

L-force

Three-phase AC motors



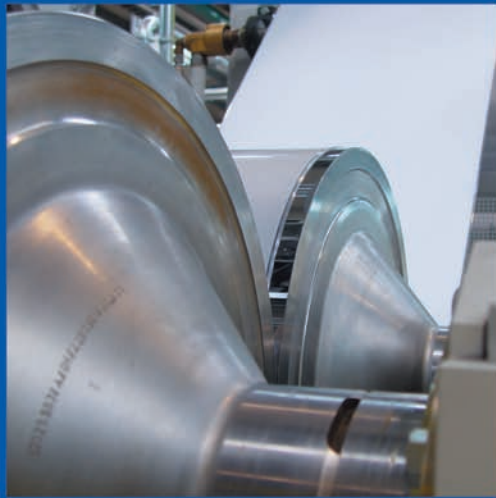
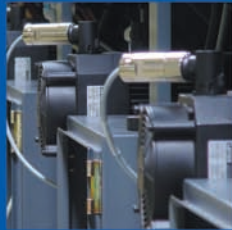
Efficient and precisely tailored

NEW

Lenze

This is what we stand for.

You want to implement your machine and plant concepts efficiently and easily or optimise existing concepts to reduce costs? Then, Lenze is the partner you are looking for. For more than 60 years, drive and automation systems have been our core competence.

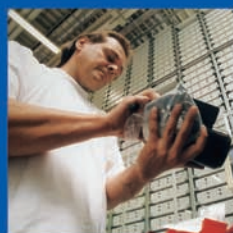


Drive and automation technology set in motion by Lenze – for example in logistics centres, in the textile and printing industry, in the automotive industry or as the driving force behind robots.

Lenze | about us

We can offer you automation solutions including control, visualisation and drive technology from a single source. Our drive systems will improve the performance of your machines. From project planning to commissioning, we have the know-how, whilst our international sales and service network can provide you with expert help and advice at any time.

Cut your process costs and increase your ability to compete. Let us analyse your drive technology tasks and support you with made-to-measure solutions. We can take an integrated approach to projects thanks to the scalability of our products and the scope of the overall portfolio. We can get the best from your machines and systems.



At your side all over the world – with thorough and professional support from our motivated team.

L-force | Your future is our drive

Demands are increasing all the time. In future, key challenges will lie in the areas of cost efficiency, time-saving and quality improvements. Faster project planning and commissioning, improved performance and increased flexibility in production are expected. New ideas are therefore needed for the machines of the future.

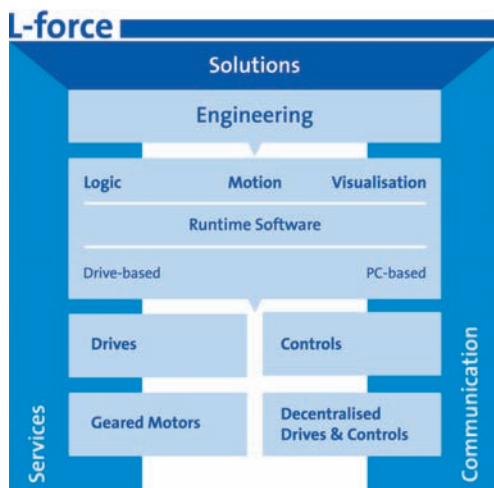
Lenze has risen to this challenge and, with L-force, we can now not only offer you an innovative family of drive and automation products, but also a new, comprehensive portfolio of solutions.

Driven by innovation – new ideas that open up new opportunities

Always on the lookout. Our idea of innovation is striving for better solutions for our customers every single day.

Driven by flexibility –

High degree of scalability for individual solutions Scalability is an important aspect of the L-force philosophy. Performance, scope of functions, software, service provisions and aftersales care – Lenze will provide you with exactly the combination you require.



Driven by usability – Simple solutions, even for complex applications

We always focus on the user. Therefore, when we developed L-force, we made sure that people with sufficient practical experience were involved, right from the start.

Driven by compatibility – Universal products and solutions

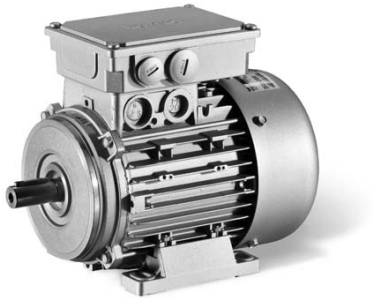
There is no need to waste time looking for suitable components and the right interfaces. With L-force, every element is perfectly matched.

Our drive is "rightsized" – the perfect solution for your application

We call it rightsizing: Optimise your processes with the new three-phase AC motors from Lenze and increase your added value.

www.L-force.de

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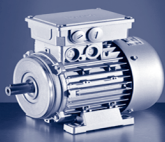
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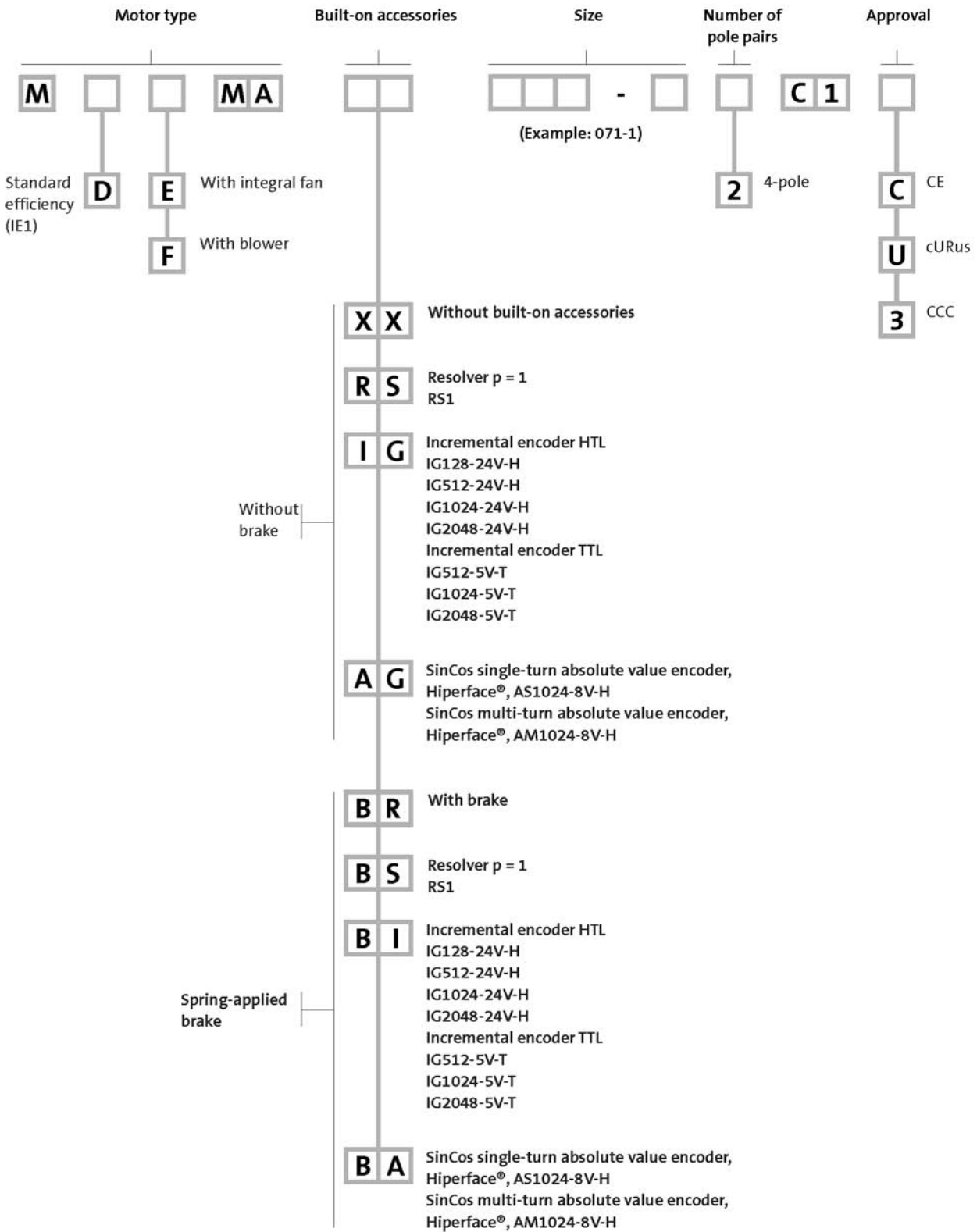
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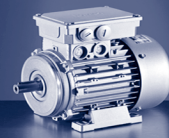
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General Product key

Three-phase AC motors

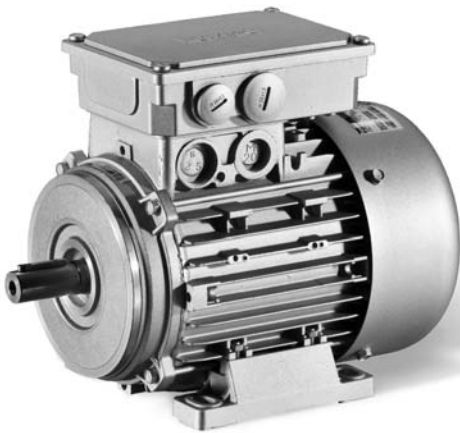


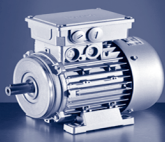


For a long time now, three-phase AC motors from Lenze have been established in virtually all industrial sectors. Based on our many years of experience in the field of drive and automation technology, we have developed a motor, which will ensure that your demands in terms of productivity, quality and availability are perfectly met.

Three-phase AC motors from the L-force series are primarily characterised by their comprehensive modularity. The wide variety of options allows you to precisely adjust the drive characteristics in line with your application. We call this rightsizing.

- ▶ The motors are available in a power range of 0.25 to 7.5 kW.
- ▶ 4-pole designs are available.
- ▶ The motors can be universally used with B3, B5 and B14 mountings, as well as the dimensions standardised in accordance with IEC 60072-1 or DIN EN 50347.
- ▶ The motor winding is specially designed for inverter operation.
- ▶ The thermal sensors, which are integrated as standard, ensure continuous temperature monitoring and are tailored to temperature class F (155°C) of the motor winding.
- ▶ In the basic design, motors are adjusted to the ambient conditions through IP55 degree of protection.
- ▶ In the case of harsh operating conditions, a surface and corrosion protection system is readily available to reliably protect the motor against corrosive agents.
- ▶ 9 brake sizes – each available with several braking torques – can be combined with three-phase AC motors.
- ▶ The LongLife design of the brake easily enables over 10×10^6 switching cycles.
- ▶ For speed and position detection, a resolver and/or various incremental and absolute value encoders can be mounted.
- ▶ Motors are also available with plugs for power connections, brakes, blowers and feedback for fast commissioning.
- ▶ The motor can optionally be equipped with a blower instead of an integral fan. At speeds below 20 Hz, a torque reduction is consequently not required.
- ▶ For drive tasks in distributed applications, the motor can be supplied with the motec frequency inverter mounted on the terminal box.
- ▶ Motors are available with UL/CSA, GOST, CCC and UkrSepro approval.





