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Lenze

Global Drive

Servo motors
MDXK / MDFQA
synchronous / asynchronous

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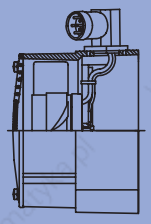
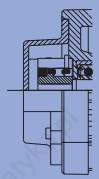
Servo motors

In the Global Drive System, asynchronous and synchronous motors perfectly match the controllers. Thanks to modular design and the planned options it is possible to select a suitable drive. Further assets of Global Drive servo motors are: small size, long life and high operational safety.

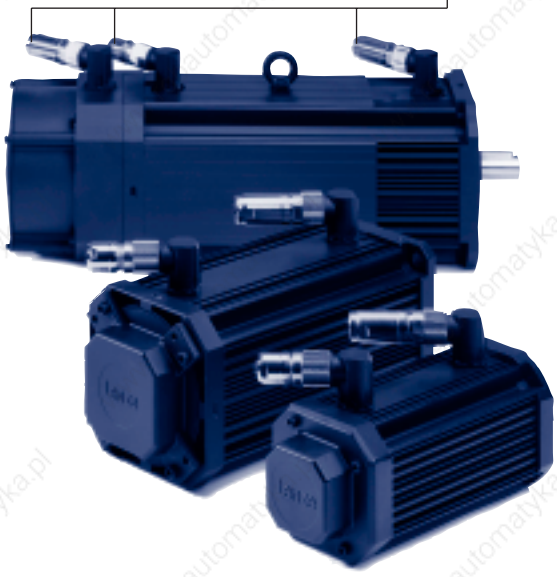
Comfortable system cables with plug-in connectors enable easy connection. Modern production processes ensure a good price / performance ratio.
This catalogue describes all preference types which are available within 15 working days as well as all industry types which require a delivery time of 30 working days. We would like to present further options of this modular design personally.

