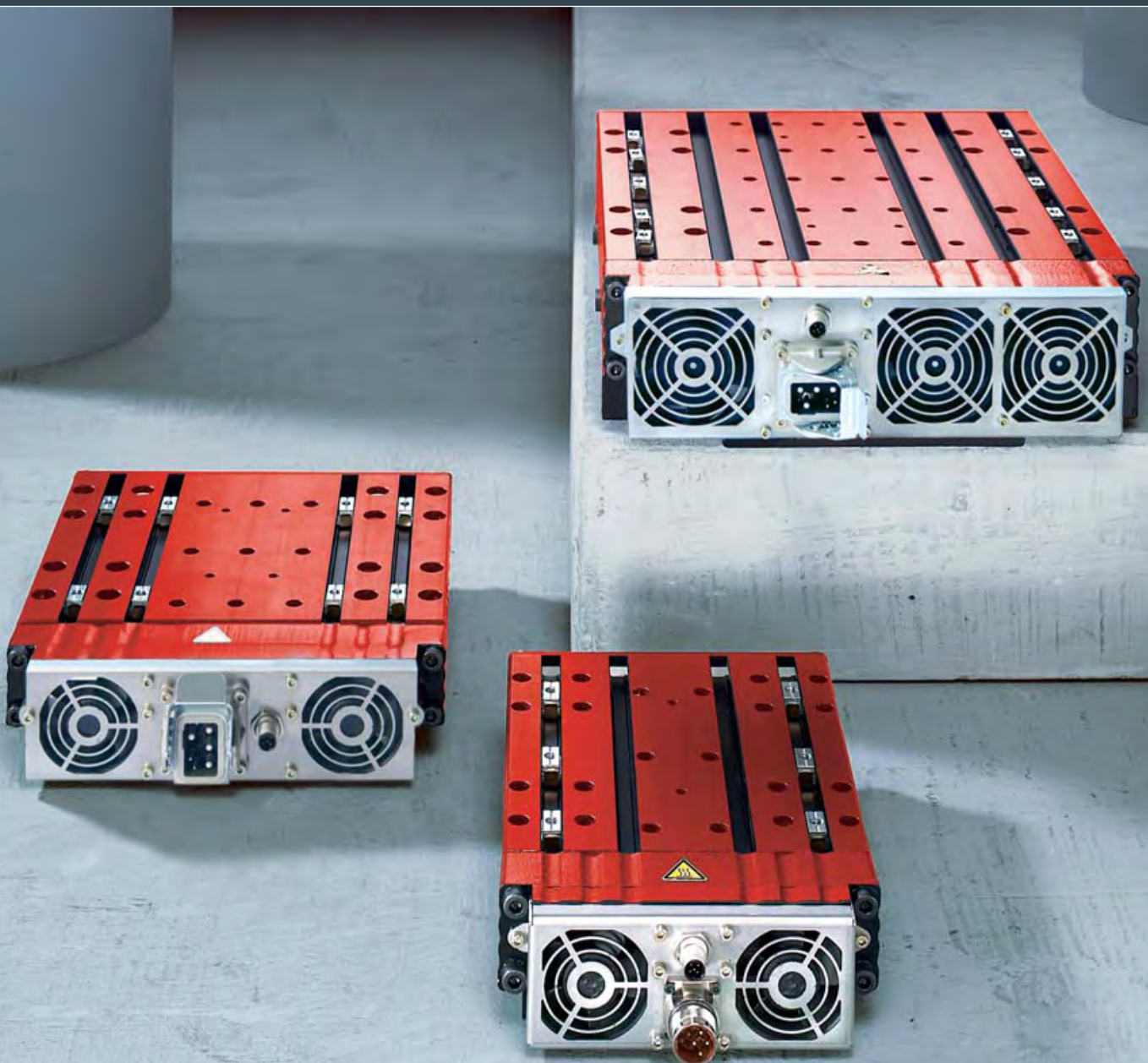


Perfect precision, highest dynamics and velocity:
**The new generation of SL2 synchronous
linear motors from SEW-EURODRIVE**

SL2-Basic, SL2-Advance System, SL2-Power System



Convection-cooled and dynamic units

The high demands on machine cycle times, accelerations and linear travel speeds for drive systems in handling, transportation and production are increasing steadily. Whether for highly dynamic or flexible processing machines, material handling or pick-and-place applications, the new SL2 synchronous linear motors from SEW-EURODRIVE are the ideal solution to meet these demands.

