

AMBIENT TEMPERATURE	40°C	WINDING DATA									
TEMPERATURE RISE	H	Winding code		MO							
INSULATION CLASS	H	Number of leads		12							
POWER FACTOR	0,8	Winding pitch		2/3							
FREQUENCY	Hz	50				60					
VOLTAGE	Star series	V	380	400	415	440	380	416	440	460	480
	Star parallel		190	200	208	220	190	208	220	230	240
RATING	kVA		11,9	12,5	12,5	11,3	12,5	13,5	14,3	15,0	15,6
	kW		9,5	10,0	10,0	9,0	10,0	10,8	11,4	12,0	12,5
EFFICIENCY (%) @ 0,8 p.f.	4/4		79,7	80,0	80,1	80,2	79,7	80,9	81,4	81,7	81,9
	3/4		82,4	82,6	82,6	82,0	82,3	83,2	83,7	83,9	84,1
	2/4		84,5	84,5	84,2	82,9	84,2	84,8	85,2	85,4	85,4
EFFICIENCY (%) @ 1,0 p.f.	4/4		85,3	85,9	86,4	87,0	84,4	85,6	86,3	86,7	87,2
	3/4		87,6	88,0	88,2	88,2	86,8	87,7	88,2	88,6	88,8
	2/4		89,3	89,4	89,4	88,3	88,6	89,2	89,5	89,7	89,8
STAND-BY RATING (163/27)	kVA		13,1	13,8	13,8	12,4	13,8	14,9	15,7	16,5	17,2
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			78,7	78,9	79,1	79,5	78,7	79,9	80,5	80,8	81,0
SHORT CIRCUIT RATIO (referred to class H rating)			0,51	0,53	0,57	0,71	0,40	0,45	0,47	0,49	0,51
REACTANCES (%) (referred to class H rating)											
Direct axis synchronous	x _d		297	281	261	210	374	337	319	306	293
Quadrature axis synchronous	x _q		129	123	114	92	163	147	139	133	127
Direct axis transient	x' _d		22,1	21,0	19,5	15,7	27,9	25,1	23,8	22,8	21,8
Direct axis subtransient	x'' _d		12,4	11,8	10,9	8,8	15,6	14,1	13,3	12,8	12,2
Quadrature axis subtransient	x'' _q		13,6	12,9	12,0	9,7	17,2	15,5	14,7	14,1	13,4
Negative sequence	x ₂		13,0	12,3	11,5	9,2	16,4	14,8	14,0	13,4	12,8
Zero sequence	x ₀		10,4	9,8	9,1	7,3	13,1	11,8	11,1	10,7	10,2

TIME CONSTANTS [s]

Open circuit (T' _{do})	0,381	Subtransient (T'' _d)	0,008
Transient (T' _d)	0,045	Armature (T _a)	0,005

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	-
N-end bearing/Lubrication	6207 2RS C3 / Prelubricated
Weight [kg]	88
Inertia (J) [kgm ²]	0,10
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	0,930
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

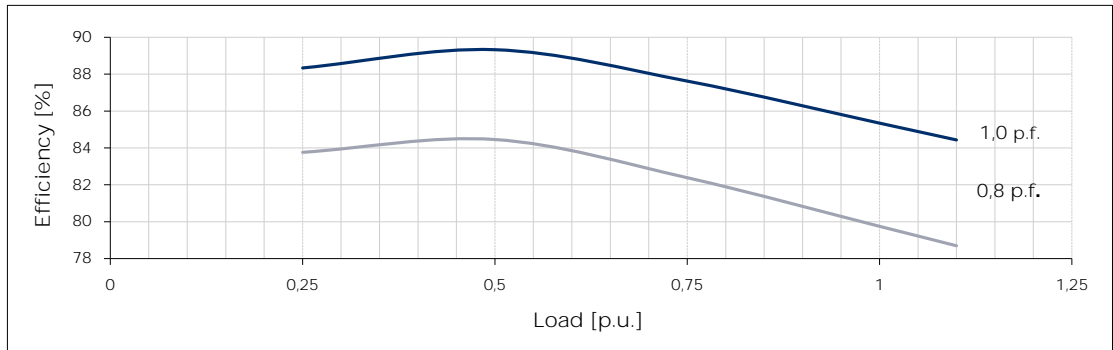
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 160 SA 4

