

Squirrel-cage motors

Sector solutions

Selection and ordering data



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Squirrel-cage motors

Sector solutions · Marine motors

Overview

Low-voltage motors in the marine version can be used as auxiliary drives below deck on ships and in the offshore industry. The thermal utilization of the motors is matched to the generally higher ambient temperatures on board ship. If the application demands compliance with additional regulations, e.g. protection against explosion hazards, the appropriate motor series must be chosen from the previous section of this catalogue.

The classification authorities categorize the auxiliary drives on board ships into "essential services" and "non-essential services". Acceptance testing by a representative of the relevant classification authority is required for motors used in essential auxiliary drives, depending on their output.

In special cases, in addition to the acceptance test, supervision of construction may also be required. Supervision of construction involves monitoring of the separate manufacturing stages of a motor by an inspector from the classification authority.

The charges of the classification authority incurred for acceptance testing or acceptance testing with supervision of construction will be invoiced separately.

Approved motor series type with aluminium (Alu) and cast iron (C iron) housings to the IP55 and IP56 (non-heavy sea) degrees of protection in accordance with Sections 3, 4 and 5. ²⁾

Motors	Sizes																	Output range ¹⁾ kW
1LA7/1PP7	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu									0.06 – 18.5
1LA5/1PP5										Alu	Alu	Alu						11 – 45
1LA9/1PP9	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu							0.06 – 53
1LA6							C iron	C iron	C iron	C iron								0.75 – 18.5
1LG4/1PP4										C iron	C iron	C iron	C iron	C iron	C iron			11 – 200
1LG6/1PP6										C iron	C iron	C iron	C iron	C iron	C iron			11 – 200
1LA8, 1PQ8 ³⁾															C iron	C iron	C iron	160 – 1000
1MA7		Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu									0.12 – 16
1MA6							C iron	C iron	C iron	C iron	C iron	C iron	C iron	C iron	C iron			1.3 – 165
1MJ6							C iron	C iron	C iron	C iron	C iron	C iron	C iron					0.25 – 37
1MJ7 ³⁾														C iron	C iron	C iron	C iron	18.5 – 132

Standards and specifications

Due to the particular climatic conditions, marine motors also comply with the IEC 92-301 standard (electrical installation on board ship) in addition to the regulations for standard motors. In addition, the motors are manufactured and type approved in accordance with the regulations of the following marine classification authority:

BV Bureau Veritas (France)
GL Germanischer Lloyd (Germany)
LRS Lloyds Register of Shipping (Great Britain)
DNV Det Norske Veritas (Norway)

Furthermore, the motors can be produced in accordance with the regulations of the following classification authority (however without a type approval certificate):

ABS American Bureau of Shipping (USA)
RINA Registro Italiano Navale (Italy)
CCS Chinese Classification Society (China)

Regulations of the individual classification authorities:

IEC/EN /classification agencies	Coolant temperature CT	Limit temperature for temperature class F	Acceptance testing for drives for essential services above ⁴⁾	Supervision of construction for drives for essential services	Order code for motors in temperature class F used acc. to F ³⁾ ⁵⁾ ⁶⁾ with/without type test	Order code for 1LA8/1PQ8 motors in temperature class F used acc. to F ⁵⁾ ⁶⁾ without type test
IEC/EN 60034-1	°C	K	kW	kW		
GL	45	100	≥ 50	–	E11/–	E11
LRS	45	95	≥ 100	≥ 100	E21/–	E21
BV	45	100	≥ 50	–	E31/–	E31
DNV	45	95	≥ 300	–	E51/–	E51
ABS	50	95	≥ 100	≥ 100	–/E00	E61
RINA	45	95	≥ 50	–	–/E00	–
CCS	45	100	≥ 100	–	–/E00	E71

1) Output data with reference to 50 Hz mains-fed operation at CT 45 °C in temperature class F, used acc. to F.

2) Derating may be necessary in the case of 1MA and 1MJ motors, (E) Ex n (Zone 2) motors and 1LA9 motors with increased power.

3) The 1LA8/1PQ8 and 1MJ7 motors are not type approved (certificate only for individual acceptance test).

4) Individual acceptance tests are not required below the specified outputs.

5) Utilization of temperature class F according to B can cause derating.

6) Acceptance testing may be required for drives for essential services.

Mechanical versions

In general, all marine motors have an external earthing terminal. The rating plate features the relevant marine classification authority complete with the associated coolant temperature. In addition, a factory test certificate 2.3 to EN 10 204 is supplied that includes the certificate number of the marine classification authority.

Standard version to IP55 degree of protection, optionally IP56 (non-heavy sea) can be ordered with order code **K52**.

Motors can be supplied, depending on the motor series, in corrosion-resistant aluminium housing and in rugged cast iron version. The motors with an aluminium housing in the flange version have a rugged cast iron flange.

Increased coolant temperature

The motors in temperature class F have a thermal reserve. Derating may be necessary with coolant temperatures higher than CT 45° C (price supplement). When ordering, specify Order No. with **-Z** and plain text. For 1LA8 motors use Order Code **E80** and plain text when ordering. The permissible output power can be determined using the following table.

	Coolant temperature CT °C			
	45	50	55	60
Reduction factor	1.00	0.96	0.92	0.87

Higher efficiency

The efficiency of marine motors is similar to that of energy-saving motors. This ensures energy-saving operation on board ship.

Windings and motor protection

For winding and bearing monitoring, the motors can be equipped with PTC thermistors, temperature sensors and resistance thermometers. Motors can be equipped with anti-condensation heating if windings are to be exposed to condensation.

Paint finish

The special paint finish range for the "worldwide" climate group according to DIN IEC 60 721-2-1 offers high corrosion protection and is recommended for installation of motors in a corrosive sea atmosphere or in rooms that are constantly damp. Special paint finish is standard for all 1LA5, 1LA6, 1LA7, 1LA9, 1MA7 motors as well as 1MA6/1MJ6 up to size 200L.

Special paint finish can be ordered for 1LG4/6 and 1MA6 in sizes 225S – 315M depending on the RAL color shade as an option. Special paint with increased layer thickness available on request.

Ordering example

Squirrel-cage motor IP55, 1500 rpm, 55 kW, efficiency class EFF1, 400VΔ /690 VY, 50 Hz, IM B3 type, marine version essential drive with acceptance test and certificate from Germanischer Lloyd, coolant temperature 45 °C, special paint finish RAL 5007

In order, specify:
1LG6 253-4AA60-Z
E11+Y54

Plain text (E-line):
GL-individual acceptance test, special paint finish RAL 5007

Certificates



Squirrel-cage motors

Sector solutions · Smoke extraction motors

Overview

Low-voltage motors for use in smoke and heat extraction machinery according to EN 12 101-3

The new low-voltage motors with squirrel-cage rotors for use in smoke and heat extraction machinery in accordance with EN 12 101-3 are mainly designed for driving smoke extraction fans, so they are also known as smoke extraction motors. They are mainly used in buildings that demand smoke monitoring due to their shape and design. Some typical application examples are tunnels, single and multi-storey shopping centres, industrial buildings and warehouses, building complexes and atriums, theatres, enclosed car parks and stairways.

The dual function motors function in

- operation under normal conditions as a fan motor
- fault operation (at high ambient temperatures, specified minimum operating times) to keep access and escape routes smoke-free, to aid fire fighting by creating a smoke-free layer, to delay and/or prevent spread of a fire, to protect devices and equipment, to reduce the heat stress of components during a fire, and to reduce secondary fire damage due to thermal decomposition products and hot gases.

Temperature/time classification according to EN 12 101-3

- **F200** or 200 °C for 120 min
- **F300** or 300 °C for 60 min
- **F400** or 400 °C for 120 min

Testing and test certification

The smoke extraction motor series listed in the selection tables have been tested by the "Research and test laboratory of the Department of Climate Control and Building Services of the Technical University of Munich" in accordance with EN 12 101-3.

