



ELECTRIC DRIVES

FOR EVERY DEMAND



Additional installation, operating and maintenance instructions

Three-phase roller table motors with squirrel-cage rotor for mains
and inverter operation
(translation)

Standard design

Design series:

A21., A20., A22., A42.
ARB, ARC

Motors that comply with the Directive 2005/32/EC and the regulation No. 640/2009 receive the marking IEx before the type designation, whereas x = 1, 2, 3, 4 (acc. to EN 60034-30). (Example IE2-K21B 250 M4 HW).

General

Attention! Read installation, operation and maintenance instructions, connection diagram, additional connection diagram and safety regulations before transportation, installation, start-up, maintenance and repair. Mind the information!

The existing additional operation and maintenance manual is valid together with the already mentioned documents and the operation and maintenance manual for standard motors, where the basic specifications for connection, installation, operation and maintenance as well as the spare parts lists are included.

For better clarity the installation, operation and maintenance instructions do not include individual information for all possible special fields of operation and applications with special requirements. Therefore the operator has to make appropriate safety arrangements.

Roller table motors are a special drive element for the rolling mill industry. The electrical and mechanical requirements for roller table motors are extraordinary demanding conditions due to different duty types and load situations like continuous, intermitten and short-time duty in addition to start, brake and reversing operation. Roller table motors are designed to operate with all types of overload situations in a standard mill operation as for example stucking of rolling stock that lead to a blockage of the motor.

1.1 Light roller table motors, type series A21., A20., A22., A42.

The design series A2.R, A42R (IC 411); A210, A420 (IC410) and A2.F, A42F (IC 416) are derived from the VEM standard motor series and are of the same mechanical design with regard to their main structural elements. The windings of these motors have been adapted for driving roller tables. Furthermore, all screwed connections are additionally secured, and the corrosion protection has also been adapted for use in rolling mills.

1.2 Roller table motors for use with frequency converters, type series ARC

The design series ARC (IC 410) has been developed for use with frequency converters in rolling mills. It provides a combination of the desirable properties of a converter-fed double squirrel cage rotor, with its acceleration-oriented torque characteristic (MC/MA approx. 3), and the mechanically robust design of a heavy roller table motor. With the exception of the form of its housing (ring-type ribs) and bearing/sealing arrangement on the drive end, its construction is identical to that of a VEM standard motor.

1.3 Heavy roller table motors, type series ARB

The heavy roller table motor ARB (IC 410) is intended for mains operation. Like the type series ARC the housing is provided with ring-type ribs and is composed of grey cast iron with ribs running transverse to the axis direction.

2. Conformity

The motors comply with IEC/EN 60034-1 and other corresponding European standards. The delivery according to special regulations (i.e. classification societies) is possible.

3. Type of protection

The motors have at least the type of protection IP 55 according to IEC/EN 60034-5. The type of protection corresponding with each design can be taken from the nameplate.

4. Terminal boxes

The terminal boxes have at least the type of protection IP 55 according to IEC/EN 60034-5. They are the same design as the terminal boxes of standard series K../W..

5. Additional mounted parts or installations

Depending on the motor design and order different additional installations (i.e. anti-condensation heating, temperature sensors for winding monitoring or others) can be installed or attached.

6. Assembly

For the assembly the following specific information about IP protection type is given in addition to the "General information" and manuals for possible mounted parts.

The motors have condensate drain holes at the bottom of the end shields. These drain holes are not closed at delivery. If the customer wants to comply with the definition of IEC 60034-5 for IP 54, these holes can be closed before installation of the motors by using the plastic plug included in the auxiliary parts bag. However it was proved by many years of experience that for standard operational conditions in industrial atmosphere even for outdoor installations problems during operation due to dust or water ingress is not to be expected.

The use of the plastic plug is advisable if the motor is operated with an installed anti-condensation heating to avoid condensate water.

If the condensate drain holes are closed with a plug, the condensate water must be drained frequently by hand.

7. Bearings

7.1. General

VEM motors are equipped with anti-friction bearings from respected manufacturers. The rated bearing lifetime is at least 20,000 h with the exploitation of the maximum permissible load. The rated bearing lifetime for motors installed in a horizontal position without additional axial loading is 40,000 h in the case of coupling service.

The versions

- fixed bearing at N-end
- without fixed bearing
- (floating bearing arrangement)
- permanent lubrication
- lubrication device
- heavy bearing on D-end
- (for increased lateral forces)

and the

- figures of bearing arrangement
- disk spring or wave washer types
- V-ring types

can be taken from the overviews of the bearing arrangements. The respective flat grease nipples are contained in the tables of the design drawings. Motors in the normal versions with two deep groove ball bearings have preloaded bearings.

Versions with cylindrical roller bearings on the D-end (heavy bearing arrangement VL) are excepted from the preloading.

The most important prerequisite for achieving the normal bearing lifetime is correct lubrication, i.e. the use of the right kind of grease according to the application, the filling with the correct amount of grease and the maintenance of the subsequent lubrication periods.

The frame sizes 56 to 160 are equipped with life-lubricated bearings. These bearings are to be changed promptly in accordance with the usable grease life. In the case of motors from size 180, the bearings must be lubricated promptly in accordance with the usable grease life to keep the nominal bearing lifetime. Under normal operating conditions, the lubrication filling will allow 10,000 operating hours for the 2-pole version and 20,000 operating hours for the 4-pole version without lubrication. Under normal service conditions, for version with lubrication device, 2,000 or 4,000 operational hours will apply.

Design of the motor	Grease type	Name acc. to	Temperaturbereich in °C
Design series A2.., A4..	Asonic GHY 72	KE2/3R-40	-40 bis +180
Design series ARB, ARC	Berutox FH 28 KN	KHC1R-30	-30 bis +180
Customer request	Only after consultation with design department of VEM		

After approx. 5 re-greasings this old grease should be removed, e.g. as part of inspection work.

The final information about bearing size, grease type and lubrication periods must be taken from the nameplate.