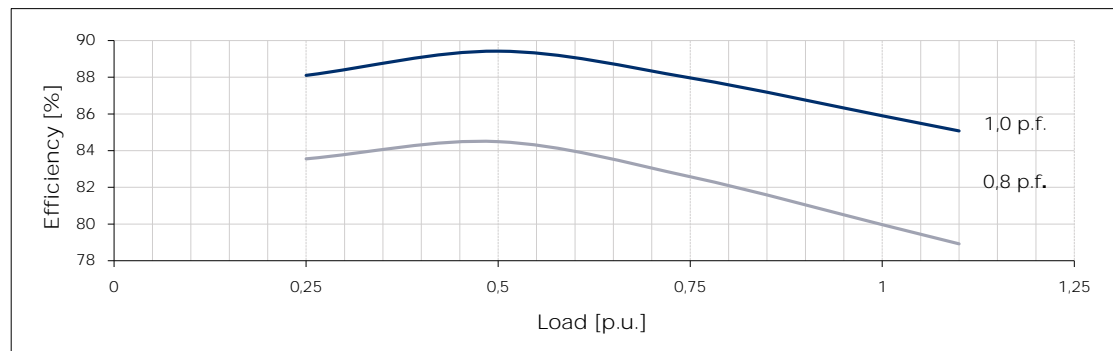
Typical efficiency curves

50 Hz - 1500 min⁻¹

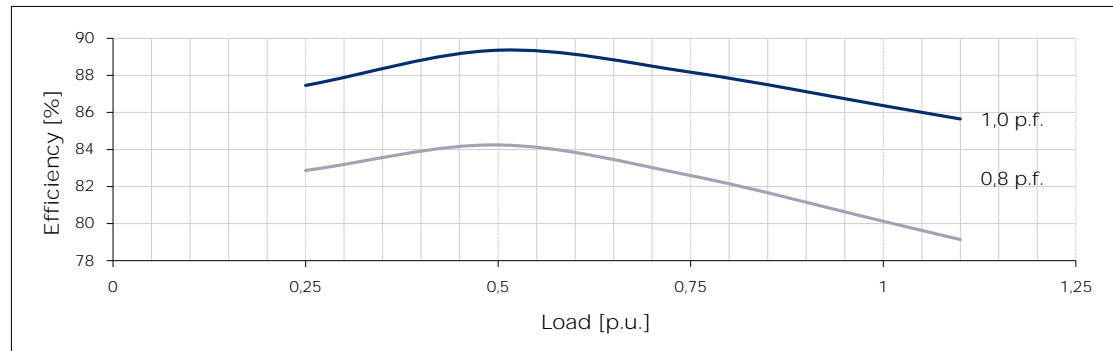
380 V



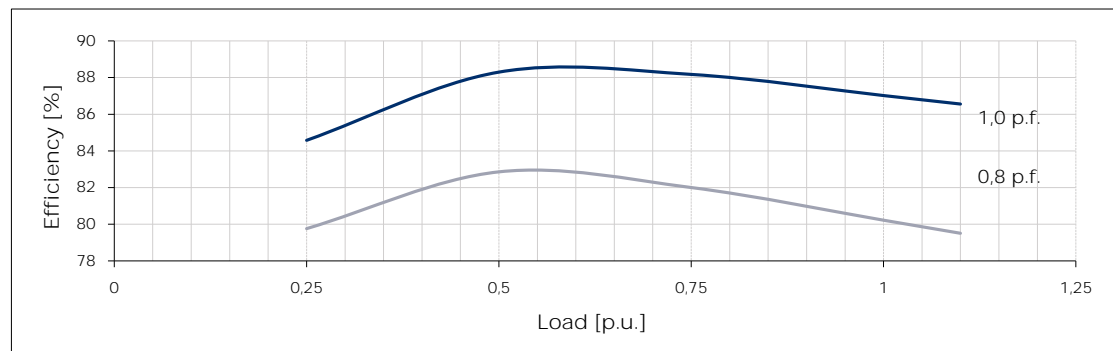
400 V



