



AERON



PC-29
Electric Motors

INDEX

ABB Electric Motors.....	01
General technical specification	05
Mez Electric Motors	09
Mez Electric Motors – Wiring diagram	12
Mez Electric Motors – Lubrication Table.....	13
HØYER MARINE MOTORS.....	14



GENERAL INFORMATION

ABB's motors comply with all the requirements of classification societies, ship owners, shipyards and manufacturers of ship based products for applications

such as fans, pumps and compressors, hydraulic pumps, lifting and cargo systems, offering economical and reliable high performance in heavy-duty operation.

A COMPREHENSIVE RANGE OF LOW VOLTAGE MOTORS FOR MARINE APPLICATIONS

Three-phase motors: Totally enclosed IP 55 and open drip proof IP 23, squirrel cage motors

Variable speed drive compatibility: Optimised performance in VSD applications based on ABB's leading frequency converter technology.

Two-speed motors for fan and pump drives with constant torque.

Naval motors: ABB motors have been successfully tested by several world's navies, for instance for shock resistance, in the most demanding environments. The motors on test have been ABB standard motors.

Motors for hazardous areas. For hazardous area motors in marine applications, please contact ABB for further information. See also our product catalogue, Motors for Hazardous Areas.

Special designs: As well as providing an extensive range of modifications to existing standard motors, ABB can also manufacture customised motors, which is a particular interest in the field of special drive applications.

Motors for open deck mounting: IP 56, with or without fan and cover.

Water cooled motors: IC71W, squirrel cage motors for all kind of applications, including VSD applications.

STANDARDS AND CLASSIFICATION SOCIETIES

ABB's marine motors comply with the following international standards.

ABB's marine motors are certified to all major international classification societies. For more information see the chapters 'Variant codes'.

Standard motors

IEC Publ. 60034, 60072, 60079, 60085 and 60092-series
 VDE 0530
 DIN
 SFS
 SEN
 EN
 CENELEC

Classification societies

ABS American Bureau of Shipping
BV Bureau Veritas
CCS China Classification Societies
CR China Corporational Register of Shipping
DNV Det Norske Veritas
GL Germanischer Lloyd
KR Korean Register of Shipping
LR Lloyd's Register of Shipping
NK Nippon Kaiji Kyokai
RINA Registro Italiano Navale
RS Russian Maritime Register of Shipping

Classification societies and standards	Ambient temperature °C	Permissible temperature rise in K for stator windings insulation class	
		B	F
Industrial Motors			
IEC Publ. 60034-1	40	80	105
Marine Motors			
IEC 92-301 ¹⁾	50	70	90
ABS	50	70	95
BV	45	75	100
CCS	45	75	100
CR	45	75	95
DNV	45	70	95
GL	45	75	100
KR	45	75	95
LR	45	70	95
NK	45 ²⁾	75	100
RINA	45	75	100
RS	45	75	95

¹⁾ Electrical installation in ships

Motors for hazardous areas: required ambient temperature 50°C. Permissible temperature rise B class 70 K, F class 95 K.

²⁾ Motors for hazardous areas: required ambient temperature 50°C. Permissible temperature rise B class 70 K, F class 95 K.

“ESSENTIAL” AND “NON-ESSENTIAL SERVICE”

Depending on the motor application, the classification societies, for example ABS, BV, GL and LR normally classify equipment as suitable for “Primary Essential Service” and “Secondary Essential Service”. In this catalogue terms “Essential Service” and “Non-Essential Service” are used.

The requirements regarding testing, test reports and certification of motors for “Essential Service” are more demanding than for “Non-Essential Service”. For example, motors over 100 kW for “Essential Service” on a ship registered by Lloyd’s Register of Shipping must be certified by Lloyd’s.

For detailed information, please see the table on the next page. The table shows ABB’s type approved motors. For any specific customer needs, applicationspecific certification or case-by-base certification, please contact ABB.

The catalogue values are based on motors for marine duty with temperature 90 K. If a lower temperature rise is needed, i.e. class B (70 K) is needed, it is necessary to reduce the rated output. As an indication the following formula can be used

$$P2 = P1 \times \sqrt{\frac{70}{\Delta_t}}$$

P1 = output according to catalogue value

P2 = new output according to class B rise (70 K)

Δ_t = actual temperature rise, normally 90 K

Examples of “Essential Service” equipment according to Lloyd’s Register of Shipping. Other classification societies may have other requirements:

- Air compressors for heavy oil engines
- Scavenge blowers
- Air pumps
- Ballast pumps
- Bilge pumps
- Circulating and cooling water pumps
- Condenser circulating pumps
- Extractions pumps
- Feed water pumps
- Fire pumps
- Lubrication oil pumps
- Oil fuel pumps and oil fuel burning units
- Cargo refrigerating motors, including compressors,
- brine pumps, circulating pumps, fans etc.
- Fans for force draught to boilers
- Steering gear
- Windlasses
- Ventilating fans for engine room and boiler rooms
- Oil separators



REQUIREMENTS FOR ELECTRIC MOTORS USED IN ESSENTIAL AND NON-ESSENTIAL SERVICES ACCORDING TO CLASSIFICATION SOCIETIES' REQUIREMENTS