Motors of design series ARB are equipped with lubrication device as standard. In addition to the given regular lubrication periods they must be lubricated after each prolonged blockage. After extended storage the bearing grease must be checked visually and exchanged when the grease has hardened or other irregular conditions are visible. If the motors will only be put into operation 3 years or longer after delivery by the manufacturer, the bearing grease must be changed in any case. Motors with closed or sealed bearings must be changed after a storage period of 4 years by new ones from the same type.

7.2 Use of cylindrical roller bearings

By using cylindrical roller bearings ("heavy bearing arrangement" VL), relatively high radial forces or masses can be taken up at the motor shaft end. Examples: belt drives, pinions or heavy couplings. The minimum radial force at the shaft end must amount to a quarter of the permissible radial force. Account must be taken of the permissible shaft end loading. The relevant specifications can be taken from the main catalogue 2017 "Low-voltage electrical machines", Section 1 "Introduction", and from the Tables below.

Important note:

Radial forces below the minimum value can lead to bearing damage within a few hours. Test runs in no-load state are only permissible for a short period. If the specified minimum radial force is not achieved, we recommend the use of deep-groove ball bearings (so-called "light bearing arrangement"). The bearing arrangement can be re-arranged on request.

7.3 Bearing loading and shaft end loading

Due to the international standardisation of asynchronous motors, dimensioning of the bearing arrangement and shaft is only variable within limits; a constructional optimum has thus been selected.

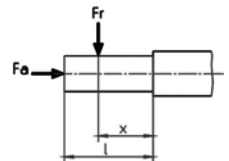
7.4 Admissible shaft end loading

The size of the permissible shaft end loading is determined using the following main criteria:

- permissible bending of the shaft
- shaft end fatigue strength
- bearing service life

The admissible shaft end loading (radial and axial forces) is based on a bearing service life of 20,000 hours and resistance to fatigue of >2.0. The loading diagram is specified in the following illustration:

- F_r = radial shaft end loading
- F_a = axial shaft end loading
- l = length of the shaft end
- x = distance of the application point F_r from the shaft shoulder



The type-related data for the permissible axial shaft end loading F_a and the permissible radial shaft end loading $F_{r0.5}$ (at the application point $x : l = 0.5$), $F_{r1.0}$ (at the application point $x : l = 1.0$) for the basic version and for the heavy bearing arrangement in horizontal and vertical mounting position of the motor are specified in the product catalogue.

The permissible radial forces are depicted as a function of the position of the application point on the shaft end for motors in horizontal and vertical mounting position of the motor (taking into account the effective direction of the radial force in relation to gravity). The permissible forces given are valid for practically vibration-free mounting of the motors.

The shaft loading for frame sizes 315 L and LX and frame size 355 can be verified by the manufacturer on request.

The loadings F_r and F_a are generally dependent on the transmission elements used, i.e. on the axial and radial forces arising from these transmission elements, including their weights.

The forces are calculated using mechanical formulas, e.g. for belt pulleys

$$F_r = 2 \cdot 10^7 \cdot \frac{P}{n \cdot D} \cdot c \quad \text{where}$$

F_r = radial force in N

P = rated motor output in kW (transmission output)

n = nominal motor speed

D = belt pulley diameter in mm

c = pretension factor as stated by the belt manufacturer (for V-belts preferably 2.5)

In practice, the radial force F_r does not always act at $x : l = 0.5$. The conversion of the permissible radial force within the range $x : l = 0.5$ up to $x : l = 1.0$ can be done by linear interpolation.

If the calculated shaft loadings exceed the permissible ones, the drive elements must be changed. There are the following possibilities, among others:

- selection of a larger belt pulley diameter,
- use of V-belts instead of flat belts,
- selection of another pinion diameter or skew angle of the teeth,
- selection of another coupling version, etc.

Generally, care must be taken that the resulting load application point of F_r will not be outside the shaft end. If a solution has still not been found, the manufacturer would be happy to check special constructions which can be used to deal with problems of this kind.

7.5 Bearing arrangements

7.5.1 Series A2.R

Basic version, series A21R

Type	D-end					Disc spring	N-end				Figure		Fixed bearing
	Anti-friction bearing	V-ring	Y-ring	Feltring	wave washer		Anti-friction bearing	V-ring	wave washer	Feltring	D-end	N-end	
A21R 63	6201 2Z C3	-	-	11.5 x 19	-	130	6201 2Z C3	-	32	12 x 22	1	2	Without
A21R 71	6202 2Z C3	-	-	14.5 x 21	-		6202 2Z C3	-	35	15 x 24			
A21R 80	6204 2Z C3	-	-	19.5 x 26	-		6204 2Z C3	-	47	20 x 32			
A21R 90	6205 2Z C3	-	-	24.5 x 35	-		6205 2Z C3	-	52	25 x 40			
A21R 100	6206 2Z C3	-	-	29.2 x 40	-		6206 2Z C3 6306 2Z C3	-	62 80	30 x 50			
A21R 100 LX		-	-		-								
A21R 112 M	6208 2ZN C3 6208 2RS C3	-	-	39 x 60	-		6207 2RS C3	-	-	-			
A21R 132 S2, 4T (FNS)		-	-		-			80					
A21R 132 S, SX2, M6, 8	6307 2RS C3	-	-	-	90		6308 2RS C3	-	-	-			
A21R 132 M4, MX6		-	-	-	100								
A21R 160 M, MX8	6310 2RS C3	-	-	-	110		6309 2RS C3	-	-	-			
A21R 160 MX2, L		-	-	-									
A21R 180 M4, L6, 8	6310 C3	50A	-	-	130		6310 C3	50A	-	-			
A21R 180 M2, L4		-	-	-									
A21R 200 L, LX6	6312 C3	60A	-	-	130	6312 C3	60A	-	-				
A21R 200 LX2		-	-	-									

