

AMBIENT TEMPERATURE		40°C					WINDING DATA					
TEMPERATURE RISE		H					Winding code				M0	
INSULATION CLASS		H					Number of leads				12	
POWER FACTOR		0,8					Winding pitch				2/3	
FREQUENCY		Hz	50				60					
VOLTAGE		Star series Star parallel	V	380 190	400 200	415 208	440 220	380 190	416 208	440 220	460 230	480 240
RATING		kVA kW	14,2 11,4	15,0 12,0	15,0 12,0	14,0 11,2	15,0 12,0	16,3 13,0	17,2 13,8	18,0 14,4	18,8 15,0	
EFFICIENCY (%) @ 0,8 p.f.		4/4	82,9	83,0	83,0	82,9	82,9	83,8	84,2	84,4	84,5	
		3/4	85,1	85,1	85,0	84,3	84,9	85,7	86,0	86,2	86,2	
		2/4	86,6	86,5	86,2	84,8	86,3	86,9	87,1	87,2	87,2	
EFFICIENCY (%) @ 1,0 p.f.		4/4	87,5	87,9	88,2	88,5	86,8	87,7	88,2	88,6	88,9	
		3/4	89,3	89,5	89,6	89,5	88,7	89,4	89,8	90,0	90,2	
		2/4	90,5	90,5	90,4	89,4	89,9	90,4	90,6	90,8	90,8	
STAND-BY RATING (163/27)		kVA	15,6	16,5	16,5	15,4	16,5	17,9	18,9	19,8	20,6	
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			82,0	82,1	82,3	82,3	82,1	83,0	83,5	83,7	83,8	
SHORT CIRCUIT RATIO (referred to class H rating)			0,57	0,60	0,64	0,77	0,45	0,50	0,53	0,55	0,57	
REACTANCES (%) (referred to class H rating)												
Direct axis synchronous		x _d	276	263	245	203	350	317	299	286	274	
Quadrature axis synchronous		x _q	120	114	106	88	152	137	130	124	119	
Direct axis transient		x' _d	19,2	18,3	17,0	14,2	24,4	22,0	20,8	19,9	19,1	
Direct axis subtransient		x'' _d	11,4	10,8	10,1	8,4	14,4	13,0	12,3	11,8	11,3	
Quadrature axis subtransient		x'' _q	12,5	11,9	11,1	9,2	15,8	14,3	13,5	13,0	12,4	
Negative sequence		x ₂	11,9	11,4	10,6	8,8	15,1	13,7	12,9	12,4	11,8	
Zero sequence		x ₀	8,7	8,3	7,7	6,4	11,0	10,0	9,4	9,0	8,6	

TIME CONSTANTS [s]

Open circuit (T' _{do})	0,403	Subtransient (T'' _d)	0,008
Transient (T' _d)	0,044	Armature (T _a)	0,007

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	-
N-end bearing/Lubrication	6207 2RS C3 / Prelubricated
Weight [kg]	97
Inertia (J) [kgm ²]	0,11
Overspeed [min ⁻¹]	2250
Method of cooling	IC 01
Cooling air required [m ³ /s] @ 50/60 Hz	0,11 / 0,13
Degree of protection	IP 23
Type of construction available	B2
Direction of rotation	CW

OTHER DATA

Phase resistance [Ω] @ 20 °C - Star series	0,662
Overloads	10% for 1 hour
3-phase short circuit current	>= 300% (3 I _n) with aux. winding or PMG
Voltage regulation accuracy	+/- 0,5 % (@ rated load, balanced and non-distorting, p.f. 0,8)
Radio interference	EN 55011 Class B Group 1
Wave form THF	< 2%
Total harmonic content	< 2% (at no load)

STANDARDS

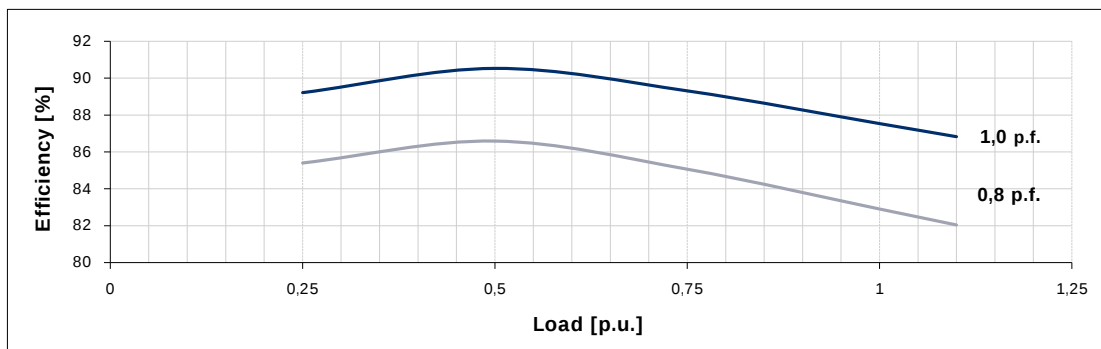
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 MX 4