Classification Society's requirements and standard test procedure									ABB Type Approved motors				
Classification Society	Required ambient max. temperature	Max. temper. Rise accepted by Classsif. Societes degree C. B/F	Duty ¹⁾	Output limit kW	Witnessed test requirement	Type Test report accepted when based on motor with identical data	Complete test on motor no 1, routine test for remaining batch +147/153	Works certificate	Aluminum motors ⁴⁾	Cast iron motors	Steel motors	Open drip proof motors	Flameproof motors Ex d, Ex de
ABS ³⁾	50	70/90	N										
			E < 100										
			E ≥ 100		X		X			112-280	160-400	280-400	280-400
BV	45	75/100	N										
			E < 100				X						
			E ≥ 100		X		X			112-280	160-400	280-400	280-400
CCS	45	75/100	N										
			E < 100		X		X						
			E ≥ 100		X		X			112-280	160-355	280-400	280-400
CR	45	75/95	N										
			E No limit		X		X			112-280	160-250		
DNV	45	75/100	N										
			E ≥ 10 < 100				X		X				
			E ≥ 100 < 300					X					
GL	45	75/100	N										
			E < 50				X						
			E ≥ 50		X		X			112-280	160-400	280-400	280-400
KR	45	75/95	N										
			E < 7.5				X						
			E ≥ 7.5		X		X			112-280	160-315	280-400	280-400
LR	45	70/95	N										
			E < 100				X						
NK ²⁾	45	75/100	N										
			E < 100										
			E ≥ 100							112-280	160-400	280-400	280-355
RINA	45	75/100	N										
			E < 100				X						
			E ≥ 100		X		X			56-280	280-400	280-400	280-400
RS	45	75/95	N										
			E < 50				X						
			E ≥ 50		X		X			56-250	225-250	160-400	280-400

1) Duty

N = Non Essential Service (No document requirement)

E = Essential Service

2) NK Essential Service and Japanese flag = No kW limit.

3) Product Design Approval

4) For smaller sizes see 'Variant code' pages.

Testing of marine motors with variable speed drives, please contact ABB.



Classification Society	Duty	Output limit kW	Test confirmation or Routine test report variant code 140 or 148 ¹⁾	Type test report; type test as basis, variant code 145 ²⁾	Classification society's certificate based on witness test ³⁾	Classification society's certificate issued with ABB's test report as basis ⁴⁾	Serial no. and documentation not required by Classification societies ⁵⁾	Classified shaft material ⇒375 kW classified shaft required. EN 10204 3.2	Classified shaft material ⇒100 kW classified shaft required. EN 10204 3.1
ABS	N		X				X		
	E	< 100		X					
	E	≥ 100			X			X ⁸⁾	
BV	N		X				X		
	E	< 100	X						
	E	≥ 100			X	X			X ⁸⁾
CCS	N				X	X			
	E	< 100			X	X			
	E	≥ 100			X	X			
CR	N		X				X		
	E	No limit			X	X			
DNV	N		X				X		
	E	< 100		X					
	E	≥ 100 < 300							
	E	≥ 300				X	X		
GL	N		X				X		
	E	< 50	X						
	E	≥ 50			X	X			X ⁸⁾
KR	N		X				X		
	E	< 7.5	X						
	E	≥ 7.5			X	X			X
LR	N		X				X		
	E	< 100		X					
	E	≥ 100			X				X
NK ⁶⁾	N		X				X		
	E	< 100	X						
	E	≥ 100			X	X		X	
RINA	N		X				X		
	E	< 100	X						
	E	≥ 100			X	X			X ⁸⁾
RS	N		X				X		
	E	< 50			X	X			
	E	≥ 50			X	X			

For Non-Essential Services no special requirements for documentation.

¹⁾ Variant code 140 = Test Confirmation or 148 = Routine Test Report (included in marine design)

²⁾ Variant code 145 = Type Test Report (Type test as basis) (included in marine design)

³⁾ Classification Society's Certificate based on witness test (Classification Society's Certificate fee will be charged)

⁴⁾ Classification Society's Certificate issued with ABB's Test Report as basis (Classification Society's Certificate fee will be charged)

⁵⁾ Serial No. and Documentation not required by Classification Societies. (Upon request ABB can supply Test Confirmation/Type Test Report).

⁶⁾ NK Essential Service and Japanese flag = No kW limit.

⁷⁾ Product certificate is not needed, manufacturers Works Certificate is applicable when Type Approval is valid

⁸⁾ Only for propulsion services/plants.



MECHANICAL AND ELECTRICAL DESIGN Mounting arrangements

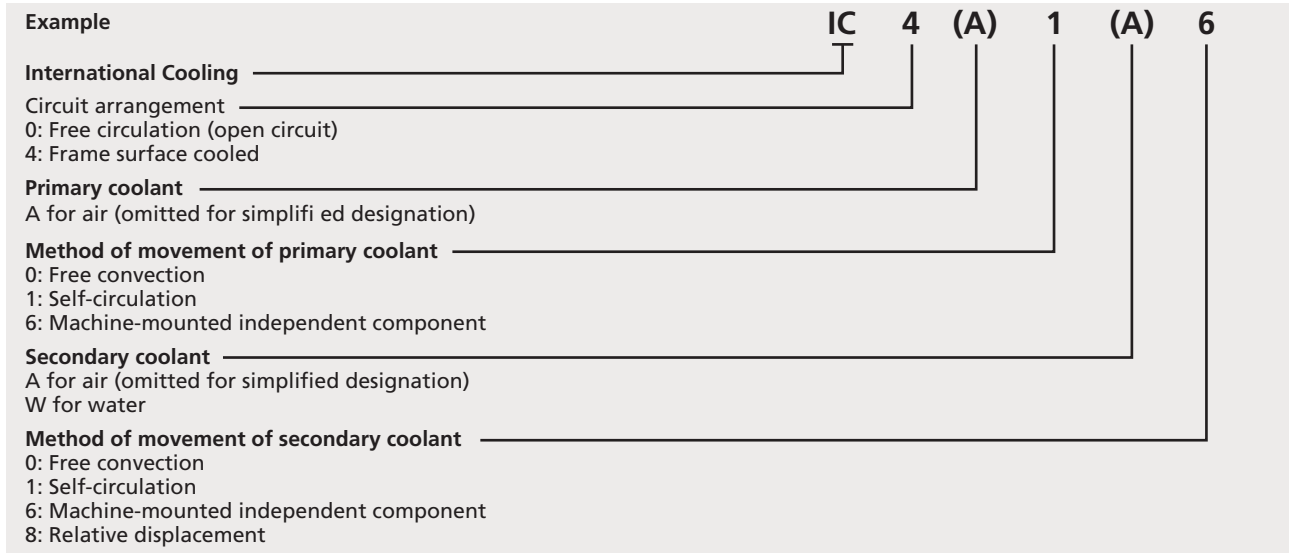
	Code I / Code II						
Foot-mounted motor	IM B3 IM 1001	IM V5 IM 1011	IM V6 IM 1031	IM B6 IM 1051	IM B7 IM 1061	IM B8 IM 1071	A = foot-mounted, term.box top R = foot-mounted, term.box RHS L = foot-mounted, term.box LHS
	M000007						
Flange-mounted motor, large flange	IM B5 IM 3001	IM V1 IM 3011	IM V3 IM 3031	IM *) IM 3051	IM *) IM 3061	IM *) IM 3071	B = flange mounted, large flange
	M000008						
Flange-mounted motor, small flange	IM B14 IM 3601	IM V18 IM 3611	IM V19 IM 3631	IM *) IM 3651	IM *) IM 3661	IM *) IM 3671	C = flange mounted, small flange
	M000009						
Foot- and flange-mounted motor with feet, large flange	IM 35 IM 2001	IM V15 IM 2011	IM V36 IM 2031	IM *) IM 2051	IM *) IM 2061	IM *) IM 2071	H = foot/flange-mounted, term.box top S = foot/flange-mounted, term.box RHS T = foot/flange-mounted, term.box LHS
	M000010						
Foot- and flange-mounted motor with feet, small flange	IM B34 IM 2101	IM 2111	IM 2131	IM 2151	IM 2161	IM 2171	J = foot/flange-mounted, small flange
	M000011						
Foot-mounted motor, shaft with free extensions	IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072	
	M000012						

