

**FRAME****1114M****WINDING****6****MODELS**      **LL1114M**

REF: F1114MW6-2      MAY 2012

**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 <sup>3</sup> /s 0.06/0.072

**EXCITATION DETAILS**

Excitation system	<b>SHUNT</b>
AVR model	R220
Sustained short-circuit current	-
Steady state voltage regulation	±1.0%

**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	V	50Hz / 1500rpm				60Hz / 1800rpm							
		380	400	415	440	380	400	416	440	460	480		
Series star	V	220	230	240	220	230	240	220	230	240	220	230	240
Series delta	V	200	208	220	200	208	220	200	208	220	200	208	220
Parallel star	V	200	208	220	200	208	220	200	208	220	200	208	220

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

Class	Rating	kVA	20.0	20.0	20.0	19.0	25.0	25.5	26.0	26.0	26.0	26.0
Class H rise BR	125/40	kVA	20.0	20.0	20.0	19.0	25.0	25.5	26.0	26.0	26.0	26.0
		kW	16.0	16.0	16.0	15.2	20.0	20.4	20.8	20.8	20.8	20.8
Class H rise PR	150/40	kVA	21.2	21.2	21.2	20.1	26.5	27.0	27.6	27.6	27.6	27.6
		kW	17.0	17.0	17.0	16.1	21.2	21.6	22.1	22.1	22.1	22.1
Class H rise PR	163/27	kVA	22.0	22.0	22.0	20.9	27.5	28.1	28.6	28.6	28.6	28.6
		kW	17.6	17.6	17.6	16.7	22.0	22.4	22.9	22.9	22.9	22.9
Class F rise BR	105/40	kVA	18.2	18.2	18.2	17.3	22.8	23.2	23.7	23.7	23.7	23.7
		kW	14.6	14.6	14.6	13.8	18.2	18.6	18.9	18.9	18.9	18.9

**EFFICIENCIES**      *Power factor 0.8*

Efficiency	Class	Rating	%	86.5	86.7	86.5	85.9	85.5	86.0	86.4	86.9	87.2	87.3
110%	Class H BR		%	86.5	86.7	86.5	85.9	85.5	86.0	86.4	86.9	87.2	87.3
100%	Class H BR		%	87.0	87.1	86.9	86.1	86.1	86.6	86.9	87.4	87.6	87.6
75%	Class H BR		%	87.9	87.7	87.3	86.1	87.6	87.9	88.1	88.2	88.2	88.1
50%	Class H BR		%	87.8	87.2	86.6	84.6	88.3	88.3	88.3	88.1	87.8	87.4
25%	Class H BR		%	84.1	82.8	81.6	78.1	85.9	85.5	85.2	84.3	83.5	82.5

**CHARACTERISTIC PARAMETERS**      *Reactance base class H BR rating*

K <sub>c</sub>	Short-circuit ratio		0.53	0.62	0.72	0.97	0.32	0.35	0.38	0.44	0.51	0.57
X <sub>d</sub>	D-Axis synchronous reactance (unsaturated)	pu	2.14	1.93	1.79	1.52	3.21	2.95	2.78	2.49	2.28	2.09
X' <sub>d</sub>	D-Axis transient reactance (saturated)	pu	0.17	0.15	0.14	0.12	0.26	0.24	0.22	0.20	0.18	0.17
X'' <sub>d</sub>	D-Axis sub-transient reactance (saturated)	pu	0.085	0.077	0.072	0.060	0.128	0.118	0.111	0.099	0.091	0.083
X <sub>q</sub>	Q-Axis synchronous reactance (unsaturated)	pu	2.05	1.85	1.72	1.45	3.07	2.83	2.67	2.39	2.18	2.00
X'' <sub>q</sub>	Q-Axis sub-transient reactance (saturated)	pu	0.180	0.162	0.151	0.127	0.269	0.248	0.234	0.209	0.191	0.176
X <sub>2</sub>	Negative-sequence reactance (saturated)	pu	0.132	0.120	0.111	0.094	0.199	0.183	0.172	0.154	0.141	0.129
X <sub>0</sub>	Zero-sequence reactance (independent)	pu	0.007	0.006	0.006	0.005	0.010	0.010	0.009	0.008	0.007	0.007
T' <sub>d</sub>	D-Axis transient time constant	ms		74						74		
T'' <sub>d</sub>	D-Axis sub-transient time constant	ms		7.4						7.4		
T' <sub>do</sub>	D-Axis open-circuit time constant	ms		927.4025974						927.4025974		
T <sub>a</sub>	Armature time constant	ms		11.1						11.1		
T <sub>r</sub>	Voltage recovery time	ms		< 300						< 300		

