

AC-synchronous motors

Series LSSM-36.

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© **Ruchservomotor JV**

The firm «Ruchservomotor» develops and makes direct drive systems on the base of step and synchronous motors. In addition to standard samples, introduced in the catalogue of production, we offer development of motors in according the requirements of the customer, including the different sizes, joint dimensions, dynamic, accuracy and capacity of the characteristic.

Next technical parameters are possible:

- *Length of movement up to 5m*
- *Peak effort (moment) up to 9400N (21000Nm)*
- *Position accuracy up to 0,1mm*
- *Max. speed up to 6 m/s*
- *Max. acceleration up to 13g.*

The Direct Drives Ruchservomotor JV are constructed on the basis of AC-synchronous motors with permanent magnets.

The primary part (forcer in linear motors or stator in rotary motors) contains a magnetic circuit and three-phase system of a winding, are connected in a star or in a triangle.

By means of a magnet system forms linearly - distributed or circle magnetic field. The position of a resultant is determined by currents phases of the inverter, and the amplitude of vector, so and effort, developed by a motor, is set by amplitudes of phase currents.

The secondary part (magnetic road in linear engines or rotor in rotary motors) contains permanent magnets with alternating polarity, which at the expense of interaction with a magnetic field of a primary part provide a thrust effort.

Advantages of a direct drives "Ruchservomotor" JV

- High dynamics, rigidity, accuracy and reliability stipulated by absence of a mechanical transmission (of ballscrews transmissions, reduction gearboxes, gear belts).
- Low detent effort (torque) at the expense of an optimum licensed design of a magnet system, wide band of speed regulation.
- The high specific thrust characteristics in all speed range, compact design.
- High scale of protection.
- Capability of water cooling of a primary part ensuring absence of the temperature extension in precision machine tools.
- Capability of built fulfilment, including rotary motors with a hollow shaft ensuring optimum design integration

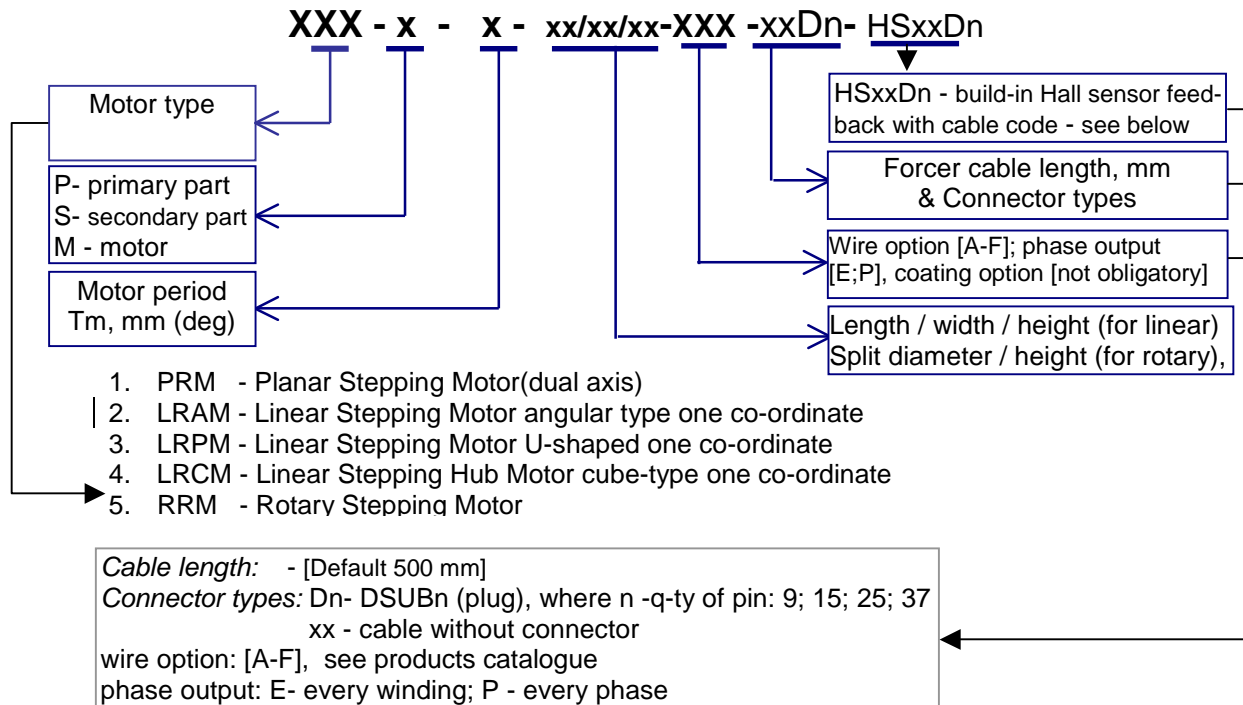
Ordering Code of Ruchservomotor JV products

Each motor (module) basically consists from primary part (forcer with coil) and secondary part.