*) Not stated in IEC 60034-7



COOLING

Designation system concerning methods of cooling refers to standard IEC 60034-6.



DEGREES OF PROTECTION: IP CODE/IK CODE

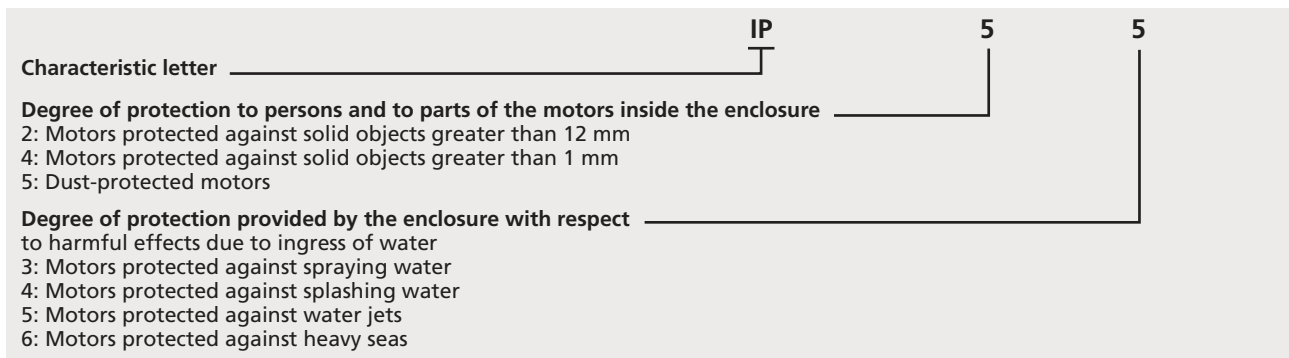
The classification of degrees of protection provided by enclosures refers to:

- Standard IEC 60034-5 or EN 60529 for IP code
- Standard EN 50102 for IK code

IP protection:

Protection of persons against getting into contact with (or approaching) live parts and against contact with moving parts inside the enclosure.

Also gives protection for the machine against ingress of solid foreign objects, as well as protection of machines against harmful effects due to the ingress of water.



IK CODE :

Classification of degrees of protection provided by enclosure for motors against external mechanical impacts.

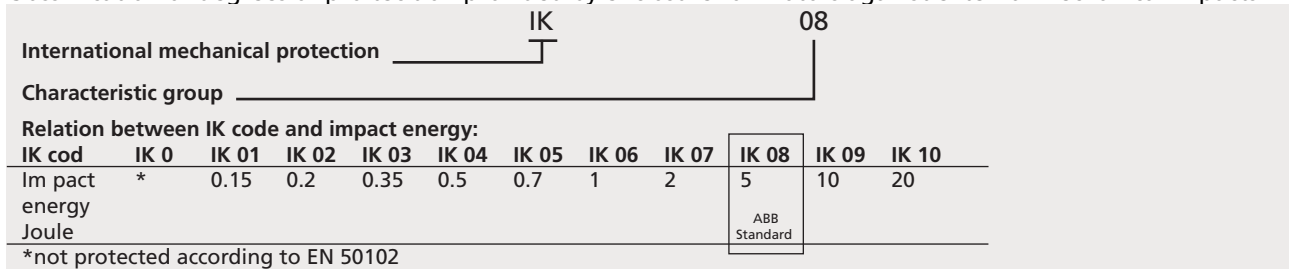




ABB uses class F insulation systems, which, with temperature rise B, is the most common requirement in industry today.

The use of Class F insulation with Class B temperature rise gives ABB products a 25° C safety margin. This can be used to increase the loading by up to 12 per cent for limited periods, to operate at higher ambient temperatures or altitudes, or with greater voltage and frequency tolerances. It can also be used to extend insulation life.