The direct generation of the linear motion and force does not require any mechanical transmission elements subject to wear, such as spindles, ball bearings or toothed belts. Modern winding technology and a laminated iron core make for optimized force to density ratio. The SL2 synchronous linear motor with

convection cooling is practically maintenance-free, offers maximum reliability and availability, high control quality, speed and accuracy. Another advantage: The compact design of the SL2 synchronous linear motors.



From one source

Available in three designs

- SL2-Basic
- SL2-Advance System
- SL2-Power System

these convection-cooled, synchronous linear motors offered by SEW-EURODRIVE can be combined with the matching MOVIDRIVE® servo controller B series and the absolute linear measuring system AL1H (Hiperface®) for a perfectly matched system meeting individual drive requirements. Another advantage: the familiar functionality of the MOVIDRIVE® series is also available for the operation of SL2 synchronous linear motors.

Driving the world – with innovative drive solutions for all branches of industry and for every application. Products and systems from SEW-EURODRIVE for any application – worldwide. SEW-EURODRIVE products can be found in a variety of industries, e.g. automotive, building materials, food and beverage as well as metal-processing. The decision to use drive technology “made by SEW-EURODRIVE” stands for safety regarding functionality and investment.



System solutions for your application

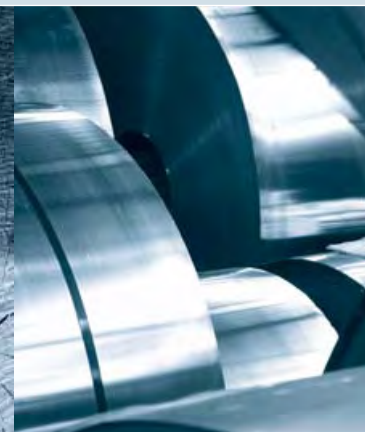
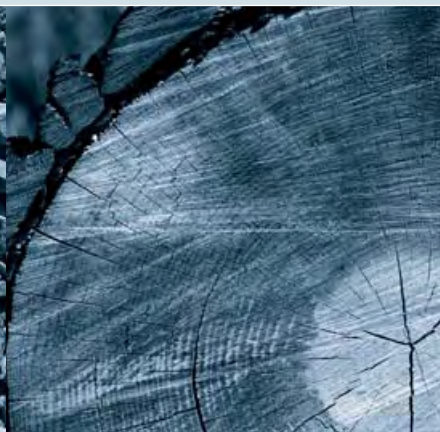
Dynamic and precise mechanics combined with intelligent drive electronics and control from the spectrum of modules from SEW-EURODRIVE in the high quality that only drive technology from SEW-EURODRIVE offer:

- SL2 synchronous linear motors available in SL2-Basic, SL2-Advance System and SL2-Power System designs
- All motors are available in several widths and lengths
- Velocity classes 1 / 3 / 6 [m/s] are available even with the use of an AL1H linear absolute encoder
- All motors have been adapted to MOVIDRIVE® drive inverters
- Effective protection from thermal overload at MOVIDRIVE® through TF or KTY
- Linear measuring systems directly evaluated by MOVIDRIVE®
- Prefabricated motor and encoder lines
- MOVIDRIVE® servo controller B series
- MOVITOOLS® operating software with startup function for SL2 synchronous linear motors
- Technology functions
- Engineering support
- After sales support
- CAD files for all motor series
- Shortest times of delivery (from stock) for the preferred types of SL2-050 to SL2-0150 motors with velocities of 1/3/6 m/s each, 1 m connection cable included



SL2 synchronous linear motors convince in:

- transport and handling systems, such as gantry systems with two or three axes, feeding devices, haul-off systems
- loading gantry systems
- assembly and handling systems
- packaging systems
- wood processing systems
- drilling systems
- cutting systems
- small press systems
- the manufacture of special purpose machinery