General

List of abbreviations

$\eta_{100\%}$	[%]	Efficiency, Full load
$\eta_{75\%}$	[%]	Efficiency, Partial load
$\cos \varphi$		Power factor,
F_{ax}	[N]	Axial force,
$F_{ax,max}$	[N]	Max. axial force,
$F_{ax,min}$	[N]	Min. axial force,
F_{rad}	[N]	Radial force,
$F_{rad,max}$	[N]	Max. radial force,
I_N	[A]	Rated current,
$I_{N,\Delta}$	[A]	Rated current, Delta
$I_{N,Y}$	[A]	Rated current, Star
I_{max}	[A]	Max. current consumption,
J	[kgcm ²]	Moment of inertia, Standard
m	[kg]	Mass,
M_a	[Nm]	Starting torque,
M_b	[Nm]	Stalling torque,
M_{max}	[Nm]	Max. torque,
M_N	[Nm]	Rated torque,
n_N	[r/min]	Rated speed,
P_N	[kW]	Rated power,
P_{max}	[kW]	Max. power input,

U_{max}	[V]	Max. mains voltage, AC
U_{min}	[V]	Min. mains voltage, AC
$U_{N,\Delta}$	[V]	Rated voltage, Delta
$U_{N,Y}$	[V]	Rated voltage, Star

CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker



Enclosure EN 60529			IP55
Energy efficiency class IEC 60034-30			IE1
Approval Type			CCC cURus GOST UkrSepro
Temperature class VDE 0530; utilisation			B
VDE 0530; insulation system (enamel-insulated wire)			F
Vibrational severity EN 60034-14			A
Min. ambient operating temperature	$T_{opr,min}$	[°C]	-20
Max. ambient operating temperature			
Without power reduction	$T_{opr,max}$	[°C]	40
With power reduction	$T_{opr,max}$	[°C]	60
Max. installation height above sea level			
Without power reduction	H_{max}	[m]	1000
With power reduction	H_{max}	[m]	4000

Drive dimensioning

Three-phase AC motor versions

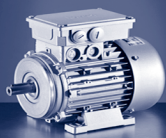
	MD□MA□□071-12 MD□MA□□071-32 MD□MA□□071-42	MD□MA□□080-12 MD□MA□□080-32 MD□MA□□080-42	MD□MA□□090-12 MD□MA□□090-32	MD□MA□□100-12 MD□MA□□100-32
Design	B14 B3 B5			
Shaft end	14 x 30	19 x 40	24 x 50	28 x 60
Brake Spring-applied brake	Low noise Reduced, standard or increased braking torque Standard design With manual release lever With rectifier			
Speed/angle sensor	Resolver Incremental encoder SinCos multi-turn SinCos single-turn			
Temperature sensor	KTY83-110 TK0			
Motor connection Power connection	Connector ICN HAN modular connector HAN10E connector Terminal box			
Brake connection	HAN modular connector Terminal box HAN10E connector Terminal box			
Blower connection	Connector ICN Terminal box			
Feedback connection	Connector ICN Terminal box			
Temperature sensor connection	Terminal box KTY at connector in the feedback connection Thermal contact at connector in the power connection			
Shaft bearings Position of the locating bearing	Drive end			
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate			
Colour	primed Paint in various corrosion-protection designs in accordance with RAL colours Not painted			

Drive dimensioning

Three-phase AC motor versions



	MD□MA□□112-22	MD□MA□□132-12	MD□MA□□132-22
Design	B14 B3 B5		
Shaft end	28 x 60		38 x 80
Brake Spring-applied brake	Low noise Reduced, standard or increased braking torque Standard design With manual release lever With rectifier		
Speed/angle sensor	Resolver Incremental encoder SinCos multi-turn SinCos single-turn		
Temperature sensor	KTY83-110 TK0		
Motor connection			
Power connection	Connector ICN HAN modular connector HAN10E connector Terminal box	Connector ICN HAN modular connector Terminal box	Connector ICN HAN modular connector
Brake connection	HAN modular connector Terminal box HAN10E connector Terminal box	HAN modular connector Terminal box Terminal box	HAN modular connector Terminal box
Blower connection		Connector ICN Terminal box	
Feedback connection		Connector ICN Terminal box	
Temperature sensor connection		Terminal box KTY at connector in the feedback connection Thermal contact at connector in the power connection	
Shaft bearings			
Position of the locating bearing	Drive end		
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, sealing disc or cover plate		
Colour	primed Paint in various corrosion-protection designs in accordance with RAL colours Not painted		



Rated data 4-pole motors

Rated frequency 50 Hz

	P_N	n_N	M_N	M_a	M_b	$I_{N,\Delta}$	$I_{N,Y}$	I_a / I_N
	[kW]	[r/min]	[Nm]	[Nm]	[Nm]	[A]	[A]	
MD□MA□□071-12	0.25	1370	1.74	3.10	3.10	1.30	0.75	2.90
MD□MA□□071-32	0.37	1410	2.51	4.76	5.81	1.60	0.95	3.30
MD□MA□□071-42	0.55	1405	3.74	7.85	9.12	2.40	1.40	3.50
MD□MA□□080-12		1390	3.80	6.80	7.20	2.50		3.80
MD□MA□□080-32	0.75	1410	5.10	11.0	12.1	3.30	1.90	4.60
MD□MA□□080-42	1.10	1390	7.50	16.5	18.4	4.80	2.80	4.40
MD□MA□□090-12			7.56	15.5	16.0			4.10
MD□MA□□090-32	1.50	1410	10.1	23.7	27.1	6.60	3.80	4.80
MD□MA□□100-12	2.20	1440	14.6	38.0	44.0	9.20	5.30	6.00
MD□MA□□100-32	3.00	1430	20.5	43.0	50.0	12.5	7.20	4.60
MD□MA□□112-22	4.00	1450	26.3	70.0	95.0	16.1	9.30	6.20
MD□MA□□132-12	5.50		36.2	100	110	20.2	11.7	4.00
MD□MA□□132-22	7.50	1455	49.2		150	28.6	16.5	5.90

	$U_{N,\Delta}$	$U_{N,Y}$	$\cos \varphi$	$\eta_{75\%}$	$\eta_{100\%}$	$J^{1)}$	$m^{1)}$
	[V]	[V]		[%]	[%]	[kgcm ²]	[kg]
MD□MA□□071-12	230	400	0.75	65	66	8.30	5.80
MD□MA□□071-32			0.77	73	73	10.7	
MD□MA□□071-42				74	74	12.8	6.40
MD□MA□□080-12			0.80	70	70	16.9	10.0
MD□MA□□080-32				73	74	26.0	11.0
MD□MA□□080-42			77	77			
MD□MA□□090-12			0.81	75	75	23.2	12.0
MD□MA□□090-32			0.76	78	79	28.4	17.0
MD□MA□□100-12			0.73	83	84	61.0	24.0
MD□MA□□100-32			0.75		83		
MD□MA□□112-22			0.73	85	86	107	31.0
MD□MA□□132-12			0.75	86		188	56.0
MD□MA□□132-22			0.76	87	88	336	66.0

¹⁾ Without accessories

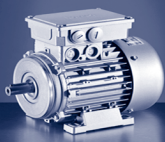


Rated frequency 60 Hz

	P_N	n_N	M_N	M_a	M_b	$I_{N,\Delta}$	$I_{N,Y}$	I_a / I_N
	[kW]	[r/min]	[Nm]	[Nm]	[Nm]	[A]	[A]	
MD□MA□□071-12	0.31	1670	1.74	3.40	4.20	1.30	0.75	2.90
MD□MA□□071-32	0.45	1710	2.51	4.80	5.80	1.60	0.95	3.30
MD□MA□□071-42	0.68	1705	3.74	8.00	9.30	2.40	1.40	3.50
MD□MA□□080-12		1690	3.80	8.10	9.10			3.80
MD□MA□□080-32	0.92	1710	5.10	11.6	13.3	3.30	1.90	5.10
MD□MA□□080-42	1.30	1690	7.50	17.8	21.0	4.80	2.80	5.00
MD□MA□□090-12			7.56	21.8	23.1			4.10
MD□MA□□090-32	1.80	1710	10.1	24.7	30.2	6.60	3.80	5.30
MD□MA□□100-12	2.60	1740	14.6	38.0	47.0	9.20	5.30	6.60
MD□MA□□100-32	3.60	1730	20.5	43.0	54.0	12.5	7.20	5.20
MD□MA□□112-22	4.80	1750	26.4	58.0	102	16.1	9.30	6.40
MD□MA□□132-12	6.60		36.2	100	115	20.2	11.7	4.20
MD□MA□□132-22	9.00	1755	49.2		160	28.6	16.5	6.50

	$U_{N,\Delta}$	$U_{N,Y}$	$\cos \varphi$	$\eta_{75\%}$	$\eta_{100\%}$	$J^{1)}$	$m^{1)}$	
	[V]	[V]		[%]	[%]	[kgcm ²]	[kg]	
MD□MA□□071-12	277	480	0.75	65	66	8.30	5.80	
MD□MA□□071-32			0.77	74	73	10.7		
MD□MA□□071-42				76	74	12.8	6.40	
MD□MA□□080-12			0.80	74	75	16.9	10.0	
MD□MA□□080-32				79	79	26.0	11.0	
MD□MA□□080-42						23.2	12.0	
MD□MA□□090-12			0.74	80	82	28.4	17.0	
MD□MA□□090-32			0.73	84	85	61.0	24.0	
MD□MA□□100-12				87	88			
MD□MA□□100-32			0.73	86	87	107	31.0	
MD□MA□□112-22				0.79	87	88	188	56.0
MD□MA□□132-12							336	66.0
MD□MA□□132-22			0.75	88				

¹⁾ Without accessories

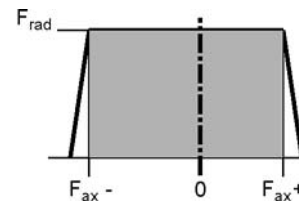
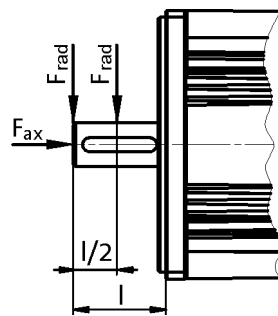


Rated data 4-pole motors

Rated frequency 87 Hz

	P_N	n_N	M_N	M_{max}	$I_{N, \Delta}$	$U_{N, \Delta}$	$\cos \varphi$	$\eta_{75\%}$	$\eta_{100\%}$	$J^1)$	$m^1)$
	[kW]	[r/min]	[Nm]	[Nm]	[A]	[V]		[%]	[%]	[kgcm ²]	[kg]
MD□MA□□071-12	0.45	2480	1.74	7.00	1.30	400	0.74	66	68	8.30	5.80
MD□MA□□071-32	0.66	2520	2.51	10.0	1.60		0.72	76	78	10.7	
MD□MA□□071-42	1.00	2515	3.74	15.0	2.40		0.74	79	80	12.8	6.40
MD□MA□□080-12		2500	3.80		2.50		0.78	72	72	16.9	10.0
MD□MA□□080-32	1.40	2520	5.10	20.0	3.30		0.80	75	77	26.0	11.0
MD□MA□□080-42	2.00	2500	7.50	30.0	4.80			81	82	23.2	
MD□MA□□090-12			7.56				0.78	77	77	23.2	12.0
MD□MA□□090-32	2.70	2520	10.1	40.0	6.70		0.73	83	85	28.4	17.0
MD□MA□□100-12	3.90	2550	14.6	60.0	9.20		0.71	87	88	61.0	24.0
MD□MA□□100-32	5.40	2540	20.5	80.0	12.5						
MD□MA□□112-22	7.10	2560	26.3	105	16.1		0.71	90	90	107	31.0
MD□MA□□132-12	9.70		36.2	145	20.1		0.78			188	56.0
MD□MA□□132-22	13.2		2565	49.2	200		29.3			0.75	336

¹⁾ Without accessories



Force position at $l/2$

	Bearing service life L_{10}											
	10000 h			20000 h			30000 h			50000 h		
	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
M□□MA□□071	740	-800	470	590	-630	300	510	-550	220	430	-470	140
M□□MA□□080	960	-1090	580	770	-860	350	670	-760	250	570	-650	
M□□MA□□090	1050	-1160	630	840	-920	390	730	-800	280	620	-690	160
M□□MA□□100	1490	-1490	910	1190	-1160	580	1050	-1010	430	890	-860	270
M□□MA□□112	2250	-2330	1340	1790	-1830	840	1570	-1600	610	1330	-1360	370
M□□MA□□132	3300	-2150	1190	2640	-1670	710	2320	-1440	480	1970	-1210	250

Force position at l

	Bearing service life L_{10}											
	10000 h			20000 h			30000 h			50000 h		
	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$	$F_{rad,max}$	$F_{ax,min}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
M□□MA□□071	680	-800	470	540	-630	300	470	-550	220	400	-470	140
M□□MA□□080	880	-1090	580	700	-860	350	610	-760	250	520	-650	
M□□MA□□090	940	-1160	630	750	-920	390	660	-800	280	560	-690	160
M□□MA□□100	1350	-1490	910	1080	-1160	580	940	-1010	430	800	-860	270
M□□MA□□112	2040	-2330	1340	1620	-1830	840	1420	-1600	610	1210	-1360	370
M□□MA□□132	3020	-2150	1190	2420	-1670	710	2120	-1440	480	1800	-1210	250

- ▶ The values for the bearing service life L_{10} refer to an average speed of 2000 rpm. Depending on the ambient temperatures, the service life of the bearings is also reduced by the grease lifetime.
- ▶ Data for axial forces relate to the maximum radial force with the corresponding bearing service life.