Class F insulation system

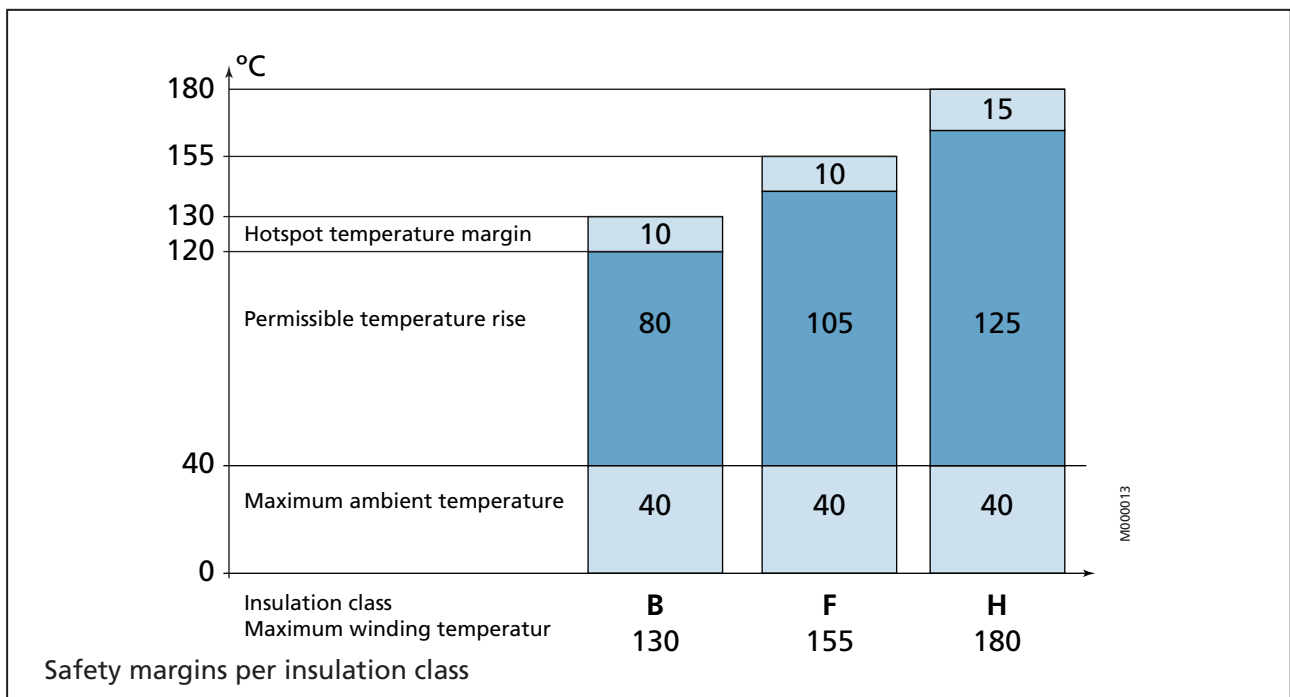
- Max ambient temperature 40° C
- Max permissible temperature rise 105 K
- Hotspot temperature margin + 10 K

Class B rise

- Max ambient temperature 40° C
- Max permissible temperature rise 80 K
- Hotspot temperature margin + 10 K

Insulation system temperature class

- Class F 155° C
- Class B 130° C
- Class H 180° C



HIGH EFFICIENCY

ABB's motors are designed for the highest possible efficiency, aiming to save energy and operation costs during the whole lifetime of the motor.

NOISE LEVEL

The motors are designed for low noise level. Data for 50 Hz can be found in the product catalogues (General Purpose Motors and Process Performance Motors). The noise level at 60 Hz is approximately 4 dB(A) higher.

SURFACE TREATMENT

Special attention has been paid to the finish of ABB's motors. All parts are treated by the method most appropriate to each material, giving reliable anticorrosion protection under severe environmental conditions. The color is blue, Munsel color code: 8B, 4.5/3.25 (NCS4822-B05G the closest shade in other standards). Specific details of paint types are available on request.

THERMAL PROTECTION

Thermistors (PTC) are fitted as standard in the windings of the motors M2BA 71 to 132, M3AA 200 to 280, M2AA 250, M3_ 280 to 450. For other sizes, this type of protection is optional.





EXPLANATION OF OPTIONAL VERSIONS

IP56

Water- and air-tight version recommended for motors exposed to weather, wind and sea.

HEATING ELEMENT

The element is activated when the motor is turned off. The heating element keeps the motor dry and warm at all times, preventing condensation and moisture from forming on the motor winding. Standard voltage: 220 V. Other voltages are available.

PTC THERMISTORS

PTC thermistors are mounted in series in the winding (one in each phase). They prevent the windings from overheating. PTC thermistors are connected to an amplifier relay which in turn cuts the control current in the starter panel.

NOTE! PTC thermistors must not be connected directly to supply current.

THERMAL SWITCHES

Microthermal switches are thermal bimetallic strips that open or close (2 types) when hot. Microthermal switches can be connected in series to the control current for the main contactor coil.

TROPICAL INSULATION

A varnish is applied that fills in the gaps between the windings, giving them a smooth surface, protecting the motor against condensation.

NOISE-REDUCING FAN

A new fan is mounted to the motor's fan side to reduce motor noise. The rotational direction of the motor shaft must be indicated beforehand.

SPECIAL PAINT

Applies to flange motors that are combined with our worm/gear programme. The motor is painted in the same colour as the worm/gear.

MEZ ELECTRIC MOTORS

MEZ electric motors are delivered in accordance with IEC publications IEC 72-DIN 42673 and IEC 34-6.

Being one of the largest suppliers in the Nordic countries, we have about 20,000 motors in stock at all times. We have motors with 220/380-230/40 volts at 50Hz as well as 380/660-400/690 volts at 50Hz (from 3 kW). These motors can also be used at 60Hz.

Our motors come in a foot-mounted version B3, flange versions B5 and B14 and a combination thereof.

Our electromechanical workshop provides a number of services including:

- Modification of electric motors according to customer specifications.
- Building of complete starter panel including testing and documentation.
- Connection of frequency converters in complete panels including testing and documentation.
- Assembly of motor gear/worm and motor gear/worm.

OUTPUT (KW) AND RPM

The output is defined in kW (hp x 0.736) and, as in this catalogue, is based on 100% load over a long period: so-called S1 service load.

The motors can yield other outputs by defining them under other service loads. For example: S2, S3, S4, S6, etc., which means full load for short periods, or different types of intermittent service. The working cycle for these service loads must then be carefully followed.

The RPM basically depends on two factors: the motor's number of poles (2, 4, 6 or 8 poles) and frequency supply (50 or 60 Hz).

INSULATION CLASS

The insulation class indicates maximum motor temperature:

The most common insulation classes are:

B = 130°C

F = 155°C

H = 180°C

The MEZ motors come with F insulation based on B temperature increase and 40°C ambient temperature. Because of their moderate load temperatures, ME Z motors can be used in higher ambient temperatures than can ordinary, standard motors, and they can handle loads that are higher than nominally specified.