You decide on a system – we take care of project planning and configuration

The project planning and configuration of system concepts that place high demands on speed and precision or require high travel speeds and repetition accuracy is very time-consuming. Apart from the calculation and selection of the drive system, the time spent on designing the motor system in the machine base is the decisive factor in project planning. Therefore, SEW-EURODRIVE now performs the decisive and time-consuming planning for integrating the synchronous linear motor for the three convection-cooled SL2 synchronous linear motors. The user only has to choose an assembly system and get the functionality for every application: Convection-cooled, synchronous linear motors in a rated power range from 280 ... 6,000 Nm with peak forces of up to 12,600 N.

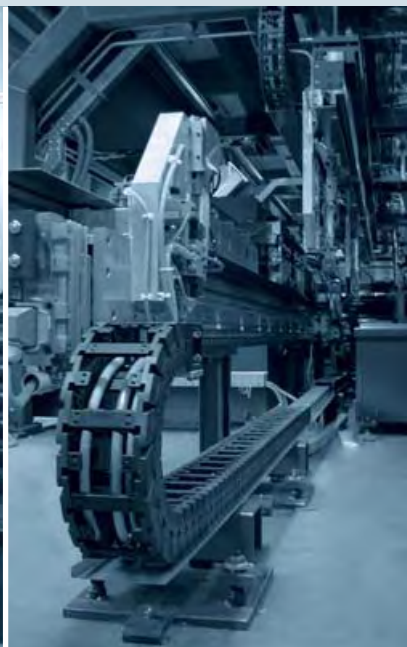
All three SL2 synchronous linear motors from SEW-EURODRIVE consist of a primary and a secondary component. The primary consists of a laminated core with motor winding and temperature sensor and serves as the stator. The secondary made of steel represents the rotor and comes equipped with high-quality permanent magnets. The motor is cooled by mounting a metallic mounting platform of sufficient size.

SL2-Advance System and SL2-Power System are the result of consistently continuing the development of the SL2-Basic based on customer needs and areas of application. The systems come completely assembled

and wired, resulting in less time and effort during design as well as startup. Project planning of the entire drive will be much safer because the performance data will be accomplished regardless of the mounting situation. The primary is installed in the motor cooling unit for both designs. The result is a mounted, optimized cooling unit for maximum performance. Electrical connectors have been integrated for communication with the fieldbus interfaces. The motor cooling unit makes for great mechanical rigidity at minimum weight and size. It also serves as the supporting frame for mounting of customer-supplied components. There are mounting surfaces on the side and bottom for mounting

of commercial linear guidance systems and encoder systems to the motor cooling unit. There are floating bearings located at the mounting site for guide carriages to compensate the heat expansion of the aluminum heat sink.

The SL2-Power System is available with optional forced cooling fan on the motor cooling unit for even better cooling properties. The result is an increase in performance by 50 % and an improvement in drive efficiency (especially the magnets in the secondaries of linear drives will be used more efficiently).



Always the right choice: SL2 synchronous linear motors

Thermally insulated and water cooled motors are mainly used in mechanical engineering. But with increasing requirements on the motor in terms of dynamics and positioning accuracy, conventional motors are not suitable anymore. Convection-cooled SL2 synchronous linear motors are therefore increasingly being used for servo applications. The three types from SEW-EURODRIVE achieve the highest levels of positioning accuracy up to the μm range.

