

FRAME 5114H / 5124H WINDING 6



MODELS LL5114H / LL5124H / LL5134H

REF: F5104HW6-1 AUGUST 2016

WINDING DETAILS

Code	6	Insulation class	H
Phase	3	Leads	12
Pole number	4	Pitch	2/3

MECHANICAL DETAILS

Standard protection	IP23
Overspeed	rpm 2250
Air flow 50Hz/60Hz	m ³ /s 0.48 / 0.58

EXCITATION DETAILS

Excitation system	SHUNT	AREP/PMG
AVR model	R250	R450M
Sustained short-circuit current	-	300%:10s
Steady state voltage regulation	±0.5%	±0.5%

WAVEFORM

<i>Line voltage on no load or balanced linear rated load</i>	
Total harmonic content THC	<2%
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					
Series star	V	380	400	415	440	380	400	416	440	460	480
Series delta	V	220	230	240		220	230	240			
Parallel star	V		200	208	220		200	208	220	230	240

RATING *Power factor 0.8, Altitude ≤1000m*

Class H rise BR	125/40	kVA	240	250	250	216	247	260	271	286	299	313
		kW	192	200	200	173	198	208	217	229	240	250
Class H rise PR	150/40	kVA	254	265	265	229	262	276	287	304	317	331
		kW	204	212	212	183	210	221	230	243	254	265
Class H rise PR	163/27	kVA	264	275	275	238	272	286	298	315	329	344
		kW	211	220	220	190	218	229	238	252	264	275
Class F rise BR	105/40	kVA	218	228	228	196	225	237	246	261	273	284
		kW	175	182	182	157	180	190	197	209	218	228

EFFICIENCIES *Power factor 0.8*

110%	Class H BR	%	92.0	92.1	92.2	91.8	92.0	92.2	92.5	92.7	92.7	92.8
100%	Class H BR	%	92.4	92.5	92.5	92.1	92.4	92.6	92.8	93.0	93.0	93.0
75%	Class H BR	%	93.3	93.2	93.1	92.5	93.2	93.3	93.5	93.5	93.6	93.6
50%	Class H BR	%	93.7	93.5	93.2	92.1	93.4	93.5	93.6	93.5	93.6	93.5
25%	Class H BR	%	92.2	91.8	91.0	89.0	91.6	91.6	91.6	91.2	91.4	91.2

CHARACTERISTIC PARAMETERS *Reactance base class H BR rating*

K _c	Short-circuit ratio		0.36	0.42	0.49	0.75	0.25	0.27	0.29	0.32	0.35	0.40
X _d	D-Axis synchronous reactance (unsaturated)	pu	4.38	4.12	3.82	2.94	5.41	5.14	4.95	4.68	4.47	4.29
X' _d	D-Axis transient reactance (saturated)	pu	0.30	0.28	0.26	0.20	0.37	0.36	0.34	0.32	0.31	0.30
X'' _d	D-Axis sub-transient reactance (saturated)	pu	0.180	0.169	0.157	0.120	0.222	0.211	0.203	0.192	0.183	0.176
X _q	Q-Axis synchronous reactance (unsaturated)	pu	2.19	2.06	1.91	1.47	2.71	2.57	2.47	2.34	2.24	2.14
X'' _q	Q-Axis sub-transient reactance (saturated)	pu	0.232	0.218	0.202	0.155	0.286	0.272	0.262	0.247	0.237	0.227
X ₂	Negative-sequence reactance (saturated)	pu	0.215	0.202	0.187	0.144	0.266	0.252	0.243	0.229	0.219	0.210
X ₀	Zero-sequence reactance (independent)	pu	0.005	0.005	0.004	0.003	0.006	0.006	0.006	0.005	0.005	0.005
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		1444						1444		
T _a	Armature time constant	ms		15						15		
T _r	Voltage recovery time	ms		< 500						< 500		

EXCITATION VOLTAGE AND CURRENT

No load excitation voltage	V	12.4	14.2	16.0	20.2	8.4	9.0	9.6	10.7	11.9	13.3
No load excitation current	A	0.84	0.97	1.09	1.38	0.57	0.61	0.65	0.73	0.81	0.91
Class H BR excitation voltage	V	47.3	49.8	51.4	50.6	41.1	41.9	42.7	44.2	46.0	48.4
Class H BR excitation current	A	3.22	3.39	3.49	3.44	2.80	2.85	2.91	3.01	3.13	3.29

