

Roller table motors

Motor selection data, 50 Hz, 2- up to 12-pole
3000/1500/1000/750/600/500 rpm

Series

ARC, ARB

mounting dimensions acc. to IEC 60072, DIN EN 50347

Sizes

ARC 132 – 355

ARB 22 – 65

Output range

0.4 – 175 kW

Degrees of protection

IP 55 acc. to DIN EN 60034-5

higher degrees of protection as an option

Cooling method

IC 411 acc. to DIN EN 60034-6

Types of construction

IM B3, IM B35, IM B5 and derived types of construction acc. to DIN EN 60034-7

Ambient temperatures

-40 °C up to +40 °C

Three-phase roller table motors with squirrel-cage rotor

for use on a frequency inverter, series ARC

non-ventilated with surface cooling, IC 410

modes of operation S4, S7, S9

insulation class F, degree of protection IP 55, design frequency 50 Hz

Project planning data for the intermittent duty calculation / motor pre-selection

ARC	Output equivalent to S1							Impact load (max. 10 s)					No-load operation			
	P_{eff} (S1)	M_{eff}	I_n 400 V	n_n	η_n apply to P_{eff}	$\cos \varphi_n$	M_K/M_n	M_{max}	M_{max}/M_{eff}	I_{max}	η_{max} apply to M_{max}	$\cos \varphi_{max}$	I_0	$\cos \varphi_0$	J	m
	kW	Nm	A	rpm	%	-		Nm		A	%	-	A	-	kgm ²	kg
Synchronous speed 1500 rpm – 4-pole version																
ARC 112 M4	2.3	15	4.7	1465	83.5	0.84	4.1	47	3.1	17	81.0	0.90	2.3	0.15	0.015	60
ARC 112 MX4	2.5	16						49	3.0						0.017	63
ARC 112 MZ4	3.0	20						60	3.1						0.020	67
ARC 132 S4	3.0	19	6.6	1480	85.0	0.77	4.2	61	3.2	20	84.0	0.81	3.8	0.13	0.028	90
ARC 132 M4	4.4	28	9.0	1475	89.0	0.79	4.3	93	3.3	30	84.0	0.87	4.9	0.12	0.035	95
ARC 132 MX4	6.2	40						120	3.0						0.044	105
ARC 160 S4	5.5	35	11.5	1480	88.0	0.80	3.9	105	3.0	32	85.0	0.84	5.8	0.13	0.078	130
ARC 160 M4	7.7	50	16.0	1480	89.0	0.79	3.9	150	3.0	52	85.0	0.84	8.5	0.11	0.090	144
ARC 160 MX4	8.0	52	16.5	1480	89.0	0.78	4.0	160	3.1	53	85.0	0.84	9.0	0.11	0.104	170
ARC 160 L4	10.2	66						200							0.116	210
ARC 180 S4	8.8	57	18.5	1480	86.0	0.80	4.0	175	3.1	55	84.5	0.83			0.138	170
ARC 180 M4	11.0	71	21.5	1480	91.0	0.82	3.9	215	3.0	61	90.0	0.85	15.0	0.07	0.168	215
ARC 180 L4	14.0	90		1480				270	3.0						0.203	300
ARC 200 M4	15.0	100	29.5	1475	91.0	0.80	4.0	307	3.1	94	91.1	0.85	15.0	0.08	0.275	270
ARC 200 L4	18.5	119	35.0	1490	92.5	0.82	4.0	367	3.1	115	91.5	0.82	16.0	0.08	0.313	300
ARC 200 LX4	20.0	128						380	3.0						0.356	350
ARC 225 M4	22.0	141	43.0	1485	92.0	0.80	3.9	425	3.0	140	92.5	0.86	16.0	0.09	0.525	375
ARC 225 MX4	25.0	161						480	3.0						0.638	420
ARC 250 S4	32.0	205	59.0	1490	92.0	0.85	4.0	624	3.0	173	93.5	0.86			0.95	520
ARC 250 M4	40.0	257	73.0	1485	93.0	0.85	3.9	778	3.0	245	93.7	0.86	33.5	0.08	1.10	580
ARC 280 S4	50.0	319	102.0	1495	93.5	0.76	3.9	968	3.0	330	95.0	0.85	40.0	0.08	1.96	740