Additional benefits from using SL2 synchronous linear motors

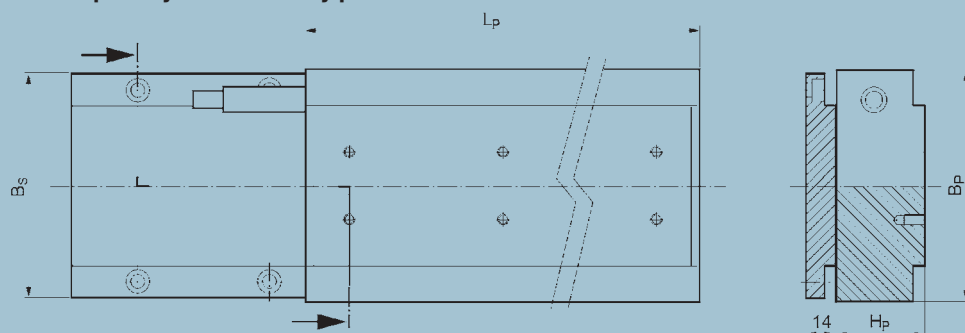
- Higher acceleration because no rotating mass moments of inertia are present
- Good synchronous operation accuracy
- No backlash or spring effects associated with mechanical transmission components
- No wear due to contactless energy transfer
- Excellent positioning performance
- High travelling velocities (e.g. $V > 3 \text{ m/s}$)
- Low-noise even with high supply voltages
- Excellent control characteristics
- High stiffness of the control loop in conjunction with MOVIDRIVE® series B
- Long service life and reliable system
- IP65 enclosure for SL2-Basic
- Low operating and maintenance costs
- Less complex system due to convection cooling allows for innovative machine designs

Legend:

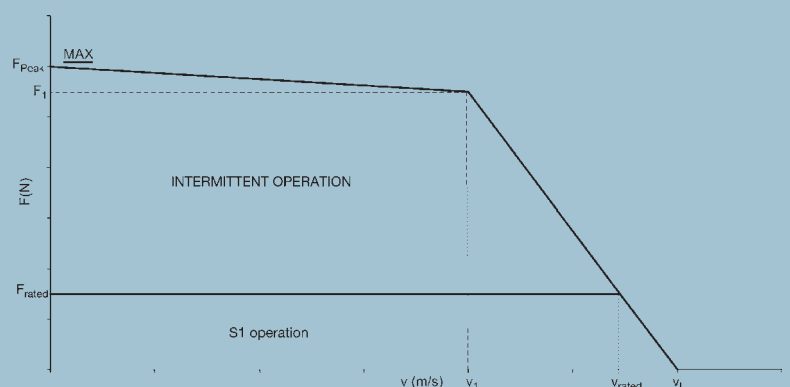
- F_{rated} = Permanent force*
 F_1 = Maximum force available up to V_1
 F_{Peak} = Maximum force available at standstill
 V_L = Theoretical maximum travel velocity
 V_1 = Velocity available up to force F_1
 V_{rated} = Velocity available up to the rated force

* when mounting an aluminum heat sink with up to four times the primary part surface, 10 mm thickness and a room temperature of 40 °C

Dimensions primary and secondary part



Characteristic curve





Overview SL2-Basic

System components	Features / advantages
Primary = Stator	<ul style="list-style-type: none"> – Encapsulated SL2 synchronous linear motor with laminated iron core – The motor system is convection-cooled and reaches its rated cooling by mounting a sufficiently large metallic mounting platform to the flange surface of the motor – Very economical: There is no need for time-consuming and expensive maintenance work, heat exchangers and water ducts required for liquid cooling
Secondary with permanent magnets = Rotor	<ul style="list-style-type: none"> – Made of steel with high-quality permanent magnets protected from external influences by encapsulation – For longer travel distances, secondary is available in different lengths that can be easily lined up in rows

Legend:

F_{rated} = Permanent force*

F_1 = Maximum force available up to V_1

F_{Peak} = Maximum force available at standstill

V_L = Theoretical maximum travel velocity

V_1 = Velocity available up to force F_1

V_{rated} = Velocity available up to the rated force

I_{rated} = Rated current

I_1 = Current at F_1

I_{Peak} = Current at F_{Peak}

F_D = Force through magnetic pull

m_p = Mass primary part

m_s = Mass secondary part

* when mounting an aluminum heat sink with up to four times the primary part surface, 10 mm thickness and a room temperature of 40 °C!