F200/F300 was generally tested at 300 °C for 120 min.

The verification documents for the tests are available.

Supervised construction approvals for smoke extraction units – Certification procedure

- **Use of smoke extraction motors in smoke extraction fans with existing supervised construction approval in accordance with EN 12 101-3.**

1. Application by the fan manufacturer to the DIBT (Deutsches Institut für Bautechnik - German Institute for Building Installation Systems) in Berlin for installing the motors tested to EN 12 101-3 in an already existing approval for the smoke extraction fans.
2. DIBT requests an expert opinion concerning the suitability of the tested motors from the fan testing authority.
3. DIBT includes the motors in the supervised construction approvals after receiving a satisfactory expert opinion.

- **Initial approval of smoke extraction units**

In this case, complete assemblies (motor + fan) must be tested at an approved test centre (e.g. TU Munich) before submission of an application for the supervised construction approval to the DIBT.

Technical design

Motor series

The smoke extraction motors based on basic series 1LA and 1LG

- Basic series 1PP.; forced-air cooled, version without internal fan, located in air flow of the driven fan
- Sub-series 1LA. or 1LG.; self-cooled, version with internal fan (metal)

The motors are manufactured with cast iron or aluminium housings in accordance with their fire protection classes.

Standards and specifications

Also applicable:

Permanently installed fire fighting equipment EN 12 101-3: Equipment for controlling smoke and heat flow, Part 3, Specification for smoke and heat extraction units.

Voltage and frequency

Rated voltages according to IEC 60034-1

230 VΔ 50 Hz

400 VΔ 50 Hz and
400 VY 50 Hz

500 VΔ 50 Hz and
500 VY 50 Hz

690 VY 50 Hz

Abnormal voltages and 60 Hz, on request.

Labeling

- Rating plate
For the listed rated voltages with 50 Hz performance data.
- Fault plate showing:
Number and year of issue of the European standard, temperature/time class, minimum operating time.

All labels, corrosion resistant, second set of labels loose.

Rated output, operating mode, number of poles

The rated output applies for continuous operation (normal operation) to IEC 60034-1, at a frequency of 50 Hz, coolant temperature up to 40 °C, installation height up to 1000 m above sea level. For a higher coolant temperature and installation altitude, derating is required (for reduction factors, see "Technical information").

Fault operation:

In contrast to normal operation, there is fault operation to EN 12 101-3.

At the end of the fault time, the motor may be inoperable. Deinstallation of the motor followed by an overhaul or replacement with a new motor is therefore mandatory.

Any "thermal motor protection" implemented must be deactivated in the event of a fault.

No. of poles: 2, 4 and 6; more poles and pole-change, on request.

Insulation arrangement

Special insulation arrangements, matched to the respective temperature/time classes. Maximum thermal utilization according to temperature class F.

Insulation of the smoke extraction motors is designed to permit operation with a converter at voltages ≤ 500 V without restrictions. This also applies for operation with a PWM converter with voltage peak times $t_s > 0.1 \mu s$ at the motor terminals.

Converter-fed operation is not permitted in the event of emergency situation.

Technical design (continued)

Water drain holes

Always provided; sealed in accordance with IP55 degree of protection.

Bearing plates

All bearing plates are cast iron.

Connection method

Protruding non-metallic sheathed cable, without terminal block, with cover plate or funnel cap. Cable length is dependent on the axle height.

Sizes 80 to 112: 1.0 m

Sizes 132 to 200: 1.5 m

Sizes 225 to 315: 2.5 m

Special designs of connecting cables, on request.

Position of the connecting cable

• Sizes 80 to 160:

– On the top at NDE as standard. Optionally left or right on the NDE (for foot-mounted type with screw mounted feet).

• Sizes 180 to 315:

– Flange foot-mounted types: On the top at NDE as standard. Optionally left or right at NDE.

– All foot-mounted types: On the top at DE as standard with connecting cable looped through in the direction of NDE. Optionally left or right on the DE with connecting cables looped through in the direction of NDE (for foot-mounted types with screw-mounted feet).

Earthing by means of protruding cable

Bearing, grease

Special bearing arrangements matched to the respective temperature class.

In accordance with fire protection classes F200/F300, F400, and the individual sizes, grooved ball bearing series of 62 or 63 clearance.

Fixed bearing at DE.

Nominal bearing service life L_{10h} (fan drive) at least 20000 hours at maximum permitted rated load.

Motors in sizes 80 to 250 are usually permanently greased.

Paint finish

The motors are given a two-part paint finish as standard (worldwide) in the color shade RAL 7030.

Minimum necessary cooling air quantities during normal operation

1LA7/1PP7 motors, sizes 80 to 160; 1LA5/1PP5, sizes 180 to 225; 1LA6/1PP6, sizes 100 to 160

Size	Air flow required in m ³ /min for number of poles		
	2	4	6
80	1.74	0.90	0.60
90	3.12	1.56	1.08
100	3.96	1.86	1.26
112	4.98	3.0	1.98
132	8.04	5.04	3.36
160	12.90	9.54	6.36
180	10.98	10.98	7.267
200	15.12	13.02	8.58
225	12.12	13.02	8.58

In the motor version without an integral fan (1PP5, 6, 7), the motor lies in the air flow of the driven fan which must drive the

minimum cooling air quantity over the motor housing.

1LG6/1PP6 motors, sizes 180 to 315:

Size	Air flow required in m ³ /min for number of poles		
	2	4	6
180	12.0	13.0	8.5
200	20.5	17.0	11.0
225	20.5	18.5	12.5
250	25.5	22.5	17.0
280	24.5	28.0	21.5
315	47.0	36.0	26.5

With larger quantities of cooling air, the operating temperature of the motor can be reduced.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Overview

Technical design (continued)

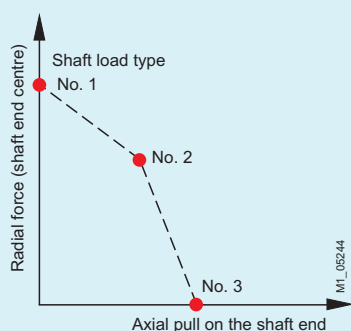
Permissible load on the shaft end

Permitted loads in axial and radial direction. The data apply to any number of poles.

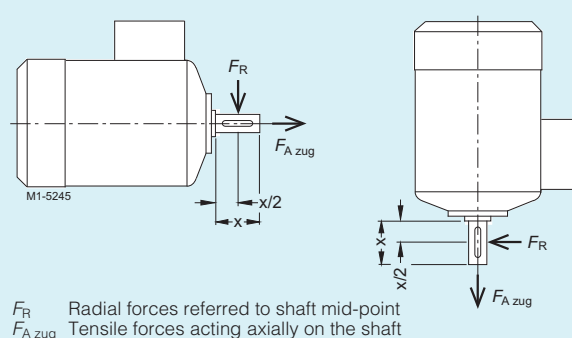
Higher loading with appropriate bearings have not been tested.