ARC 280 M4	60.0	384	117.0	1492	94.0	0.79	4.0	1169	3.0	380	94.0	0.84	43.5	0.07	2.27	840
ARC 280 MX4	70.0	449	136.0	1490	94.0	0.79	3.9	1330	3.0	480	94.0	0.85	58.0	0.05	2.73	1000
ARC 315 M4	95.0	607	172.0	1495	96.0	0.83	3.8	1780	2.9	580	95.0	0.87	62.5	0.05	4.82	1300
ARC 315 L4	132.0	845	239.0	1492	96.0	0.83	3.1	2040	2.4	680	95.5	0.88	72.0	0.05	5.93	1450
ARC 315 LX4	150.0	961	268.0	1490	96.0	0.84	3.9	2884	3.0	980	95.5	0.88	98.0	0.04	6.82	1630
ARC 355L4	160.0	1029		1485				3087	3.0						10.00	2500
ARC 355L4	175.0	1125		1485				3376	3.0						10.00	2500
Synchronous speed 1000 rpm – 6-pole version																
ARC 112 M6	1.5	15	4.1	975	78.5	0.68	3.9	45	3.0	11	74.1	0.84	3.0	0.12	0.018	46
ARC 112 MX6	1.9	19	4.6	975	81.0	0.74	4.0	57	3.1	13	77.0	0.82	3.5	0.12	0.023	53
ARC 112 MZ6	2.2	22						66	3.1						0.029	62
ARC 132 S6	2.6	25	6.3	980	83.5	0.71	4.1	79	3.1	16	78.5	0.83	4.3	0.11	0.043	90
ARC 132 M6	3.5	34	9.3	980	82.5	0.66	3.9	103	3.0	24	83.6	0.77	6.5	0.11	0.053	95
ARC 132 MX6	4.2	41	10.5	978	84.0	0.70	4.1	130	3.2	28	82.8	0.80	7.0	0.11	0.066	110
ARC 160 S6	4.8	47	10.5	980	84.5	0.78	4.0	145	3.1	29	82.8	0.87	6.5	0.12	0.113	120
ARC 160 M6	6.5	63	14.5	980	85.5	0.76	4.0	195	3.1	40	84.0	0.84	8.7	0.12	0.145	145
ARC 160 L6	7.0	68						205	3.0						0.166	155
ARC 180 S6	7.6	74	15.0	985	89.5	0.81	4.0	228	3.1	46	85.6	0.87	9.5	0.11	0.228	180
ARC 180 M6	9.5	92	19.5	985	88.5	0.79	4.0	283	3.1	54	87.2	0.87	11.5	0.10	0.268	215
ARC 180 MX6	11.0	107						320	3.0						0.324	340
ARC 200 M6	12.5	121	25.0	985	89.5	0.81	4.0	373	3.1	75	88.7	0.88	13.0	0.11	0.443	325
ARC 200 L6	15.0	145	30.0	985	89.5	0.80	4.0	450	3.1	90	88.5	0.88			0.514	340
ARC 200 LX6	19.5	189	37.0	985	90.0	0.84	4.0	580	3.1	115	88.7	0.88	20.0	0.11	0.620	360
ARC 225 M6	16.5	159	33.0	990	91.0	0.79	4.1	496	3.1	95	89.6	0.88	17.0	0.09	0.825	390
ARC 225 MX6	18.0	174						535	3.1						0.920	440
ARC 250 S6	22.0	212	43.0	991	91.0	0.81	3.3	540	2.5	110	90.7	0.88	24.0	0.08	1.28	465
ARC 250 M6	27.0	260	51.5	991	92.0	0.82	3.5	706	2.7	140	91.3	0.88	26.0	0.08	1.48	520
ARC 280 S6	37.0	356	71.5	992	94.0	0.80	3.9	1075	3.0	230	93.1	0.88	32.0	0.05	2.63	690
ARC 280 M6	44.0	424	83.0	992	93.5	0.82	3.9	1265	3.0	260	93.4	0.87	41.0	0.07	3.33	800
ARC 280 MX6	48.0	461	90.5	995	93.5	0.82	4.5	1608	3.5	320	92.8	0.86	45.0	0.07	3.60	880
ARC 315 M6	75.0	721	138.0	993	94.5	0.83	3.5	1945	2.7	380	93.9	0.87	55.0	0.06	6.00	1050
ARC 315 L6	90.0	866	167.0	993	94.8	0.82	3.2	2140	2.5	460	94.4	0.88	73.0	0.06	6.67	1250
ARC 315 LX6	100.0	960	191.0	995	94.5	0.80	3.8	2800	2.9	540	94.0	0.88	85.0	0.05	8.60	1460
ARC 355M6	140.0	1344		995				4031	3.0						8.20	1650
ARC 355MX6	160.0	1536		995				4607	3.0						12.80	2200
ARC 355L6	180.0	1728		995				5183	3.0						14.00	2400