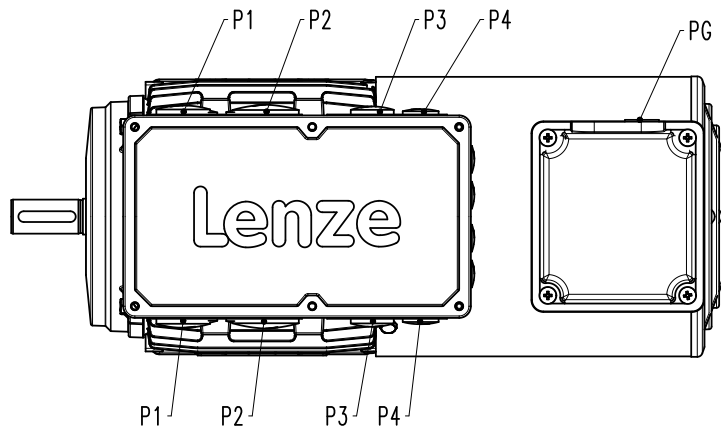
Accessories

Motor connection

The three-phase AC motors are intended for operation both on a constant mains and for inverter operation. For 50 Hz operation, motors should be operated in a Δ connection at 230 V or in Y-connection at 400 V. For inverter operation the base frequency has been set to 87 Hz for a rated voltage of 400 V in a Δ connection.

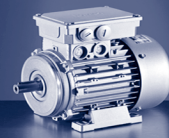
Motors are connected as standard in the terminal box. Motors are also available with the optional connectors described on the following pages, provided that the permissible rated data is not exceeded. Details of the corresponding contact assignments can be found in the project planning manual.

Cable glands on terminal box



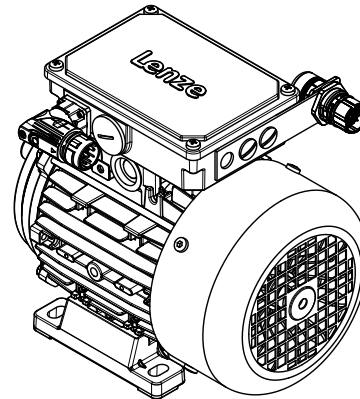
Motor options	MDEMA XX MDEMA BR MDEMA RS MDEMA IG MDEMA AG				MDEMA BS MDEMA BI MDEMA BA			
	P ₁	P ₂	P ₃	P ₄	P ₁	P ₂	P ₃	P ₄
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	M16x1.5	M20x1.5						
080								
090	M20x1.5	M25x1.5			M25x1.5	M32x1.5	M20x1.5	M16x1.5
100								
112								
132	M25x1.5	M32x1.5	M20x1.5	M16x1.5				

Motor options	MDFMA XX MDFMA BR MDFMA RS MDFMA IG MDFMA AG					MDFMA BS MDFMA BI MDFMA BA				
	P ₁	P ₂	P ₃	P ₄	P ₆	P ₁	P ₂	P ₃	P ₄	P ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	M16x1.5	M20x1.5								
080										
090	M20x1.5	M25x1.5			M16x1.5	M25x1.5	M32x1.5	M20x1.5	M16x1.5	M16x1.5
100										
112										
132	M25x1.5	M32x1.5	M20x1.5	M16x1.5						

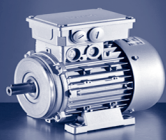


Motor terminal box with ICN connector

The connectors can be rotated through 270° and fitted with a bayonet fixing. As the connector fixing is also compatible with conventional union nuts, existing mating connectors can continue to be used without difficulty. The motor connection is determined in the terminal box and must be checked before commissioning.

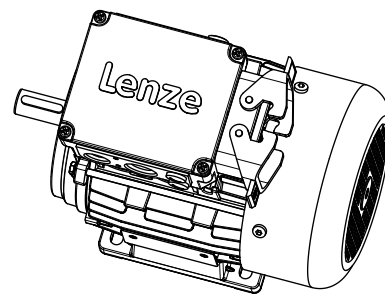


Design			ICN 6-pole	ICN 8-pole
Number of power contacts			3	
Number of earthing contacts			1	
Number of signalling contacts			2	2
Brake/rectifier supply voltage				
TCO thermal contacts supply voltage				
Max. current capacity	I_{\max}	[A]	20.0	
Socket identifier for Lenze system cables			M04	
Counter plug				



Motor terminal box with HAN-10 E connector

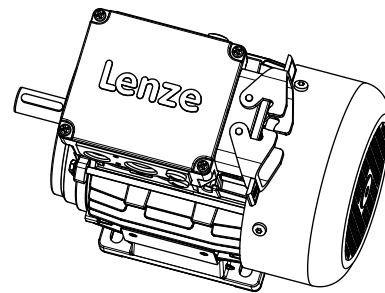
On the HAN-10E rectangular connector all six ends of the three winding phases are designed on the power contacts. The motor connection is therefore determined in the mating connector.



Design			HAN-10E
Number of power contacts			6
Number of earthing contacts			1
Number of signalling contacts			2
Brake/rectifier supply voltage			2
TCO thermal contacts supply voltage			2
Max. current capacity	I_{max}	[A]	16.0

Motor terminal box with HAN modular connector

The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.



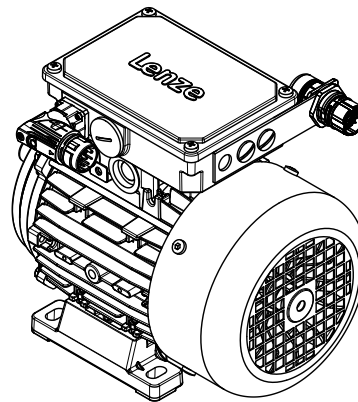
Design			HAN modular
Number of power contacts			3
Number of earthing contacts			1
Number of signalling contacts			2
Brake/rectifier supply voltage			2
Rectifier DC switching contacts supply voltage			2
TCO thermal contacts supply voltage			2
Max. current capacity	I_{max}	[A]	16.0 40.0



Connector for feedback

ICN connector

All encoder systems (apart from IG128-24V-H) are also available with an ICN connector fixed to the motor terminal box for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing mating connectors can therefore continue to be used without difficulty.

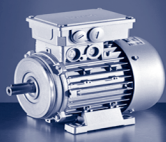


Design		Resolver	Incremental encoder
Number of signalling contacts			12
Coding	[°]	0	20
Socket identifier for Lenze system cables Counter plug		F05	F06

Connector for IG128-24V-H

This incremental encoder is fitted as standard with a 0.5 m flying lead, with an industry-standard M12 connector at the end.

Design		Incremental encoder IG128-24V-H
Number of signalling contacts		4
Coding	[°]	0

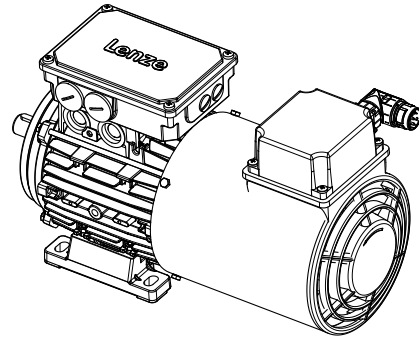


Accessories

Motor connection

Connector for blower

The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used without difficulty.



Design	Blower 1-ph	Blower 3-ph
Number of power contacts		6
Number of earthing contacts		1
Socket identifier for Lenze system cables Counter plug	L04	L06



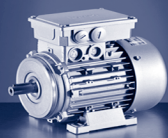
Decentralised frequency inverter motec - motor assignment

Rated frequency 50 Hz

Rated power	Product key	
	Motor	Inverter
P_N		
[kW]		
0.25	MD□MA□□071-12	E82MV251_2B
0.37	MD□MA□□071-32	E82MV371_2B
0.55	MD□MA□□071-42	E82MV551_4B
	MD□MA□□080-12	
0.75	MD□MA□□080-32	E82MV751_4B
1.10	MD□MA□□080-42	E82MV152_4B
	MD□MA□□090-12	
1.50	MD□MA□□090-32	
2.20	MD□MA□□100-12	E82MV222_4B
3.00	MD□MA□□100-32	E82MV302_4B
4.00	MD□MA□□112-22	E82MV402_4B
5.50	MD□MA□□132-12	E82MV552_4B
7.50	MD□MA□□132-22	E82MV752_4B

Rated frequency 87 Hz

Rated power	Product key	
	Motor	Inverter
P_N		
[kW]		
0.45	MD□MA□□071-12	E82MV551_4B
0.66	MD□MA□□071-32	E82MV751_4B
1.00	MD□MA□□071-42	E82MV152_4B
	MD□MA□□080-12	
1.40	MD□MA□□080-32	
2.00	MD□MA□□080-42	E82MV222_4B
	MD□MA□□090-12	
2.70	MD□MA□□090-32	E82MV302_4B
3.90	MD□MA□□100-12	E82MV402_4B
5.40	MD□MA□□100-32	E82MV552_4B
7.10	MD□MA□□112-22	E82MV752_4B



Accessories

Spring-applied brake

Three-phase AC motors can be fitted with a spring-applied brake. This is activated after the supply voltage is switched off (closed-circuit principle). For optimum adjustment of the brake motor to the application, a range of braking torques and control versions is available for every motor frame size. For applications with very high operating frequencies the brake is also available in a LongLife version, with reinforced mechanical brake components.

Features

Versions

► Standard

1 x 10⁶ Repeating switching cycles

1 x 10⁶ Reversing switching cycles

► LongLife

10 x 10⁶ Repeating switching cycles

15 x 10⁶ Reversing switching cycles

Control

► DC supply

► AC supply via rectifier in the terminal box

Degree of protection

► Without manual release IP55

► With manual release IP54

Friction lining

► Non-asbestos, low wearing

Options

► Manual release

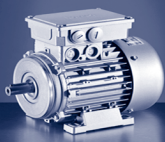
► UL/CSA approval

Motor – brake assignment

Design	Standard		LongLife	
	Size	Characteristic torque	Size	Characteristic torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
MD□MAB□071-12 MD□MAB□071-32	06	2.50	06 08	4.00
	06	4.00		3.50
	08	3.50		
MD□MAB□071-42	06	2.50	06 08 08	4.00
	06	4.00		3.50
	08	3.50		8.00
	08	8.00		
MD□MAB□080-12 MD□MAB□080-32	08	3.50	08 10	8.00
	08	8.00		7.00
	10	7.00		
MD□MAB□080-42	08	3.50	08 10 10	8.00
	08	8.00		7.00
	10	7.00		16.0
	10	16.0		



Design	Standard		LongLife	
	Size	Characteristic torque	Size	Characteristic torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
MD□MAB□090-12 MD□MAB□090-32	08	3.50	08 10 10	8.00 7.00 16.0
	08	8.00		
	10	7.00		
	10	16.0		
	10	23.0		
MD□MAB□100-12	10	7.00	10 12 12	16.0 14.0 32.0
	10	16.0		
	12	14.0		
	12	32.0		
MD□MAB□100-32	10	7.00		
	10	16.0		
	12	14.0		
	12	32.0		
	12	46.0		
MD□MAB□112-22	12	14.0		
	12	32.0		
	14	35.0		
	14	60.0		
MD□MAB□132-12 MD□MAB□132-22	14	35.0		
	14	60.0		
	16	60.0		
	16	80.0		
	16	100		



Accessories

Spring-applied brake

Brake connection

Direct connection without rectifier

If the brake is activated directly without a rectifier, a freewheeling diode or a spark suppressor is required to protect against induction peaks.

