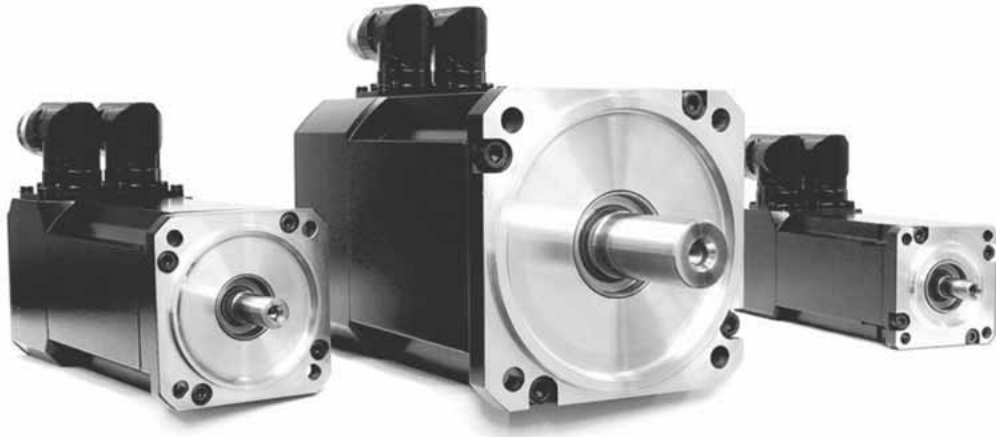


MR 75 AC SERVO MOTORS

AC Servo Motors with High Power Density



AC servo motors without casing with rated torques between 0.45 and 33 Nm and five different flange sizes, rated speeds of 3,000 r.p.m., other speeds on request. All motors are available with brakes.

Main Characteristics

- maintenance-free, since brushless
- high dynamics
- compact dimensions due to rare earth magnet material with high power density
- built-in resolver for sinusoidal commutation, other position sensors as options
- IP 54 protection, optional shaft sealing with radial sealing ring

ESR Drive System Packages

MR 75 servo motors are adapted to the digital and analog ESR servo drives. Servo drives and servo motors with or without gearbox, complete with position sensors and, if required, brakes are available as drive system packages. For further information, see the back of this data sheet.

Applications

Positioning and feed movements with high dynamics and accuracy in

- Handling and assembly systems
- Electronics production machinery
- Semiconductor production machinery
- Measuring and testing machinery
- Optical discs production machinery (CDs, DVDs, ...)
- Machine tools and metal working machinery
- Packaging machinery
- Textile machinery
- Plastics processing machinery
- Coiling machinery
- and many other applications

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Operating Principle of a Servo Drive System

General	A servo drive system consists of servo motor and servo drive. The three-phase winding of the motor is fed by the drive. The position sensor system of the motor guarantees the sinusoidal supply of the windings (sinusoidal commutation) and provides for a smooth motor operation, even at low speeds. Motor, position sensor system, and servo drive form a closed control loop.
Control loops	<p>For torque control only, the current controller can be driven directly. In case of a difference between target and actual torque, the rate of the pulse width modulation is adjusted so that the current amplitude corresponds to the required torque.</p> <p>In velocity mode, the speed control loop with underlying current controller is active. In case of a difference between target and actual speed, the frequency of the three-phase current is increased or reduced until the actual speed has reached the rated speed. The current controller regulates the current to the required torque.</p> <p>A position control is integrated in the ESR digital servo drives. The position control loop is superimposed to the speed and current controller and ensures that the motor moves to a specified position. During that, adjustable acceleration and deceleration ramps are followed.</p>

Construction of the Servo Motors

General	The series MR 75 AC servo motors are permanent-magnet three-phase synchronous motors for applications with high demands to dynamics and positioning accuracy at small construction volume and low weight. The stator carries a three-phase winding, the rotor is equipped with rare earth magnets at the surface. Due to its high remanence and field strength, this magnet material permits high dynamics and a compact design of the motor.
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Construction types and equipment An overview of the different types and the available equipment (holding brake, key, etc.) is given in the type code below.

Special design In addition to the stated types and equipment, special designs are possible, e. g. motors with hollow shafts, special flange, adjusted winding, etc. If required, please contact ESR.

Type Code

The type code clearly identifies a servo motor equipped in a certain way.

Example:

MR 75 **24** **5113** **U3** **N030** **G01** **A0D** **M0** **P0** **S0**



24

Frame size and rotor length

Xx first number: frame size (1..5)
xX second number: rotor length (1..8)

5113

Assembly code or other classification

Internal coding of ESR, given for various feature combinations. Statement of the assembly code is not required if all other features unequal zero are stated and the customer-specific equipment is described. For above-mentioned example "MR 7524-U3-N030-G01-A0D" would be sufficient.

U3

DC-bus voltage

U3 motor for 320 V DC-bus voltage (corresponds to 230 V supply voltage)
U5 motor for 560 V DC-bus voltage (corresponds to 400 V supply voltage)

N030

Rated speed

in 100 r.p.m., e. g. N030 = 3000 r.p.m. rated speed

G01

Motor position sensor

G01 with resolver (1 pole pair) (standard) G11 with EnDat encoder, single-turn (2048)
G06 with high-res. incremental encoder (Heidenhain, 2048) G12 with EnDat encoder, multi-turn (2048)
G09 with Sincos (Hiperface) encoder, single-turn (Stegmann, 1024)
G10 with Sincos (Hiperface) encoder, multi-turn (Stegmann, 1024) other motor position sensors on request

A0D

Motor connection

A0D rotatable connectors (standard)