**EXCITATION VOLTAGE AND CURRENT**

No load excitation voltage	V	8.9	9.9	11.0	13.3	6.6	7.1	7.6	8.3	9.2	9.9
No load excitation current	A	0.73	0.80	0.89	1.08	0.54	0.58	0.62	0.67	0.75	0.80
Class H BR excitation voltage	V	25.0	25.7	26.4	27.7	26.8	26.6	26.6	26.4	26.6	26.8
Class H BR excitation current	A	2.03	2.09	2.14	2.26	2.18	2.16	2.16	2.14	2.16	2.18

**WINDING RESISTANCE**      *At 20° C*

Stator line-to-line (series star)	Ω	0.560		Exciter field	Ω	12.3
Main field	Ω	4.31				

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.

**FRAME**

**1114M**

**WINDING**

**6**



**MODELS**

**LL1114M**

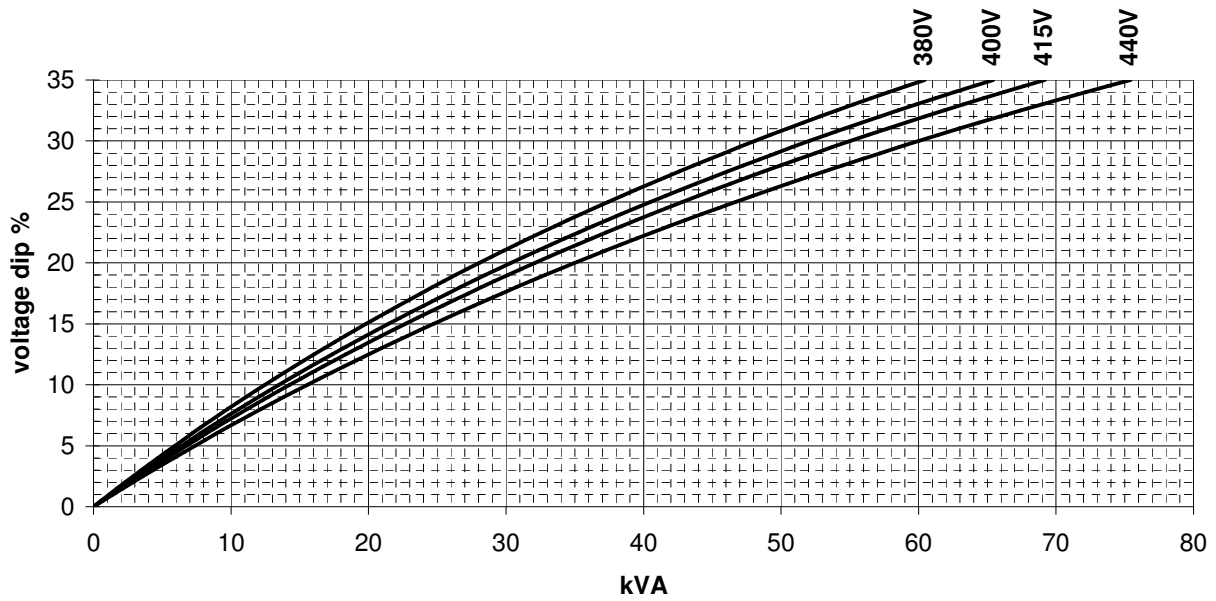
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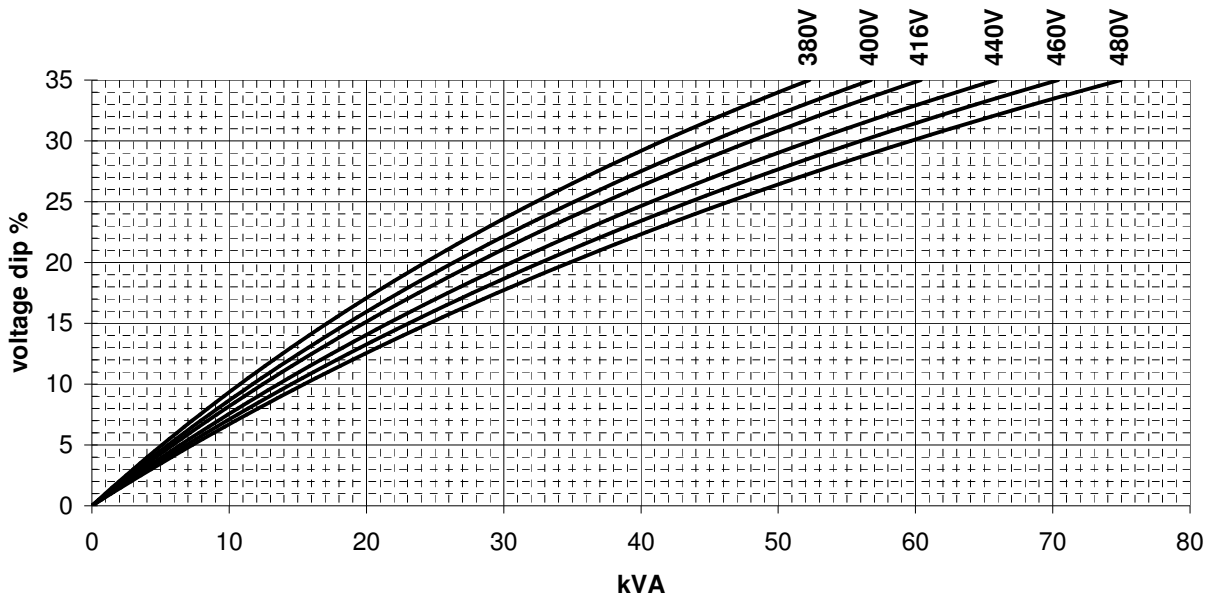
**LOCKED ROTOR MOTOR STARTING CURVES**

