MODEL FG29A360 WINDING R1

REF: FG29A360R1-0 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^3/s	0.25/0.30

EXCITATION DETAILS

Excitation system	**SHUNT**	**PMG**
AVR model	GRT7-TH4E	IVR
Sustained short-circuit current	-	300:10s
Steady state voltage regulation	+/- 0.5 %	+/- 0.25 %

WAVEFORM

Line voltage on no load or balanced linear rated load

Total harmonic content THC	< 3 %
Telephone influence factor TIF (NEMA)	< 50 %
Telephone harmonic factor THF (IEC)	< 2 %

LINE VOLTAGE

Frequency / speed		**50Hz / 1500rpm**			**60Hz / 1800rpm**				
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 <=1000m

Class H rise BR	**125/40**	**kVA**	**428**	**450**	**450**	**453**	**494**	**515**	**533**	**555**
		kW	*342*	*360*	*360*	*362*	*395*	*412*	*426*	*444*
Class H rise PR	**150/40**	**kVA**	**470**	**495**	**495**	**475**	**519**	**541**	**559**	**583**
		kW	*376*	*396*	*396*	*380*	*415*	*433*	*447*	*466*
Class H rise PR	**163/27**	**kVA**	**492**	**518**	**518**	**498**	**544**	**566**	**586**	**610**
		kW	*393*	*414*	*414*	*398*	*435*	*453*	*469*	*488*
Class F rise BR	**105/40**	**kVA**	**385**	**405**	**405**	**407**	**444**	**464**	**479**	**500**
		kW	*308*	*324*	*324*	*326*	*356*	*371*	*383*	*400*

EFFICIENCIES

Power factor 0.8

110%	**Class H BR**	**%**	93.7	93.8	95.7	95.0	95.3	95.5	95.6	95.8
100%	**Class H BR**	**%**	94.2	94.2	95.9	95.3	95.6	95.7	95.9	96.0
75%	**Class H BR**	**%**	94.9	94.9	96.3	95.8	96.0	96.1	96.2	96.3
50%	**Class H BR**	**%**	94.6	94.6	95.8	95.3	95.4	95.5	95.5	95.6
25%	**Class H BR**	**%**	92.8	92.7	94.0	93.2	93.3	93.4	93.4	93.4

CHARACTERISTIC PARAMETERS

Reactance base class H BR rating

K_{cc}	Short-circuit ratio		0.38	0.44	0.46	0.25	0.28	0.31	0.35	0.39
X_d	D-Axis synchronous reactance (unsaturated)	pu	3.28	3.12	3.08	4.44	4.04	3.77	3.56	3.41
X'_d	D-Axis transient reactance (saturated)	pu	0.12	0.11	0.11	0.15	0.14	0.13	0.12	0.12
X''_d	D-Axis sub-transient reactance (saturated)	pu	0.108	0.103	0.096	0.138	0.126	0.117	0.111	0.106
X_q	Q-Axis synchronous reactance (unsaturated)	pu	1.50	1.42	1.36	1.96	1.78	1.66	1.57	1.51
X''_q	Q-Axis sub-transient reactance (saturated)	pu	0.165	0.156	0.147	0.212	0.193	0.180	0.170	0.163
X_2	Negative-sequence reactance (saturated)	pu	0.140	0.130	0.120	0.170	0.160	0.150	0.140	0.130
X_0	Zero-sequence reactance (independent)	pu	0.007	0.006	0.006	0.009	0.008	0.007	0.007	0.007
T'_d	D-Axis transient time constant	ms		85				84		
T''_d	D-Axis sub-transient time constant	ms		2				2		
T'_{do}	D-Axis open-circuit time constant	ms		2327				2474		
T_a	Armature time constant	ms		17				17		

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
No load excitation current	A	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
Class H BR excitation current	A	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	0.012	Exciter field	Ω 9.86
Main field	Ω	0.78		

