

FRAME

FGL60010

WINDING

6



MODELS FGL60010

REF: FGL60010W6-2 DEC 2020

## 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 0.9 / 1.10

## EXCITATION DETAILS

Excitation system	SHUNT	PMG
AVR model	R150	R180
Sustained short-circuit current	-	270%:5s
Steady state voltage regulation	±0.8%	±0.5%

## WAVEFORM

<i>Line voltage on no load</i>	
Total harmonic content THC	< 1.5%
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					
Series Star	V	380	400	415	440	380	400	416	440	460	480
Series Delta	V	220	230	240		220	230	240			
Parallel star	V		200	208	220		200	208	220	230	240

## RATING

*Power factor 0.8, Altitude <=1000m*

Class	Rating	kVA	390	410	410	400	450	465	480	500	505	510
Class H rise BR	125/40	kVA	390	410	410	400	450	465	480	500	505	510
		kW	312	328	328	320	360	372	384	400	404	408
Class H rise PR	150/40	kVA	413	435	435	424	477	493	509	530	535	541
		kW	331	348	348	339	382	394	407	424	428	432
Class H rise PR	163/27	kVA	429	451	451	440	495	512	528	550	556	561
		kW	343	361	361	352	396	409	422	440	444	449
Class F rise BR	105/40	kVA	355	373	373	364	410	423	437	455	460	464
		kW	284	298	298	291	328	339	349	364	368	371

## EFFICIENCIES

*Power factor 0.8*

110%	Class H BR	%	92.6	92.8	93.1	93.6	91.3	91.8	92.0	92.5	92.8	93.2
100%	Class H BR	%	93.0	93.2	93.5	93.9	91.8	92.3	92.5	92.9	93.2	93.5
75%	Class H BR	%	94.0	94.2	94.4	94.6	93.0	93.3	93.5	93.8	94.1	94.3
50%	Class H BR	%	94.7	94.8	94.9	94.8	93.9	94.1	94.2	94.4	94.5	94.6
25%	Class H BR	%	94.1	94.1	93.9	93.5	93.1	93.2	93.3	93.4	93.4	93.3

## CHARACTERISTIC PARAMETERS

*Reactance base class H BR rating*

K <sub>c</sub>	Short-circuit ratio		0.21	0.23	0.26	0.33	0.14	0.15	0.16	0.18	0.20	0.22
X <sub>d</sub>	D-Axis synchronous reactance (unsaturated)	pu	5.10	4.84	4.49	3.90	7.06	6.58	6.28	5.85	5.41	5.01
X' <sub>d</sub>	D-Axis transient reactance (saturated)	pu	0.26	0.25	0.23	0.20	0.36	0.33	0.32	0.30	0.27	0.25
X'' <sub>d</sub>	D-Axis sub-transient reactance (saturated)	pu	0.181	0.172	0.160	0.139	0.251	0.234	0.223	0.208	0.192	0.178
X <sub>q</sub>	Q-Axis synchronous reactance (unsaturated)	pu	2.60	2.47	2.29	1.99	3.60	3.36	3.20	2.98	2.76	2.56
X'' <sub>q</sub>	Q-Axis sub-transient reactance (saturated)	pu	0.203	0.193	0.179	0.155	0.281	0.262	0.250	0.233	0.215	0.200
X <sub>2</sub>	Negative-sequence reactance (saturated)	pu	0.192	0.182	0.169	0.147	0.266	0.248	0.237	0.220	0.204	0.189
X <sub>0</sub>	Zero-sequence reactance (independent)	pu	0.011	0.010	0.009	0.008	0.015	0.014	0.013	0.012	0.011	0.011
T' <sub>d</sub>	D-Axis transient time constant	ms		100						100		
T'' <sub>d</sub>	D-Axis sub-transient time constant	ms		10						10		
T' <sub>do</sub>	D-Axis open-circuit time constant	ms		1968						1968		
T <sub>a</sub>	Armature time constant	ms		15						15		
T <sub>r</sub>	Voltage recovery time	ms		< 500						< 500		

## EXCITATION VOLTAGE AND CURRENT

No load excitation voltage	V	6.6	7.2	7.9	9.0	5.1	5.4	5.7	6.3	6.7	7.2
No load excitation current	A	0.62	0.68	0.74	0.85	0.48	0.51	0.54	0.59	0.63	0.68
Class H BR excitation voltage	V	37.8	38.6	38.2	37.1	40.8	40.4	40.5	40.5	39.9	39.4
Class H BR excitation current	A	3.55	3.63	3.59	3.49	3.83	3.80	3.81	3.81	3.75	3.70

## WINDING RESISTANCE

*At 20°C*

Stator line-to-line (series star)	Ω	0.019		Exciter field - Shunt	Ω	10.6
Main field	Ω	0.48				

According to: IEC 60034, NEMA MG 1.32-33, ISO 8528-3, CSA C22.2, VDE0875G/N and EN55011

Values quoted are typical. In line with our policy of continuous improvement, we reserve the right to change specification without notice.

