

Standards and specifications

In addition to the relevant standards and regulations, EN 12101-3 applies for non-portable fire-fighting systems:

Systems for controlling smoke and heat flows, part 3, specifications 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

Non-standard voltages (voltage code **9** and order code **L1Y**) as well as 60 Hz are available on request, only for 4, 6, 8-pole motors as well as 6/4 and 8/4-pole motors with $n_{\max.} = 3000$ rpm)

The following rating plates are available for the smoke-extraction motors:

- Rating plate
For the listed rated voltages with 50 Hz output data.
- Fire event plate
Complete with number and year of issue of the European standard, temperature/time class and minimum duration of function.

All plates are resistant to corrosion. A second set of plates is included with the motor, loose.

Rated output, duty type, number of poles

The rated output applied for continuous duty (normal duty) according to IEC 60034-1, for a frequency of 50 Hz, coolant temperatures of up to 40 °C, site altitude of up to 1000 m above sea level.

Derating is necessary at higher coolant temperatures and site altitudes (reduction factor k_{HT}), see table below.

Reduction factor k_{HT} for different site altitudes and/or coolant temperatures

Site altitude above sea level in m	Coolant temperature in °C					
	<30	30-40	45	50	55	60
1000	1.07	1.00	0.96	0.92	0.87	0.82
1500	1.04	0.97	0.93	0.89	0.84	0.79
2000	1.00	0.94	0.9	0.86	0.82	0.77
2500	0.96	0.90	0.86	0.83	0.78	0.74
3000	0.92	0.86	0.82	0.79	0.75	0.70
3500	0.88	0.82	0.79	0.75	0.71	0.67
4000	0.82	0.77	0.74	0.71	0.67	0.63

Coolant temperature and site altitude are rounded up to 5 °C or 500 m.

Operation in the event of fire

In addition to normal duty, operation in the event of a fire as specified in EN 12101-3 is available.

At the end of the fire incident, the motor may be unfit for normal duty. **It is therefore specified that the motor is removed and overhauled or replaced with a new motor.**

In the event of a fire, any “thermal motor protection” must be deactivated.

Standard number of poles

- 2, 4 and 6
- For more poles and pole-changing motors, please inquire.

Insulation system

The special insulation systems are adapted to the respective temperature/time classes.

The insulation of the smoke extraction motors is designed such that converter-fed operation is possible without limitation at voltages ≤ 460 V. This also applies for operation with a pulse-controlled AC converter with voltage rise times $t_s > 0.1 \mu s$ at the motor terminals.

In the event of fire, the motors must be switched over from converter-fed operation to mains-fed operation. If converter-fed operation is also required in the event of fire, system testing and acceptance testing must be performed in accordance with this (please inquire).

Drainage holes

Generally available, but closed if ordered according to IP55 degree of protection.

Bearing plates

All bearing plates are in cast-iron.

Termination system

Protruding cable with casing, without connection box with cover plate or “Nozzle cap”. Cable length depends on the shaft height.

- Frame sizes 80 to 112: 1.0 m
- Frame sizes 132 to 200: 1.5 m
- Frame sizes 225 to 315: 2.5 m

Special versions of connecting cables are available on request.

Position of the connecting cable

- Frame sizes 80 to 160:
 - On the top at non-drive-end (NDE) as standard.
Optionally left or right at non-drive-end (NDE)
(for type of construction with screwed-on feet).
- Frame sizes 180 to 315:
 - Flange types of construction without feet:
On the top at non-drive-end (NDE) as standard.
Optionally on left or right at non-drive-end (NDE).
 - All types of construction with feet:
On the top at drive-end (DE) as standard with connection cable routed towards the non-drive end (NDE).
Optionally on left or right at drive-end (DE) with connection cable routed towards the non-drive-end (NDE)
(for types of construction with screwed-on feet).

The equipment is earthed with a protruding cable.

Bearings, grease

Special bearing systems are used that are matched to the respective temperature classes.

Deep-groove bearings of series 60, 62 or 63 without play are used depending on the fire classes F200/F300, F400 and the frame sizes.

The located bearing is generally at the drive-end (DE).

The nominal bearing lifetime L_{10h} (fan drive) is at least 20,000 hours at full rated load.

