

DSM Series Linear Motors

20-50 Width Sizes

www.mdsmotor.com



MDS Motor
Feel the perfect motion...

Kocaeli Üniversitesi Teknopark |
Vatan Cad. No:83 |41275 |
Başiskele, Kocaeli, Türkiye

Table of Content

DSM Series Linear Motors.....	1
Size Range and Nomenclature.....	2
Definitions of Motor Parameters.....	3
DSM-W20 Datasheet.....	4
DSM-W30 Datasheet.....	6
DSM-W35 Datasheet.....	8
DSM-W50 Datasheet.....	10
Motor Design Sheet.....	12
Notes.....	13

DSM Series Linear Motors

MDS Motor has several ironless linear motors for linear direct drive applications.

MDS Motor offer DSM series linear synchronous motors for high performance applications. These ironless motors come in various configurations allowing customized solutions to meet any application requirement.

DSM Series linear motors are no cogging and magnet attraction force between the ironless coil and the magnets, and capable of achieving high speeds.

Please contact MDS Motor Ltd. for specifications on your new custom linear motor needs and assistance in selecting the right motor from DSM series motor family.

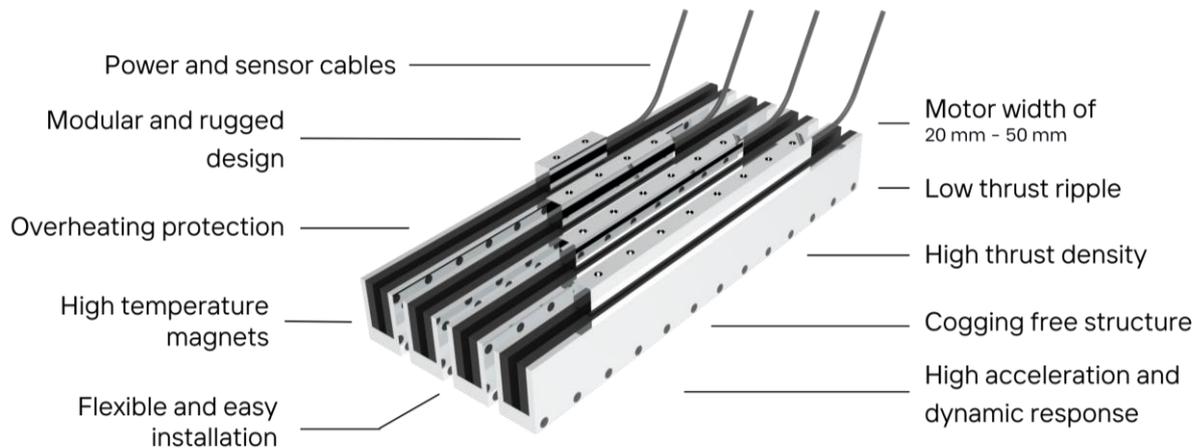
Main Features and Benefits

- Frame sizes from 20mm up to 50mm are available with various stacks
- Low and high voltage DC bus levels for your applications
- Motors offering high force-per-weight ratios
- No cogging force to allow smooth motion and high position accuracy
- High output force quality (low force ripple)
- High acceleration and good motor dynamics due to low inertia
- Low back-EMF THD levels allow precise control
- High temperature rare-earth magnets with custom winding options
- Maintenance free and low-cost motors

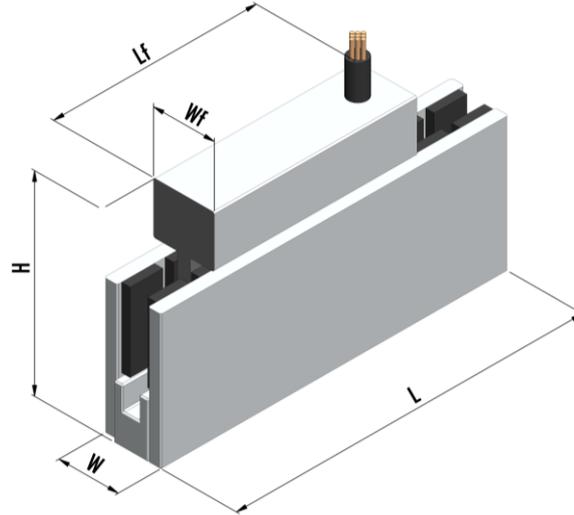
Description of DSM Series Linear Motors

MDS Motor's DSM series permanent magnet synchronous linear motors are perfect for high-speed linear applications. The DSM series linear motors provide high peak force constants, with small size, low inertia, and low thermal resistance.

All DSM series ironless linear motors are delivered with various options depending on the customers' needs and specific applications.