M0

Holding brake

M0 without holding brake (standard) MF with spring pressure holding brake

P0

Shaft, key

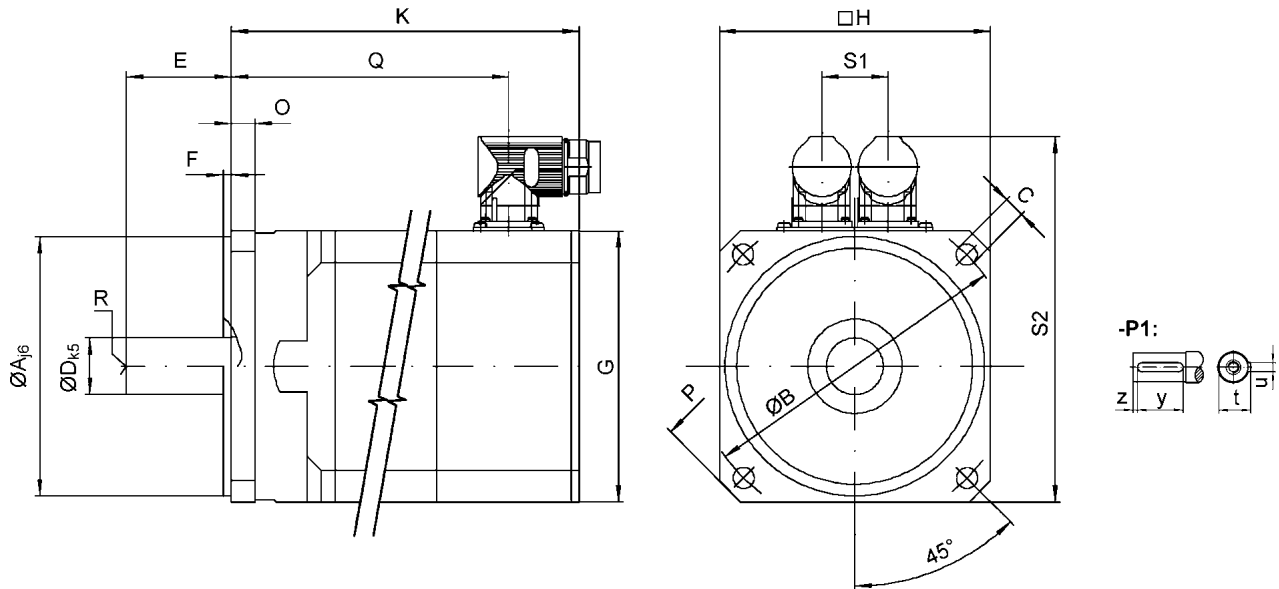
P0 shaft, flat (standard) P1 shaft with key

S0

Special design (described by text)

S0 motor in standard design S3 motor with special flange
S1 motor with special winding SU motor with UL certification
S2 motor with special shaft SK other special design

Dimensions



	A_{j6}	B	C	D_{k5}	E	F	G	H	$K^{(1)}$ -G01 -M0	$K^{(2)}$ -G01 -MF	$K^{(3)}$ -Gxx -M0	$K^{(4)}$ -Gxx -MF	O	P	Q	R	S1	S2	t	u_{h9}	y	z	
MR 7511	40	63	5.5	9	20	2.5	56.5	55	85	133	<127	<174	10		64	M4	27	95	10.2	3	16	2	
MR 7512									105	152	<147	<194			84								
MR 7514									145	193	<187	<234			124								
MR 7522	60	75	5.5	11	23	2.5		70	110	153	<149	<191	11	90	89	M4	28	112	12.5	4	16	4	
MR 7524									150	193	<189	<231			129								
MR 7532	80	100	7	19	40	3		90	120	169	<152	<200	14	120	99	M5	28	129	21.5	6	32	5	
MR 7534									160	209	<192	<240			139								
MR 7536									200	249	<232	<280			179								
MR 7542	110	130	9	24	50	3.5		115	128	178	<161	<210	14	150	107	M8	28	154	27	8	40	5	
MR 7544									168	218	<201	<250			147								
MR 7546									208	258	<241	<290			187								
MR 7552	130	165	11	32	58	3.5		140	135	191	<167	<223	16	190	112	M12	28	182	35	10	50	5	
MR 7554									175	231	<207	<263			152								
MR 7558									255	311	<287	<343			232								

Dimension K:

¹⁾ with resolver, without brake / ²⁾ with resolver, with brake / ³⁾ with high-resolution encoder, without brake / ⁴⁾ with high-resolution encoder, with brake

All dimensions in millimeters, CAD files (3D/Step) are available on request.

Mechanical Data

Mounting standards	Flange-mounted motor, flange according to DIN 42 677; special flange on request
Mounting positions	Any
Construction types	Abbreviation acc. to DIN IEC 34 part 7: IM B 5; special construction types on request
Flange accuracy	Standard acc. to DIN 42 955; higher accuracy on request
Cooling	Self-cooling
Bearings lubrication	K3N acc. to DIN 51 825 part 1
Varnishing	Matt black RAL 9005
Bearing shields	High-quality light-metal alloy
Stator	Without housing; stator package welded and cast
Vibration intensity	Rotor dynamically balanced according to vibration intensity stage R, S according to DIN EN 60034-14 (VDE 0530-14) on request
Rotor	Rotor with rare earth permanent magnets
Protection Class	IP 54, rotary shaft seal optionally
Shaft end	Acc. to DIN 748, part 3, with more precise fit k5, threaded on centerline similar to DIN 332 Bl. 2 Standard shaft without key; shaft with keyway as option Special shaft ends on request

Motor Shaft

Permissible mechanical load	Basis: service life of ball bearings 20,000 h, application of radial force F_R to shaft center at motor speed 3,000 r.p.m. (up to +50% at 1,100 r.p.m.), no simultaneous loading with max. F_R and F_A .
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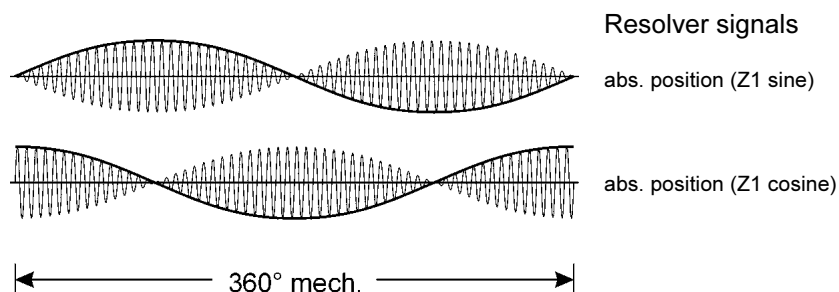
Motor Size	MR	751x	752x	753x	754x	755x
Radial force F_R	N	200	270	400	560	950
Axial force F_A	N	85	85	140	180	340

Electrical Data

General	The motors are three-phase synchronous motors with 5 pole pairs. They comply with the DIN EN 60034-1 (VDE 0530) Rules for Electrical Machines.
Voltage	The motors are designed for connection to servo drives with DC-bus voltages of 320 V or 560 V, see back of this data sheet. Other voltages on request.
Connection	Connector, rotating (power: 8-pin, position sensor: 12- or 17-pin)
Insulation	Insulation class F acc. to DIN VDE 0530.
Performance	The rated output in the technical specifications applies to operating conditions defined according to DIN EN 60834-1 (VDE 0530): installation location below 1000m above sea level, cooling air temperature ≤ 40 °C, operating mode S1.
Winding protection	<p>The servo drive monitors the power consumption of the motor using an I^2t circuit and protects it against overloading.</p> <p>In addition to the monitoring by the servo drive, the winding is monitored by PTC resistors installed in the motor, options on request. If the permissible winding temperature is exceeded, the servo drive responds to the abrupt rise of the PTC resistance.</p>

Motor Position Sensors

General	For determining position and speed, the servo motors are equipped with a motor position sensor. Two types of position sensors are available: resolvers, optical, or magnetic position sensors with higher resolution, including Sincos (Hiperface), high-resolution incremental, or EnDat encoders. Usually, resolvers are used. Sincos (Hiperface), high-resolution incremental, and EnDat encoders can be used in connection with digital servo drives. They are intended for applications in which high accuracy and dynamics or low speed ripple are required. The multi-turn types additionally provide an absolute position determination for 4096 revolutions.
Resolvers (Option -G01)	Resolvers are inexpensive and robust sensors with magnetic position acquisition. A 1-pole-pair brushless hollow-shaft resolver with a transmission ratio of 1 : 0.5 working according to the transmitter principle is used. In the servo drive, the exact rotor position is determined from the analog resolver signals.