WINDING RESISTANCE *At 20°C*

Stator line-to-line (series star)	Ω	0.0320				Exciter field		Ω	14.70
Main field	Ω	0.29							

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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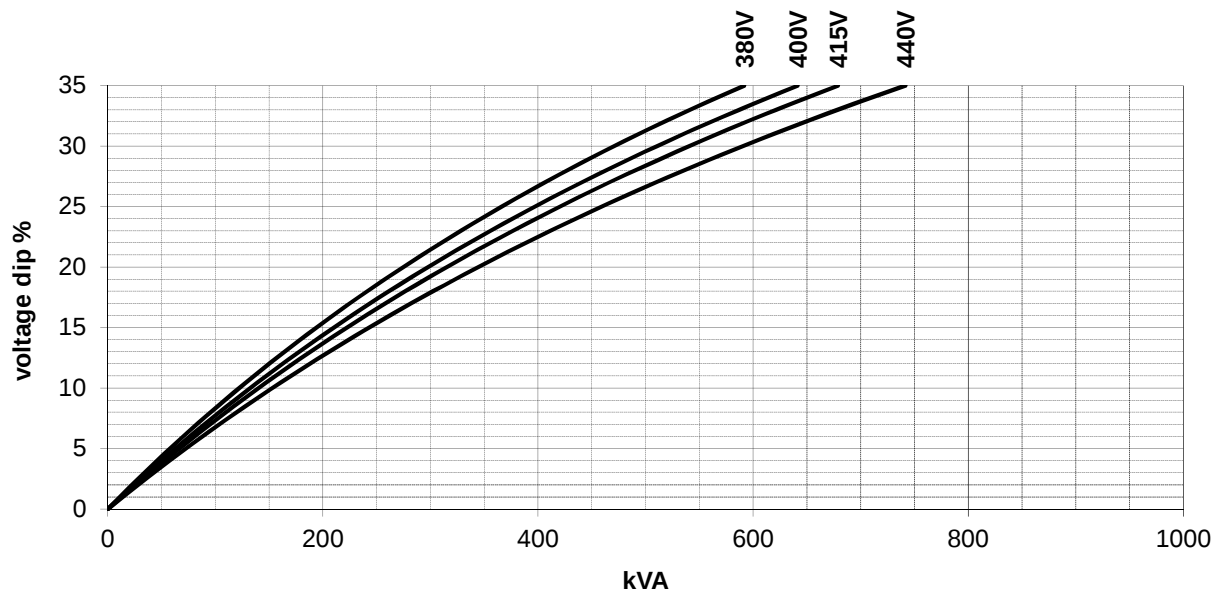
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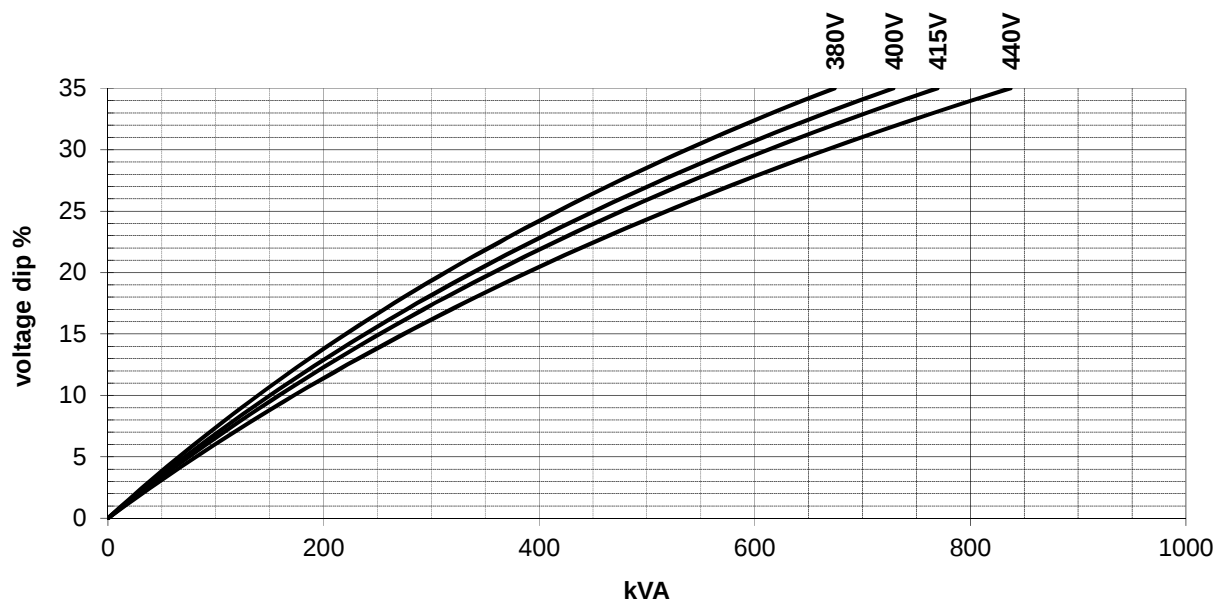
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