Type	D-end						N-end				Figure		Fixed bearing		
	Anti-friction bearing	V-ring	Y-ring	Feltring	wave washer	Disc spring	Anti-friction bearing	V-ring	wave washer	Feltring	D-end	N-end			
A21R 225 M2	6312 C3	60A	-	-		130	6312 C3	60A	-	-	6	8	N-end		
A21R 225 S4, 8, M4, 6, 8	6313 C3	65A	-	-		140		-	-						
A21R 250 M2			6314 C3	70A		-	-	150	6313 C3	65A				-	-
A21R 250 M4, 6, 8	6316 C3	80A				-	-		170	6314 C3				70A	-
A21R 280 S2, M2			6317 C3	85A		-	-	180		6316 C3				80A	-
A21R 280 S4, 6, 8, M4, 6, 8	6220 C3	RB85				-	215		6317 C3 ¹⁾						-
A21R 315 S2, M2		6317 C3	RB100	-		180		-		-					
A21R 315 S4, 6, 8, M4, 6, 8	6320 C3		RB85	-			215	85A	-	-	18	19			
A21R 315 MX2		6317 C3	RB100	-		260			-	-					
A21R 315 MX4, 6, 8	6320 C3		RB85	-			180	6317 C3	-	-					
A21R 315 MY2		6320 C3	RB120	-		260			-	-					
A21R 315 MY4, 6, 8	6317 C3		RB85	-			2)	6317 C3	-	-					
A21R 315 L2, LX2		6320 C3	RB120	-		2)			6319 C3	-	-				
A21R 315 L4, 6, 8, LX4, 6, 8	6317 C3		RB85	-			2)	-		-					
A22R 355 ... 2-pole		6324 C3	RB120	-		2)		-	-						
A22R 355 ... 4-, 6-, 8-pole	6317 C3		RB85	-			-	-							
A42R 355 MX, L ... 2-pole		6324 C3	RB85	-		-	-								
A42R 355 MX, L ... 4-, 6-, 8-pole	6317 C3		RB120	-		-	-								
A42R 400 ... 2-pole		6324 C3	RB85	-		-	-								
A42R 400 ... 4-, 6-, 8-pole	6324 C3		RB120	-		-	-								

1) for vertical types of construction Q317 C3, figures 18 and 21
From size A21R 315 MX lubrication device as standard

2) Pressure spring

Basic version, series A20R

Type	D-end						N-end				Figure		Fixed bearing	
	Anti-friction bearing	V-ring	Y-ring	Feltring	wave washer	Disc spring	Anti-friction bearing	V-ring	wave washer	Feltring	D-end	N-end		
A20R 56	6201 2Z C3	-	-	11.5 x 19	-	-	6201 2Z C3	-	32	12 x 22	1	2	With-out	
A20R 63	6202 2Z C3	-	-	14.5 x 21	-	-	6202 2Z C3	-	35	15 x 24				
A20R 71	6204 2Z C3	-	-	19.5 x 26	-	-	6204 2Z C3	-	47	20 x 32				
A20R 80	6205 2Z C3	-	-	24.5 x 35	-	-	6205 2Z C3	-	52	25 x 40				
A20R 90		-	-		-	-								
A20R 100	6206 2Z C3	-	-	29.2 x 40	-	-	6206 2Z C3	-	62	30 x 50				
A20R 112 M2-8	6207 2RS C3	-	-	-	-	-	6207 2RS C3	-	-	-	3	5		N-end
A20R 112 MX6, 8		-	-	-	72	-		-	-	-				
A20R 132 S, M	6308 2RS C3	-	-	-	90	-	6308 2RS C3	-	-	-				
A20R 160 S, M	6310 2RS C3	-	-	-	110	-	6309 2RS C3	-	-	-				
A20R 180 S2, M2	6310 C3	50A	-	-	-	-	6310 C3	50A	-	-	6	8		
A20R 180 S4-8, M4-8	6312 C3	60A	-	-	-	130			-	-				
A20R 200 M2, L2			-	-	-	-	6312 C3	60A	-	-				
A20R 200 M4-8, L4-8	6313 C3	65A	-	-	-	140			-	-				
A20R 225 M2			-	-	-	-	6313 C3	65A	-	-				
A20R 225 M4, 6, 8	6314 C3	70A	-	-	-	150			-	-				
A20R 250 S2, M2			-	-	-	-	6314 C3	70A	-	-				
A20R 250 S4-8, M4-8	6316 C3	80A	-	-	-	170			-	-				
A20R 280 S2, M2			-	-	-	-	6316 C3	80A	-	-				
A20R 280 S4-8, M4-8	6317 C3	85A	-	-	-	180			-	-				
A20R 315 S2			-	RB85	-	-	-	-	-	-				
A20R 315 S4, 6, 8	6220 C3	-	RB100	-	-	-	-	-	13	16				
A20R 315 M2, L2	6317 C3	-	RB85	-	-	-	-	-	18	19				
A20R 315 M4-8, L4-8	6320 C3	-	RB100	-	-	215	6317 C3 ¹⁾	85A			-	-		

1) for vertical types of construction Q317 C3, figures 18 and 21
From size A20R 315 lubrication device as standard

Special version heavy bearing arrangement VL, series A21R

Type	D-end			N-end		Figure		Fixed bearing
	Anti-friction bearing	V-ring	Y-ring	Anti-friction bearing	V-ring	D-end	N-end	
A21R 132 S, SX2, M6, 8 VL	NU 208 E	40A	-	6207 RS C3	-	4	10	N-end
A21R 132 M4, MX6 VL	NU 308 E		-	6308 RS C3	-			
A21R 160 M, MX8 VL	NU 309 E	45A	-	6309 RS C3	-	7	9	
A21R 160 MX2, L VL	NU 310 E	50A	-		-			
A21R 180 M4, L6, 8 VL			-	6310 C3	50A			
A21R 180 M2, L4 VL			-					
A21R 200 L, LX6 VL	NU 312 E	60A	-	6312 C3	60A	7	9	
A21R 200 LX2 VL			-					
A21R 225 M2 VL			-	6312 C3	60A			
A21R 225 S4, 8, M4, 6, 8 VL	NU 313 E	65A	-	6313 C3	65A	7	9	
A21R 250 M2 VL			-					
A21R 250 M4, 6, 8 VL	NU 314 E	70A	-	6314 C3	70A	7	9	
A21R 280 S2, M2 VL			-					
A21R 280 S4, 6, 8, M4, 6, 8 VL	NU 316 E	80A	-	6316 C3	80A	7	9	
A21R 315 S2, M2 VL			-					
A21R 315 S4, 6, 8, M4, 6, 8 VL	NU 317 E	85A	-	6316 C3	80A	7	9	
A21R 315 MX2 VL		-	RB85					
A21R 315 MX4, 6, 8 VL	NU 2220 E	-	RB100	6317 C3 ¹⁾	85A	20	19	
A21R 315 MY2 VL	NU 317 E	-	RB85					
A21R 315 MY4, 6, 8 VL	NU 320 E	-	RB100					
A21R 315 L2, LX2 VL	NU 317 E	-	RB85					
A21R 315 L4, 6, 8, LX4, 6, 8 VL	NU 320 E	-	RB100					
A22R 355 ... 2-pole VL	NU 317 E	-	RB85					
A22R 355 ... 4-, 6-, 8-pole VL	NU 324 E	-	RB120					
A42R 355 MX, L ... 2-pole VL	NU 317 E	-	RB85					
A42R 355 MX, L ... 4-, 6-, 8-pole VL	NU 324 E	-	RB120					
A42R 400 ... 2-pole, VL	NU 317 E	-	RB85					6317 C3
A42R 400 ... 4-, 6-, 8-pole, VL	NU 324 E	-	RB120	6319 C3				

