

FRAME 7224L

WINDING 6S



MODELS LL7224L / LL7234L

REF: F7204LW6S-0 JAN 2017

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 -

EXCITATION DETAILS

Excitation system	AREP/PMG
AVR model	R450M
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	<4%
Telephone influence factor TIF (NEMA)	<50
Telephone harmonic factor THF (IEC)	<2%

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

Frequency / speed		50Hz / 1500rpm				60Hz / 1800rpm					
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 H rise BR	125/40	kVA	830	835	830	730	830	870	905	960	1000	1045
		kW	664	668	664	584	664	696	724	768	800	836
Class H rise PR	150/40	kVA	880	885	880	774	880	922	959	1018	1060	1108
		kW	704	708	704	619	704	738	767	814	848	886
Class H rise PR	163/27	kVA	915	920	915	805	915	960	1000	1060	1100	1150
		kW	732	736	732	644	732	768	800	848	880	920
Class F rise BR	105/40	kVA	755	760	755	664	755	792	824	874	910	951
		kW	604	608	604	531	604	633	659	699	728	761

EFFICIENCIES *Power factor 0.8*

110%	Class H BR	%	94.6	94.8	94.8	95.1	93.8	94.1	94.2	94.4	94.6	94.7
100%	Class H BR	%	94.8	95.0	95.0	95.3	94.1	94.3	94.5	94.7	94.8	94.9
75%	Class H BR	%	95.2	95.4	95.4	95.4	94.6	94.8	95.0	95.1	95.2	95.3
50%	Class H BR	%	95.5	95.5	95.5	95.1	94.7	94.9	95.0	95.1	95.2	95.2
25%	Class H BR	%	94.4	94.2	94.0	92.8	93.0	93.1	93.2	93.3	93.4	93.3

CHARACTERISTIC PARAMETERS *Reactance base class H BR rating*

K _c	Short-circuit ratio		0.31	0.35	0.37	0.48	0.21	0.23	0.24	0.26	0.29	0.33
X _d	D-Axis synchronous reactance (unsaturated)	pu	3.82	3.47	3.20	2.51	4.58	4.34	4.17	3.95	3.77	3.62
X' _d	D-Axis transient reactance (saturated)	pu	0.19	0.17	0.16	0.12	0.22	0.21	0.20	0.19	0.18	0.18
X'' _d	D-Axis sub-transient reactance (saturated)	pu	0.149	0.135	0.125	0.098	0.179	0.169	0.163	0.154	0.147	0.141
X _q	Q-Axis synchronous reactance (unsaturated)	pu	2.29	2.08	1.92	1.50	2.75	2.60	2.50	2.37	2.26	2.17
X'' _q	Q-Axis sub-transient reactance (saturated)	pu	0.167	0.152	0.140	0.110	0.201	0.190	0.183	0.173	0.165	0.158
X ₂	Negative-sequence reactance (saturated)	pu	0.158	0.144	0.133	0.104	0.190	0.180	0.173	0.164	0.156	0.150
X ₀	Zero-sequence reactance (independent)	pu	0.007	0.006	0.006	0.004	0.008	0.008	0.007	0.007	0.007	0.006
T' _d	D-Axis transient time constant	ms		100					100			
T'' _d	D-Axis sub-transient time constant	ms		10					10			
T' _{do}	D-Axis open-circuit time constant	ms		2048					2048			
T _a	Armature time constant	ms		15					15			
T _r	Voltage recovery time	ms		< 3000					< 3000			

EXCITATION VOLTAGE AND CURRENT

No load excitation voltage	V	12.5	13.7	15.0	17.7	9.5	10.1	10.7	11.7	12.6	13.7
No load excitation current	A	0.79	0.87	0.95	1.12	0.60	0.64	0.68	0.74	0.80	0.87
Class H BR excitation voltage	V	57.5	57.2	57.0	52.7	53.1	53.5	54.3	55.6	56.7	58.3
Class H BR excitation current	A	3.64	3.62	3.61	3.34	3.36	3.39	3.44	3.52	3.59	3.69

WINDING RESISTANCE *At 20°C*

Stator line-to-line (series star)	Ω	0.0030				Exciter field			Ω	15.79
Main field	Ω	0.44								

