

**MODEL****FG29A280****WINDING****R1**

REF: FG29A280R1-0 JAN 2019

**WINDING DETAILS**

Code	R1	Insulation class	H
Phase	3	Leads	12
Pole number	4	Pitch	2/3

**MECHANICAL DETAILS**

Standard protection	IP21
Overspeed	rpm 2250
Air flow 50Hz/60Hz	m <sup>3</sup> /s 0.25/0.30

**EXCITATION DETAILS**

Excitation system	<b>SHUNT</b>	<b>PMG</b>
AVR model	GRT7-TH4E	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	380	400	415	380	416	440	460	480
Series delta	V	220	230	240	220	240	254	266	277
Parallel star	V	190	200	208	190	208	220	230	240

**RATING**

Power factor 0.8, Altitude &lt;=1000m

Class	Rating	kVA	333	350	350	363	388	408	428	436
Class H rise BR	125/40	kVA	333	350	350	363	388	408	428	436
		kW	266	280	280	290	310	326	342	349
Class H rise PR	150/40	kVA	366	385	385	380	406	428	449	458
		kW	293	308	308	304	325	342	359	366
Class H rise PR	163/27	kVA	382	403	403	399	426	448	470	480
		kW	306	322	322	319	341	358	376	384
Class F rise BR	105/40	kVA	299	315	315	326	349	367	385	393
		kW	239	252	252	261	279	293	308	314

**EFFICIENCIES**

Power factor 0.8

Efficiency	Class	%	93.0	93.1	93.6	92.9	93.4	93.6	93.8	93.8
110%	Class H BR	%	93.0	93.1	93.6	92.9	93.4	93.6	93.8	93.8
100%	Class H BR	%	93.5	93.6	94.1	93.4	93.8	94.1	94.2	94.2
75%	Class H BR	%	94.4	94.4	94.7	94.3	94.6	94.7	94.8	94.8
50%	Class H BR	%	94.2	94.2	94.4	94.1	94.3	94.4	94.4	94.4
25%	Class H BR	%	92.4	92.3	92.5	92.1	92.2	92.3	92.3	92.2

**CHARACTERISTIC PARAMETERS**

Reactance base class H BR rating

K <sub>cc</sub>	Short-circuit ratio		0.37	0.41	0.45	0.25	0.28	0.31	0.33	0.33
X <sub>d</sub>	D-Axis synchronous reactance (unsaturated)	pu	3.46	3.29	3.05	4.53	4.04	3.79	3.64	3.42
X' <sub>d</sub>	D-Axis transient reactance (saturated)	pu	0.12	0.12	0.11	0.16	0.15	0.14	0.13	0.12
X'' <sub>d</sub>	D-Axis sub-transient reactance (saturated)	pu	0.113	0.108	0.100	0.149	0.133	0.125	0.120	0.112
X <sub>q</sub>	Q-Axis synchronous reactance (unsaturated)	pu	1.53	1.46	1.35	2.00	1.79	1.68	1.61	1.51
X'' <sub>q</sub>	Q-Axis sub-transient reactance (saturated)	pu	0.172	0.164	0.152	0.226	0.201	0.189	0.182	0.171
X <sub>2</sub>	Negative-sequence reactance (saturated)	pu	0.147	0.140	0.130	0.190	0.170	0.160	0.150	0.141
X <sub>0</sub>	Zero-sequence reactance (independent)	pu	0.007	0.006	0.006	0.009	0.008	0.007	0.007	0.007
T' <sub>d</sub>	D-Axis transient time constant	ms		75				75		
T'' <sub>d</sub>	D-Axis sub-transient time constant	ms		2				2		
T' <sub>do</sub>	D-Axis open-circuit time constant	ms		2090				2090		
T <sub>a</sub>	Armature time constant	ms		15				15		

**EXCITATION VOLTAGE AND CURRENT**

No load excitation voltage	V	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
No load excitation current	A	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Class H BR excitation voltage	V	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Class H BR excitation current	A	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50

**WINDING RESISTANCE**

At 20° C

Stator line-to-line (Series Star)	Ω	0.017			Exciter field	Ω	9.86
Main field	Ω	0.61					

According to: IEC 60034-1 &amp; 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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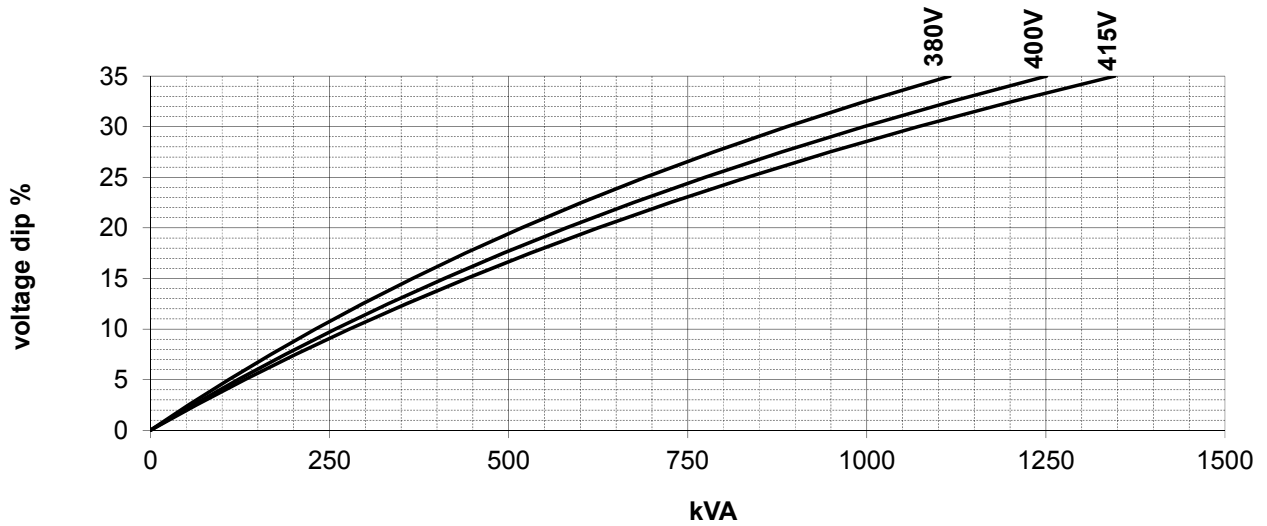