Size	No. of poles	DE bearing	Type of loading on the shaft		Shaft horizontally		Shaft vertically downwards	
					F_R N	$F_{A \text{ pull}}$ N	F_R N	$F_{A \text{ pull}}$ N
80	2 – 8	6004	No.					
			1	Radial force	400	0	360	0
			2	Radial force + axial pull	150	130	40	170
90	2 – 8	6205	3	Axial pull	0	215	0	200
			1	Radial force	650	0	590	0
			2	Radial force + axial pull	250	205	100	260
100	2 – 8	6206	3	Axial pull	0	343	0	310
			1	Radial force	890	0	820	0
			2	Radial force + axial pull	400	265	300	265
112	2 – 8	6206	3	Axial pull	0	490	0	430
			1	Radial force	870	0	760	0
			2	Radial force + axial pull	400	250	250	260
132	2 – 8	6208	3	Axial pull	0	480	0	405
			1	Radial force	1070	0	810	0
			2	Radial force + axial pull	450	315	250	300
160	2 – 8	6209	3	Axial pull	0	580	0	450
			1	Radial force	1440	0	1210	0
			2	Radial force + axial pull	700	450	500	335
180	2 – 8	6210	3	Axial pull	0	825	0	620
			1	Radial force	1540	0	1020	0
			2	Radial force + axial pull	770	430	550	220
200	2 – 8	6212	3	Axial pull	0	815	0	455
			1	Radial force	2050	0	1450	0
			2	Radial force + axial pull	1200	770	500	460
225	2 – 8	6213	3	Axial pull	0	1350	0	720
			1	Radial force	2460	0	1910	0
			2	Radial force + axial pull	1370	900	500	660
250	2 – 8	6215	3	Axial pull	0	1560	0	920
			1	Radial force	2770	0	1490	0
			2	Radial force + axial pull	1400	840	500	460
280	2 4 – 8	6217 6317	3	Axial pull	0	1500	0	710
			1	Radial force	3180	0	3000	0
			2	Radial force + axial pull	1700	1820	600	1085
315	2 4 – 8	6219 6319	3	Axial pull	0	2630	0	1380
			1	Radial force	3470	0		
			2	Radial force + axial pull	1750	2200	On request	On request
			3	Axial pull	0	3000		

Load types



Forces on shaft extension



Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of con- struction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia <i>J</i>	Weight
			Rated speed	Efficien- cy <i>η</i>	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	For direct-on-line starting as multiple of the rated current	torque			Type of constr. IM B 3 approx. kg
kW			rpm	%		A	Nm				KL	kg m²	
Forced-air cooled motors 1PP7, 1PP5 (aluminium housing) and 1PP6 (cast iron housing) IP55 degree of protection, type of cooling IC 411, temperature/time classes F200 and F300												EN 12 101-3	
		3000 rpm, 2-pole, 50 Hz											
0.75 1.1	80 M	1PP7 080-2TA .. 1PP7 083-2TA ..	2830 2845	65.0 75.0	0.82 0.80	2.1 2.7	2.5 3.7	2.3 2.6	5.6 6.1	2.4 2.7	16 16	0.00085 0.0011	9.8 11.5
1.5 2.2	90 S 90 L	1PP7 090-2TA .. 1PP7 096-2TA ..	2860 2880	76.0 80.0	0.80 0.80	3.7 5.1	5.0 7.3	2.4 2.8	5.5 6.3	2.7 3.1	16 16	0.0015 0.002	14.6 17.4
3	100 L	1PP7 106-2TA ..	2890	78.0	0.83	6.8	9.9	2.8	6.8	3.0	16	0.0038	23
4	112 M	1PP7 113-2TA ..	2905	83.0	0.83	8.5	13	2.6	7.2	2.9	16	0.0055	31
5.5 7.5	132 S	1PP7 130-2TA .. 1PP7 131-2TA ..	2925 2930	85.0 88.0	0.87 0.89	10.7 13.8	18 24	2.0 2.3	5.9 6.9	2.8 3.0	16 16	0.016 0.021	44 52
11 15 18.5	160 M 160 L	1PP7 163-2TA .. 1PP7 164-2TA .. 1PP7 166-2TA ..	2940 2940 2940	89.5 90.0 91.0	0.86 0.90 0.91	21 26.5 32.5	36 49 60	2.1 2.2 2.4	6.5 6.6 7.0	2.9 3.0 3.1	16 16 16	0.034 0.04 0.052	71 82 95
22	180 M	1PP5 183-2TA ..	2940	91.7	0.88	39	71	2.5	6.9	3.2	16	0.077	119
30 37	200 L	1PP5 206-2TA .. 1PP5 207-2TA ..	2945 2945	92.3 92.8	0.89 0.89	53 65	97 120	2.4 2.4	7.2 7.7	2.8 2.8	16 16	0.14 0.16	168 191
45	225 M	1PP5 223-2TA ..	2960	93.6	0.89	78	145	2.8	7.7	3.4	16	0.2	226
55	250 M	1PP6 253-2TB ..	2975	95.1	0.90	94	177	2.5	7.4	3.3	13	0.466	405
75 90	280 S 280 M	1PP6 280-2TB .. 1PP6 283-2TB ..	2975 2975	95.3 95.6	0.91 0.90	126 152	241 289	2.6 3.0	7.5 7.5	2.9 3.0	13 13	0.832 1.00	510 595
110 132 160 200	315 S 315 M 315 L 315 L	1PP6 310-2TB .. 1PP6 313-2TB .. 1PP6 316-2TB .. 1PP6 317-2TB ..	2985 2984 2984 2984	95.9 96.1 96.3 96.4	0.90 0.91 0.93 0.93	186 220 260 325	352 422 512 640	2.6 2.7 2.8 2.5	7.5 7.4 7.5 7.0	3.2 3.0 3.1 2.8	13 13 13 13	1.39 1.62 2.09 2.46	770 895 1035 1225
		1500 rpm, 4-pole, 50 Hz											
0.55 0.75	80 M	1PP7 080-4TA .. 1PP7 083-4TA ..	1395 1395	61.0 72.0	0.75 0.81	1.96 1.86	3.7 5.1	2.2 2.3	3.9 4.2	2.2 2.3	16 16	0.0015 0.0018	9.6 11
1.1 1.5	90 S 90 L	1PP7 090-4TA .. 1PP7 096-4TA ..	1415 1420	70.5 74.1	0.74 0.74	3.15 4.0	7.4 10	2.3 2.4	4.6 5.3	2.4 2.6	16 16	0.0028 0.0035	14 17.3
2.2 3	100 L	1PP7 106-4TA .. 1PP7 107-4TA ..	1420 1415	78.5 79.5	0.78 0.78	5.4 7.2	15 20	2.5 2.7	5.6 5.6	2.8 3.0	16 16	0.0048 0.0058	23 26
4	112 M	1PP7 113-4TA ..	1440	80.0	0.80	9.2	27	2.7	6.5	3.0	16	0.011	33
5.5 7.5	132 S 132 M	1PP7 130-4TA .. 1PP7 133-4TA ..	1450 1455	85.0 85.0	0.78 0.78	12 16.5	36 49	2.5 2.7	6.3 6.7	3.1 3.2	16 16	0.018 0.024	46 52
11 15	160 M 160 L	1PP7 163-4TA .. 1PP7 166-4TA ..	1460 1460	88.5 87.0	0.81 0.80	23 32	72 98	2.2 2.6	6.2 6.5	2.7 3.0	16 16	0.04 0.052	70 95
18.5 22	180 M 180 L	1PP5 183-4TA .. 1PP5 186-4TA ..	1460 1460	88.0 90.0	0.79 0.80	40 45	121 144	2.3 2.3	7.5 7.5	3.0 3.0	16 16	0.13 0.15	116 130
30	200 L	1PP5 207-4TA ..	1465	91.8	0.81	60	196	2.6	7.0	3.2	16	0.24	173
37 45	225 S 225 M	1PP5 220-4TA .. 1PP5 223-4TA ..	1470 1470	92.9 93.4	0.87 0.87	66 80	241 293	2.8 2.8	7.0 7.7	3.2 3.3	16 16	0.32 0.36	218 244
55	250 M	1PP6 253-4TA ..	1485	94.9	0.86	97	354	2.9	7.5	3.3	16	0.856	445
75 90	280 S 280 M	1PP6 280-4TA .. 1PP6 283-4TA ..	1486 1485	95.0 94.9	0.87 0.88	132 156	482 579	2.6 2.5	7.3 7.3	2.8 2.8	16 16	1.39 1.71	555 655
110 132 160 200	315 S 315 M 315 L 315 L	1PP6 310-4TA .. 1PP6 313-4TA .. 1PP6 316-4TA .. 1PP6 317-4TA ..	1488 1488 1488 1488	95.3 95.5 95.9 95.7	0.87 0.87 0.87 0.88	192 230 275 345	706 847 1027 1284	2.6 2.7 2.9 3.2	6.9 7.0 7.4 7.3	2.8 2.7 2.9 3.1	16 16 16 16	2.31 2.88 3.46 4.22	790 945 1085 1285

Forced-air cooled (surface cooled) motors without external fan and fan cover; the motors are located in the air flow of the driven fan and are adequately cooled during operation under normal conditions.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz	230 VΔ / 400 VY	400 VΔ / 690 VY	500 VY	500 VΔ	IM B 3	Price supplement IM B 5	IM V1 without protec- tive cover
1PP7 080 to 1PP7 096	1	6	3	–	0	0	1	6
1PP7 106 to 1PP7 166	1	6	3	5	0	0	1	6
1PP5 183 to 1PP5 223	1	6	3	5	0	0	1	6
1PP6 253 to 1PP6 313	1	6	3	5	0	0	1 ¹⁾	6
1PP6 316 to 1PP6 318	–	6	–	5	0	0	8	6

1) Additional radial supports must be provided.