Position sensors with a higher resolution:

High-resolution incremental encoder
(Option -G06)

Sincos (Hiperface) encoder
(Option -G09 and -G10)

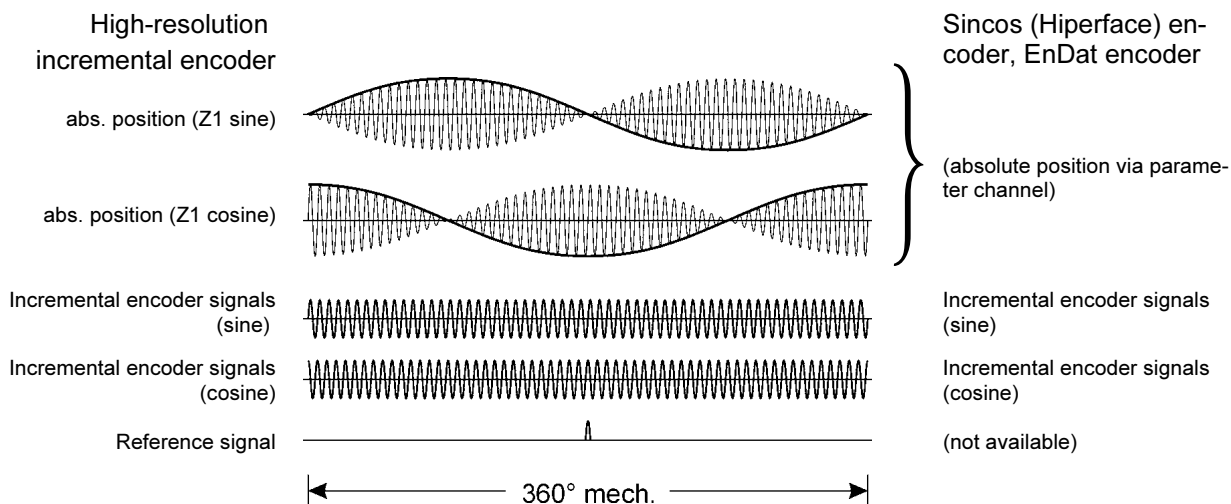
EnDat encoder
(Option -G11 and -G12)

In connection with the digital servo drives and the ESR multi-axis servo system, a high-resolution incremental encoder, a Sincos (Hiperface) encoder, or an EnDat encoder (with optical position acquisition) can be used.

The high resolution improves control quality and smooth running. Furthermore, by using analog incremental signals a reduction of the band width is achieved compared to the transmission of the actual position value via incremental encoder with rectangular output signals.

The high-resolution incremental encoder passes a reference signal once per revolution (zero pulse). Before the encoder has passed the reference signal for the first time, the position information of the rotor is acquired via a second track (Z1 track) ("rough" commutation). As soon as the reference signal has been passed once, the position is determined from the incremental signals, the position information is highly accurate.

With Sincos (Hiperface) and EnDat encoders, the sinusoidal and cosinusoidal incremental signals are transmitted to the servo drive via the process data channel. The parameter channel (serial RS 485 interface) serves for transmitting the absolute rotor position information.



Single-turn

With the single-turn types of motor position sensors with a higher resolution (option -G06, -G09, or -G11), the position acquisition for several revolutions is transmitted to a software counter in the servo drive. Therefore, for positioning operating modes, a reference run has to be carried out after each switch-off and switch-on of the control supply voltage in order to determine the absolute position of the axis.

Multi-turn

With the multi-turn types (option -G10 or -G12), the position is determined for 4096 revolutions in the encoder. It is read from the motor position sensor after each switch-off and switch-on of the control supply voltage so that a reference run is not required.

Other position sensors

In addition to the motor position sensors described in this data sheet, other types are available. If required, please contact us.

Holding Brake

General

(Option -MF)

The optional holding brake is a spring pressure safety brake. The supply voltage of the brake is 24 V DC $\pm 10\%$.

The brake is designed as holding brake, it usually serves for holding the motor shaft at standstill. Occasional load brakings, e. g. in case of an emergency-stop, are permitted. It is recommended to protect the brake rectifier using a voltage-dependent resistor (varistor).

Function

The braking force is generated by spring pressure; the torque is transferred from the brake to the motor shaft via a toothed bushing.

Motor Size	MR	751x	752x	753x	754x	755x
Holding torque	Nm	2.0	4.0	11	25	53
Rated voltage	V _{DC}	24	24	24	24	24
Rated current	A	0.36	0.42	0.67	0.81	1.17
Switching times (24 V on/off)	ms	40 / 40	50 / 40	100 / 50	120 / 60	130 / 60
Moment of inertia	10 ⁻³ kg·m ²	0.0024	0.0073	0.045	0.031	0.22
Weight	kg	0.5	0.8	1.2	1.9	2.9

Connection to the Servo Drive

General

For connection to the servo drive, the motor is equipped with two connectors. The motor phases (power) are connected with the servo drive using a shielded cable. The motor position sensor is connected with twisted-pair conductors via a multi-core shielded cable.

The optional brake is connected via the power supply cable. The motor temperature sensor is connected either via the motor position sensor connector (for resolvers) or the power supply cable (for high-resolution incremental encoder, Sincos (Hiperface), or EnDat).

Cables (ready-assembled, as well) and cable sets are available as accessories.

Torque Increase at Intermittent Duty S3

General

The typical working cycle of a servo drive consists of load phases in which the motor runs at high speed or torque interrupted by periods in which it is operated at reduced power or is standing still. Therefore, the design of the drive should not only consider the desired rated speed but the ratio of load and rest phases to specify a drive which meets the requirements optimally.

Operating modes in compliance with VDE 0530

The servo drive technology differs between the following operating modes:

- S1 = continuous duty
- S3 = intermittent duty; in this case, the ratio between load and rest phases is stated, e. g.
 - S3 25% = intermittent duty with a switch-on period of 25%
 - S3 40% = intermittent duty with a switch-on period of 40%

Torque increase

If the servo motor is used in S3 intermittent duty, it can be operated at a higher torque. The following table lists some examples for converting the values of the technical specifications of the motors.

