

MODEL FG33A560**WINDING R16**

REF: FG33A560R16-1 APR 2019

WINDING DETAILS

Code	R16	Insulation class	H
Phase	3	Leads	6
Pole number	4	Pitch	2/3

MECHANICAL DETAILS

Standard protection	IP21
Overspeed	rpm 2250
Air flow 50Hz/60Hz	m ³ /s 1.15/1.38

EXCITATION DETAILS

Excitation system	SHUNT	PMG
AVR model	A-OPT-04E	IVR
Sustained short-circuit current	-	300:10s
Steady state voltage regulation	+/- 0.5 %	+/- 0.25 %

WAVEFORM

<i>Line voltage on no load or balanced linear rated load</i>	
Total harmonic content THC	< 3 %
Telephone influence factor TIF (NEMA)	< 50 %
Telephone harmonic factor THF (IEC)	< 2 %

LINE VOLTAGE

Frequency / speed	V	50Hz / 1500rpm			60Hz / 1800rpm				
		380	400	415	380	416	440	460	480
Series star	V	220	230	240	220	240	254	266	277
Series delta	V								

RATING

Power factor 0.8, Altitude <=1000m

Class	Rating	kVA	665	700	700	721	783	820	850	875
Class H rise BR	125/40	kVA	532	560	560	577	626	656	680	700
		kW	585	616	616	606	657	689	714	735
Class H rise PR	150/40	kVA	732	770	770	758	821	861	893	919
		kW	612	644	644	635	688	722	748	770
Class H rise PR	163/27	kVA	765	805	805	794	860	903	935	963
		kW	599	630	630	649	704	738	765	788
Class F rise BR	105/40	kVA	479	504	504	519	563	590	612	630

EFFICIENCIES

Power factor 0.8

Efficiency	Class	%	94.4	94.6	94.8	94.5	94.4	94.8	94.9	95.0
110%	Class H BR	%	94.8	94.9	95.2	94.9	94.7	95.1	95.2	95.3
100%	Class H BR	%	95.4	95.4	95.6	95.3	95.3	95.5	95.6	95.7
75%	Class H BR	%	95.2	95.3	95.4	95.1	95.0	95.2	95.3	95.3
50%	Class H BR	%	93.5	93.5	93.7	93.1	93.1	93.2	93.3	93.3
25%	Class H BR	%								

CHARACTERISTIC PARAMETERS

Reactance base class H BR rating

Parameter	Unit	0.40	0.43	0.47	0.28	0.31	0.34	0.36	0.39
K _{cc} Short-circuit ratio		2.84	2.70	2.51	3.89	3.52	3.29	3.13	2.95
X _d D-Axis synchronous reactance (unsaturated)	pu	0.13	0.12	0.11	0.17	0.15	0.14	0.14	0.13
X' _d D-Axis transient reactance (saturated)	pu	0.101	0.096	0.090	0.132	0.119	0.112	0.106	0.100
X'' _d D-Axis sub-transient reactance (saturated)	pu	1.27	1.20	1.12	1.69	1.53	1.43	1.36	1.28
X _q Q-Axis synchronous reactance (unsaturated)	pu	0.140	0.133	0.123	0.183	0.166	0.155	0.147	0.139
X'' _q Q-Axis sub-transient reactance (saturated)	pu	0.120	0.110	0.106	0.160	0.140	0.130	0.130	0.120
X ₂ Negative-sequence reactance (saturated)	pu	0.006	0.006	0.006	0.008	0.007	0.007	0.007	0.006
X ₀ Zero-sequence reactance (independent)	pu								
T' _d D-Axis transient time constant	ms		104				103		
T'' _d D-Axis sub-transient time constant	ms		3				3		
T' _{do} D-Axis open-circuit time constant	ms		2285				2400		
T _a Armature time constant	ms		17				17		

EXCITATION VOLTAGE AND CURRENT

Parameter	Unit	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
No load excitation voltage	V	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No load excitation current	A	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Class H BR excitation voltage	V	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Class H BR excitation current	A								

WINDING RESISTANCE

At 20° C

Parameter	Unit	0.006	Exciter field	Ω	10.64
Stator line-to-line (Series Star)	Ω				
Main field	Ω	1.08			

According to: IEC 60034-1 & 22, 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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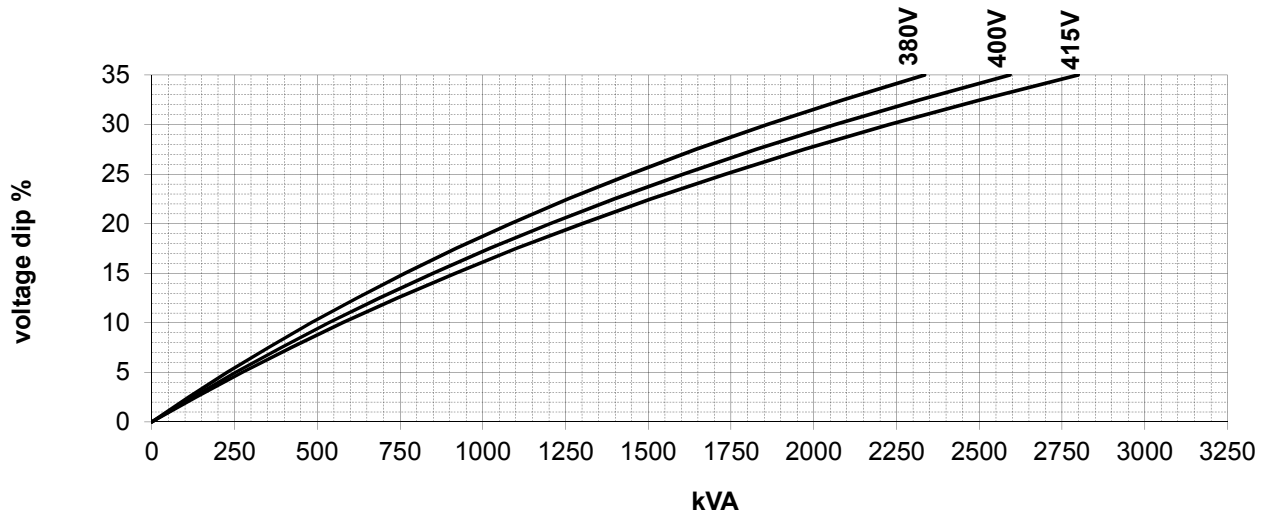