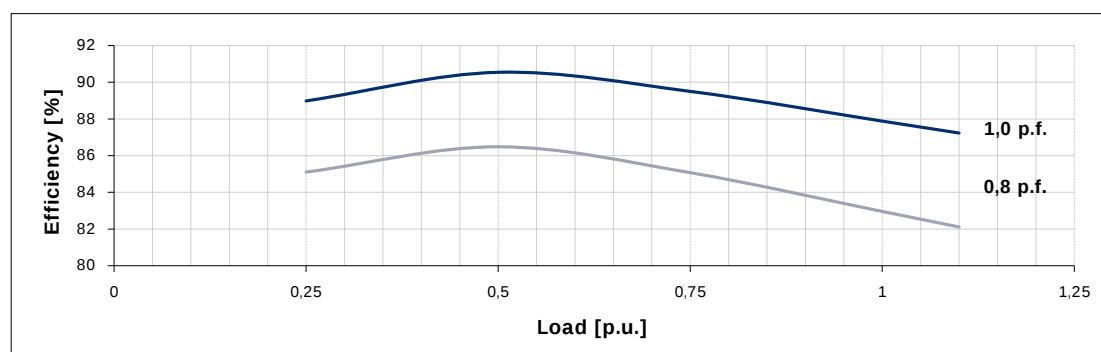
Typical efficiency curves

50 Hz - 1500 min⁻¹

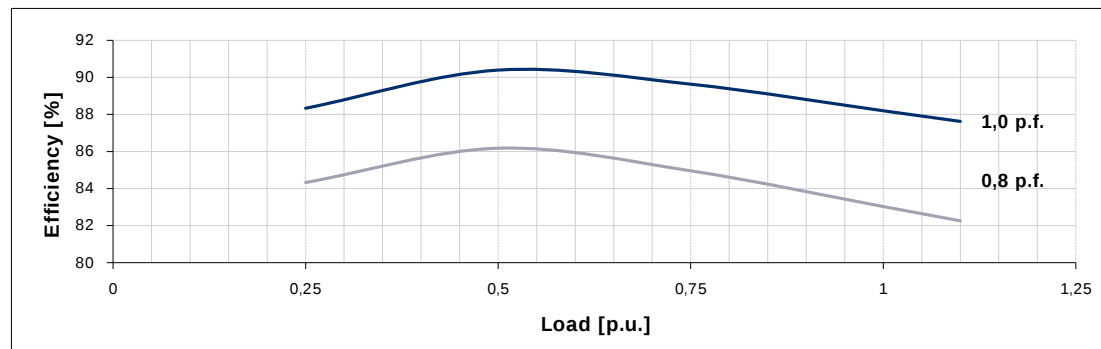
380 V



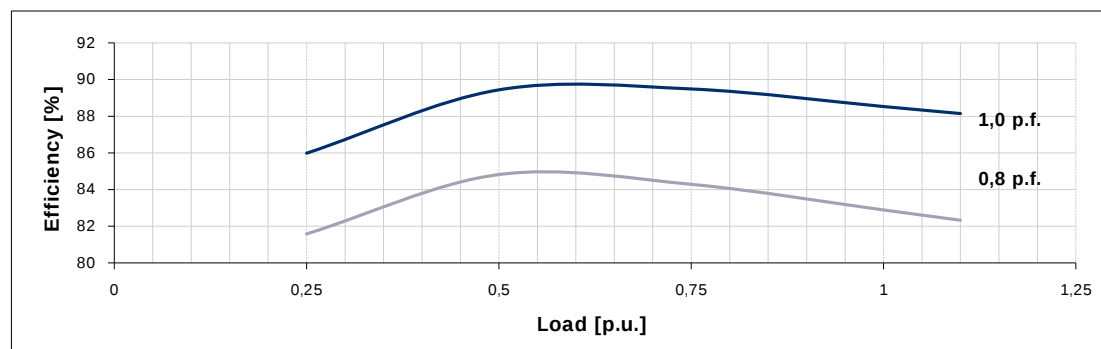
400 V



415 V



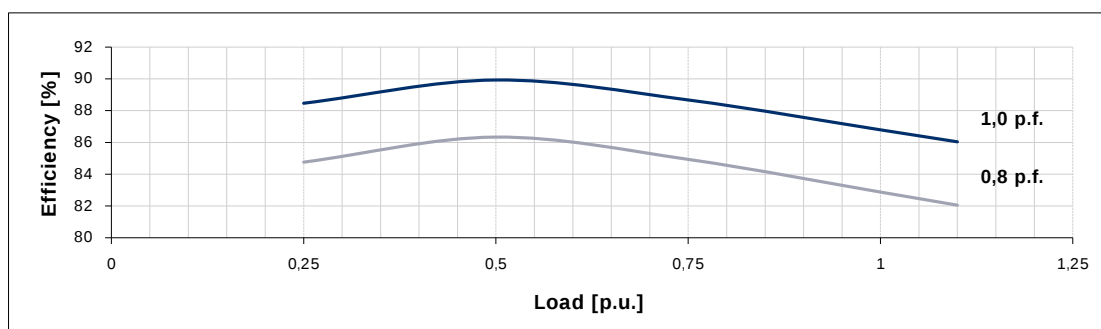
440 V



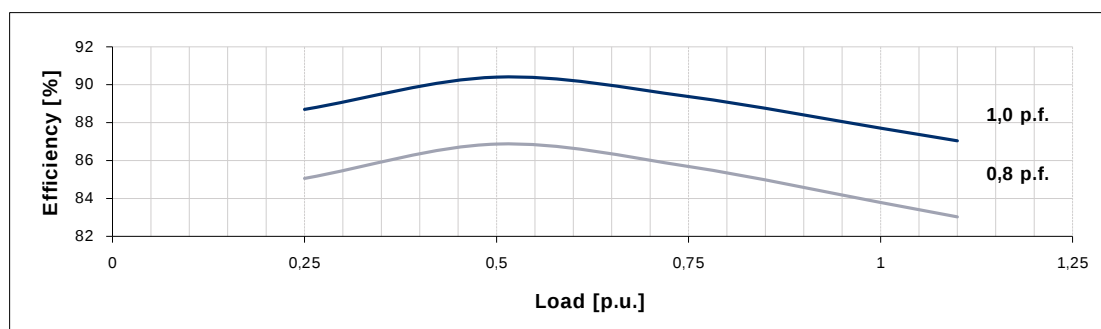
Typical efficiency curves

60 Hz - 1800 min⁻¹