Torque increase related to the rated torque in S1 continuous duty $M_{N S1}$:

Increased torque...		...related to rated torque
Increased standstill torque $M_{0 S3}$	S3 25%	$M_{0 S3 25\%} = 1.6 \cdot M_{N S1}$
	S3 40%	$M_{0 S3 40\%} = 1.4 \cdot M_{N S1}$
Increased rated torque $M_{N S3}$	S3 25%	$M_{N S3 25\%} = 1.54 \cdot M_{N S1}$
	S3 40%	$M_{N S3 40\%} = 1.34 \cdot M_{N S1}$

Notes for the Technical Data

General

Table "Technical Specifications" shows detailed electrical and mechanical data of the different motors which are grouped according to the DC-bus voltage:

- $U_{ZK} = 320$ V page 12ff
- $U_{ZK} = 560$ V page 16ff

Operating mode specification

The values in the tables of the technical specifications of the individual motors are basically stated for continuous duty S1.

Selection Criteria for Servo Motors and General Overview

Selection criteria

Major criteria for selecting a servo motor are:

- standstill torque $M_{0,200}$
- rated speed n_N
- torque at rated speed M_N
- ratio moment of inertia J_{motor} to J_{load}

On the basis of rated current I_N , the corresponding servo drive or servo power module is selected for the motor.

General overview

Values for standstill torque and rated speed can be found in the overview below. For an assignment of servo motors to ESR servo drives or servo power modules, see page 11ff (320 V) and page 15ff (560 V).

General

All other electrical and mechanical specifications of the different motors are listed in table "Technical Specifications":

- motors for 320 V from page 12
- motors for 560 V from page 16

$M_{0,200}$ [Nm]	n_N [r.p.m.]	Motors for 320 V		Motors for 560 V	
		Order No.	$I_{0,200}$ [A _{rms}]	Order No.	$I_{0,200}$ [A _{rms}]
0.55	3,000	MR 7511-U3-N030:	0.6	MR 7511-U5-N030:	0.35
1.0	3,000	MR 7512-U3-N030:	1.0	MR 7512-U5-N030:	0.6
1.9	3,000	MR 7514-U3-N030:	2.1	MR 7514-U5-N030:	1.3
2.1	3,000	MR 7522-U3-N030:	2.0	MR 7522-U5-N030:	1.2
3.5	3,000	MR 7524-U3-N030:	3.2	MR 7524-U5-N030:	1.9
3.7	3,000	MR 7532-U3-N030:	3.6	MR 7532-U5-N030:	2.1
7.3	3,000	MR 7534-U3-N030:	7.5	MR 7534-U5-N030:	4.3
10.5	3,000	–	–	MR 7536-U5-N030:	5.9
9.1	3,000	–	–	MR 7542-U5-N030:	5.5
16.4	3,000	–	–	MR 7544-U5-N030:	9.7
22.8	3,000	–	–	MR 7546-U5-N030:	13.8
13.0	3,000	–	–	MR 7552-U5-N030:	6.7
25.5	3,000	–	–	MR 7554-U5-N030:	13.8
45.0	3,000	–	–	MR 7558-U5-N030:	23.8

Servo Motors for $U_{ZK} = 320$ V: Overview and Assignment

Order Number Motor	Rated Speed n_N [r.p.m.]	Rated Torque M_N [Nm]	Standstill Torque $M_{0.200}$ [Nm]	Standstill Current $I_{0.200}$ [A _{rms}]	Servo Drive or Servo Power Module with Rated Current ...
MR 7511-U3-N030	3,000	0.45	0.55	0.6	2 A
MR 7512-U3-N030	3,000	0.9	1.0	1.0	2 A
MR 7514-U3-N030	3,000	1.7	1.9	2.1	2 A
MR 7522-U3-N030	3,000	1.8	2.1	2.0	2 A
MR 7524-U3-N030	3,000	3.1	3.5	3.2	4 A
MR 7532-U3-N030	3,000	3.0	3.7	3.6	4 A
MR 7534-U3-N030	3,000	5.5	7.3	7.5	6 A

Other speeds on request.

Corresponding Servo Drives and Servo Power Modules with 320 V DC-Bus Voltage:

Servo Drive Family	TrioDrive D/xS	TrioDrive D	TrioDrive A	TrioDrive C	
Design	compact	compact	compact	compact	
Power supply	direct 230 V~	direct 230 V~	direct 230 V~	direct 230 V~	
Technology	digital	digital	analog	multi-axis servo system	
Rated current	2 A	BN 6756	BN 6751	BN 6651	BN 6621
	4 A	BN 6757	BN 6752	BN 6652	BN 6622
	6 A	BN 6758	BN 6753	BN 6653	BN 6623

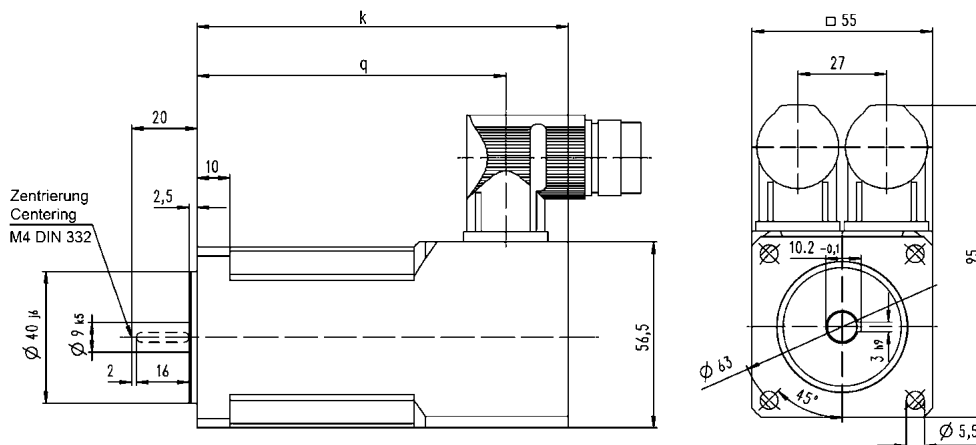
Servo Motors for $U_{ZK} = 320$ V: Technical Specifications (1) – MR 7511, MR 7512, and MR 7514

For the following types: MR 7511..-U3, MR 7512..-U3, or MR 7514..-U3 (type code see page 3)

Motors MR 7511 to MR 7514 for $U_{ZK} = 320$ V			MR 7511 -N030	MR 7512 -N030	MR 7514 -N030
Rated speed	n_N	r.p.m.	3,000	3,000	3,000
Rated output	P_N	W	145	290	540
Rated current	I_N	A_{rms}	0.5	0.9	1.9
Torque at rated speed	M_N	Nm	0.45	0.9	1.7
Standstill torque	$M_{0,200}$	Nm	0.55	1.0	1.9
Standstill current	$I_{0,200}$	A_{rms}	0.6	1.0	2.1
Peak torque	M_{max}	Nm	1.65	3.0	5.7
Peak current	I_{max}	A	1.9	3.2	7.6
Torque constant	K_t	Nm/ A_{rms}	0.93	1.02	0.89
Voltage constant	K_e	V/1000 r.p.m.	51	49	50
Resistance phase-phase	R_{u-v}	Ω	54.0	23.1	10.0
Inductance phase-phase	L_{u-v}	mH	23.0	10.6	5.3
Electr. time constant	T_{el}	ms	0.43	0.46	0.53
Rotor inertia	J_R	10^{-3} kg m ²	0.025	0.042	0.063
Weight		kg	1.7	1.9	2.1

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 751x:



Dimensions in mm:

Motor Type	MR 7511		MR 7512		MR 7514		
	Option	-G01	-Gxx	-G01	-Gxx	-G01	-Gxx
Dimension q		64	64	84	84	124	124
Dimension k	-M0	85	<127	105	<147	145	<187
	-MF	133	<174	153	<194	193	<234

Assignment to the servo drives see page 11.