50 Hz SHUNT



50 Hz AREP / PMG



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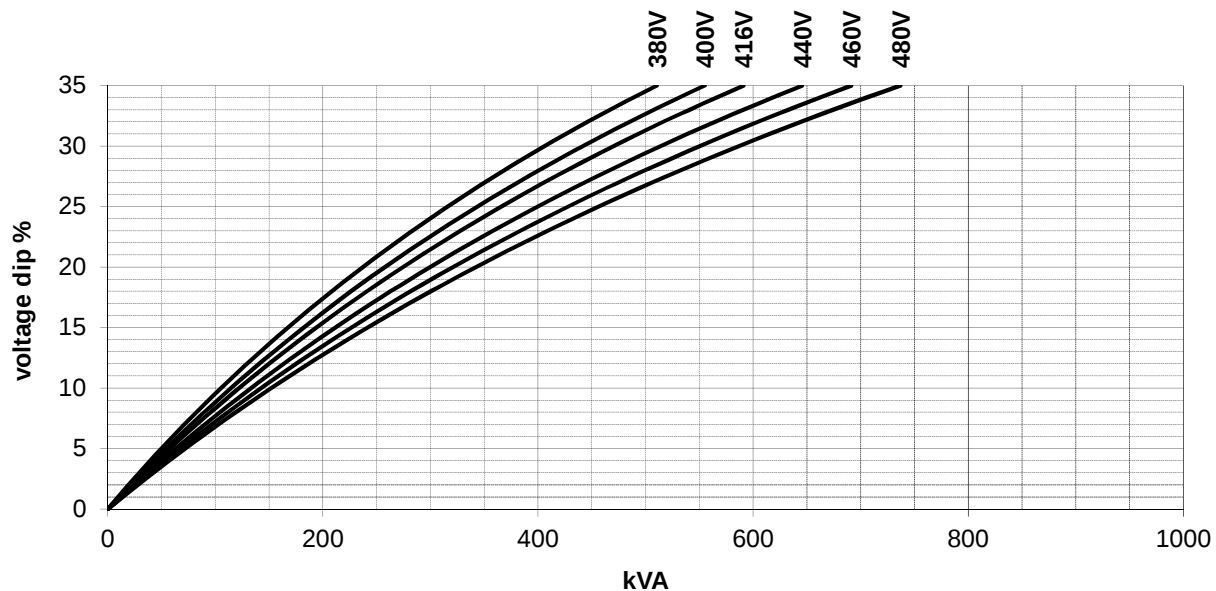
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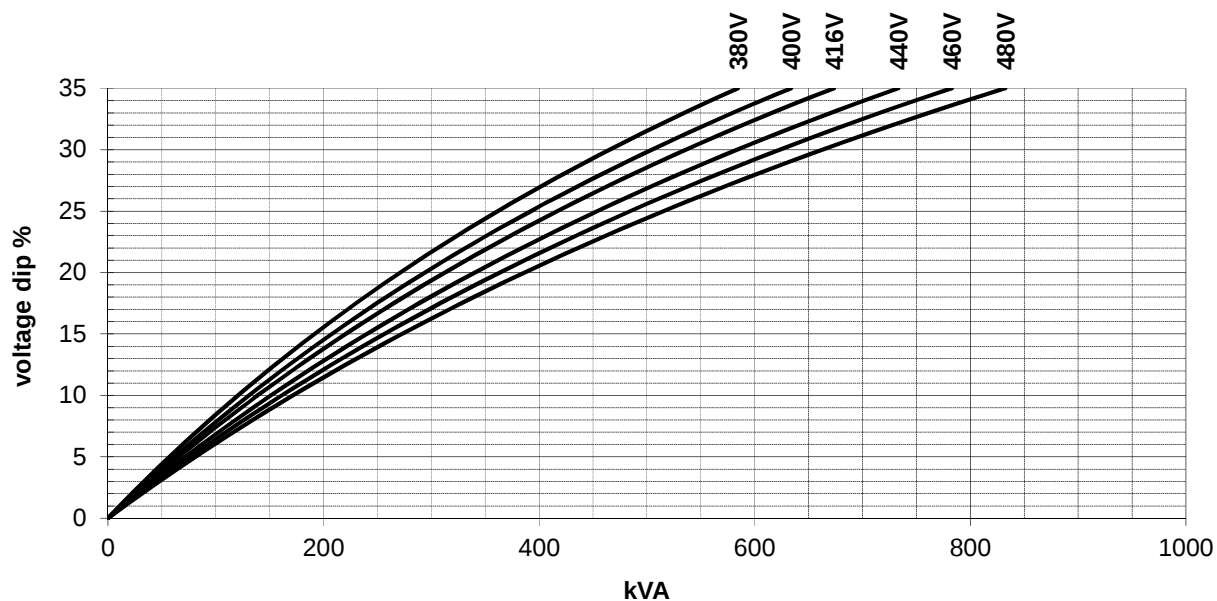
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