Three-phase roller table motors with squirrel-cage rotor

for use on a frequency inverter, series ARC

non-ventilated with surface cooling, IC 410

modes of operation S4, S7, S9

insulation class F, degree of protection IP 55, design frequency 50 Hz

Project planning data for the intermittent duty calculation / motor pre-selection

ARC	Output equivalent to S1							impact load (max. 10 s)					no-load operation			
	P_{eff} (S1)	M_{eff}	I_n	n_n	η_n	$\cos \varphi_n$	M_K/M_n	M_{max}	M_{max}/M_{eff}	I_{max}	η_{max}	$\cos \varphi_{max}$	I_0	$\cos \varphi_0$	J	m
	kW	Nm	400 V A	rpm	apply to P_{eff} %	-		Nm		A	apply to M_{max} %	-	A	-	kgm ²	kg
Synchronous speed 750 rpm – 8-pole version																
ARC 112 M8	1.1	14	3.8	725	71.5	0.59	3.5	38	2.6	7	72.0	0.78	3.2	0.13	0.018	46
ARC 112 MX8	1.5	20	5.7	728	72.2	0.53	3.6	54	2.8	9	72.3	0.81	3.8	0.11	0.023	53
ARC 112 MZ8	1.7	22						65	3.0						0.029	62
ARC 132 S8	1.8	24	5.3	730	78.5	0.62	3.2	57	2.4	12	77.5	0.77	4.2	0.11	0.043	90
ARC 132 M8	2.5	33	9.0	734	76.0	0.53	3.5	87	2.7	15	78.6	0.77	6.0	0.10	0.053	95
ARC 132 MX8	3.0	39						110	2.8						0.066	110
ARC 160 S8	3.6	47	9.2	735	83.5	0.68	3.2	117	2.5	20	81.0	0.78	6.5	0.10	0.113	120
ARC 160 M8	5.0	65	12.5	730	83.0	0.69	3.5	174	2.7	29	82.0	0.79	9.0	0.11	0.145	145
ARC 160 L8	7.3	95						255	2.7						0.166	155
ARC 180 S8	6.5	84	16.5	740	87.0	0.66	4.0	257	3.1	41	84.0	0.81	12.0	0.08	0.228	180
ARC 180 M8	7.5	97	19.5	740	86.0	0.65	4.2	316	3.3	49	86.0	0.82	15.0	0.09	0.268	215
ARC 180 MX8	8.0	103						325	3.2						0.324	340
ARC 200 M8	9.0	116	20.5	740	88.3	0.68	4.4	390	3.4	62	87.0	0.84	13.0	0.09	0.443	325
ARC 200 L8	11.0	143	22.5	735	89.5	0.78	3.7	410	2.9	63	87.0	0.84	13.0	0.08	0.514	340
ARC 225 M8	13.0	167	28.0	743	86.3	0.78	3.7	480	2.9	74	88.8	0.80			0.825	390
ARC 225 MX8	14.0	180						540	3.0						0.92	440
ARC 250 S8	17.5	226	38.0	740	90.5	0.73	3.4	590	2.6	90	89.8	0.81	22.0	0.07	1.35	465
ARC 250 M8	22.0	284	50.0	740	90.5	0.70	3.3	715	2.5	114	90.7	0.77	30.5	0.07	1.55	520
ARC 280 S8	28.0	359	63.0	745	92.0	0.70	3.8	1040	2.9	190	91.8	0.79	36.0	0.06	2.63	690
ARC 280 M8	35.0	449	77.5	745	92.0	0.71	3.8	1320	2.9	250	91.6	0.81	48.0	0.06	3.33	800
ARC 280 L8	37.0	474	82.0	746	92.0	0.70	4.6	1685	3.6	290	92.3	0.80			3.60	880
ARC 315 M8	55.0	710	113.0	741	93.6	0.75	3.8	2100	3.0	306	91.1	0.82			6.00	1050
ARC 315 L8	68.0	875	145.0	745	94.4	0.71	3.2	2140	2.4	309	94.1	0.82			6.76	1250
ARC 315 LX8	85.0	1090		745				2724	2.5						8.71	1460
ARC 355 M8	90.0	1154		745				3461	3.0						9.50	1600
ARC 355 MX8	110.0	1410		745				4230	3.0						13.40	2200
ARC 355 L8	140.0	1795		745				5384	3.0						15.80	2400