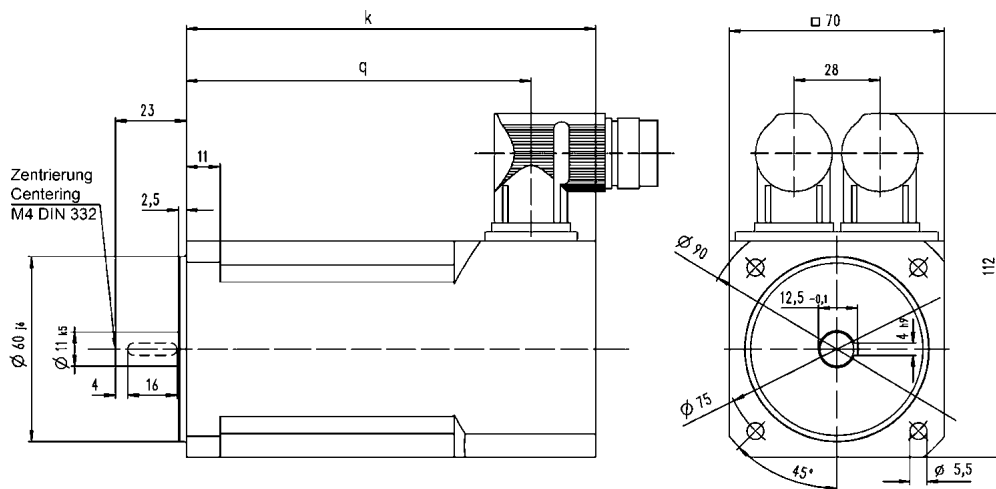
Servo Motors for $U_{ZK} = 320$ V: Technical Specifications (2) – MR 7522 and MR 7524

For the following types: MR 7522..-U3 and MR 7524..-U3 (type code see page 3)

Motors MR 7522 and MR 7524 for $U_{ZK} = 320$ V			MR 7522 -N030	MR 7524 -N030
Rated speed	n_N	r.p.m.	3,000	3,000
Rated output	P_N	W	590	1,000
Rated current	I_N	A_{rms}	1.8	2.9
Torque at rated speed	M_N	Nm	1.8	3.1
Standstill torque	$M_{0,200}$	Nm	2.1	3.5
Standstill current	$I_{0,200}$	A_{rms}	2.0	3.2
Peak torque	M_{max}	Nm	6.3	10.5
Peak current	I_{max}	A	6.6	10.0
Torque constant	K_t	Nm/ A_{rms}	1.03	1.08
Voltage constant	K_e	V/1000 r.p.m.	52	54
Resistance phase-phase	R_{u-v}	Ω	16.3	3.6
Inductance phase-phase	L_{u-v}	mH	6.5	3.1
Electr. time constant	T_{el}	ms	0.40	0.87
Rotor inertia	J_R	10^{-3} kg m ²	0.100	0.160
Weight		kg	2.3	3.3

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 752x:



Dimensions in mm:

Motor Type	MR 7522		MR 7524		
	Option	-G01	-Gxx	-G01	-Gxx
Dimension q		89	89	129	129
Dimension k	-M0	110	<149	150	<189
	-MF	153	<191	193	<231

Assignment to the servo drives see page 11.

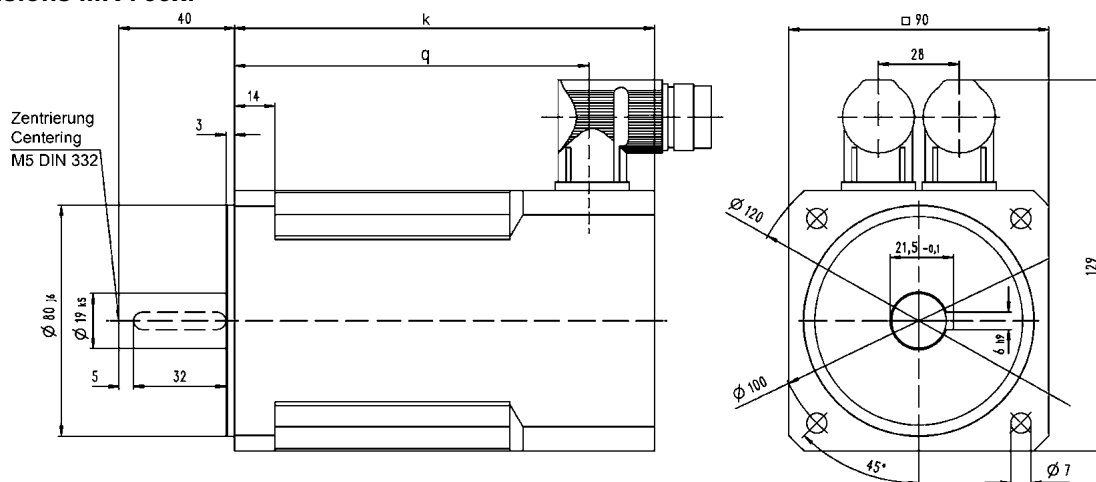
Servo Motors for $U_{ZK} = 320$ V: Technical Specifications (3) – MR 7532 and MR 7534

For the following types: MR 7532..-U3 or MR 7534..-U3 (type code see page 3)

Motors MR 7532 and MR 7534 for $U_{ZK} = 320$ V			MR 7532 -N030	MR 7534 -N030
Rated speed	n_N	r.p.m.	3,000	3,000
Rated output	P_N	W	950	1,750
Rated current	I_N	A_{rms}	3.1	5.7
Torque at rated speed	M_N	Nm	3.0	5.5
Standstill torque	$M_{0,200}$	Nm	3.7	7.3
Standstill current	$I_{0,200}$	A_{rms}	3.6	7.5
Peak torque	M_{max}	Nm	11.1	21.9
Peak current	I_{max}	A	12.3	24.3
Torque constant	K_t	Nm/ A_{rms}	0.96	0.96
Voltage constant	K_e	V/1000 r.p.m.	49	50
Resistance phase-phase	R_{u-v}	Ω	2.1	0.9
Inductance phase-phase	L_{u-v}	mH	2.8	1.4
Electr. time constant	T_{el}	ms	1.33	1.55
Rotor inertia	J_R	10^{-3} kg m ²	0.460	0.730
Weight		kg	4.1	5.6

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 753x:



Dimensions in mm:

Motor Type	MR 7532		MR 7534		
	Option	-G01	-Gxx	-G01	-Gxx
Dimension q		99	99	139	139
Dimension k	-M0	120	<152	160	<192
	-MF	169	<200	209	<240

Assignment to the servo drives see page 11.

