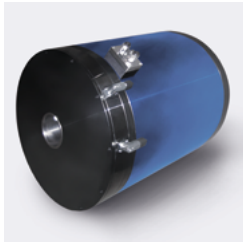
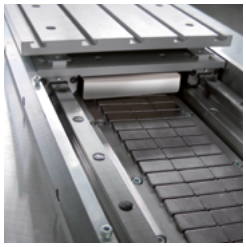
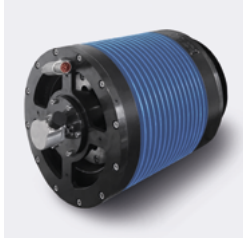
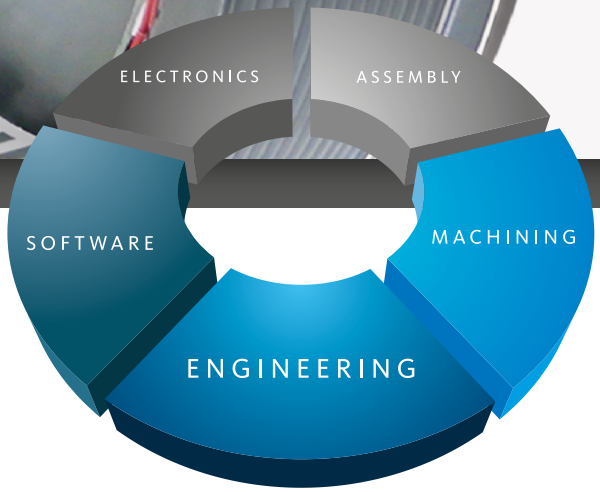
Highly dynamic torque and linear motors
Systems with direct drives









SPECIAL-PURPOSE MACHINERY
TEST RIGS AND COMPONENTS
DIRECT DRIVES
EDDY CURRENT TEST SYSTEMS
ASSEMBLY TECHNOLOGY
JOB-ORDER PRODUCTION
BUILDING CONTROL SYSTEMS

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Company overview

Our competence is focused on the production of high-performance direct drive systems „Made in Germany“ with high power density. FGB is a global company specialized in prototypes, special motors and small batches in the field of high-performance direct drive systems. The company offers frameless motors or complete systems including bearings / guiding, measuring systems, housing etc.

A team of 170 engineers and experts with more than 50 years of experience in the field of special purpose machinery and our broad expertise across various application areas and industries guarantee a high level of innovation in all our products. For more power of our motors.

Today, modern production facilities with efficient manufacturing processes are expected in general but we additionally convince with manufactory-like production, guaranteeing highest quality standards. Following the completion of the manufacturing process, extensive performance tests are carried out on in-house test stands. The test results which we have accrued from this intensive testing have been used in the ongoing development of our products for many years.

This makes us unique

- direct drive systems (torque and linear motors) with high power density, amongst other things thanks to special winding technology in combination with a high slot fill factor
- customer specific solutions for special requirements in terms of installation space, harsh ambient conditions, innovative technologies etc.
- integration expertise thanks to extensive experience in the field of special purpose machinery
- individual and professional consulting
- flexibility and efficiency of a medium-sized company
- short delivery times and agreements you can rely on

Production capabilities at FGB

In order to guarantee the high quality of FGB direct drive systems, all production steps are carried out in company-owned facilities: Design, calculation, construction, punching, coil winding, wiring, potting, installation of magnets and assembly of the drive systems.

Our company-owned machining systems (turning, milling, grinding, eroding) make us a true all-rounder. This way, we can guarantee that tools for motor production as well as rotors and housings of drive systems are manufactured in-house. Our range of machinery is completed by our in-house test stands. Here, the performance of newly developed motors is extensively tested and the results are compared against the calculated characteristic values of the design.

Benefits of direct drive systems

In direct drive systems, the motor is directly mounted on the machine tool. This way, mechanical transmission elements between motor and machine tool are avoided to a very large extent. Components such as belts and gears are not required. Wear, noise / maintenance costs and the influence of connections are considerably reduced. These drive systems require less components and consequently less space.

The higher system rigidity of direct drive systems enables very precise positioning. High acceleration rates guarantee considerably shortened cycle times. Direct drive systems are mainly controlled with permanent magnet excitation and distinguish themselves by high torque (torque motor) or high thrust (linear motor).

By installation of a direct drive system, an integrated machine element is achieved that is a component of the respective machine tool.

For illustration, here the most important advantages are listed:

- no need for gears / belts, which results in less noise, no oil inside the system, less friction and reduced wear and maintenance costs
- less components to reduce acquisition and assembly costs
- zero clearance ensures / highly dynamic acceleration with high positional accuracy
- high dynamics: shorter cycle times increase machine tool efficiency
- high efficiency thanks to application-specific design
- less installation space: machine tools require less space

Direct drive systems from FGB offer full torque / full thrust even at stall and are able to provide that across the full motor speed range.

Benefits of direct drive systems

The specified characteristics show the full performance of the motors. Based on the water cooling of the stators, and the operation with torque angle shift, usually referred to as field weakening. If the stators are cooled directly with oil, then the heat dissipation is so good that the maximum power can be delivered permanently. In most applications, not all capabilities of the motors are needed at the same time. Very often the maximum torque is needed but not the maximum possible speed or power. You are welcome to contact FGB and request customer-specific characteristics. Likewise, of course, the adaptation to other conditions, such as voltage, temperature, available maximum current, operation only in base speed range, with air or oil cooling is possible. Below you find a table to help yourself to make a quick estimate.

	Speed	Speed	Current	Torque
Catalogue	min $^{-1}$	100 %	100 %	100 %
Customized	2.000	100 %	100 %	100 %
Customized	1.800	90 %	90 %	90 %
Customized	1.600	80 %	80 %	80 %
Customized	1.400	70 %	70 %	70 %
Customized	1.200	60 %	60 %	60 %
Customized	1.000	50 %	50 %	50 %
Customized	800	40 %	40 %	40 %
Customized	600	30 %	30 %	30 %
Customized	400	20 %	20 %	20 %
Customized	200	10 %	10 %	10 %

Cooling	Torque Mo
Air	50 %
Fan	75 %
Water	100 %
Oil	200 %

Setup of FGB direct drive systems

Direct drive systems offered by FGB are permanent magnet excited, brushless (i.e. electronically commutated) synchronous motors for highly demanding applications in terms of dynamics and positional accuracy while at the same time being of compact design and limited weight.

Each drive system consists of a primary and a secondary component. The primary component includes the active coil system. The secondary component consists of the permanent magnets. If the coils are supplied with current, a magnetic field is generated leading to forces (torque) in combination with the secondary component. The generated forces and torques are mainly defined by air gaps between the primary and the secondary components. This effect is achieved by a direct, i.e. rigid connection to the machine tool without any gears or other mechanical transmission elements.

The standard model range displayed here includes model sizes with air gap diameters between 062 to 800 mm. These drive systems feature a high pole design and are therefore particularly well suited for applications requiring high torques (up to several 1000 Newton meters) in the lower and medium motor speed range (from stall to 30.000 rpm). In addition to that, our company offers customer specific designs of drive systems in other performance ranges.

The mechanical concept of direct drive systems is intended to allow for easy and constructive implementation into the respective machine tool. On request, this can be carried out by the customer himself for build-in motors. However, we would be pleased to carry out the implementation process for you and also offer complete motor systems including housing, bearings and measuring systems. FGB motors are available as external and internal rotor motors. The generated heat can be discharged optionally by free convection or by means of a water cooling system in order to improve cooling.

Properties of FGB direct drive systems

Motor types RMI 062 to RMI 800 particularly distinguish themselves through the following characteristics:

- extremely low cogging
- sinusoidal commutation / sinusoidal motor EMF
- three-phase coil in Y connection / on customer request, the neutral point can be led out separately
- Nd-Fe-B or Sm-Co-permanent magnets
- constantly high torque also in stall range (thanks to a broad motor speed range, no motor or transmission grading is required)
- minimal inertia thanks to favorable rotor design and consequently very good dynamic properties
- high overload capabilities / peak load moments

Thanks to these properties, FGB direct drive systems are particularly suited for the following machines and facilities:

- extruders
- injection molding machines
- printing machines
- press technology
- winding machines
- wire drawing machines
- automation technology
- machine tools
- wood working machines
- special machines
- electric and hybrid vehicle
- oil and gas exploration

Overview – torque motors

Stator Ø no poles	Stack length L1	DC bus voltage	Continuous stall torque	Continuous stall current	Peak torque	Nominal speed	Motor terminal resistance
		U_{DC} [v]	M_0 [Nm]	$I_{0\,rms}$ [A]	M_{max} [Nm]	n_n [rpm]	R_{tt} @20 °C [Ω]
RMI062-030L	030	560	13	70	19	24.000	0,125
RMI062-060L	060	560	25	110	38	21.300	0,043
RMI062-120L	120	560	46	197	77	18.300	0,017
RMI062-240L	240	560	80	318	155	13.500	0,071
RMI072-030L	030	750	13	70	22	19.440	0,237
RMI072-060L	060	750	24	110	44	21.360	0,081
RMI072-120L	120	750	45	197	88	18.240	0,031
RMI072-240L	240	750	77	318	176	13.440	0,013
RMI080-015L	015	560	11,3	6,2	16,9	3.400	9,290
RMI080-060L	060	560	36,1	19,3	67,6	3.200	1,270
RMI080-120L	120	560	73,9	39,8	135,2	3.000	0,546
RMI080-240L	240	560	101,6	81,0	270,4	3.200	0,251
RMI100-015L	015	560	18,0	10,1	26,9	3.960	5,400
RMI100-060L	060	560	71,8	31,6	107,7	3.240	0,738
RMI100-120L	120	560	143,6	54,3	215,5	3.080	0,318
RMI100-240L	240	560	287,3	111,0	430,9	3.000	0,146
RMI130-015L	015	560	29,3	17,9	47,1	5.000	2,321
RMI130-060L	060	560	91,5	55,7	188	3.850	0,317
RMI130-120L	120	560	181,0	110,0	376	3.850	0,136
RMI130-360L	360	560	547,0	333,0	1.130	3.850	0,041
RMI162-015L	015	560	35,7	18,7	71	3.960	2,430
RMI162-060L	060	560	139,0	72,6	285	4.000	0,332
RMI162-120L	120	560	284,0	140,0	571	3.280	0,143
RMI162-360L	360	560	582,0	304,0	1.715	3.080	0,043
RMI200-015L	015	560	51	27	106	2.580	1,580
RMI200-060L	060	560	197	105	425	2.400	0,216
RMI200-120L	120	560	344	180	851	2.340	0,093
RMI200-360L	360	560	1.074	621	2.555	2.190	0,028
RMI250-025L	025	750	139	65	280	3.200	0,146
RMI250-100L	100	750	520	242	1.120	2.360	0,021
RMI250-200L	200	750	1.131	528	2.241	2.200	0,009
RMI250-500L	500	750	2.696	1.257	5.603	2.160	0,003
RMI320-025L	025	750	204	70	464	2.580	0,163
RMI320-100L	100	750	898	309	1.857	2.400	0,023
RMI320-200L	200	750	1.815	625	3.714	2.340	0,010
RMI320-500L	500	750	4.329	1.489	9.286	2.190	0,004
RMI400-025L	025	750	363	113	730	1.944	0,100
RMI400-100L	100	750	1.429	441	2.920	1.632	0,014
RMI400-200L	200	750	2.800	896	5.814	1.008	0,006
RMI400-500L	500	750	6.924	2.132	14.603	1.008	0,002
RMI500-025L	025	750	765	195	1.151	1.944	0,055
RMI500-100L	100	750	3.065	781	4.606	1.632	0,008
RMI500-200L	200	750	5.079	792	9.213	1.008	0,014
RMI500-500L	500	750	15.333	1.953	23.033	1.008	0,005
RMI640-025L	025	750	1.254	285	1.898	1.824	0,0340
RMI640-100L	100	750	5.129	1.167	7.595	1.488	0,0049
RMI640-200L	200	750	11.700	1.270	15.190	1.056	0,0086
RMI640-500L	500	750	26.954	3.035	37.976	1.032	0,0032
RMI800-025L	025	750	1.808	367	2.839	1.760	0,0223
RMI800-100L	100	750	6.175	1.241	11.356	1.700	0,0079
RMI800-200L	200	750	1.528	3.058	22.713	1.760	0,0026
RMI800-500L	500	750	37.669	7.674	56.782	1.541	0,0010

Motor terminal inductance	Motor inertia	Voltage constant	Torque constant	Dynamic factor	Mass without brake	Minimum flow rate	Dimensions without brake
L_{tt} [mH]	J [kgcm²]	k_e [Vs]	k_m [Nm/A_{rms}]	$\dot{\omega}$ [rad/s²]	m [kg]	Q [liter/min]	d x l [mm x mm]
0,613	3,12	0,246	0,301	61.000	2,4	5	120 x 030
0,292	6,35	0,246	0,301	61.000	4,8	5	120 x 060
0,142	12,51	0,246	0,301	61.000	9,6	10	120 x 120
0,007	25	0,246	0,301	61.000	19,2	15	120 x 240
1,287	2,74	0,328	0,401	80.000	1,77	2,5	130 x 030
0,617	5,50	0,328	0,401	80.000	3,75	5	130 x 060
0,302	11,00	0,328	0,401	80.000	7,51	10	130 x 120
0,149	22,00	0,328	0,401	80.000	15	10	130 x 240
8,210	2,08	1,56	1,915	81.500	1,53	1	148 x 015
0,960	8,37	1,56	1,915	81.500	6,13	2	148 x 060
0,389	16,70	1,56	1,915	81.500	12,27	4	148 x 120
0,172	33,39	1,56	1,915	81.500	24,74	5	148 x 240
5,257	4,36	1,56	1,915	61.800	1,82	1	168 x 015
0,615	17,46	1,56	1,915	61.800	7,28	2	168 x 060
0,249	34,91	1,56	1,915	61.800	14,56	4	168 x 120
0,110	69,82	1,56	1,915	61.800	29,12	10	168 x 240
3,017	12,67	1,34	1,642	36.000	2,401	1	200 x 015
0,353	50,66	1,34	1,642	36.000	9,692	3	200 x 060
0,143	101,33	1,34	1,642	36.000	19,204	5	200 x 120
0,040	304,00	1,34	1,642	36.000	57,612	10	200 x 360
4,107	25	1,56	1,915	28.600	2,01	1	210 x 015
0,481	101	1,56	1,915	28.600	8,64	2	210 x 060
0,195	202	1,56	1,915	28.600	16,27	3	210 x 120
0,056	607	1,56	1,915	28.600	48,38	10	210 x 360
2,050	55	1,56	1,915	19.212	5,07	1	300 x 015
0,240	221	1,56	1,915	19.212	20,18	5	300 x 060
0,097	443	1,56	1,915	19.212	40,56	18	300 x 120
0,027	1.329	1,56	1,915	19.212	122	20	300 x 360
0,871	192	1,99	2,442	14.342	10,2	2	350 x 025
0,215	771,00	1,99	2,442	14.342	40,6	8	350 x 100
0,108	1.543	1,99	2,442	14.342	82	15	350 x 200
0,043	3.858	1,99	2,442	14.342	205	30	350 x 500
0,678	420	2,74	3,357	11.052	12,7	3	420 x 025
0,168	1.681	2,74	3,357	11.052	50,8	8	420 x 100
0,084	3.363	2,74	3,357	11.052	101,8	16	420 x 200
0,033	8.407	2,74	3,357	11.052	254	30	420 x 500
0,194	850	2,74	3,357	8.602	17	4	508 x 025
0,048	3.401	2,74	3,357	8.602	67	12	508 x 100
0,024	6.803	2,74	3,357	8.602	134	25	508 x 200
0,010	17.007	2,74	3,357	8.602	335	50	508 x 500
0,133	0,173	3,558	4,395	6.630	33,3	4	675 x 025
0,033	0,694	3,558	4,395	6.630	121,1	15	675 x 100
0,066	1,388	7,177	8,790	6.630	266,1	30	675 x 200
0,026	3,469	7,177	8,790	6.630	665	60	675 x 500
0,1330	0,416	3,558	4,395	4.552	19,08	5	736 x 025
0,0328	1,664	3,558	4,395	4.552	95,10	20	736 x 100
0,0656	3,329	7,177	8,790	4.552	190,10	40	736 x 200
0,0262	8,321	7,177	8,790	4.552	475,90	80	736 x 500
0,1650	2,080	4,647	5,691	1.365	46,00	5	920 x 025
0,0412	8,160	4,647	5,691	1.365	180,00	20	920 x 100
0,0206	17,000	4,647	5,691	1.365	357,00	50	920 x 200
0,0082	42,000	4,647	5,691	1.365	894,00	100	920 x 500