The motors of frame sizes 80 to 250 generally have bearings that are greased for life.

Paint finish

The motors have a two-component finish (worldwide) as standard in the color RAL 7030.

Required minimum cooling air flow in standard duty

Frame size	1LA7/1PP7	1LA5/1PP5	1LA6/1PP6	Required cooling air flow for number of poles		
				2 m ³ /min.	4 m ³ /min.	6 m ³ /min.
80	X			1.74	0.90	0.60
90	X			3.12	1.56	1.08
100	X		X	3.96	1.86	1.26
112	X		X	4.98	3.00	1.98
132	X		X	8.04	5.04	3.36
160	X		X	12.90	9.54	6.36
180		X		10.98	10.98	7.27
200		X		15.12	13.02	8.58
225		X		12.12	13.02	8.58

Frame size	1LG6/1PP6	Required cooling air flow for number of poles		
		2 m ³ /min.	4 m ³ /min.	6 m ³ /min.
180	X	12.0	13.0	8.5
200	X	20.5	17.0	11.0
225	X	20.5	18.5	12.5
250	X	25.5	22.5	17.0
280	X	24.5	28.0	21.5
315	X	47	36.0	26.5

In the motor version without an integrated fan (1PP5, 1PP6 and 1PP7), the motor is located in the air flow of the ventilator to be driven which must drive the minimum cooling air flow over the motor housing. For a faster air flow, the operating temperature of the motor can be reduced.

Admissible loading on the shaft extension

The values specified in the table "Admissible loading on shaft extension" are the tested and approved maximum values (test duration two hours, temperature in case of fire 300 or 400 °C).

In standard duty at coolant temperatures of up to 40 °C, a bearing lifetime L_{10h} >20000 hours was achieved.

The values apply to all horizontal mounting positions and to all vertical mounting positions with shaft pointing downwards.

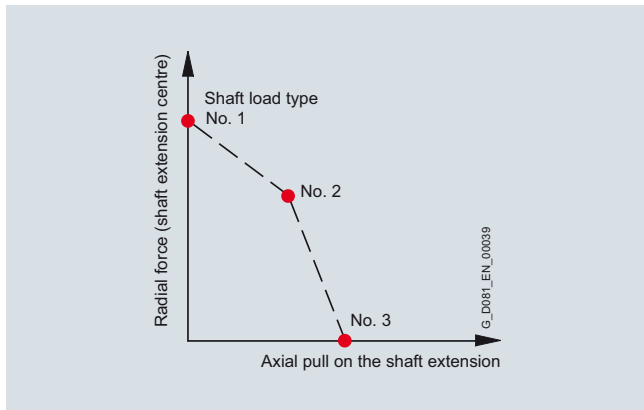
Please inquire in the case of :

- Higher force pairings
- Motors with more poles or pole-changing motors
- Vertical arrangement, depending on the rotor mass and mounting location (shaft pointing downwards or shaft pointing upwards) of the smoke-extraction motor. If necessary, higher forces can be approved.

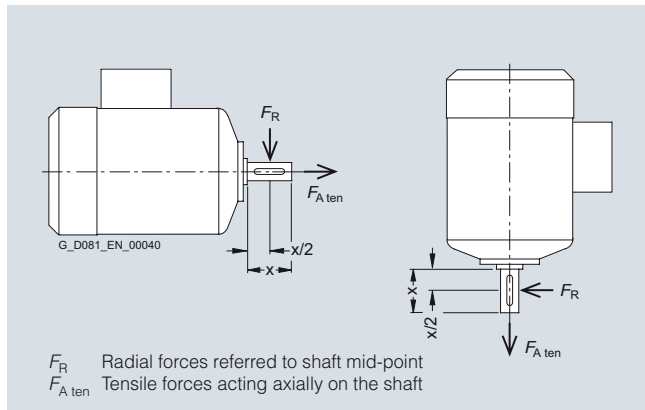
Admissible loading in the event of a fault (fire) on the shaft extension (continued)