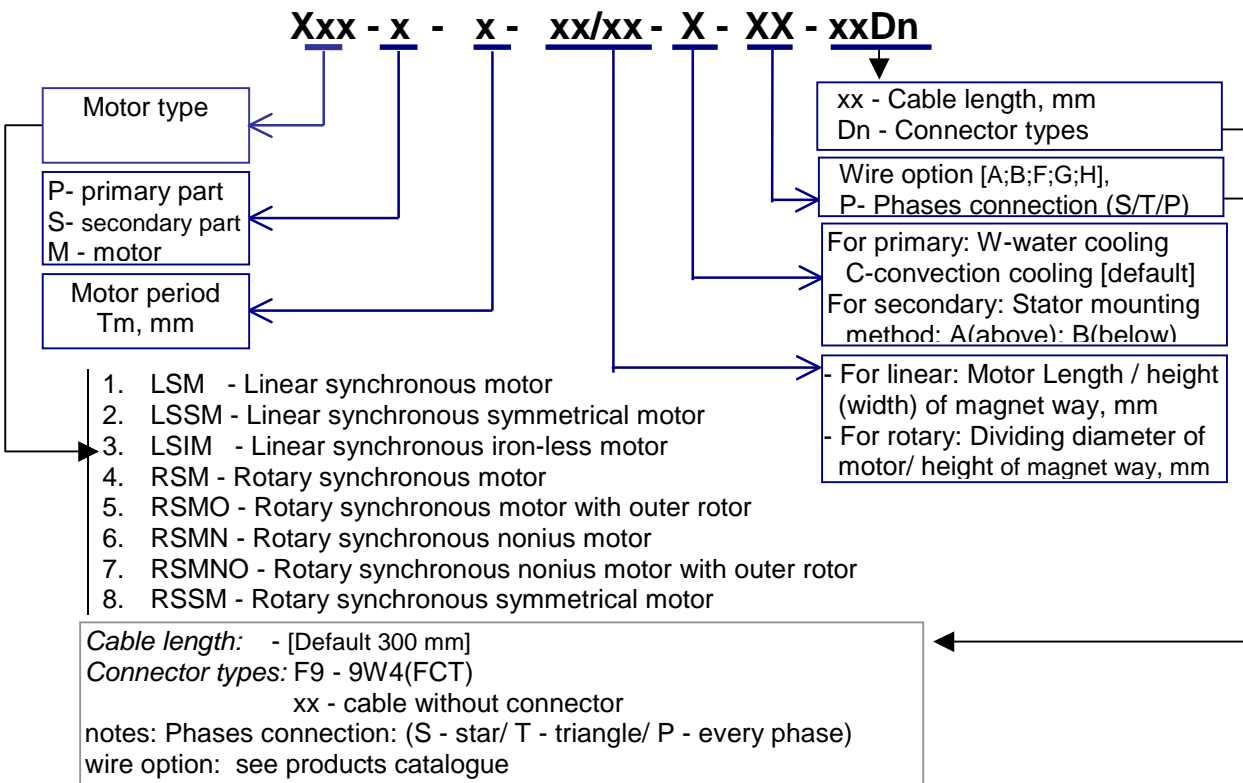
For select the proper linear stepping motor model using the next code.

Note: at order the rotary motors you don't need order the secondary part. It is actuated in the forcer ordering code

Ordering code for Stepping motors (linear und rotary)



Ordering code for Synchronous motors (linear and rotary)

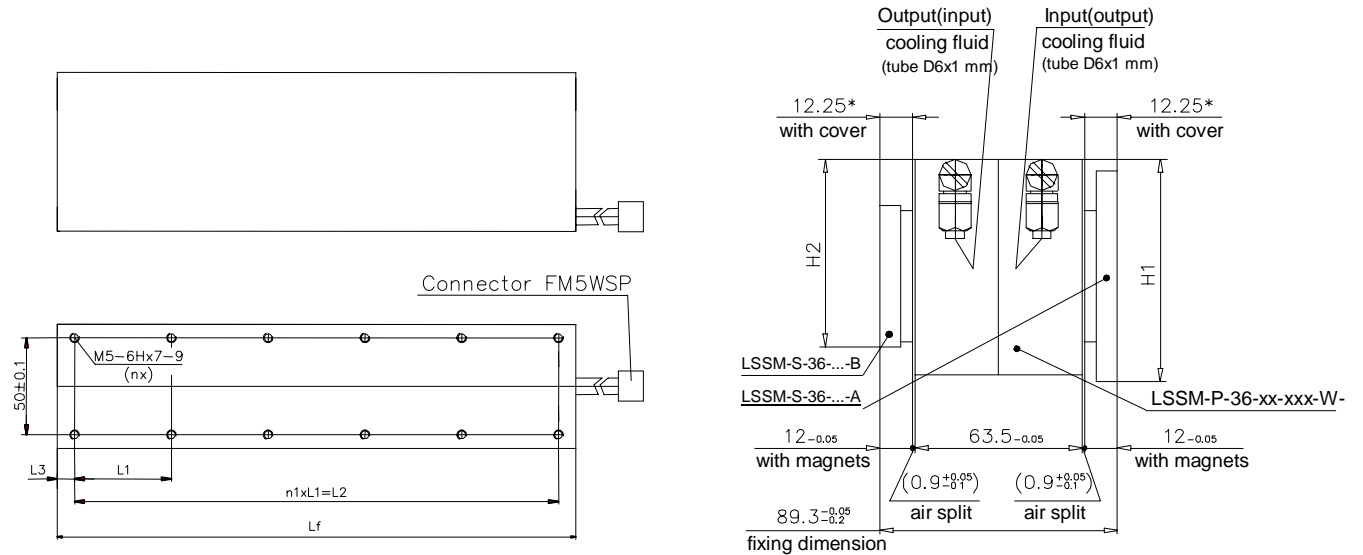


Linear Synchronous Motor series LSSM-36

Notes:

1. Motor has peak force at peak current I_p (2...3 cek)
2. Air split between rotor and stator - 0.65mm (with magnets protection by stainless steel).
3. Max temperature of stator should be less than 70°C .
4. The forcer has build-in threshold sensor for temperature 120°C .
5. (S/T) - motor phase connection: Star / Triangle
6. Input pressure of liquid fluid - 1,1 bar
7. All data are subject to change without notice
8. All data tolerance $\pm 10\%$.