415 V



440 V

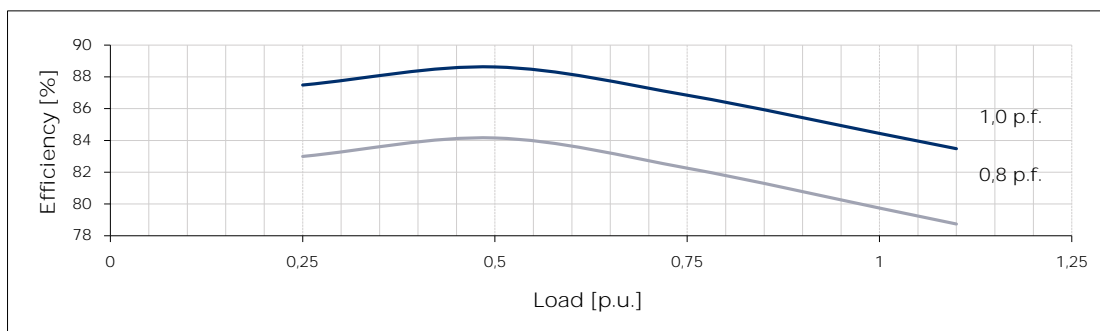


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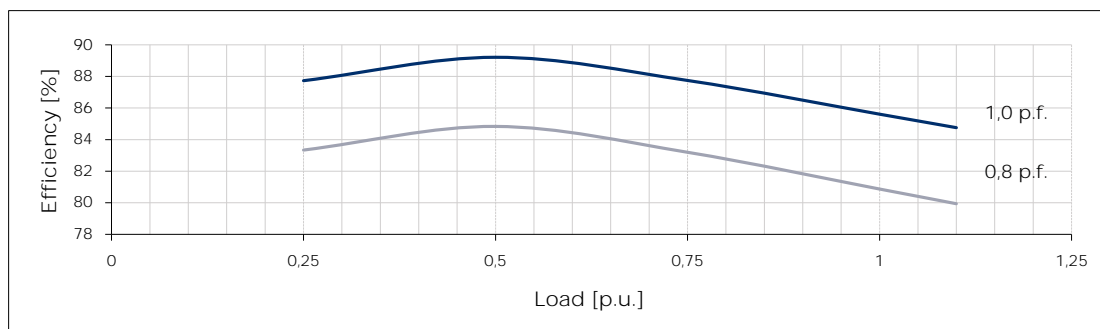
Typical efficiency curves