Servo Motors for $U_{ZK} = 560$ V: Overview and Assignment

Order Number Motor	Rated Speed n_N [r.p.m.]	Rated Torque M_N [Nm]	Standstill Torque $M_{0.200}$ [Nm]	Standstill Current $I_{0.200}$ [A _{rms}]	Servo Drive or Servo Power Module with Rated Current ...
MR 7511-U5-N030	3,000	0.45	0.55	0.35	2 A
MR 7512-U5-N030	3,000	0.9	1.0	0.6	2 A
MR 7514-U5-N030	3,000	1.7	1.9	1.3	2 A
MR 7522-U5-N030	3,000	1.8	2.1	1.2	2 A
MR 7524-U5-N030	3,000	3.1	3.5	1.9	2 A
MR 7532-U5-N030	3,000	3.0	3.7	2.1	2 A
MR 7534-U5-N030	3,000	5.5	7.3	4.3	4 A
MR 7536-U5-N030	3,000	8.0	10.5	5.9	8 A
MR 7542-U5-N030	3,000	7.5	9.1	5.5	8 A
MR 7544-U5-N030	3,000	14.0	16.4	9.7	12 A/16 A
MR 7546-U5-N030	3,000	20.0	22.8	13.8	12 A/16 A
MR 7552-U5-N030	3,000	10.0	13.0	6.7	8 A
MR 7554-U5-N030	3,000	19.0	25.5	13.8	12 A/16 A
MR 7558-U5-N030	3,000	33.0	45.0	23.8	20 A/32 A

Other speeds on request.

Corresponding Servo Drives and Servo Power Modules with 560 V DC-Bus Voltage:

Servo Drive Family	MidiDrive D/xS	MidiDrive D	MaxiDrive	MidiDrive A	MidiDrive C	
Design	compact	compact	compact	compact	compact	
Power supply	direct 3 × 400/480 V	direct 3 × 400 V	direct 3 × 400 V	direct 3 × 400/480 V	direct 3 × 400/480 V	
Technology	digital	digital	digital	analog	multi-axis servo system	
Rated current	2 A	BN 6745	BN 6741	BN 6721	BN 6681	BN 6626
	4 A	BN 6746	BN 6742	BN 6722	BN 6682	BN 6627
	8 A	BN 6747	BN 6743	BN 6723	BN 6683	BN 6628
	12 A			BN 6724	BN 6684	BN 6629
	16 A	BN 6748				
	20 A			BN 6725	BN 6685	BN 6630
32 A	BN 6749					

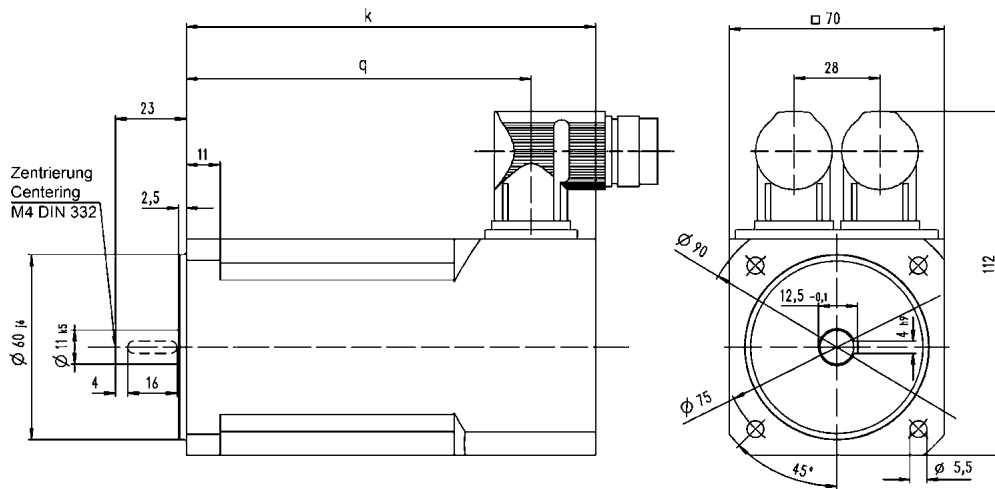
Servo Motors for $U_{ZK} = 560$ V: Technical Specifications (1) – MR 7511 to MR 7524

For the following types: MR 751x..-U5 or MR 752x..-U5 (type code see page 3)

Motors MR 7511 to MR 7524 for $U_{ZK} = 560$ V			MR 7511 -N030	MR 7512 -N030	MR 7514 -N030	MR 7522 -N030	MR 7524 -N030
Rated speed	n_N	r.p.m.	3,000	3,000	3,000	3,000	3,000
Rated output	P_N	W	145	290	540	590	1,000
Rated current	I_N	A_{rms}	0.3	0.5	1.1	1.0	1.7
Torque at rated speed	M_N	Nm	0.45	0.9	1.7	1.8	3.1
Standstill torque	$M_{0,200}$	Nm	0.55	1.0	1.9	2.1	3.5
Standstill current	$I_{0,200}$	A_{rms}	0.35	0.6	1.3	1.2	1.9
Peak torque	M_{max}	Nm	1.65	3.0	5.7	6.3	10.5
Peak current	I_{max}	A	1.1	1.8	4.4	3.8	5.8
Torque constant	K_t	Nm/ A_{rms}	1.60	1.76	1.54	1.78	1.88
Voltage constant	K_e	V/1000 r.p.m.	92	88	90	91	94
Resistance phase-phase	R_{U-V}	Ω	164.0	69.3	30.0	49.0	10.9
Inductance phase-phase	L_{U-V}	mH	63.9	32.0	15.9	19.5	9.4
Electr. time constant	T_{el}	ms	0.39	0.46	0.53	0.40	0.86
Rotor inertia	J_R	10^{-3} kg m ²	0.025	0.042	0.063	0.100	0.160
Weight		kg	1.7	1.9	2.1	2.3	3.3

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 752x:



Dimensions in mm:

Motor Type	MR 751x	MR 7522		MR 7524	
Option		-G01	-Gxx	-G01	-Gxx
Dimension q		89	89	129	129
Dimension k	-M0	110	<149	150	<189
	-MF	153	<191	193	<231

Assignment to the servo drives see page 15.

