

FRAME 9304F**WINDING 6S****MODELS LL9324F / LL9334F**

REF: F9304FW6S-0 MAR 2015

WINDING DETAILS

Code	6S	Insulation class	H
Phase	3	Leads	6
Pole number	4	Pitch	2/3

MECHANICAL DETAILS

Standard protection		IP23
Overspeed	rpm	2250
Air flow 50Hz/60Hz	m ³ /s	2.50 / 2.80

EXCITATION DETAILS

Excitation system	AREP/PMG
AVR model	D510
Sustained short-circuit current	300%:10s
Steady state voltage regulation	±0.5%

WAVEFORM

<i>Line voltage on no load or balanced linear rated load</i>	
Total harmonic content THC	<3.5%
Telephone influence factor TIF (NEMA)	<50
Telephone harmonic factor THF (IEC)	<2%

LINE VOLTAGE*No overvoltage tolerance for 440V 50Hz excitation level*

Frequency / speed	V	50Hz / 1500rpm				60Hz / 1800rpm					
		380	400	415	440	380	400	416	440	460	480
Star	V	380	400	415	440	380	400	416	440	460	480
Delta	V	220	230	240		220	230	240			

RATING*Power factor 0.8, Altitude <=1000m*

Class	Rating	kVA	1860	1860	1860	1700	1860	1860	1935	2045	2140	2230
Class H rise BR	125/40	kVA	1860	1860	1860	1700	1860	1860	1935	2045	2140	2230
		kW	1488	1488	1488	1360	1488	1488	1548	1636	1712	1784
Class H rise PR	150/40	kVA	1972	1972	1972	1802	1972	1972	2051	2168	2268	2364
		kW	1577	1577	1577	1442	1577	1577	1641	1734	1815	1891
Class H rise PR	163/27	kVA	2046	2046	2046	1870	2046	2046	2129	2250	2354	2453
		kW	1637	1637	1637	1496	1637	1637	1703	1800	1883	1962
Class F rise BR	105/40	kVA	1693	1693	1693	1530	1693	1693	1761	1861	1947	2029
		kW	1354	1354	1354	1224	1354	1354	1409	1489	1558	1623

EFFICIENCIES*Power factor 0.8*

Efficiency	Class	Rating	%	95.6	95.8	95.9	96.2	95.5	95.8	95.9	96.1	96.2	96.2
110%	Class H BR		%	95.6	95.8	95.9	96.2	95.5	95.8	95.9	96.1	96.2	96.2
100%	Class H BR		%	95.8	96.0	96.1	96.4	95.8	96.0	96.1	96.2	96.3	96.4
75%	Class H BR		%	96.3	96.4	96.4	96.5	96.2	96.4	96.5	96.5	96.6	96.6
50%	Class H BR		%	96.5	96.5	96.4	96.2	96.4	96.5	96.5	96.6	96.6	96.5
25%	Class H BR		%	95.7	95.4	95.1	94.3	95.4	95.3	95.3	95.4	95.2	95.1

CHARACTERISTIC PARAMETERS*Reactance base class H BR rating*

Parameter	Description	Unit	0.29	0.36	0.44	0.63	0.22	0.24	0.26	0.28	0.32	0.36
K _c	Short-circuit ratio		0.29	0.36	0.44	0.63	0.22	0.24	0.26	0.28	0.32	0.36
X _d	D-Axis synchronous reactance (unsaturated)	pu	4.07	3.67	3.41	2.77	4.88	4.41	4.24	4.01	3.84	3.67
X' _d	D-Axis transient reactance (saturated)	pu	0.32	0.29	0.27	0.22	0.39	0.35	0.34	0.32	0.30	0.29
X'' _d	D-Axis sub-transient reactance (saturated)	pu	0.166	0.150	0.139	0.113	0.199	0.180	0.173	0.164	0.157	0.150
X _q	Q-Axis synchronous reactance (unsaturated)	pu	2.27	2.05	1.90	1.55	2.72	2.46	2.36	2.23	2.14	2.04
X'' _q	Q-Axis sub-transient reactance (saturated)	pu	0.173	0.156	0.145	0.118	0.207	0.187	0.180	0.170	0.163	0.156
X ₂	Negative-sequence reactance (saturated)	pu	0.170	0.153	0.143	0.116	0.204	0.184	0.177	0.167	0.160	0.153
X ₀	Zero-sequence reactance (independent)	pu	0.026	0.023	0.022	0.018	0.031	0.028	0.027	0.025	0.024	0.023
T' _d	D-Axis transient time constant	ms		255						255		
T'' _d	D-Axis sub-transient time constant	ms		24						24		
T' _{do}	D-Axis open-circuit time constant	ms		2765						2765		
T _a	Armature time constant	ms		29						29		
T _r	Voltage recovery time	ms		< 500						< 500		