PROTECTION CLASS (IP class)

The IP class indicates how well the motor is protected against dust and water.

IP54 is a standard protection class for industrial motors.

IP55 is a protection class that should be used for motors outdoors.

IP56 is a protection class used on ships' decks for motors exposed to harsh weather, wind and sea.

The first digit indicates protection value against dust.

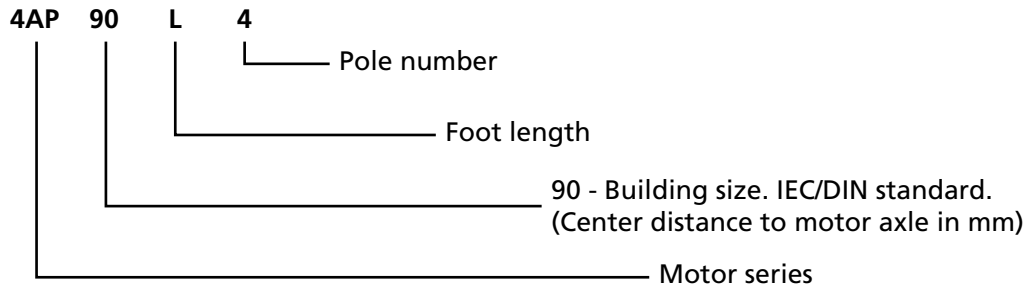
The second digit indicates protection value against water.

The higher the number, the better the motor is protected.

MEZ electric motors have protection class IP55 as standard.

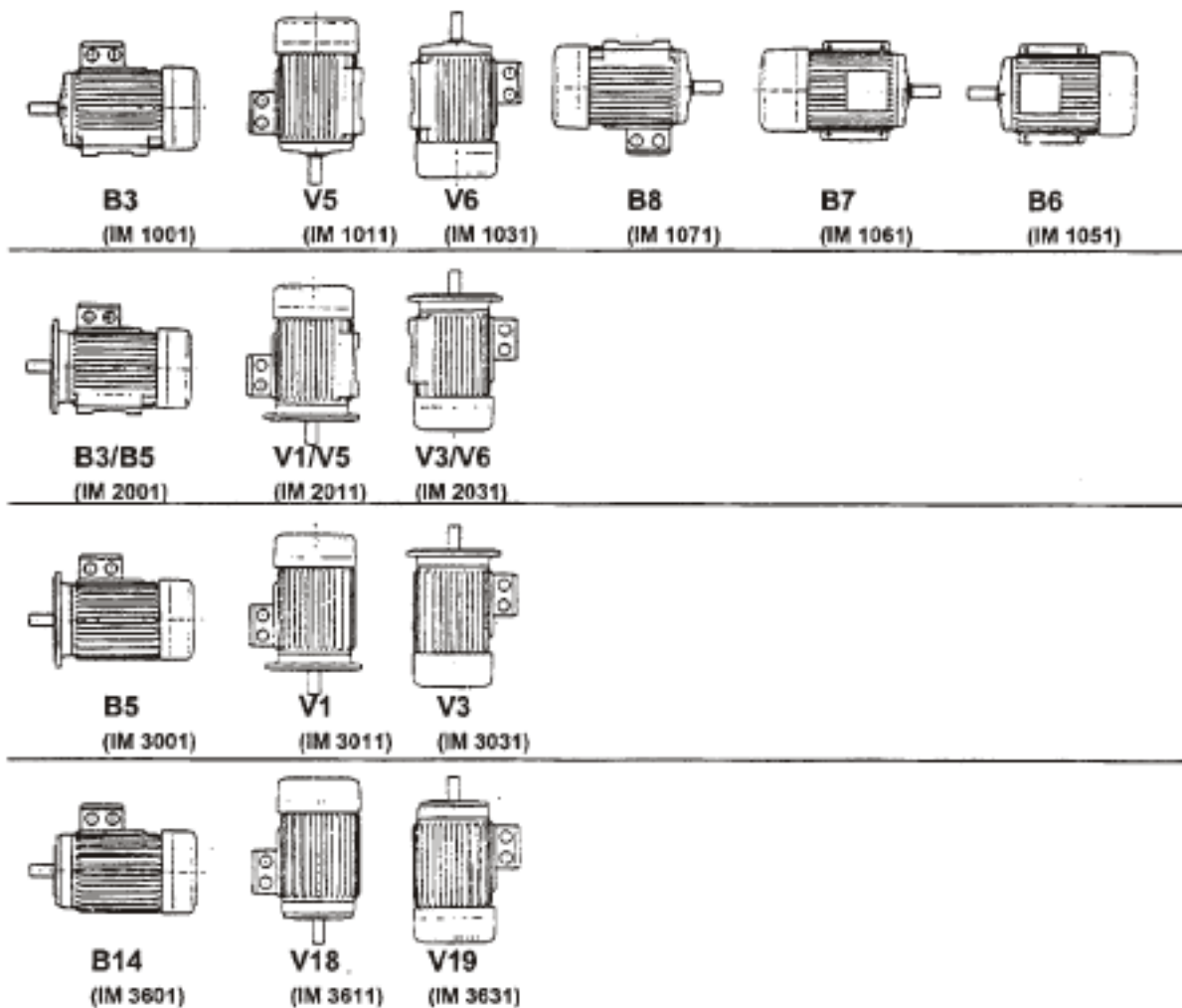


MOTOR DESCRIPTION



When ordering you must also indicate type of assembly (B3, B5 or B14) and voltage at 50 or 60 Hz.