For other types of construction, see "Technical information", "Types of construction".

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of con- struction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia J	Weight
			Rated speed	Efficien- cy η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	For direct-on-line starting as multiple of the rated current				Type of constr. IM B 3 approx.
kW			rpm	%		A	Nm				KL	kg m ²	kg
Forced-air cooled motors 1PP7, 1PP5 (aluminium housing) and 1PP6 (cast iron housing) IP55 degree of protection, type of cooling IC 411, temperature/time classes F200 and F300												EN 12 101-3	
	1000 rpm, 6-pole, 50 Hz												
0.37 0.55	80 M	1PP7 080-6TA .. 1PP7 083-6TA ..	920 910	62.0 67.0	0.72 0.74	1.2 1.6	3.9 5.8	1.9 2.1	3.1 3.4	2.1 2.2	16 16	0.0015 0.0018	9.6 11
0.75 1.1	90 S 90 L	1PP7 090-6TA .. 1PP7 096-6TA ..	915 915	69.0 72.0	0.76 0.77	2.1 2.9	7.8 11.5	2.2 2.3	3.7 3.8	2.2 2.3	16 16	0.0028 0.0035	14.2 17.4
1.5	100 L	1PP7 106-6TA ..	925	74.0	0.75	3.9	15	2.3	4	2.3	16	0.0063	25
2.2	112 M	1PP7 113-6TA ..	940	75.0	0.70	6.0	22	2.2	4.6	2.5	16	0.011	29
3 4 5.5	132 S 132 M	1PP7 130-6TA .. 1PP7 133-6TA .. 1PP7 134-6TA ..	950 950 950	79.0 80.5 81.0	0.76 0.76 0.75	7.2 9.4 14.5	30 40 55	1.9 2.1 2.3	4.2 4.5 5	2.2 2.4 2.6	16 16 16	0.015 0.019 0.025	44 49 57
7.5 11	160 M 160 L	1PP7 163-6TA .. 1PP7 166-6TA ..	960 960	83.0 87.5	0.72 0.74	18 24.5	75 109	2.1 2.3	4.6 4.8	2.5 2.6	16 16	0.041 0.049	78 104
15	180 L	1PP5 186-6TA ..	970	89.5	0.77	31.5	148	2.0	5.2	2.4	16	0.15	130
18.5 22	200 L	1PP5 206-6TA .. 1PP5 207-6TA ..	975 975	90.2 90.8	0.77 0.77	38.5 45.5	181 215	2.7 2.8	5.5 5.5	2.8 2.9	16 16	0.24 0.28	173 193
30	225 M	1PP5 223-6TA ..	978	91.8	0.77	61	294	2.8	5.7	2.9	16	0.36	234
37	250 M	1PP6 253-6TA ..	984	92.6	0.84	69	359	2.7	6.4	2.4	16	0.934	390
45 55	280 S 280 M	1PP6 280-6TA .. 1PP6 283-6TA ..	986 986	92.8 92.7	0.86 0.87	81 99	436 533	2.5 2.5	6.6 6.5	2.5 2.5	16 16	1.37 1.65	500 550
75 90 110	315 S 315 M 315 L	1PP6 310-6TA .. 1PP6 313-6TA .. 1PP6 316-6TA ..	990 990 990	93.9 94.3 94.7	0.85 0.86 0.87	136 160 192	723 868 1061	2.7 2.7 2.6	7.0 7.3 7.4	2.9 3.0 3.0	16 16 16	2.50 3.20 4.02	740 915 990
132 160	315 L 315 L	1PP6 317-6TA .. 1PP6 318-6TA ..	988 990	94.8 95.0	0.87 0.86	230 285	1276 1543	3.0 3.1	7.2 7.5	2.8 3.0	16 16	4.71 5.39	1160 1225

Forced-air cooled (surface cooled) motors without external fan and fan cover; the motors are located in the air flow of the driven fan and are adequately cooled during operation under normal conditions.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ		IM B 5	IM V1 without protec- tive cover	IM B 35
1PP7 080 to 1PP7 096	1	6	3	–	0	1	1	6
1PP7 106 to 1PP7 166	1	6	3	5	0	1	1	6
1PP5 183 to 1PP5 223	1	6	3	5	0	1	1	6
1PP6 253 to 1PP6 313	1	6	3	5	0	1	1	6
1PP6 316 to 1PP6 318	–	6	–	5	0	1 ¹⁾	8	6