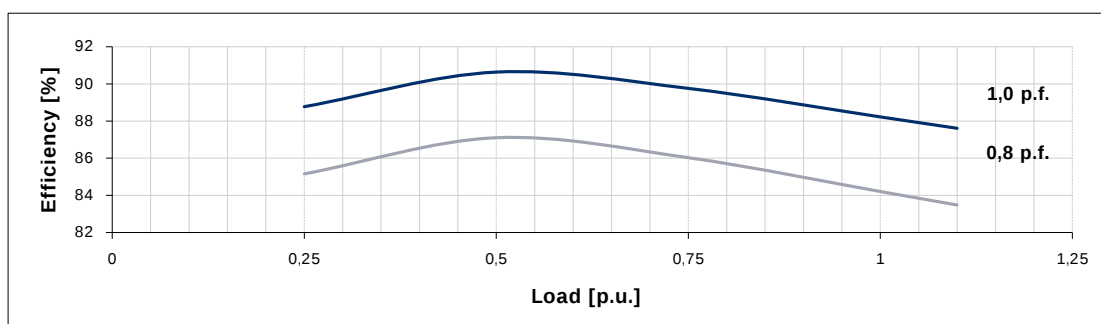
380 V



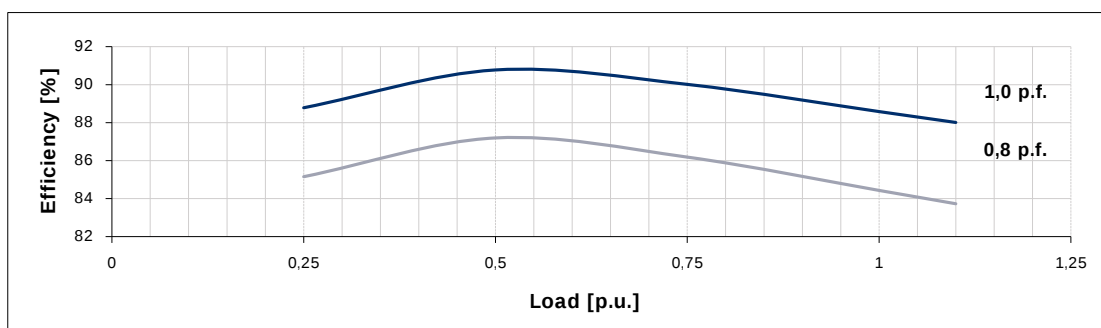
416 V



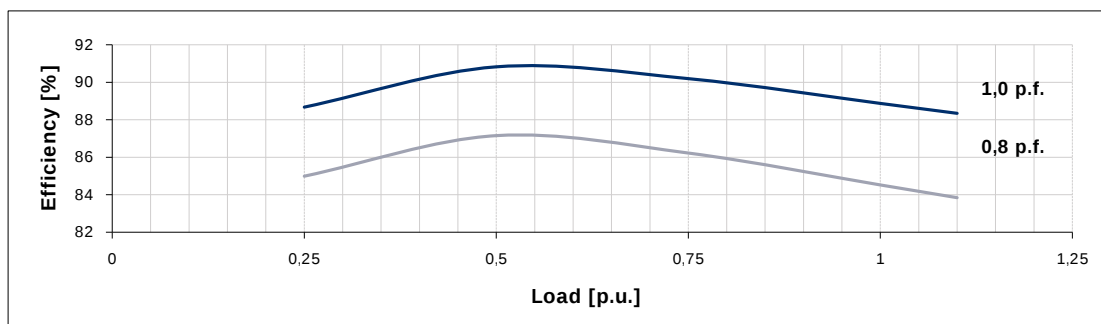
440 V



460 V



480 V

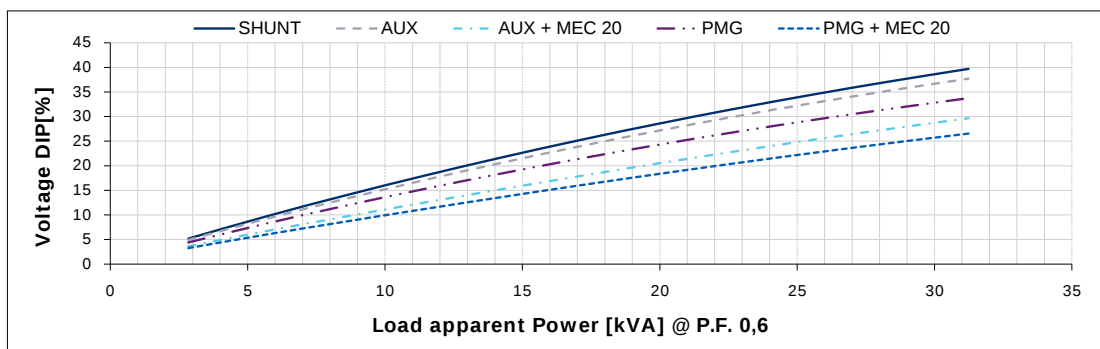


THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 MX 4

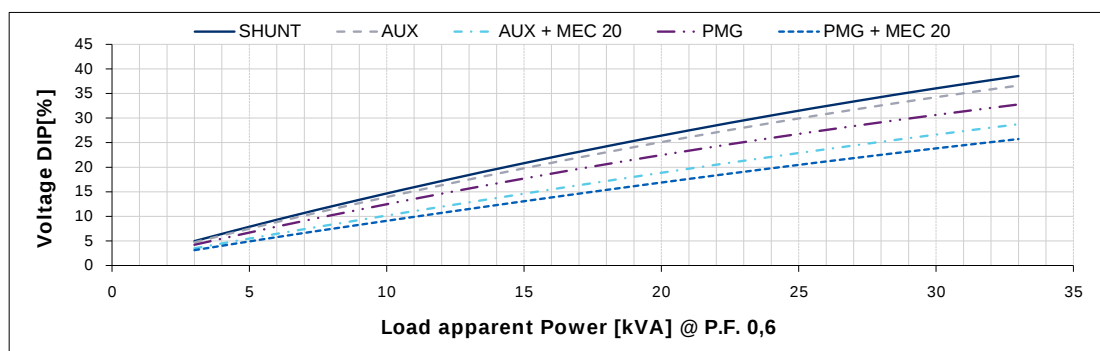
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

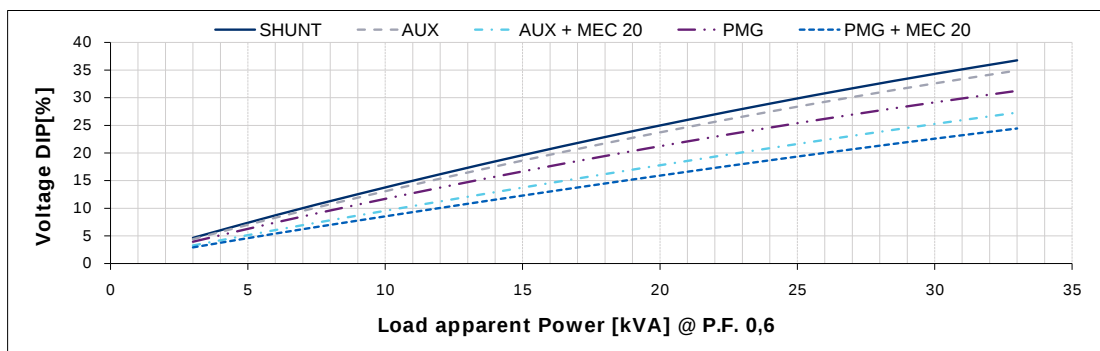
380 V



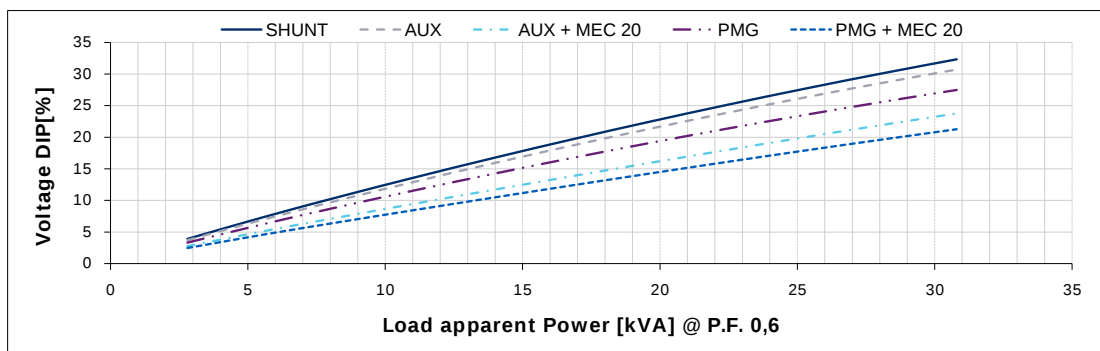
400 V



415 V



440 V

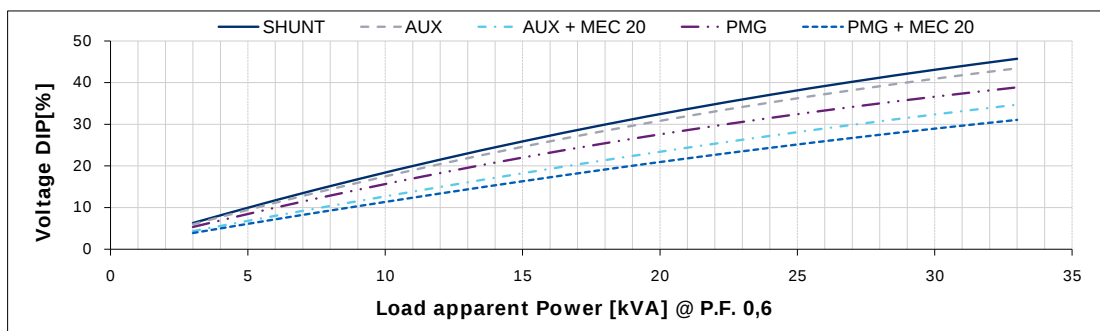


THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 MX 4

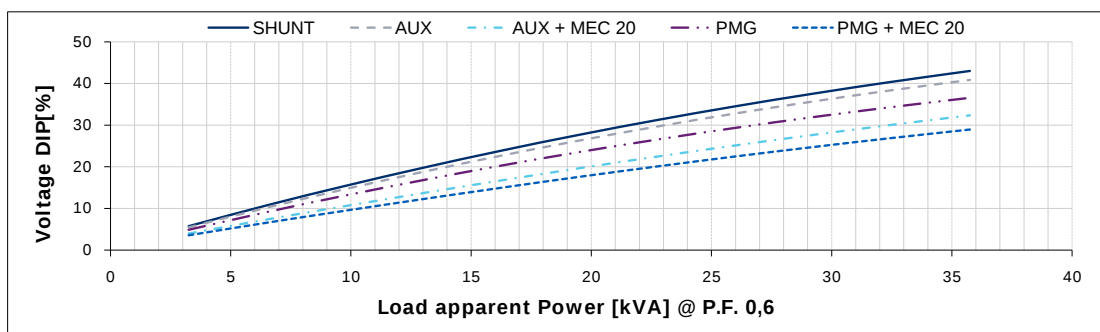
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

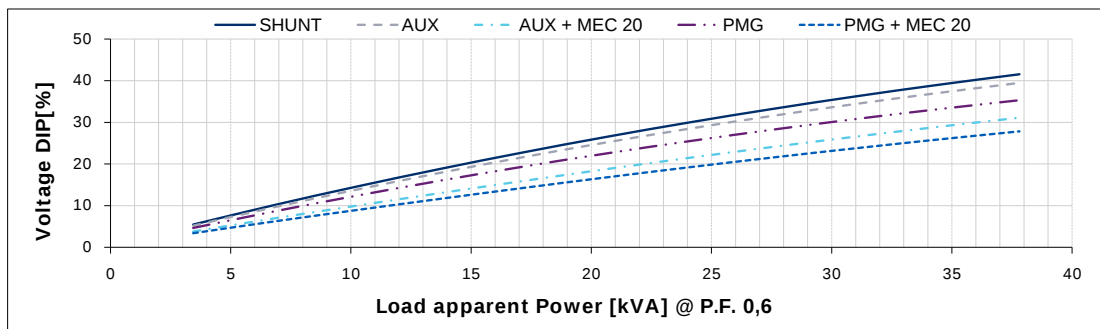
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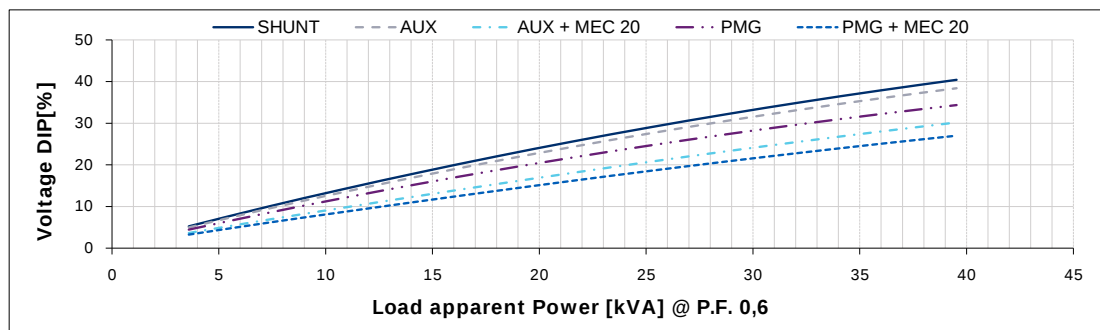
416 V