Torque motor RMI 062

Technical data: size RMIx062-xxxL-2D5S

Characteristics and nominal values:

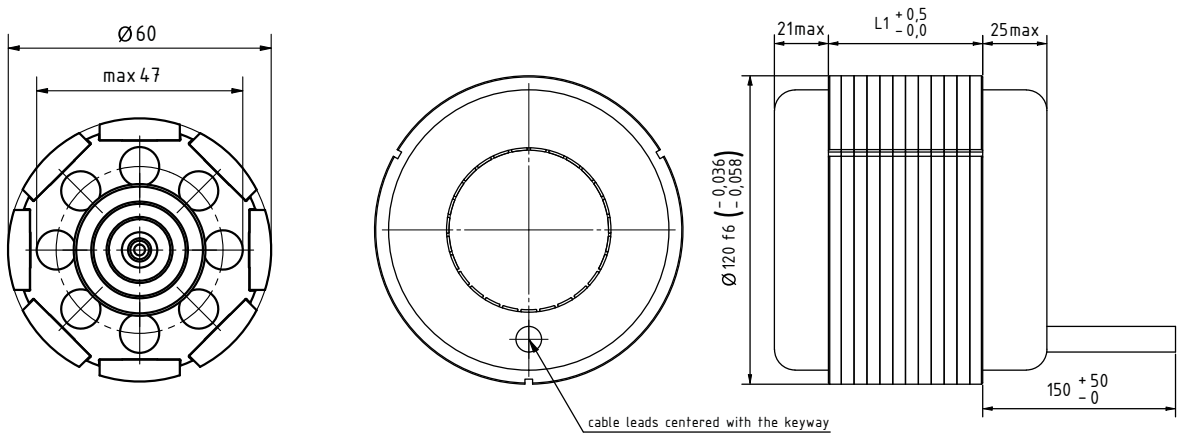
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

Stack length L1	Unit	030L	060L	120L	240L
Torque constant k_m	Nm/A	←			0,301 →
Voltage constant k_e	Vs	←			0,246 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			25,74 →
Terminal inductance L_{tt}	mH	0,613	0,292	0,142	0,007
Terminal resistance R_{tt}	Ω	0,125	0,043	0,017	0,071
Maximum power P_{max}	kW	39	81	166	336
Maximum torque M_{max}	Nm	19	38	77	155
Maximum current I_{max}	A	115	230	460	920
Thermal resistance R_{th}	K/W	0,131	0,109	0,089	0,080
Continuous stall torque M_0	Nm	13	25	46	80
Continuous stall current I_0	A	70	110	197	318
No-load speed n_0	rpm	←			21.758 →
Number of poles 2p	-	←			8 →
Rated torque M_n	Nm	10	20	34	57
Rated current I_n	A	42	80	131	212
Rated speed n_n	rpm	24.000	21.300	18.300	13.500
Motor inertia J	kgcm²	3,12	6,35	12,51	25
Motor mass frameless m	kg	2,4	4,8	9,6	19,2
Dynamic factor $\dot{\omega}$	rad/s²	←			61.000 →

Dimensions of the frameless motor:

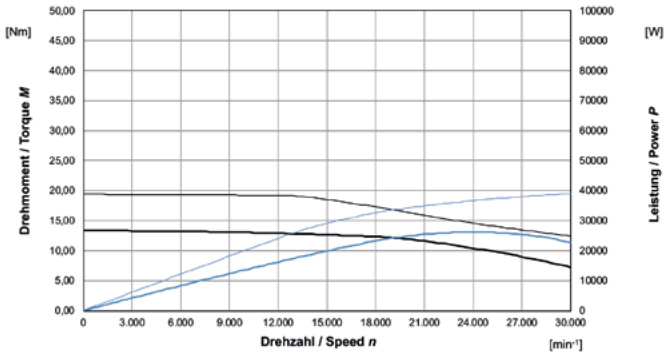
- with potted stator
- user manual available on request
- option: customized dimensions



Motor characteristic: size RMIx062-xxxL-2D5S

Options of customization:

- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



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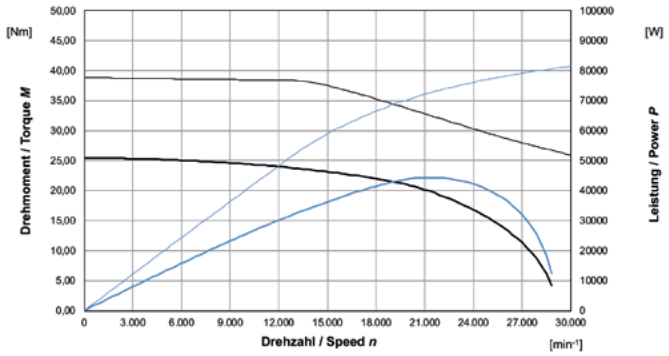

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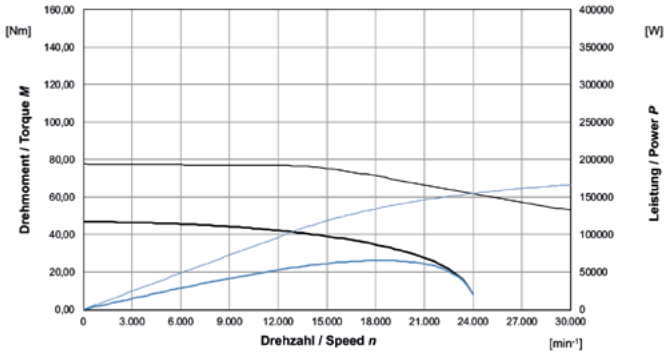

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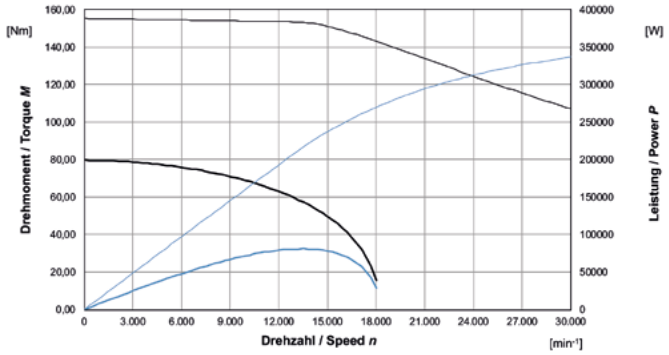

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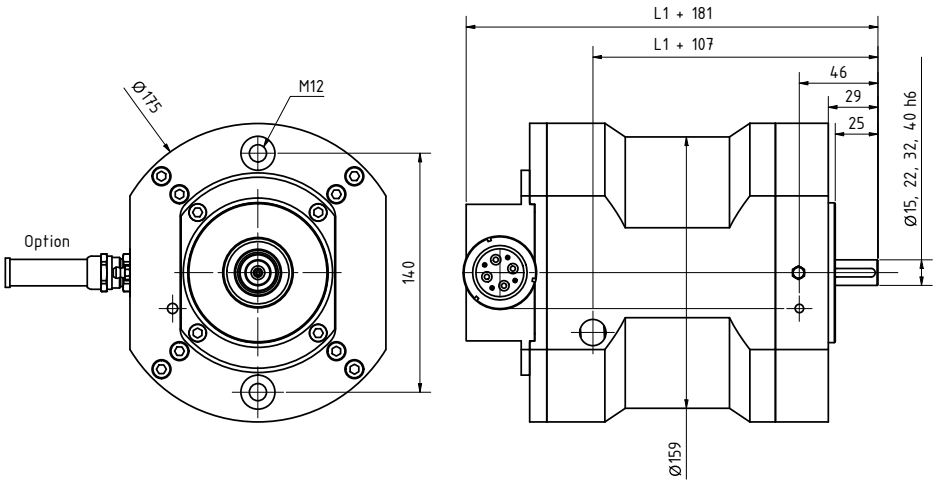


RMIx062-xxxL-2D5S motor with housing

Torque motor RMI 072

Technical data: size RMIx072-xxxL-3D3S

Characteristics and nominal values:

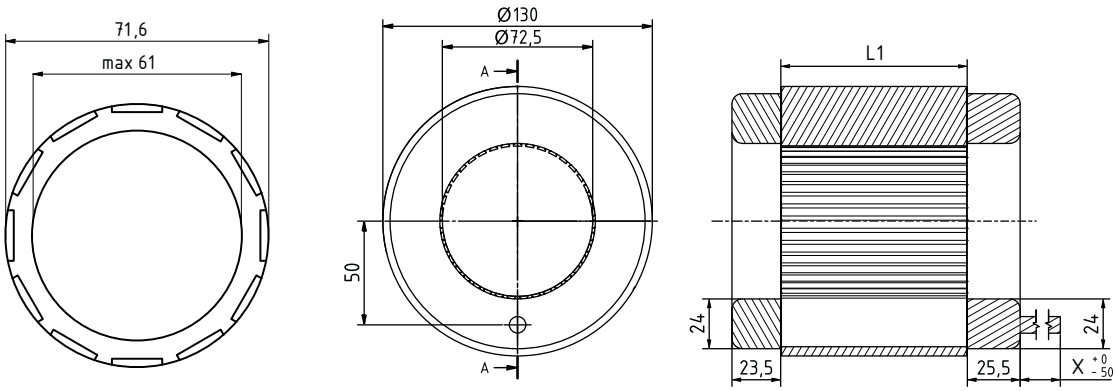
The conditions for the following nominal values are

- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

Stack length L1	Unit	030L	060L	120L	240L
Torque constant k_m	Nm/A	←			0,401 →
Voltage constant k_e	Vs	←			0,328 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			34,32 →
Terminal inductance L_{tt}	mH	1,287	0,617	0,302	0,013
Terminal resistance R_{tt}	Ω	0,237	0,081	0,031	0,013
Maximum power P_{max}	kW	22	47	98	200
Maximum torque M_{max}	Nm	22	44	88	176
Maximum current I_{max}	A	120	240	480	960
Thermal resistance R_{th}	K/W	0,131	0,109	0,089	0,080
Continuous stall torque M_0	Nm	13	24	45	77
Continuous stall current I_0	A	70	110	197	318
No-load speed n_0	rpm	←			21.856 →
Number of poles 2p	-	←			12 →
Rated torque M_n	Nm	11	18	33	55
Rated current I_n	A	42	80	131	212
Rated speed n_n	rpm	29.440	21.360	18.240	13.440
Motor inertia J	kgcm²	2,74	5,50	11,00	22
Motor mass frameless m	kg	1,77	3,75	7,51	15
Dynamic factor $\dot{\omega}$	rad/s²	←			80.000 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions

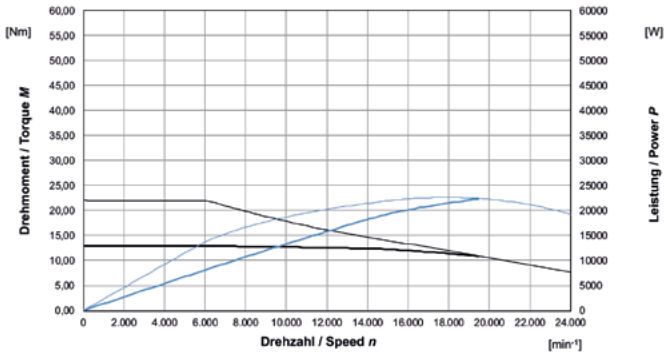


Detailed image:

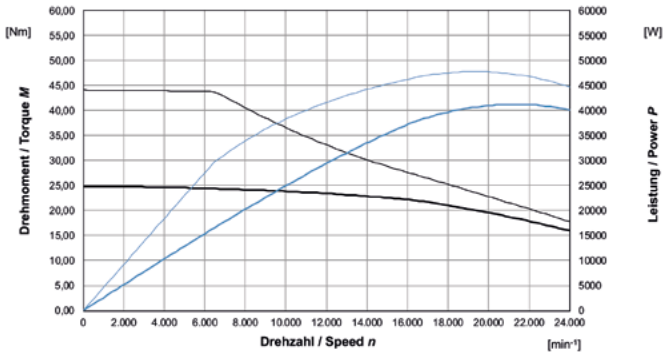
Motor characteristic: size RMIx072-xxxL-3D3S

Options of customization:

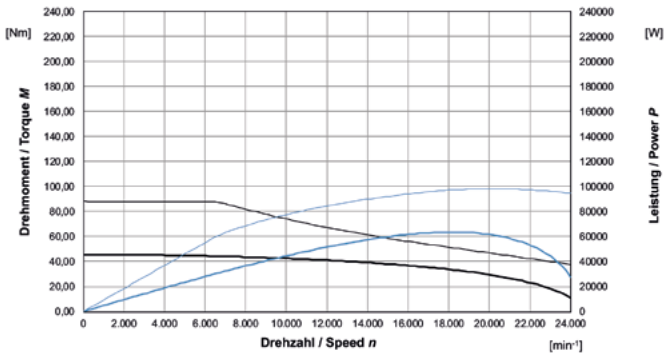
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



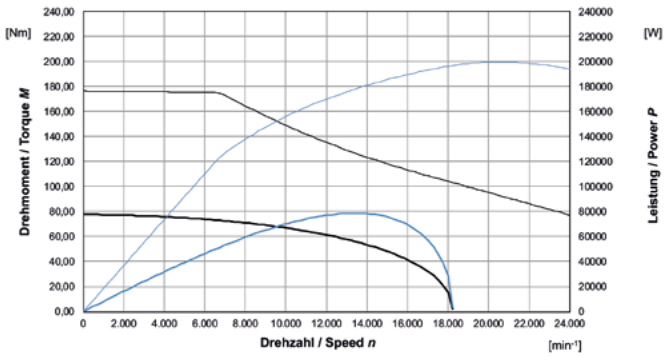
RMIF072-030L-3D3T



RMIF072-060L-3D3T



RMIF072-120L-3D3T



RMIF072-240L-3D3T

Torque motor RMI 080

Technical data: size RMIF080-xxxL-1V6S

Characteristics and nominal values:

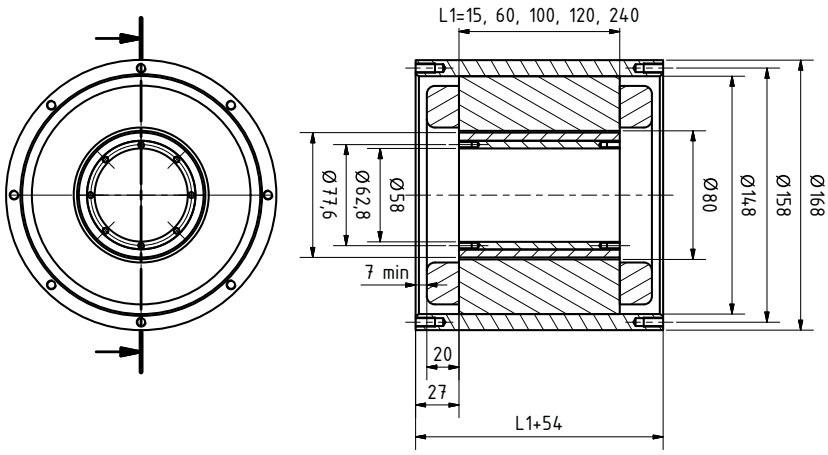
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

Stack length L1	Unit	015L	060L	120L	240L
Torque constant k_m	Nm/A	←			1,915 →
Voltage constant k_e	Vs	←			1,564 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			165 →
Terminal inductance L_{tt}	mH	8,213	0,961	0,389	0,172
Terminal resistance R_{tt}	Ω	9,292	1,269	0,546	0,251
Maximum power P_{max}	kW	3,939	19,430	39,828	80,950
Maximum torque M_{max}	Nm	16,900	67,610	135,220	270,430
Maximum current I_{max}	A	9,500	38,000	76,000	152,000
Thermal resistance R_{th}	K/W	0,127	0,096	0,076	0,063
Continuous stall torque M_0	Nm	11,300	36,050	73,900	101,620
Continuous stall current I_0	A	6,200	19,300	36,900	79,700
No-load speed n_0	rpm	←			3.420 →
Number of poles 2p	-	←			32 →
Rated torque M_n	Nm	8,910	28,420	55,990	69,640
Rated current I_n	A	4,8	15,000	29,600	59,100
Rated speed n_n	rpm	3.400	3.200	3.000	2.200
Motor inertia J	kgcm²	2,08	8,37	16,70	33,39
Motor mass frameless m	kg	1,53	6,13	12,27	24,74
Dynamic factor $\dot{\omega}$	rad/s²	←			81.500 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions

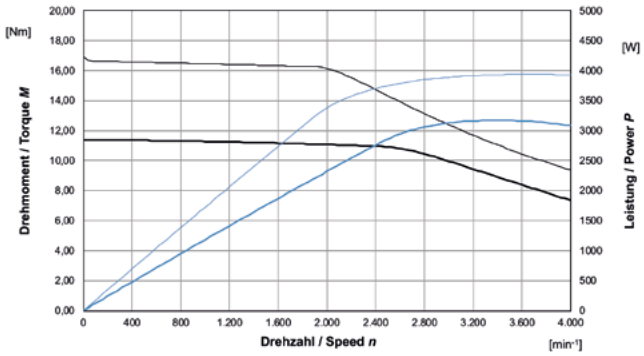


Detailed images:

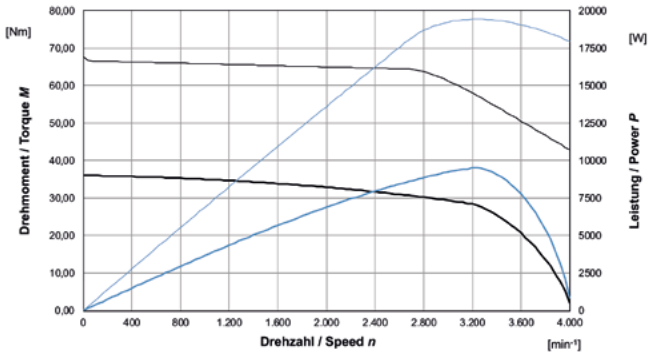
Motor characteristic: size RMIF080-xxxL-1V6S

Options of customization:

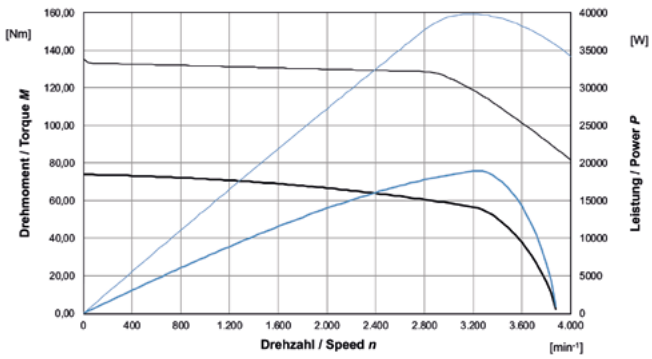
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



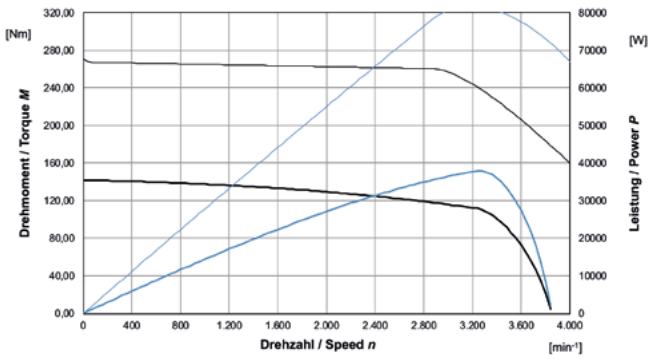
RMIF080-015L-1V6S



RMIF080-060L-1V6S



RMIF080-120L-1V6S



RMIF080-240L-1V6S

Torque motor RMI 100

Technical data: size RMIF100-xxxL-1V6S

Characteristics and nominal values:

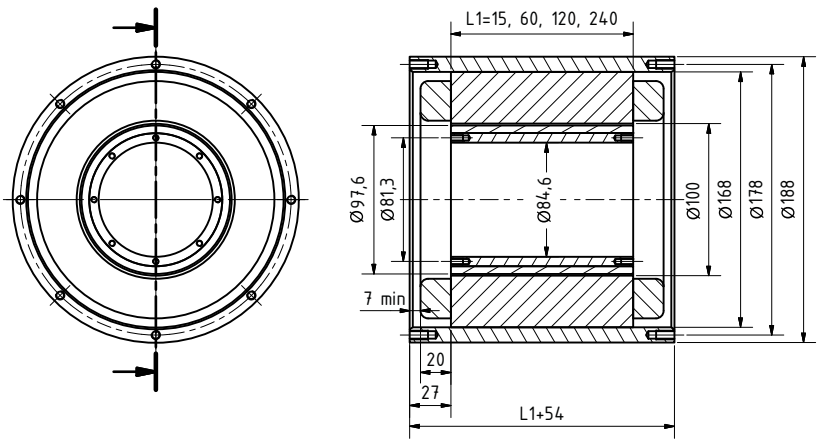
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

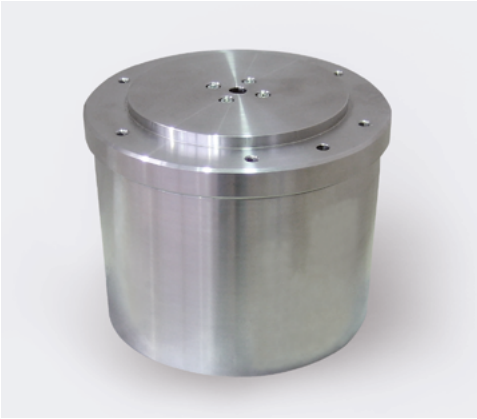
Stack length L1	Unit	015L	060L	120L	240L
Torque constant k_m	Nm/A	←			1,915 →
Voltage constant k_e	Vs	←			1,564 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			165 →
Terminal inductance L_{tt}	mH	5,257	0,615	0,249	0,11
Terminal resistance R_{tt}	Ω	5,400	0,738	0,318	0,146
Maximum power P_{max}	kW	5,500	31,400	64,200	129,800
Maximum torque M_{max}	Nm	26,900	107,700	215,500	430,900
Maximum current I_{max}	A	16,200	64,800	129,600	259,800
Thermal resistance R_{th}	K/W	0,082	0,061	0,048	0,025
Continuous stall torque M_0	Nm	18,000	71,800	143,600	287,300
Continuous stall current I_0	A	10,100	31,600	54,300	111,000
No-load speed n_0	rpm	←			3.420 →
Number of poles 2p	-	←			40 →
Rated torque M_n	Nm	12,160	45,310	68,220	139,740
Rated current I_n	A	6,600	24,600	36,400	74,700
Rated speed n_n	rpm	3.960	3.240	3.080	3.000
Motor inertia J	kgcm²	4,36	17,46	34,91	69,82
Motor mass frameless m	kg	1,82	7,28	14,56	29,12
Dynamic factor $\dot{\omega}$	rad/s²	←			61.800 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions



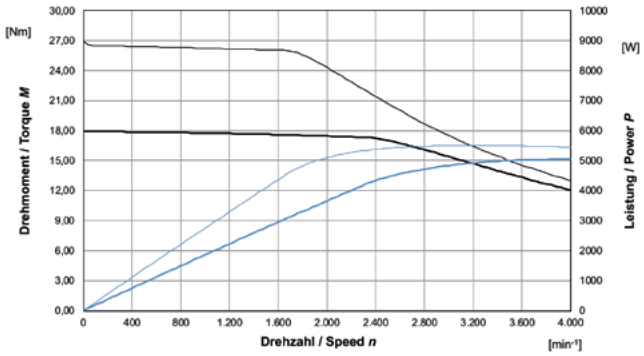
Detailed images:



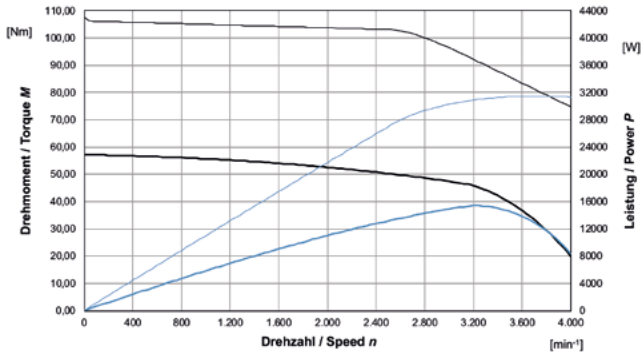
Motor characteristic: size RMIF100-xxxL-1V6S

Options of customization:

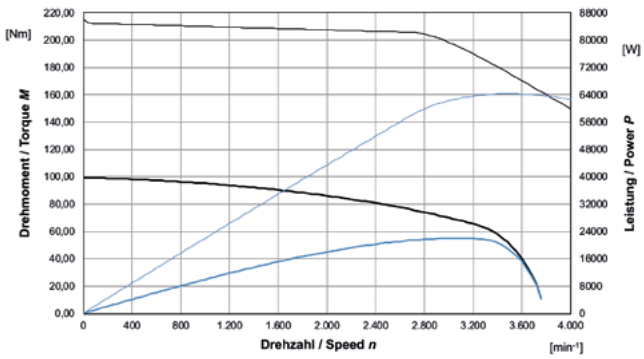
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



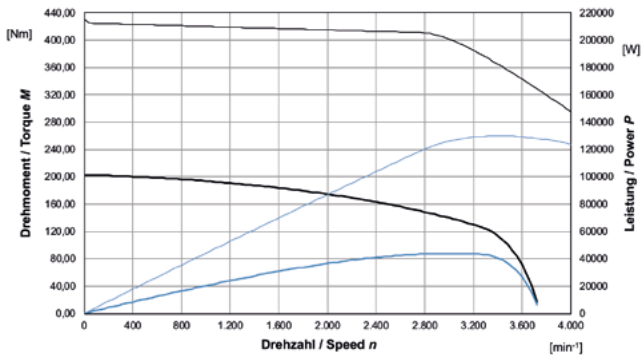
RMIF100-015L-1V6S



RMIF100-060L-1V6S



RMIF100-120L-1V6S



RMIF100-240L-1V6S

Torque motor RMI 130

Technical data: size RMIF130-xxxL-1V3S

Characteristics and nominal values:

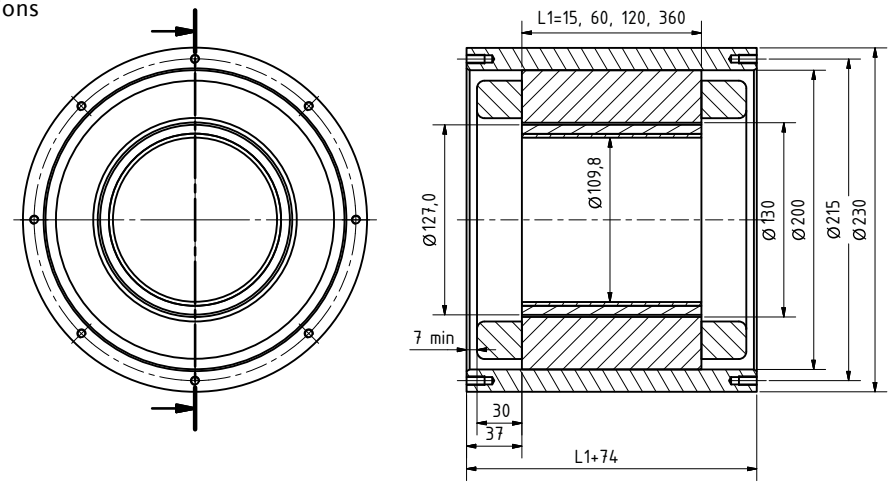
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

Stack length L1	Unit	015L	060L	120L	360L
Torque constant k_m	Nm/A	←			1,642 →
Voltage constant k_e	Vs	←			1,340 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			140 →
Terminal inductance L_{tt}	mH	3,017	0,353	0,143	0,040
Terminal resistance R_{tt}	Ω	2,321	0,317	0,136	0,041
Maximum power P_{max}	kW	13	70	141	426
Maximum torque M_{max}	Nm	47,1	188	376	1.130
Maximum current I_{max}	A	32	128	256	768
Thermal resistance R_{th}	K/W	0,061	0,046	0,027	0,010
Continuous stall torque M_0	Nm	29,32	91,47	181	547
Continuous stall current I_0	A	17,9	55,7	110	333
No-load speed n_0	rpm	←			3.990 →
Number of poles 2p	-	←			30 →
Rated torque M_n	Nm	20,15	77,51	150	444
Rated current I_n	A	11,6	47,2	91,4	270
Rated speed n_n	rpm	5.000	3.850	3.850	3.850
Motor inertia J	kgcm²	12,67	50,66	101,33	304
Motor mass frameless m	kg	2,401	9,602	19,204	57,612
Dynamic factor $\dot{\omega}$	rad/s²	←			36.000 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions

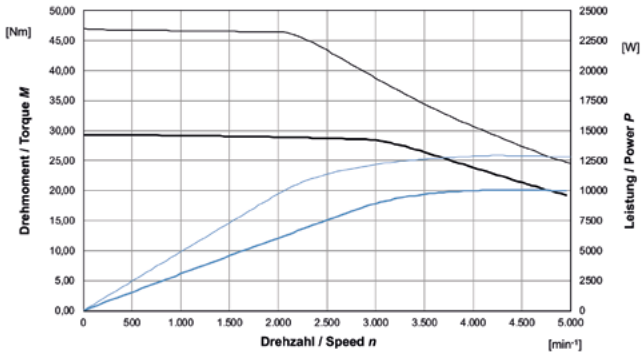


Detailed images:

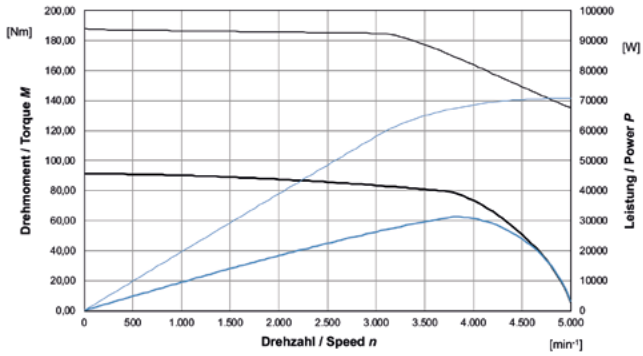
Motor characteristic: size RMIF130-xxxL-1V3S

Options of customization:

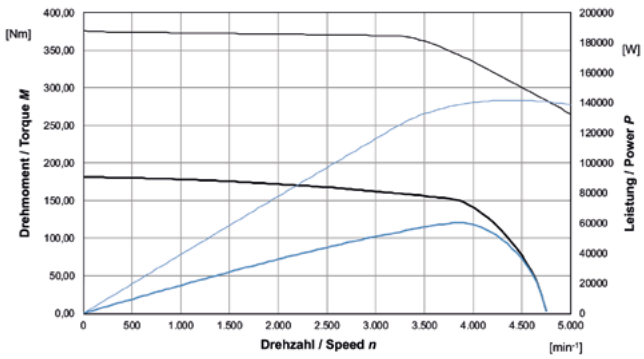
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



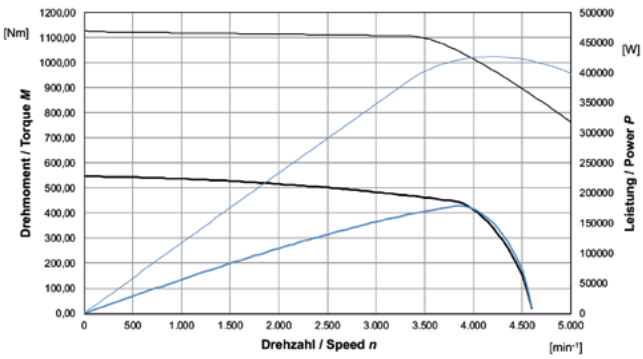
RMIF130-015L-1V3S



RMIF130-060L-1V3S



RMIF130-120L-1V3S



RMIF130-360L-1V3S

Torque motor RMI 162

Technical data: size RMIF162-xxxL-1V6S

Characteristics and nominal values:

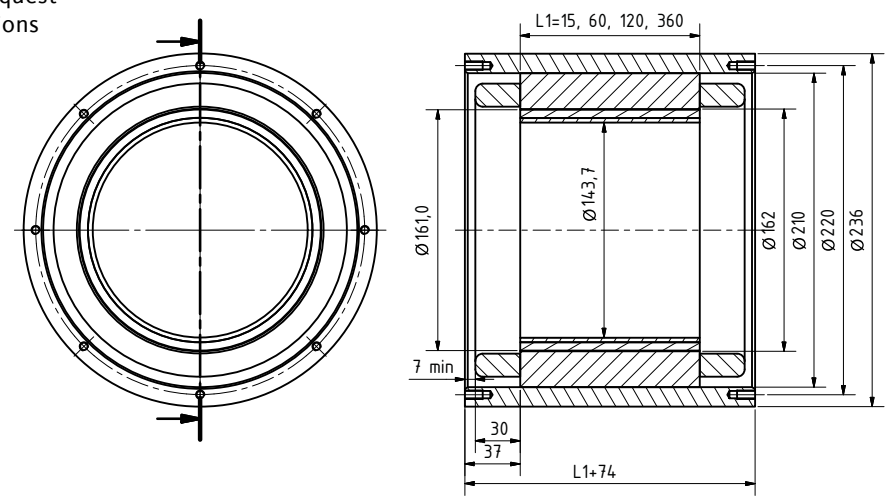
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

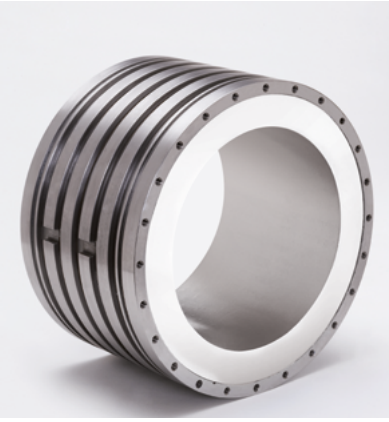
Stack length L1	Unit	015L	060L	120L	360L
Torque constant k_m	Nm/A	←			1,915 →
Voltage constant k_e	Vs	←			1,564 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			165 →
Terminal inductance L_{tt}	mH	4,107	0,481	0,195	0,056
Terminal resistance R_{tt}	Ω	2,430	0,332	0,143	0,043
Maximum power P_{max}	kW	10,7	84,9	184	572
Maximum torque M_{max}	Nm	71,49	285	571	1.715
Maximum current I_{max}	A	48	192	384	1.152
Thermal resistance R_{th}	K/W	0,054	0,026	0,014	0,012
Continuous stall torque M_0	Nm	35,74	139	284	582
Continuous stall current I_0	A	18,7	72,6	148	304
No-load speed n_0	rpm	←			3.420 →
Number of poles 2p	-	←			32 →
Rated torque M_n	Nm	23,79	100,71	241	399
Rated current I_n	A	12,4	44,6	126	208
Rated speed n_n	rpm	3.960	4.000	3.280	3.080
Motor inertia J	kgcm²	25,32	101,31	202	607
Motor mass frameless m	kg	2,01	8,64	16,27	48,38
Dynamic factor $\dot{\omega}$	rad/s²	←			28.600 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions



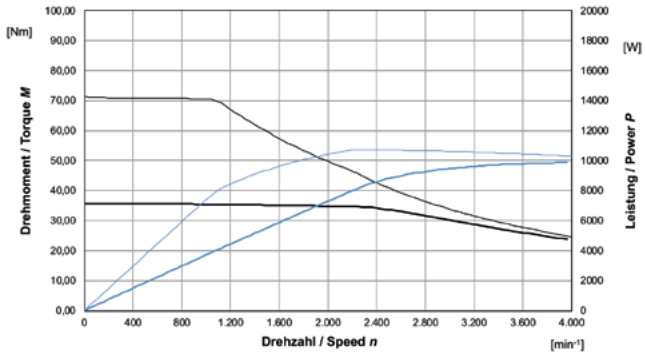
Detailed images:



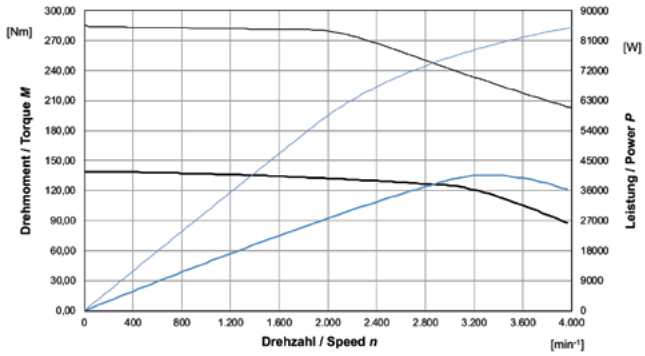
Motor characteristic: size RMIF162-xxxL-1V6S

Options of customization:

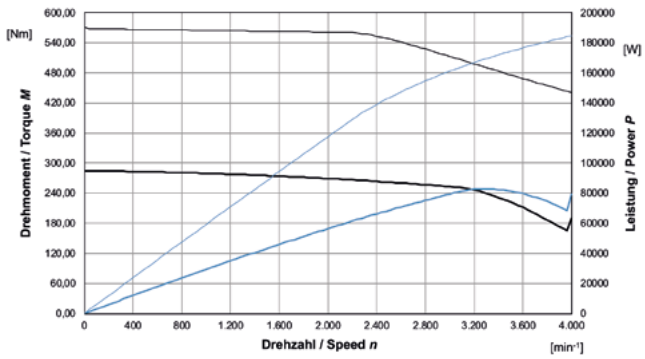
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



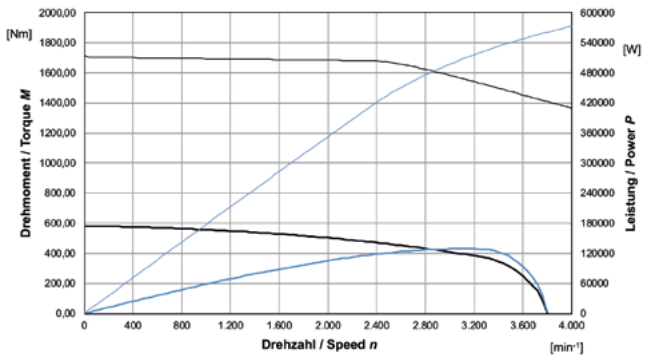
RMIF162-015L-1V6S



RMIF162-060L-1V6S



RMIF162-120L-1V6S



RMIF162-360L-1V6S

Torque motor RMI 200

Technical data: size RMIF200-1V6L-xxxS

Characteristics and nominal values:

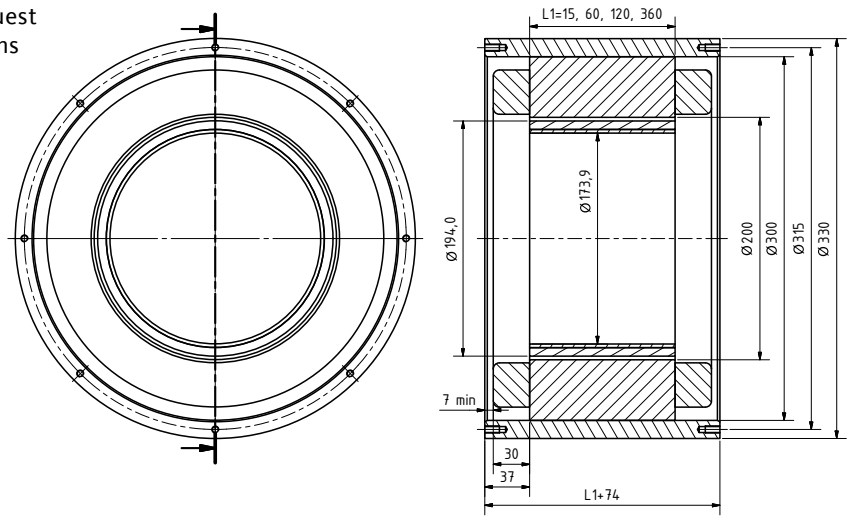
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

Stack length L1	Unit	015L	060L	120L	360L
Torque constant k_m	Nm/A	←			1,915 →
Voltage constant k_e	Vs	←			1,564 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			165 →
Terminal inductance L_{tt}	mH	2,05	0,24	0,097	0,027
Terminal resistance R_{tt}	Ω	1,58	0,216	0,093	0,028
Maximum power P_{max}	kW	15,8	119	258	798
Maximum torque M_{max}	Nm	106	425	851	2.555
Maximum current I_{max}	A	70	280	560	1.680
Thermal resistance R_{th}	K/W	0,038	0,019	0,015	0,004
Continuous stall torque M_0	Nm	51	197	344	1.174
Continuous stall current I_0	A	27,4	104,6	180	621
No-load speed n_0	rpm	←			3.420 →
Number of poles 2p	-	←			40 →
Rated torque M_n	Nm	156	656	1.296	2.985
Rated current I_n	A	53	223	441	1.015
Rated speed n_n	rpm	2.580	2.400	2.340	2.190
Motor inertia J	kgcm²	55,38	221	443	1.329
Motor mass frameless m	kg	5,07	20,18	40,56	122
Dynamic factor $\dot{\omega}$	rad/s²	←			19.212 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions



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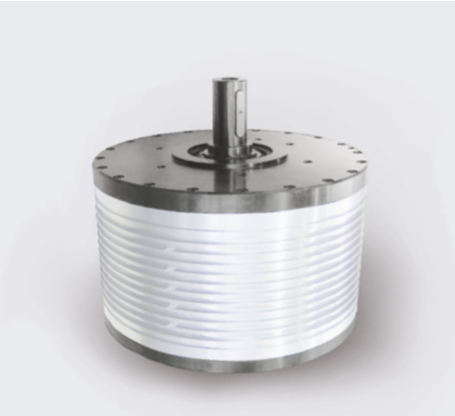
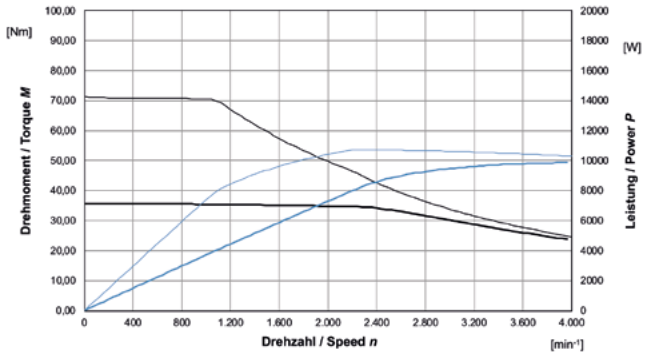


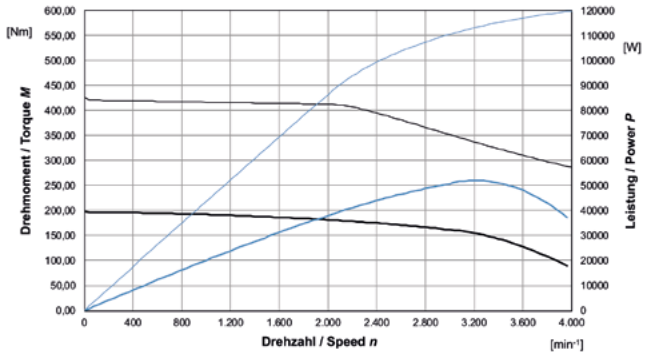
Motor characteristic: size RMIF200-1V6L-xxxS

Options of customization:

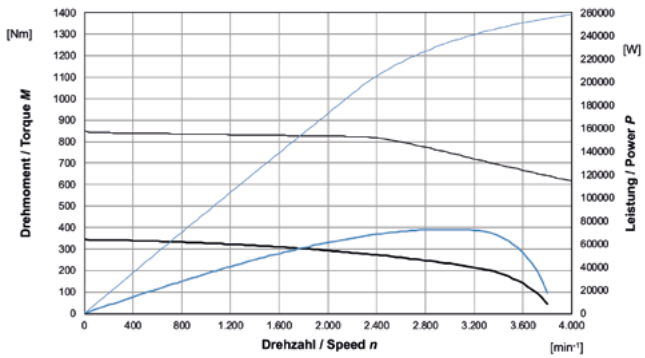
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



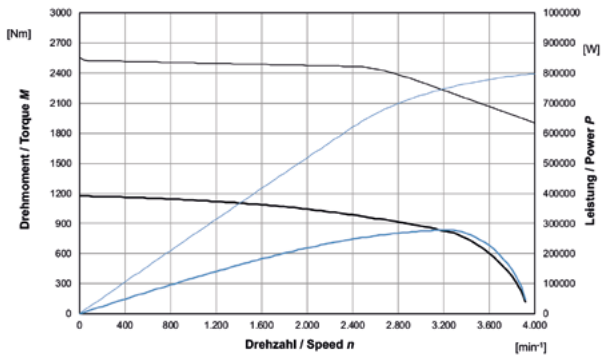
RMIF200-015L-1V6S



RMIF200-060L-1V6S



RMIF200-120L-1V6S



RMIF200-360L-1V6S

Torque motor RMI 250

Technical data: size RMIF250-2V0L-xxxS

Characteristics and nominal values:

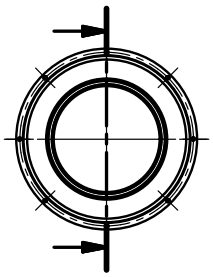
The conditions for the following nominal values are

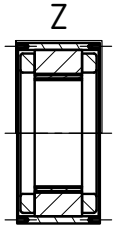
- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

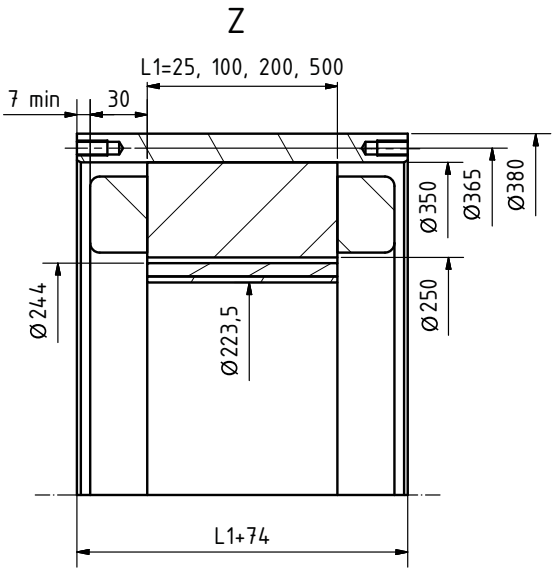
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←			2,442 →
Voltage constant k_e	Vs	←			1,994 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			208 →
Terminal inductance L_{tt}	mH	0,871	0,215	0,108	0,043
Terminal resistance R_{tt}	Ω	0,146	0,021	0,009	0,003
Maximum power P_{max}	kW	58	240	483	1.211
Maximum torque M_{max}	Nm	280	1.120	2.241	5.603
Maximum current I_{max}	A	134	536	1.072	2.680
Thermal resistance R_{th}	K/W	0,073	0,036	0,018	0,008
Continuous stall torque M_0	Nm	139	520	1.131	2.696
Continuous stall current I_0	A	65	242	528	1.257
No-load speed n_0	rpm	←			3.593 →
Number of poles 2p	-	←			48 →
Rated torque M_n	Nm	102	358	783	1.667
Rated current I_n	A	47,4	166	363	865
Rated speed n_n	rpm	3.200	2.360	2.200	2.160
Motor inertia J	kgcm²	192	771	1.543	3.858
Motor mass frameless m	kg	10,2	40,6	82	205
Dynamic factor $\dot{\omega}$	rad/s²	←			14.342 →

Dimensions of the frameless motor:

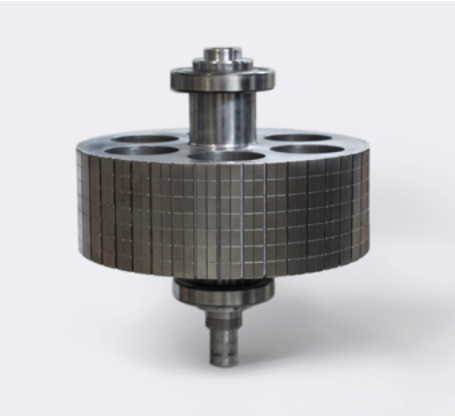
- with potted stator
- user manual available on request
- option: customized dimensions







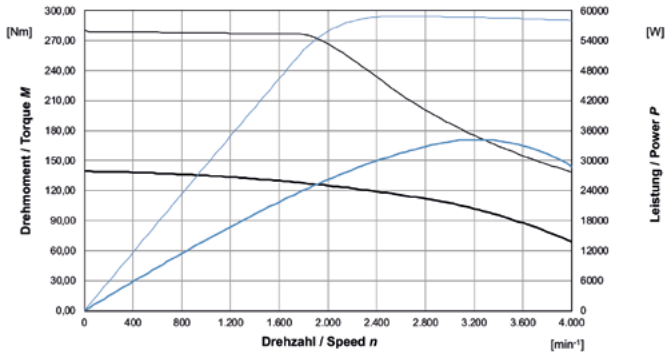
Detailed images:



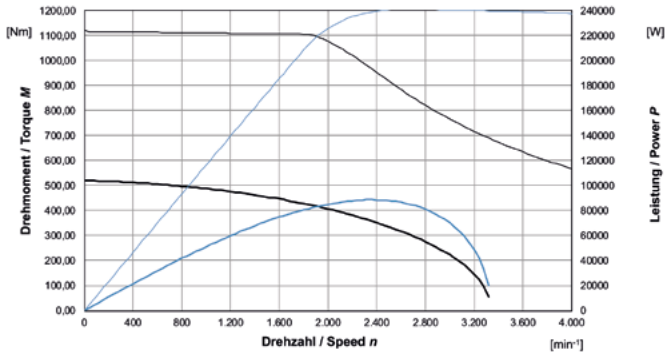
Motor characteristic: size RMIF250-2V0L-xxxS

Options of customization:

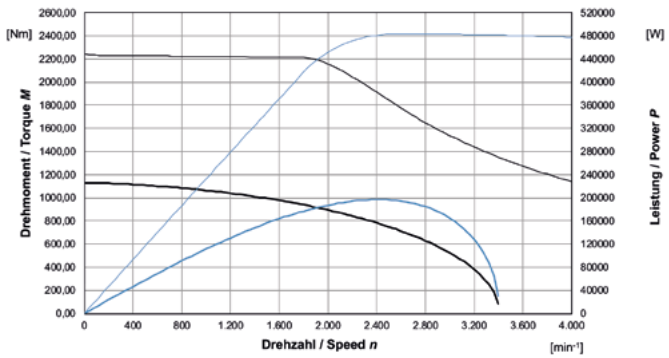
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



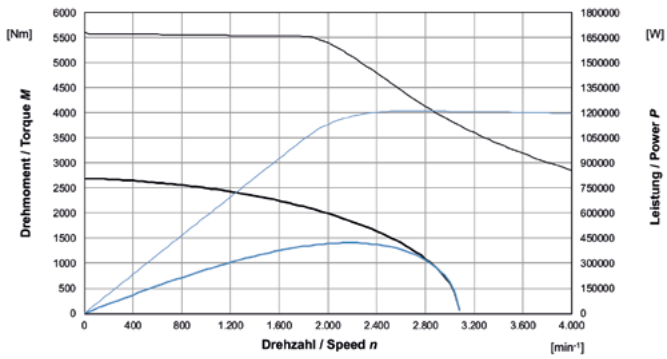
RMIF250-025L-2V0T



RMIF250-100L-2V0T



RMIF250-200L-2V0T



RMIF250-500L-2V0T

Torque motor RMI 320

Technical data: size RMIx320-2V7L-xxxS

Characteristics and nominal values:

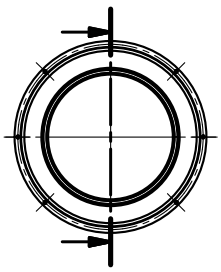
The conditions for the following nominal values are

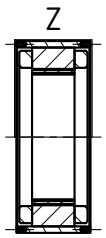
- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

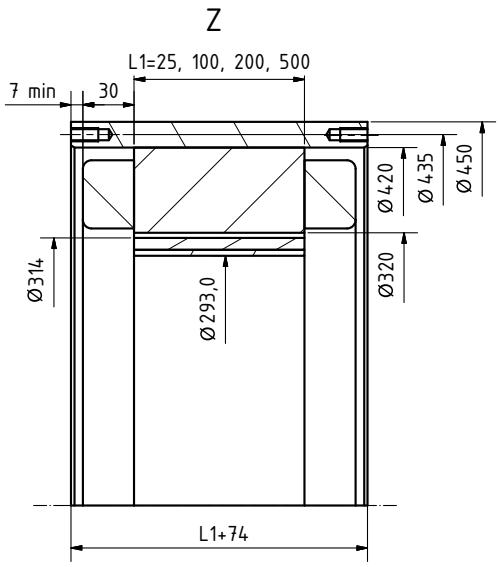
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←			3,357 →
Voltage constant k_e	Vs	←			2,741 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			287 →
Terminal inductance L_{tt}	mH	0,678	0,168	0,084	0,033
Terminal resistance R_{tt}	Ω	0,163	0,023	0,01	0,004
Maximum power P_{max}	kW	76	311	626	1.569
Maximum torque M_{max}	Nm	464	1.857	3.714	9.286
Maximum current I_{max}	A	167	668	1.336	3.340
Thermal resistance R_{th}	K/W	0,057	0,02	0,011	0,005
Continuous stall torque M_0	Nm	204	898	1.815	4.329
Continuous stall current I_0	A	70	309	625	1.489
No-load speed n_0	rpm	←			2.613 →
Number of poles 2p	-	←			64 →
Rated torque M_n	Nm	156	656	1.296	2.985
Rated current I_n	A	53	223	441	1.015
Rated speed n_n	rpm	2.580	2.400	2.340	2.190
Motor inertia J	kgcm²	420	1.681	3.363	8.407
Motor mass frameless m	kg	12,7	50,8	101,8	254
Dynamic factor $\dot{\omega}$	rad/s²	←			11.052 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions



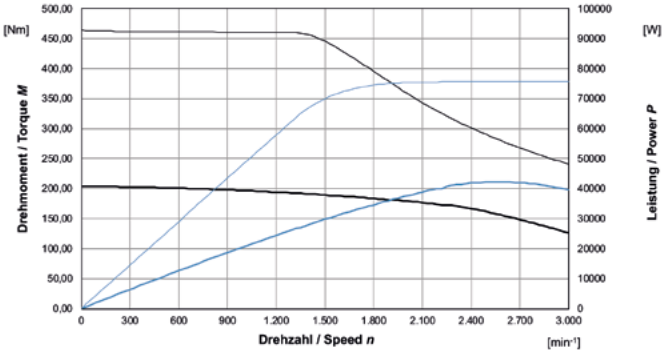




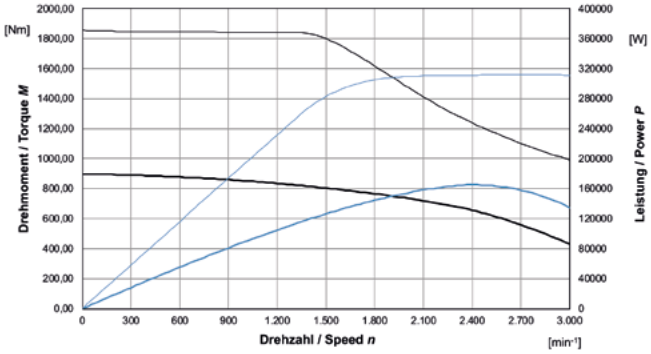
Motor characteristic: size RMIx320-2V7L-xxxS

Options of customization:

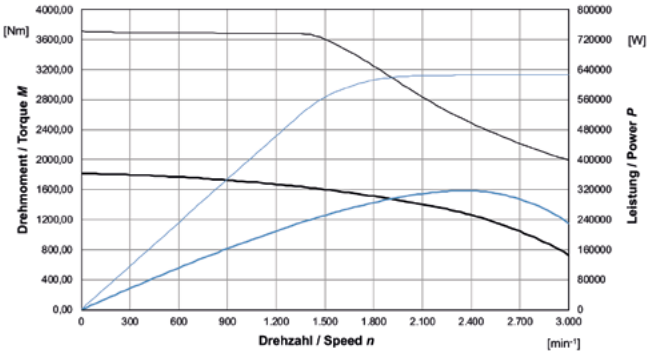
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



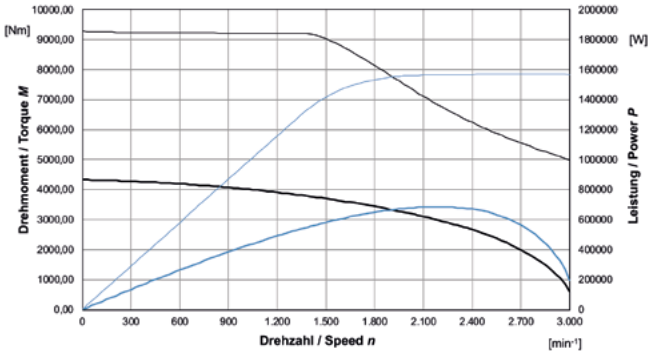
RMIF320-025L-2V7T



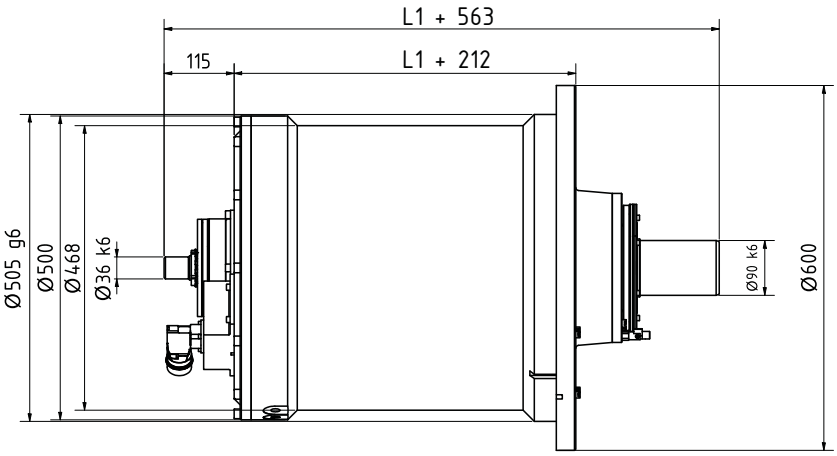
RMIF320-100L-2V7T



RMIF320-200L-2V7T



RMIF320-500L-2V7T



RMIH320-xxx motor with housing

Torque motor RMI 400

Technical data: size RMIF400-2V7L-xxxS

Characteristics and nominal values:

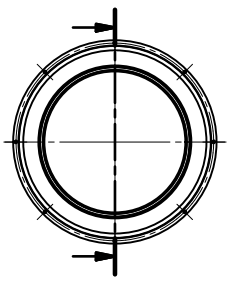
The conditions for the following nominal values are

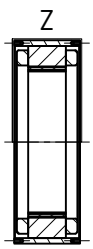
- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

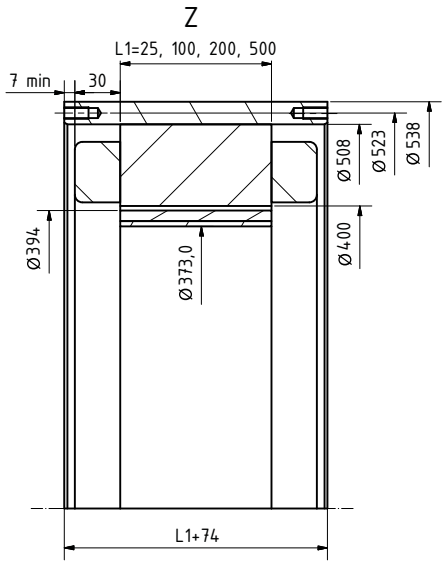
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←			3,357 →
Voltage constant k_e	Vs	←			2,741 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			287 →
Terminal inductance L_{tt}	mH	0,194	0,048	0,024	0,010
Terminal resistance R_{tt}	Ω	0,100	0,014	0,006	0,002
Maximum power P_{max}	kW	176	718	1.442	3.614
Maximum torque M_{max}	Nm	730	2.920	5.814	14.603
Maximum current I_{max}	A	242	968	1.936	4.848
Thermal resistance R_{th}	K/W	0,036	0,016	0,009	0,004
Continuous stall torque M_0	Nm	364	1.429	2.800	6.924
Continuous stall current I_0	A	112,7	441	896	2.132
No-load speed n_0	rpm	←			2.613 →
Number of poles 2p	-	←			80 →
Rated torque M_n	Nm	252	978	1.954	4.716
Rated current I_n	A	76,6	296	591	1.424
Rated speed n_n	rpm	1.944	1.632	1.008	1.008
Motor inertia J	kgcm²	850	3.401	6.803	17.008
Motor mass frameless m	kg	17	67	134	335
Dynamic factor $\dot{\omega}$	rad/s²	←			8.602 →