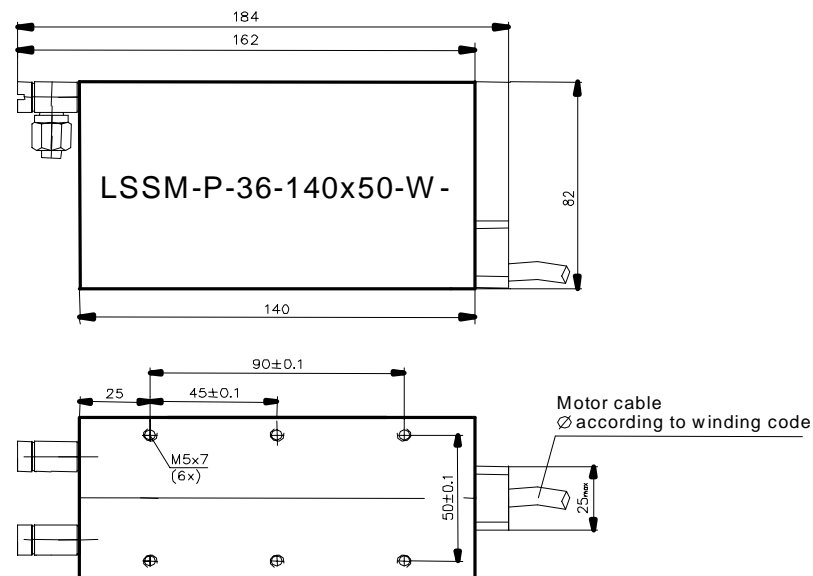
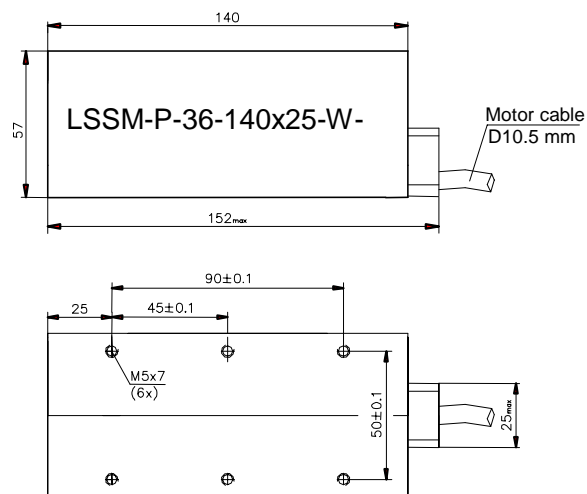
* value «terminal-terminal»



Overall and join dimensions

	Continuous force at convection cooling (coil at 120C). F_a , N	Continuous force at water cooling (coil at 120C). F_w , N	Peak force (coil at 20C) F_p , N	Recommended supply voltage U_s , VDC	Max. velocity at F_a and U_s (coil at 20C) [S/T], m/s	Max. velocity at F_w and U_s (coil at 20C) [S/T], m/s	Max. velocity at F_p and U_s (coil at 20C) [S/T], m/s	Forcer weight m_r , kr	Forcer length, L_f , mm	Forcer height H_f , mm	Forcer width B_r , mm	Stator width, mm		Stator height H_s , mm
												H1	H2	
LSSM- P- 36- 140*25-...	161	322	429	310	7,3 / 12,5	5,1 / 8,8	3,0 / 5,3	2,1	140	57	63,5	59,5	46,5	12,25
LSSM- P- 36- 140*50-...	317	637	859		3,7 / 6,4	2,5 / 4,5	1,4 / 2,6	3,8	140	57		84,5	71,5	
LSSM- P- 36- 210*25-...	242	483	644	310	4,9 / 8,4	3,3 / 5,9	1,9 / 3,5	3,1	210	57		59,5	46,5	
LSSM- P- 36- 210*50-...	475	956	1288	600	4,8 / 8,3	3,3 / 5,8	1,9 / 3,4	5,6	210	82		84,5	71,5	
LSSM- P- 36- 266*25-...	322	645	859	600	7,1 / 12,1	4,9 / 8,5	2,9 / 5,1	4,0	266	57		59,5	46,5	
LSSM- P- 36- 266*50-...	634	1275	1718		3,6 / 6,2	2,4 / 4,3	1,4 / 2,5	6,8	266	82		84,5	71,5	
LSSM- P- 36- 354*25-...	403	806	1074	600	5,7 / 9,8	3,9 / 6,9	2,3 / 4,1	5,0	354	57		59,5	46,5	
LSSM- P- 36- 354*50-...	792	1594	2147		2,8 / 5,0	1,9 / 3,5	1,0 / 2,0	8,0	354	82		84,5	71,5	
LSSM- P- 36- 392*50-...	951	1912	2577	600	2,3 / 4,1	1,6 / 2,8	0,8 / 1,6	9,2	392	82		84,5	71,5	