Manufactured for FG Wilson by Leroy Somer - Nidec.

**FRAME FGL60010 WINDING 6**



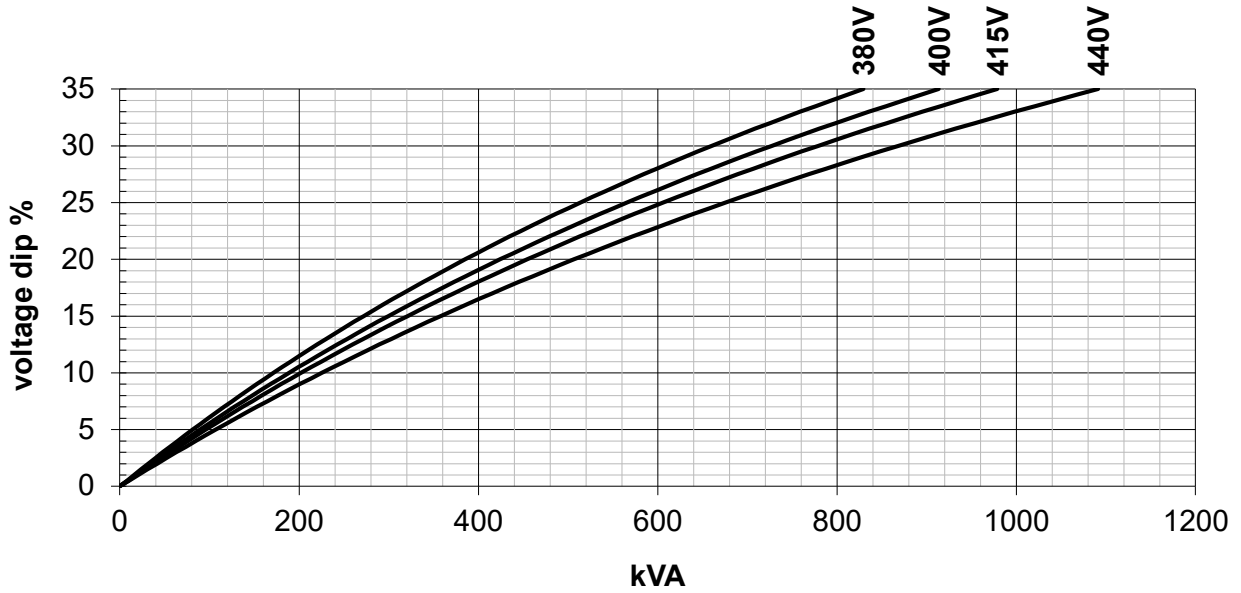
**MODELS FGL60010**

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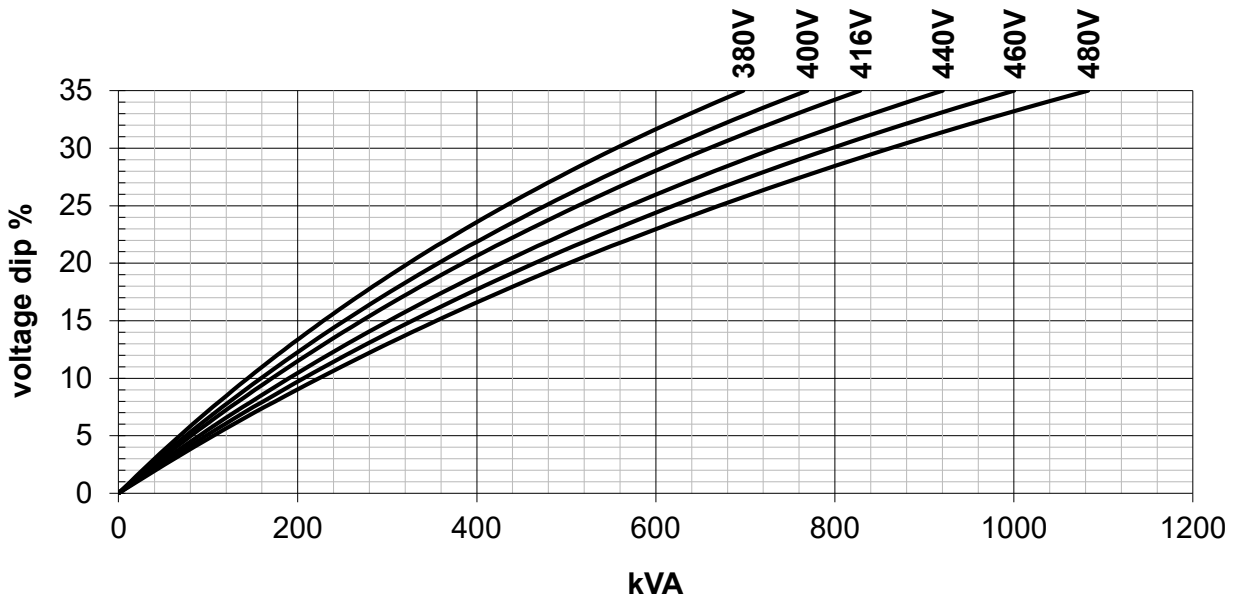
**LOCKED ROTOR MOTOR STARTING CURVES**