Dimensions of the frameless motor:

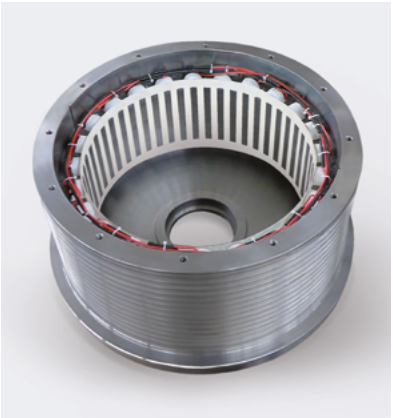
- with potted stator
- user manual available on request
- option: customized dimensions

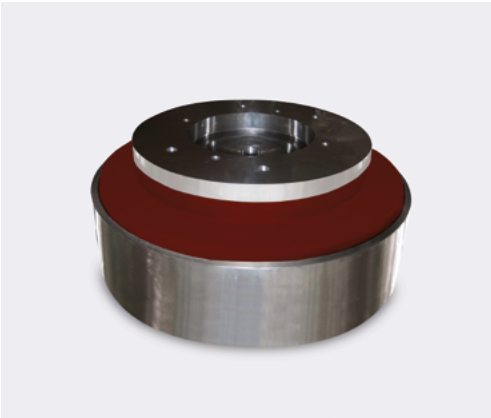






Detailed images:

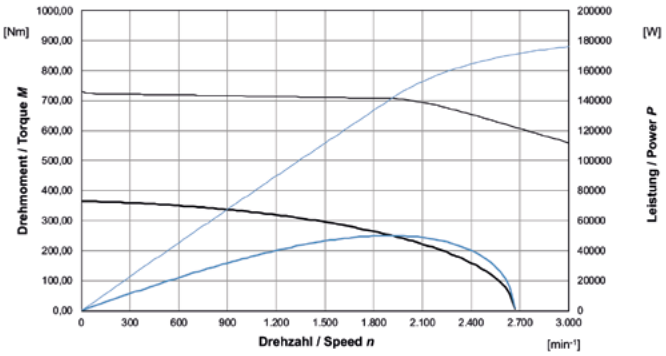




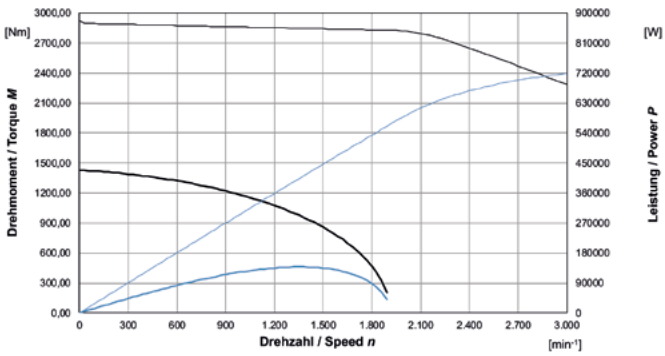
Motor characteristic: size RMIF400-2V7L-xxxS

Options of customization:

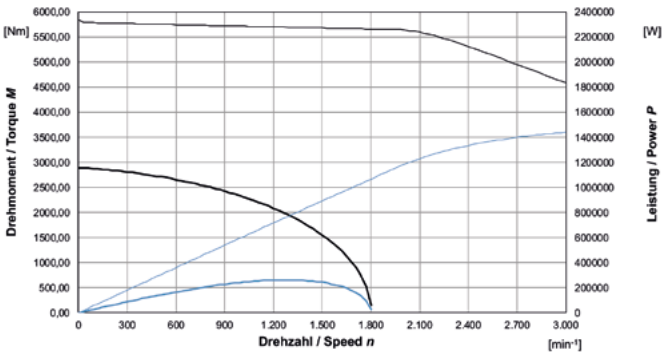
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



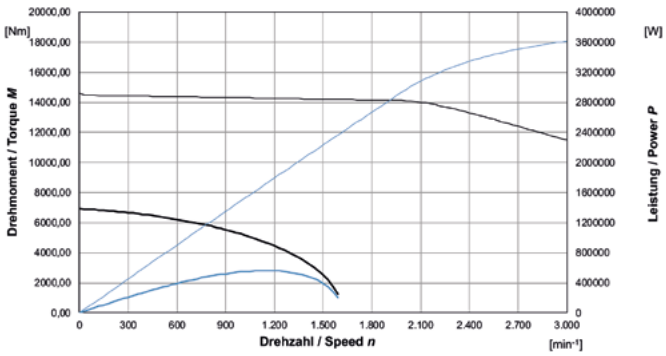
RMIF400-025L-2V7T



RMIF400-100L-2V7T



RMIF400-200L-2V7T



RMIF400-500L-2V7T

Torque motor RMI 500

Technical data: size RMIF500-xxxL-xxxS

Characteristics and nominal values:

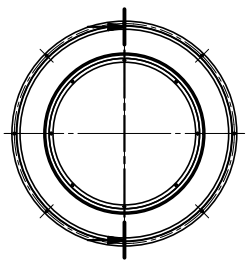
The conditions for the following nominal values are

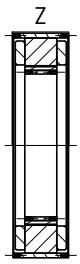
- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

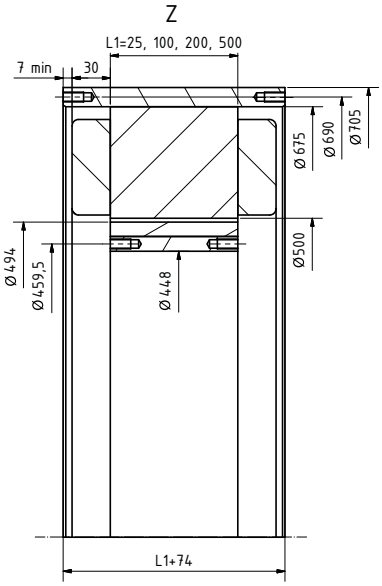
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←	4,395	←	8,790 →
Voltage constant k_e	Vs	←	3,558	←	7,177 →
Back emf U_{ipk}	$V_{@1000rpm}$	←	375	←	750 →
Terminal inductance L_{tt}	mH	0,133	0,033	0,066	0,026
Terminal resistance R_{tt}	Ω	0,055	0,008	0,014	0,005
Maximum power P_{max}	kW	231	938	960	2.410
Maximum torque M_{max}	Nm	1.150	4.600	9.213	23.000
Maximum current I_{max}	A	320	1.280	1.280	3.100
Thermal resistance R_{th}	K/W	0,022	0,009	0,005	0,002
Continuous stall torque M_0	Nm	766	3.066	5.079	15.333
Continuous stall current I_0	A	195	781	792	1.953
No-load speed n_0	rpm	1.996	1.006	998	998
Number of poles 2p	-	←			96 →
Rated torque M_n	Nm	764	2.139	5.216	12.627
Rated current I_n	A	145	521	650	1.567
Rated speed n_n	rpm	1.944	1.632	1.008	1.008
Motor inertia J	kgm²	0,173	0,694	1,388	3,469
Motor mass frameless m	kg	33,3	121,1	266,1	665
Dynamic factor $\dot{\omega}$	rad/s²	←			6.630 →

Dimensions of the frameless motor:

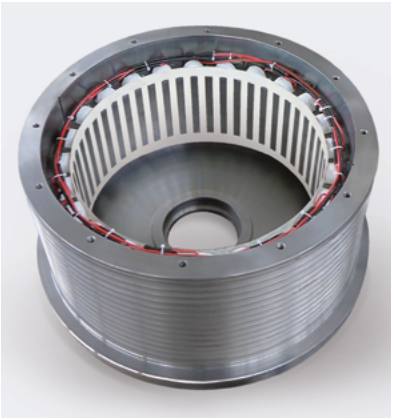
- with potted stator
- user manual available on request
- option: customized dimensions

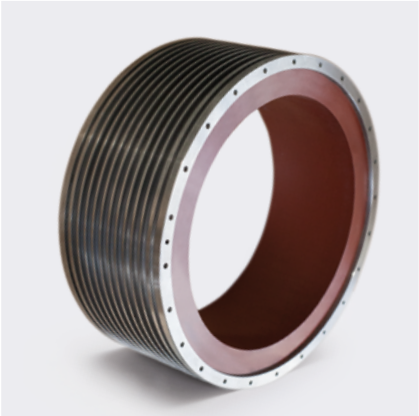






Detailed images:

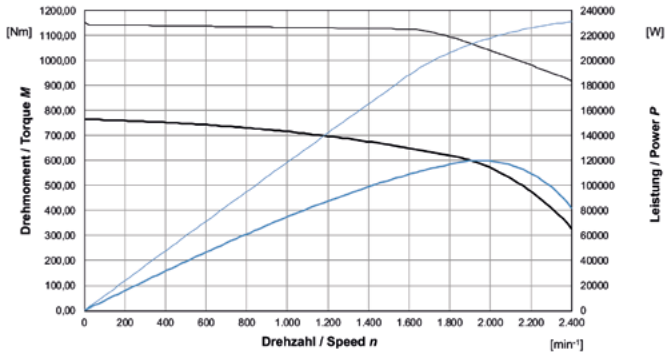




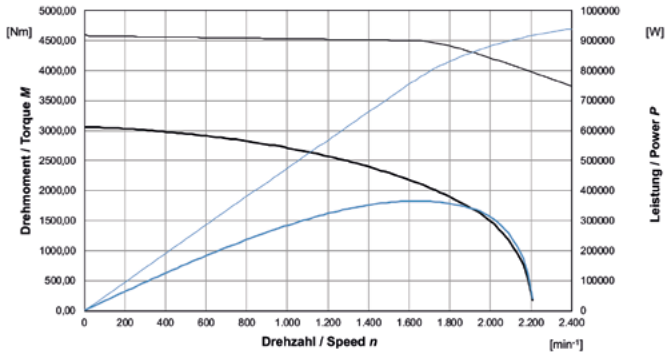
Motor characteristic: size RMIF500-xxxL-xxxS

Options of customization:

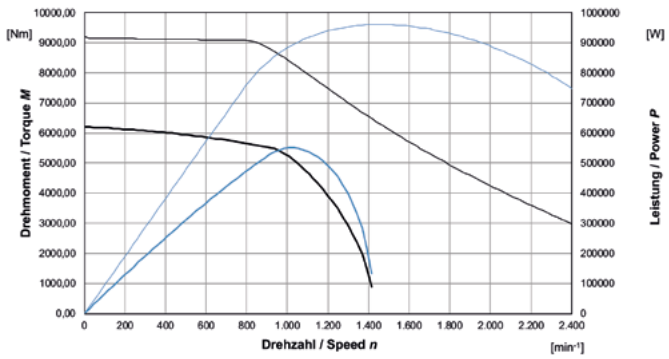
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



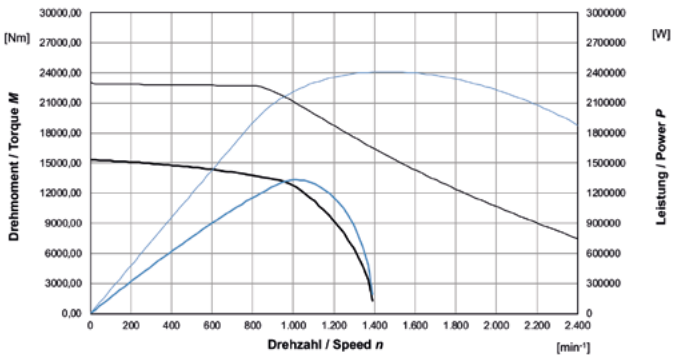
RMIF500-025L-3V6T



RMIF500-100L-3V6T



RMIF500-200L-7V2T



RMIF500-500L-7V2T

Torque motor RMI 640

Technical data: size RMIF640-xxxL-xxxS

Characteristics and nominal values:

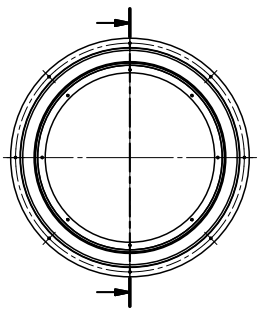
The conditions for the following nominal values are

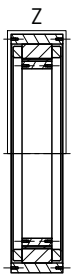
- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

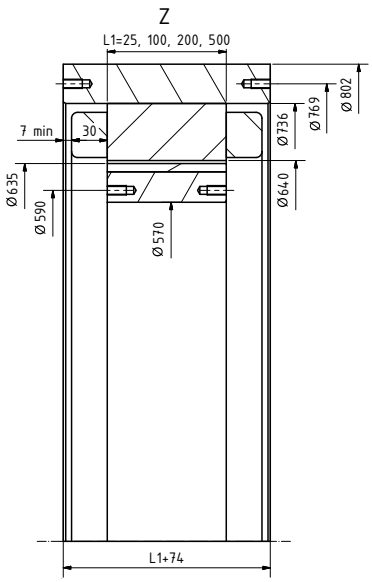
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←	4,395	←	8,790 →
Voltage constant k_e	Vs	←	3,558	←	7,177 →
Back emf U_{ipk}	$V_{@1000rpm}$	←	375	←	750 →
Terminal inductance L_{tt}	mH	0,1330	0,0328	0,0656	0,0262
Terminal resistance R_{tt}	Ω	0,034	0,0049	0,0086	0,0032
Maximum power P_{max}	kW	314	1.286	1.291	3.240
Maximum torque M_{max}	Nm	1.898	7.595	15.190	37.976
Maximum current I_{max}	A	470	1.880	1.880	4.700
Thermal resistance R_{th}	K/W	0,016	0,0067	0,0032	0,0016
Continuous stall torque M_0	Nm	1.254	5.129	11.170	26.594
Continuous stall current I_0	A	285	1.167	1.270	3.035
No-load speed n_0	rpm	2.000	2.000	1.000	1.000
Number of poles 2p	-	←			120 →
Rated torque M_n	Nm	912	3.477	8.339	19.750
Rated current I_n	A	207	791	948	2.246
Rated speed n_n	rpm	1.824	1.488	1.056	1.032
Motor inertia J	kgm²	0,416	1,664	3,329	8,321
Motor mass frameless m	kg	19,68	95,10	190,10	475,80
Dynamic factor $\dot{\omega}$	rad/s²	←			4.552 →