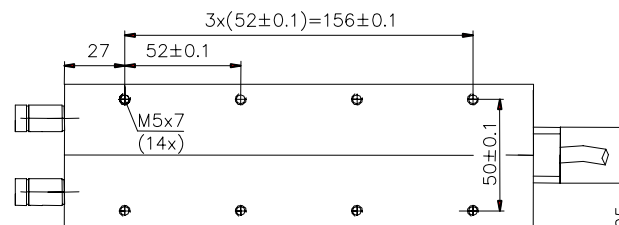
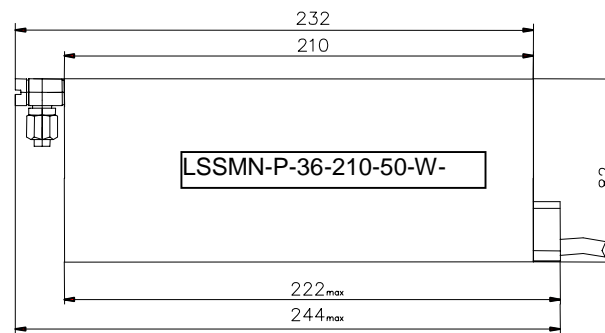
Serie LSSM - P - 36 – 140- ...



Overall and join dimensions

Parameter	Symbo	Unit	LSSM-P-36-140-...			
			25-...		50-...	
			FS	FT	FS	FT
Peak force (coil at 20°C)	Fp	N	429		859	
Continuous force (coil at 120°C), water cooling	Fw	N	322		637	
Continuous force (coil at 120°C), air cooling	Fa	N	161		317	
Detent force	Fd	N	5,2		10,3	
Attraction force of magnets	Fm	N	50		100	
Recommended supply voltage DC	Us	V	310		310	
Motor constant (coil at 20°C)	Ko	N/√W	23,0		36,0	
Peak power dissipation (coil at 20°C)	Pp	W	1417	1450	2278	2305
Continuous power dissipation (coil at 120°C), water cooling	Pw	W	374	401	561	584
Continuous power dissipation (coil at 120°C), air cooling	Pa	W	89	108	121	135
Coolant flow for temperature difference 5°C by power Pw	Cf	L/min	0,3	0,3	1,6	1,7
Maximum velocity at Fp and Us (Coil at 20°C)	Vp	m/s	3,0	5,3	1,4	2,6
Maximum velocity at Fw and Us (Coil at 20°C)	Vw	m/s	5,1	8,8	2,5	4,5
Maximum velocity at Fa and Us (Coil at 20°C)	Va	m/s	7,3	12,5	3,7	6,4
Peak current (RMS) at Fp and V=0	Ip	Arms	20,6	35,7	20,6	35,7
Continuos current at 120°C with water cooling at Fw and V=0	Iw	Arms	10,2	17,7	10,0	17,4
Continuos current at 120°C with air cooling at Fa and V=0	Ia	Arms	4,5	7,7	4,4	7,6
Efficiency at Mw and 540V DC (Coil at 20°C)	Ew	%	81,5	87,6	74,2	83,1
Back EMF constant (*) (peak phase-phase)	Ku	V/(m/s)	29,4	17,0	58,9	34,0
Electrical resistance at 20°C (*)	R	Ohm	1,64	0,55	2,68	0,89
Electrical inductance (*)	L	mH	17,6	5,9	35,3	11,8

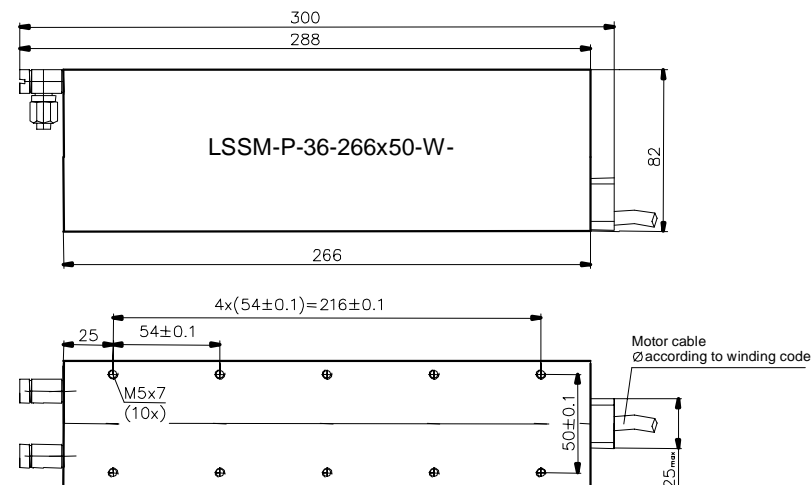
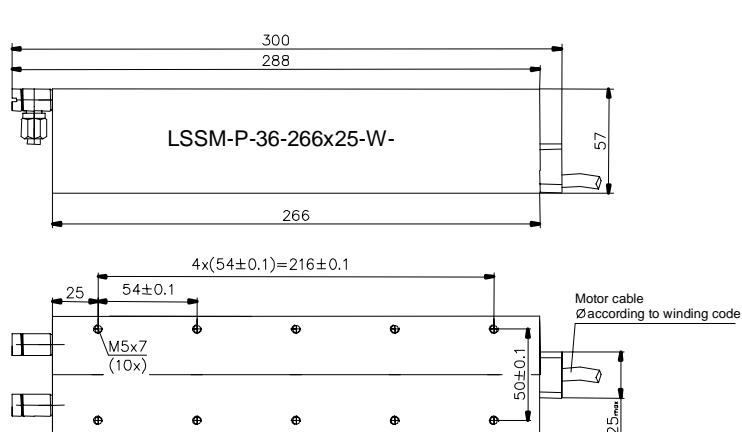
Serie LSSM - P - 36 – 210- ...