¹⁾ for vertical types of construction Q317 C3, figures 20, 21
From size A21R 315 MX lubrication device as standard

Special version heavy bearing arrangement VL, series A20R

Type	D-end			N-end		Figure		Fixed bearing
	Anti-friction bearing	V-ring	Y-ring	Anti-friction bearing	V-ring	D-end	N-end	
A20R 112 M2, 4, 6, 8 VL	NU 207 E	40A	-	6207 2RS C3	-	4	10	N-end
A20R 112 MX6, 8 VL			-		-			
A20R 132 S, M VL	NU 308 E	45A	-	6308 2RS C3	-	7	9	
A20R 160 S, M VL	NU 310 E	50A	-	6309 2RS C3	-			
A20R 180 S2, M2 VL			-	6310 C3	50A			
A20R 180 S4, 6, 8, M4, 6, 8 VL	NU 312 E	60A	-					
A20R 200 M2, L2 VL			-					
A20R 200 M4, 6, 8, L4, 6, 8 VL	NU 313 E	65A	-	6313 C3	65A			
A20R 225 M2 VL			-					
A20R 225 M4, 6, 8 VL	NU 314 E	70A	-	6314 C3	70A			
A20R 250 S2, M2 VL			-					
A20R 250 S4, 6, 8, M4, 6, 8 VL	NU 316 E	80A	-	6316 C3	80A			
A20R 280 S2, M2 VL			-					
A20R 280 S4, 6, 8, M4, 6, 8 VL	NU 317 E	85A	-	6317 C3 ¹⁾	85A			
A20R 315 S2 VL		-	RB85					
A20R 315 S4, 6, 8 VL	NU 2220 E	-	RB100		15	16		
A20R 315 M2, L2 VL	NU 317 E	-	RB85		20	19		
A20R 315 M4, 6, 8, L4, 6, 8 VL	NU 320 E	-	RB100					

¹⁾ for vertical types of construction Q317 C3, figures 20, 21
From size A20R 315 lubrication device as standard

Lubrication device, series A21R

Type	D-end						N-end		Figure		Fixed bearing
	Anti-friction bearing	V-ring	Y-ring	Feltring	Wave washer	Disc spring	Anti-friction bearing	V-ring	D-end	N-end	
A21R 132 S, SX2, M6, 8	For reasons of design not possible at D-end										
A21R 132 M4, MX6											
A21R 160 M, MX8											
A21R 160 MX2, L ¹⁾	6310 C3	-	RB50	-	110	-	6309 C3	45A	13	14	N-end
A21R 180 M4, L6, 8 ¹⁾		-		-		-					
A21R 180 M2, L4 ¹⁾	-	-	-								
A21R 200 L, LX6 ¹⁾	6312 C3	-	RB60	-	-	130	6310 C3	50A			
A21R 200 LX2 ¹⁾		-		-							
A21R 225 M2		-		-			-				
A21R 225 S4, 8, M4, 6, 8	6313 C3	-	RB65	-	-	140	6312 C3	60A			
A21R 250 M2		-		-							
A21R 250 M4, 6, 8	6314 C3	-	RB70	-	-	150	6313 C3	65A			
A21R 280 S2, M2		-		-			-				
A21R 280 S4, 6, 8, M4, 6, 8	6316 C3	-	RB80	-	-	170	6314 C3	70A			
A21R 315 S2, M2		-		-			-				
A21R 315 S4, 6, 8, M4, 6, 8	6317 C3	-	RB85	-	-	180	6316 C3	80A			
A21R 315 MX2	See basic version										
A21R 315 MX4, 6, 8											
A21R 315 MY2											
A21R 315 MY4, 6, 8											
A21R 315 L2, LX2											
A21R 315 L4, 6, 8, LX4, 6, 8											
A22R 355 ... 2-pole											
A22R 355 ... 4-, 6-, 8-pole											
A42R 355 MX, L ... 2-pole											
A42R 355 MX, L ... 4-, 6-, 8-pole											
A42R 400 ... 2-pole											
A42R 400 ... 4-, 6-, 8-pole											