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions







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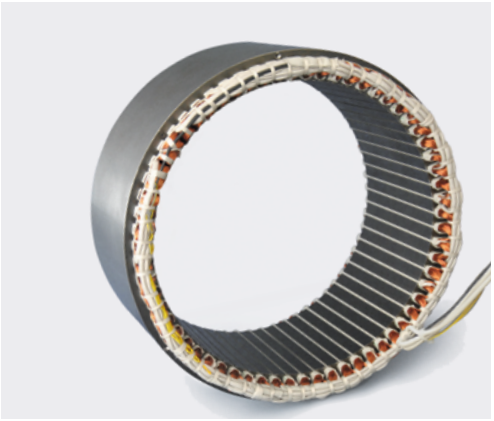
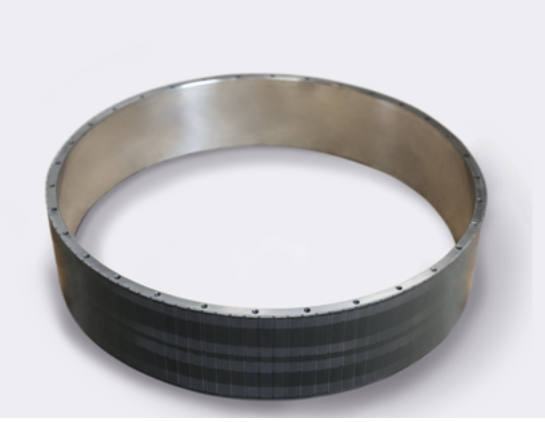
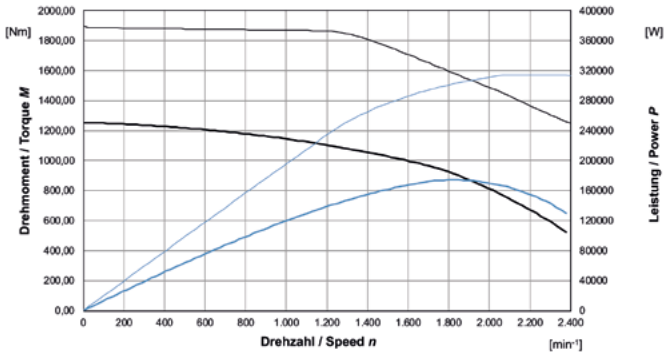




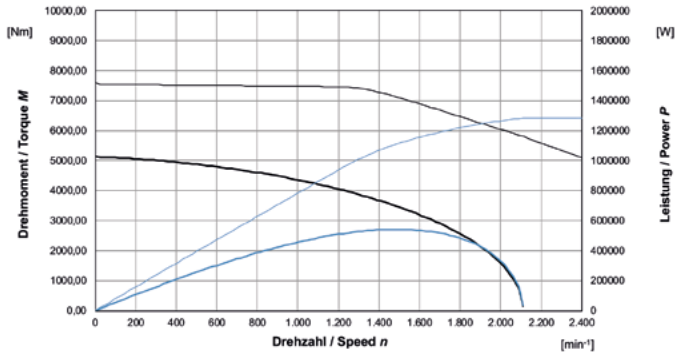
Motor characteristic: size RMIF640-xxxL-xxxS

Options of customization:

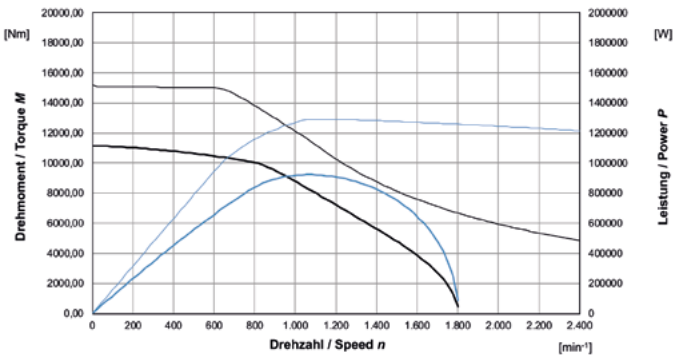
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



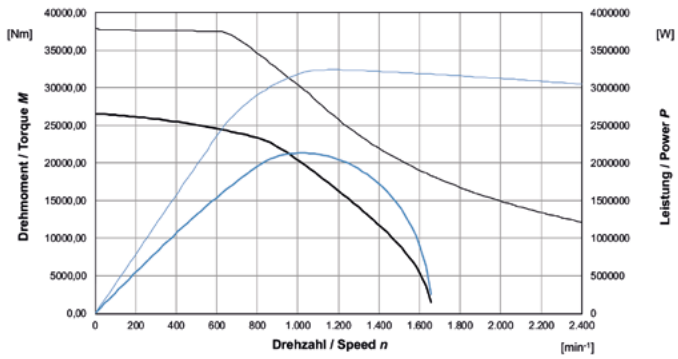
RMIF640-025L-3V6T



RMIF640-100L-3V6T



RMIF640-200L-7V2T



RMIF640-500L-7V2T

Torque motor RMI 800

Technical data: size RMIF800-xxxL-4V6T

Characteristics and nominal values:

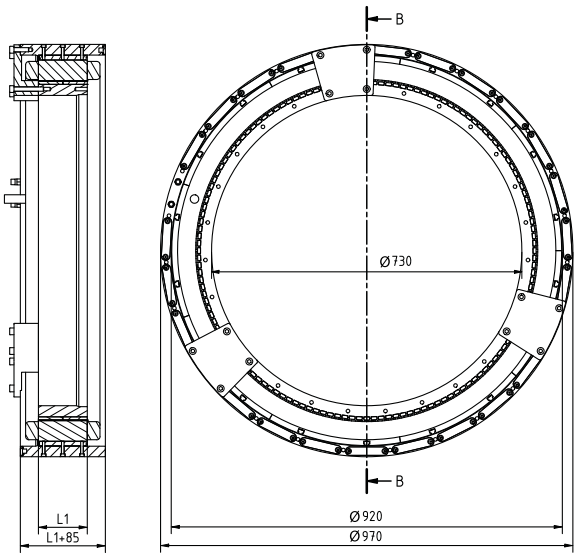
The conditions for the following nominal values are

- DC bus voltage of 750 V (530 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 140 °C (In.CL.F)
- liquid cooling with water-antifreeze

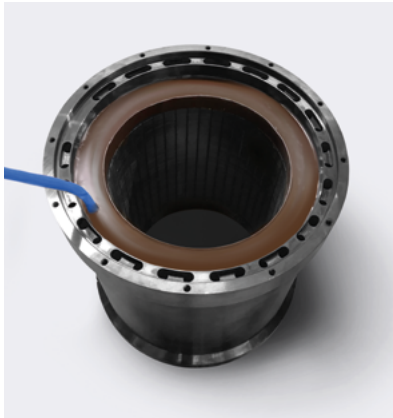
Stack length L1	Unit	025L	100L	200L	500L
Torque constant k_m	Nm/A	←			5,691 →
Voltage constant k_e	Vs	←			4,647 →
Back emf U_{ipk}	$V_{@1000rpm}$	←			486 →
Terminal inductance L_{tt}	mH	0,165	0,041	0,021	0,008
Terminal resistance R_{tt}	Ω	0,023	0,008	0,003	0,001
Maximum power P_{max}	kW	246	977	1.973	4.933
Maximum torque M_{max}	Nm	2.839	11.356	22.713	56.782
Maximum current I_{max}	A	600	2.400	4.800	12.000
Thermal resistance R_{th}	K/W	0,019	0,005	0,002	0,001
Continuous stall torque M_0	Nm	1.808	6.175	15.028	37.669
Continuous stall current I_0	A	367	1.241	3.058	7.674
No-load speed n_0	rpm	←			1.541 →
Number of poles 2p	-	←			144 →
Rated torque M_n	Nm	1.209	4.432	9.932	24.888
Rated current I_n	A	249	877	1.974	4.947
Rated speed n_n	rpm	1.760	1.700	1.760	1.541
Motor inertia J	kgm²	2,08	8,16	17	42
Motor mass frameless m	kg	46	180	357	894
Dynamic factor $\dot{\omega}$	rad/s²	←			1.365 →

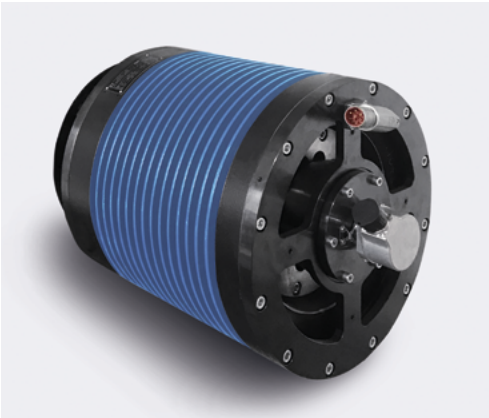
Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions



Detailed images:

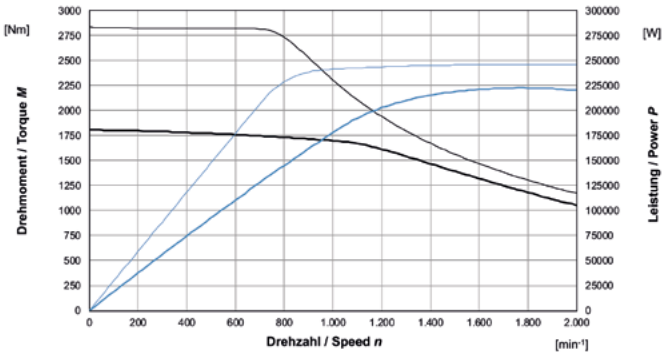




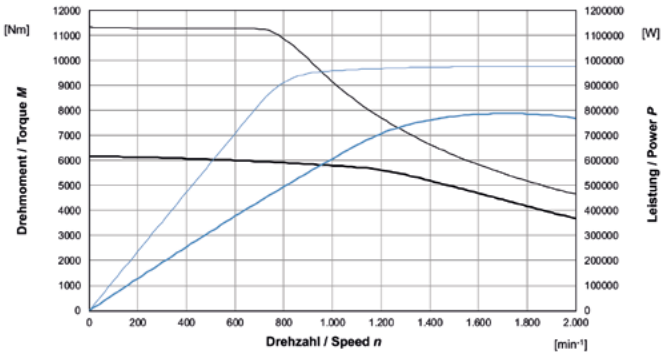
Motor characteristic: size RMIF800-xxxL-4V6T

Options of customization:

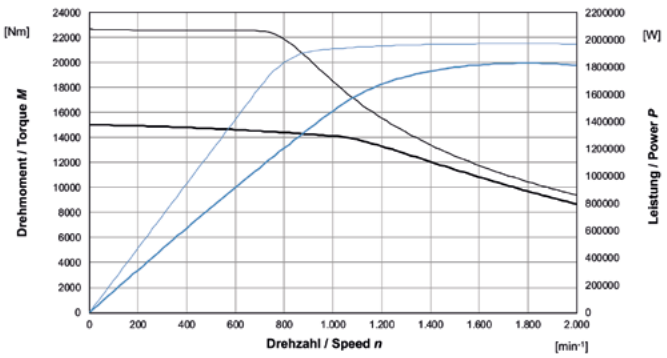
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



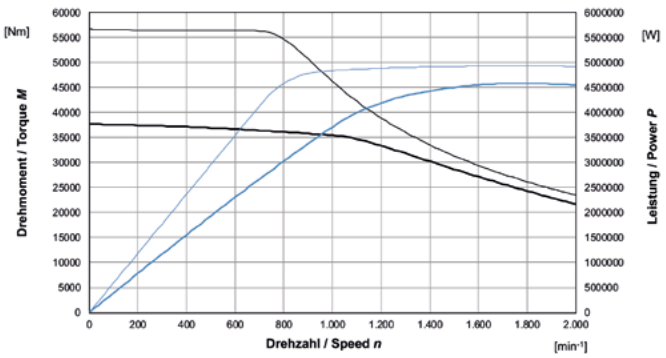
RMIF800-025L-4V6T



RMIF800-100L-4V6T



RMIF800-200L-4V6T



RMIF800-500L-4V6T

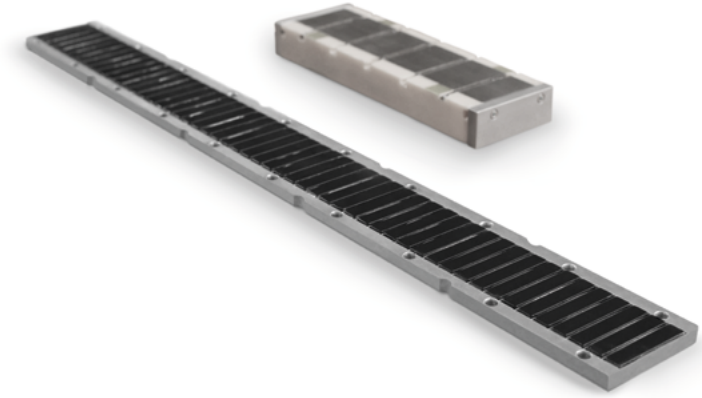
Linear motors

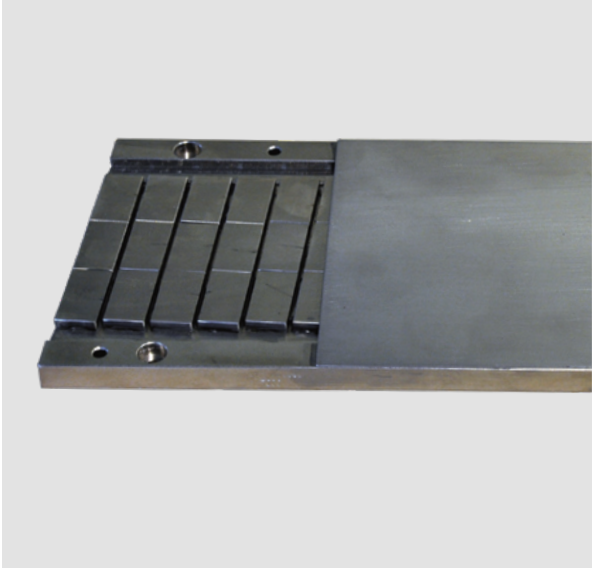
Linear motors can be used as direct drives wherever the highest dynamics and precision with a long lifespan (up to 1 billion cycles) are required. The customer-specific modification of the direct drives from FGB enables linear motors to be optimally adapted to the conditions of the machine and perfect integration. If required, we will also use designs and materials that are not commonplace, in order to offer our customers the best result possible. The range of services offered by FGB covers the complete process chain: Calculation, design engineering and production of linear motors are carried out in close coordination with the customer. FGB offers individual components in the form of primary and secondary parts as well as complete linear motor systems. In general, FGB motors are characterized by a compact design with high force density. For cooling, the direct drives can be used to generate a thrust force of up to 12 N/cm^2. Different speeds and DC link voltages are realized with corresponding windings. Besides FGB is also experienced in the field of short and long stators.