Overall and join dimensions

Parameter	Symbol	Unit	LSSM-P-36-210-...			
			25-...		50-...	
			FS	FT	FS	FT
Peak force (coil at 20°C)	Fp	N	644		1288	
Continuous force (coil at 120°C), water cooling	Fw	N	483		956	
Continuous force (coil at 120°C), air cooling	Fa	N	242		475	
Detent force	Fd	N	7,7		15,5	
Attraction force of magnets	Fm	N	75		150	
Recommended supply voltage DC	Us	V	310		600	
Motor constant (coil at 20°C)	Ko	N/√W	28,1		44,1	
Peak power dissipation (coil at 20°C)	Pp	W	2103	2136	3433	3485
Continuous power dissipation (coil at 120°C), water cooling	Pw	W	542	569	855	899
Continuous power dissipation (coil at 120°C), air cooling	Pa	W	120	139	190	219
Coolant flow for temperature difference 5°C by power Pw	Cf	L/min	1,6	1,6	2,4	2,6
Maximum velocity at Fp and Us (Coil at 20°C)	Vp	m/s	1,9	3,5	1,9	3,4
Maximum velocity at Fw and Us (Coil at 20°C)	Vw	m/s	3,3	5,9	3,3	5,8
Maximum velocity at Fa and Us (Coil at 20°C)	Va	m/s	4,9	8,4	4,8	8,3
Peak current (RMS) at Fp and V=0	Ip	Arms	20,6	35,7	20,6	35,7
Continuous current at 120°C with water cooling at Fw and V=0	Iw	Arms	10,2	17,7	10,0	17,4
Continuous current at 120°C with air cooling at Fa and V=0	Ia	Arms	4,5	7,7	4,4	7,6
Efficiency at Mw and 540V DC (Coil at 20°C)	Ew	%	74,9	83,4	78,8	86,1
Back EMF constant (*) (peak phase-phase)	Ku	V/(m/s)	44,2	25,5	88,4	51,0
Electrical resistance at 20°C (*)	R	Ohm	2,47	0,82	4,03	1,34
Electrical inductance (*)	L	mH	26,4	8,8	52,9	17,6

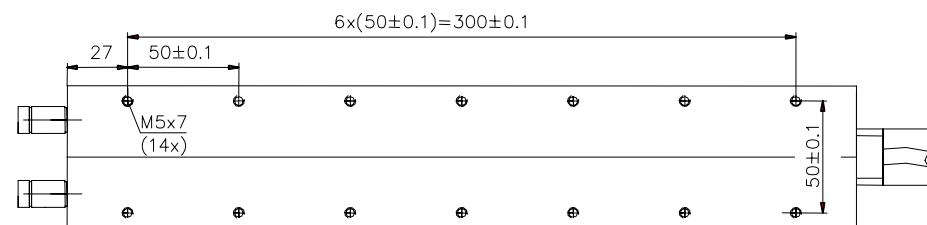
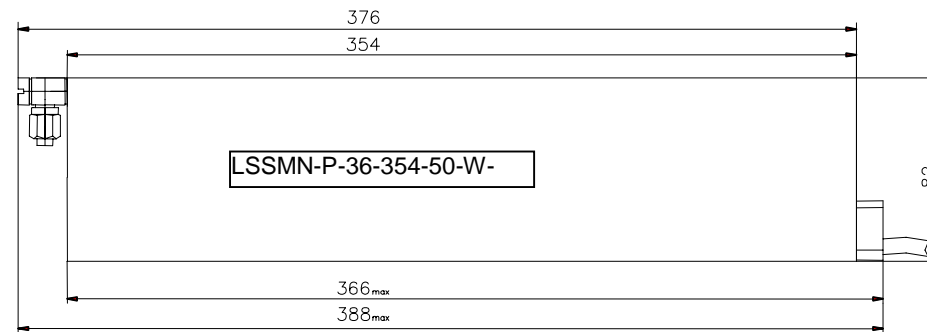
Serie LSSM - P - 36 – 266- ...