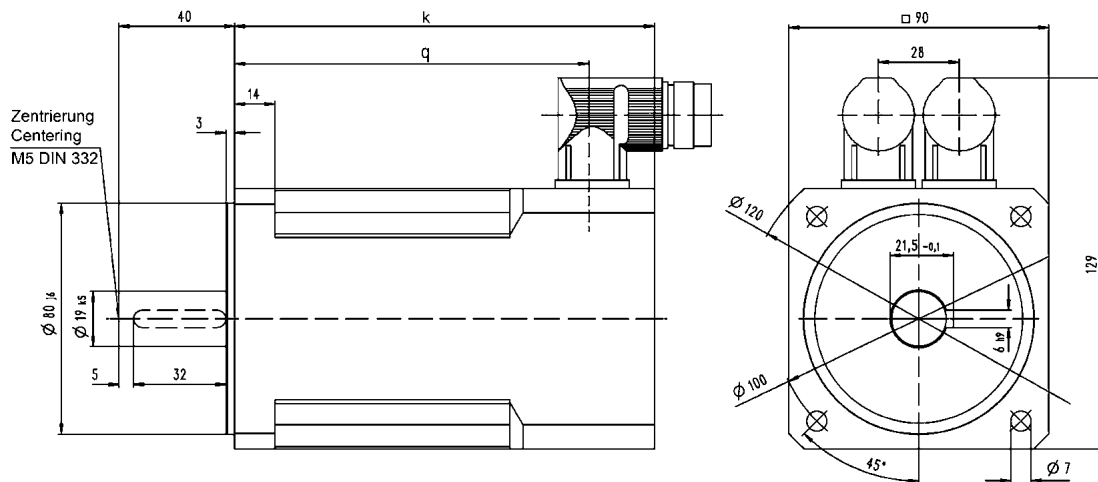
Servo Motors for $U_{ZK} = 560$ V: Technical Specifications (2) – MR 7532 to MR 7536

For the following types: MR 7532..-U5, MR 7534..-U5, or MR 7536..-U5 (type code see page 3)

Motors MR 7532 to MR 7536 for $U_{ZK} = 560$ V			MR 7532 -N030	MR 7534 -N030	MR 7536 -N030
Rated speed	n_N	r.p.m.	3,000	3,000	3,000
Rated output	P_N	W	950	1,750	2,600
Rated current	$4.4I_N$	A_{rms}	1.8	3.3	4.5
Torque at rated speed	M_N	Nm	3.0	5.5	8.0
Standstill torque	$M_{0,200}$	Nm	3.7	7.3	10.5
Standstill current	$I_{0,200}$	A_{rms}	2.1	4.3	5.9
Peak torque	M_{max}	Nm	11.1	21.9	31.5
Peak current	I_{max}	A	7.1	14.1	18.5
Torque constant	K_t	Nm/ A_{rms}	1.66	1.66	1.77
Voltage constant	K_e	V/1000 r.p.m.	88	90	92
Resistance phase-phase	R_{u-v}	Ω	6.4	2.6	1.8
Inductance phase-phase	L_{u-v}	mH	8.4	4.1	2.8
Electr. time constant	T_{el}	ms	1.31	1.54	1.59
Rotor inertia	J_R	10^{-3} kg m ²	0.460	0.730	1.030
Weight		kg	4.1	5.6	7.1

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 753x:



Dimensions in mm:

Motor Type	MR 7532		MR 7534		MR 7536		
	Option	-G01	-Gxx	-G01	-Gxx	-G01	-Gxx
Dimension q		99	99	139	139	179	179
Dimension k	-M0	120	<152	160	<192	200	<232
	-MF	169	<200	209	<240	249	<280

Assignment to the servo drives see page 15.

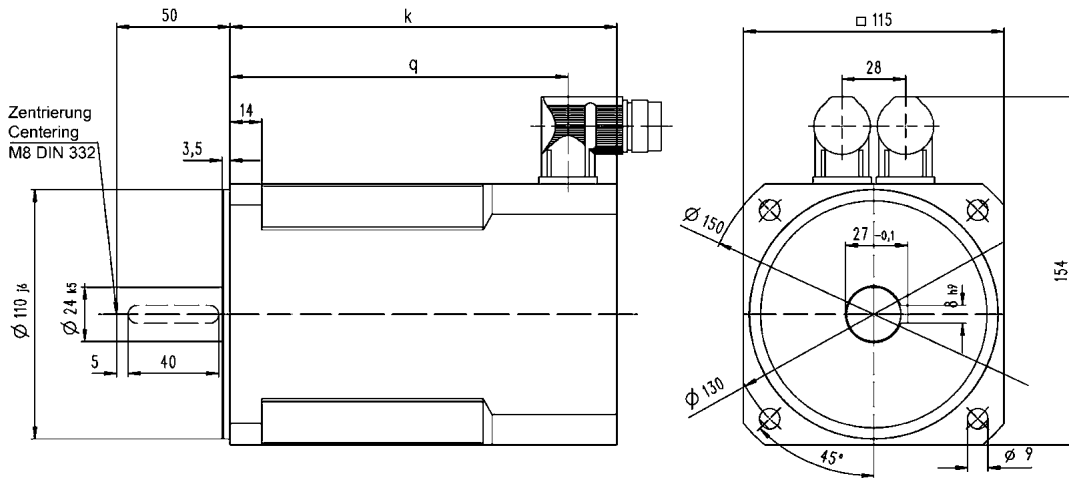
Servo Motors for $U_{ZK} = 560$ V: Technical Specifications (3) – MR 7542 to MR 7546

For the following types: MR 7542..-U5, MR 7544..-U5 or MR 7546..-U5 (type code see page 3)

Motors MR 7542 to MR 7546 for $U_{ZK} = 560$ V			MR 7542 -N030	MR 7544 -N030	MR 7546 -N030
Rated speed	n_N	r.p.m.	3,000	3,000	3,000
Rated output	P_N	W	2.4	4.4	6.3
Rated current	I_N	A_{rms}	4.5	8.3	12.0
Torque at rated speed	M_N	Nm	7.5	14.0	20.0
Standstill torque	$M_{0,200}$	Nm	9.1	16.4	22.8
Standstill current	$I_{0,200}$	A_{rms}	5.5	9.7	13.8
Peak torque	M_{max}	Nm	27.3	49.2	68.4
Peak current	I_{max}	A	17.1	30.8	42.8
Torque constant	K_t	Nm/ A_{rms}	1.67	1.68	1.66
Voltage constant	K_e	V/1000 r.p.m.	90	89	91
Resistance phase-phase	R_{u-v}	Ω	2.1	0.9	0.5
Inductance phase-phase	L_{u-v}	mH	4.3	2.2	1.3
Electr. time constant	T_{el}	ms	2.05	2.34	2.51
Rotor inertia	J_R	10^{-3} kg m ²	0.920	1.460	2.050
Weight		kg	5.8	11.1	16.2

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 754x:



Dimensions in mm:

Motor Type	MR 7542		MR 7544		MR 7546		
	Option	-G01	-Gxx	-G01	-Gxx	-G01	-Gxx
Dimension q		107	107	147	147	187	187
Dimension k	-M0	128	<161	168	<201	208	<241
	-MF	178	<210	218	<250	258	<290

Assignment to the servo drives see page 15.