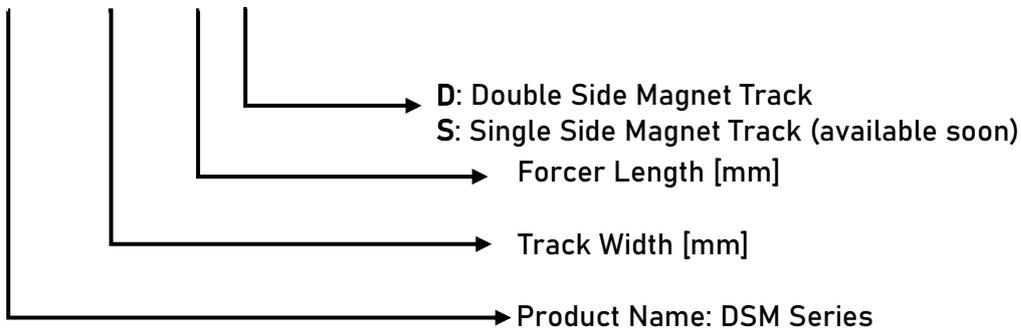
Size Range and Nomenclature



Motor Series	W	L	W _f	L _f	H
	Track Width	Track Length	Forcer Width	Forcer Length	Height
	(mm)	(mm)	(mm)	(mm)	(mm)
DSM-W20-070D	21	120	21	70	68.5
DSM-W30-130D	30	300	30	130	100.5
DSM-W35-130D	35	300	35	130	91.5
DSM-W50-250D	48	300	48	250	132.5

Note: Depending on the application needs of the customers, minor changes can be made on base dimensions.

DSM-W20-070D



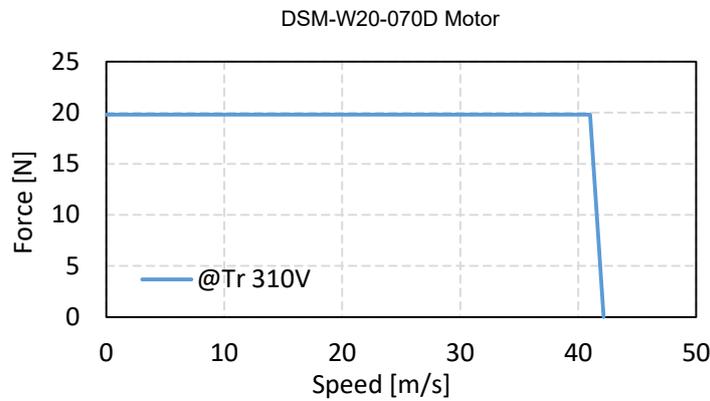
Definition of Motor Parameters

Peak Force	F_p	Maximum force that the motor delivers when maximum current (I_p) is provided. Peak force is available for a maximum of 2 seconds
Continuous Force	F_c	Force value at rated speed when continuous power is the output
Motor Constant	K_m	Ratio of peak force to square root of input power: $K_m = F_{peak}/(P_{peak})^{.5}$. It shows the ability of a motor to convert electrical power to force
Peak Current	I_p	Current required to obtain peak force from the motor
Continuous Current	I_c	Current required to obtain the rated continuous force
Force Constant	K_f	Ratio of the developed force to input current
Back-EMF Constant	K_v	Ratio of voltage generated in the winding to rotor speed
Line Resistance	R_{LL}	Cold (25°C) resistance measured between two leads of the winding
Line Inductance	L_{LL}	Inductance measured between two leads of the AC winding (@60Hz)
Terminal voltage	V_{DC}	Motor DC bus voltage level
Elect. Time Constant	τ_e	The electrical time constant is time it takes for the current in a motor to reach a certain percentage (typically 63%) of its final value in response to a change in applied voltage
Thermal Resistance	R_{th}	Ratio of winding temperature rise to average stator power loss at rated motor operation
Max. winding temp.	T_w	Maximum allowable winding temperature
Forcer Length	L_f	Total length of the forcer
Forcer Weight	W_f	Total weight of the forcer
Magnet pitch	$2\tau_p$	Length of the magnet in mm
Attractive force	F_a	Force between the forcer and the magnet