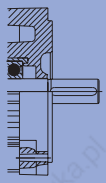


Separate fan

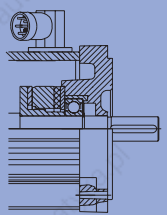


Resolver



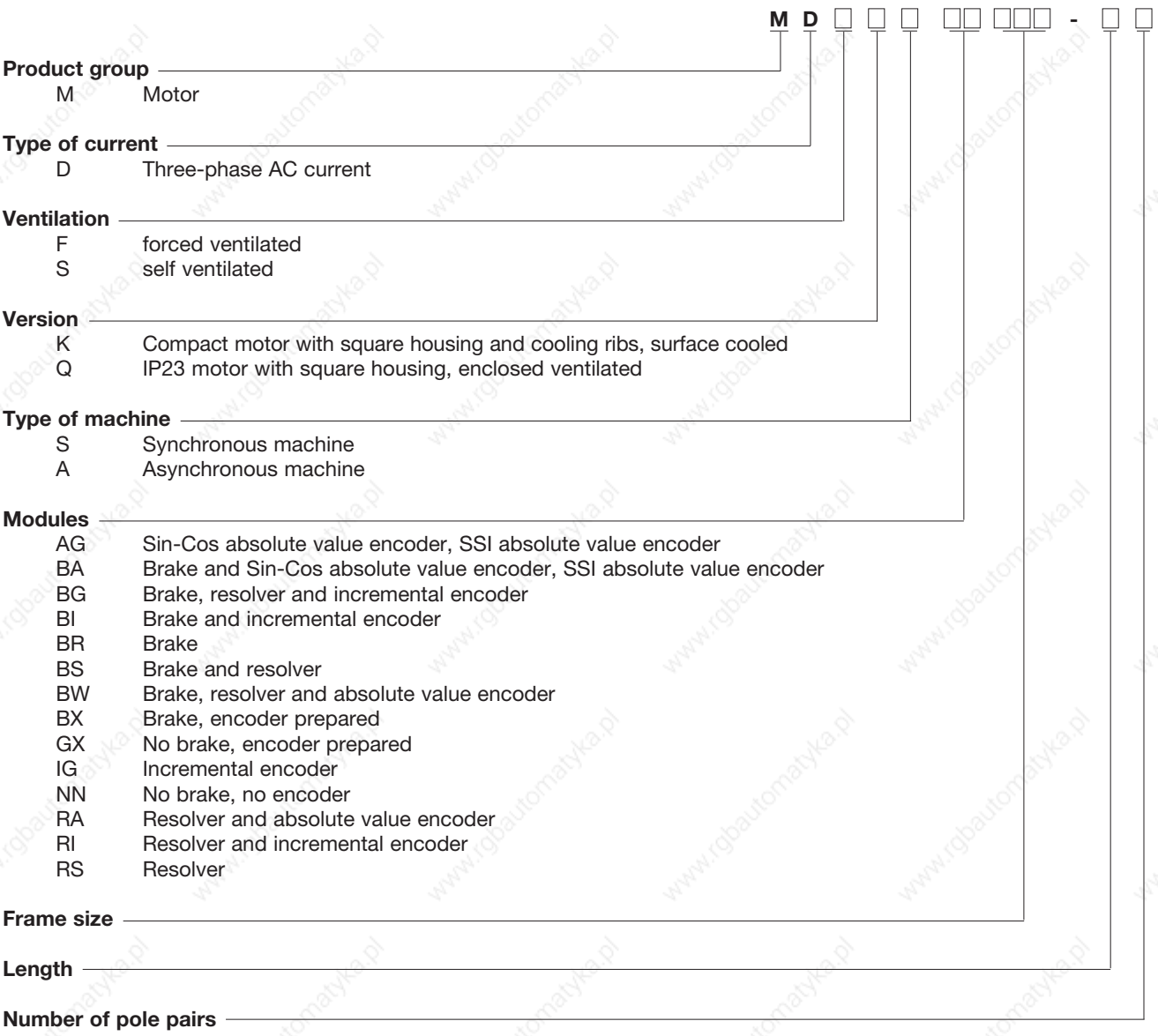


without holding brake



Holding brake

Product code



Lenze

No matter which drive solution you imagine – we make your dreams come true.

According to our maxim „one stop shopping“ we offer you a complete programme of electronic and mechanical drive systems which are distinguished by reliability and efficiency.
Our supply range includes frequency inverters, speed controllers, variable speed drives, gearboxes and motors as well as clutches and brakes.
Lenze is thus the competent partner for your application – not only as supplier for single components but also for complete drive systems including planning, execution and commissioning. Furthermore, a world-wide service and distribution network allows a qualified customer advisory service on site and a fast and extensive after sales service. Our quality assurance system for development, production, sales and service is certified to DIN ISO 9001. Our customers set the scale for measuring the quality of our products. Our task is to meet your requirements. Customer orientation as a Lenze principle means the highest quality.

See for yourself.

List of abbreviations

Abbreviations used in this catalogue

h	[mm]	Axis height
n_{rated}	[min^{-1}]	Rated speed
M_{rated}	[Nm]	Rated torque
P_{rated}	[kW]	Rated power
I_{rated}	[A]	Rated current
I_0	[A]	Continuous current at standstill
f_{rated}	[Hz]	Rated frequency
M_{max}	[Nm]	Maximum torque
I_{max}	[A]	Maximum current
n_{max}	[min^{-1}]	Maximum speed
J_{load}	[kgcm^2]	Moment of inertia load machine
M_{load}	[Nm]	Torque load machine
M_0	[Nm]	Continuous torque at standstill
M_{cont}	[Nm]	Continuous torque
M_{perm}	[Nm]	Permissible torque
$\eta_{gearbox}$		Gearbox efficiency
J_{mot}	[kgcm^2]	Moment of inertia motor
m	[kg]	Mass
$\cos\varphi_N$		Power factor asynchronous motor
U_{rated}	[V]	Rated voltage
F_a	[N]	Permissible axial force
F_{r1}	[N]	Permissible radial force at shaft middle
F_{r2}	[N]	Permissible radial force at shaft end
i		Gearbox ratio
M_B	[Nm]	Holding torque brake
J_B	[kgcm^2]	Moment of inertia brake

MDFQA	Enclosed ventilated asynchronous servo motor, forced ventilated (MDFQA)
MDXKX	Asynchronous or synchronous servo motor, self or forced ventilated (MDSKA / MDSKS or MDFKA / MDFKS)
MDSKX	Asynchronous or synchronous servo motor self ventilated (MDSKA / MDFKA)
MDFKX	Asynchronous servo motor, self ventilated or forced ventilated (MDSKA / MDFKA)
MDXKA	Asynchronous servo motor, self ventilated or forced ventilated (MDSKA / MDFKA)
MDXKS	Synchronous servo motor, self ventilated or forced ventilated (MDXKS / MDFKS)
AC	AC voltage
DC	DC voltage
DIN	Deutsches Institut für Normung
EMC	Electromagnetic compatibility
EN	European Standard
IEC	International Electrotechnical Commission
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
VDE	Verband deutscher Elektrotechniker
CE	Communauté Européene
IM	International Mounting Code

Lenze

Global Drive servo motors

Product information

Selection of servo motors

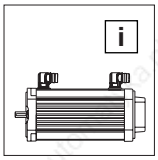
Technical data of servo motors

Dimensions of servo motors

Application examples

Order forms

Lenze worldwide



Product information

Servo motors MDXK and MDFQA

Today, servo drive systems must fulfil highest demands. With Global Drive, Lenze succeeded in combining different drive components to form a perfectly matching system. The programme of servo motors for the power range up to 60.1 kW is completed by brushless synchronous servo motors for the lower power range from 0.25 to 4.2 kW. Compared with standard three-phase AC motors, these servo motors provide a very low moment of inertia, low weight, high maximum speed and a wide speed-setting range.