60 Hz SHUNT



60 Hz AREP / PMG



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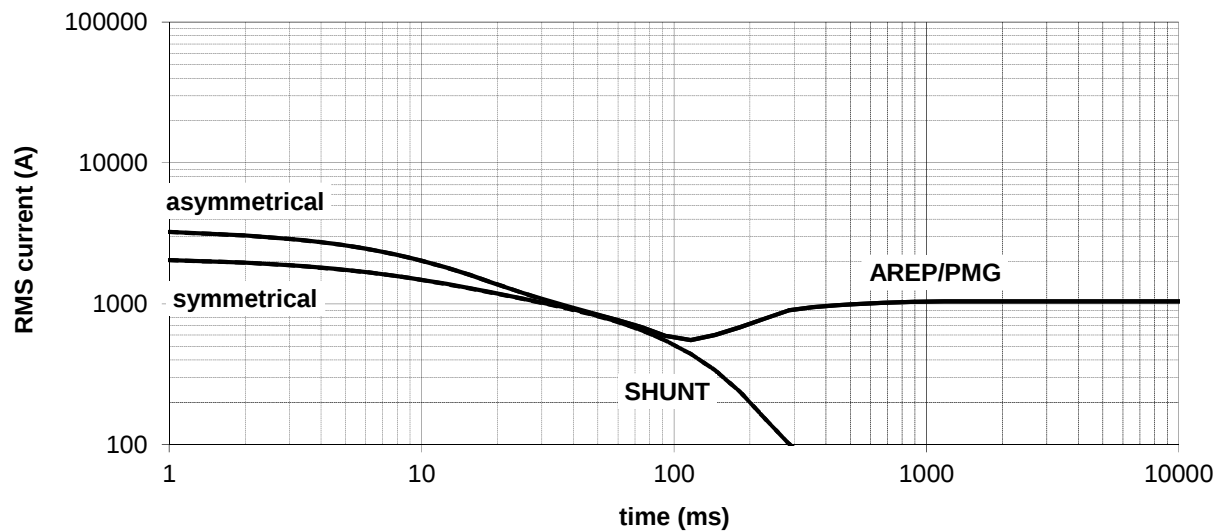
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THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES

No-load excitation at rated speed

400V 50Hz, 480V 60Hz

Series 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	Series Star	Parallel Star	Series Delta
Multiplication Factor	1.00	2.00	1.73

Apply factor to the complete curve

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

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