60 Hz - 1800 min⁻¹

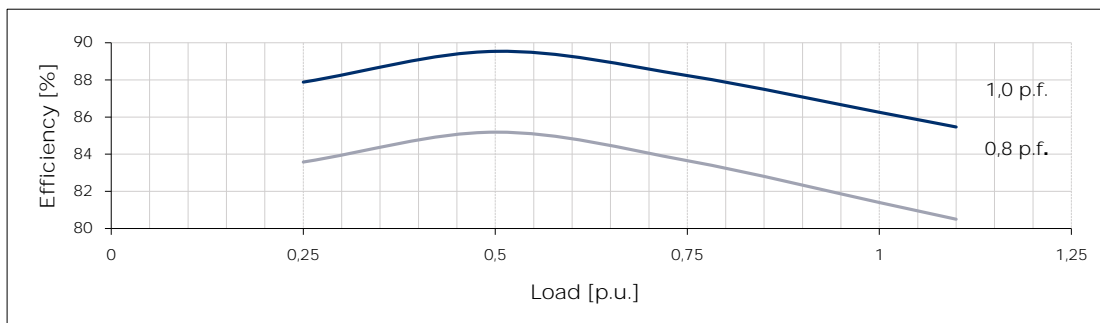
380 V



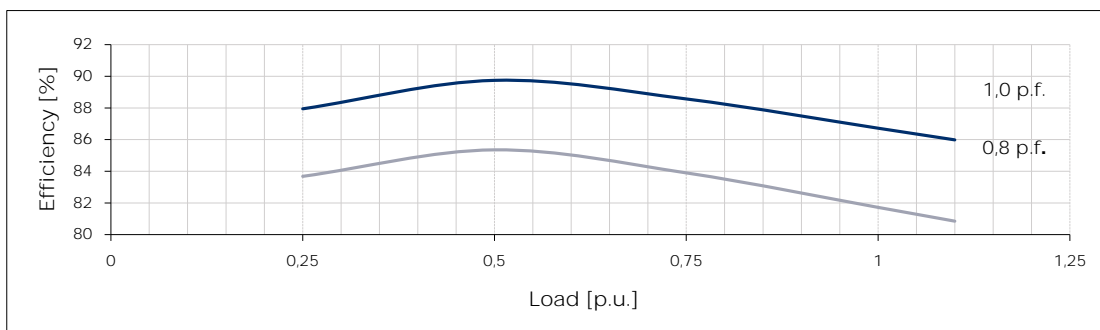
416 V



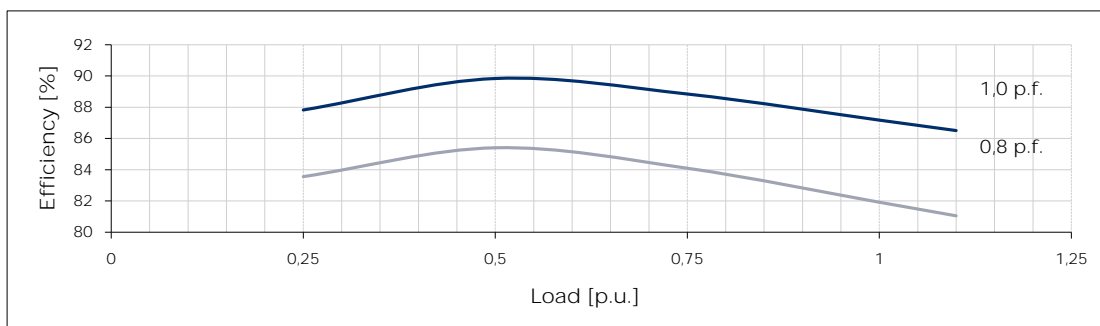
440 V



460 V



480 V





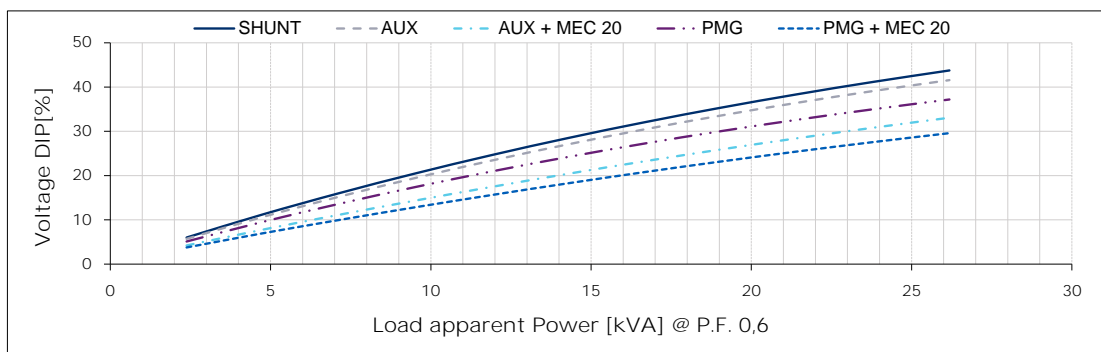
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Inspired solutions

THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 SA 4

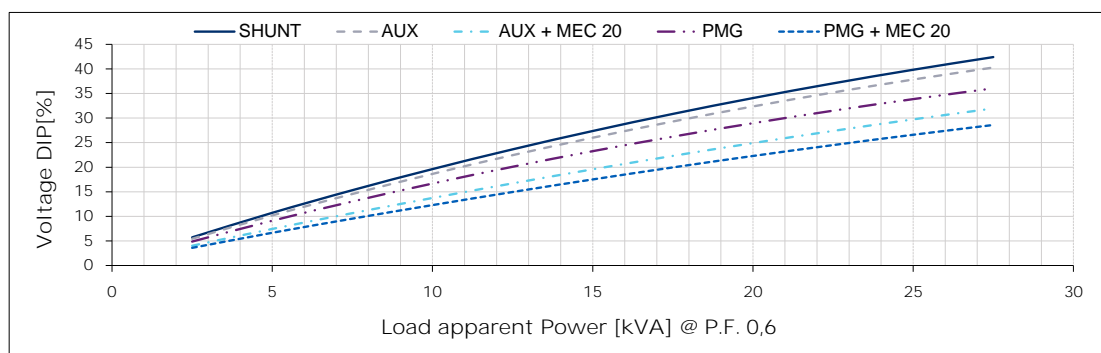
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

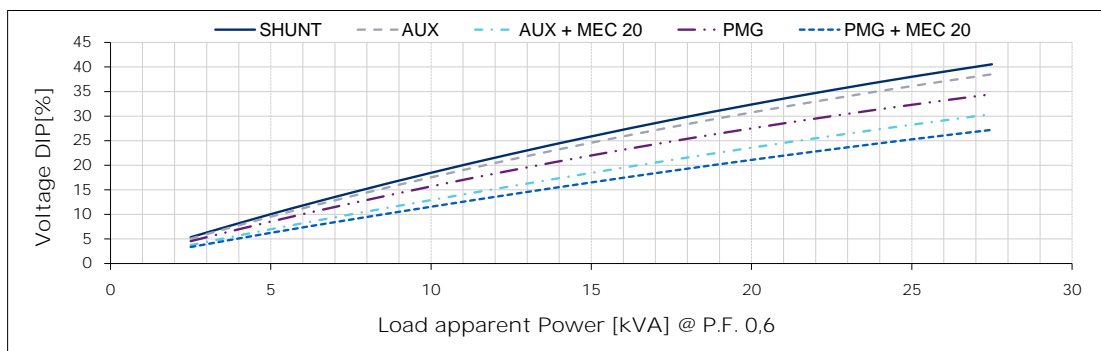
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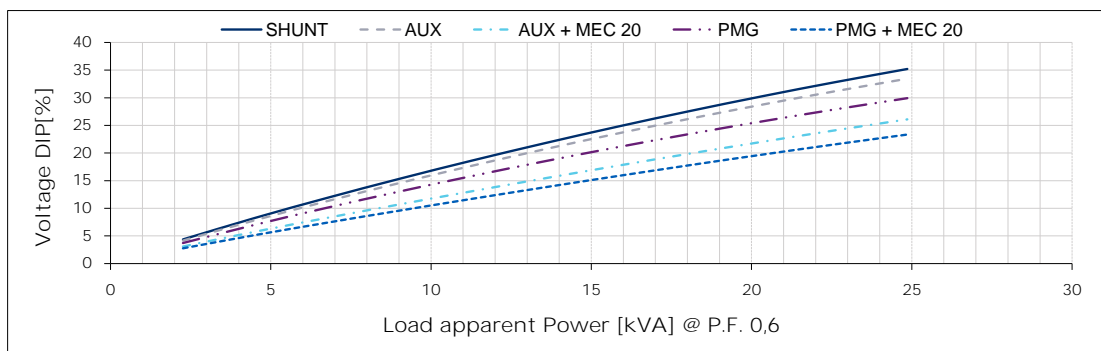
400 V