According to: IEC 60034-1 & 22, BS 4999/5000, NEMA MG 1-33

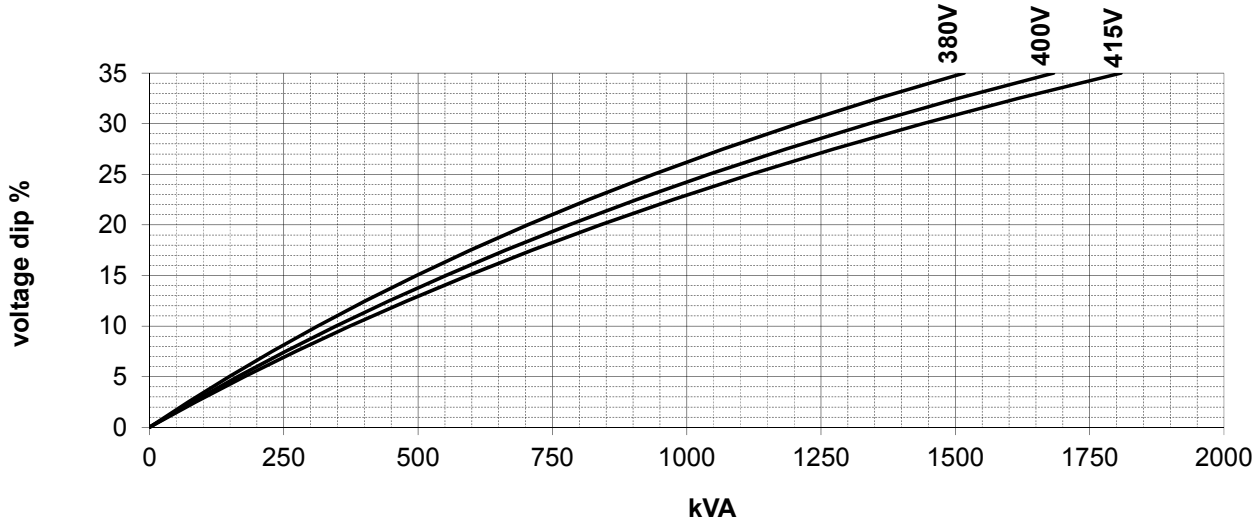
MODEL	FG29A360	WINDING	R1

REF: FG29A360R1-0 JAN 2019

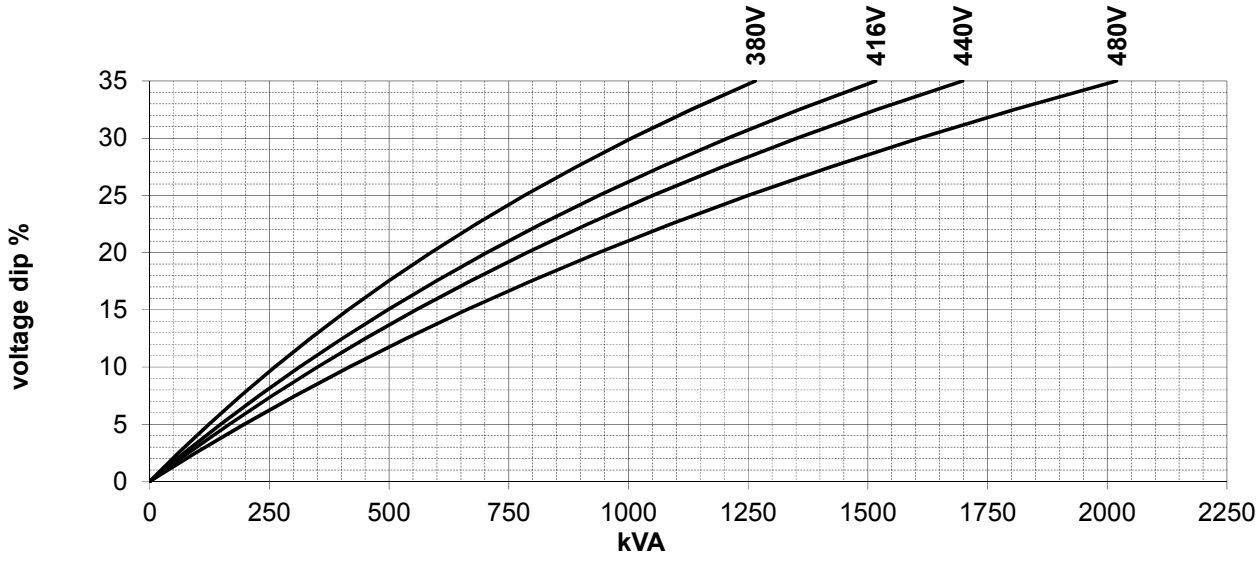
LOCKED ROTOR MOTOR STARTING CURVES

Power factor 0.6

50 Hz



60 Hz



According to: IEC 60034-1 & 22, BS 4999/5000, NEMA MG 1-33

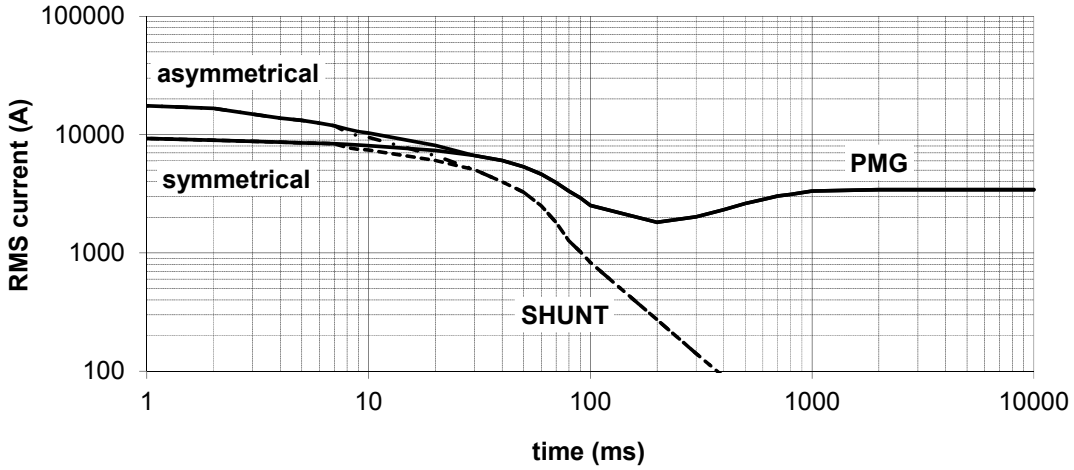
MODEL FG29A360 **WINDING** R1

REF: FG29A360R1-0 JAN 2019

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

According to: IEC 60034-1 & 22, BS 4999/5000, NEMA MG 1-33