Overall and joint dimensions

Parameter	Symbol	Unit	LSSM-P-36-266-...			
			25-...		50-...	
			FS	FT	FS	FT
Peak force (coil at 20°C)	Fp	N	859		1718	
Continuous force (coil at 120°C), water cooling	Fw	N	645		1275	
Continuous force (coil at 120°C), air cooling	Fa	N	322		634	
Detent force	Fd	N	10,3		20,6	
Attraction force of magnets	Fm	N	100		200	
Recommended supply voltage DC	Us	V	600		600	
Motor constant (coil at 20°C)	Ko	N/√W	32,5		50,9	
Peak power dissipation (coil at 20°C)	Pp	W	2831	2894	4554	4606
Continuous power dissipation (coil at 120°C), water cooling	Pw	W	745	798	1121	1164
Continuous power dissipation (coil at 120°C), air cooling	Pa	W	176	212	240	269
Coolant flow for temperature difference 5°C by power Pw	Cf	L/min	2,1	2,3	3,2	3,3
Maximum velocity at Fp and Us (Coil at 20°C)	Vp	m/s	2,9	5,1	1,4	2,5
Maximum velocity at Fw and Us (Coil at 20°C)	Vw	m/s	4,9	8,5	2,4	4,3
Maximum velocity at Fa and Us (Coil at 20°C)	Va	m/s	7,1	12,1	3,6	6,2
Peak current (RMS) at Fp and V=0	Ip	Arms	20,6	35,7	20,6	35,7
Continuous current at 120°C with water cooling at Fw and V=0	Iw	Arms	10,2	17,7	10,0	17,4
Continuous current at 120°C with air cooling at Fa and V=0	Ia	Arms	4,5	7,7	4,4	7,6
Efficiency at Mw and 540V DC (Coil at 20°C)	Ew	%	81,0	87,3	73,5	82,6
Back EMF constant (*) (peak phase-phase)	Ku	V/(m/s)	58,9	34,0	117,9	68,1
Electrical resistance at 20°C (*)	R	Ohm	3,29	1,10	5,37	1,79
Electrical inductance (*)	L	mH	35,3	11,8	70,5	23,5

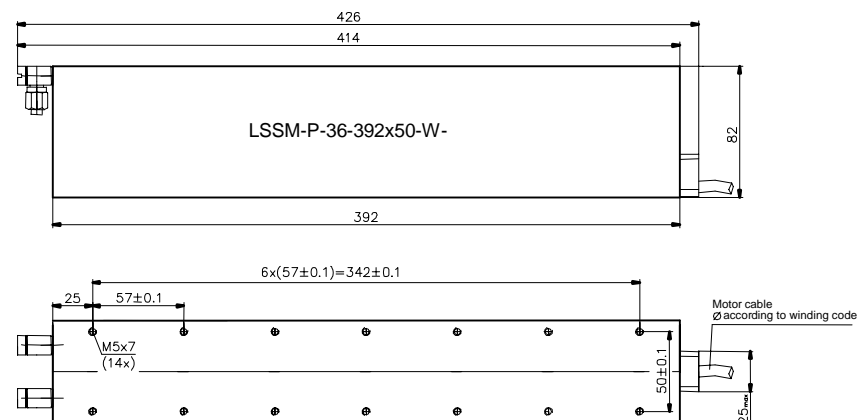
Serie LSSM - P - 36 – 354- ...



Overall and join dimensions

Parameter	Symbo	Unit	LSSM-P-36-354-...			
			25-...		50-...	
			FS	FT	FS	FT
Peak force (coil at 20°C)	Fp	N	1074		2147	
Continuous force (coil at 120°C), water cooling	Fw	N	806		1594	
Continuous force (coil at 120°C), air cooling	Fa	N	403		792	
Detent force	Fd	N	12,9		25,8	
Attraction force of magnets	Fm	N	125		250	
Recommended supply voltage DC	Us	V	600		600	
Motor constant (coil at 20°C)	Ko	N/√W	36,3		56,9	
Peak power dissipation (coil at 20°C)	Pp	W	3517	3581	5674	5727
Continuous power dissipation (coil at 120°C), water cooling	Pw	W	913	967	1386	1430
Continuous power dissipation (coil at 120°C), air cooling	Pa	W	207	243	290	319
Coolant flow for temperature difference 5°C by power Pw	Cf	L/min	2,6	2,8	4,0	4,1
Maximum velocity at Fp and Us (Coil at 20°C)	Vp	m/s	2,3	4,1	1,0	2,0
Maximum velocity at Fw and Us (Coil at 20°C)	Vw	m/s	3,9	6,9	1,9	3,5
Maximum velocity at Fa and Us (Coil at 20°C)	Va	m/s	5,7	9,8	2,8	5,0
Peak current (RMS) at Fp and V=0	Ip	Arms	20,6	35,7	20,6	35,7
Continuos current at 120°C with water cooling at Fw and V=0	Iw	Arms	10,2	17,7	10,0	17,4
Continuos current at 120°C with air cooling at Fa and V=0	Ia	Arms	4,5	7,7	4,4	7,6
Efficiency at Mw and 540V DC (Coil at 20°C)	Ew	%	77,5	85,1	68,7	79,4
Back EMF constant (*) (peak phase-phase)	Ku	V/(m/s)	73,6	42,5	147,3	85,1
Electrical resistance at 20°C (*)	R	Ohm	4,11	1,37	6,71	2,24
Electrical inductance (*)	L	mH	44,1	14,7	88,2	29,4

Serie LSSM - P - 36 – 392- ...