- ▶ Supply voltages
 - DC 24 V
 - DC 180 V
 - DC 205 V

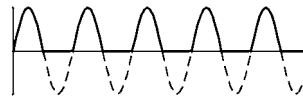
Connection via mains voltage

Brake rectifier

If the brake is not directly supplied with DC voltage, a rectifier is required. This is included in the scope of supply and is located in the terminal box of the motor. The rectifier converts the AC voltage of the connection into DC voltage. The following rectifiers are available:

Half-wave rectifier, 6-pin

- ▶ Ratio of supply voltage to brake coil voltage = 2.22
- ▶ Approved by UL/CSA
- ▶ Supply voltages
 - AC 230 V
 - AC 277 V
 - AC 400 V
 - AC 460 V
 - AC 480 V



Bridge rectifier, 6-pin

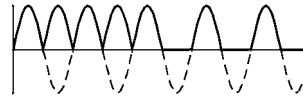
- ▶ Ratio of supply voltage to brake coil voltage = 1.11
- ▶ Supply voltage
 - AC 230 V





Bridge/half-wave rectifier, 6-pin

- ▶ Ratio of supply voltage to brake coil voltage
up to overexcitation time = 1.11
beyond overexcitation time = 2.22



Supply voltages:

- ▶ AC 230 V
- ▶ AC 277 V
- ▶ AC 400 V

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time t_{oe} and then as a half-wave rectifier. This combination optimises the properties of the brake – depending on the assignment of brake coil voltage and supply voltage:

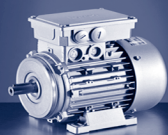
- ▶ **Short-time overexcitation of the brake coil**

Activating the brake coil for the overexcitation time t_{oe} with twice the rated voltage allows the disengagement time to be reduced. The brake opens more quickly and wear on the friction lining is reduced.

These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.

- ▶ **Holding current reduction (cold brake)**

By reducing the holding current, the bridge/half-wave rectifier is able to reduce the power input of the open brake. As the brake heats up less, this type of activation is known as "cold brake".



Accessories

Spring-applied brake

Brake data, reduced braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input	P	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100 r/min	M _B	[Nm]	2.50	3.50	7.00	14.0	35.0	60.0	80.0	145	265
1000 r/min	M _B	[Nm]	2.30	3.10	6.10	12.0	30.0	50.0	65.0	115	203
1200 r/min	M _B	[Nm]	2.30	3.10	6.00	12.0	29.0	48.0	63.0	112	199
1500 r/min	M _B	[Nm]	2.20	3.00	5.80	11.0	28.0	47.0	61.0	109 ¹⁾	193 ¹⁾
1800 r/min	M _B	[Nm]	2.10	2.90	5.70	11.0	28.0	46.0	60.0 ¹⁾		
3000 r/min	M _B	[Nm]	2.00	2.80	5.30	10.0	26.0 ¹⁾	43.0 ¹⁾			
3600 r/min	M _B	[Nm]	2.00	2.70	5.20	10.0 ¹⁾					
Maximum switching energy											
100 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600 r/min	Q _E	[J]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency	S _{hü}	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for Q_{BW} can be reduced to 40 %.



Brake data, reduced braking torque

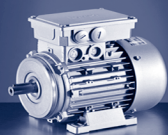
Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Delay time Engaging	t_{11}	[ms]	11.0	14.0	20.0	21.0	37.0	53.0	32.0	47.0	264
Rise time Braking torque	t_{12}	[ms]	13.0	10.0	17.0	19.0	22.0	30.0	20.0	100	120
Engagement time	t_1	[ms]	24.0		37.0	40.0	59.0	83.0	52.0	147	384
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Overexcitation time	$t_{\ddot{u}}$	[ms]	300				1300				
Min. break time	t	[ms]	900				3900				
Delay time Engaging	t_{11}	[ms]	12.0	22.0	35.0	49.0	61.0	114	83.0	126	304
Rise time Braking torque	t_{12}	[ms]	14.0	16.0	30.0	45.0	37.0	65.0	52.0	269	138
Engagement time	t_1	[ms]	26.0	38.0	66.0	93.0	97.0	180	134	395	443
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

- ▶ The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Accessories

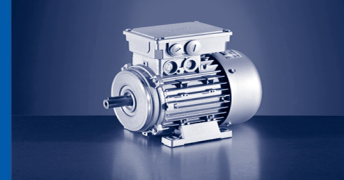
Spring-applied brake

Brake data, standard braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input	P	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100 r/min	M _B	[Nm]	4.00	8.00	16.0	32.0	60.0	80.0	150	260	400
1000 r/min	M _B	[Nm]	3.70	7.20	14.0	27.0	51.0	66.0	121	206	307
1200 r/min	M _B	[Nm]	3.60	7.00	14.0	27.0	50.0	65.0	118	201	300
1500 r/min	M _B	[Nm]	3.50	6.80	13.0	26.0	48.0	63.0	115	195 ¹⁾	291 ¹⁾
1800 r/min	M _B	[Nm]	3.40	6.70	13.0	26.0	47.0	61.0	112 ¹⁾		
3000 r/min	M _B	[Nm]	3.20	6.30	12.0	24.0	44.0 ¹⁾	57.0 ¹⁾			
3600 r/min	M _B	[Nm]	3.20	6.10	12.0	23.0 ¹⁾					
Maximum switching energy											
100 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000 r/min	Q _E	[J]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600 r/min	Q _E	[J]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency	S _{hü}	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for Q_{BW} can be reduced to 40 %.



Brake data, standard braking torque

Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Delay time Engaging	t_{11}	[ms]	15.0		28.0		17.0	27.0	33.0	65.0	110
Rise time Braking torque	t_{12}	[ms]	13.0	16.0	19.0	25.0		30.0	45.0	100	120
Engagement time	t_1	[ms]	28.0	31.0	47.0	53.0	42.0	57.0	78.0	165	230
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Overexcitation time	$t_{\ddot{u}}$	[ms]	300				1300				
Min. break time	t	[ms]	900				3900				
Delay time Engaging	t_{11}	[ms]	16.0	25.0	31.0	48.0	33.0	58.0	80.0	102	154
Rise time Braking torque	t_{12}	[ms]	14.0	27.0	21.0	43.0	49.0	64.0	109	157	168
Engagement time	t_1	[ms]	30.0	52.0		90.0	82.0	122	189	259	322
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- ▶ The brake response and application times are guide values.
The engagement time is 10 times longer with AC-side switching.
With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Accessories

Spring-applied brake

Brake data, increased braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			10	12	14	16	16	18	20	20	25	25
Power input	P	[kW]	0.030	0.040	0.050	0.055	0.055	0.085	0.10	0.10	0.11	0.11
Braking torque												
100 r/min	M_B	[Nm]	23.0	46.0	75.0	100	125	200	315	400	490	600
1000 r/min	M_B	[Nm]	20.0	39.0	64.0	83.0	103	162	249	317	376	461
1200 r/min	M_B	[Nm]	20.0	39.0	62.0	81.0	101	158	244	309	367	449
1500 r/min	M_B	[Nm]	19.0	38.0	60.0	78.0	98.0	153	237 ¹⁾	300 ¹⁾	356 ¹⁾	436 ¹⁾
1800 r/min	M_B	[Nm]	19.0	37.0	59.0	77.0	96.0	150 ¹⁾				
3000 r/min	M_B	[Nm]	17.0	34.0	55.0 ¹⁾	71.0 ¹⁾	89.0 ¹⁾					
3600 r/min	M_B	[Nm]	17.0	33.0 ¹⁾								
Maximum switching energy												
100 r/min	Q_E	[J]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1000 r/min	Q_E	[J]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1200 r/min	Q_E	[J]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1500 r/min	Q_E	[J]	12.0	24.0	30.0	36.0	36.0	60.0	24.0 ¹⁾	24.0 ¹⁾	36.0 ¹⁾	36.0 ¹⁾
1800 r/min	Q_E	[J]	12.0	24.0	30.0	36.0	36.0	36.0 ¹⁾				
3000 r/min	Q_E	[J]	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾	11.0 ¹⁾					
3600 r/min	Q_E	[J]	12.0	7.00 ¹⁾								
Transition operating frequency	$S_{h\ddot{u}}$	[1/h]	40.0	30.0	28.0	27.0	27.0	20.0	19.0	19.0	15.0	15.0
Moment of inertia	J	[kgcm ²]	0.20	0.45	0.63	1.50	1.50	2.90	7.30	7.30	20.0	20.0
Mass	m	[kg]	2.60	4.20	5.80	8.70	8.70	12.6	19.5	19.5	31.0	31.0

¹⁾ In the region of the load limit the value for Q_{BW} can be reduced to 40 %.

Activation via half-wave or bridge rectifier

Size			10	12	14	16	18	20	25			
Friction energy	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time												
Engaging	t_{11}	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time												
Braking torque	t_{12}	[ms]	19.0	25.0		30.0	45.0		100		120	
Engagement time	t_1	[ms]	29.0	41.0	36.0	52.0	47.0	69.0	146	117	197	158
Disengagement time	t_2	[ms]	109	193	308	297	435	356	378	470	451	532



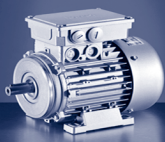
Brake data, increased braking torque

Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)									
Size			10	12	14	16	18	20	25			
Friction energy	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time	$t_{\ddot{u}}$	[ms]	300		1300							
Min. break time	t	[ms]	900		3900							
Delay time Engaging	t_{11}	[ms]	24.0	27.0	17.0	41.0	21.0	60.0	69.0	17.0	123	85.0
Rise time Braking torque	t_{12}	[ms]	44.0	43.0	37.0	55.0	37.0	113	148	100	190	270
Engagement time	t_1	[ms]	68.0	70.0	54.0	97.0	57.0	173	217	334	313	355
Disengagement time	t_2	[ms]	109	193	308	297	435	356	378	470	451	532

Design			Over-excitation									
Size			10	12	14	16	18	20	25			
Friction energy	Q_{BW}	[MJ]	264	706	761	966	1542	2322	3522			
Overexcitation time	$t_{\ddot{u}}$	[ms]	300		1300							
Min. break time	t	[ms]	900		3900							
Delay time Engaging	t_{11}	[ms]	29.0	54.0	31.0	70.0	46.0	86.0	103	55.0	171	135
Rise time Braking torque	t_{12}	[ms]	53.0	87.0	68.0	93.0	83.0	160	222	319	266	430
Engagement time	t_1	[ms]	82.0	141	99.0	163	129	246	325	374	437	565
Disengagement time	t_2	[ms]	53.0	81.0	117	141	168	151	160	167	184	204

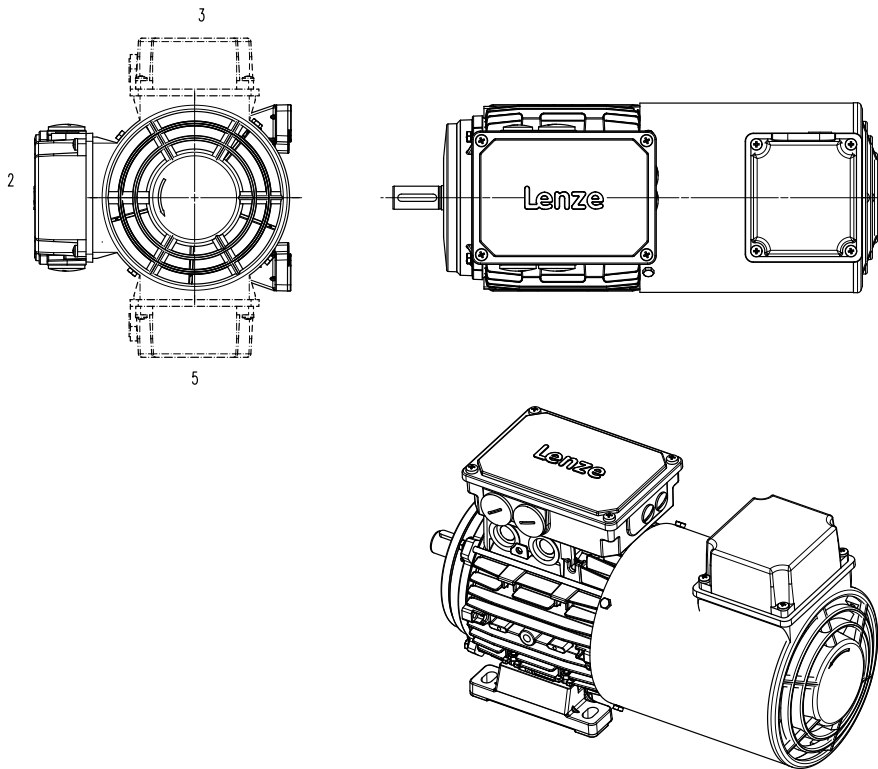
- ▶ The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Accessories

Blower

- The terminal box for the separate fan is available in positions 2, 3 and 5.