High dynamic response and accuracy
Servo motors provide a low moment of inertia and a high overloadability. Optimum temperature-independent control features are achieved by continuously measuring the temperature with an integrated temperature sensor. Together with servo inverters of series 9300, the motors ensure high speed accuracy, best concentricity and high angle acceleration.

Long service life
The high quality standard, Lenze sets for all components, meets the requirements of modern drive technology for operational safety and service life.
A reinforced isolation with thermal reserve (coated wire to thermal class H, class F temperature rise) ensures a long service life of the winding.
Prestressed rolling bearings with high temperature resistant lubrication ensure a long service life.

Operational safety
Enclosure IP54 of MDXK motors ensures good protection against dust and water ingress. MDFQA motors up to 60.1 kW are protected by enclosure IP23.

CE conformity
Of course, Lenze servo motors MDXK and MDFQA comply with the EC Directives:
– CE conformity to the Low Voltage Directive
– CE conformity to the Electromagnetic Compatibility of a typical drive configuration with inverter.

The electromagnetic compatibility can be easily guaranteed by using predetermined system cables.

No compromises with the output speed
The wide ratio range of gearboxes combined with the small ratio step of 1.12 enables the exact selection of the output speed range required.

Compact
The high power density of the motors facilitates small drive units.
Especially compact drives are formed by using geared servo motors with directly connected motors.

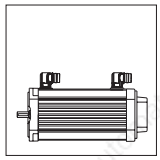
Adaptability
The modular motor design and the number of planned variants facilitate the selection of the motor for your application.
Thanks to the variety of output designs of motors and geared motors, the drives fulfil many application requirements:
– Servo motors with cylindrical shaft end with or without key
– Servo motors with flanges provided with through hole bores for mounting position B5, with threaded bores for mounting position B14.
– Geared servo motors with solid shaft, hollow shaft or hollow shaft with shrink disc.
– Geared servo motors with or without flange, foot or centring
– Different integrated angle encoders ensure the accuracy required:
  Resolver as standard solution, optimised characteristic because of internal improvement of the resolver accuracy. SinCos absolute value encoder as industry type for highest accuracy. Incremental encoder with 2048 pulses as preference type for MDFQA and as industry type for MDXK.

Low noise
High chopper frequency of the inverters (up to 16 kHz) result in a low noise generation.
In addition, optimised toothing geometry and internally ribbed cast iron housings of Lenze Gearboxes reduce the noise generated.

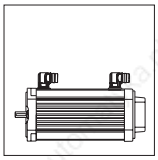
Reduced backlash
The application of backlash-free permanent magnet holding brakes enables a defined holding of a position even when no voltage is applied.
Compared with other gearboxes, backlash-free connection elements of Lenze Gearboxes and the high splining quality achieved by precise production ensure a low backlash at the output of geared servo motors.

Special types
Special applications require special motor designs.
Possible options are e.g.:
– incremental encoder as feedback with 4096 pulses
– second feedback.

We are prepared to give more detailed information.