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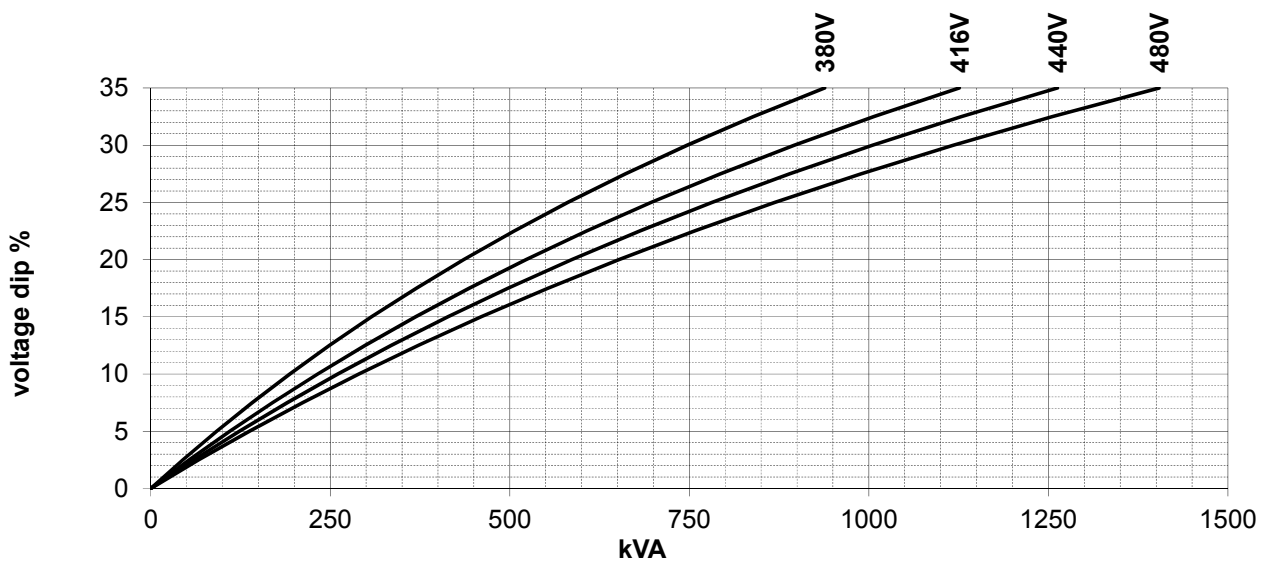
**LOCKED ROTOR MOTOR STARTING CURVES**

Power factor 0.6

**50 Hz**



**60 Hz**



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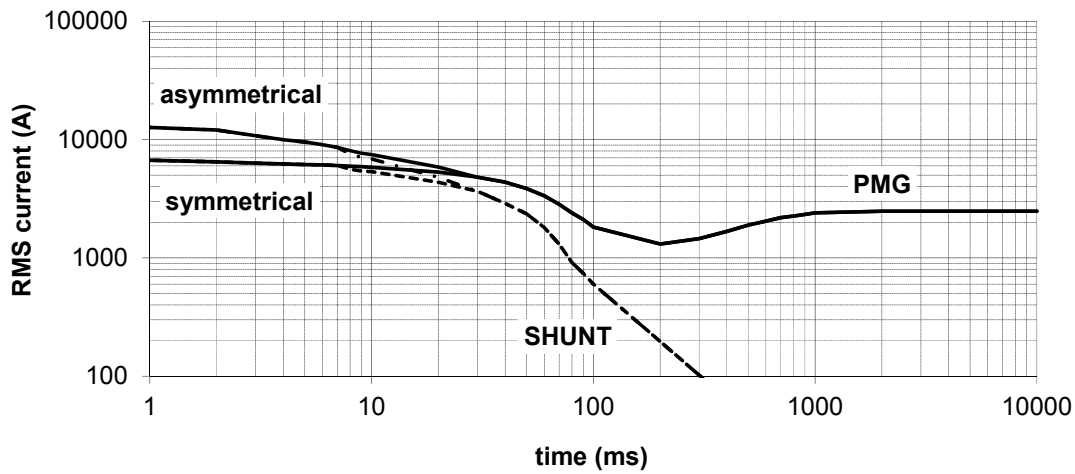
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THREE PHASE - SHORT CIRCUIT DECREMENT CURVES

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      1.00

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

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