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of construction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia <i>J</i>	Weight
			Rated speed	Efficiency η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	starting current	torque			Type of constr. IM B 3 approx.
kW			rpm	%		A	Nm				KL	kg m ²	kg
Self-cooled motors 1LA7, 1LA5 (aluminium housing) and 1LG6 (cast iron housing) IP55 degree of protection, type of cooling IC 411, temperature/time classes F200 and F300												EN 12 101-3	
	3000 rpm, 2-pole, 50 Hz												
0.75	80 M	1LA7 080-2TA ..	2830	65.0	0.82	2.1	2.5	2.3	5.6	2.4	16	0.00085	10.2
1.1		1LA7 083-2TA ..	2845	75.0	0.80	2.7	3.7	2.6	6.1	2.7	16	0.0011	11.9
1.5	90 S	1LA7 090-2TA ..	2860	76.0	0.80	3.7	5.0	2.4	5.5	2.7	16	0.0015	15.2
2.2	90 L	1LA7 096-2TA ..	2880	80.0	0.80	5.1	7.3	2.8	6.3	3.1	16	0.002	18
3	100 L	1LA7 106-2TA ..	2890	78.0	0.83	6.8	9.9	2.8	6.8	3.0	16	0.0038	24
4	112 M	1LA7 113-2TA ..	2905	83.0	0.83	8.5	13	2.6	7.2	2.9	16	0.0055	32
5.5	132 S	1LA7 130-2TA ..	2925	85.0	0.87	10.7	18	2.0	5.9	2.8	16	0.016	45
7.5		1LA7 131-2TA ..	2930	88.0	0.89	13.8	24	2.3	6.9	3.0	16	0.021	53
11	160 M	1LA7 163-2TA ..	2940	89.5	0.86	21	36	2.1	6.5	2.9	16	0.034	74
15	160 L	1LA7 164-2TA ..	2940	90.0	0.90	26.5	49	2.2	6.6	3.0	16	0.04	85
18.5		1LA7 166-2TA ..	2940	91.0	0.91	32.5	60	2.4	7.0	3.1	16	0.052	98
22	180 M	1LA5 183-2TA ..	2940	91.7	0.88	39	71	2.5	6.9	3.2	16	0.077	125
30	200 L	1LA5 206-2TA ..	2945	92.3	0.89	53	97	2.4	7.2	2.8	16	0.14	176
37		1LA5 207-2TA ..	2945	92.8	0.89	65	120	2.4	7.7	2.8	16	0.16	199
45	225 M	1LA5 223-2TA ..	2960	93.6	0.89	78	145	2.8	7.7	3.4	16	0.2	235
55	250 M	1LG6 253-2TB ..	2975	94.2	0.90	94	177	2.5	7.4	3.3	13	0.466	420
75	280 S	1LG6 280-2TB ..	2975	94.8	0.91	126	241	2.6	7.5	2.9	13	0.832	530
90	280 M	1LG6 283-2TB ..	2975	95.2	0.90	152	289	3.0	7.5	3.0	13	1.00	615
110	315 S	1LG6 310-2TB ..	2985	95.0	0.90	186	352	2.6	7.5	3.2	13	1.39	790
132	315 M	1LG6 313-2TB ..	2984	95.3	0.91	220	422	2.7	7.4	3.0	13	1.62	915
160	315 L	1LG6 316-2TB ..	2984	95.7	0.93	260	512	2.8	7.5	3.1	13	2.09	1055
200	315 L	1LG6 317-2TB ..	2984	95.9	0.93	325	640	2.5	7.0	2.8	13	2.46	1245
	1500 rpm, 4-pole, 50 Hz												
0.55	80 M	1LA7 080-4TA ..	1395	61.0	0.75	1.96	3.7	2.2	3.9	2.2	16	0.0015	10
0.75		1LA7 083-4TA ..	1395	72.0	0.81	1.86	5.1	2.3	4.2	2.3	16	0.0018	11.4
1.1	90 S	1LA7 090-4TA ..	1415	70.5	0.74	3.15	7.4	2.3	4.6	2.4	16	0.0028	14.6
1.5	90 L	1LA7 096-4TA ..	1420	74.1	0.74	4.0	10	2.4	5.3	2.6	16	0.0035	17.9
2.2	100 L	1LA7 106-4TA ..	1420	78.5	0.78	5.4	15	2.5	5.6	2.8	16	0.0048	24
3		1LA7 107-4TA ..	1415	79.5	0.78	7.2	20	2.7	5.6	3.0	16	0.0058	27
4	112 M	1LA7 113-4TA ..	1440	80.0	0.80	9.2	27	2.7	6.5	3.0	16	0.011	34
5.5	132 S	1LA7 130-4TA ..	1450	85.0	0.78	12	36	2.5	6.3	3.1	16	0.018	47
7.5	132 M	1LA7 133-4TA ..	1455	85.0	0.78	16.5	49	2.7	6.7	3.2	16	0.024	53
11	160 M	1LA7 163-4TA ..	1460	88.5	0.81	23	72	2.2	6.2	2.7	16	0.04	73
15	160 L	1LA7 166-4TA ..	1460	87.0	0.80	32	98	2.6	6.5	3.0	16	0.052	98
18.5	180 M	1LA5 183-4TA ..	1460	88.0	0.79	40	121	2.3	7.5	3.0	16	0.13	125
22	180 L	1LA5 186-4TA ..	1460	90.0	0.80	45	144	2.3	7.5	3.0	16	0.15	139
30	200 L	1LA5 207-4TA ..	1465	91.8	0.81	60	196	2.6	7.0	3.2	16	0.24	184
37	225 S	1LA5 220-4TA ..	1470	92.9	0.87	66	241	2.8	7.0	3.2	16	0.32	230
45	225 M	1LA5 223-4TA ..	1470	93.4	0.87	80	293	2.8	7.7	3.3	16	0.36	256
55	250 M	1LG6 253-4TA ..	1485	94.7	0.86	97	354	2.9	7.5	3.3	16	0.856	460
75	280 S	1LG6 280-4TA ..	1486	94.6	0.87	132	482	2.6	7.3	2.8	16	1.40	575
90	280 M	1LG6 283-4TA ..	1485	94.6	0.88	156	579	2.5	7.3	2.8	16	1.70	675
110	315 S	1LG6 310-4TA ..	1488	95.0	0.87	192	706	2.6	6.9	2.8	16	2.31	810
132	315 M	1LG6 313-4TA ..	1488	95.3	0.87	230	847	2.7	7.0	2.7	16	2.88	965
160	315 L	1LG6 316-4TA ..	1488	95.7	0.87	275	1027	2.9	7.4	2.9	16	3.46	1105
200	315 L	1LG6 317-4TA ..	1488	95.5	0.88	345	1284	3.2	7.3	3.1	16	4.22	1305

Surface-cooled motors with external fan and fan cover.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VY	400 VΔ / 690 VY	500 VY	500 VΔ		IM B 5	IM V1 without protective cover	IM B 35
1LA7 080 to 1LA7 096	1	6	3	–	0	1	1	6
1LA7 106 to 1LA7 166	1	6	3	5	0	1	1	6
1LA5 183 to 1LA5 223	1	6	3	5	0	1	1	6
1LG6 253 to 1LG6 313	1	6	3	5	0	1	1	6
1LG6 316 to 1LG6 318	–	6	–	5	0	1 ¹⁾	8	6

1) Additional radial supports must be provided.

For other types of construction, see "Technical information", "Types of construction".

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of con- struction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia J	Weight
			Rated speed	Efficien- cy η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	multiple of the rated current	torque		KL	kg m ²
kW			rpm	%		A	Nm						
Self-cooled motors 1LA7, 1LA5 (aluminium housing) and 1LG6 (cast iron housing) IP55 degree of protection, type of cooling IC 411, temperature/time classes F200 and F300												EN 12 101-3	
	1000 rpm, 6-pole, 50 Hz												
0.37 0.55	80 M	1LA7 080-6TA .. 1LA7 083-6TA ..	920 910	62.0 67.0	0.72 0.74	1.2 1.6	3.9 5.8	1.9 2.1	3.1 3.4	2.1 2.2	16 16	0.0015 0.0018	9.5 11.4
0.75 1.1	90 S 90 L	1LA7 090-6TA .. 1LA7 096-6TA ..	915 915	69.0 72.0	0.76 0.77	2.1 2.9	7.8 11.5	2.2 2.3	3.7 3.8	2.2 2.3	16 16	0.0028 0.0035	14.8 18
1.5	100 L	1LA7 106-6TA ..	925	74.0	0.75	3.9	15	2.3	4	2.3	16	0.0063	26
2.2	112 M	1LA7 113-6TA ..	940	75.0	0.70	6.0	22	2.2	4.6	2.5	16	0.011	30
3 4 5.5	132 S 132 M	1LA7 130-6TA .. 1LA7 133-6TA .. 1LA7 134-6TA ..	950 950 950	79.0 80.5 81.0	0.76 0.76 0.75	7.2 9.4 14.5	30 40 55	1.9 2.1 2.3	4.2 4.5 5	2.2 2.4 2.6	16 16 16	0.015 0.019 0.025	45 50 58
7.5 11	160 M 160 L	1LA7 163-6TA .. 1LA7 166-6TA ..	960 960	83.0 87.5	0.72 0.74	18 24.5	75 109	2.1 2.3	4.6 4.8	2.5 2.6	16 16	0.041 0.049	81 107
15	180 L	1LA5 186-6TA ..	970	89.5	0.77	31.5	148	2.0	5.2	2.4	16	0.15	139
18.5 22	200 L	1LA5 206-6TA .. 1LA5 207-6TA ..	975 975	90.2 90.8	0.77 0.77	38.5 45.5	181 215	2.7 2.8	5.5 5.5	2.8 2.9	16 16	0.24 0.28	184 204
30	225 M	1LA5 223-6TA ..	978	91.8	0.77	61	294	2.8	5.7	2.9	16	0.36	246
37	250 M	1LG6 253-6TA ..	984	92.4	0.84	69	359	2.7	6.4	2.4	16	0.934	405
45 55	280 S 280 M	1LG6 280-6TA .. 1LG6 283-6TA ..	986 986	92.7 92.6	0.86 0.87	81 99	436 533	2.5 2.5	6.6 6.5	2.5 2.5	16 16	1.40 1.60	520 570
75 90 110	315 S 315 M 315 L	1LG6 310-6TA .. 1LG6 313-6TA .. 1LG6 316-6TA ..	990 990 990	93.8 94.2 94.6	0.85 0.86 0.87	136 160 192	723 868 1061	2.7 2.7 2.6	7.0 7.3 7.4	2.9 3.0 3.0	16 16 16	2.50 3.20 4.02	760 935 1010
132 160	315 L 315 L	1LG6 317-6TA .. 1LG6 318-6TA ..	988 990	94.7 94.9	0.87 0.86	230 285	1276 1543	3.0 3.1	7.2 7.5	2.8 3.0	16 16	4.71 5.39	1180 1245