SL2-Basic

Motor	Force				Velocity		Currents			Primary				Secondary	
Type	F _{Peak} [N]	F ₁ [N]	F _{rated} [N]	F _D [N]	V ₁ [m/s ⁻¹]	V _{rated} [m/s ⁻¹]	I _{Peak} [A]	I ₁ [A]	I _{rated} [A]	L _p [mm]	B _p [mm]	H _p [mm]	m _p [kg]	B _s [mm]	m _s [kg/m]
SL2-050VS*	—	—	—	—	0.0	—	—	—	—	—	—	—	—	—	—
	650	500	280	1480	3.0	3.4	6.0	4.4	2.2	192	84	43.9	3.6	80	7.4
					6.0	8.0	13.9	10.3	5.3						
				1.0	1.3	4.8	3.5	1.8							
SL2-050S	1300	1000	560	2880	3.0	3.4	11.8	8.7	4.5	368	84	43.9	6.9	80	7.4
					6.0	6.9	24.5	17.8	9.0						
					1.0	1.1	5.9	4.4	2.2						
SL2-050M	1950	1500	840	4300	3.0	3.3	18.0	12.8	6.5	544	84	43.9	10.4	80	7.4
					6.0	6.4	33.0	24.6	12.6						
					1.0	1.1	7.8	5.8	2.9						
SL2-050ML	2600	2000	1120	5700	3.0	3.4	24.0	17.8	9.1	720	84	43.9	13.9	80	7.4
					6.0	6.9	48.0	35.5	18.2						
					1.0	1.1	8.0	5.8	3.1						
SL2-100VS	1325	1000	600	2950	1.0	1.1	4.8	3.4	1.9	192	134	43.9	6.5	130	12.5
					3.0	3.8	14.2	10.3	5.6						
					6.0	6.9	24.6	17.8	9.7						
SL2-100S	2650	2000	1200	5760	1.0	1.1	8.0	5.8	3.1	368	134	43.9	12.5	130	12.5
					3.0	3.4	25.0	17.8	9.7						
					6.0	6.9	49.0	35.5	20.0						
SL2-100M	3970	3000	1800	8570	1.0	1.3	14.2	10.3	5.6	544	134	43.9	18.9	130	12.5
					3.0	3.2	35.0	24.6	13.5						
					6.0	6.9	75.0	53.3	29.2						
SL2-100ML	5300	4000	2400	11380	1.0	1.1	16.0	11.5	6.3	720	134	43.9	25.0	130	12.5
					3.0	3.4	49.0	35.5	19.5						
					6.0	7.0	100.0	74.4	40.7						
SL2-150VS nur Basic	2000	1500	900	4420	1.0	1.1	6.1	4.4	1.9	192	184	45.9	9.5	180	20.5
					3.0	3.3	18.0	12.8	7.0						
					6.0	6.4	35.0	24.6	13.5						
SL2-150S	3900	3000	1800	8640	1.0	1.1	12.0	8.7	4.8	368	184	45.9	18.0	180	20.5
					3.0	3.2	33.5	24.5	13.5						
					6.0	6.4	67.0	49.0	27.0						
SL2-150M	5800	4500	2700	12860	1.0	1.1	18.0	13.1	7.2	544	184	45.9	27.0	180	20.5
					3.0	3.4	53.0	39.0	21.5						
					6.0	6.4	100.0	74.5	40.7						
SL2-150ML	7700	6000	3600	17000	1.0	1.1	24.0	17.4	9.4	720	184	45.9	36.0	180	20.5
					3.0	3.7	76.0	56.7	31.0						
					6.0	6.4	132.0	98.0	53.8						
SL2-200VS	2700	2000	1260	5900	1.0	1.1	8.1	5.7	3.3	192	234	45.9	12.0	230	26.6
					3.0	3.4	25.0	17.8	10.2						
					6.0	7.6	55.0	39.2	22.5						
SL2-200S	5200	4000	2520	11520	1.0	1.1	15.6	11.5	6.6	368	234	45.9	23.5	230	26.6
					3.0	3.4	48.2	35.5	20.4						
					6.0	7.2	101.0	74.4	42.7						
SL2-200M	7800	6000	3780	17150	1.0	1.1	23.4	17.2	9.9	544	234	45.9	35.0	230	26.6
					3.0	3.4	72.0	53.3	30.1						
					1.0	1.1	30.6	22.7	13.0						
SL2-200ML	10350	8000	5040	22780	3.0	3.6	100.0	74.4	42.8	720	234	45.9	47.0	230	26.6
					1.0	1.2	10.0	7.3	4.1						
					3.0	3.5	30.0	21.8	12.4						
SL2-250VS	3170	2400	1500	7370	6.0	6.6	57.0	41.2	23.5	192	284	45.9	15.0	285	33.0
					1.0	1.1	18.7	13.6	7.8						
					3.0	3.3	57.0	41.2	23.5						
SL2-250S	6300	4800	3000	14400	6.0	6.6	113.0	82.4	47.0	368	284	45.9	29.0	285	33.0
					1.0	1.1	30.0	21.8	12.4						
					3.0	3.5	90.0	65.0	37.2						
SL2-250M	9450	7200	4500	21430	1.0	1.1	37.0	27.2	15.5	544	284	45.9	43.0	285	33.0
					3.0	3.3	113.0	82.5	47.0						
					1.0	1.1	37.0	27.2	15.5						
SL2-250ML	12600	9600	6000	28450	3.0	3.3	113.0	82.5	47.0	720	284	45.9	58.0	285	33.0
					1.0	1.1	37.0	27.2	15.5						
					3.0	3.3	113.0	82.5	47.0						

Dimensions: Primary: SL2-P...VS = Very short, SL2-P...S = Short, SL2-P...M = Medium, SL2-P...ML = Medium long

Secondary: Available length per magnetized area with: 64 mm, 128 mm, 256 mm, 512 mm

* Rated thrust forces of less than 280 N upon request

Overview SL2-Advance System

Systems components	Features / advantages
Primary = Stator	<ul style="list-style-type: none"> – Encapsulated SL2 synchronous linear motor with laminated iron core – The motor system is convection-cooled and reaches its rated cooling by mounting a sufficiently large metallic mounting platform to the flange surface of the motor – Very economical: There is no need for time-consuming and expensive maintenance work, heat exchangers and water ducts required for liquid cooling
Secondary with permanent magnets = Rotor	<ul style="list-style-type: none"> – Made of steel with high-quality permanent magnets protected from external influences by encapsulation – For longer travel distances, secondary is available in different lengths that can be easily lined up in rows
Motor cooling unit with electrical plug connectors	<ul style="list-style-type: none"> – Mounted, optimized motor cooling unit for maximum performance of the SL2 synchronous linear motor – System completely assembled and wired – Standard servo connector with prefabricated servo motor cable – The housing of the motor cooling unit is also used as a supporting structure and allows the customer to mount loads – Standard slot tracks and slot stones for mounting of customer loads – Prepared mounting surfaces on the motor cooling unit for installation of all commercial linear guide systems and encoder systems – There are floating bearings located at the mounting site for guide carriages to compensate the heat expansion of the aluminum heat sink – Mounting of the linear distance measuring system – Integration of linear braking systems – Maximum lightweight design and rigidity of extruded aluminum heat sink