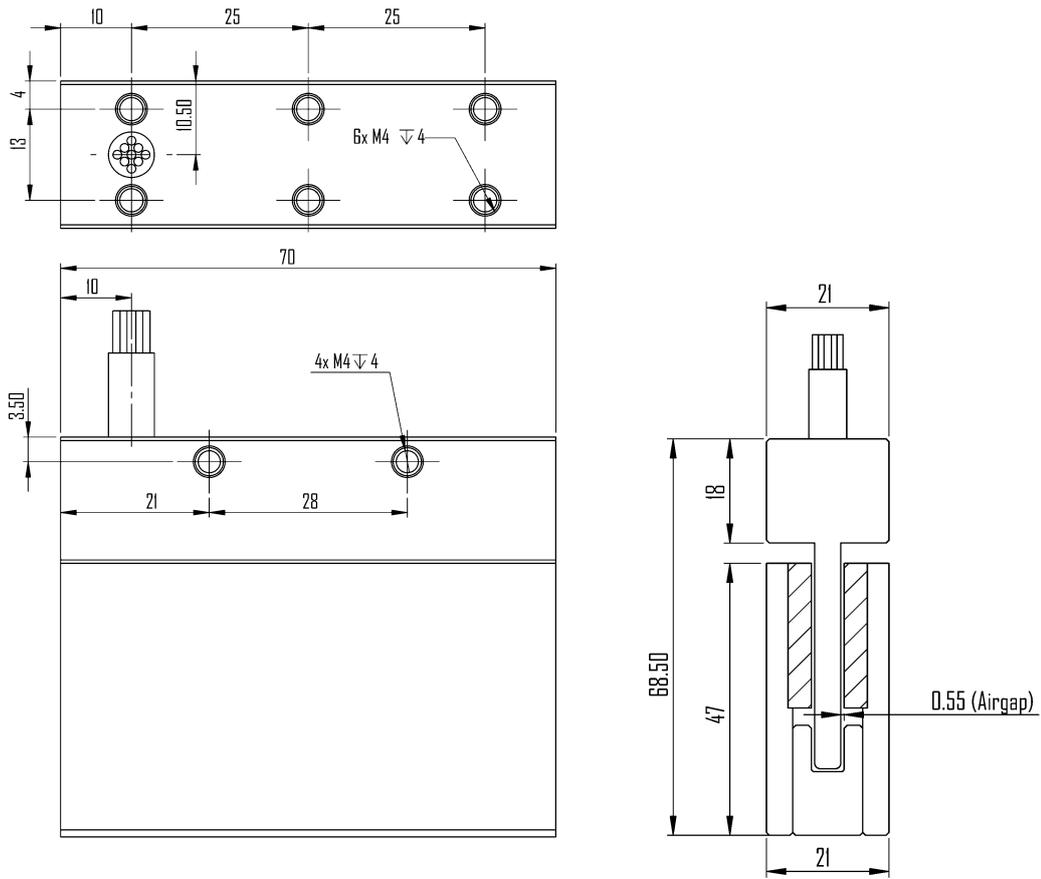
NOTE: All performance data is obtained at 25

Motor Parameters	Symbols	Units	DSM-W20-070D
PERFORMANCE			
Peak Force	F_p	N	69.3
Continuous Force	F_c	N	19.8
Motor Constant	K_m	N/VW	0.7
ELECTRICAL			
Peak Current	I_p	A_{rms}	6.6
Continuous Current	I_c	A_{rms}	2.2
Force Constant	K_f	N/A_{rms}	9.0
Back EMF Constant	K_v	$V/(m/s)$	7.4
Line Resistance @25°C	R_{LL}	ohm	3.1 ($\pm 20\%$)
Line Inductance (@60Hz)	L_{LL}	mH	0.86 ($\pm 30\%$)
Terminal Voltage	V_{DC}	V	310
Electrical Time Cons.	τ_e	ms	0.28
THERMAL			
Thermal Resistance	R_{th}	$^{\circ}C/W$	4.9
Max. Winding Temp.	T_w	$^{\circ}C$	135
MECHANICAL			
Forcer Length	L	mm	70
Forcer Weight	W_f	kg	0.14
Magnet Pitch	$2\tau_p$	mm	30
Attractive Force	F_a	N	0