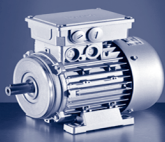
Blower data 50 Hz

	Number of phases	Connection method	U_{\min}	U_{\max}	P_{\max}	I_{\max}	m
			[V]	[V]	[kW]	[A]	[kg]
M□FMA□□071	1		230	277	0.028	0.10	2.10
	3	Δ	220	290	0.030	0.050	
M□FMA□□080	1		230	277		0.029	0.11
	3	Δ	220	290	0.031	0.10	
M□FMA□□090	1		230	277		0.082	0.30
	3	Δ	220	290	0.097	0.34	
M□FMA□□100	1		230	277		0.086	0.31
	3	Δ	220	290	0.10	0.35	
M□FMA□□112	1		230	277		0.085	0.31
	3	Δ	220	290	0.095	0.33	
M□FMA□□132	1		230	277		0.12	0.40
	3	Δ	220	290	0.14	0.45	
		Y	380	500			0.24



Blower data 60 Hz

	Number of phases	Connection method	U_{\min}	U_{\max}	P_{\max}	I_{\max}	m
			[V]	[V]	[kW]	[A]	[kg]
M□FMA□□071	1		230	277	0.041	0.12	2.10
	3	Δ	220	332	0.033	0.10	
		Y	380	575		0.060	
M□FMA□□080	1		230	277	0.044	0.13	2.30
	3	Δ	220	332	0.034	0.10	
		Y	380	575		0.060	
M□FMA□□090	1		220	277	0.070	0.25	2.70
	3	Δ		332	0.10	0.30	
		Y	380	575		0.18	
M□FMA□□100	1		220	277	0.079	0.29	3.00
	3	Δ		332	0.10	0.32	
		Y	380	575		0.18	
M□FMA□□112	1		220	277	0.095	0.39	3.10
	3	Δ		332	0.10	0.31	
		Y	380	575		0.18	
M□FMA□□132	1		230	277	0.18	0.59	4.20
	3	Δ	220	332	0.15	0.41	
		Y	380	575		0.24	



Accessories

Feedback

Tailored to meet the requirements of the various applications and necessary accuracies, the following feedback systems are available.

Resolver

Stator-fed resolver with two 90° stator windings and one rotor winding with transformer winding.

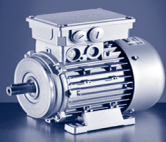
Speed/angle sensor				RS1
Accuracy			[°]	-10 ... 10
Absolute positioning				1 revolution
Max. input voltage DC	$U_{in,max}$		[V]	10.0
Max. input frequency	$f_{in,max}$		[kHz]	4.00
Ratio Stator/rotor		$\pm 5\%$		0.30
Rotor impedance	Z_{ro}		[Ω]	51 + j90
Stator impedance	Z_{so}		[Ω]	102 + j150
Impedance	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				1



Incremental and SinCos absolute value encoder

Encoder type			HTL incremental				TTL incremental			SinCos absolute value		
			IG128-24V-H	IG512-24V-H	IG1024-24V-H	IG2048-24V-H	IG512-5V-T	IG1024-5V-T	IG2048-5V-T	AS1024-8V-H	AM1024-8V-H	
Encoder type										Single-turn	Multi-turn	
Pulses			128	512	1024	2048	512	1024	2048	1024		
Output signals			HTL				TTL			1 Vss		
Interfaces										Hiperface		
Absolute revolution			0							1	4096	
Accuracy		[°]	-22.5 ... 22.5						-2 ... 2		-0.8 ... 0.8	
Min. input voltage DC	$U_{in,min}$	[V]	8.00				4.75			7.00		
Max. input voltage DC	$U_{in,max}$	[V]	26.0	30.0			5.25			12.0		
Max. current consumption	I_{max}	[A]	0.040					0.15		0.080		
Limit frequency	f_{max}	[kHz]	30.0	160			300			200		
Inverter assignment			E84AVSC E84AVHC	E84AVHC				E94A ECS EVS93				

- ▶ The absolute value encoders AS1024-8V-H and AM1024-8V-H are currently only available in combination with a blower.



Accessories

Temperature sensor

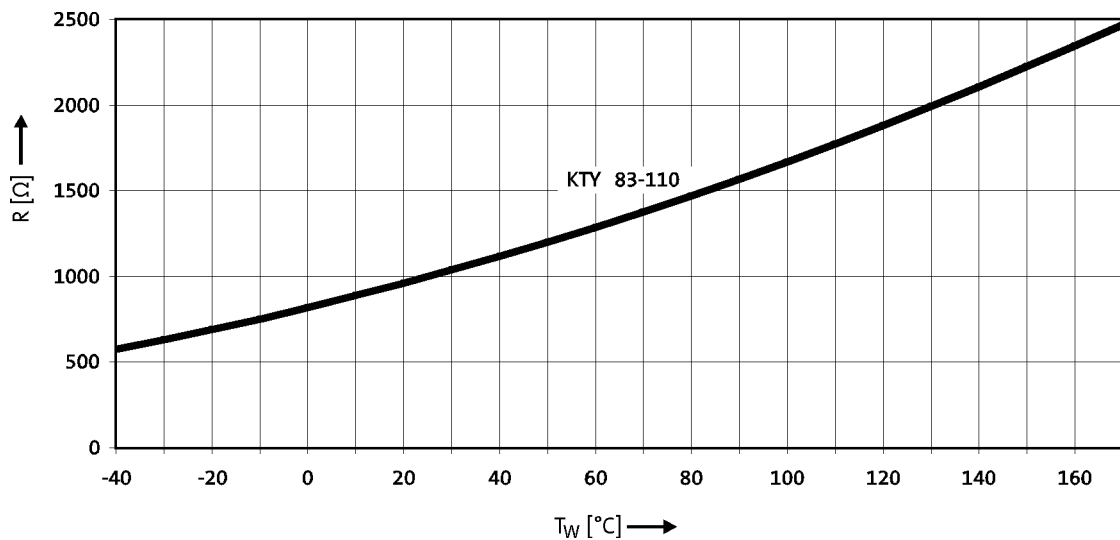
The thermal sensors are integrated in the windings. The use of an additional motor protection switch is recommended.

Thermal contacts

Function	Operating temperature	Min. reset temperature	Max. reset temperature	Max. input current	Max. input voltage
					AC
	T	T _{min}	T _{max}	I _{in,max}	U _{in,max}
	[°C]	[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

KTY continuous temperature sensor

Function	Rated resistance			Max. input current	
	25 °C	150 °C	170 °C	25 °C	170 °C
	R _N	R _N	R _N	I _{in,max}	I _{in,max}
	[Ω]	[Ω]	[Ω]	[A]	[A]
Continuous resistance change	1000	2225	2471	0.010	0.002

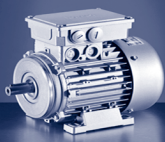


- If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.

Accessories

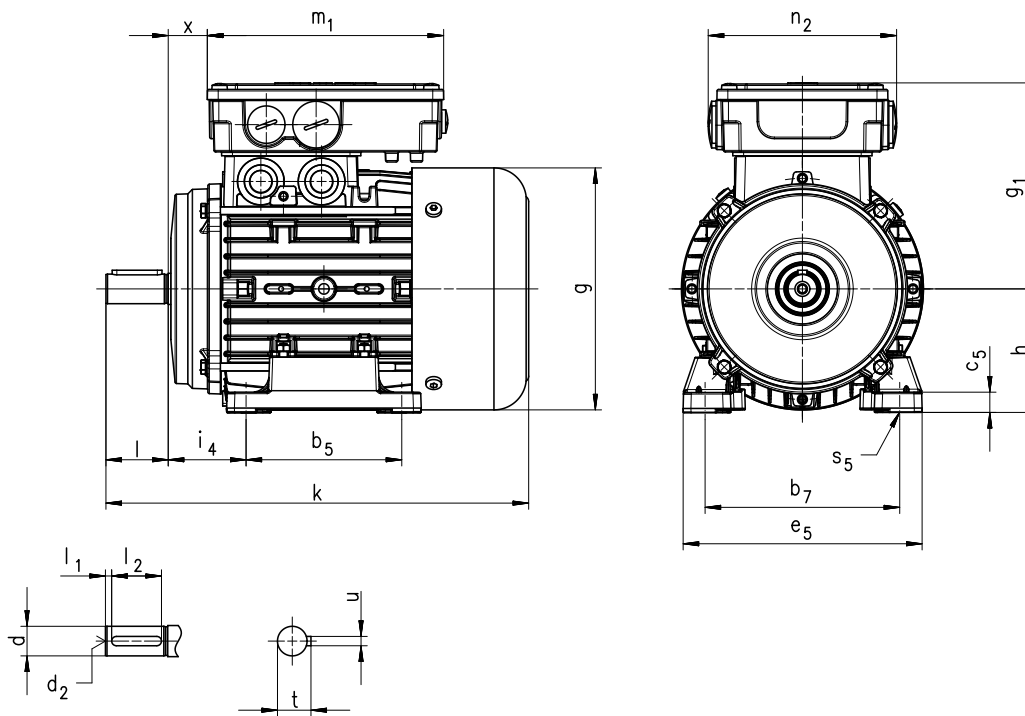
Temperature sensor





Dimensions

MDEMA, B3



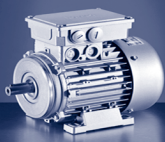
Motor options	MDEMA XX						MDEMA BR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	246	139	118	24	136	103	297	139	118	24	136	103
080	272	156	132	25	152	121	345	154	132	25	152	121
090	311	176	137	29			373	176	137	29		
100	382	194	147	36			458	194	147	36		
112	392	218	158	38			479	218	158	38		
132	497	258	187	51	194	125	606	258	187	51	194	125

Motor options	MDEMA RS MDEMA IG MDEMA AG						MDEMA BS MDEMA BI MDEMA BA					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	297	139	118	24	136	103	338	139	133	13	194	125
080	369	158	132	25	152	121	379	156	142	24		
090	392	178	137	29			410	176	147	28		
100	463	196	147	36			479	194	158	35		
112	472	220	158	38			509	218	168	37		
132	599	261	187	51	194	125	621	258	187	51		

