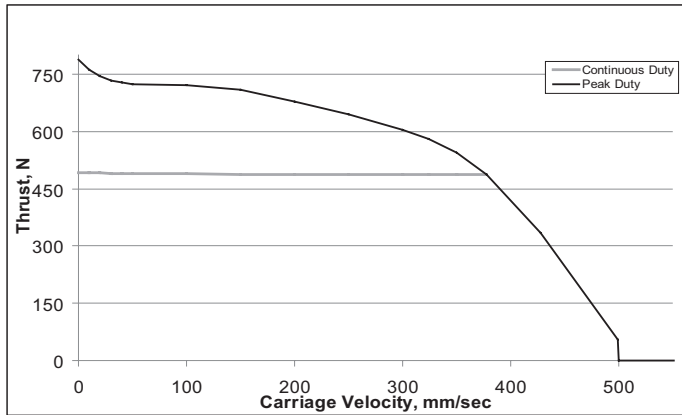
VL-ST45 - SM23165D @ 24V, 12mm/rev lead ball screw



*65 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

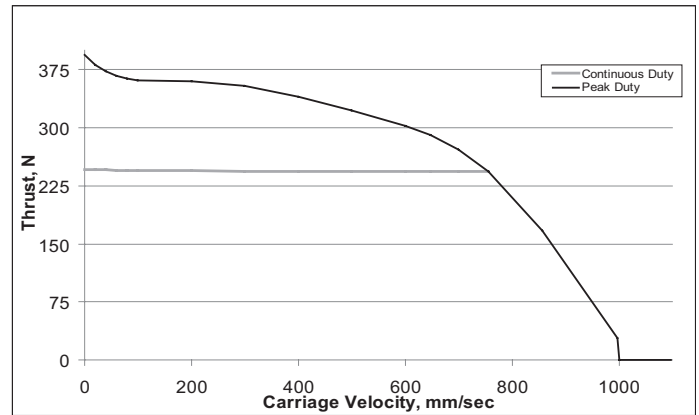
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

VL-ST60 - SM23165DT @ 48V, 6mm/rev lead ball screw



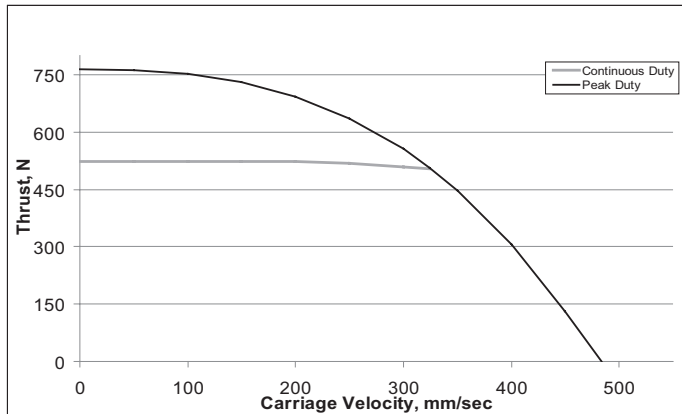
*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165DT @ 48V, 12mm/rev lead ball screw



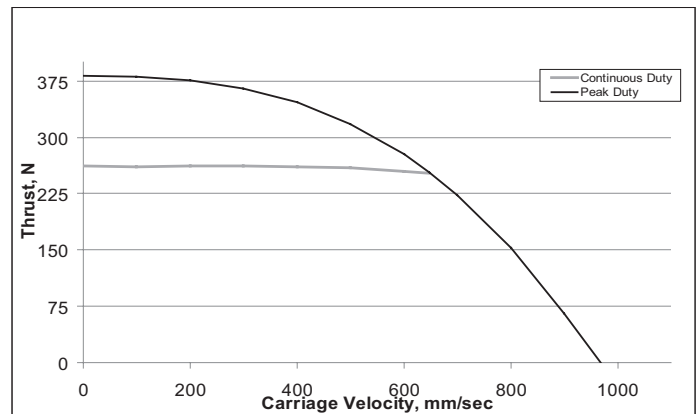
*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165DT @ 42V, 6mm/rev lead ball screw