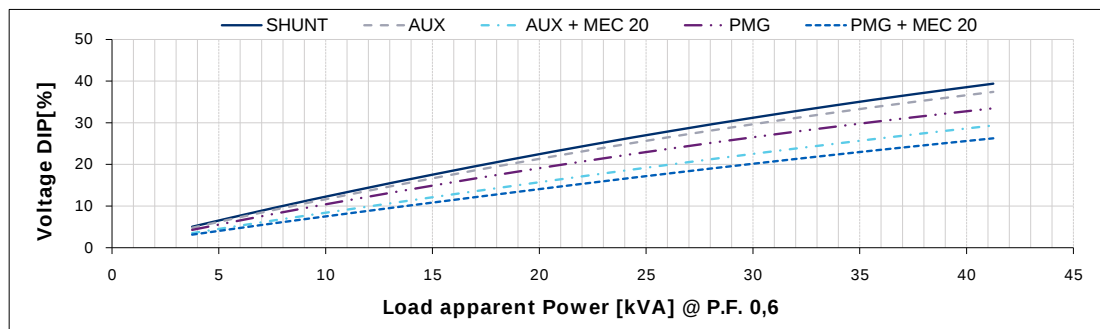
440 V



460 V



480 V



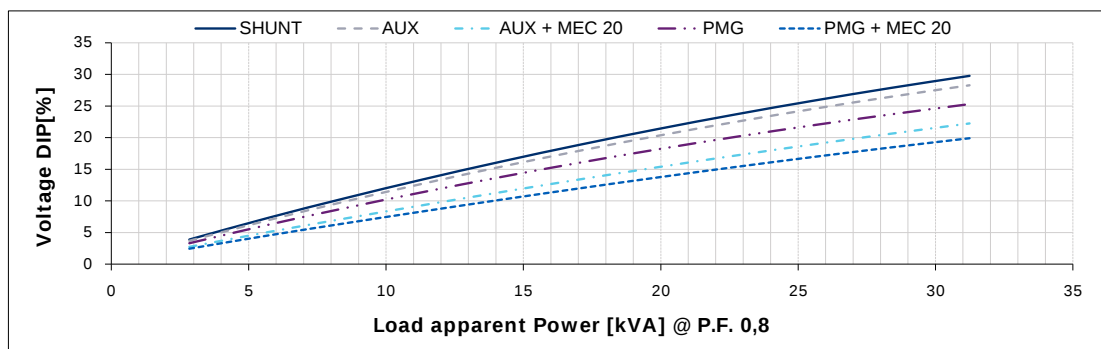
For P.F. different from 0,6 the following simplified formula can be used: $\Delta V @ P.F. = \Delta V @ 0,6 \cdot \sin(\arccos(P.F.)) / 0,8$

THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 MX 4

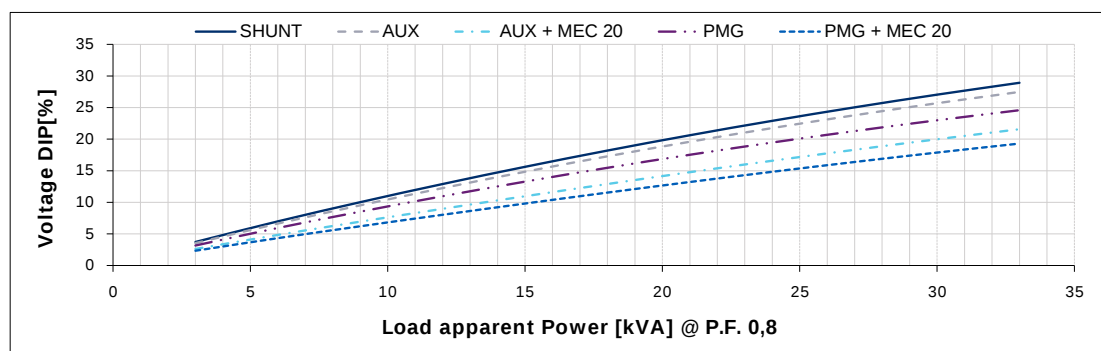
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