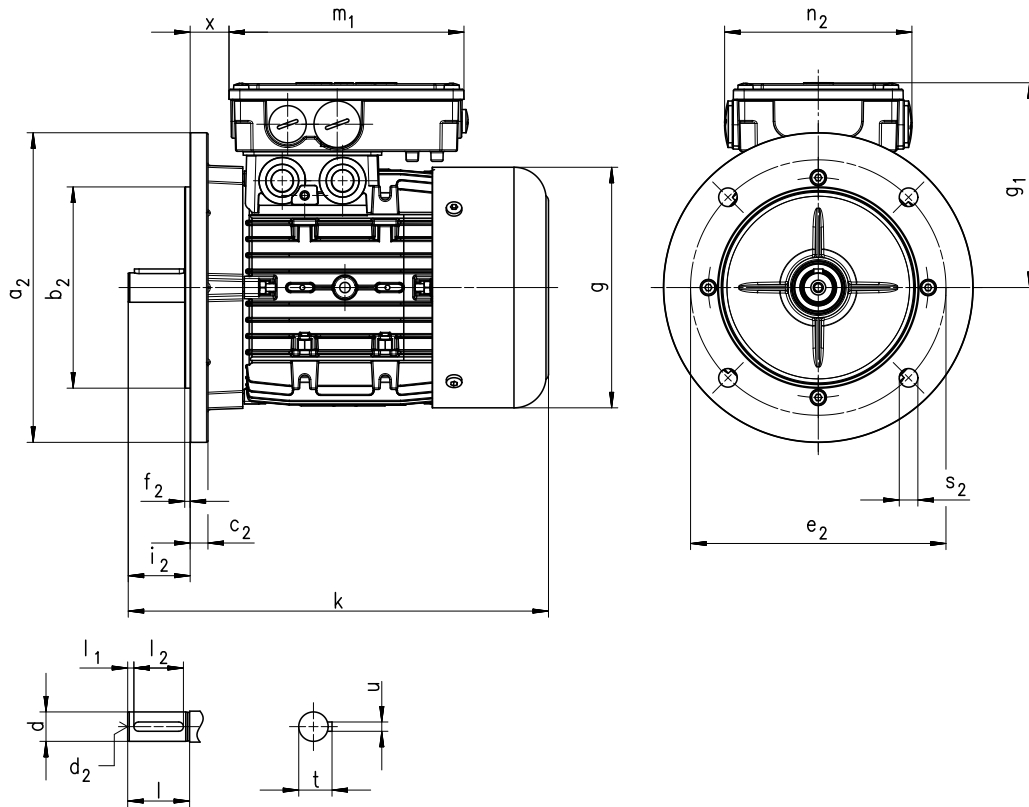


	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50		40	27.0	8.0
100	28		M10	60	5.0	50	31.0	
112						60		
132			38	M12	80		70	41.0

	b ₇	i ₄	b ₅	e ₅	h	c ₅	s ₅
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	112	45	90	134	71	11	7.0
080	125	50	100	154	80	13	10.0
090	140	56		174	90		
100	160	63	140	194	100	15	12.0
112	190	70		223	112	14	
132	216	89		178	260	132	



Dimensions MDEMA, B5



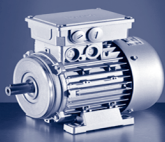
Motor options	MDEMA XX						MDEMA BR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	246	139	118	24	136	103	297	139	118	24	136	103
080	272	156	132	25	152	121	345	154	132	25	152	121
090	311	176	137	29			373	176	137	29		
100	382	194	147	36			458	194	147	36		
112	392	218	158	38			479	218	158	38		
132	497	258	187	51	194	125	606	258	187	51	194	125

Motor options	MDEMA RS MDEMA IG MDEMA AG						MDEMA BS MDEMA BI MDEMA BA					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	297	139	118	24	136	103	338	139	133	13	194	125
080	369	158	132	25	152	121	379	156	142	24		
090	392	178	137	29			410	176	147	28		
100	463	196	147	36			479	194	158	35		
112	472	220	158	38			509	218	168	37		
132	599	261	187	51	194	125	621	258	187	51		



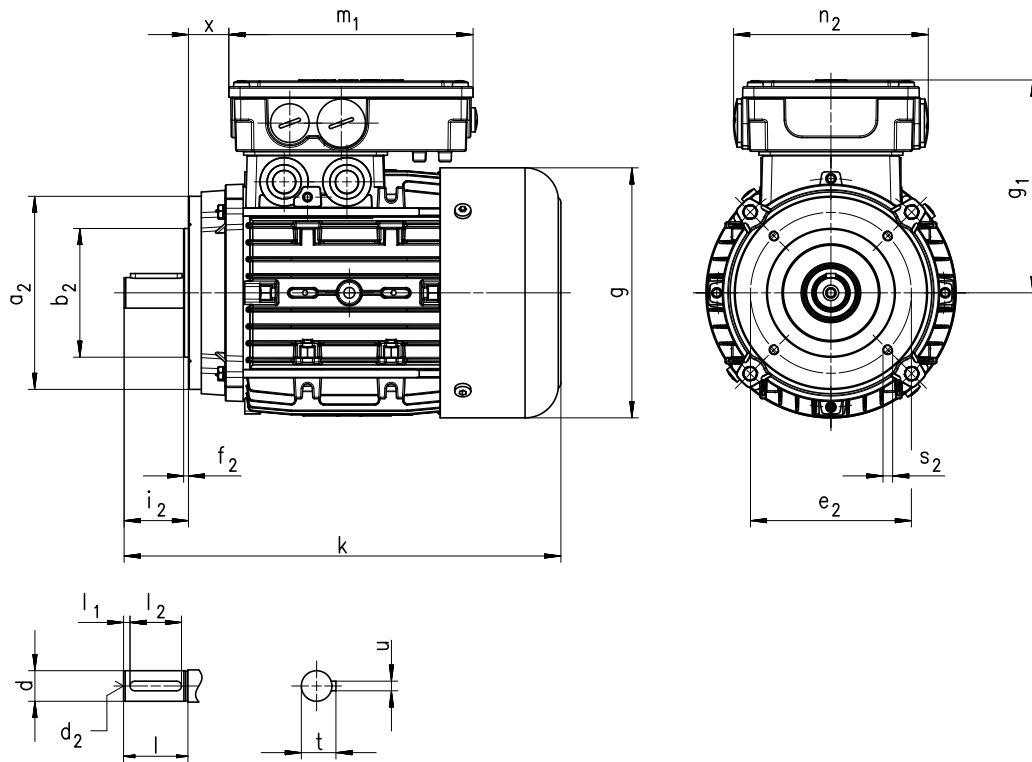
	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50		40	27.0	8.0
100	28		M10	60	5.0	50	31.0	
112						60		
132			38	M12	80		70	41.0

	Flange size	a ₂	b ₂	c ₂	e ₂	f ₂	s ₂	i ₂
			j6					
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	FF130	160	110	10	130	3.5	10.0	30
080	FF165	200	130	11	165		12.0	40
090							50	
100	FF215	250	180	15	215	4.0	14.5	60
112								80
132	FF265	300	230	20	265			



Dimensions

MDEMA, B14



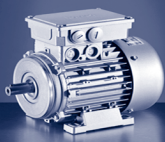
Motor options	MDEMA XX						MDEMA BR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	246	139	118	24	136	103	297	139	118	24	136	103
080	272	156	132	25	152	121	345	154	132	25	152	121
090	311	176	137	29			373	176	137	29		
100	382	194	147	36			458	194	147	36		
112	392	218	158	38			479	218	158	38		

Motor options	MDEMA RS MDEMA IG MDEMA AG						MDEMA BS MDEMA BI MDEMA BA					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	297	139	118	24	136	103	338	139	133	13	194	125
080	369	158	132	25	152	121	379	156	142	24		
090	392	178	137	29			410	176	147	28		
100	463	196	147	36			479	194	158	35		
112	472	220	158	38			509	218	168	37		



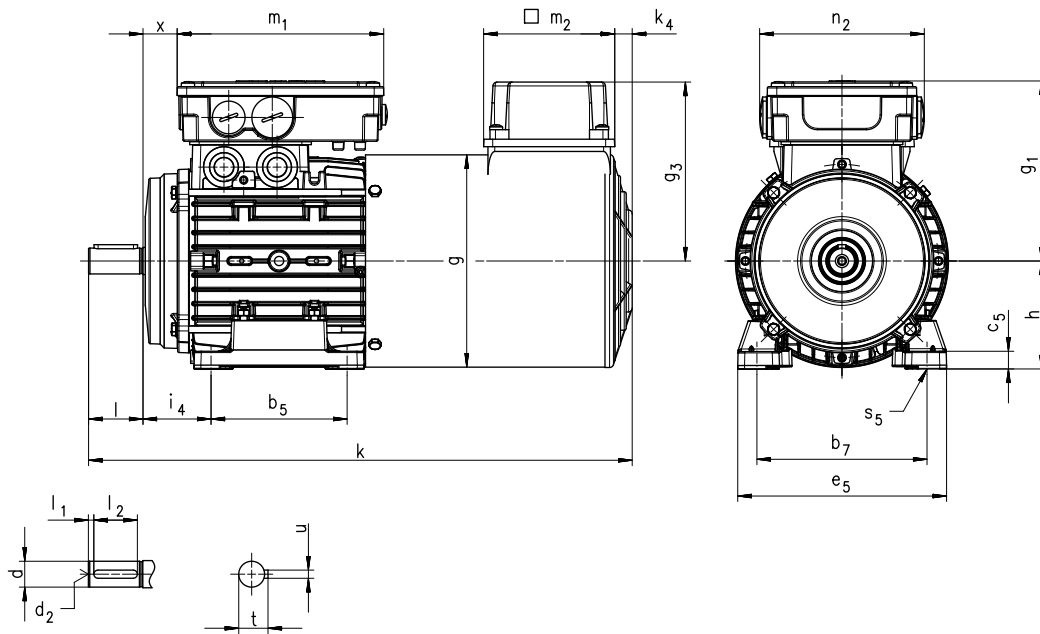
	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50	5.0	40	27.0	8.0
100	28		M10	60		50	31.0	
112						60		

	Flange size	a ₂	b ₂	e ₂	f ₂	s ₂	i ₂
			j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	FT85	105	70	85	2.5	M6x10	30
080	FT100	120	80	100	3.0	M6x12	40
	FT130	160	110	130	3.5	M8x16	
090	FT115	140	95	115	3.0	M8x14	50
						M8x16	
100	FT130	160	110	130	3.5	M8x14	60
112						M8x16	



Dimensions

MDFMA, B3



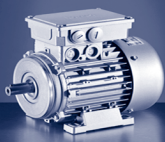
Motor options	MDFMA XX										MDFMA BR								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
071	373	138	118	24	136	103	123	14	106	410	138	118	24	136	103	123	14	106	
080	400	156	132	25	152	121	132			455	156	132	25	132					
090	434	176	137	29			141	487	176	137	29	141							
100	491	194	147	36			150	552	194	147	36	150	22	105					
112	494	218	158	38	162	575	218	158	38	162									
132	612	257	187	51	194	125	182	22	105	698	257	187	51	194	125	182	22	105	

Motor options	MDFMA RS MDFMA IG MDFMA AG										MDFMA BS MDFMA BI MDFMA BA								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
071	373	138	118	24	136	103	123	14	106	410	138	118	13	194	125	123	14	106	
080	400	156	132	25	152	121	132			455	156	142	24			132			
090	434	176	137	29			141	487	176	147	28	141							
100	491	194	147	36			150	552	194	158	35	150	22	105					
112	494	218	158	38	162	575	218	168	37	162									
132	612	257	187	51	194	125	182	22	105	698	257	187	51	194	125	182	22	105	



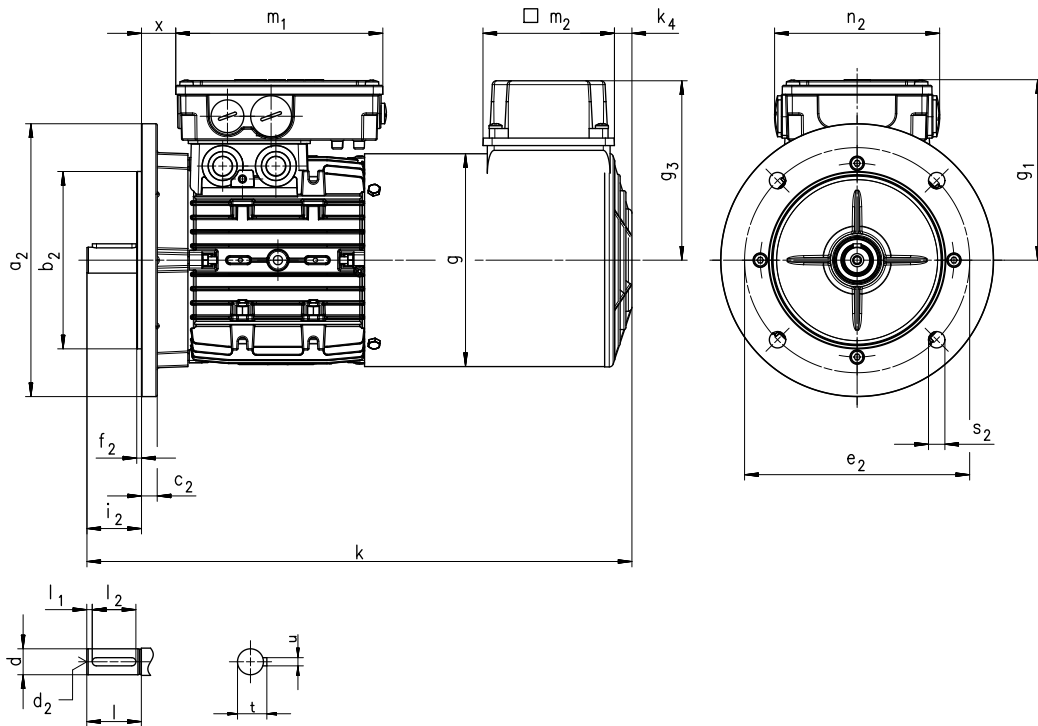
	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50		40	27.0	8.0
100	28		M10	60	5.0	50	31.0	
112						60		
132			38	M12	80		70	41.0

	b ₇	i ₄	b ₅	e ₅	h	c ₅	s ₅
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	112	45	90	134	71	11	7.0
080	125	50	100	154	80	13	10.0
090	140	56		174	90		
100	160	63	140	194	100	15	12.0
112	190	70		223	112	14	
132	216	89		178	260	132	