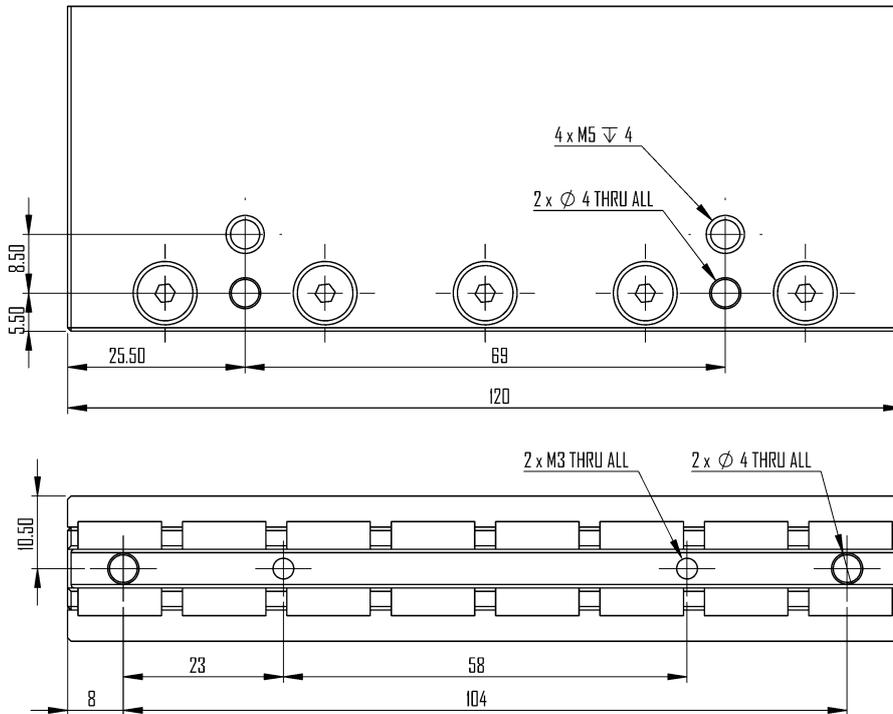
DSM-W20 Force-Speed Curves



Coil Assembly

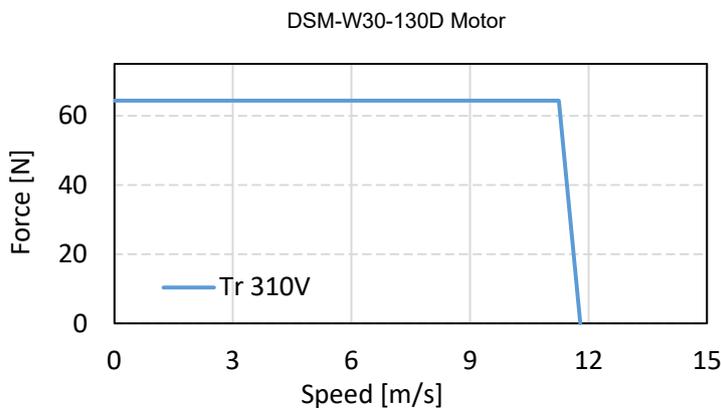


Track Assembly

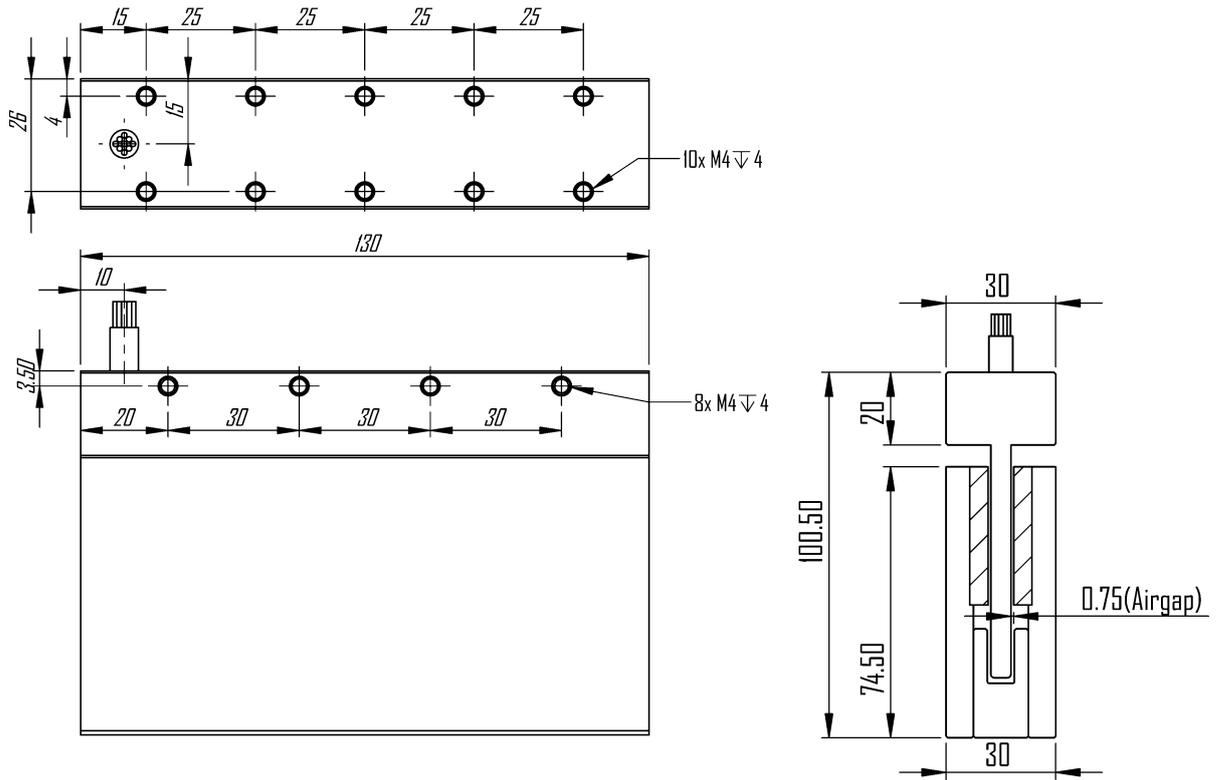


Motor Parameters	Symbols	Units	DSM-W30-130D
PERFORMANCE			
Peak Force	F_p	N	193.2
Continuous Force	F_c	N	64.4
Motor Constant	K_m	N/VW	2.4
ELECTRICAL			
Peak Current	I_p	A_{rms}	6.0
Continuous Current	I_c	A_{rms}	2.0
Force Constant	K_f	N/A_{rms}	32.2
Back EMF Constant	K_v	$V/(m/s)$	26.3
Line Resistance @25°C	R_{LL}	ohm	11.04 (±20%)
Line Inductance (@60Hz)	L_{LL}	mH	9.04 (±30%)
Terminal Voltage	V_{DC}	V	310
Electrical Time Cons.	τ_e	ms	0.82
THERMAL			
Thermal Resistance	R_{th}	°C/W	1.7
Max. Winding Temp.	T_w	°C	135
MECHANICAL			
Forcer Length	L	mm	130
Forcer Weight	W_f	kg	0.51
Magnet Pitch	$2\tau_p$	mm	60
Attractive Force	F_a	N	0