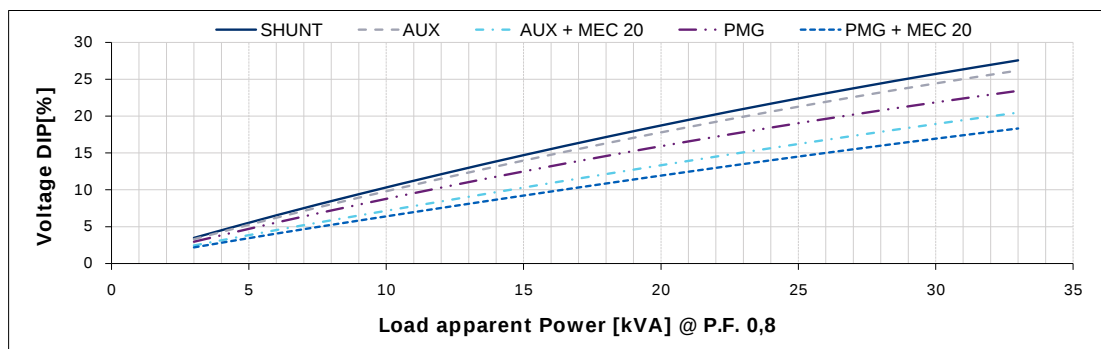
380 V



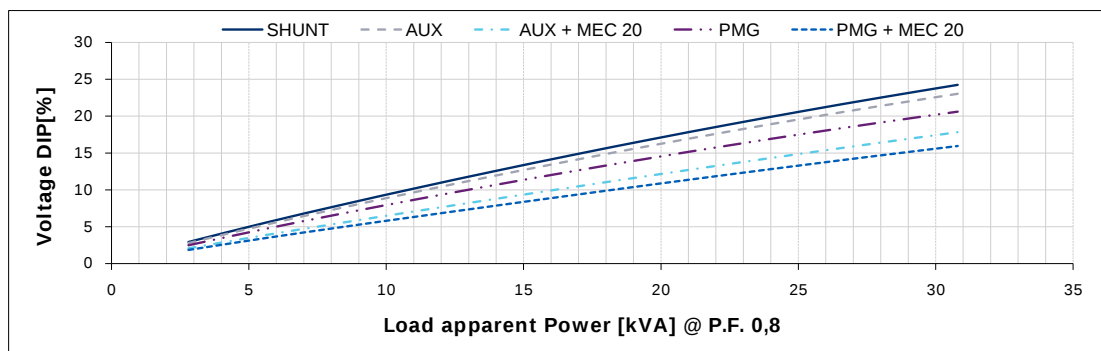
400 V



415 V



440 V

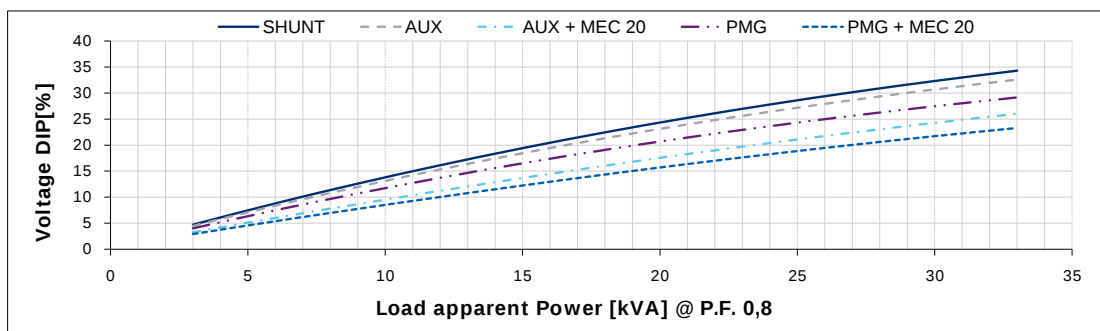


THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 MX 4

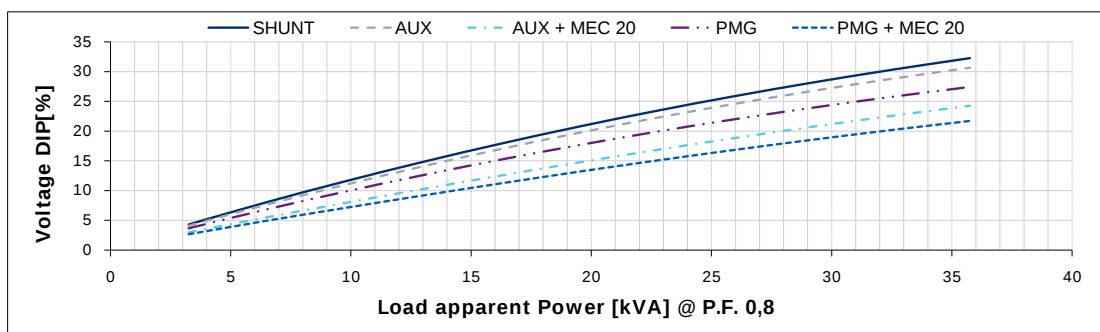
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