*Power factor 0.6*

**50 Hz SHUNT**



**60 Hz SHUNT**



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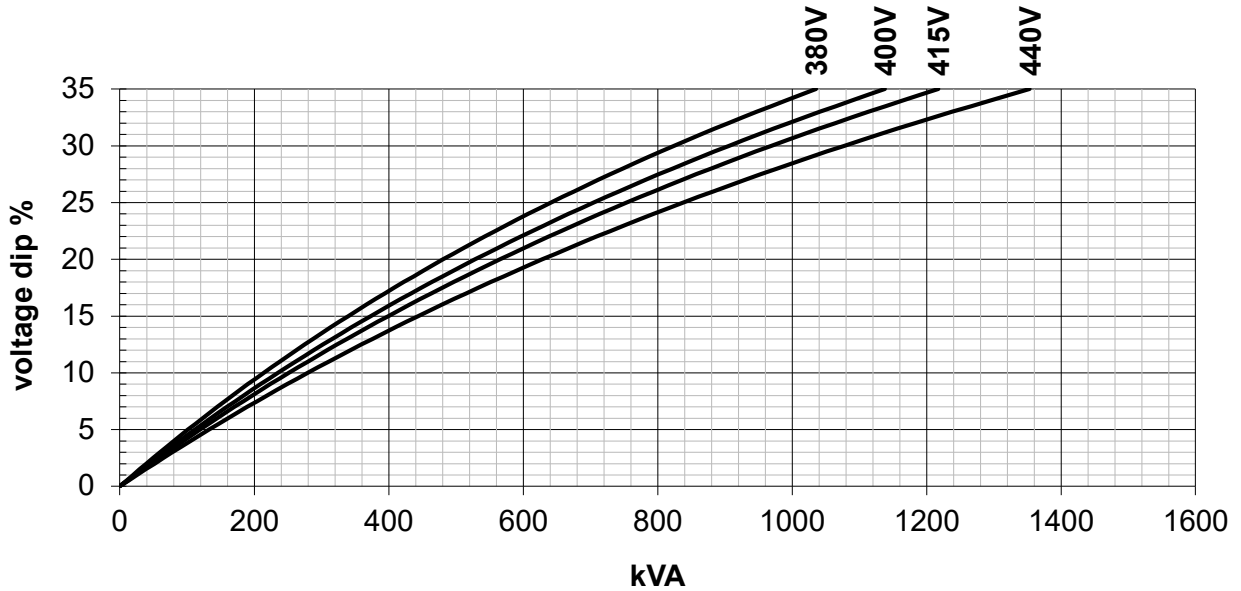
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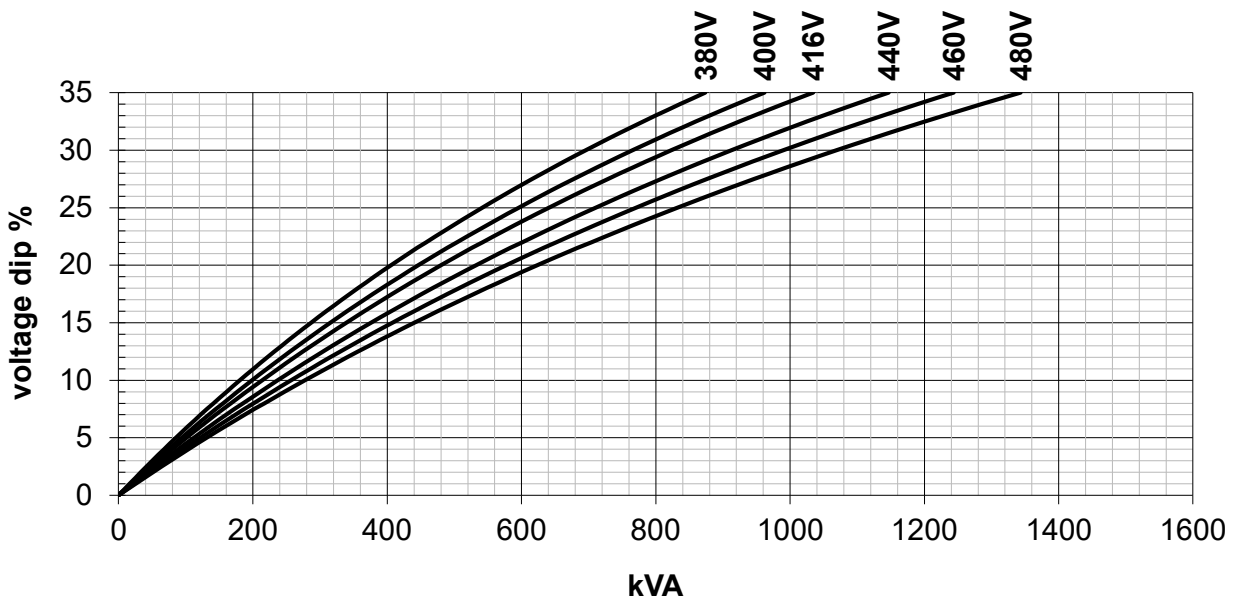
**LOCKED ROTOR MOTOR STARTING CURVES**