Surface-cooled motors with external fan and fan cover.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VY	400 VΔ / 690 VY	500 VY	500 VΔ		IM B 5	IM V1 without protec- tive cover	IM B 35
1LA7 080 to 1LA7 096	1	6	3	–	0	1	1	6
1LA7 106 to 1LA7 166	1	6	3	5	0	1	1	6
1LA5 183 to 1LA5 223	1	6	3	5	0	1	1	6
1LG6 253 to 1LG6 313	1	6	3	5	0	1	1	6
1LG6 316 to 1LG6 318	–	6	–	5	0	1 ¹⁾	8	6

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports
must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of construction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia <i>J</i>	Weight
			Rated speed	Efficiency η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque					
kW			rpm	%		A	Nm				KL	kg m ²	kg
Forced-air cooled motors 1PP6 (cast iron housing) IP55 degree of protection, cooling type IC 411, temperature/time class F400													EN 12 101-3
	3000 rpm, 2-pole, 50 Hz												
3	100 L	1PP6 106–2UA ..	2875	79.0	0.85	6.5	10	2.5	6.2	2.8	16	0.0038	31
4	112 M	1PP6 113–2UA ..	2900	82.0	0.85	8.7	13	2.5	6.8	2.9	16	0.0055	40
5.5	132 S	1PP6 130–2UA ..	2920	84.0	0.89	10.8	18	1.9	5.7	2.7	16	0.016	49
7.5		1PP6 131–2UA ..	2930	85.0	0.89	14.5	24	2.0	6.5	2.8	16	0.021	54
11	160 M	1PP6 163–2UA ..	2930	87.0	0.85	21	36	1.8	6.4	2.7	16	0.034	91
15	160 M	1PP6 164–2UA ..	2930	86.0	0.89	27.5	49	2.0	6.5	2.80	16	0.04	99
18.5	160 L	1PP6 166–2UA ..	2930	87.0	0.90	34	60	2.0	7.0	2.70	16	0.052	109
22	180 M	1PP6 183–2UA ..	2955	93.1	0.88	39	71	2.4	7.0	3.2	16	0.086	175
30	200 L	1PP6 206–2UA ..	2955	92.8	0.88	53	97	2.3	6.7	3.1	16	0.151	215
37	200 L	1PP6 207–2UA ..	2958	93.0	0.89	65	119	2.4	7.1	3.2	16	0.182	245
45	225 M	1PP6 223–2UA ..	2962	95.0	0.89	77	145	2.4	7.1	3.1	16	0.266	320
55	250 M	1PP6 253–2UA ..	2972	94.9	0.90	94	177	2.3	6.7	2.9	16	0.466	405
75	280 S	1PP6 280–2UB ..	2975	94.9	0.89	128	241	2.4	6.8	2.9	13	0.832	510
90	280 M	1PP6 283–2UB ..	2976	95.2	0.90	152	289	2.5	7.4	3.0	13	1.00	595
110	315 S	1PP6 310–2UB ..	2982	95.3	0.91	184	352	2.4	6.8	2.7	13	1.39	770
132	315 M	1PP6 313–2UB ..	2980	95.7	0.91	220	423	2.5	6.9	2.8	13	1.62	895
160	315 L	1PP6 316–2UB ..	2982	96.0	0.92	265	512	2.4	7.1	2.8	13	2.09	1035
190	315 L	1PP6 317–2UB ..	2982	96.3	0.93	325	608	2.6	7.2	2.9	13	2.46	1225
	1500 rpm, 4-pole, 50 Hz												
2.2	100 L	1PP6 106–4UA ..	1410	79.0	0.78	5.5	15	2.2	5.2	2.7	16	0.0048	31
3		1PP6 107–4UA ..	1410	79.0	0.80	7.1	20	2.5	5.0	2.6	16	0.0058	34
4	112 M	1PP6 113–4UA ..	1440	82.0	0.75	9.5	27	2.7	5.7	3.0	16	0.011	42
5.5	132 S	1PP6 130–4UA ..	1455	81.0	0.80	12.8	36	2.5	6.3	3.0	16	0.018	51
7.5	132 M	1PP6 133–4UA ..	1455	84.0	0.75	17.2	49	2.7	6.7	3.1	16	0.024	58
11	160 M	1PP6 163–4UA ..	1460	85.0	0.80	24	72	2.2	6.2	2.7	16	0.04	95
15	160 L	1PP6 166–4UA ..	1460	85.0	0.78	34	98	2.4	6.4	2.8	16	0.052	108
18.5	180 M	1PP6 183–4UA ..	1470	91.2	0.84	35	120	2.4	6.1	2.8	16	0.122	150
22	180 L	1PP6 186–4UA ..	1472	92.1	0.85	40.5	143	2.4	6.4	2.9	16	0.144	175
30	200 L	1PP6 207–4UA ..	1470	92.6	0.86	55	195	2.4	6.4	3.1	16	0.234	215
37	225 S	1PP6 220–4UA ..	1480	92.9	0.86	67	239	2.6	6.5	2.8	16	0.398	280
45	225 M	1PP6 223–4UA ..	1480	93.6	0.86	81	290	2.7	6.6	2.9	16	0.486	320
55	250 M	1PP6 253–4UA ..	1485	94.5	0.87	97	354	2.5	7.4	2.9	16	0.856	445
75	280 S	1PP6 280–4UA ..	1484	94.6	0.87	132	483	2.4	6.7	2.8	16	1.39	554
90	280 M	1PP6 283–4UA ..	1486	95.1	0.86	160	578	2.6	7.3	3.0	16	1.71	655
110	315 S	1PP6 310–4UA ..	1488	95.3	0.87	192	706	2.7	7.0	2.8	16	2.31	790
132	315 M	1PP6 313–4UA ..	1488	95.6	0.88	225	847	2.6	7.1	2.8	16	2.88	945
160	315 L	1PP6 316–4UA ..	1490	95.8	0.88	275	1025	2.9	7.2	2.9	16	3.46	1085
200	315 L	1PP6 317–4UA ..	1488	95.9	0.88	345	1284	3.1	7.5	2.9	16	4.22	1285

Forced-air cooled (surface cooled) motors without external fan and fan cover; the motors are located in the air flow of the driven fan and are adequately cooled during operation under normal conditions.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz	230 VΔ / 400 VY	400 VΔ / 690 VY	500 VY	500 VΔ	IM B 3	Price supplement	IM B 35
1PP6 106 to 1PP6 313	1	6	3	5	0	1	1 ¹⁾	8
1PP6 316 to 1PP6 318	—	6	—	5	0	1	1 ¹⁾	8