415 V



440 V





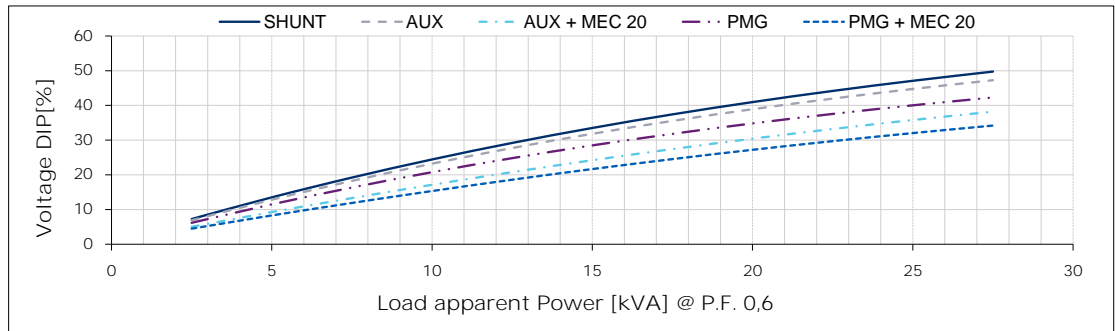
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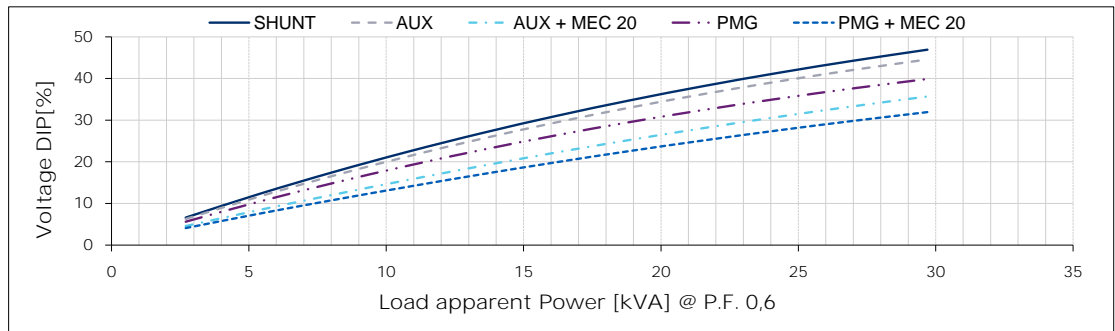
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