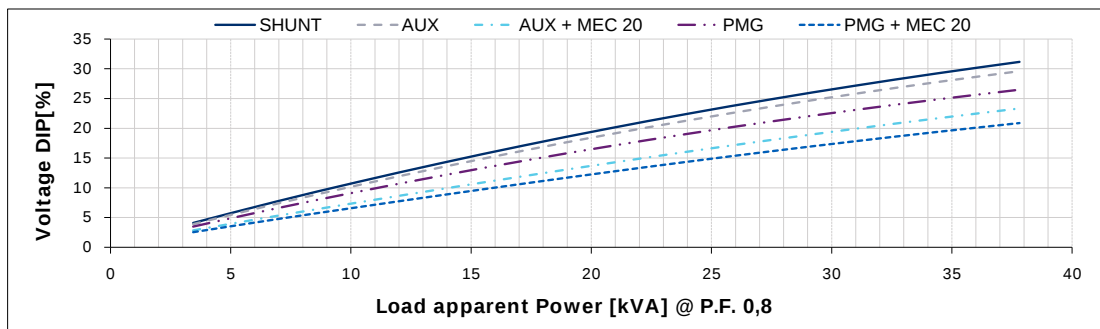
380 V



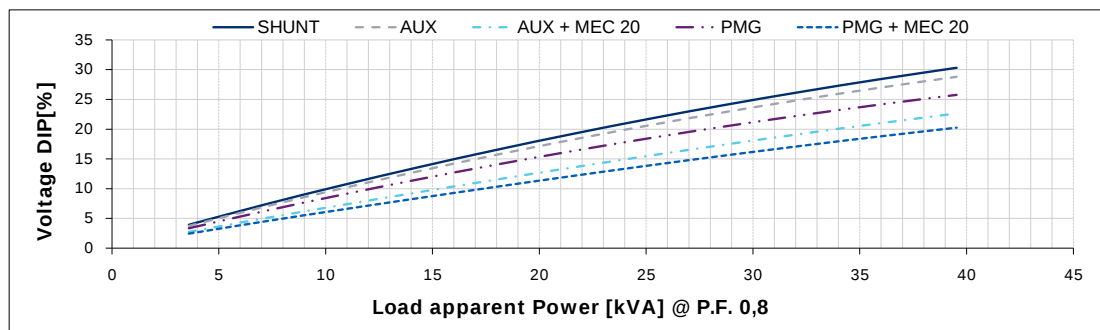
416 V



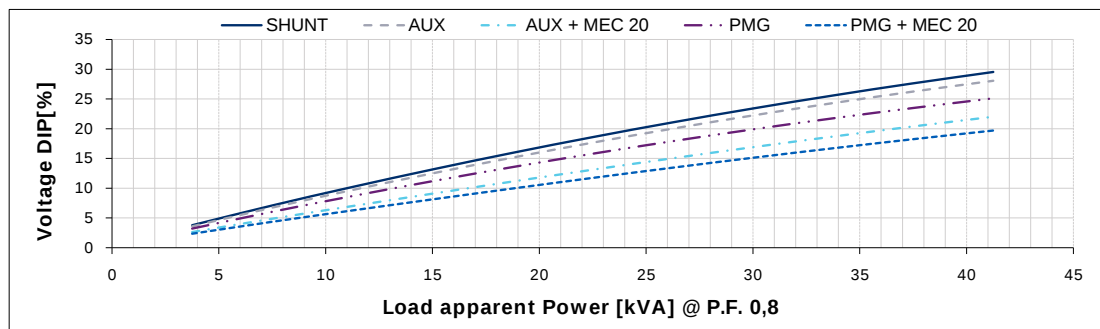
440 V



460 V



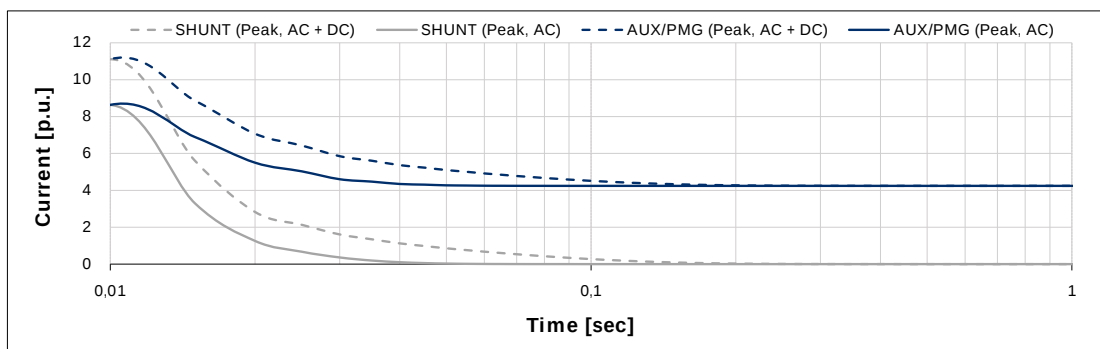
480 V



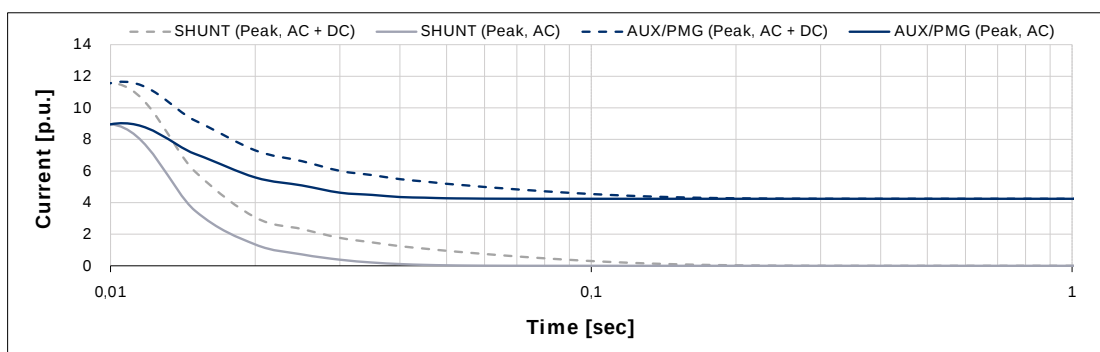
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

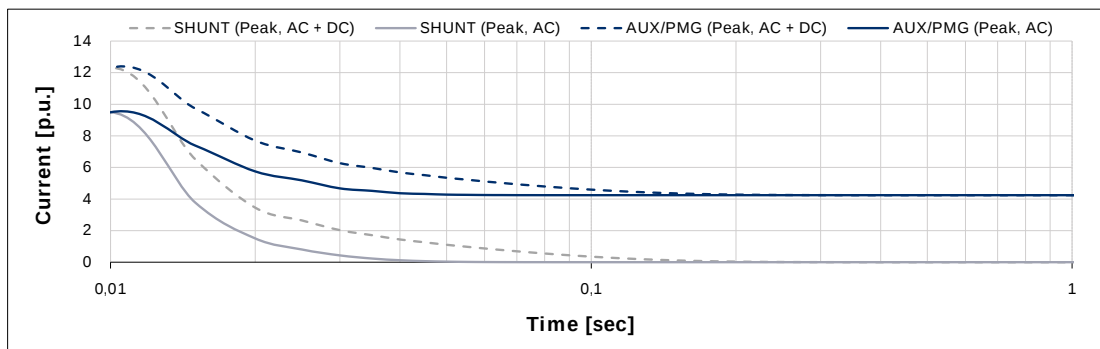
380 V



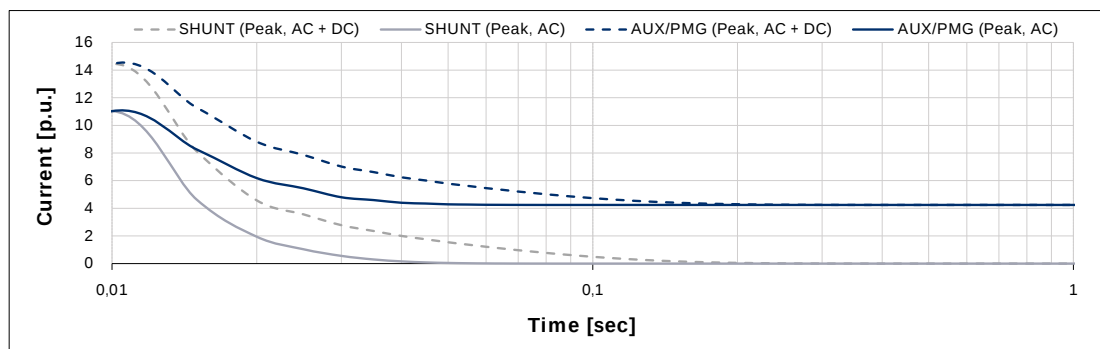
400 V



415 V



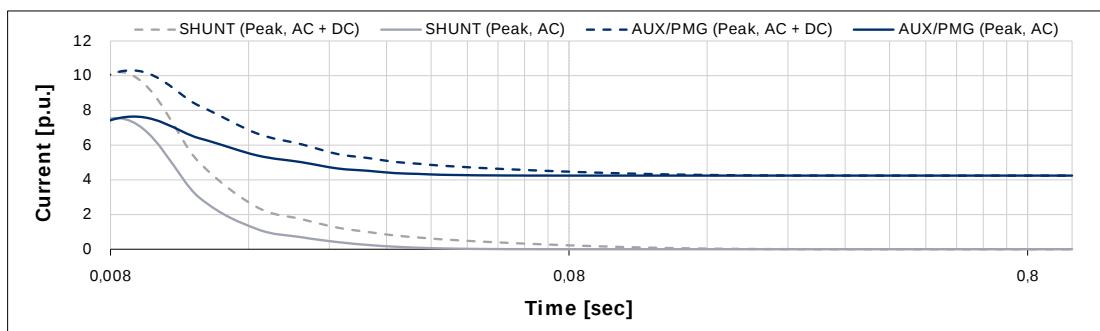
440 V



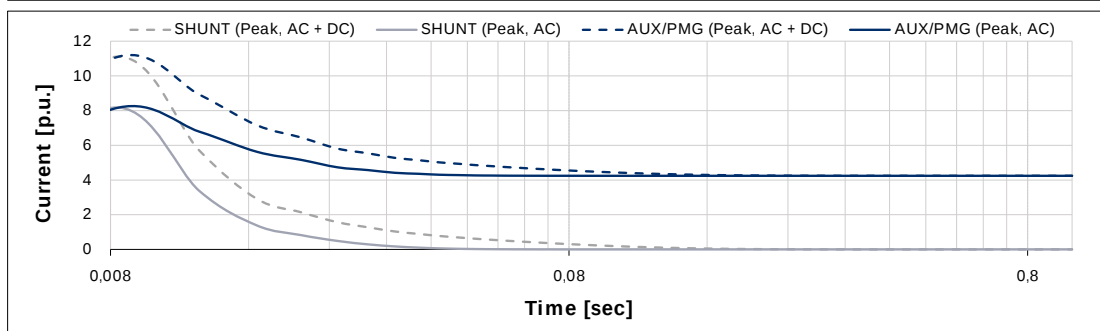
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

