



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-9162
This Certificate consists of 3 pages

This is to certify that the
Electric Motor
with type designation(s)
M2FA

Manufactured by
ABB Oy, Motors,
Finland

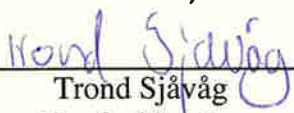
is found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application
For installation in non hazardous area.

Enclosure class	IP23
Insulation class	F
Temp. class (°C)	45
Voltage (V)	220 - 690
Power (kW)	37 - 750
Frequency (Hz)	50 - 60
Speed (RPM)	750 - 3600

Place and date
Høvik, 2008-09-26

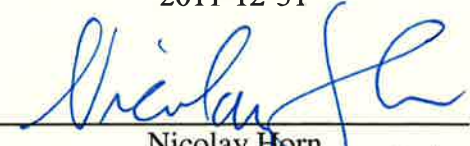

for ~~DET NORSKE VERITAS AS~~


Trond Sjøvåg
Head of Section



Local Office
DNV Helsinki

This Certificate is valid until
2011-12-31


Nicolay Horn
Surveyor 

Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: E-9162
File No.: 821.20

Product description

Type M2FA, 3-phase squirrel cage induction motors acc. to IEC 60034, IEC frame of steel with open drip proof design, motor size 250 up to 400.

Rated Voltage:	220V- 690V
Rated Frequency:	50Hz, 60Hz
Nominal power:	37 - 750 kW
Number of poles:	2, 4, 6, 8
Duty type:	S1 – S9
Enclosure class:	IP23
Ambient air temp.:	45 °C
Insulation class:	F

Technical data for motors at 440 V and 60 Hz:

Type designation	Nom. Power (kW)	Type designation	Max power (kW)
2 pole		6 pole	
250SA 2	103	250SA 6	52
250MA 2	126	250MA 6	63
280SMA 2	152	250MB 6	86
315SA 2	184	280SA 6	86
315SMA 2	230	280SMA 6	103
315MB 2	287	280MB 6	126
315MC 2	362	315SA 6	126
315LA 2	408	315SMA 6	152
315LB 2	460	315MB 6	184
355SA 2	460	315LA 6	212
355MA 2	520	355SA 6	230
355MB 2	575	355SB 6	287
355LA 2	725	355MA 6	345
4 pole		8 pole	
250SA 4	86	250SB 8	42
250MA 4	103	250MB 8	52
250MB 4	126	280SA 8	63
280SA 4	126	280SMA 8	86
280SMA 4	152	280MB 8	103
280MB 4	183	315SMA 8	103
315SA 4	184	315MB 8	126
315SMA 4	230	315LA 8	152
315MB 4	287	355SA 8	172
315LA 4	360	355SB 8	212
355SA 4	362	-	-
355SB 4	408	-	-
355MA 4	500	-	-
400LKB	750	-	-



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Application/Limitation

For installation in non hazardous area.

Type Approval documentation

Drawings: 1493 M2FA 25001, 149 M2FA 0100 C, H330146/E, 1D & 2A, 149 M2FA 250001 A, 149 M2FA 25001 A, 149 M2FA 25002 A, 149 M2FA 28001 A, 149 M2FA 280002 A, 149 M2FA 315001 A, 149 M2FA 315002 A, 149 M2FA 355001A, 149 M2FA 355002 A, 23 M2FA 28A H 3209040 & 41.

Testreports: HEL-04-1910 dated 2004-02-04, HEL-03-1909 dated 2003-02-26

Tests carried out

Temperature, Overload, Overspeed, Insulation resistance, Winding resistance, No load.

Marking of product

The motors are to be marked with the following specifications:

- Manufacturers name and type designation
- Serial number and date of manufacture
- Voltage, frequency, rpm
- Power class (kW / kVA)
- Winding insulation class
- Degree of protection

Certificate retention survey

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE