

FRAME

1504P

WINDING

6



MODELS LL1514P/LL1524P/LL1534P

REF: F1504PW6-1 NOVEMBER 2012

WINDING DETAILS

Code	6	Insulation class	H
Phase	3	Leads	12
Pole number	4	Pitch	0.667

MECHANICAL DETAILS

Standard protection	IP23
Overspeed	rpm 2250
Air flow 50Hz/60Hz	m ³ /s 0.1/0.13

EXCITATION DETAILS

Excitation system	SHUNT	AREP/PMG
AVR model	R220	R438
Sustained short-circuit current	-	300
Steady state voltage regulation	+/- 0.5%	+/- 0.5%

WAVEFORM

Line voltage on no load or balanced linear rated load

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					
	V	380	400	415	440	380	400	416	440	460	480
Series star	V	220	230	240	240	220	230	240	240	240	240
Series delta	V										
Parallel star	V		200	208	220		200	208	220	230	240

RATING

Power factor 0.8, Altitude <=1000m

Class	Rating	kVA	60.0	60.0	60.0	52.0	59.0	62.0	65.0	69.0	75.0	75.0
Class H rise BR	125/40	kVA	60.0	60.0	60.0	52.0	59.0	62.0	65.0	69.0	75.0	75.0
		kW	48.0	48.0	48.0	41.6	47.2	49.6	52.0	55.2	60.0	60.0
Class H rise PR	150/40	kVA	63.6	63.6	63.6	55.1	62.5	65.7	68.9	73.1	79.5	79.5
		kW	50.9	50.9	50.9	44.1	50.0	52.6	55.1	58.5	63.6	63.6
Class H rise PR	163/27	kVA	66.0	66.0	66.0	57.2	64.9	68.2	71.5	75.9	82.5	82.5
		kW	52.8	52.8	52.8	45.8	51.9	54.6	57.2	60.7	66.0	66.0
Class F rise BR	105/40	kVA	54.6	54.6	54.6	47.3	53.7	56.4	59.2	62.8	68.3	68.3
		kW	43.7	43.7	43.7	37.9	43.0	45.1	47.3	50.2	54.6	54.6

EFFICIENCIES

Power factor 0.8

Efficiency	Class	%	89.7	90.0	90.1	90.5	90.1	90.4	90.5	90.7	90.6	90.9
110%	Class H BR	%	89.7	90.0	90.1	90.5	90.1	90.4	90.5	90.7	90.6	90.9
100%	Class H BR	%	90.2	90.5	90.6	90.8	90.6	90.9	91.0	91.2	91.1	91.3
75%	Class H BR	%	91.5	91.6	91.5	91.2	91.8	92.0	92.1	92.2	92.2	92.2
50%	Class H BR	%	92.3	92.1	91.9	90.9	92.7	92.7	92.8	92.8	92.7	92.6
25%	Class H BR	%	91.2	90.6	90.0	87.6	91.7	91.6	91.5	91.3	91.3	90.8

CHARACTERISTIC PARAMETERS

Reactance base class H BR rating

Parameter	Unit	0.40	0.47	0.54	0.82	0.30	0.33	0.34	0.37	0.39	0.45
K _c Short-circuit ratio		0.40	0.47	0.54	0.82	0.30	0.33	0.34	0.37	0.39	0.45
X _d D-Axis synchronous reactance (unsaturated)	pu	3.16	2.85	2.65	2.04	3.73	3.53	3.43	3.25	3.23	2.97
X' _d D-Axis transient reactance (saturated)	pu	0.16	0.15	0.14	0.10	0.19	0.18	0.18	0.17	0.17	0.15
X'' _d D-Axis sub-transient reactance (saturated)	pu	0.081	0.073	0.068	0.052	0.096	0.091	0.088	0.083	0.083	0.076
X _q Q-Axis synchronous reactance (unsaturated)	pu	1.58	1.43	1.32	1.02	1.86	1.77	1.71	1.63	1.62	1.48
X'' _q Q-Axis sub-transient reactance (saturated)	pu	0.116	0.105	0.098	0.075	0.137	0.130	0.126	0.120	0.119	0.109
X ₂ Negative-sequence reactance (saturated)	pu	0.099	0.089	0.083	0.064	0.116	0.110	0.107	0.102	0.101	0.093
X ₀ Zero-sequence reactance (independent)	pu	0.010	0.009	0.008	0.006	0.012	0.011	0.011	0.010	0.010	0.009
T' _d D-Axis transient time constant	ms		50						50		
T'' _d D-Axis sub-transient time constant	ms		5						5		
T' _{do} D-Axis open-circuit time constant	ms		974						974		
T _a Armature time constant	ms		7.5						7.5		
T _r Voltage recovery time	ms		< 500ms						< 500ms		

EXCITATION VOLTAGE AND CURRENT

No load excitation voltage	V	9.0	10.1	11.2	13.8	6.7	7.1	7.5	8.3	9.0	9.8
No load excitation current	A	0.51	0.57	0.64	0.78	0.38	0.41	0.43	0.47	0.51	0.56
Class H BR excitation voltage	V	31.6	32.1	33.1	32.7	28.0	28.5	29.2	30.3	32.4	32.8
Class H BR excitation current	A	1.79	1.83	1.88	1.86	1.59	1.62	1.66	1.72	1.84	1.86

WINDING RESISTANCE

At 20°C

Stator line-to-line (series star)	Ω	0.182		Exciter field	Ω	17.6
Main field	Ω	0.95				

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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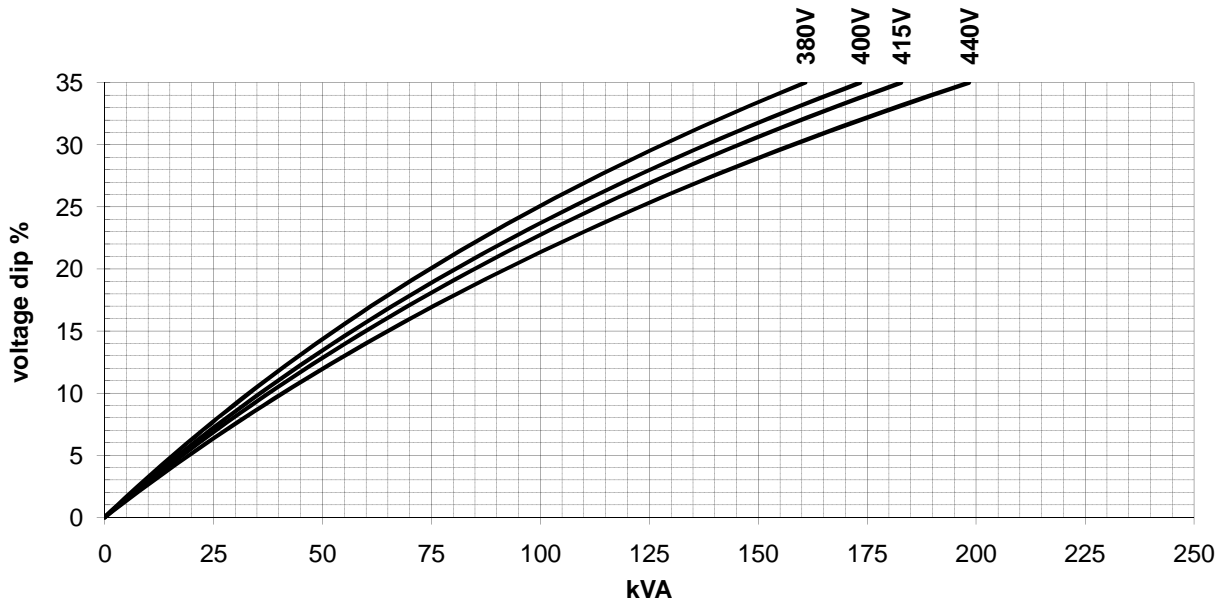
MODELS LL1514P/LL1524P/LL1534P