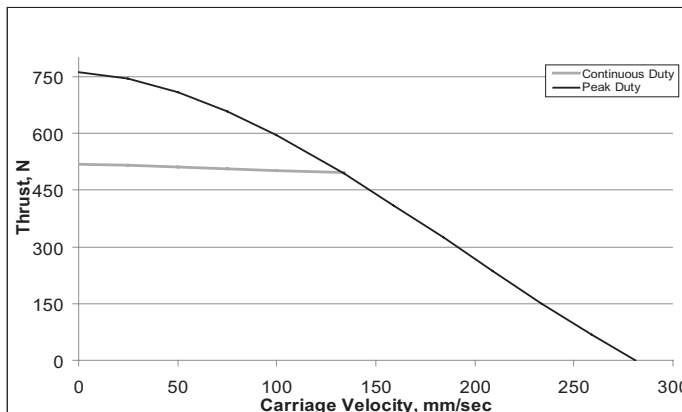
*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165DT @ 42V, 12mm/rev lead ball screw



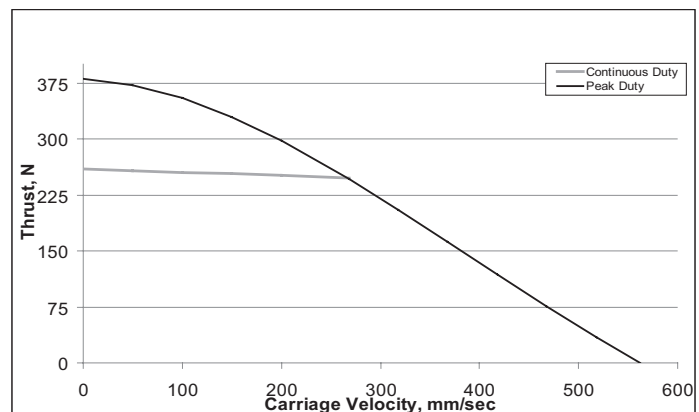
*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165DT @ 24V, 6mm/rev lead ball screw



*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

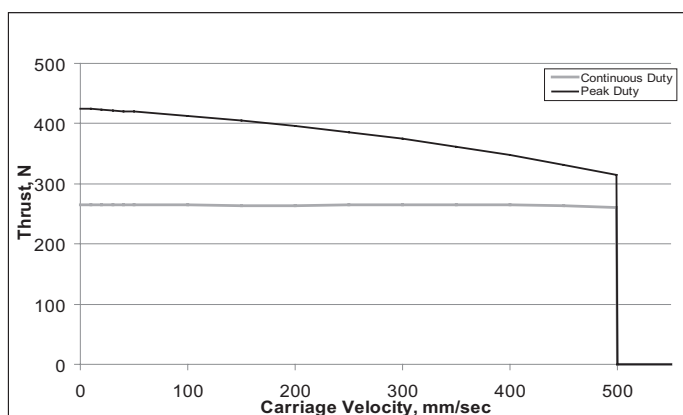
VL-ST60 - SM23165DT @ 24V, 12mm/rev lead ball screw



*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

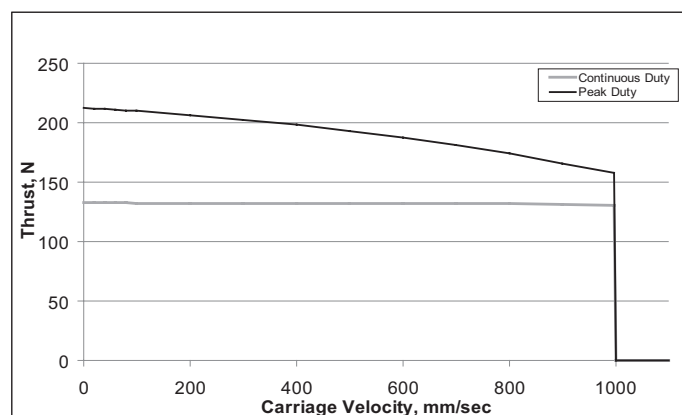
NOTE: Motor and actuator specifications are subject to changes without notice. Consult website and factory for latest data.