Dimensions

MDFMA, B5



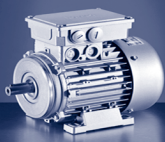
Motor options	MDFMA XX										MDFMA BR								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	373	138	118	24	136	103	123	14	106	410	138	118	24	136	103	123	14	106	
080	400	156	132	25	152	121	132			455	156	132	25	132					
090	434	176	137	29			141	487	176	137	29	141							
100	491	194	147	36			150	552	194	147	36	150	22	105					
112	494	218	158	38	162	575	218	158	38	162									
132	612	257	187	51	182	698	257	187	51	194	125	182							

Motor options	MDFMA RS MDFMA IG MDFMA AG										MDFMA BS MDFMA BI MDFMA BA								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	373	138	118	24	136	103	123	14	106	410	138	118	13	194	125	123	14	106	
080	400	156	132	25	152	121	132			455	156	142	24			132			
090	434	176	137	29			141	487	176	147	28	141							
100	491	194	147	36			150	552	194	158	35	150	22	105					
112	494	218	158	38	162	575	218	168	37	162									
132	612	257	187	51	182	698	257	187	51	182									



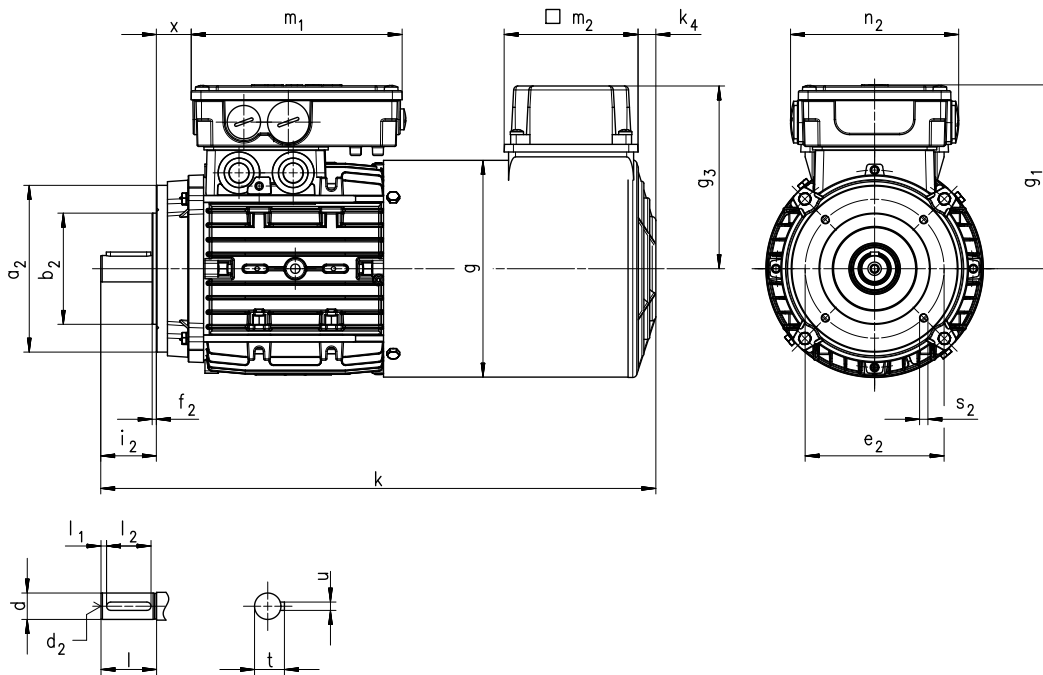
	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50		40	27.0	8.0
100	28		M10	60	5.0	50	31.0	
112						60		
132			38	M12	80		70	41.0

	Flange size	a ₂	b ₂	c ₂	e ₂	f ₂	s ₂	i ₂
			j6					
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	FF130	160	110	10	130	3.5	10.0	30
080	FF165	200	130	11	165		12.0	40
090							50	
100	FF215	250	180	15	215	4.0	14.5	60
112								80
132	FF265	300	230	20	265			



Dimensions

MDFMA, B14



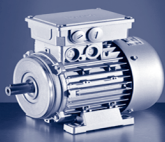
Motor options	MDFMA XX										MDFMA BR								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂		k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	373	138	118	24	136	103	123	14	106	410	138	118	24	136	103	123	14	106	
080	400	156	132	25	152	121	132			455	156	132	25	152	121	132			
090	434	176	137	29			141	487	176	137	29	141							
100	491	194	147	36	150	22	150	552	194	147	36	150	22	150					
112	494	218	158	38	162	162	162	575	218	158	38	162	22	162					

Motor options	MDFMA RS MDFMA IG MDFMA AG										MDFMA BS MDFMA BI MDFMA BA								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂		k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	373	138	118	24	136	103	123	14	106	410	138	118	13	194	125	123	14	106	
080	400	156	132	25	152	121	132			455	156	142	24			132			
090	434	176	137	29			141	487	176	147	28	141							
100	491	194	147	36	150	22	150	552	194	158	35	150	22	150					
112	494	218	158	38	162	162	162	575	218	168	37	162	22	162					



	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	14		M5	30	4.0	22	16.0	5.0
080	19		M6	40		32	21.5	6.0
090	24		M8	50	5.0	40	27.0	8.0
100	28		M10	60		50	31.0	
112						60		

	Flange size	a ₂	b ₂	e ₂	f ₂	s ₂	i ₂
			j6				
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071	FT85	105	70	85	2.5	M6x10	30
080	FT100	120	80	100	3.0	M6x12	40
	FT130	160	110	130	3.5	M8x16	
090	FT115	140	95	115	3.0	M8x14	50
						M8x16	
100	FT130	160	110	130	3.5	M8x14	60
112						M8x16	



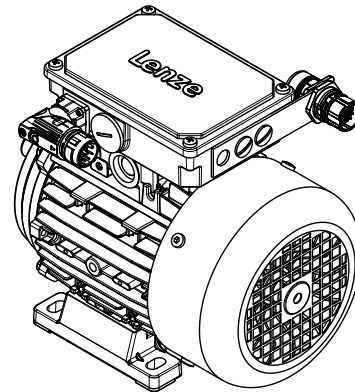
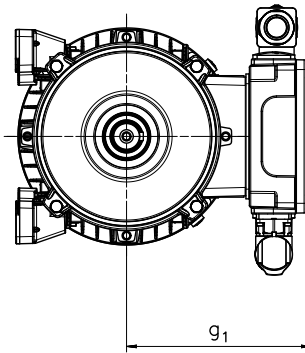
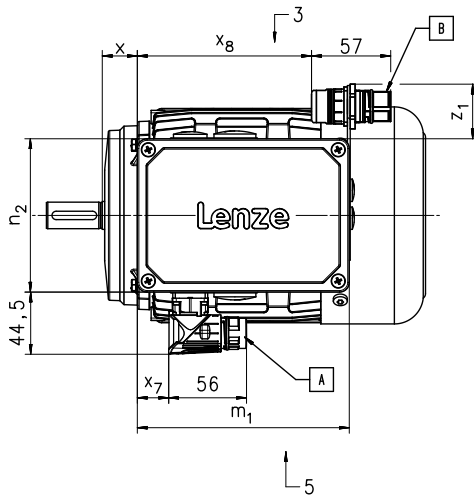
Dimensions

Motor connection

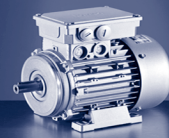
Motor terminal box with ICN connector

The connector can be installed in the following positions:

- ▶ Power connection (A) in position 5 and feedback connection (B) in position 3
- ▶ Power connection (A) in position 3 and feedback connection (B) in position 5
- ▶ In motor frame size 132 the feedback connection (B) is only available in position 3 or 5

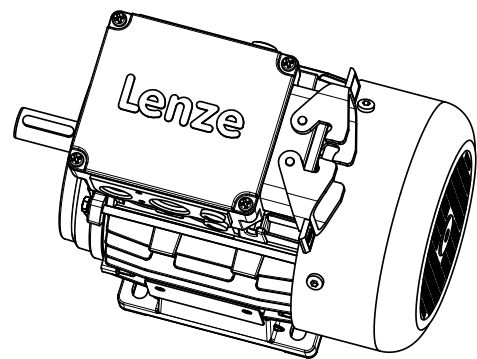
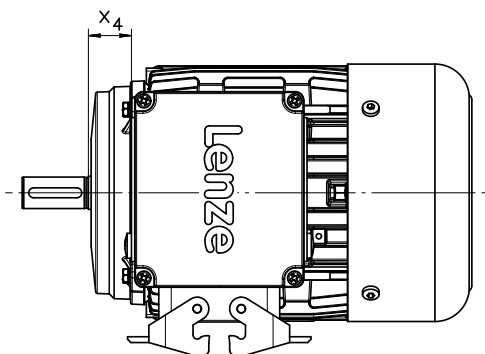
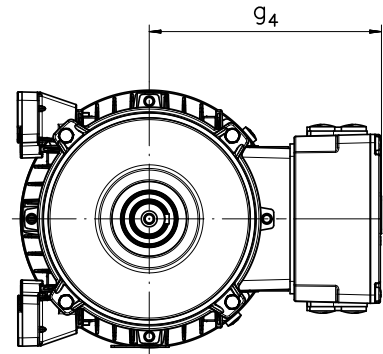
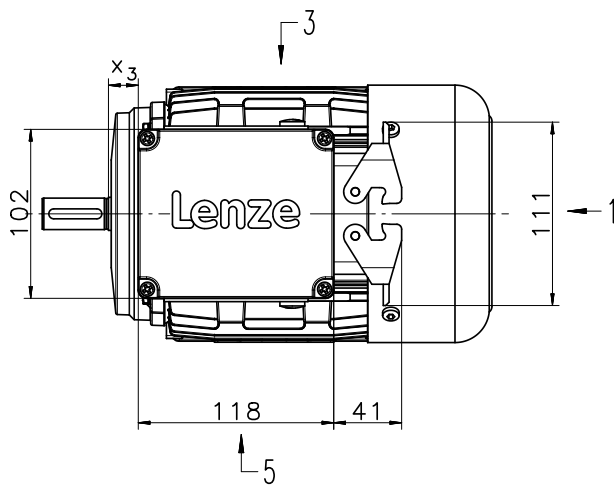


Motor options	MDEMA XX MDEMA BR MDEMA RS MDEMA IG MDEMA AG MDEMA BS MDEMA BI MDEMA BA				MDFMA XX MDFMA BR MDFMA RS MDFMA IG MDFMA AG MDFMA BS MDFMA BI MDFMA BA			
	g_1 [mm]	x [mm]	m_1 [mm]	n_2 [mm]	x_7 [mm]	x_8 [mm]	$z_{1, \max}$ [mm]	
071	118	24	136	103	16	109	43	
080	132	25	152	121	23	125	41	
090	137	29						
100	147	36						
112	158	38	194	125	27	166	71	
132	187	51						

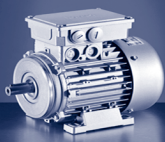


Motor terminal box with HAN-10E/HAN-Modular connector

The connection position for the connector is shown in position 1. Positions 3 and 5 are also possible.