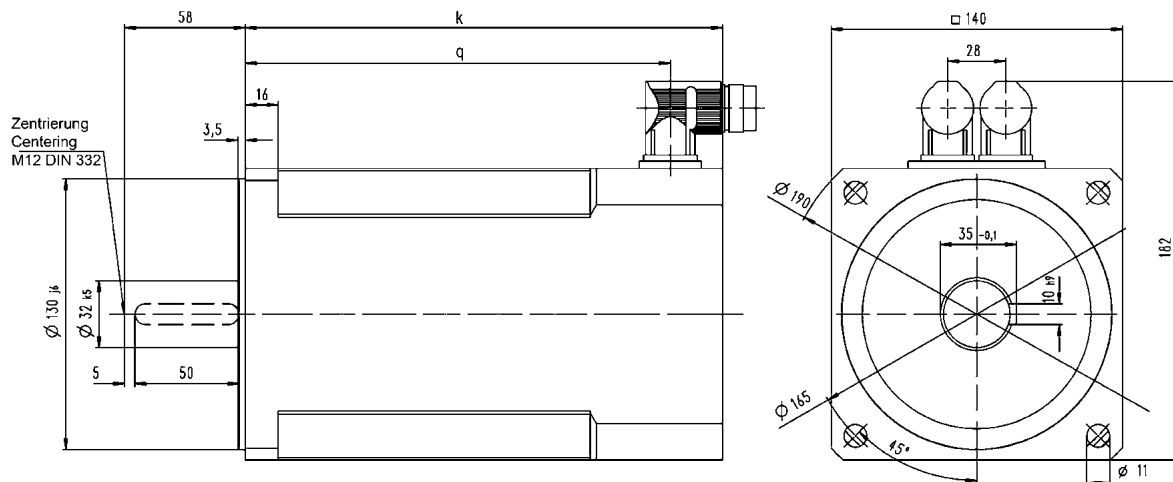
Servo Motors for $U_{ZK} = 560$ V: Technical Specifications (4) – MR 7552 to MR 7558

For the following types: MR 7552..-U5, MR 7554..-U5 or MR 7558..-U5 (type code see page 3)

Motors MR 7552 to MR 7558 for $U_{ZK} = 560$ V			MR 7552 -N030	MR 7554 -N030	MR 7558 -N030
Rated speed	n_N	r.p.m.	3,000	3,000	3,000
Rated output	P_N	W	3.2	6.0	10.5
Rated current	I_N	A_{rms}	5.2	10.3	17.7
Torque at rated speed	M_N	Nm	10.0	19.0	33.0
Standstill torque	$M_{0,200}$	Nm	13.0	25.5	45.0
Standstill current	$I_{0,200}$	A_{rms}	6.7	13.8	23.8
Peak torque	M_{max}	Nm	39.0	76.5	135.0
Peak current	I_{max}	A	21.1	42.5	75.0
Torque constant	K_t	Nm/ A_{rms}	1.92	1.84	1.86
Voltage constant	K_e	V/1000 r.p.m.	91	89	92
Resistance phase-phase	R_{u-v}	Ω	1.9	0.8	0.4
Inductance phase-phase	L_{u-v}	mH	5.2	2.4	1.2
Electr. time constant	T_{el}	ms	2.69	3.16	3.28
Rotor inertia	J_R	10^{-3} kg m ²	2.870	4.650	8.430
Weight		kg	9.1	13.2	21.6

Note: The maximum achievable values depend on the servo drive used.

Dimensions MR 755x:



Dimensions in mm:

Motor Type	Option	MR 7552		MR 7554		MR 7558	
		-G01	-Gxx	-G01	-Gxx	-G01	-Gxx
Dimension q		112	112	152	152	232	232
Dimension k	-M0	135	<167	175	<207	255	<287
	-MF	191	<223	231	<263	311	<343

Assignment to the servo drives see page 15.

Servo Drive System Packages by ESR Pollmeier GmbH

ESR – the complete servo drive system from a single source

General

The series MR 75 AC servo motors described in this data sheet are components of the ESR drive system packages. These consist of servo drives and servo motors with or without gearboxes, completely with position sensors and, if required, brakes. They are supplemented by software and accessories. All parts of the packages are matching and have been tested as combinations. This delivery from one single source guarantees trouble-free commissioning, reliable operation, and a definite system responsibility on the part of only one supplier.

System design

Our services include an individual drive system configuration. With many years of experience, we will be pleased to assist you at choosing the appropriate servo drive system for your application.

Drive system packages

The following drive system packages are available on the basis of the series MR 75 AC servo motors:

Digital Servo Drive Systems

Servo Drive Family	TrioDrive D/xS	MidiDrive D/xS	TrioDrive D	MidiDrive D	MaxiDrive
Power supply	230 V~ *	3 × 400/ 480 V *	230 V~	3 × 400 V	3 × 400 V
DC-bus voltage	320 V	560/680 V	320 V	560 V	560 V
Rated current (rms)	2 .. 6 A	2 .. 32 A	2 .. 6 A	2 .. 8 A	2 .. 20 A
Peak current (crest value)	8.5 .. 25.5 A	5.5 .. 90 A	5.5 .. 17 A	5.5 .. 22 A	5.5 .. 56 A
Rated torque	0.45 .. 5.5 Nm	0.4 .. 33 Nm	0.45 .. 5.5 Nm	0.4 .. 10 Nm	0.4 .. 33 Nm
Shaft power	0.1 .. 1.7 kW	0.3 .. 6.3 kW	0.1 .. 1.7 kW	0.3 .. 3.2 kW	0.3 .. 6.3 kW
Positioning control	option	option	option	option	yes
Field bus	option	option	option	option	option
Data sheet	6755.250 (D/AS) 6755.252 (D/CS) 6755.255 (D/PS) 6755.257 (D/ES)	6755.250 (D/AS) 6755.252 (D/CS) 6755.255 (D/PS) 6755.257 (D/ES)	6750.250	6730.250	6710.250

* wide-range inputs

Analog Servo Drive Systems, Multi-Axis Servo Systems

Servo Drive Family	TrioDrive A	MidiDrive A	TrioDrive C	MidiDrive C
Power supply	230 V~ *	3 × 400/480 V *	230 V~ *	3 × 400/480 V *
DC-bus voltage	320 V	560/680 V	320 V	560/680 V
Rated current (rms)	2 .. 6 A	2 .. 20 A	2 .. 6 A	2 .. 20 A
Peak current (crest value)	5.5 .. 17 A	5.5 .. 55 A	5.5 .. 17 A	5.5 .. 55 A
Rated torque	0.45 .. 5.5 Nm	0.4 .. 33 Nm	0.45 .. 5.5 Nm	0.4 .. 33 Nm
Shaft power	0.1 .. 1.7 kW	0.3 .. 6.3 kW	0.1 .. 1.7 kW	0.3 .. 6.3 kW
Data sheet	6650.250	6680.250	6620.250	6620.250

* wide-range inputs

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