TYPE OF ELECTRIC MOTOR ASSEMBLY

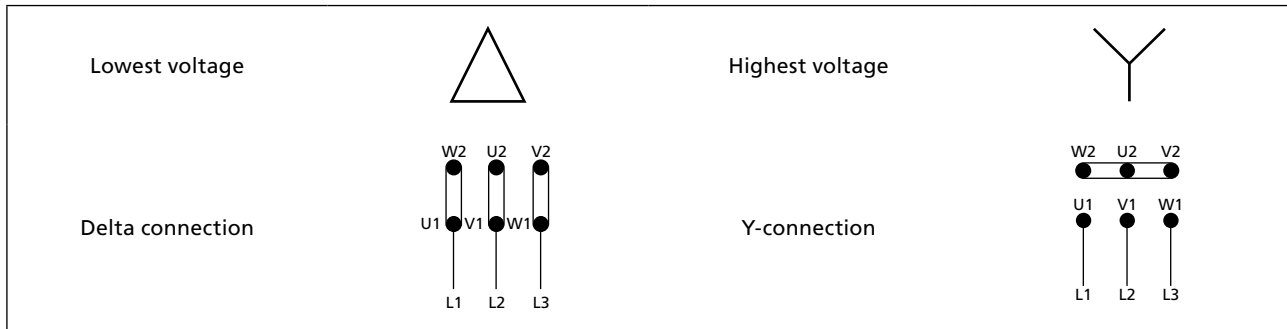


MEZ ELECTRIC MOTORS – WIRING DIAGRAM

MEZ 3-PHASE MOTORS

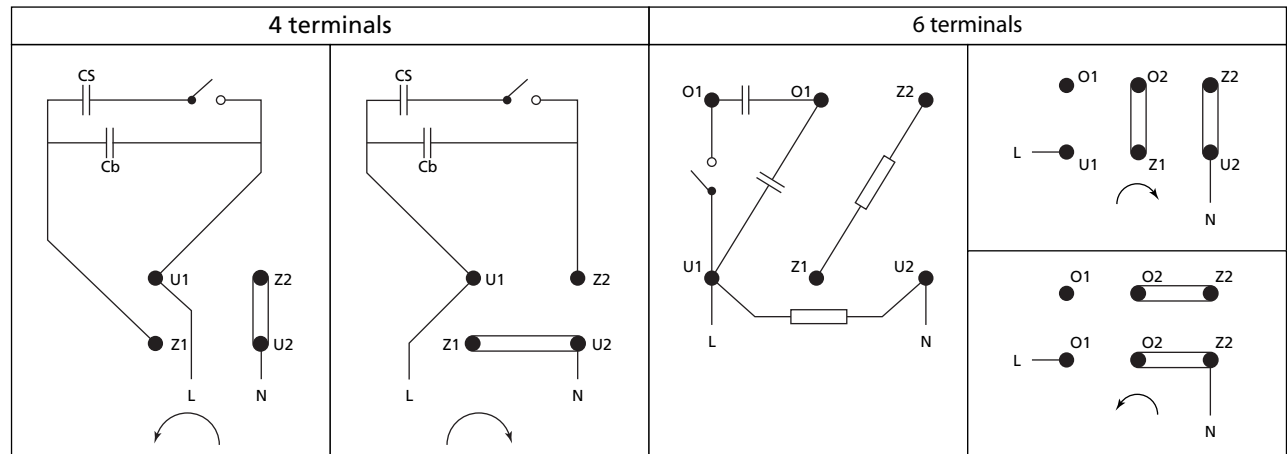
Mez 3-phase motors usually come in voltage 220/380 V - 50 Hz, and 380/660 V - 400/690 V - 50 Hz (from 3 kW). The motor can also be used at 60 Hz as shown below.

Motor wound for 50 Hz	Used at 60 Hz
Δ/Y 220/380 volt	Δ/Y 254/440 volt
Δ/Y 230/400 volt	Δ/Y 265/460 volt
Δ/Y 380/660 volt	Δ/Y 440/764 volt
Δ/Y 400/690 volt	Δ/Y 460/796 volt



When using a Y/delta connection, the lowest voltage must be equal to the main voltage.

MEZ SINGLE-PHASE MOTORS



- $U_1 - U_2$ = Main winding
- $Z_1 - Z_2$ = Auxiliary winding
- Cs = Starter capacitor
- Cb = Service capacitor

MEZ ELECTRIC MOTORS – LUBRICATION TABLE



LUBRICATION TABLE

Motor size	Service side		Fan side		Recommended lubrication/hours			
	Bearing	CD/oil seal	Bearing	CD/oil seal				
4AP 63	6201-ZZ C3	12 x 35 x 7	6201-ZZ C3	12 x 35 x 7	15000	30000	30000	30000
4AP 71	6202-ZZ C3	15 x 30 x 8	6202-ZZ C3	15 x 30 x 8	15000	30000	30000	30000
4AP 80	6204-ZZ C3	20 x 38 x 7	6204-ZZ C3	20 x 38 x 7	15000	30000	30000	30000
4AP 90	6205-ZZ C3	25 x 42 x 7	6205-ZZ C3	25 x 42 x 7	15000	30000	30000	30000
4AP 100	6206-ZZ C3	30 x 52 x 8	6206-ZZ C3	30 x 52 x 8	15000	30000	30000	30000
4AP 112	6306-ZZ C3	30 x 52 x 8	6306-ZZ C3	30 x 52 x 8	10000	20000	30000	30000
7BA/AA 112	6306-ZZ C3	30 x 36 x 5	6205-ZZ C3	30 x 36 x 5	10000	20000	30000	30000
4AP 132	6308-ZZ C3	40 x 62 x 8	6308-ZZ C3	40 x 62 x 8	10000	20000	30000	30000
7BA/AA 132	6308-ZZ C3	40 x 47 x 5	6208-ZZ C3	40 x 47 x 5	10000	20000	30000	30000
C 160	6309 C3	45 x 62 x 12	6309 C3	45 x 62 x 12	8000	14500	18500	22000
7BA/AA 160	6309 C3	45 x 52 x 4	6209 C3	45 x 52 x 4	8000	14500	18500	22000
C 180	6310 C3	50 x 72 x 12	6310 C3	50 x 72 x 12	7500	13000	17500	20000
C 200	6312 C3	60 x 90 x 13	6312 C3	60 x 90 x 13	7000	11500	16500	19000
F 225	6315 C3	65 x 90 x 13	6313 C3	65 x 90 x 13	6500	11000	15000	18000
C 225	6313 C3	65 x 90 x 13	6313 C3	65 x 90 x 13	6500	11000	15000	18000
F250	6315 C3	70 x 90 x 13	6313 C3	70 x 90 x 13	5500	10500	14000	17000
F 280	6316 C3	80 x 110 x 13	6315 C3	80 x 110 x 13	5000	10000	13000	16500

Synthetic lubricating grease with a drop point of 170°C for operating temperatures from -30°C to +110°C.
Recommended lubrication grease: Type SKF-LGTM 2 or similar.