Motor options	MDEMA XX MDEMA BR		MDFMA XX MDFMA BR	
	g_4 [mm]	x_3 [mm]	x_4 [mm]	
071	132	16	24	
071	132	16	24	
080	132	18	26	
090	141	22	30	
100	146	29	37	
112	157	31	39	
132	167	42	50	

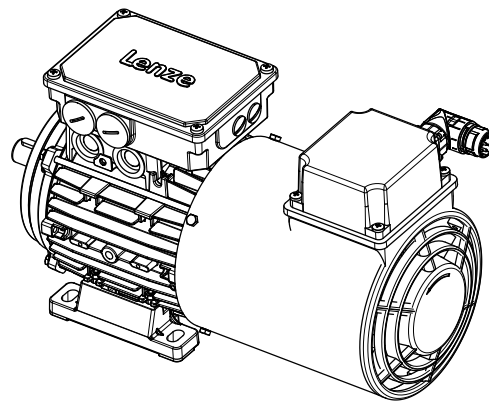
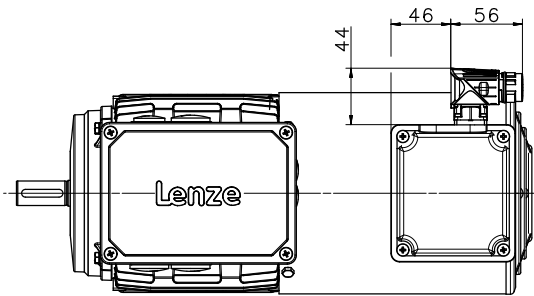
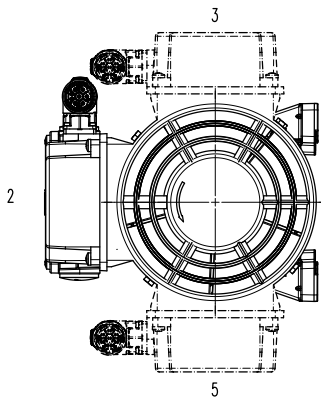


Dimensions

Motor connection

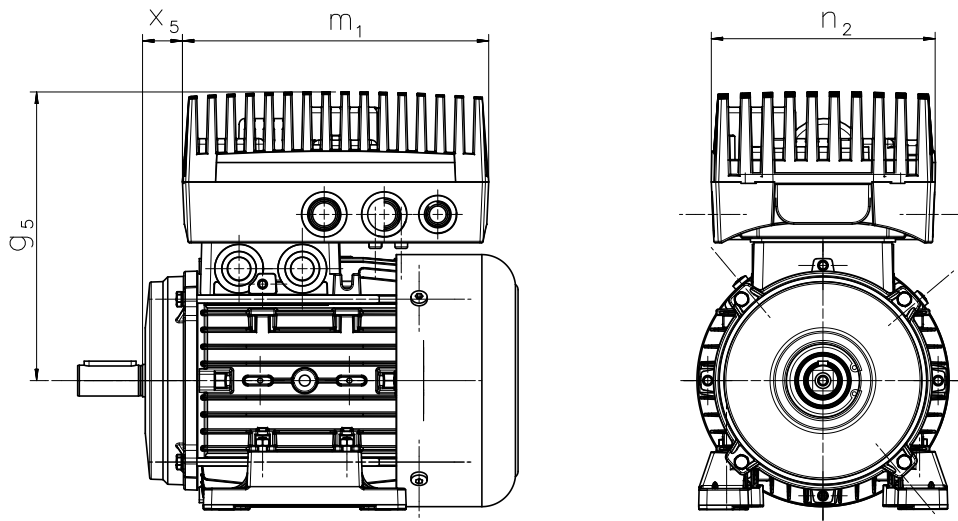
Connector for blower

- ▶ The terminal box for the separate fan is available in positions 2, 3 and 5.
- ▶ In addition, the cover of the fan terminal box (including connectors) can be rotated progressively through 90° if necessary.



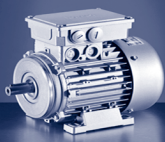


Decentralised frequency inverter motec



Rated frequency 50 Hz

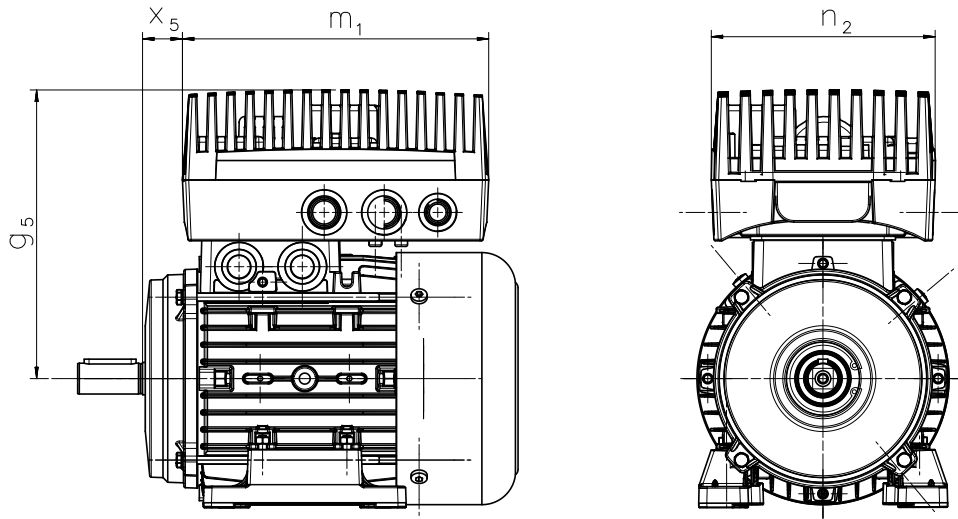
Product key					
Motor	Inverter	g_5	x_5	m_1	n_2
		[mm]	[mm]	[mm]	[mm]
MD□MA□□071-12	E82MV251_2B	180	31	190	138
MD□MA□□071-32	E82MV371_2B				
MD□MA□□071-42	E82MV551_4B	228	2	202	156
MD□MA□□080-12					
MD□MA□□080-32	E82MV751_4B	223	12		
MD□MA□□080-42		239			
MD□MA□□090-12	E82MV152_4B	244	16	230	176
MD□MA□□090-32					
MD□MA□□100-12	E82MV222_4B	255	23		
MD□MA□□100-32	E82MV302_4B	271	19		
MD□MA□□112-22	E82MV402_4B	281	21	325	211
MD□MA□□132-12	E82MV552_4B				
MD□MA□□132-22	E82MV752_4B	300	30		



Dimensions

Motor connection

Decentralised frequency inverter motec

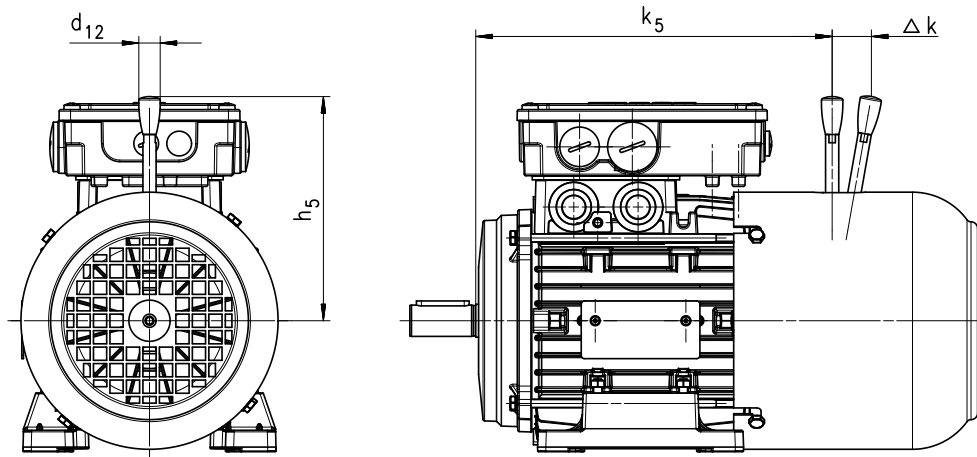


Rated frequency 87 Hz

Product key					
Motor	Inverter	g_5	x_5	m_1	n_2
		[mm]	[mm]	[mm]	[mm]
MD□MA□□071-12	E82MV551_4B	228	2	202	156
MD□MA□□071-32	E82MV751_4B				
MD□MA□□071-42		244			
MD□MA□□080-12	E82MV152_4B		12	230	176
MD□MA□□080-32		239			
MD□MA□□080-42	E82MV222_4B	244	16		
MD□MA□□090-12	E82MV302_4B	260	12	325	211
MD□MA□□090-32					
MD□MA□□090-42		271	19		
MD□MA□□100-12	E82MV402_4B		12		
MD□MA□□100-32	E82MV552_4B	281	14		
MD□MA□□112-22	E82MV752_4B				

Dimensions

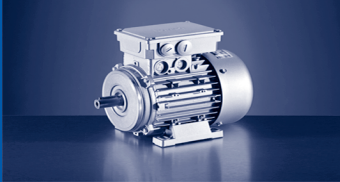
Brake motor with manual release lever



Motor options	MDEMA BR MDEMA BS MDEMA BI MDEMA BA	MDFMA BR MDFMA BS MDFMA BI MDFMA BA				
	Size					
	Brake					
		k₅	Δ k	h₅	d₁₂	
		[mm]	[mm]	[mm]	[mm]	
071	06	205	29	107	13.0	
	08	206	27	116		
080	10	224	28	132		
	08	238	27	116		
090	10	251	28	132		
	12	305	37	161		
112	14	307	41	195		24.0
	16	323	55	240		
132	16	400				
	16	406				

The following combinations with the manual release lever and motor connection in the same position are not possible:

- ▶ HAN connector with connection in position 1
- ▶ motec inverter
- ▶ Terminal boxes for motor sizes 071, 080, 090 for brake and feedback (M□□MA BR/BS/BA/BI)



Surfaces and corrosion protection

For optimum protection of three-phase AC motors against ambient conditions, the surface and corrosion protection system (OKS) offers tailor-made solutions.

Various surface coatings ensure that the motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The three-phase AC motors are also available unpainted (no surface and corrosion protection).

OKS-G (primed)

Applications

- ▶ Dependent on subsequent top coat applied

Measures

- ▶ One-component priming coat (grey)

OKS-S

Applications

- ▶ Standard applications
- ▶ Indoor installation in heated buildings
- ▶ Air humidity up to 90%

Measures

- ▶ Surface coating in accordance with corrosivity class C1 (in accordance with EN 12944-2)

OKS-M

Applications

- ▶ Indoor installation in unheated buildings
- ▶ Outdoor installation in covered, protected area
- ▶ Air humidity up to 95 %

Measures

- ▶ Surface coating in accordance with corrosivity class C2 (in accordance with EN 12944-2)

OKS-L

Applications

- ▶ Outdoor installation
- ▶ Air humidity over 95%
- ▶ Chemical industrial plants
- ▶ Food industry

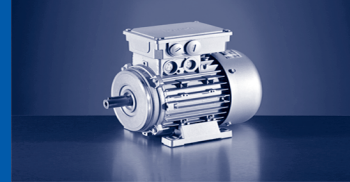
Measures

- ▶ Surface coating complies with corrosivity class C3 (in accordance with EN 12944-2)
- ▶ Additional priming coat on fan cover and B-end shield
- ▶ Galvanised bolts
- ▶ Cable glands with sealing rings
- ▶ Corrosion-resistant brake with seal, non-rusting friction plate and chrome-plated armature plate (on request)

Optional measures

- ▶ Sealed recesses on motor (on request)

A blower cannot be used in combination with OKS-L.

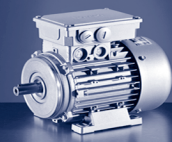


Structure of surface coating

Surface and corrosion protection system	Without	OKS-G	OKS-S	OKS-M	OKS-L
Corrosivity category according to DIN EN ISO			C1	C2	C3
Structure of the surface coating					
1K primer					
2K-EP primer					
2K-PUR top coat					
Colour		Grey	Standard: RAL 7012 Optional: According to RAL Classic		



Surfaces and corrosion protection



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