EXCITATION VOLTAGE AND CURRENT

Parameter	Unit	8.7	10.4	11.3	13.9	6.1	7.0	7.0	7.8	8.7	9.6
No load excitation voltage	V	8.7	10.4	11.3	13.9	6.1	7.0	7.0	7.8	8.7	9.6
No load excitation current	A	1.00	1.20	1.30	1.60	0.70	0.80	0.80	0.90	1.00	1.10
Class H BR excitation voltage	V	47.0	46.1	46.1	44.4	45.2	43.5	43.5	44.4	44.4	45.2
Class H BR excitation current	A	5.40	5.30	5.30	5.10	5.20	5.00	5.00	5.10	5.10	5.20

WINDING RESISTANCE*At 20° C*

Parameter	Unit	0.0020	Exciter field	Ω	8.70
Stator line-to-line (series star)	Ω	0.0020	Exciter field	Ω	8.70
Main field	Ω	0.350			

According to: IEC 60034, UTE NFC51.111, VDE 0530, BS 4999/5000, NEMA MG 1-33

Values quoted are typical. In line with our policy of continuous improvement, we reserve the right to change specification without notice.

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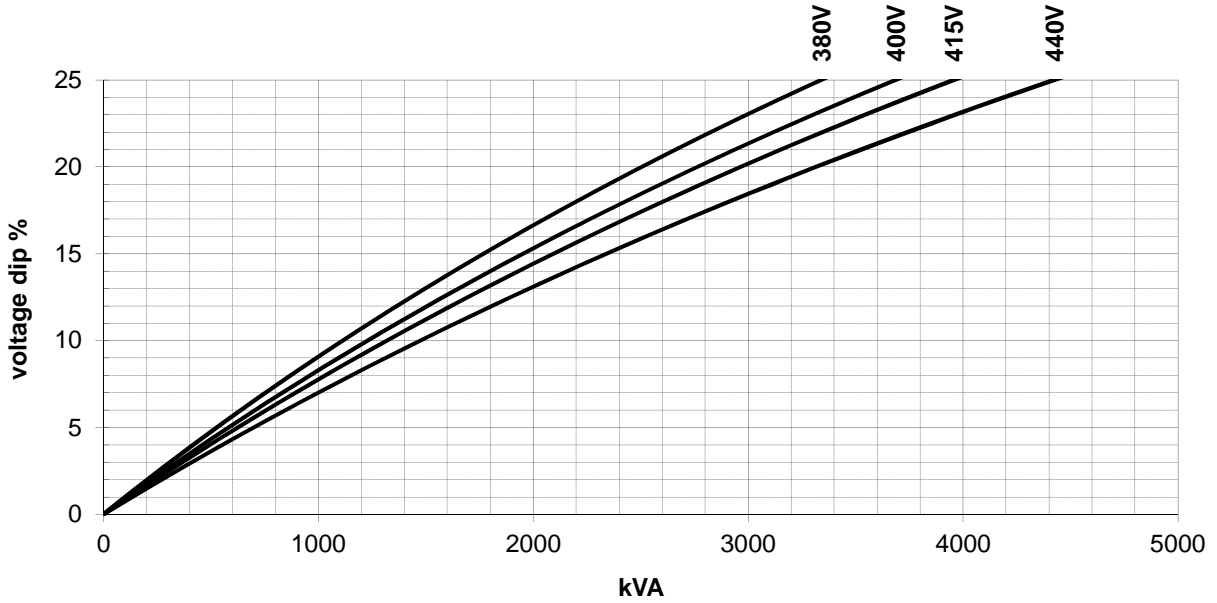
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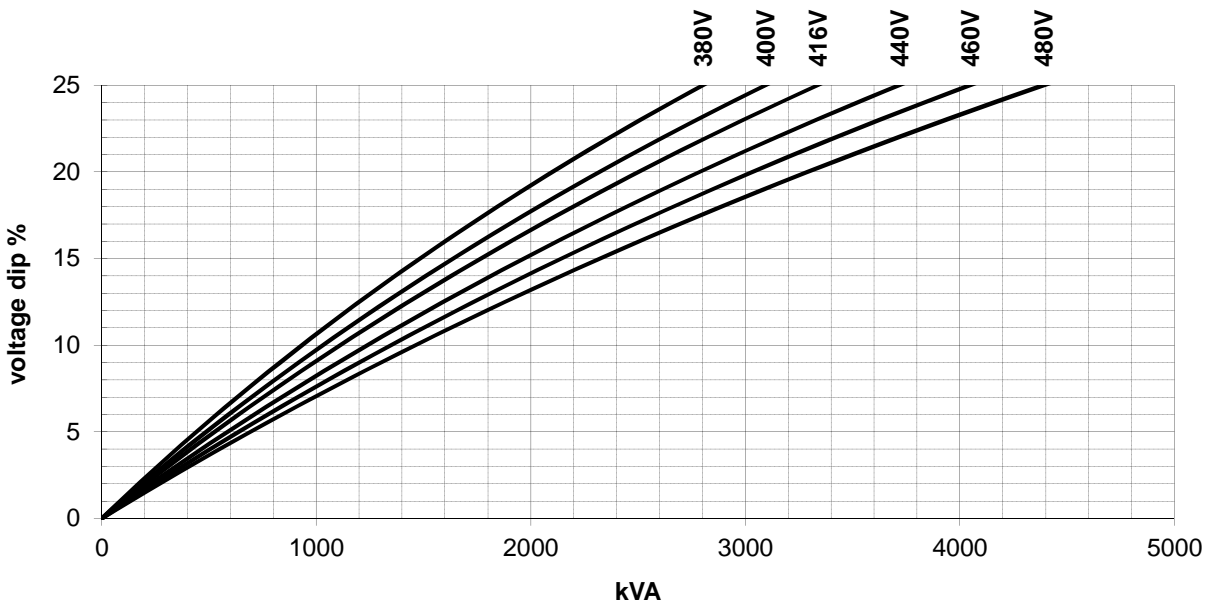
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.4