¹⁾ Type of protection IP 54

Lubrication device, series A20R

Type	D-end					N-end		Figure		Fixed bearing
	Anti-friction bearing	V-ring	Y-ring	Wave washer	Disc spring	Anti-friction bearing	V-ring	D-end	N-end	
A20R 112 M2, 4, 6, 8 ¹⁾	6207 C3	-	RB35	72	-	6207 C3	35A	13	14	N-end
A20R 112 MX6, 8 ¹⁾		-			-					
A20R 132 S, M ¹⁾	6308 C3	-	RB40	90	-	6308 C3	40A			
A20R 160 S, M ¹⁾	6310 C3	-	RB50	110	-	6309 C3	45A			
A20R 180 S2, M2 ¹⁾		-			-					
A20R 180 S4, 6, 8, M4, 6, 8 ¹⁾	6312 C3	-	RB60	-	130	6310 C3	50A			
A20R 200 M2, L2		-				-				
A20R 200 M4, 6, 8, L4, 6, 8	6313 C3	-	RB65	-	140	6312 C3	60A			
A20R 225 M2		-				-				
A20R 225 M4, 6, 8	6314 C3	-	RB70	-	150	6313 C3	65A			
A20R 250 S2, M2		-				-				
A20R 250 S4, 6, 8, M4, 6, 8	6316 C3	-	RB80	-	170	6314 C3	70A			
A20R 280 S2, M2		-				-				
A20R 280 S4, 6, 8, M4, 6, 8	6317 C3	-	RB85	-	180	6316 C3	80A			
A20R 315 S2	See basic version									
A20R 315 S4, 6, 8										
A20R 315 M2, L2										
A20R 315 M4, 6, 8, L4, 6, 8										

¹⁾ Type of protection IP 54

Quantity of grease for first lubrication and lubrication at maintenance
Light-duty roller table motors, series A21R, A21O, A21F/A20R, A20O, A20F

Series A21	Grease quantity in cm ³ First lubrication		Grease quantity in cm ³ Lubrication at maintenance	
	D-end	N-end	D-end	N-end
A21R 132 S, SX2, M6, 8	9.6	7.68	-	-
A21R 132 M4, MX6	14.4	19.2	17	17
A21R 160 M, MX8	28.8	19.2	-	-
A21R 160 MX2, L	33.6	28.8	23	20
A21R 180 M4, L6, 8	33.6	28.8	23	20
A21R 180 M2, L4	33.6	33.6	23	23
A21R 200 L, LX6	48	33.6	31	23
A21R 200 LX2	48	48	31	31
A21R 225 M2	48	48	31	31
A21R 225 S4, 8, M4, 6, 8	62.4	48	35	31
A21R 250 M2	62.4	62.4	35	35
A21R 250 M4, 6, 8	72	62.4	41	35
A21R 280 S2, M2	72	72	41	41
A21R 280 S4, 6, 8, M4, 6, 8	96	72	52	41
A21R 315 S2, M2	96	96	52	41
A21R 315 S4, 6, 8, M4, 6, 8	105.6	96	57	52
A21R 315 MX2	105.6	96	57	52
A21R 315 MX4, 6, 8	124.8	96	64	52
A21R 315 MY2	105.6	105.6	57	57
A21R 315 MY4, 6, 8	124.8	105.6	78	57
A21R 315 L2, LX2	105.6	105.6	57	57
A21R 315 L4, 6, 8, LX4, 6, 8	124.8	105.6	78	57
A22R 355 ... 2-pole	105.6	105.6	57	57
A22R 355 ... 4-, 6-, 8-pole	172.8	105.6	90	57
A42R 355 MX, L ... 2-pole	105.6	105.6	57	57
A42R 355 MX, L ... 4-, 6-, 8-pole	172.8	105.6	90	57
A42R 400 ... 2-pole	105.6	105.6	57	57
A42R 400 ... 4-, 6-, 8-pole	172.8	140	90	65

Series A20	Grease quantity in cm ³ First lubrication		Grease quantity in cm ³ Lubrication at maintenance	
	D-end	N-end	D-end	N-end
A20R 112 M2-8	7.68	7.68	10	10
A20R 112 MX6, 8	7.68	7.68	10	10
A20R 132 S, M	19.2	19.2	17	17
A20R 160 S, M	33.6	28.8	23	20
A20R 180 S2, M2	33.6	33.6	23	23
A20R 180 S4-8, M4-8	48	33.6	31	23
A20R 200 M2, L2	48	48	31	31
A20R 200 M4-8, L4-8	62.4	48	35	31
A20R 225 M2	62.4	62.4	35	35
A20R 225 M4, 6, 8	72	62.4	41	35
A20R 250 S2, M2	72	72	41	41
A20R 250 S4-8, M4-8	96	72	52	41
A20R 280 S2, M2	96	96	52	52
A20R 280 S4-8, M4-8	105.6	96	57	52
A20R 315 S2	105.6	96	57	52
A20R 315 S4, 6, 8	124.8	96	64	52
A20R 315 M2, L2	105.6	105.6	57	57
A20R 315 M4-8, L4-8	144	105.6	78	57

Special version heavy bearing arrangement VL, series A21R

Series A21 reinforced bearings	Grease quantity in cm ³ First lubrication		Grease quantity in cm ³ Lubrication at maintenance	
	D-end	N-end	D-end	N-end
A21R 132 S, SX2, M6, 8 VL	9.6	14.4	-	-
A21R 132 M4, MX6 VL	19.2	19.2	17	17
A21R 160 M, MX8 VL	28.8	19.2	-	-
A21R 160 MX2, L VL	33.6	28.8	23	20
A21R 180 M4, L6, 8 VL	33.6	28.8	23	20
A21R 180 M2, L4 VL	33.6	33.6	23	23
A21R 200 L, LX6 VL	48	33.6	31	23
A21R 200 LX2 VL	48	48	31	31
A21R 225 M2 VL	48	48	31	31
A21R 225 S4, 8, M4, 6, 8 VL	62.4	48	35	31
A21R 250 M2 VL	62.4	62.4	35	35
A21R 250 M4, 6, 8 VL	72	62.4	41	35
A21R 280 S2, M2 VL	72	72	41	41
A21R 280 S4, 6, 8, M4, 6, 8 VL	96	72	52	41
A21R 315 S2, M2 VL	96	96	52	41
A21R 315 S4, 6, 8, M4, 6, 8 VL	105.6	96	57	52
A21R 315 MX2 VL	105.6	96	57	52
A21R 315 MX4, 6, 8 VL	124.8	96	64	52
A21R 315 MY2 VL	105.6	105.6	57	57
A21R 315 MY4, 6, 8 VL	144	105.6	78	57
A21R 315 L2, LX2 VL	105.6	105.6	57	57
A21R 315 L4, 6, 8, LX4, 6, 8 VL	144	105.6	78	57
A22R 355 ... 2-pole VL	105.6	105.6	57	57
A22R 355 ... 4-, 6-, 8-pole VL	172.8	105.6	90	57
A42R 355 MX, L ... 2-pole VL	105.6	105.6	57	57
A42R 355 MX, L ... 4-, 6-, 8-pole VL	172.8	105.6	90	57
A42R 400 ... 2-pole, VL	105.6	105.6	57	57
A42R 400 ... 4-, 6-, 8-pole, VL	172.8	140	90	65