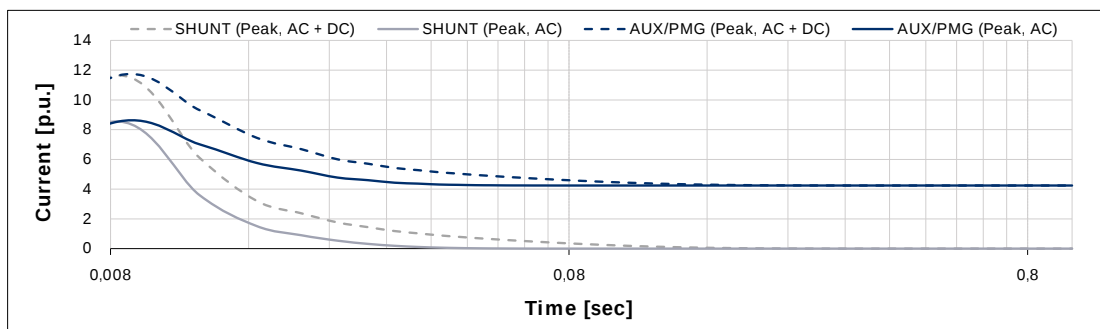
380 V



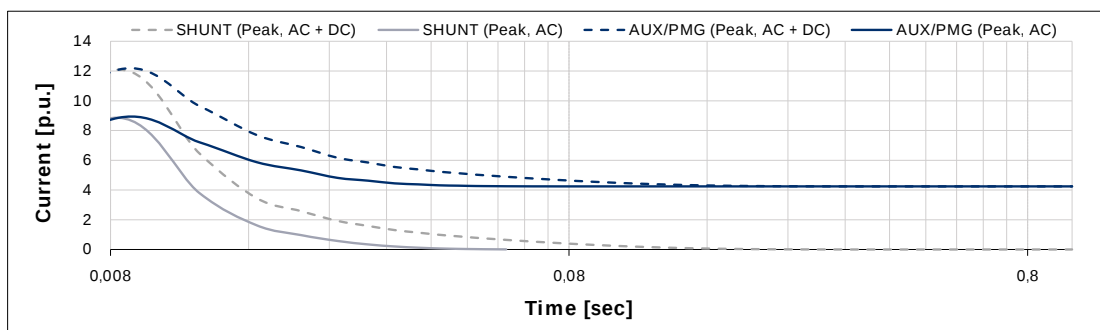
416 V



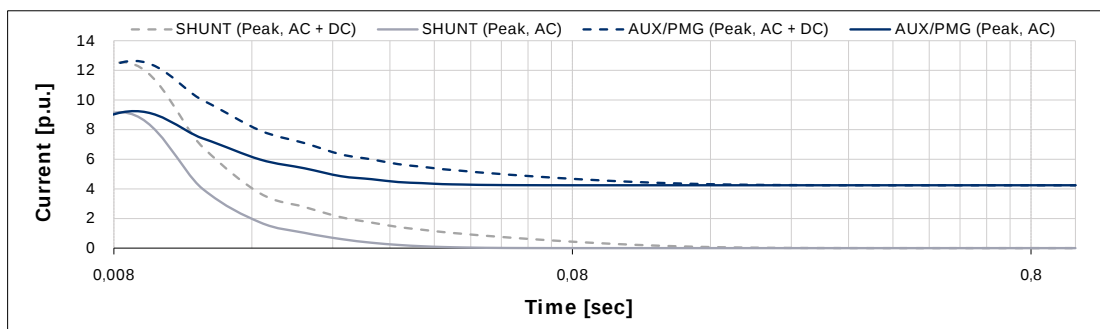
440 V



460 V



480 V



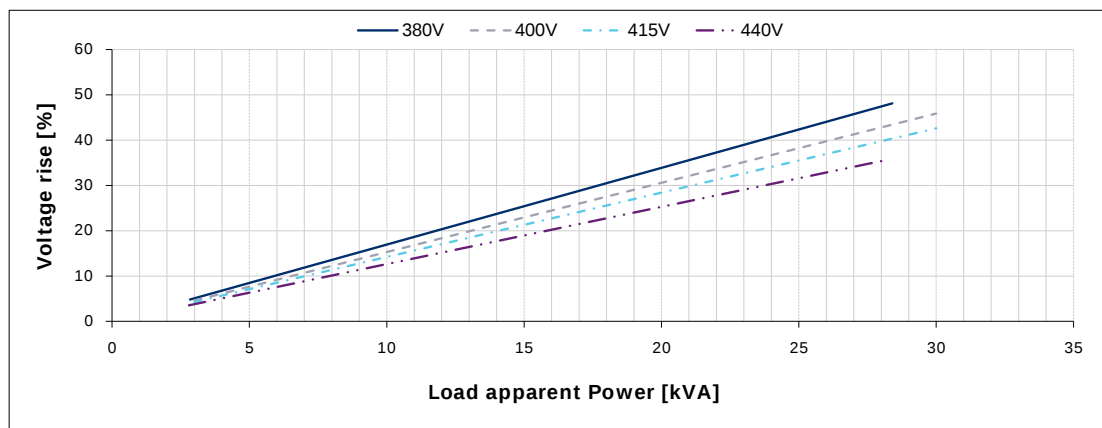
Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

	2 phase	1 phase
Instantaneous (max)	0,97	1,18
Continuous	1,50	1,83

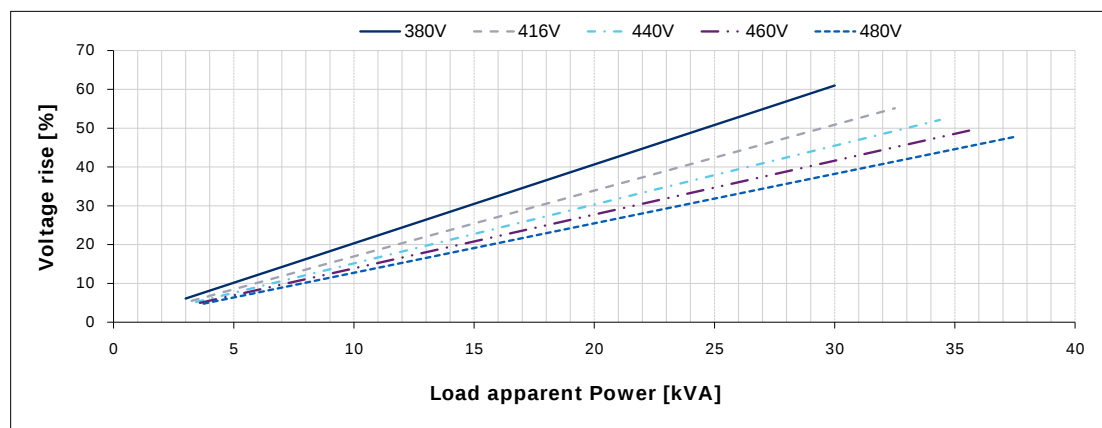
SYN.DS.0052_ =

Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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SYN.DS.0052_ =