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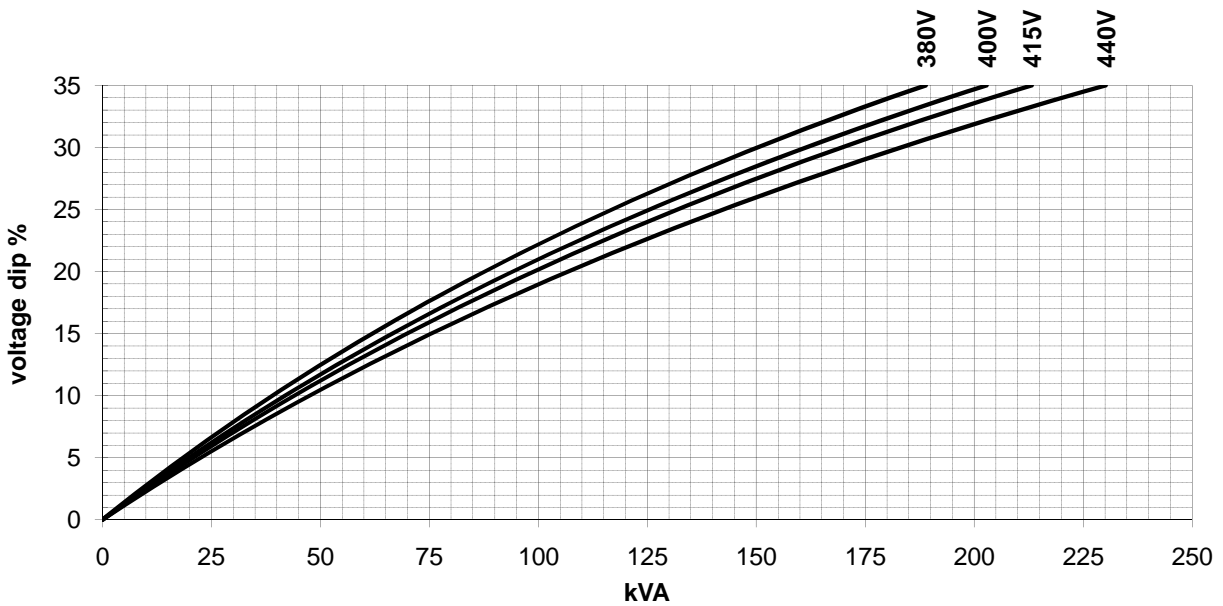
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

50 Hz SHUNT



50 Hz AREP/PMG



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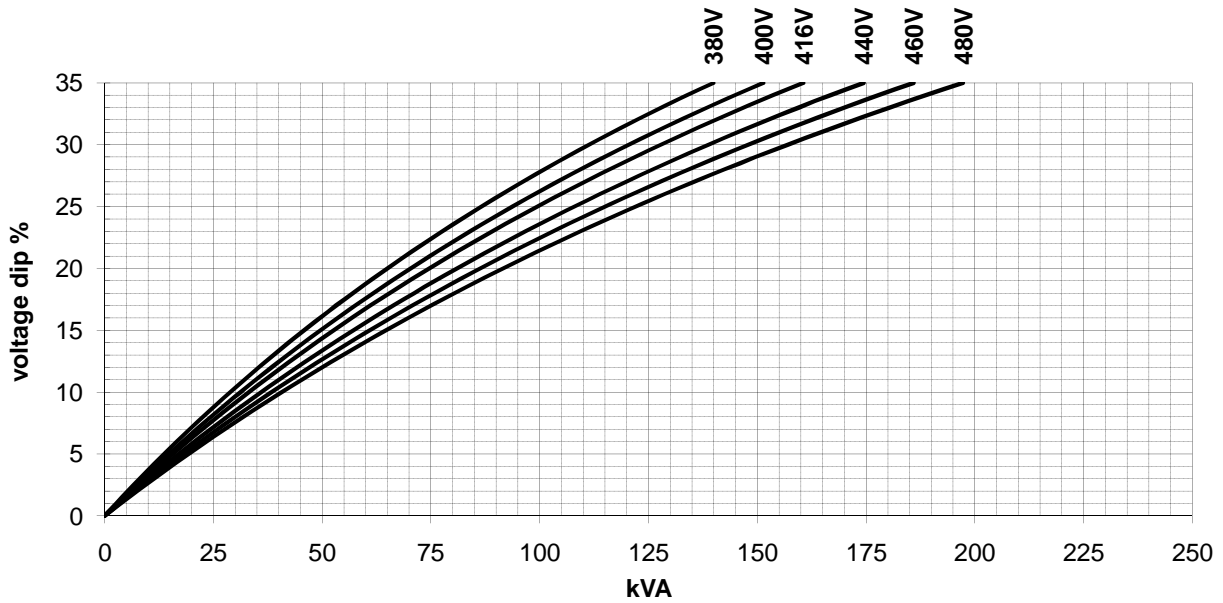
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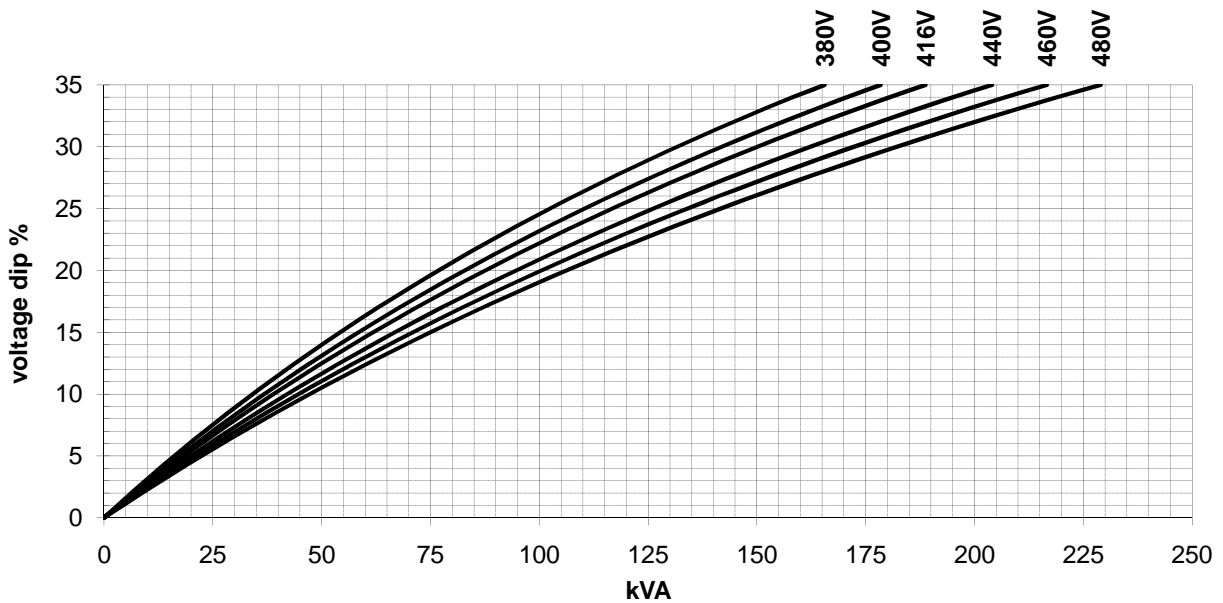
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Power factor 0.6