Synchronous speed 600 rpm – 10-pole version

ARC 112 M10	0.55	9		570	data on request		25	2.7							0.018	46
ARC 112 MX10	0.75	13		570	data on request		35	2.8							0.023	53
ARC 112 MZ10	0.85	14		570			40	2.8							0.029	62
ARC 132 S10	1.1	18		575	data on request		50	2.7							0.043	90
ARC 132 M10	1.5	25		575	data on request		75	3.0							0.053	95
ARC 132 MX10	1.8	30		575			90	3.0							0.066	110
ARC 160 S10	2.8	46		575	data on request		135	3.0							0.113	120
ARC 160 M10	3.0	50		575	data on request		150	3.0							0.145	145
ARC 160 L10	4.0	66		575			200	3.0							0.166	155
ARC 180 S10	4.5	75		575	data on request		225	3.0							0.228	180
ARC 180 M10	6.5	108		575	data on request		330	3.0							0.268	215
ARC 180 MX10	7.0	116		575			350	3.0							0.324	340
ARC 200 M10	8.5	140		580	data on request		420	3.0							0.443	325
ARC 200 L10	9.0	148		580			440	3.0							0.514	340
ARC 225 M10	11.0	181		580	data on request		540	3.0							0.825	390
ARC 225 MX10	12.0	198		580			600	3.0							0.920	440
ARC 250 S10	13.5	220		585	data on request		660	3.0							1.28	465
ARC 250 M10	17.0	278		585	data on request		840	3.0							1.48	520
ARC 280 S10	22.5	364		590	data on request		1080	3.0							2.63	690
ARC 280 M10	27.5	445		590	data on request		1350	3.0							3.33	800
ARC 280 MX10	37.5	607		590	data on request		1800	3.0							3.60	880
ARC 315 M10	45.0	728		590	data on request		2190	3.0							6.00	1050
ARC 315 L10	55.0	890		590	data on request		2670	3.0							6.76	1250
ARC 355 M10	68.0	1091		595	data on request		3274	3.0							9.50	1600
ARC 355 MX10	80.0	1284		595	data on request		3852	3.0							13.40	2200
ARC 355 LY10	90.0	1445		595	data on request		4334	3.0							15.80	2400
ARC 355 L10	110.0	1766		595	data on request		5297	3.0							18.50	2400

Three-phase roller table motors with squirrel-cage rotor

for use on a frequency inverter, series ARC

non-ventilated with surface cooling, IC 410

modes of operation S4, S7, S9

insulation class F, degree of protection IP 55, design frequency 50 Hz

Project planning data for the intermittent duty calculation / motor pre-selection