	Synchronous servo motors Series MDSKS, MDFKS	Asynchronous servo motors Series MDSKA, MDFKA	Asynchronous servo motors MDFQA
Enclosure	IP54 / IP65		IP23
Thermal class (VDE 0530)	Thermal class F use, Insulation (coated wire) as thermal class H		
UL-conformity	UL listed material for coated wire, brush leads, insulation material		
Dielectric strength	Max. voltage amplitude $\hat{V}$ = 1.5 kV Max. rate of voltage rise du/dt = 5 kV/µs		
Vibrational severity	N	N frame sizes 056 and 071, R as of frame size 80	N
Concentricity, eccentricity, coaxiality (DIN 42955)	N	N frame sizes 056 and 071, R as of frame size 80	N
Mechanical tolerance	Diameter shaft end d Ø11 to Ø38: k6, d Ø55: m6 Diameter centring flange b1 : J6		
Temperature monitoring (no complete protection)	Continuous temperature sensor (KTY 83-110)		
Connection	1 plug for each: Motor and brake Resolver and temperature sensor, separate fan (as of frame size 071) or terminal box		Motor connection as terminal box, encoder connection with plug
Temperature range	-20 to + 40 °C without power derating (without brake, non-ventilated) -10 to + 40 °C without power derating (with brake) -15 to +40 °C without power derating (separately ventilated)		
Surface temperature	Self ventilated motors (MDSK) up to 140 °C Forced ventilated motors (MDFK) up to 110 °C		to 110 °C
Installation height	up to 1000 m a. m. s. l. without power derating		
Demagnetising limit	$> 4 \cdot I_{rated}$ with self ventilation $> 2{,}9 \cdot I_{rated}$ with forced ventilation	Demagnetisation not possible	
Maximum torque	$> 4 \cdot M_{rated}$ with self ventilation $> 2{,}9 \cdot M_{rated}$ with forced ventilation	$> 5 \cdot M_{rated}$	
Rated speed	3000 min^{-1}	1635-4160 min^{-1}	550-2935 min^{-1}
Angle encoder	Resolver / Sin-Cos encoder	Resolver / incremental encoder / Sin-Cos absolute value encoder	
Mounting position	B5 / B14		B5 / B35
Bearing	Deep groove ball bearing with high-temperature resistant grease, 2 seals		
	Locating bearing at A-side		at B-side
Shaft end	with / without key		
Brake	with or without permanent magnet holding brake at A-side		with and without spring-operated brake
Fan	Axial fan as of frame size 071 possible		Radial fan
Colour	Black, RAL 9005		



Selection

Technical data

Preference and industry type of servo motors

Motor type / Version		Motor series MDXKX													MDFQA		
		Synchronous motors							Asynchronous motors						Asynchr.-IP23		
		MDSKSXX 036-13	MDSKSXX 036-23	MDSKSXX 056-23	MDSKSXX 056-33	MDXKSXX 071-03	MDXKSXX 071-13	MDXKSXX 071-33	MDXKAXX 056-22	MDXKAXX 071-22	MDXKAXX 080-22	MDXKAXX 090-22	MDXKAXX 100-22	MDXKAXX 112-22	MDFQAXX 100-22	MDFQAXX 112-22	MDFQAXX 132-32
Ventilation	Self ventilation	●	●	●	●	●	●	●	●	●	●	○	○	○			
	Forced ventilated					●	●	●		●	●	●	●	●	●	●	●
Enclosure	IP54	●	●	●	●	●	●	●	●	●	●	●	●	●			
	IP65 (only with self ventilation)			○	○	○	○	○	○	○	○	○	○	○			
	IP23s														●	●	●
Frequency / speed	>100 Hz, >2800 min^{-1}	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	<100 Hz, <2500 min^{-1}										○	○	○	○	●	●	●
Mounting position	B14C105			●	●				●								
	B14C160					●	●	●		●	●	●	●	●			
	B5 FF75	●	●														
	B5A120 FF100			●	●				●								
	B5A160 FF130					●	●	●		●							
	B5A200 FF165										●	●					
	B5A250 FF215												●	●			
	B5A300 FF265													●	●		
	B5A400 FF350																●
	B35A250 FF215														●		
	B35A300 FF265															●	●
	directly connected gearbox B9			○	○	○	○	○	○	○	○	○	○	○			
Shaft end	11 x 23 MP with key	●	●														
	14 x 30 MP with key			●	●				●								
	19 x 40 MP with key					●	●	●		●							
	24 x 50 MP with key										●	●					
	28 x 60 MP with key												●				
	38 x 80 MP with key													●	●	●	
	55 x 110 MP with key																●
	11 x 23 OP without key	●	●														
	14 x 30 OP without key			●	●				●								
	19 x 40 OP without key					●	●	●		●							
	24 x 50 OP without key										●	●					
	28 x 60 OP without key												●				
	38 x 80 OP without key													●	●	●	
	55 x 110 OP without key																●
	conical shaft (B9)			○	○	○	○	○	○	○	○	○	○	○			
Brake	without brake	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	24V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	205V			○	○	○	○	○	○	○	○	○	○	○	●	●	●
Encoder	Resolver	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SinCos multi turn AM512			○	○	○	○	○	○	○	○	○	○	○	○	○	○
	SinCos single turn AS512			○	○	○	○	○	○	○	○	○	○	○	○	○	○
	ITD21, 2048IMP, TTL								○	○	○	○	○	○	○	○	○
Connection	Plug-in conn. (enc. a. power)	●	●	●	●	●	●	●	●	●	●	●	●	●			
	2 x KK (encoder and power)			○	○	○	○	○	○	○	○	○	○	○			
	1 x KK1 (power)			○	○	○	○	○	○	○	○	○	○	○	●	●	●
Temperature monitoring	Thermostat KTY	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Thermal encoder TKO														●	●	●

● = preference type
○ = industrial type