Motors sizes 63 to 132 have sealed bearings and cannot be lubricated, but must be replaced.

In case of abnormal operating conditions because of dust, moisture, sudden loads and vibrations, pivotal motion and high temperatures, the above intervals must be corrected as follows:

$$TN = T \times q(\text{hours}),$$

$$q = f_1 \times f_2 \times f_3 = \text{Correction factors}$$

Impact	Dust, moisture	Peak loads, vibrations, etc.	High temperatures
Medium	$f_1 = 0,9 \text{ til } 0,7$	$f_2 = 0,9 \text{ til } 0,7$	$f_3 = 0,9 \text{ til } 0,7$
Strong	$f_1 = 0,7 - 0,4$	$f_2 = 0,7 - 0,4$	$f_3 = 0,7 - 0,4$
	$f_1 = 0,4 - 0,1$	$f_2 = 0,4 - 0,1$	$f_3 = 0,4 - 0,1$

The lubricant's lifetime is basically $2 \times TN$

Grease (grams) = D (external diameter of bearing mm) x W (Width of bearing in mm) x X (factor depending on lubrication interval)

Lubrication interval	Daily	Weekly	Monthly	Annually	Every 2-3 years
Factor X	0,001	0,002	0,003	0,004	0,05



WHY CHOOSE A HØYER MOTOR?

- We have Northern Europe's largest stock of low voltage electric motors.
- We have 45.000 motors in stock, ranging from 0.06 kW up to 630 kW.
- We can deliver directly from our stock within a very short timeframe
- Short response time for all customer queries
- Technical support and full documentation for all motors
- Competitive prices

SVEND HØYER A/S is a major supplier of low voltage electric motors to the leading manufacturers of marine pumps, combustion air fans, and ventilation systems in Europe





TECHNICAL DATA 2 POLE - 400V 50 Hz and 440V 60 Hz.

		2-Pole (3000 RPM)					
Type		400V / 50 Hz		440V / 60 Hz		Weight (IMB3) Kg	
		40 dgr.C		45 dgr.C			
		kW	min-1	kW	min-1		
MS	56 1-2	0,09	2640	0,11	3168	3,7	
MS	56 2-2	0,12	2640	0,14	3168	3,9	
MS	63 1-2	0,18	2715	0,22	3258	4,1	
MS	63 2-2	0,25	2715	0,30	3258	4,6	
MS*	63 3-2	0,37	2800	0,44	3360	5,6	
MS	71 1-2	0,37	2730	0,44	3276	5,5	
MS	71 2-2	0,55	2715	0,66	3258	6,0	
MS*	71 3-2	0,75	2800	0,90	3360	8,1	
MS	80 1-2	0,75	2715	0,90	3258	9,5	
MS	80 2-2	1,1	2700	1,32	3240	10,8	
MS*	80 3-2	1,5	2800	1,8	3360	12,0	
MS	90 S-2	1,5	2760	1,8	3312	14,3	
MS	90 L-2	2,2	2760	2,6	3312	16,2	
MS*	90 L2-2	3,0	2800	3,6	3360	18,8	
MS	100 L-2	3,0	2870	3,6	3444	24,0	
MS*	100 L2-2	4,0	2880	4,8	3456	27,6	
MS	112 M-2	4,0	2890	4,8	3468	31,3	
MS*	112 M1-2	5,5	2900	6,6	3480	35,4	
MS	132 S1-2	5,5	2910	6,6	3492	49,0	
MS	132 S2-2	7,5	2900	9,0	3480	54,0	
MS*	132 M1-2	9,2	2900	11,0	3480	58,0	
MS*	132 M2-2	11	2900	13,2	3480	60,5	
Y2E2	160 M1-2	11	2940	12,8	3528	109	
Y2E2	160 M2-2	15	2940	17,5	3528	121	
Y2E2	160 L-2	18,5	2940	21,5	3528	136	
Y2E2*	160 LA-2	22	2930	25,6	3516	158	
Y2E2	180 M-2	22	2940	25,6	3528	180	
Y2E2*	180 L-2	30	2950	34,9	3540	233	
Y2E2	200 L1-2	30	2950	34,9	3540	246	
Y2E2	200 L2-2	37	2950	43,1	3540	256	
Y2E2	225 M-2	45	2960	52,4	3552	328	
Y2E2*	225 M1-2	55	2960	64,0	3552	338	
Y2E2	250 M-2	55	2970	64,0	3564	433	
Y2E2	280 S-2	75	2960	87,3	3552	572	
Y2E2	280 M-2	90	2960	104	3552	632	
Y2E2*	280 M1-2	110	2960	128	3552	710	
Y2E2	315 S-2	110	2975	128	3570	950	
Y2E2	315 M-2	132	2975	153	3570	1080	
Y2E2	315 L1-2	160	2975	186	3570	1210	
Y2E2	315 L2-2	200	2975	232	3570	1240	
Y2E2	355 M-2	250	2980	291	3576	1970	
Y2E2	355 L-2	315	2980	366	3576	2000	

TECHNICAL DATA 4 POLE - 400V 50 Hz and 440V 60 Hz.