60 Hz SHUNT



60 Hz AREP/PMG

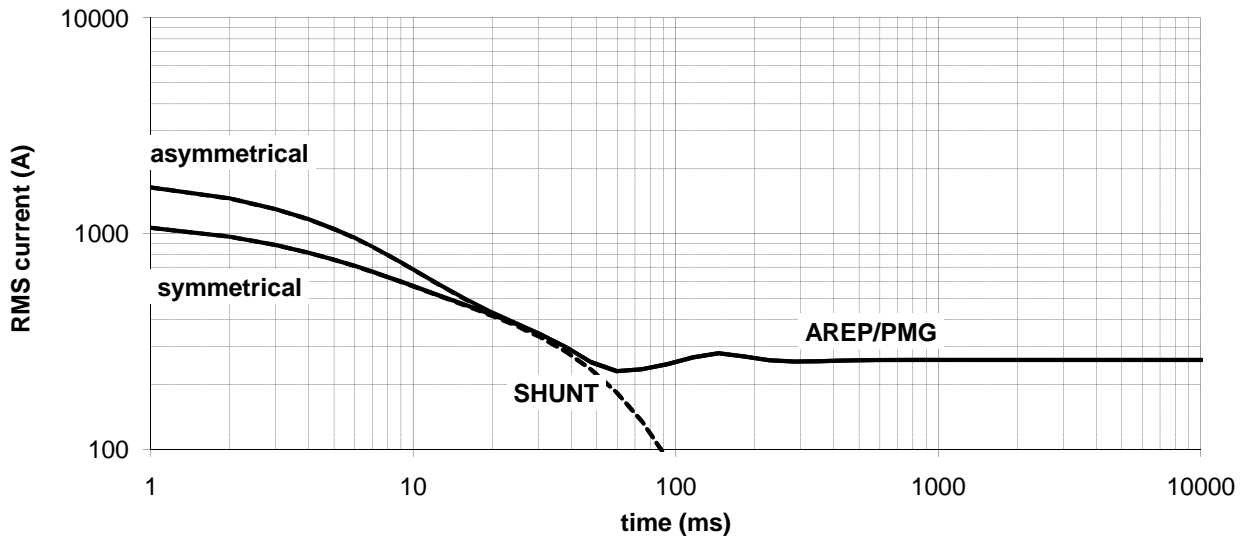


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THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES*No-load excitation at rated speed***400V 50Hz, 480V 60Hz***Series star***Multiplication Factors****50Hz Voltages**

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