SL2-Advance System

Motor	Force				Velocity	Currents			Primary				Secondary	
Type	F_{Peak} [N]	F_1 [N]	F_{rated} [N]	F_D [N]	V_1 [m/s ⁻¹]	I_{Peak} [A]	I_1 [A]	I_{rated} [A]	L_p [mm]	B_p [mm]	H_p [mm]	m_p [kg]	B_s [mm]	m_s [kg/m]
SL2-050VS	—	—	—	—	0.0	—	—	—	—	—	—	—	—	—
	650	500	280	1480	3.0	6.0	4.4	2.2	287	192	77.5	7.0	80	7.4
					6.0	13.9	10.3	5.3						
SL2-050S	1300	1000	560	2880	1.0	4.8	3.5	1.8	436	192	77.5	12.0	80	7.4
					3.0	11.8	8.7	4.5						
					6.0	24.5	17.8	9.0						
SL2-050M	1950	1500	840	4300	1.0	5.9	4.4	2.2	615	192	77.5	17.6	80	7.4
					3.0	18.0	12.8	6.5						
					6.0	33.0	24.6	12.6						
SL2-050ML	2600	2000	1120	5700	1.0	7.8	5.8	2.9	791	192	77.5	23.0	80	7.4
					3.0	24.0	17.8	9.1						
					6.0	48.0	35.5	18.2						
SL2-100VS	1325	1000	600	2950	1.0	4.8	3.4	1.9	298	262	77.5	11.3	130	12.5
					3.0	14.2	10.3	5.6						
					6.0	24.6	17.8	9.7						
SL2-100S	2650	2000	1200	5760	1.0	8.0	5.8	3.1	446	262	77.5	19.4	130	12.5
					3.0	25.0	17.8	9.7						
					6.0	49.0	35.5	20.0						
SL2-100M	3970	3000	1800	8570	1.0	14.2	10.3	5.6	622	262	77.5	28.4	130	12.5
					3.0	35.0	24.6	13.5						
					6.0	75.0	53.3	29.2						
SL2-100ML	5300	4000	2400	11380	1.0	16.0	11.5	6.3	798	262	77.5	37.0	130	12.5
					3.0	49.0	35.5	19.5						
					6.0	100.0	74.4	40.7						
SL2-150VS	No SL2-Advance design													
SL2-150S	3900	3000	1800	8640	1.0	12.0	8.7	4.8	449	347	106.5	29.6	180	20.5
					3.0	33.5	24.5	13.5						
					6.0	67.0	49.0	27.0						
SL2-150M	5800	4500	2700	12860	1.0	18.0	13.1	7.2	629	347	106.5	42.5	180	20.5
					3.0	53.0	39.0	21.5						
					6.0	100.0	74.5	40.7						
SL2-150ML	7700	6000	3600	17000	1.0	24.0	17.4	9.4	809	347	106.5	56.0	180	20.5
					3.0	76.0	56.7	31.0						
					6.0	132.0	98.0	53.8						

Dimensions: **Primary:** SL2-P...VS = Very short, SL2-P...S = Short, SL2-P...M = Medium, SL2-P...ML = Medium long

Secondary: Available length per magnetized area with: 64 mm, 128 mm, 256 mm, 512 mm

Legend:

F_{rated} = Permanent force*

F_1 = Maximum force available up to V_1

F_{Peak} = Maximum force available at standstill

V_L = Theoretical maximum travel velocity

V_1 = Velocity available up to force F_1

V_{rated} = Velocity available up to the rated force

I_{rated} = Rated current

I_1 = Current at F_1

I_{Peak} = Current at F_{Peak}

F_D = Force through magnetic pull

m_p = Mass primary part

m_s = Mass secondary part

* when mounting an aluminum heat sink with up to four times the primary part surface, 10 mm thickness and a room temperature of 40 °C



Overview SL2-Power System

Systems components	Features / advantages
Primary = Stator	<ul style="list-style-type: none"> – Encapsulated SL2 synchronous linear motor with laminated iron core – The motor system is convection-cooled and reaches its rated cooling by mounting a sufficiently large metallic mounting platform to the flange surface of the motor – Very economical: There is no need for time-consuming and expensive maintenance work, heat exchangers and water ducts required for liquid cooling
Secondary with permanent magnets = Rotor	<ul style="list-style-type: none"> – Made of steel with high-quality permanent magnets protected from external influences by encapsulation – For longer travel distances, secondary is available in different lengths that can be easily lined up in rows
Motor cooling unit with electrical plug connectors	<ul style="list-style-type: none"> – Mounted, optimized motor cooling unit for maximum performance of the SL2 synchronous linear motor – System completely assembled and wired – Standard servo connector with prefabricated servo motor cable – The housing of the motor cooling unit is also used as a supporting structure and allows the customer to mount loads – Standard slot tracks and slot stones for mounting of customer loads – Prepared mounting surfaces on the motor cooling unit for installation of all commercial linear guide systems and encoder systems – There are floating bearings located at the mounting site for guide carriages to compensate the heat expansion of the aluminum heat sink – Mounting of the linear distance measuring system – Integration of linear braking systems – Maximum lightweight design and rigidity of extruded aluminum heat sink
Motor cooling unit with forced cooling fan and electrical plug connectors	<ul style="list-style-type: none"> – Improved cooling properties: Increase of rated feed forces with 24 V forced cooling fan by up to factor 1.5 – Lower temperature level of drive resulting in higher accuracy of the entire drive