Special version heavy bearing arrangement VL, series A20R

Series A20 Size	Grease quantity in cm ³ First lubrication		Grease quantity in cm ³ Lubrication at maintenance	
	D-end	N-end	D-end	N-end
A20R 112 M2, 4, 6, 8 VL	7.68	7.68	10	10
A20R 112 MX6, 8 VL	7.68	7.68	10	10
A20R 132 S, M VL	19.2	19.2	17	17
A20R 160 S, M VL	33.6	28.8	23	20
A20R 180 S2, M2 VL	33.6	33.6	23	23
A20R 180 S4, 6, 8, M4, 6, 8 VL	48	33.6	31	23
A20R 200 M2, L2 VL	48	48	31	31
A20R 200 M4, 6, 8, L4, 6, 8 VL	62.4	48	35	31
A20R 225 M2 VL	62.4	62.4	35	35
A20R 225 M4, 6, 8 VL	72	62.4	41	35
A20R 250 S2, M2 VL	72	72	41	41
A20R 250 S4, 6, 8, M4, 6, 8 VL	96	72	52	41
A20R 280 S2, M2 VL	96	96	52	52
A20R 280 S4, 6, 8, M4, 6, 8 VL	105.6	96	57	52
A20R 315 S2 VL	105.6	96	57	52
A20R 315 S4, 6, 8 VL	124.8	96	64	52
A20R 315 M2, L2 VL	105.6	105.6	57	57
A20R 315 M4, 6, 8, L4, 6, 8 VL	144	105.6	78	57

7.5.2 Bearing arrangement series ARC

Type	D-end									N-end	Figure		
	Anti-friction bearing	Y-ring	Radial shaft seal 1	Quantity of sealing grease in g	Radial shaft seal 2	Bearings bushing	Wave washer	Disc spring	Anti-friction bearing		D-end	N-end	Fixed bearing
ARC 112 M, MX	6207 C3	9RB 35 FKM	40x62x7	50	-	IR 35x40x17EGS	72	-	6207 C3	22	23	N-end	
ARC 132 S, M	6308 C3	9RB 40 FKM	45x65x8		-	IR 40x45x17EGS	90	-	6308 C3				
ARC 160 S, M	6310 C3	9RB 50 FKM	55x75x7	70	55x85x8	IR 50x55x20EGS	110	-	6309 C3				
ARC 180 S, M	6312 C3	9RB 60 FKM	70x90x7	80	70x100x10	IR 60x70x25EGS	-	130	6310 C3				
ARC 200 S, M	6313 C3	9RB 65 FKM	72x95x10	90	72x100x10	IR 65x72x25EGS	-	140	6312 C3				
ARC 225 M	6314 C3	9RB 70 FKM	80x100x7	100	80x110x10	IR 70x80x30EGS	-	150	6313 C3				
ARC 250 S, M	6316 C3	9RB 80 FKM	90x110x7,5	110	90x120x12	IR 80x90x30EGS	-	170	6314 C3				
ARC 280 S, M	6317 C3	9RB 85 FKM	95x120x12	120	95x125x12	IR 85x90x36EGS	-	180	6316 C3				
ARC 315 M, MX	6320 C3	9RB 95 FKM	105x130x12	130	105x140x12	IR 95x105x36xEGS	-	215	6317 C3				
ARC 315 L, LX							-						
ARC 355 LY, L	6324 C3	9RB 110 FKM	125x150x15	150	125x160x12	IR 110x125x40EGS	-	260					
ARC 400 L, LX	6324 C3	9RB 120 FKM	135x170x12	150	125x160x12	IR 120x135x45EGS	-	260	6321 C3				

Grease type Berutox FH28KN (KHC1R-30 DIN 51825)

7.5.3 Bearing arrangement series ARB

Type	Anti-friction bearing D-end and N-end	Fixed bearing
ARB 22, ARB 33	6306 S1 C5	N-end
ARB 54, ARB 65	6310 S1 C5	

Heavy duty roller table motors, series ARB

Series ARB Size	Core length Pole number	Grease quantity at first lubrication in cm ³ for D-end and N-end	Grease quantity for lubrication at maintenance in cm ³ for D-end and N-end
ARB 22, ARB 33	alle	10	12
ARB 54, ARB 65		35	23

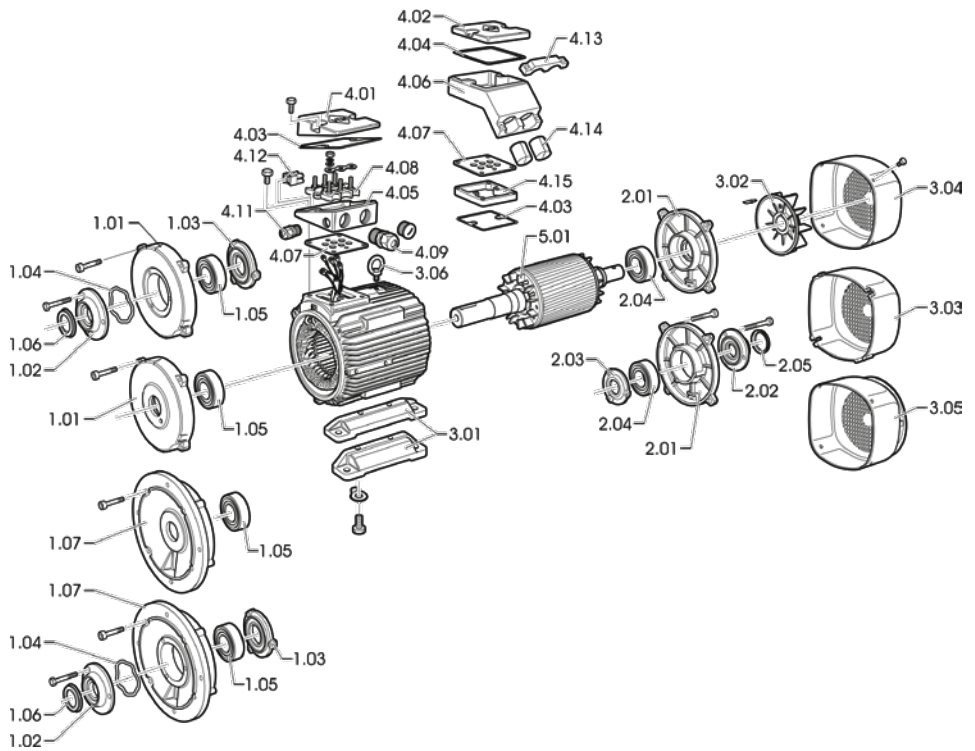
Roller table motors for inverter operation, series ARC
Quantity of grease at first lubrication