50 Hz AREP / PMG



60 Hz AREP / PMG



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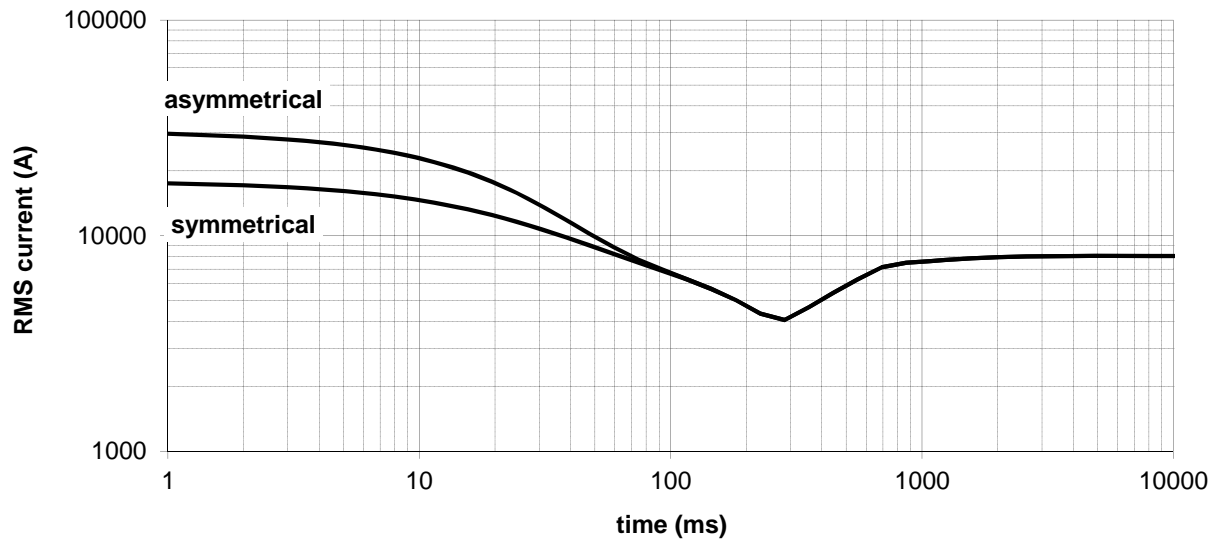
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THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES

No-load excitation at rated speed

400V 50Hz, 480V 60Hz

Star



Multiplication Factors

50Hz Voltages

380	400	415	440	
Multiplication Factor	0.95	1.00	1.04	1.10

Apply factor up to 2xT'd, remainder of curve unchanged

60Hz Voltages

380	400	416	440	460	480	
Multiplication Factor	0.79	0.83	0.87	0.92	0.96	1.00

Apply factor up to 2xT'd, remainder of curve unchanged

Winding Connection

Star	Delta	
Multiplication Factor	1.00	1.73

Apply factor to the complete curve

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