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**50 Hz PMG**



**60 Hz PMG**



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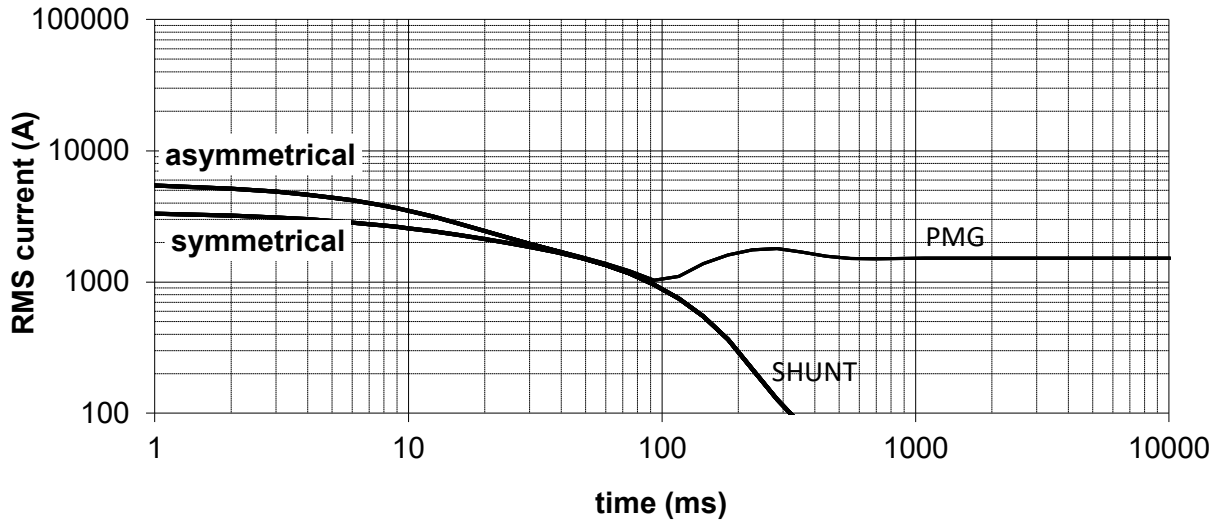


**THREE-PHASE SHORT-CIRCUIT DECREMENT CURVES**

*No-load excitation at rated speed*

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

*Star*



**Multiplication Factors**

**50Hz Voltages**

	<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*

**60Hz Voltages**

	<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*

**Winding Connection**

**Multiplication Factor**

<b>Series Star</b>	<b>Parallel Star</b>	<b>Series Delta</b>
1.00	2.00	1.73

*Apply factor to complete the curve*