Series ARC Size	Core length Pole numbe	Sealing grease D-end	Bearing grease quantity in cm ³	
			D-end	N-end
112	all	50	10	10
132		50	17	17
160		70	23	20
180		80	31	23
200		90	35	31
225		100	41	35
250		110	52	41
280		120	57	52
315		130	78	57
355		150	90	57
400		150	90	85

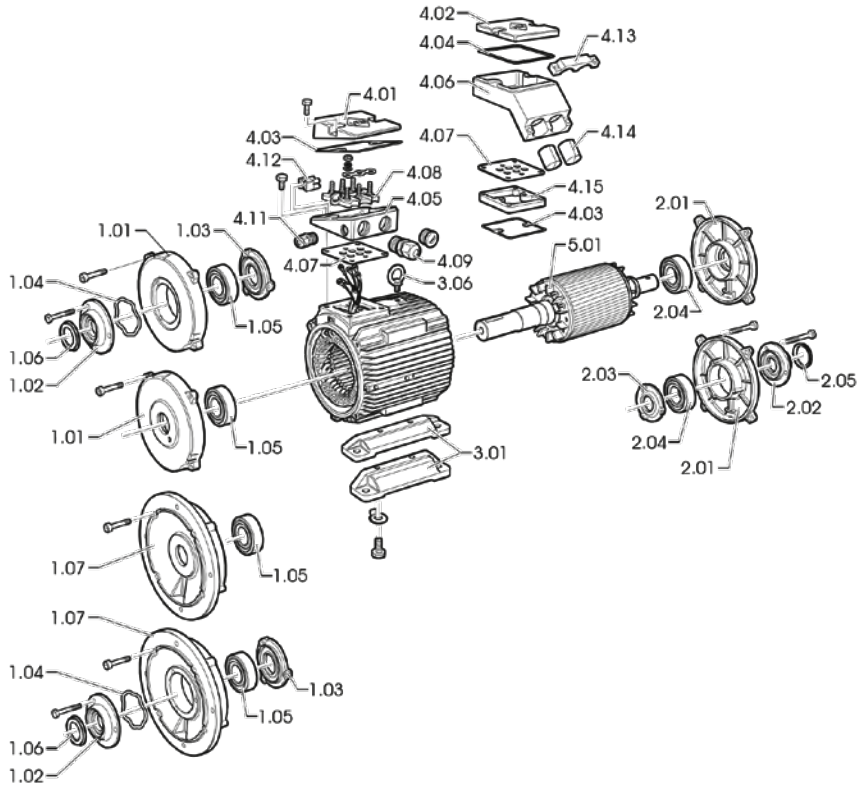
8. Construction of the motor

Kennzahl	Designation
1.01	End shield Drive-end
1.02	Bearing cover, Drive-end, external
1.03	Bearing cover, Drive-end, internal
1.04	Disc spring/wave washer, Drive-end, not for roller bearings
1.05	Antifriction bearing, Drive-end
1.06-1	V-type rotary seal, Drive-end
1.06-2	Y-type rotary seal, Drive-end
1.07	Flange end shield
1.08-1	Radial sealing ring 1, Drive-end
1.08-2	Radial sealing ring 2, Drive-end
1.09	Liner, Drive-end
2.01	End shield Non-drive end
2.02	Bearing cover, Non-drive end, external
2.03	Bearing cover, Non-drive end, internal
2.04	Antifriction bearing, Non-drive end
2.05	V-type rotary seal, Non-drive end
2.06	Wave washer, Non-drive end (or Drive-end)
3.01	1 pair of motor feet
3.02	Fan
3.03	Fan cowl, plastic
3.04	Fan cowl, sheet steel
3.05	Fan cowl with canopy
3.06	Lifting eye bolt
4.01/4.02	Terminal box cover
4.03/4.04	Terminal box cover gasket
4.05/4.06	Terminal box base
4.07	Terminal box base gasket
4.08	Terminal plate
4.09	Cable gland
4.10	Screw plug for gland opening
4.11	Cable gland for thermal winding protection
4.12	Terminal for thermal winding protection
4.13	Clamp
4.14	Sealing components
4.15	Adapter plate
4.16	Flat terminal box
4.17	Standard parts bag
5.01	Rotor, complete
6.01	Grease thrower ring, Drive-end
6.02	Grease thrower ring, Non-drive end
6.03	Labyrinth gland, Drive- and Non-drive end
6.04	Guide disc, Drive-end
6.05	Guide disc, Non-drive end
6.06	Cover, Drive-end
6.07	Cover, Drive-end
7.01	Speed sensor/Tacho generator
7.02	Built-on brake
8.01	Gear