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of construction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia <i>J</i>	Weight
			Rated speed	Efficiency η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	current	torque		kg m ²	Type of constr. IM B 3 approx
kW			rpm	%		A	Nm				KL		kg
Forced-air cooled motors 1PP6 (cast iron housing) IP55 degree of protection, cooling type IC 411, temperature/time class F400												EN 12 101-3	
	1000 rpm, 6-pole, 50 Hz												
1.5	100 L	1PP6 106-6UA ..	925	72.0	0.70	4.5	15	2.3	4.0	2.3	16	0.0063	31
2.2	112 M	1PP6 113-6UA ..	940	75.0	0.74	6.1	22	2.1	4.4	2.3	16	0.011	42
3	132 S	1PP6 130-6UA ..	950	77.0	0.75	7.8	30	1.6	4.1	1.7	16	0.015	52
4	132 M	1PP6 133-6UA ..	950	80.0	0.76	10	40	1.7	4.6	2.1	16	0.019	62
5.5	132 M	1PP6 134-6UA ..	950	81.0	0.76	14	55	2.0	5.0	2.3	16	0.025	72
7.5	160 M	1PP6 163-6UA ..	960	82.0	0.74	20	75	2.0	5.0	2.4	16	0.041	107
11	160 L	1PP6 166-6UA ..	960	84.0	0.74	27.5	109	2.0	5.0	2.5	16	0.049	129
15	180 L	1PP6 186-6UA ..	974	88.9	0.82	30	147	2.2	5.2	2.3	16	0.203	170
18.5	200 L	1PP6 206-6UA ..	975	89.8	0.82	36.5	181	2.2	5.3	2.3	16	0.285	200
22	200 L	1PP6 207-6UA ..	975	90.8	0.83	42.5	215	2.2	5.4	2.3	16	0.362	230
30	225 M	1PP6 223-6UA ..	980	92.3	0.84	56	292	2.7	6.3	2.8	16	0.629	315
37	250 M	1PP6 253-6UA ..	984	93.0	0.84	69	359	2.8	6.5	2.4	16	0.934	390
45	280 S	1PP6 280-6UA ..	986	92.6	0.86	82	436	2.8	6.3	2.5	16	1.37	500
55	280 M	1PP6 283-6UA ..	986	93.1	0.86	99	533	3.1	6.8	2.7	16	1.65	550
75	315 S	1PP6 310-6UA ..	990	94.0	0.84	138	723	2.7	7.0	2.9	16	2.50	740
90	315 M	1PP6 313-6UA ..	988	94.5	0.85	162	870	2.6	7.1	2.8	16	2.50	915
110	315 L	1PP6 316-6UA ..	988	94.7	0.85	198	1063	2.8	7.2	2.8	16	2.50	990
132	315 L	1PP6 317-6UA ..	990	95.1	0.85	235	1273	3.0	7.5	3.0	16	2.50	1160
160	315 L	1PP6 318-6UA ..	988	95.1	0.86	285	1546	3.1	7.5	3.0	16	2.50	1225

Forced-air cooled (surface cooled) motors without external fan and fan cover; the motors are located in the air flow of the driven fan and are adequately cooled during operation under normal conditions.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ		IM B 5	IM V1 without protective cover	IM B 35
1PP6 106 to 1PP6 313	1	6	3	5	0	1	1	6
1PP6 316 to 1PP6 318	—	6	—	5	0	1¹⁾	8	6

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of construction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia <i>J</i>	Weight
			Rated speed	Efficiency η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque					Type of constr. IM B 3 approx.
kW			rpm	%		A	Nm				KL	kg m²	kg
Self-cooled motors 1LA6, 1LG6 (cast iron housing) IP55 degree of protection, cooling type IC 411, temperature/time class F400												EN 12 101-3	
	3000 rpm, 2-pole, 50 Hz												
3	100 L	1LA6 106–2UA ..	2875	79.0	0.85	6.5	10	2.5	6.2	2.8	16	0.0038	32
4	112 M	1LA6 113–2UA ..	2900	82.0	0.85	8.7	13	2.5	6.8	2.9	16	0.0055	41
5.5	132 S	1LA6 130–2UA ..	2920	84.0	0.89	10.8	18	1.9	5.7	2.7	16	0.016	51
7.5		1LA6 131–2UA ..	2930	85.0	0.89	14.5	24	2.0	6.5	2.8	16	0.021	56
11	160 M	1LA6 163–2UA ..	2930	87.0	0.85	21	36	1.8	6.4	2.7	16	0.034	93
15	160 M	1LA6 164–2UA ..	2930	86.0	0.89	27.5	49	2.0	6.5	2.80	16	0.04	102
18.5	160 L	1LA6 166–2UA ..	2930	87.0	0.90	34	60	2.0	7.0	2.70	16	0.05	112
22	180 M	1LG6 183–2UA ..	2955	92.6	0.88	39	71	2.4	7.0	3.2	16	0.086	180
30	200 L	1LG6 206–2UA ..	2955	92.2	0.88	53	97	2.3	6.7	3.1	16	0.151	225
37	200 L	1LG6 207–2UA ..	2958	92.5	0.89	65	119	2.4	7.1	3.2	16	0.182	255
45	225 M	1LG6 223–2UA ..	2962	94.6	0.89	77	145	2.4	7.1	3.1	16	0.266	330
55	250 M	1LG6 253–2UA ..	2972	94.3	0.90	94	177	2.3	6.7	2.9	16	0.466	420
75	280 S	1LG6 280–2UB ..	2975	94.5	0.89	128	241	2.4	6.8	2.9	13	0.832	530
90	280 M	1LG6 283–2UB ..	2976	94.9	0.90	152	289	2.5	7.4	3.0	13	1.00	615
110	315 S	1LG6 310–2UB ..	2982	94.7	0.91	184	352	2.4	6.8	2.7	13	1.39	790
132	315 M	1LG6 313–2UB ..	2980	95.2	0.91	220	423	2.5	6.9	2.8	13	1.62	915
160	315 L	1LG6 316–2UB ..	2982	95.6	0.92	265	512	2.4	7.1	2.8	13	2.09	1055
190	315 L	1LG6 317–2UB ..	2982	95.9	0.93	325	608	2.6	7.2	2.9	13	2.46	1245
	1500 rpm, 4-pole, 50 Hz												
2.2	100 L	1LA6 106–4UA ..	1410	79.0	0.78	5.5	15	2.2	5.2	2.7	16	0.0048	32
3		1LA6 107–4UA ..	1410	79.0	0.80	7.1	20	2.5	5.0	2.6	16	0.0058	34
4	112 M	1LA6 113–4UA ..	1440	82.0	0.75	9.5	27	2.7	5.7	3.0	16	0.011	43
5.5	132 S	1LA6 130–4UA ..	1455	81.0	0.80	12.8	36	2.5	6.3	3.0	16	0.018	53
7.5	132 M	1LA6 133–4UA ..	1455	84.0	0.75	17.2	49	2.7	6.7	3.1	16	0.024	60
11	160 M	1LA6 163–4UA ..	1460	85.0	0.80	24	72	2.2	6.2	2.7	16	0.04	97
15	160 L	1LA6 166–4UA ..	1460	85.0	0.78	34	98	2.4	6.4	2.8	16	0.052	110
18.5	180 M	1LG6 183–4UA ..	1470	90.7	0.84	35	120	2.4	6.1	2.8	16	0.122	155
22	180 L	1LG6 186–4UA ..	1472	91.7	0.85	40.5	143	2.4	6.4	2.9	16	0.144	180
30	200 L	1LG6 207–4UA ..	1470	92.2	0.86	55	195	2.4	6.4	3.1	16	0.234	225
37	225 S	1LG6 220–4UA ..	1480	92.6	0.86	67	239	2.6	6.5	2.8	16	0.398	290
45	225 M	1LG6 223–4UA ..	1480	93.3	0.86	81	290	2.7	6.6	2.9	16	0.486	330
55	250 M	1LG6 253–4UA ..	1485	94.2	0.87	97	354	2.5	7.4	2.9	16	0.856	460
75	280 S	1LG6 280–4UA ..	1484	94.2	0.87	132	483	2.4	6.7	2.8	16	1.39	574
90	280 M	1LG6 283–4UA ..	1486	94.7	0.86	160	578	2.6	7.3	3.0	16	1.71	675
110	315 S	1LG6 310–4UA ..	1488	95.0	0.87	192	706	2.7	7.0	2.8	16	2.31	810
132	315 M	1LG6 313–4UA ..	1488	95.3	0.88	225	847	2.6	7.1	2.8	16	2.88	965
160	315 L	1LG6 316–4UA ..	1490	95.6	0.88	275	1025	2.9	7.2	2.9	16	3.46	1105
200	315 L	1LG6 317–4UA ..	1488	95.7	0.88	345	1284	3.1	7.5	2.9	16	4.22	1305