*Power factor 0.6*

**50 Hz SHUNT**



**60 Hz SHUNT**



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**MODELS LL1114M**

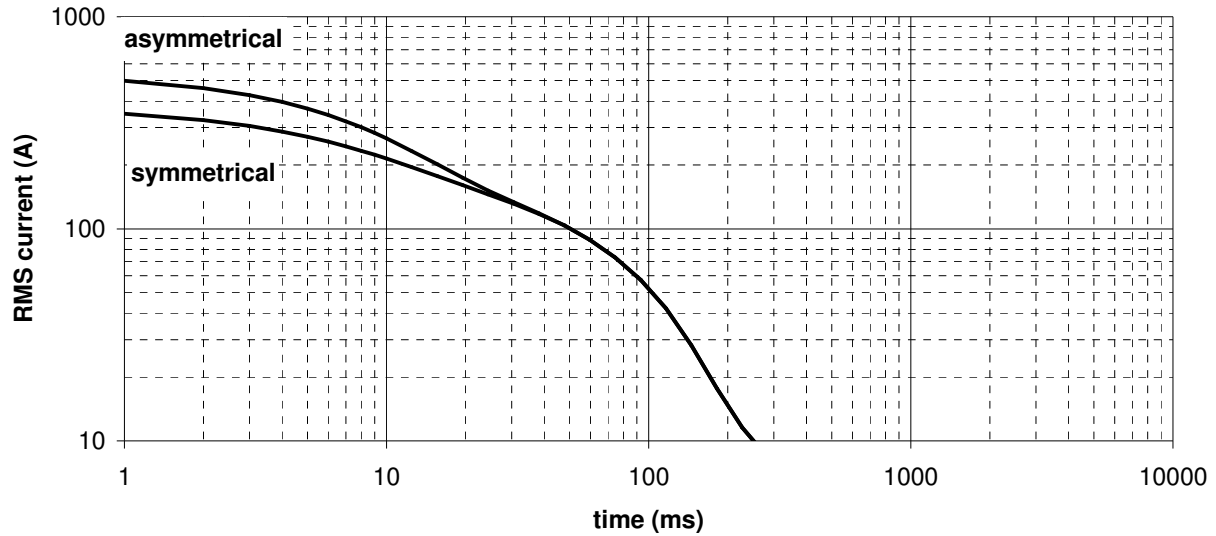
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**THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES**

*No-load excitation at rated speed*

**400V 50Hz, 480V 60Hz**

*Series star*



**Multiplication Factors**

<b>50Hz Voltages</b>	<b>380</b>	<b>400</b>	<b>415</b>	<b>440</b>
<b>Multiplication Factor</b>	0.95	1.00	1.04	1.10

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

<b>60Hz Voltages</b>	<b>380</b>	<b>400</b>	<b>416</b>	<b>440</b>	<b>460</b>	<b>480</b>
<b>Multiplication Factor</b>	0.79	0.83	0.87	0.92	0.96	1.00

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

<b>Winding Connection</b>	<b>Series Star</b>	<b>Parallel Star</b>	<b>Series Delta</b>
<b>Multiplication Factor</b>	1.00	2.00	1.73

*Apply factor to the complete curve*

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