ARC	Output equivalent to S1							impact load (max. 10 s)				no-load operation				
	P _{eff}	M _{eff}	I _n	n _n	η _n	cos φ _n	M _K /M _n	M _{max}	M _{max} /	I _{max}	η _{max}	cos φ _{max}	I ₀	cos φ ₀	J	m
	(S1)		400 V		apply to P _{eff}				M _{eff}		apply to M _{max}					
	kW	Nm	A	rpm	%	-		Nm		A	%	-	A	-	kgm ²	kg
Synchronous speed 500 rpm – 12-pole version																
ARC 112 M12	0.4	8		475	data on request			23	3.0						0.018	46
ARC 112 MX12	0.6	11		470	data on request			30	2.7						0.023	53
ARC 112 MZ12	0.7	14		470	data on request			40	2.8						0.029	62
ARC 132 S12	0.8	15		480	data on request			45	3.0						0.043	90
ARC 132 M12	1.1	22		480	data on request			60	3.0						0.053	95
ARC 132 MX12	1.5	30		480	data on request			90	3.0						0.053	110
ARC 160 S12	1.5	30		475	data on request			90	3.0						0.113	120
ARC 160 M12	2.8	55		480	data on request			165	3.0						0.145	145
ARC 160 L12	3.0	60		480	data on request			180	3.0						0.166	155
ARC 180 S12	3.0	60		480	data on request			180	3.0						0.228	180
ARC 180 M12	4.5	90		480	data on request			270	3.0						0.268	215
ARC 180 MX12	5.5	109		480	data on request			320	2.9						0.324	340
ARC 200 M12	6.5	129		480	data on request			390	3.0						0.443	325
ARC 200 L12	7.0	139		480	data on request			420	3.0						0.514	340
ARC 225 M12	8.5	169		480	data on request			510	3.0						0.825	390
ARC 225 MX12	9.0	179		480	data on request			540	3.0						0.920	440
ARC 250 S12	10.0	199		480	data on request			600	3.0						1.28	465
ARC 250 M12	12.0	239		480	data on request			705	3.0						1.48	520
ARC 280 S12	18.5	364		485	data on request			1080	3.0						2.63	690
ARC 280 M12	22.5	443		485	data on request			1320	3.0						3.33	800
ARC 280 MX12	27.5	541		485	data on request			1650	3.0						3.60	880
ARC 315 M12	37.5	738		485	data on request			2190	3.0						6.00	1050
ARC 315 L12	45	886		485	data on request			2640	3.0						6.67	1250
ARC 355 M12	55	1072		490	data on request			3216	3.0						9.50	1600
ARC 355 MX12	66	1286		490	data on request			3859	3.0						13.40	2200
ARC 355 L12	80	1559		490	data on request			4678	3.0						15.80	2400

Application of data for voltages and frequencies which deviate from 400 V, 50 Hz

Operating point $U_B, f_B > f_n$

$$\begin{aligned}
 P_B &\approx P_{\text{eff}} \\
 n_B &\approx (f_B / 50) \times n \\
 M_B &\approx (50 / f_B) \times M_{\text{eff}} \\
 M_{B \text{ max}} &\approx (50 / f_B) \times M_{\text{max}} \\
 I_{0 B} &\approx (400 / U_B) \times (f_B / 50) \times I_0 \\
 I_{n B} &\approx (400 / U_B) \times \sqrt{(f_B / 50)} \times I_n \\
 I_{\text{max} B} &\approx (400 / U_B) \times (f_B / 50) \times I_{\text{max}} \\
 \cos \varphi_{0 B} &\approx \cos \varphi_0 \\
 \cos \varphi_{n B} &\approx \sqrt{(50 / f_B)} \times \cos \varphi_{n B} \\
 \cos \varphi_{\text{max} B} &\approx \cos \varphi_{\text{max}}
 \end{aligned}$$

Operating point $U_B, f_B < f_n$

$$\begin{aligned}
 P_B &\approx (f_B / 50) \times P_{\text{eff}} \\
 n_B &\approx (f_B / 50) \times n \\
 M_B &\approx M_{\text{eff}} \\
 M_{B \text{ max}} &\approx M_{\text{max}} \\
 I_{0 B} &\approx (400 / U_B) \times (f_B / 50) \times I_0 \\
 I_{n B} &\approx (400 / U_B) \times (f_B / 50) \times I_n \\
 I_{\text{max} B} &\approx (400 / U_B) \times (f_B / 50) \times I_{\text{max}} \\
 \cos \varphi_{0 B} &\approx \cos \varphi_0 \\
 \cos \varphi_{n B} &\approx \cos \varphi_{n B} \\
 \cos \varphi_{\text{max} B} &\approx \cos \varphi_{\text{max}}
 \end{aligned}$$

Characteristic data:

P_{eff}	[kW]	effective output (output equivalent to S1)
M_{eff}	[Nm]	Effective torque
I_n	[A]	Current for equivalent S1-output
n_n	[rpm]	Speed for equivalent S1-output
η_n	[%]	Efficiency for equivalent S1-output
$\cos \varphi_n$	[rpm]	Power factor for equivalent S1-output
M_K/M_n	[-]	Relative pull-out torque
M_{max}	[Nm]	max. acceleration torque
$M_{\text{max}}/M_{\text{eff}}$	[-]	max. acceleration torque related to effective torque
η_{max}	[%]	Efficiency for max. acceleration
$\cos \varphi_{\text{max}}$	[-]	Power factor for max. acceleration torque
I_0	[A]	No-load loss
$\cos \varphi_0$	[-]	Power factor at no-load

For frequencies above 50 Hz, the increasing core losses can, depending on the motor type, result in additional temperature rise of the winding, causing an output reduction for the motor.

Three-phase roller table motors with squirrel-cage rotor

for DOL putting onto operation, series ARB

non-ventilated with surface cooling, IC 410

mode of operation S1, continuous duty

insulation class H, degree of protection IP 44 / IP 54, 50 Hz

Type	P	n	I _a	B		M _a	t _k	J	m
	kW	rpm	at 400 V A	IP 44 kgm ² /h	IP 44 kgm ² /h	Nm	min	kgm ²	kg
Synchronous speed 1500 rpm – 4-pole version									
ARB 22/4	1.1	1330	12	200	150	22.5	7.0	0.0140	60
ARB 33/4	2.2	1430	37	260	200	56.0	4.0	0.0430	90
Synchronous speed 1000 rpm – 6-pole version									
ARB 22/6	0.8	850	7	330	250	18.5	13.0	0.0140	60
ARB 33/6	1.5	940	21	570	440	53.0	10.0	0.0430	90
ARB 54/6	5.5	930	76	1400	1000	240.0	5.5	0.2330	200
Synchronous speed 750 rpm – 8-pole version									
ARB 22/8	0.6	650	7	480	370	22.5	20.0	0.0140	60
ARB 33/8	1.1	690	13	740	580	42.0	14.0	0.0430	90
ARB 54/8	4.0	680	49	1700	1300	190.0	5.5		
ARB 65/8	5.5	700	67	2450	1900	210	10.0	0.5750	290
Synchronous speed 600 rpm – 10-pole version									
ARB 33/10	0.8	530	8	1100	860	28.0	40.0	0.0430	90
ARB 54/10	3.0	555	36	2600	2000	170.0	18.0	0.2330	200
ARB 65/10	4.0	560	58	3600	2800	250	7.5	0.5750	290
Synchronous speed 500 rpm – 12-pole version									
ARB 33/12	0.4	460	7	1600	1200	29.0	55.0	0.0430	90
ARB 54/12	2.2	450	24	4000	3100	140.0	27.0	0.2330	200
ARB 65/12	3.0	455	32	5100	4000	200	20.0	0.5750	290
Synchronous speed 375 rpm – 16-pole version									
ARB 54/16	1.1	340	18	5100	4000	115.0	30.0	0.2330	200
ARB 65/16	2.2	350	33	8500	6600	200	28.5	0.5750	290
Synchronous speed 250 rpm – 24-pole version									
ARB 54/24	0.8	190	12	7000	5400	100.0	80.0	0.2330	200
ARB 65/24	1.5	210	25	13500	10600	175	50.0	0.5750	290
Synchronous speed 500/1000 rpm – 12/6-pole version									
ARB 54/12	2.5	440	26	3000	2300	135	10.0	0.2330	200
-6	4.0	920	43	750	600	100	2.2		
ARB 65/12	3.7	460	43	5200	4000	210	12.0	0.5750	290
-6	5.0	950	41	1500	1100	170	3.5		

t_k... max. admissible blocking period

B... acceleration number or B valve

B = J_G × z × k [kgm²/h]

J_G... total moment of inertia in kgm² for motor, roller + load, related to motor shaft

z... switching frequency in 1/h

k... factor for taking the switching frequency into account, k = 1 for simple starting, k = 4 for reversing operation