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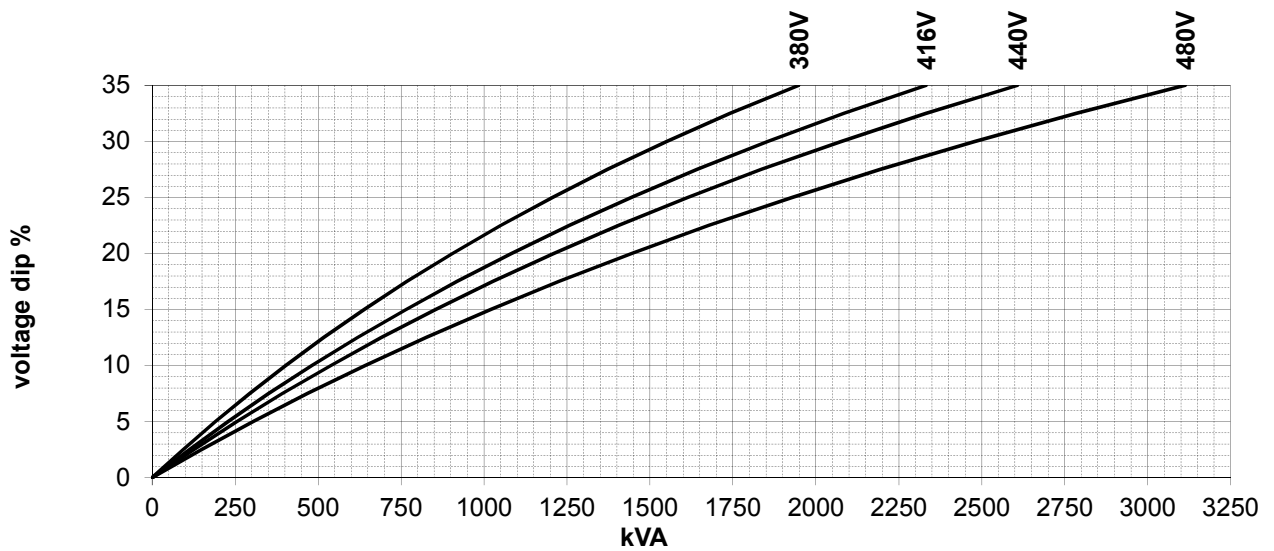
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

50 Hz



60 Hz



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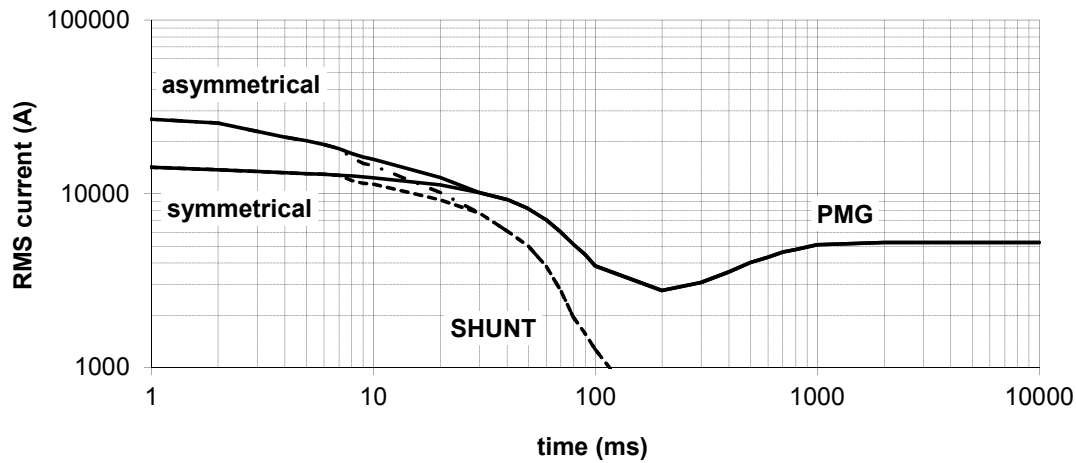
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THREE PHASE - SHORT CIRCUIT DECREMENT CURVES

No-load excitation at rated speed

400V 50Hz, 480V 60Hz

Series Star



Multiplication Factors

50Hz Voltages

	380	400	415
Multiplication Factor	0.95	1.00	1.04

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

60Hz Voltages

	380	416	440	460	480
Multiplication Factor	0.79	0.87	0.92	0.96	1

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 60034-1 & 22, BS 4999/5000, NEMA MG 1-33

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