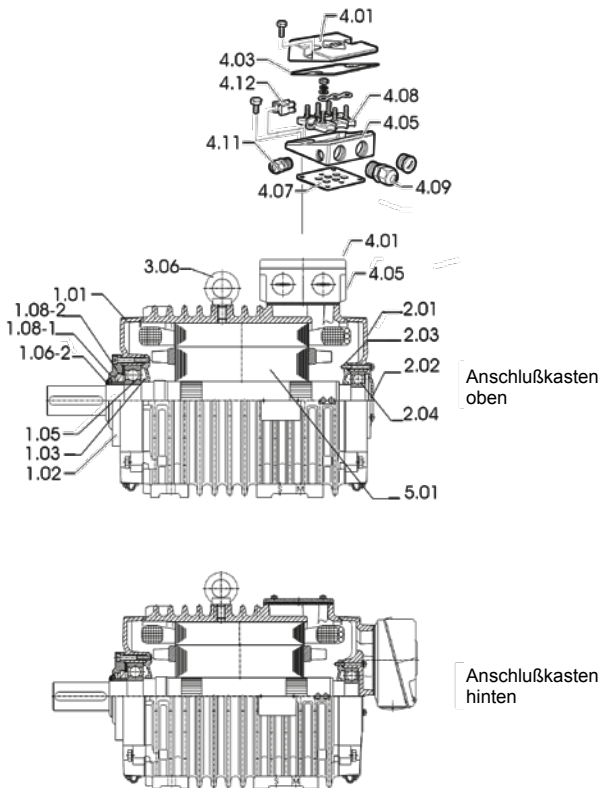
Three Phase Asynchronous Motor/Basic Version A2.R 112 – 355
(example, delivered version may differ in details)



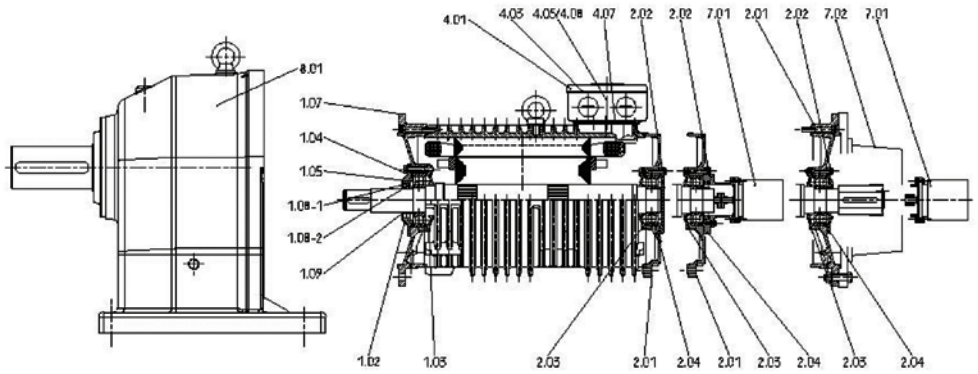
Non-Ventilated Three Phase Asynchronous Motor/Basic Version A2.O 112 – 355
 (example, delivered version may differ in details)



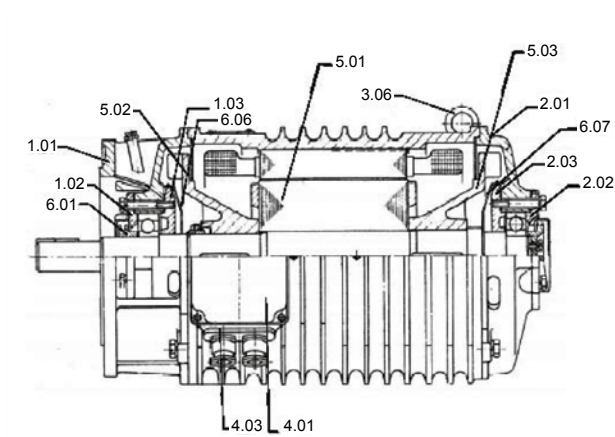
Three-phase roller table motor/Special versions ARC 112 – 355
 (example, delivered version may differ in details)



Three-phase roller table motor/Special versions AR. 112 – 355
 Geared motor version, Built-on speed sensor or tachogenerator, Built-on brake, Built-on brake and speed sensor or tachogenerator (example, delivered version may differ in details)



Three-phase roller table motor/Basic design ARB 22 – 65
(example for type of construction IM B5, other types (IM B3 and IM B35) available,
delivered version may differ in details)



EU Declaration of Conformity



Manufacturer: VEM motors GmbH
Address: Carl-Friedrich-Gauß-Str. 1
D-38855 Wernigerode

VEM motors Thurm GmbH
Äußere Dresdner Str. 35
D-08066 Zwickau

Product name: The electrical apparatus
Low Voltage asynchronous motors / generators with cage and Slipping machines of the series:

A...¹⁾
B...¹⁾
C...
G...
K...¹⁾
S...
W...¹⁾
Y...¹⁾
Gear motors SG.../SP.../KIXB...¹⁾ and
Single-phase-motors EA.../EB.../ED... for
industrial applications

¹⁾ Motors that comply with the Guideline 2009/125/EC and the regulation No. 4/2014 receive the marking IEx before the type designation, whereas x= 1,2,3,4 (acc. to EN 60034-30-1) is.

are in conformity with the instructions of the following EU Directives :
2014/35/EU

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
Official Journal of the European Union L96, 29.03.2014, S. 357-374

2014/30/EU

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
Official Journal of the European Union L96, 29.03.2014, S. 79-106

2009/125/EC

Directive of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products
Official Journal of the European Union L285, 31.10.2009, S. 10-35

The sole responsibility for issuing this Declaration of Conformity lies with the manufacturers.

Compliance with the provisions of these Directives is demonstrated by compliance with the following standards:

Reference number and issue date


EN 61000-6-2:2005, EN 61000-6-4:2007+A1:2011
EN 60038:2011, EN 60204-1:2006+A1:2009
EN 60034-1 :2010+Cor.:2010
and all other relevant parts and additions EN 60034- ...

The specified product is exclusively intended for fitting into another machine/installation. Start of operation is permitted until conformity of the end product with the directive 2006/42/EC is established.

Date of first application of CE-mark: 01.1996

Wernigerode, 15.03.2019

Zwickau, 15.03.2019


Stürtzbecher
Managing Director


Dr. Koch
Managing Director

This certificate attests the conformity with the named Directives; however, it is not a promise of properties in the meaning of product liability. In case of electronic communication, the signature does not appear.

EWN-1200, Blatt 1, Seite 2



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