Frame size	Bearings	Type of loading on shaft		Horizontal shaft						Shaft pointing vertically downwards					
				2-pole		4-pole		6-pole		2-pole		4-pole		6-pole	
				F_R N	F_A tens N	F_R N	F_A tens N	F_R N	F_A tens N	F_R N	F_A tens N	F_R N	F_A tens N	F_R N	F_A tens N
No.															
80	6004	1	Radial force	400	0	490	0	540	0	360	0	450	0	540	0
		2	Radial force + axial tensile force	150	130	170	170	190	200	40	172	40	225	40	275
		3	Axial tensile force	0	215	0	265	0	320	0	197	0	250	0	300
90	6205	1	Radial force	650	0	730	0	795	0	590	0	730	0	795	0
		2	Radial force + axial tensile force	250	205	280	260	310	305	100	259	100	330	100	390
		3	Axial tensile force	0	343	0	415	0	480	0	310	0	384	0	450
100	6206	1	Radial force	890	0	1000	0	1080	0	820	0	1000	0	1080	0
		2	Radial force + axial tensile force	400	265	500	325	600	345	300	265	300	385	300	455
		3	Axial tensile force	0	490	0	600	0	675	0	432	0	540	0	625
112	6206	1	Radial force	870	0	980	0	1055	0	760	0	970	0	1055	0
		2	Radial force + axial tensile force	400	252	500	310	600	330	250	260	250	380	250	450
		3	Axial tensile force	0	478	0	595	0	675	0	403	0	510	0	590
132	6208	1	Radial force	1070	0	1415	0	1530	0	810	0	1060	0	1220	0
		2	Radial force + axial tensile force	450	315	550	450	650	480	250	300	250	520	250	585
		3	Axial tensile force	0	580	0	775	0	850	0	450	0	640	0	820
160	6209	1	Radial force	1440	0	1630	0	1760	0	1210	0	1580	0	1780	0
		2	Radial force + axial tensile force	700	450	800	570	900	650	500	335	500	525	500	665
		3	Axial tensile force	0	824	0	1015	0	1140	0	620	0	790	0	920
180	6210	1	Radial force	1540	0	1750	0	1900	0	1020	0	1400	0	1670	0
		2	Radial force + axial tensile force	770	430	900	545	1000	630	550	218	550	420	550	575
		3	Axial tensile force	0	815	0	1040	0	1183	0	453	0	733	0	875
200	6212	1	Radial force	2050	0	2380	0	2620	0	1450	0	1700	0	2090	0
		2	Radial force + axial tensile force	1200	770	1350	970	1500	1075	500	460	500	750	500	1600
		3	Axial tensile force	0	1350	0	1650	0	1875	0	720	0	1040	0	1905
225	6213	1	Radial force	2460	0	2720	0	2970	0	1910	0	2450	0	2900	0
		2	Radial force + axial tensile force	1370	900	1500	1095	1700	1200	500	660	500	1000	500	1250
		3	Axial tensile force	0	1560	0	1910	0	2170	0	920	0	1290	0	1520
250	6215	1	Radial force	2770	0	3230	0	3500	0	1490	0	2230	0	2700	0
		2	Radial force + axial tensile force	1400	840	1600	1095	1800	1340	500	460	500	815	500	1080
		3	Axial tensile force	0	1500	0	1865	0	2130	0	710	0	1090	0	1375
280	6217 (2-pole), 6317 (4-, 6-pole)	1	Radial force	3180	0	5000	0	5500	0	3000	0	5600	0	6100	0
		2	Radial force + axial tensile force	1700	1820	2000	2000	2300	2200	600	1085	600	2300	600	2750
		3	Axial tensile force	0	2630	0	3050	0	3500	0	1380	0	2600	0	3100
315	6219 (2-pole), 6319 (4-, 6-pole)	1	Radial force	3470	0	5300	0	5900	0	1000	0	3600	0	3850	0
		2	Radial force + axial tensile force	1750	2200	2000	2170	2300	2530	200	363	1000	1150	1000	1610
		3	Axial tensile force	0	3000	0	3080	0	3560	0	463	0	1690	0	2100

Note: In the event of a fault (fire), the reduced loads provided above must be observed and ensured by appropriate measures in the ventilation system. The permitted loads in Catalog D 81.1 part 0 must be observed for operation under standard condition (CT 40 °C).



Load types



Forces on shaft extension