		4-Pole (1500 RPM)					
Type		400V / 50 Hz		440V / 60 Hz		Weight (IMB3) Kg	
		40 dgr.C		45 dgr.C			
		kW	min-1	kW	min-1		
MS	56 2-4	0,09	1380	0,11	1656	3,7	
MS	63 1-4	0,12	1350	0,14	1620	4,0	
MS	63 2-4	0,18	1340	0,22	1608	4,2	
MS*	63 3-4	0,25	1360	0,30	1632	5,4	
MS	71 1-4	0,25	1390	0,30	1668	6,0	
MS	71 2-4	0,37	1360	0,44	1632	6,5	
MS*	71 3-4	0,55	1360	0,66	1632	7,8	
MS	80 1-4	0,55	1370	0,66	1644	9,0	
MS	80 2-4	0,75	1380	0,90	1656	10,6	
MS*	80 3-4	1,1	1400	1,32	1680	13,2	
MS	90 S-4	1,1	1385	1,32	1662	13,8	
MS	90 L-4	1,5	1410	1,8	1692	16,0	
MS*	90 L2-4	2,2	1400	2,6	1680	18,0	
MS	100 L1-4	2,2	1430	2,6	1716	24,0	
MS	100 L2-4	3,0	1410	3,6	1692	25,6	
MS*	100 L3-4	4,0	1400	4,8	1680	29,1	
MS	112 M-4	4,0	1440	4,8	1728	35,0	
MS*	112 M2-4	5,5	1410	6,6	1692	36,7	
MS	132 S-4	5,5	1450	6,6	1740	50,5	
MS	132 M-4	7,5	1450	9,0	1740	59,5	
MS*	132 M3-4	11	1470	13,2	1764	67,0	
Y2E2	160 M-4	11	1470	12,8	1764	118	
Y2E2	160 L-4	15	1470	17,5	1764	138	
Y2E2	180 M-4	18,5	1470	21,5	1764	177	
Y2E2	180 L-4	22	1470	25,6	1764	203	
Y2E2*	180 LA-4	30	1470	34,9	1764	243	
Y2E2	200 L-4	30	1470	34,9	1764	243	
Y2E2*	200 L1-4	37	1475	43,1	1770	305	
Y2E2	225 S-4	37	1475	43,1	1770	305	
Y2E2*	225 M-4	45	1475	52,4	1770	328	
Y2E2*	225 M1-4	55	1480	64,0	1776	452	
Y2E2	250 M-4	55	1480	64,0	1776	452	
Y2E2*	250 M1-4	75	1475	87,3	1770	592	
Y2E2	280 S-4	75	1475	87,3	1770	592	
Y2E2	280 M-4	90	1475	104	1770	672	
Y2E2*	280 MB-4	110	1480	128	1776	730	
Y2E2	315 S-4	110	1480	128	1776	980	
Y2E2	315 M-4	132	1480	153	1776	1040	
Y2E2	315 L1-4	160	1480	186	1776	1180	
Y2E2	315 L2-4	200	1480	232	1776	1260	
Y2E2	250 M-4	250	1485	291	1782	1810	
Y2E2	355 L-4	315	1485	366	1782	1910	

TECHNICAL DATA 6 POLE - 400V 50 Hz and 440V 60 Hz.

Type		6-Pole (1000 RPM)				Weight (IMB3) Kg
		400V / 50 Hz		440V / 60 Hz		
		40 dgr.C	45 dgr.C	40 dgr.C	45 dgr.C	
		kW	min-1	kW	min-1	
MS	63 1-6	0,09	890	0,11	1068	4,3
MS	63 2-6	0,12	900	0,14	1080	5,9
MS	71 M1-6	0,18	900	0,22	1080	6,0
MS	71 M2-6	0,25	900	0,30	1080	6,5
MS	80 M1-6	0,37	900	0,44	1080	9,3
MS	80 M2-6	0,55	900	0,66	1080	10,8
MS	90 S-6	0,75	910	0,90	1092	13,8
MS	90 L-6	1,1	910	1,32	1092	16,0
MS	100 L-6	1,5	940	1,8	1128	19,0
MS	112 M-6	2,2	940	2,6	1128	33,0
MS	132 S-6	3,0	960	3,6	1152	52,5
MS	132 M1-6	4,0	960	4,8	1152	55,0
MS	132 M2-6	5,5	960	6,6	1152	61,5
Y2E2	160 M-6	7,5	970	8,7	1164	119
Y2E2	160 L-6	11,0	970	12,8	1164	147
Y2E2	180 L-6	15,0	970	17,5	1164	195
Y2E2	200 L1-6	18,5	970	21,5	1164	235
Y2E2	200 L2-6	22	970	25,6	1164	256
Y2E2	225 M-6	30	980	34,9	1176	306
Y2E2*	225 M1-6	37	980	43,1	1176	320
Y2E2	250 M-6	37	980	43,1	1176	416
Y2E2	280 S-6	45	980	52,4	1176	546
Y2E2	280 M-6	55	980	64,0	1176	614
Y2E2*	280 M1-6	75	980	87,3	1176	658
Y2E2	315 S-6	75	985	87,3	1182	970
Y2E2	315 M-6	90	985	104	1182	1180
Y2E2	315 L1-6	110	985	128	1182	1240
Y2E2	315 L2-6	132	985	153	1182	1300
Y2E2	355 M1-6	160	990	186	1188	1740
Y2E2	355 M2-6	160	990	186	1188	1740
Y2E2	355 L-62	250	990	291	1188	2070

TECHNICAL DATA 6 POLE - 400V 50 Hz and 440V 60 Hz

Please note:
If you need two-speed motors, different speeds, voltages or frequencies – please call our sales department.

OPTIONAL SPECIAL EXECUTIONS:

- Anti condensation heating (110V or 230V)
- Special bearings
- SPM (shock pulse measuring) nipples mounted
- Forced fan cooling
- Pt100 built-in thermo sensors
- PTC thermistors or bi-metal contacts for over-heating protection and signalling
- Balancing class "R" and "S" ISO 2373
- Encoders
 - IP56 (98% RH) without fan and fan cover TENV (IC410) for mounting on open deck
- TEAO (IC418) (direct driven fan motors without cooling fan on the motor)
- Customer specific motors

MARINE MOTORS FROM SVEND HØYER A/S



– V1 mounting



– Standard marine motor, insulation class F, IP 55, SKF bearings or similar, RAL 5010 blue



– with marine cable instead of terminal box