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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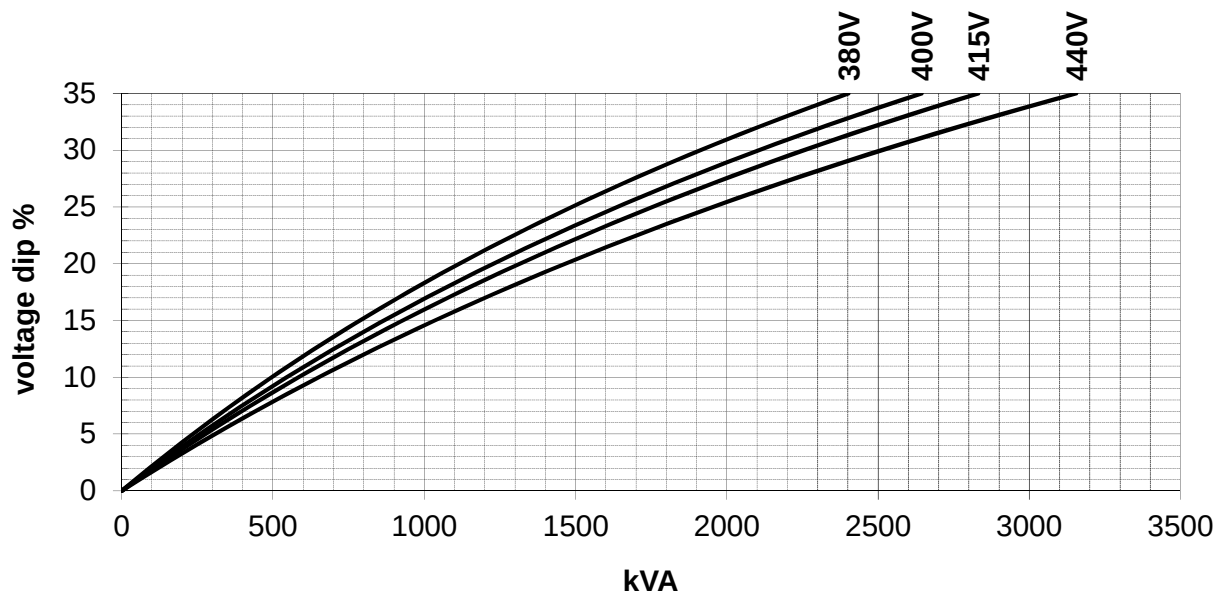
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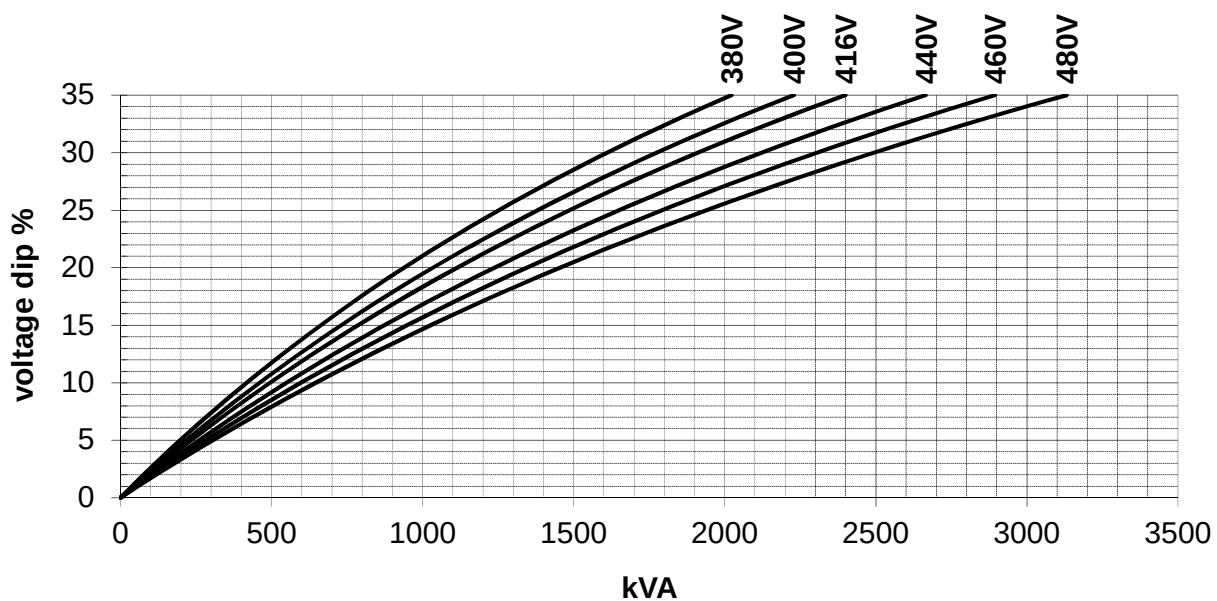
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

50 Hz AREP / PMG



60 Hz AREP / PMG



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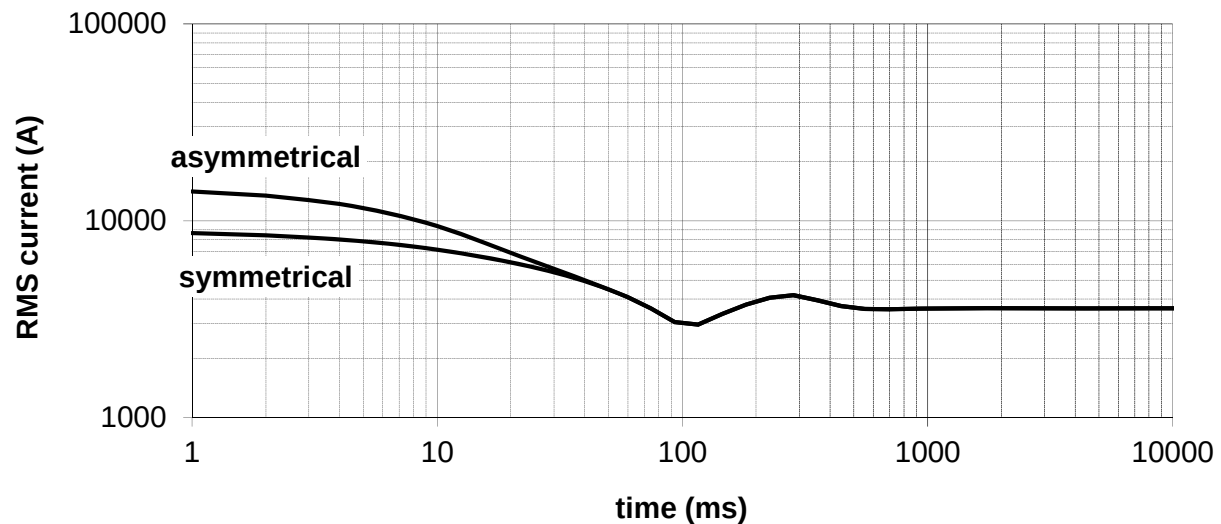
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THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES

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 $2 \times T'd$, 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 $2 \times T'd$, remainder of curve unchanged

Winding Connection

Star Delta

Multiplication Factor 1.00 1.73

Apply factor to the complete curve

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