SL2-Power System

Motor	Force				Velocity	Currents			Primary				Secondary	
Type	F _{Peak} [N]	F ₁ [N]	F _{rated} [N]	F _D [N]	V ₁ [m/s ⁻¹]	I _{Peak} [A]	I ₁ [A]	I _{rated} [A]	L _p [mm]	B _p [mm]	H _p [mm]	m _p [kg]	B _s [mm]	m _s [kg/m]
SL2-050VS	—	—	—	—	0.0	—	—	—	—	—	—	—	—	—
	650	500	400	1480	3.0	6.0	4.4	3.1	287	192	77.5	7.2	80	7.4
					6.0	13.9	10.3	7.6						
SL2-050S	1300	1000	760	2880	1.0	4.8	3.5	2.4	436	192	77.5	12.3	80	7.4
					3.0	11.8	8.7	6.1						
					6.0	24.5	17.8	12.2						
SL2-050M	1950	1500	980	4300	1.0	5.9	4.4	2.6	615	192	77.5	17.8	80	7.4
					3.0	18.0	12.8	7.6						
					6.0	33.0	24.6	14.7						
SL2-050ML	2600	2000	1280	5700	1.0	7.8	5.8	3.3	791	192	77.5	23.2	80	7.4
					3.0	24.0	17.8	10.4						
					6.0	48.0	35.5	20.8						
SL2-100VS	1325	1000	780	2950	1.0	4.8	3.4	2.5	298	262	77.5	11.5	130	12.5
					3.0	14.2	10.3	7.3						
					6.0	24.6	17.8	12.6						
SL2-100S	2650	2000	1570	5760	1.0	8.0	5.8	4.1	446	262	77.5	19.6	130	12.5
					3.0	25.0	17.8	12.7						
					6.0	49.0	35.5	25.5						
SL2-100M	3970	3000	2540	8570	1.0	14.2	10.3	7.9	622	262	77.5	28.6	130	12.5
					3.0	35.0	24.6	19.1						
					6.0	75.0	53.3	41.2						
SL2-100ML	5300	4000	2700	11380	1.0	16.0	11.5	7.1	798	262	77.5	37.2	130	12.5
					3.0	49.0	35.5	21.9						
					6.0	100.0	74.4	45.8						
SL2-150VS	No SL2-Power design													
SL2-150S	3900	3000	2700	8640	1.0	12.0	8.7	7.2	449	347	106.5	30.1	180	20.5
					3.0	33.5	24.5	20.3						
					6.0	67.0	49.0	40.5						
SL2-150M	5800	4500	3800	12860	1.0	18.0	13.1	10.1	629	347	106.5	43.1	180	20.5
					3.0	53.0	39.0	30.1						
					6.0	100.0	74.5	57.0						
SL2-150ML	7700	6000	5500	17000	1.0	24.0	17.4	14.4	809	347	106.5	56.6	180	20.5
					3.0	76.0	56.7	47.4						
					6.0	132.0	98.0	82.2						

Dimensions: **Primary:** SL2-P...VS = Very short, SL2-P...S = Short, SL2-P...M = Medium, SL2-P...ML = Medium long

Secondary: Available length per magnetized area with: 64 mm, 128 mm, 256 mm, 512 mm

Legend:

F_{rated} = Permanent force*

F₁ = Maximum force available up to V₁

F_{Peak} = Maximum force available at standstill

V_L = Theoretical maximum travel velocity

V₁ = Velocity available up to force F₁

V_{rated} = Velocity available up to the rated force

I_{rated} = Rated current

I₁ = Current at F₁

I_{Peak} = Current at F_{Peak}

F_D = Force through magnetic pull

m_p = Mass primary part

m_s = Mass secondary part

* when mounting an aluminum heat sink with up to four times the primary part surface, 10 mm thickness and a room temperature of 40 °C