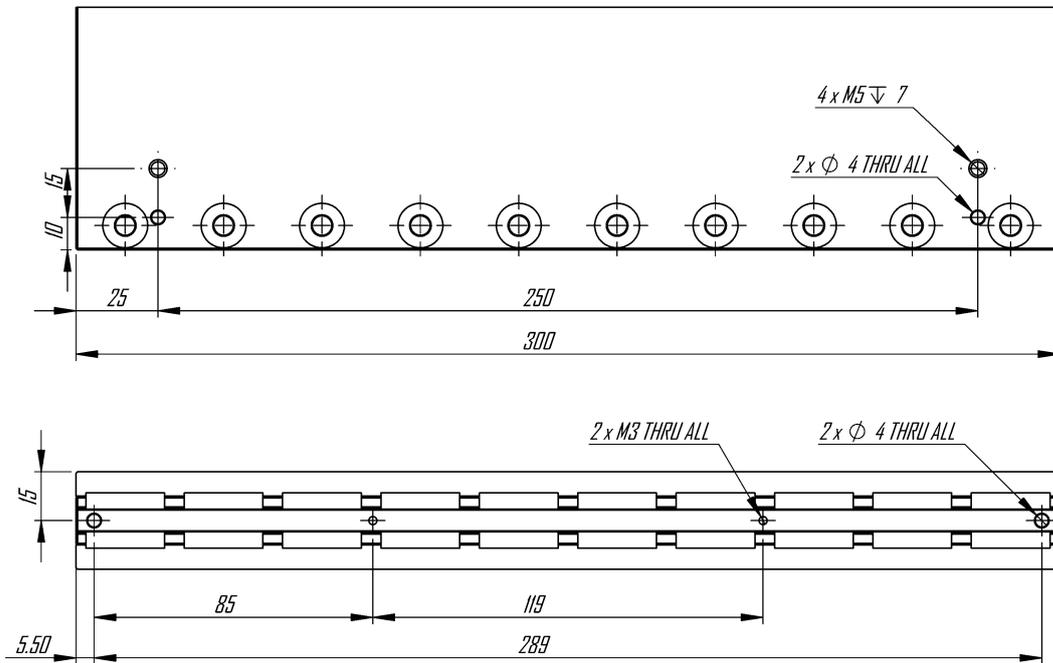
DSM-W30 Force-Speed Curves



Coil Assembly

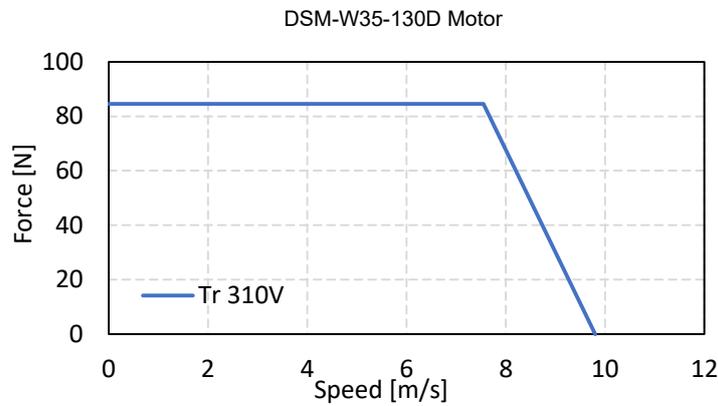


Track Assembly

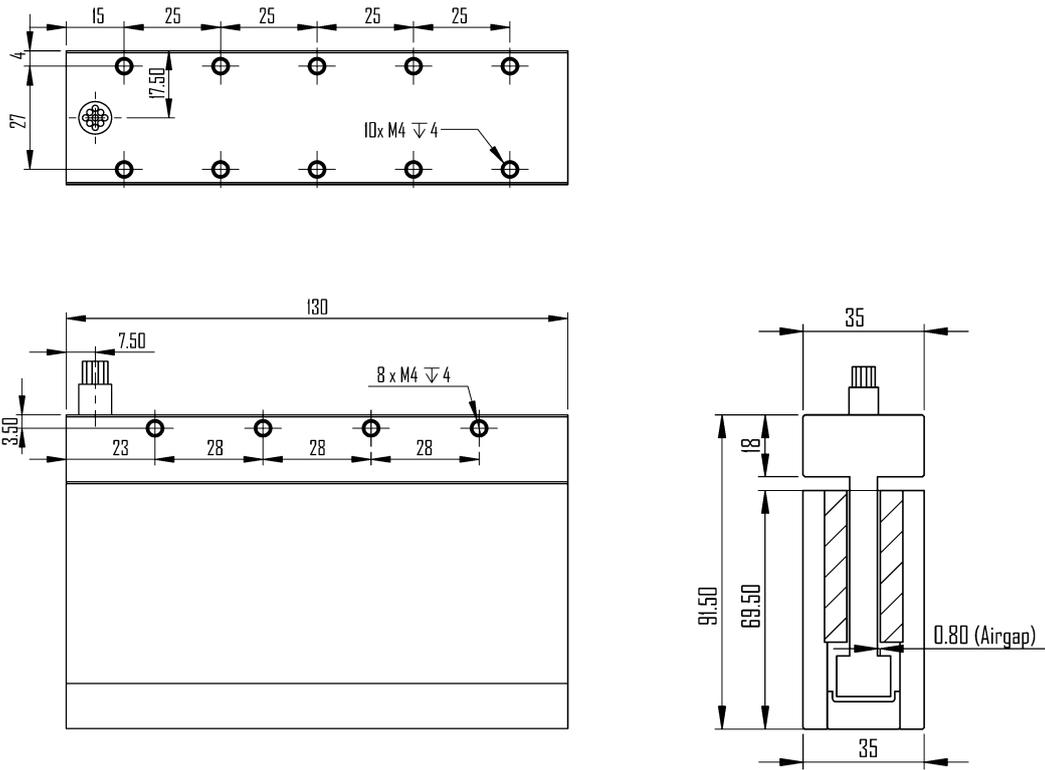


Motor Parameters	Symbols	Units	DSM-W35-130D
PERFORMANCE			
Peak Force	F_p	N	253.5
Continuous Force	F_c	N	84.5
Motor Constant	K_m	N/VW	3.27
ELECTRICAL			
Peak Current	I_p	A_{rms}	6.6
Continuous Current	I_c	A_{rms}	2.2
Force Constant	K_f	N/A_{rms}	38.4
Back EMF Constant	K_v	$V/(m/s)$	31.6
Line Resistance @25°C	R_{LL}	ohm	8.7 ($\pm 20\%$)
Line Inductance (@60Hz)	L_{LL}	mH	9.2 ($\pm 30\%$)
Terminal Voltage	V_{DC}	V	310
Electrical Time Cons.	τ_e	ms	1.1
THERMAL			
Thermal Resistance	R_{th}	°C/W	1.75
Max. Winding Temp.	T_w	°C	135
MECHANICAL			
Forcer Length	L	mm	130
Forcer Weight	W_f	kg	0.67
Magnet Pitch	$2\tau_p$	mm	60
Attractive Force	F_a	N	0

