

THREE-PHASE SYNCHRONOUS MOTORS SPMH

APPLICATION

Three-phase low-speed synchronous motors of the series SPMH are designed for direct drives of axial-flow fans in cooling towers without gearboxes. Motors are characterized by an increased efficiency that significantly reduces operating costs. In connection with variable speed control and automated operation a power savings of 30% can be reached.

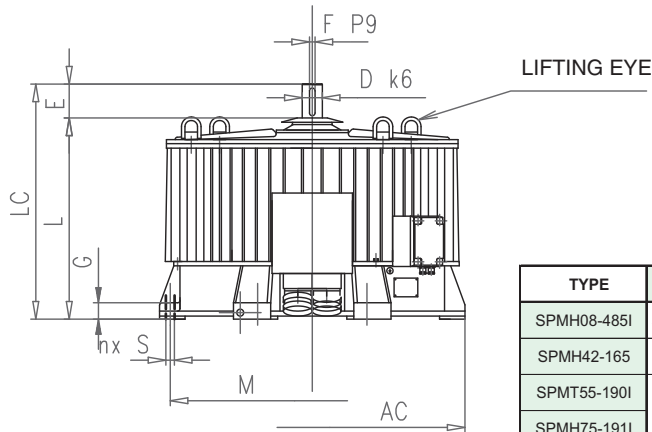
Due to a direct driven low-speed operation the noise and vibration levels are reduced, lifetime of parts of the installation is longer, the assembly costs are reduced and the maintenance requirements are lower in comparison with a standard high-speed motor equipped with a gearbox. Removal of an oil-filled gearbox lowers the environment risk in the installation.

SPMH motors are designed for humid environment corresponding to the conditions of cooling towers – relative humidity up to 100 %, temperature of moist air being delivered (forming at the same time a cooling agent removing heat losses from the motor surface) up to + 40 °C.

**SPMH**

DESIGN

- The frame of robust construction is a grey iron casting, ribbed on the surface. The motor is cooled externally by air flowing around the motor.
- The motor is mounted in roller bearings with grease lubrication. The design life is 110 000 operating hours with the lubrication interval of 3 years or 15 000 operating hours.
- The motor is mounted in vertical position with the free shaft end on top. The motor bears axial and radial loads from the driven axial fan. The free shaft end is provided with a centre dot with thread and with vertex angle 60°.
- The motor is provided with two 150W/230V heating elements for heating during operating breaks.
- The end windings are fitted with 6 pcs (in 2 sets) of posistors for thermal protection being embedded into them.

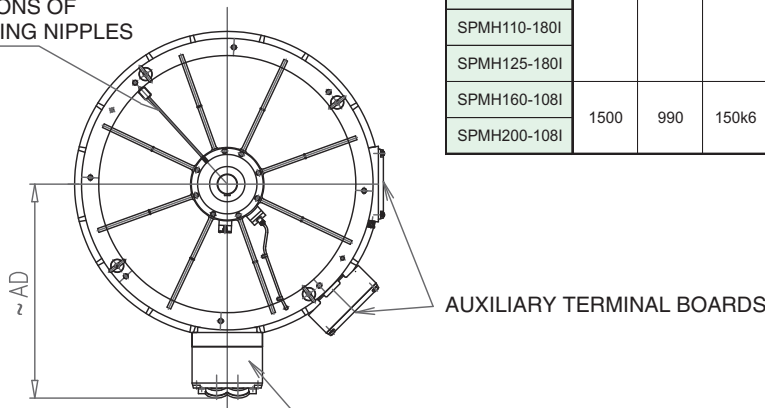


LIFTING EYE

MAIN DIMENSIONS

TYPE	AC	AD	D	E	F	L	LC	M	n x φS	G
SPMH08-485I	530/450	350	55k6	110	16	420	530	400	6 x 19	15
SPMH42-165	850	508	80k6	130	22	540,8	670,8	800	6 x 24	55
SPMT55-190I	1215	815	100k6	165	28	800	965	1130	8 x 35	65
SPMH75-191I										
SPMH90-181I										
SPMH110-180I										
SPMH125-180I	1500	990	150k6	250	36	980	1145	1410	8 x 40	55
SPMH160-108I										
SPMH200-108I										

POSITIONS OF GREASING NIPPLES



AUXILIARY TERMINAL BOARDS

POWER TERMINAL BOARD

TECHNICAL PARAMETERS

TYPE			SPMH 08-485I	SPMH 42-165	SPMT 55-190I	SPMH 75-191I	SPMH 90-181I	SPMH 110-180I	SPMH 125-180I	SPMH 160-108I	SPMH 200-108I
Rated Parameters											
Voltage	$U_{N\ MOT}$	V	316	507	355	321	345	340	332	321	340
Torque	M_N	Nm	158	2431	2760	3750	4749	3836	6632	14148	17685
Current	I_N	A	16	56	100	150	168	207	243	325	384
Speed	n_N	min ⁻¹	485	165	190	191	181	180	180	108	108
Power	P_N	kW	8	42	55	75	90	110	125	160	200
Frequency	f	Hz	48,5	27,5	50,7	50,9	48,3	48,0	48,0	28,8	28,8
Efficiency	η	%	88,8	91,7	93,9	94,2	94,4	94,4	94,3	95,0	95,1
Basic Technical Parameters											
Number of poles	2p	-	12	20	32	32	32	32	32	32	32
Winding resistance	R_{U-V}	Ω	0,492	0,409	74,2	0,037	0,037	0,028	0,022	0,018	0,016
Winding inductance	L_{U-V}	mH	10	19	2,6	1,4	1,9	1,2	1,1	1,8	1,6
Voltage constant	K_E	V.min/1000	655	2830	1880	1690	1850	1900	1910	2940	3110
Voltage constant	K_e	Vs/rad	6,3	27,1	17,9	16,2	17,7	18,2	18,3	28	29,7
Moment of inertia	J	kg.m ²	0,8	25	67	100	120	140	160	420	520
Weight	m	kg	180	1150	1895	2070	2250	2450	2552	5450	5860
Design			IMV1	IMV2	IMV2	IMV2	IMV2	IMV2	IMV2	IMV2	IMV2
Degree of protection			IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
Thermal class of insulation			F	F	F	F	F	F	F	F	F
Cooling											
Cooling method			IC410	IC410	IC410	IC410	IC410	IC410	IC410	IC410	IC410
Cooling air temperature	ϑ_a	°C	40	40	60	40	40	40	40	40	40
Cooling air velocity	v_a	ms ⁻¹	1	1	1	1	1	1	1	4	4