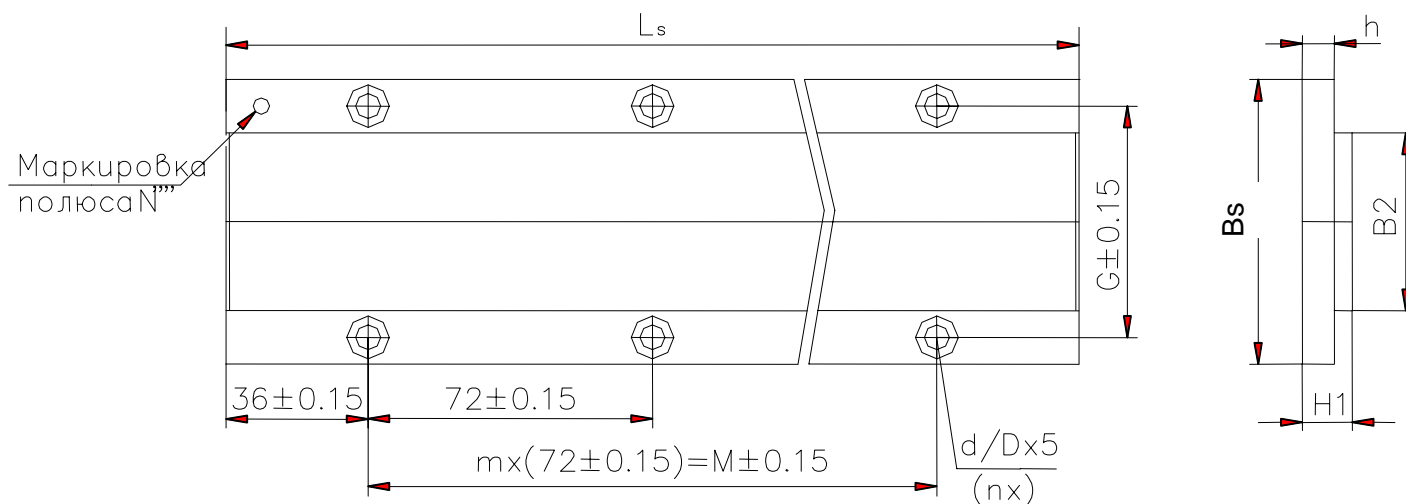
Overall and join dimensions

Parameter	Symbol	Unit	LSSM-P-36-392...	
			50-...	
			FS	FT
Peak force (coil at 20°C)	Fp	N	2577	
Continuous force (coil at 120°C), water cooling	Fw	N	1912	
Continuous force (coil at 120°C), air cooling	Fa	N	951	
Detent force	Fd	N	30,9	
Attraction force of magnets	Fm	N	300	
Recommended supply voltage DC	Us	V	600	
Motor constant (coil at 20°C)	Ko	N/√W	62,3	
Peak power dissipation (coil at 20°C)	Pp	W	6794	6847
Continuous power dissipation (coil at 120°C), water cooling	Pw	W	1651	1695
Continuous power dissipation (coil at 120°C), air cooling	Pa	W	341	369
Coolant flow for temperature difference 5°C by power Pw	Cf	L/min	4,7	4,9
Maximum velocity at Fp and Us (Coil at 20°C)	Vp	m/s	0,8	1,6
Maximum velocity at Fw and Us (Coil at 20°C)	Vw	m/s	1,6	2,8
Maximum velocity at Fa and Us (Coil at 20°C)	Va	m/s	2,3	4,1
Peak current (RMS) at Fp and V=0	Ip	Arms	20,6	35,7
Continuous current at 120°C with water cooling at Fw and V=0	Iw	Arms	10,0	17,4
Continuous current at 120°C with air cooling at Fa and V=0	Ia	Arms	4,4	7,6
Efficiency at Mw and 540V DC (Coil at 20°C)	Ew	%	64,3	76,3
Back EMF constant (*) (peak phase-phase)	Ku	V/(m/s)	176,8	102,1
Electrical resistance at 20°C (*)	R	Ohm	8,05	2,68
Electrical inductance (*)	L	mH	105,8	35,3

Magnetic road for synchronous motors LSM, LSSM with protection of magnets, type A

(mounting method - above)