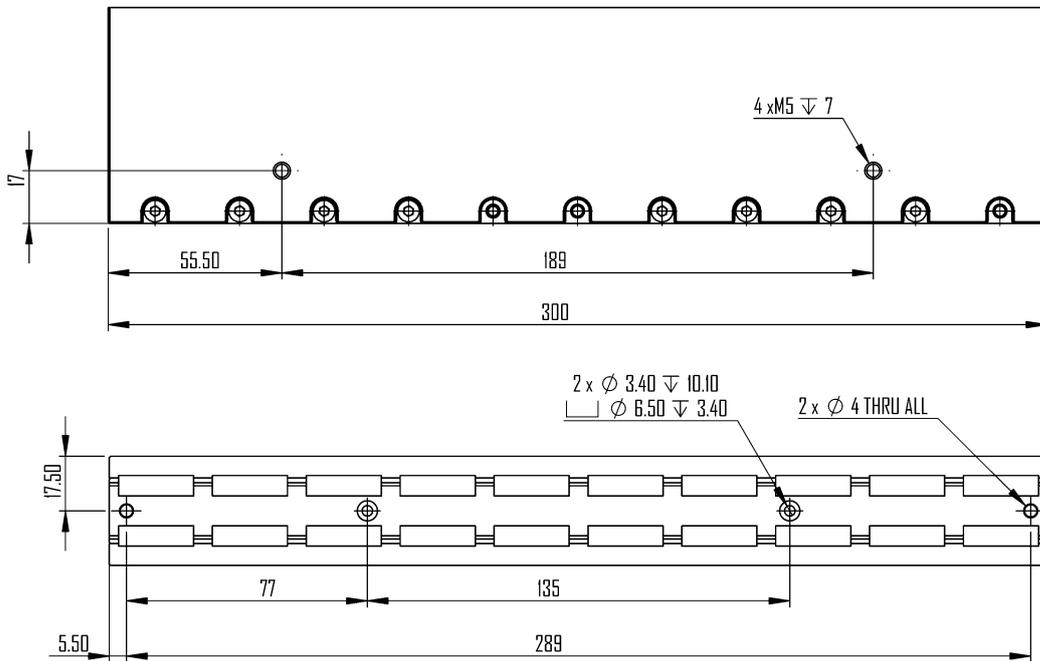
DSM-W35 Force-Speed Curves



Coil Assembly

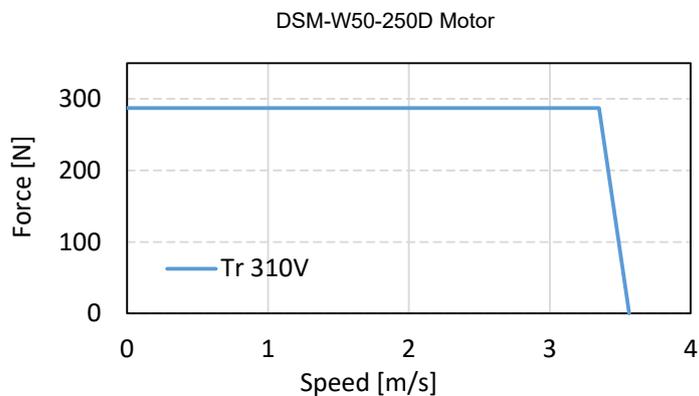


Track Assembly

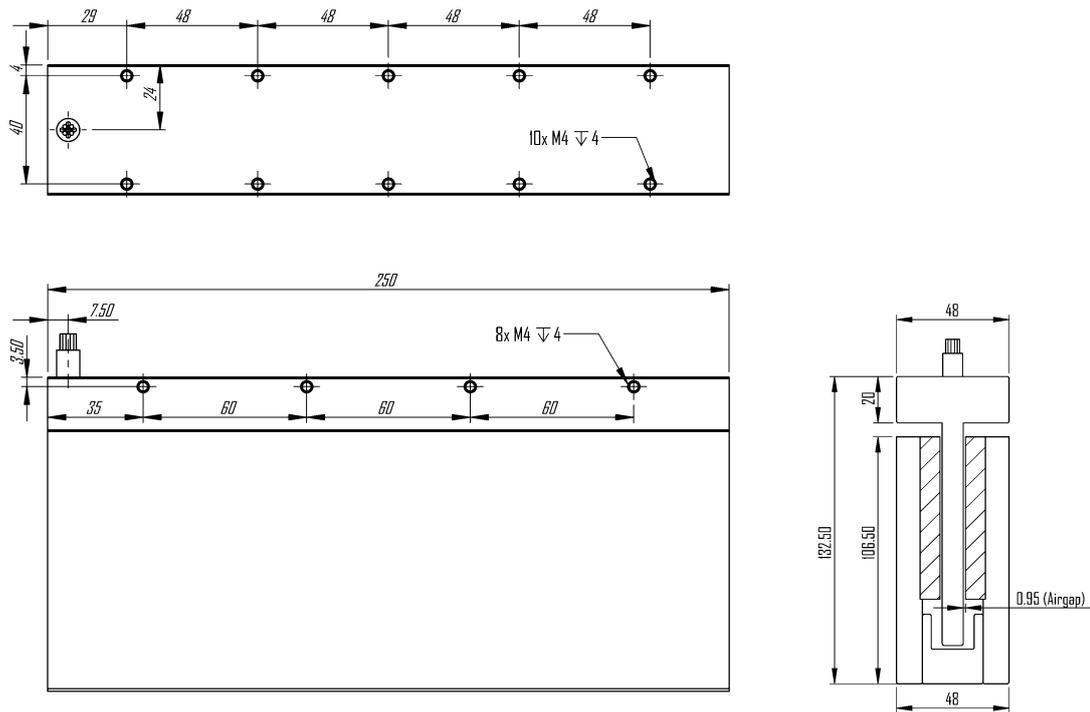


Motor Parameters	Symbols	Units	DSM-W50-250D
PERFORMANCE			
Peak Force	F_p	N	533.5
Continuous Force	F_c	N	266.8
Motor Constant	K_m	N/VW	8.9
ELECTRICAL			
Peak Current	I_p	A_{rms}	5.0
Continuous Current	I_c	A_{rms}	2.5
Force Constant	K_f	N/A_{rms}	106.7
Back EMF Constant	K_v	$V/(m/s)$	87.0
Line Resistance @25°C	R_{LL}	ohm	6.5 (±20%)
Line Inductance (@60Hz)	L_{LL}	mH	14.2(±30%)
Terminal Voltage	V_{DC}	V	310
Electrical Time Cons.	τ_e	ms	2.19
THERMAL			
Thermal Resistance	R_{th}	°C/W	1.8
Max. Winding Temp.	T_w	°C	135
MECHANICAL			
Forcer Length	L	mm	250
Forcer Weight	W_f	kg	2.1
Magnet Pitch	$2\tau_p$	mm	60
Attractive Force	F_a	N	0

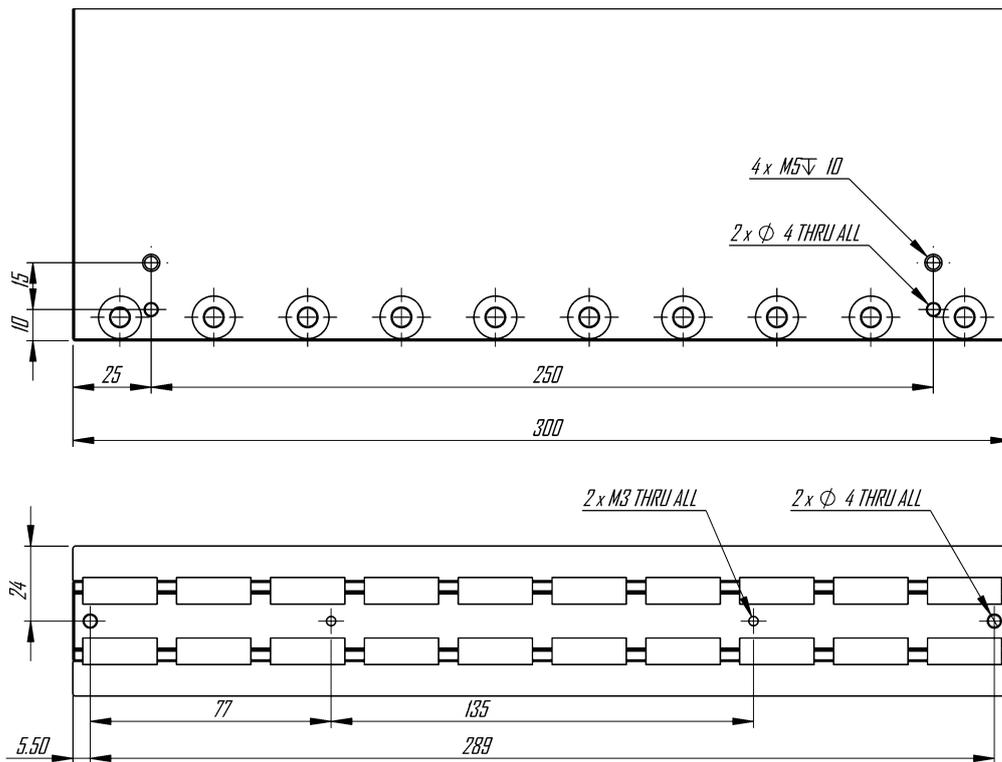
DSM-W50 Force-Speed Curves



Coil Assembly



Track Assembly



Motor Design Sheet

Please send your inquiry to
mds@mdsmotor.com or fax: +90 (262) 341 4472

Contact details	
Company:	
Name:	
Tel:	
Email:	
Application/Project:	

Specifications for motor design

Required torques			
Rated torque/force [Nm/N]			
Rated speed [rpm]			
Max. torque/force [Nm/N]			
Max speed [rpm]			
Electrical specifications			
DC bus voltage [V]			
Rated current [Arms]			
Max current [Arms]			
Current supply	BLDC / BLAC		
Motor size limits			
Max. diameter allowed [mm]			
Max. length allowed [mm]			
Weight limit if any [kg]			
Inertia req. if any			
Cooling / Construction			
Ambient temp. [oC]			
Housing / cooling type	<input type="checkbox"/> None	<input type="checkbox"/> Air cooled	<input type="checkbox"/> Water cooled
Duty cycle			
Other / Comments			
Rotor type	Surface / IPM / other...		
Torque-speed curve – please draw			
Comments			

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2	OS	08.10.2024



MDS Motor Ltd.

Kocaeli Üniversitesi TEKNOPARK
Vatan Caddesi, No:83 / C:19
41275, Başiskele, Kocaeli, TURKEY

P: +90 (262)-341-4470

F: +90 (262)-341-4472

E-mail: mds@mdsmotor.com

Website: www.mdsmotor.com

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