Overview – linear motors

Module length	Stack length L	DC bus voltage	Continuous stall force	Continuous stall current	Peak force	Nominal speed	Motor terminal resistance
		U_{DC} [v]	F_0 [N]	$I_{0\,rms}$ [A]	F_{max} [N]	v_n [m/s]	R_{tt} @20 °C [Ω]
LM136-050L	050	560	549	8,5	820	8	3,100
LM136-100L	100	560	1.099	17	1.641	8	1,540
LM272-100L	100	560	2.198	33,8	3.282	8	0,770
LM272-400L	400	560	8.790	135	13.128	8	0,190
LM136-050LMM	050	560	466	7,2	709	6	4,260
LM136-100LMM	100	560	933	14,3	1.641	6	2,130
LM272-100LMM	100	560	1.887	28	2.827	8	1,110
LM272-400LMM	400	560	7.272	114	11.236	7	0,270

Detailed images:





Motor terminal inductance	Mass of mover	Voltage constant	Force constant	Dynamic factor	Mass without brake	Minimum flow rate	dimensions without brake
L_{tt} [mH]	m [kg]	k_e [Vs/m]	k_m [N/A_{rms}]	a [m/s²]	m [kg]	Q [liter/min]	LM x L [mm x mm]
28,900	1,0	55,80	68,4	831	2,85	2,5	136 x 050
7,230	2,0	55,80	68,4	831	5,7	5	136 x 100
7,230	8,0	55,80	68,4	831	15,4	7,5	272 x 100
0,170	16,0	55,80	68,4	831	42,9	10	272 x 400
39,800	0,5	55,80	68,4	1.400	2,45	2,5	136 x 050
19,900	1,0	55,80	68,4	1.400	4,7	5	136 x 100
10,200	2,0	55,80	68,4	1.400	9,4	7,5	272 x 100
2,540	8,0	55,80	68,4	1.400	34,9	10	272 x 400

Linear motor LM 136

Technical data: size LMx136-xxxL-056S

Characteristics and nominal values:

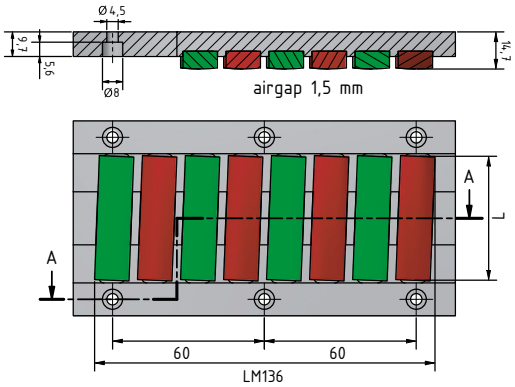
The conditions for the following nominal values are

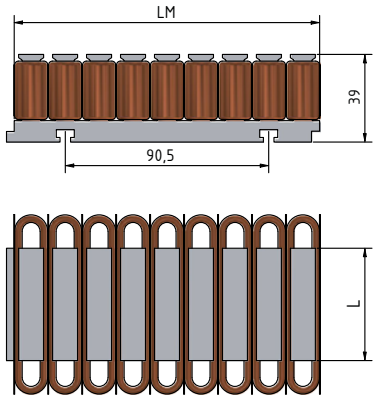
- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 180 °C (In.CL.H)
- liquid cooling with water-antifreeze

Motor length LM x stack length L	Unit	136-050L	136-100L	272-100L	272-400L
Force constant k_m	N/A	←			68,4 →
Voltage constant k_e	Vs/m	←			55,8 →
Back emf U_{ipk}	$V_{@1m/s}$	←			55,8 →
Terminal inductance L_{tt}	mH	28,9	7,23	7,23	1,8
Terminal resistance R_{tt}	Ω	3,1	1,54	0,77	0,19
Maximum power P_{max}	kW	3,28	6,56	13,1	52
Maximum force F_{max}	N	820	1.641	3.282	13.128
Maximum current I_{max}	A	15	30	60	240
Thermal resistance R_{th}	K/W	0,270	0,135	0,065	0,017
Continuous stall force F_0	N	549	1.099	2.198	8.790
Continuous stall current I_0	A	8,5	17	33,8	135
No-load speed v_0	m/s	←			10 →
Width of poles T	mm	←			17 →
Rated force F_n	Nm	357	779	1.558	6.230
Rated current I_n	A	5	12	23	94
Rated speed v_n	m/s	8	8	8	8
Weight active part m	m/s	1,85	3,7	7,4	26,9
Weight of rail m	kg/m	7,25	14,5	29	116
Dynamic long stator a	m/s²	←			831 →
Dynamic short stator a	m/s²	←			443 →
Radial force Fr	N	2.720	5.540	10.880	44.520

Dimensions of the frameless motor:

- with potted stator
- user manual available on request
- option: customized dimensions

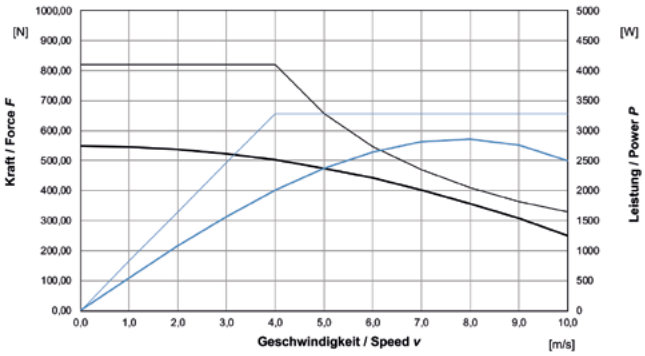




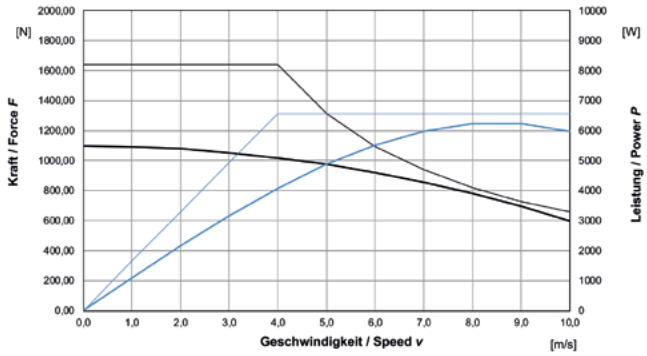
Motor characteristic: size LMx136-xxxL-056S

Options of customization:

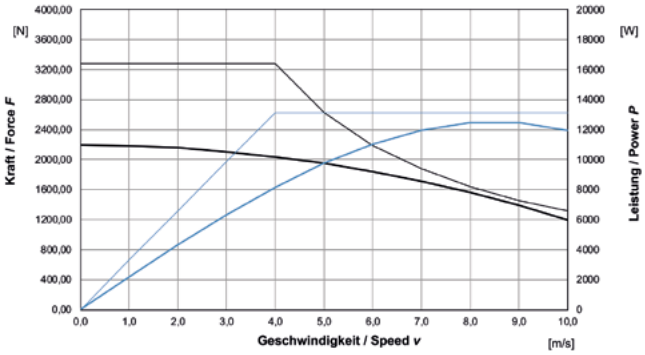
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



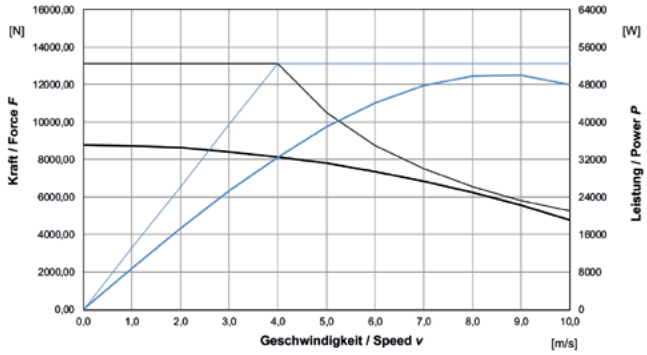
LM136-050L-040S



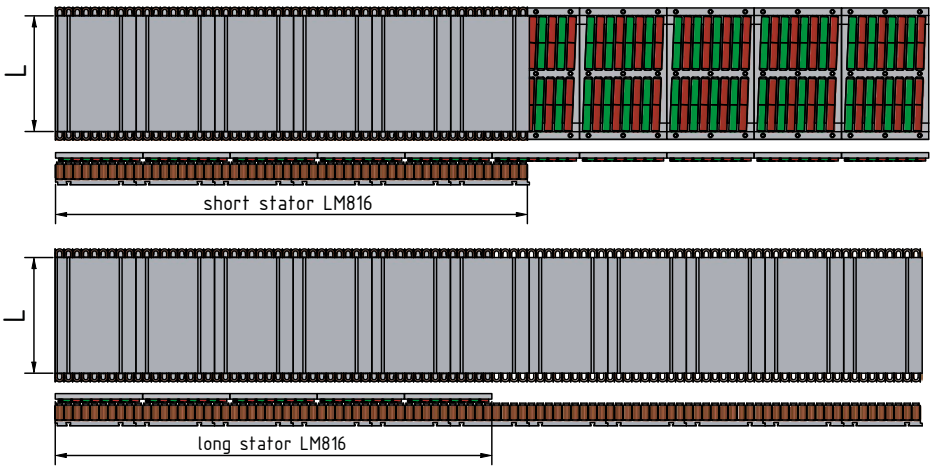
LM136-100L-040S



LM272-100L-040S



LM272-400L-040T



Linear motor LM 136MM

Technical data: size LMx136MM-xxxL-056S

Characteristics and nominal values:

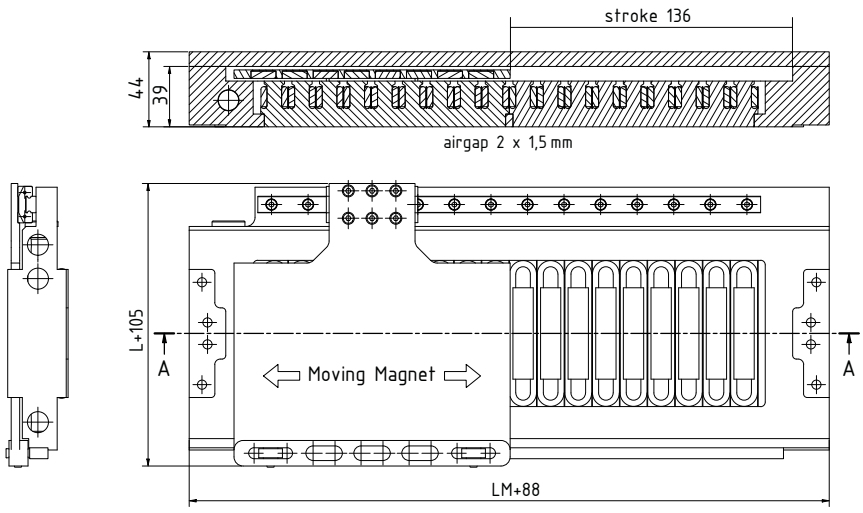
The conditions for the following nominal values are

- DC bus voltage of 560 V (400 V_{AC})
- ambient temperature of 40 °C
- maximum winding temperature of 180 °C (In.CL.H)
- liquid cooling with water-antifreeze

Motor length LM x stack length L	Unit	136-050L	136-100L	272-100L	272-400L
Force constant k_m	N/A	←			68,4 →
Voltage constant k_e	Vs/m	←			55,8 →
Back emf U_{ipk}	$V_{@1m/s}$	←			55,8 →
Terminal inductance L_{tt}	mH	39,8	19,9	10,2	2,54
Terminal resistance R_{tt}	Ω	4,26	2,13	1,11	0,27
Maximum power P_{max}	kW	2,2	4,09	8,48	33,7
Maximum force F_{max}	N	709	1.641	2.827	11.236
Maximum current I_{max}	A	13	25	51	204
Thermal resistance R_{th}	K/W	0,270	0,135	0,065	0,017
Continuous stall force F_0	N	466	933	1.867	7.272
Continuous stall current I_0	A	7,2	14,3	28,4	114
No-load speed v_0	m/s	←			10 →
Width of poles T	mm	←			17 →
Rated force F_n	Nm	353	779	1.036	4.826
Rated current I_n	A	5,3	11,7	16	73
Rated speed v_n	m/s	6	6	8	7
Weight active part m	m/s	1,85	3,7	7,4	26,9
Weight of mover m	kg	0,5	1	2	8
dynamic a	m/s²	←			1.400 →
Radial force Fr	N	±300	±600	±1.100	±4.300

Dimensions of the frameless motor:

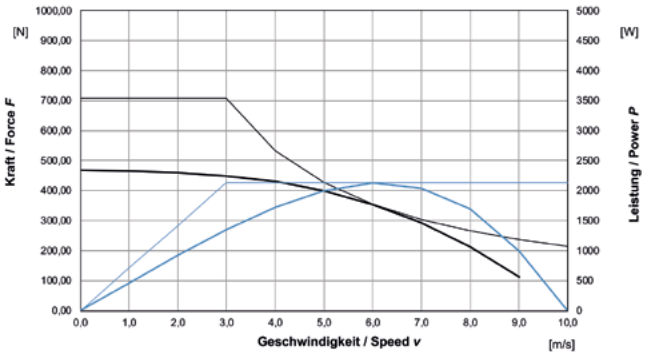
- with potted stator
- user manual available on request
- option: customized dimensions



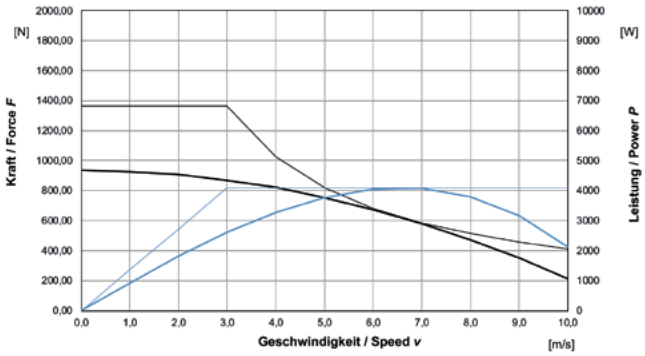
Motor characteristic: size LMx136MM-xxxL-056S

Options of customization:

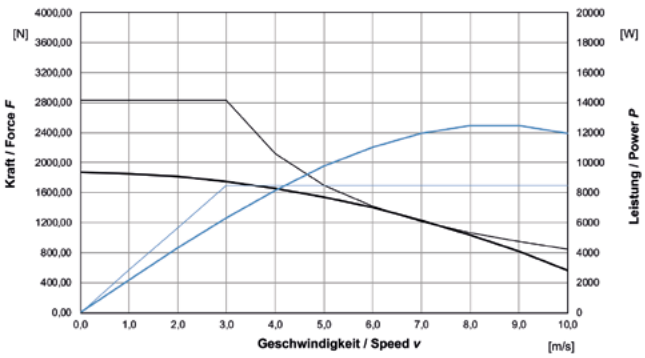
- voltage range from 5 – 750 V
- demand of speed, current and power
- stator frequency up to 2400 Hz
- temperature range -55 °C – +260 °C
- explosion proof increased safety
- vacuum 10^{-9} mbar, inert gas atmosphere
- radhard, dose 3 - 10 - 100 MGy-Si
- cooling: liquid, fan, air, oil
- certification on demand UL, Ex, CE
- motor with housing, encoder and brake



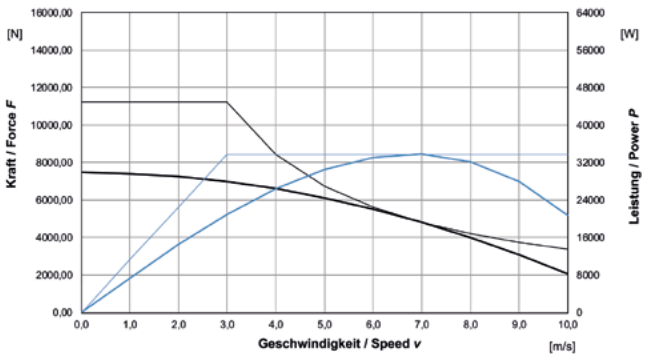
LM136MM-050L-056S



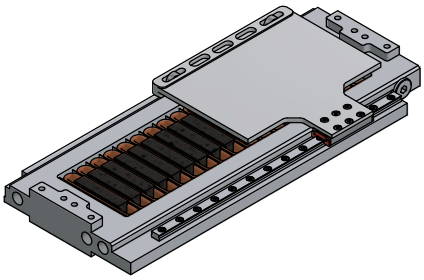
LM136MM-100L-056S



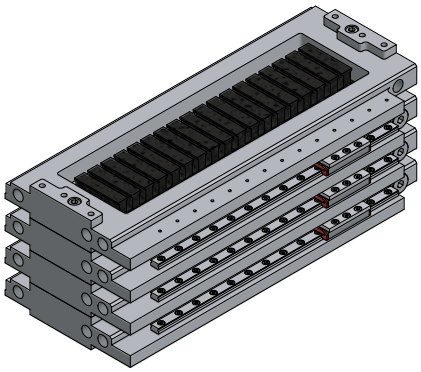
LM272MM-100L-056S



LM272MM-400L-056T



LM136MM-xxxL single motor



LM136MM-xxxL stacked motors

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