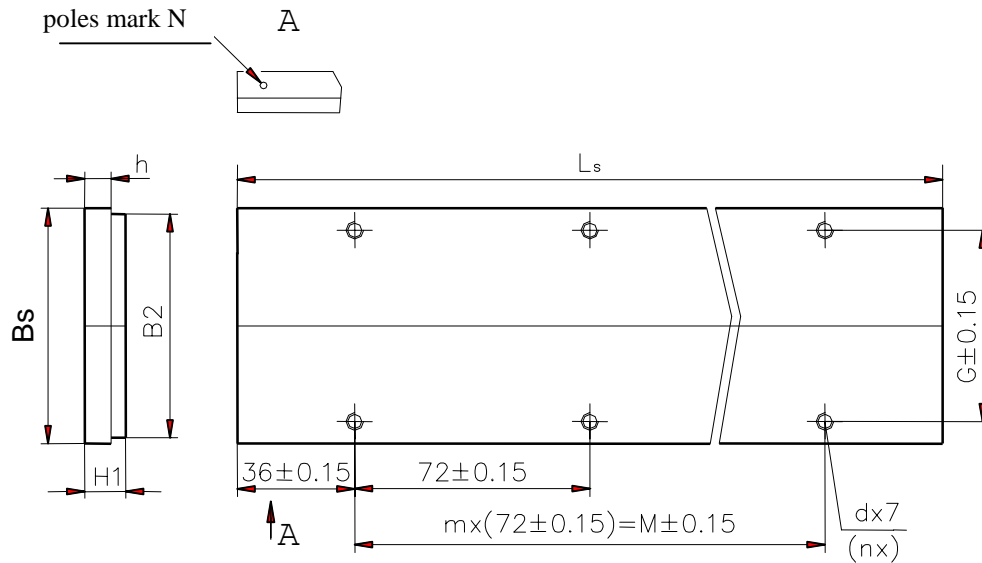
LSM(LSSM) - S - 36 - x*x-A



Name	B2,mm	G, mm	Bs,mm	H1,mm	h,mm	d,mm	D,mm	m	M,mm	n	Ls,m	weigh, kg
LSM-S-36-144x25-A	26	40	55	12.25	8	5.8	10	1	72	4	144	0.68
LSM-S-36-216x25-A								2	144	6	216	1.02
LSM-S-36-288x25-A								3	216	8	288	1.36
LSM-S-36-360x25-A								4	288	10	360	1.7
LSM-S-36-432x25-A								5	360	12	432	2.04
LSM-S-36-504x25-A								6	432	14	504	2.38
LSM-S-36-576x25-A								7	504	16	576	2.72
LSM-S-36-144x50-A	51	65	80	14.25	10	7	12	1	72	4	144	1.07
LSM-S-36-216x50-A								2	144	6	216	1.6
LSM-S-36-288x50-A								3	216	8	288	2.13
LSM-S-36-360x50-A								4	288	10	360	2.66
LSM-S-36-432x50-A								5	360	12	432	3.19
LSM-S-36-504x50-A								6	432	14	504	3.72
LSM-S-36-576x50-A								7	504	16	576	4.25
LSM-S-36-144x75-A	76	90	105	14.25	10	7	12	1	72	4	144	1.45
LSM-S-36-216x75-A								2	144	6	216	2.18
LSM-S-36-288x75-A								3	216	8	288	2.91
LSM-S-36-360x75-A								4	288	10	360	3.64
LSM-S-36-432x75-A								5	360	12	432	4.37
LSM-S-36-504x75-A								6	432	14	504	5.1
LSM-S-36-576x75-A								7	504	16	576	5.83
LSM-S-36-144x100-A	101	115	130	16.25	12	7	12	1	72	4	144	1.84
LSM-S-36-216x100-A								2	144	6	216	2.76
LSM-S-36-288x100-A								3	216	8	288	3.68
LSM-S-36-360x100-A								4	288	10	360	4.6
LSM-S-36-432x100-A								5	360	12	432	5.52
LSM-S-36-504x100-A								6	432	14	504	6.44
LSM-S-36-576x100-A								7	504	16	576	7.36
LSM-S-36-144x150-A	151	165	180	16.25	12	7	12	1	72	4	144	3.01
LSM-S-36-216x150-A								2	144	6	216	4.52
LSM-S-36-288x150-A								3	216	8	288	6.03
LSM-S-36-360x150-A								4	288	10	360	7.54
LSM-S-36-432x150-A								5	360	12	432	9.05
LSM-S-36-504x150-A								6	432	14	504	10.56
LSM-S-36-576x150-A								7	504	16	576	12.07

Magnetic road for synchronous motors LSM, LSSM with protection of magnets, type B
(mounting method - below)

LSM(LSSM) - S - 36 - x*x-B



Name	B2.mm	G.mm	Bs.mm	H1.mm	h.mm	d.mm	m	M.mm	n	Ls.mm	mass. kg
LSM-S-36-144x25-B	26	17	29	12.25	8	M5-7H	1	72	4	144	0.42
LSM-S-36-216x25-B							2	144	6	216	0.64
LSM-S-36-288x25-B							3	216	8	288	0.85
LSM-S-36-360x25-B							4	288	10	360	1.07
LSM-S-36-432x25-B							5	360	12	432	1.28
LSM-S-36-504x25-B							6	432	14	504	1.5
LSM-S-36-576x25-B							7	504	16	576	1.71
LSM-S-36-144x50-B	51	32	54	14.25	10	M6-7H	1	72	4	144	0.8
LSM-S-36-216x50-B							2	144	6	216	1.21
LSM-S-36-288x50-B							3	216	8	288	1.62
LSM-S-36-360x50-B							4	288	10	360	2.03
LSM-S-36-432x50-B							5	360	12	432	2.43
LSM-S-36-504x50-B							6	432	14	504	2.84
LSM-S-36-576x50-B							7	504	16	576	3.25
LSM-S-36-144x75-B	76	55	79	16.25	12	M6-7H	1	72	4	144	1.2
LSM-S-36-216x75-B							2	144	6	216	1.8
LSM-S-36-288x75-B							3	216	8	288	2.4
LSM-S-36-360x75-B							4	288	10	360	3
LSM-S-36-432x75-B							5	360	12	432	3.6
LSM-S-36-504x75-B							6	432	14	504	4.2
LSM-S-36-576x75-B							7	504	16	576	4.8
LSM-S-36-144x100-B	101	75	104	18.25	14	M6-7H	1	72	4	144	1.58
LSM-S-36-216x100-B							2	144	6	216	2.37
LSM-S-36-288x100-B							3	216	8	288	3.16
LSM-S-36-360x100-B							4	288	10	360	3.95
LSM-S-36-432x100-B							5	360	12	432	4.74
LSM-S-36-504x100-B							6	432	14	504	5.53
LSM-S-36-576x100-B							7	504	16	576	6.32
LSM-S-36-144x150-B	151	120	154	20.25	16	M6-7H	1	72	4	144	2.7
LSM-S-36-216x150-B							2	144	6	216	4.05
LSM-S-36-288x150-B							3	216	8	288	5.4
LSM-S-36-360x150-B							4	288	10	360	6.75
LSM-S-36-432x150-B							5	360	12	432	8.1
LSM-S-36-504x150-B							6	432	14	504	9.45
LSM-S-36-576x150-B							7	504	16	576	10.79