VL-ST60 - SM23165D @ 48V, 6mm/rev lead ball screw



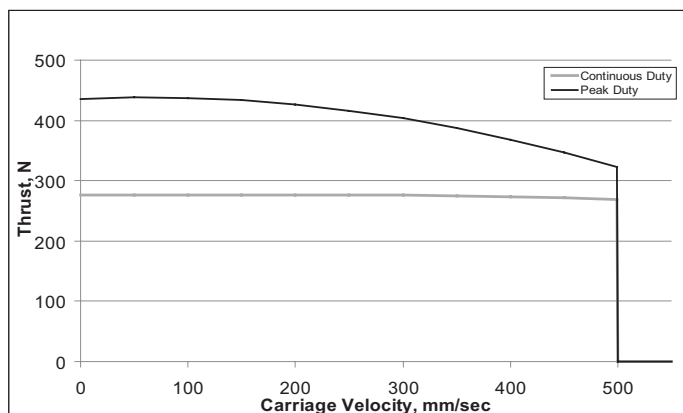
*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165D @ 48V, 12mm/rev lead ball screw



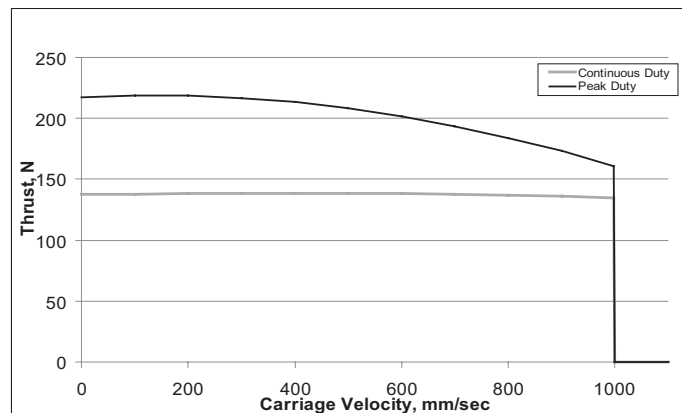
*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165D @ 42V, 6mm/rev lead ball screw



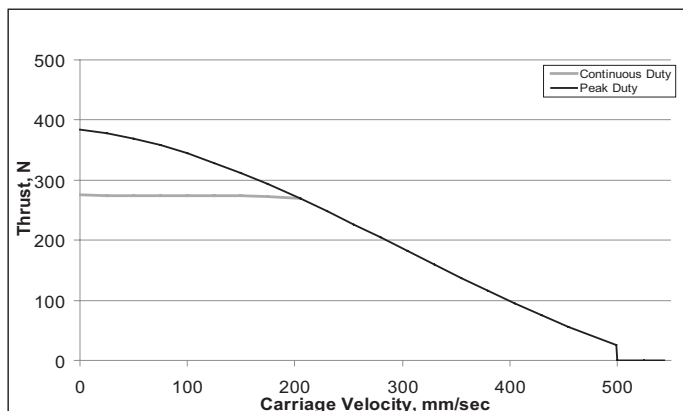
*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165D @ 42V, 12mm/rev lead ball screw



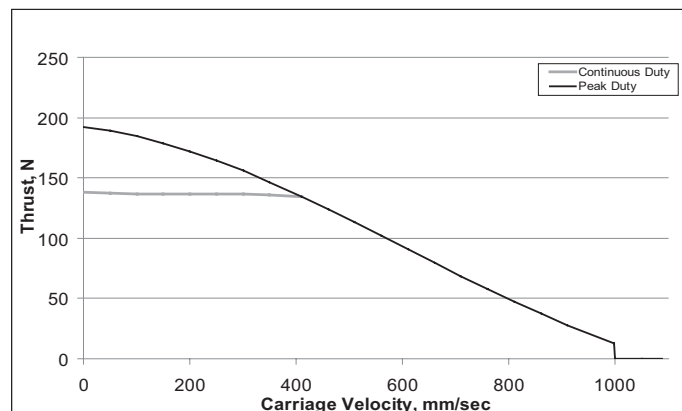
*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165D @ 24V, 6mm/rev lead ball screw



*130 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

VL-ST60 - SM23165D @ 24V, 12mm/rev lead ball screw



*100 N Dynamic Thrust Limit for Basic Service Life when operated at critical speed limits within average speed requirements stated on pages 135–153.

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