Surface-cooled motors with integral fan and fan cover.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ		IM B 5	IM V1 without protective cover	IM B 35
1LA6 106 to 1LG6 313	1	6	3	5	0	1	1	6
1LG6 316 to 1LG6 318	—	6	—	5	0	1 ¹⁾	8	6

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Selection and ordering data

Rated output	Size	Order No. Order No. supplements for voltage and type of con- struction, see table below	Operating data at rated output					Starting torque	Starting current	Stalling torque	Torque class	Moment of inertia J	Weight
			Rated speed	Efficien- cy η	Power factor p.f.	Rated current at 400 V	Rated torque	For direct-on-line starting as multiple of the rated torque	as multiple of the rated current	torque			Type of constr. IM B 3 approx
kW			rpm	%		A	Nm				KL	kg m²	kg
Self-cooled motors 1LA6, 1LG6 (cast iron housing) IP55 degree of protection, cooling type IC 411, temperature/time class F400												EN 12 101-3	
	1000 rpm, 6-pole, 50 Hz												
1.5	100 L	1LA6 106-6UA ..	925	72.0	0.70	4.5	15	2.3	4.0	2.3	16	0.0063	32
2.2	112 M	1LA6 113-6UA ..	940	75.0	0.74	6.1	22	2.1	4.4	2.3	16	0.011	43
3	132 S	1LA6 130-6UA ..	950	77.0	0.75	7.8	30	1.6	4.1	1.7	16	0.015	54
4	132 M	1LA6 133-6UA ..	950	80.0	0.76	10	40	1.7	4.6	2.1	16	0.019	63
5.5	132 M	1LA6 134-6UA ..	950	81.0	0.76	14	55	2.0	5.0	2.3	16	0.025	74
7.5	160 M	1LA6 163-6UA ..	960	82.0	0.74	20	75	2.0	5.0	2.4	16	0.041	110
11	160 L	1LA6 166-6UA ..	960	84.0	0.74	27.5	109	2.0	5.0	2.5	16	0.049	132
15	180 L	1LG6 186-6UA ..	974	88.7	0.82	30	147	2.2	5.2	2.3	16	0.203	175
18.5	200 L	1LG6 206-6UA ..	975	89.4	0.82	36.5	181	2.2	5.3	2.3	16	0.285	210
22	200 L	1LG6 207-6UA ..	975	90.5	0.83	42.5	215	2.2	5.4	2.3	16	0.362	240
30	225 M	1LG6 223-6UA ..	980	92.2	0.84	56	292	2.7	6.3	2.8	16	0.629	325
37	250 M	1LG6 253-6UA ..	984	92.6	0.84	69	359	2.8	6.5	2.4	16	0.934	405
45	280 S	1LG6 280-6UA ..	986	92.3	0.86	82	436	2.8	6.3	2.5	16	1.37	520
55	280 M	1LG6 283-6UA ..	986	92.8	0.86	99	533	3.1	6.8	2.7	16	1.65	570
75	315 S	1LG6 310-6UA ..	990	93.7	0.84	138	723	2.7	7.0	2.9	16	2.50	760
90	315 M	1LG6 313-6UA ..	988	94.2	0.85	162	870	2.6	7.1	2.8	16	3.20	935
110	315 L	1LG6 316-6UA ..	988	94.5	0.85	198	1063	2.8	7.2	2.8	16	4.02	1010
132	315 L	1LG6 317-6UA ..	990	94.9	0.85	235	1273	3.0	7.5	3.0	16	4.71	1180
160	315 L	1LG6 318-6UA ..	988	94.9	0.86	285	1546	3.1	7.5	3.0	16	5.39	1245

Surface-cooled motors with integral fan and fan cover.

Order No. supplement

Motor type	Penultimate position: Voltage identifier				Final position: Type of construction identifier			
	50 Hz				IM B 3	Price supplement		
	230 VΔ / 400 VΥ	400 VΔ / 690 VΥ	500 VΥ	500 VΔ		IM B 5	IM V1 without protec- tive cover	IM B 35
1LA6 106 to 1LG6 313	1	6	3	5	0	1	1	6
1LG6 316 to 1LG6 318	–	6	–	5	0	1¹⁾	8	6

For other types of construction, see "Technical information", "Types of construction".

1) Additional radial supports
must be provided.

Squirrel-cage motors

Sector solutions · Smoke extraction motors

Order codes for special designs

Additional or- der suffix –Z with order code	Special designs	Motor type – Size						
		1PP7	1PP5	1PP6	1LA7	1LA5	1LG6	1LA6

Windings and motor protection

A11	Motor protection by means of PTC thermistor with 3 built-in temperature sensors for shutdown ¹⁾	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
A12	Motor protection by means of PTC thermistor with 6 built-in temperature sensors for warning and shutdown ¹⁾	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
A23	Motor temperature sensing with built-in KTY 84-130 temperature sensors ¹⁾	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160

Paint finish

<i>Special paintwork in RAL 7030 stone grey</i>		Standard design (without order code)						
M16	RAL 1002 sand yellow	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
M17	RAL 1013 pearl white							
M18	RAL 3000 flame red							
K27	RAL 6011 mignonette green							
M19	RAL 6021 pale green							
M20	RAL 7001 silver grey							
K28	RAL 7031 bluish grey							
L42	RAL 7032 pebble grey							
M21	RAL 7035 light grey							
M22	RAL 9001 cream white							
M23	RAL 9002 grey white							
L43	RAL 9005 jet black							
Y54 ●	Special paintwork in other colors: RAL 1015, 1019, 2003, 2004, 3007, 5007, 5009, 5010, 5012, 5015, 5017, 5018, 5019, 6019, 7000, 7004, 7011, 7016, 7022, 7033	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
	And special paintwork RAL							
K23	Unpainted (only cast iron parts primed)	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
K24	Unpainted, only primed	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160

Mechanical design

K40	Regreasing device	100 – 160	180 – 225	100 – 315	100 – 160	180 – 225	180 – 315	100 – 160
L13	External earthing	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
K31	Extra rating plate, loose	Standard version						
Y82 ●	Extra rating plate	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
	And order code							
K45	Anti-condensation heating for 230 V	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
K46	Anti-condensation heating for 115 V	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
L99	Wire-lattice pallet	80 – 160	180	100 – 180	80 – 150	180	180	100 – 160

Notes on safety and commissioning/certification

B02	Factory test certificate 2.3 acc. to EN 10 204 (routine test)	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
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Additional suffixes

A60	Installation of 3 PT 100 G resistance thermometers	–	225	225 – 315	–	225	225 – 315	–
A61	Installation of 6 PT 100 G resistance thermometers	–	225	225 – 315	–	225	225 – 315	–
G50	Measuring nipples for SPM shock pulse measurement for bearing monitoring	–	180 – 225	180 – 315	–	180 – 225	180 – 315	–
K50	IP65 degree of protection	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
L03	Vibration-proof version	80 – 160	180 – 225	100 – 160	80 – 160	180 – 225	–	100 – 160
L51	Protruding cable end – right side	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
L52	Protruding cable end – left side	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160
L68	Full-key balancing	80 – 160	180 – 225	100 – 315	80 – 160	180 – 225	180 – 315	100 – 160

- Additional plain text required.

1) For appropriate tripping unit, see Catalog LV 10.

Squirrel-cage motors

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Notes

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