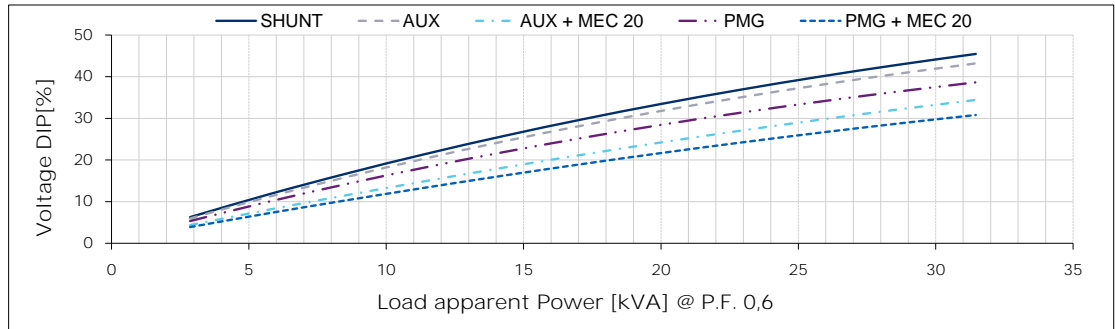
380 V



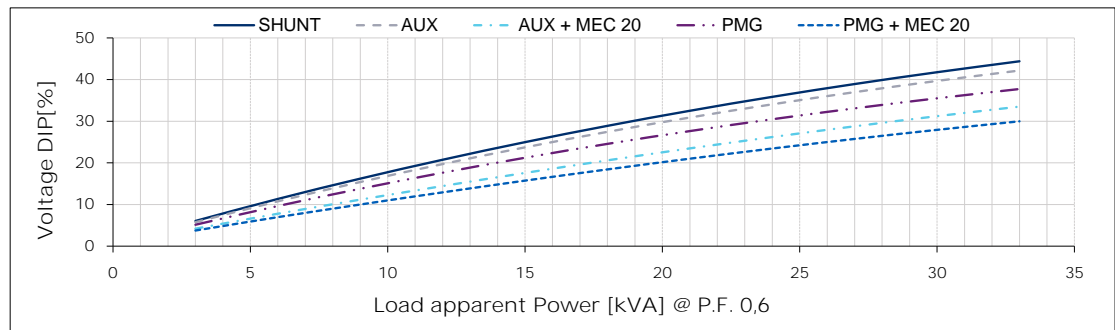
416 V



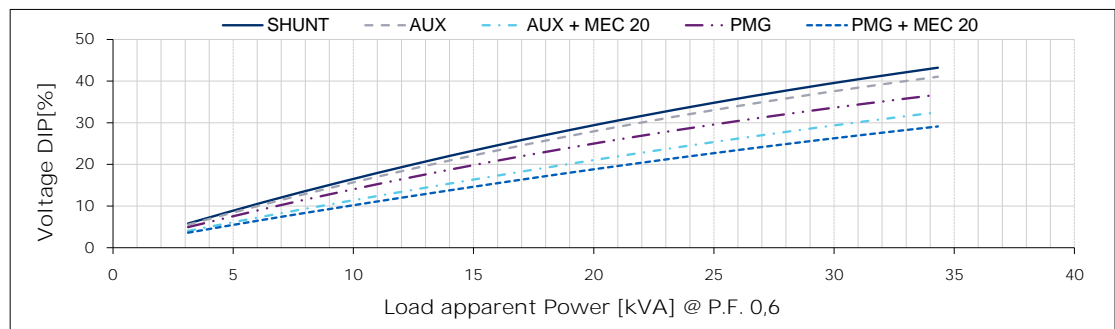
440 V



460 V



480 V



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



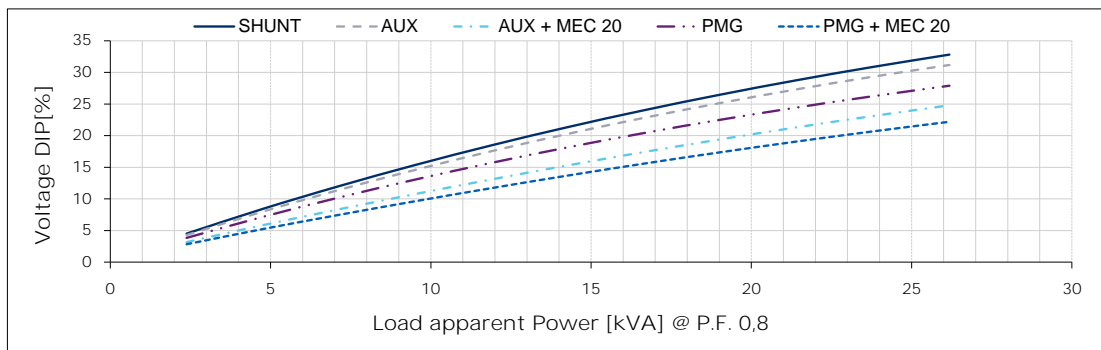
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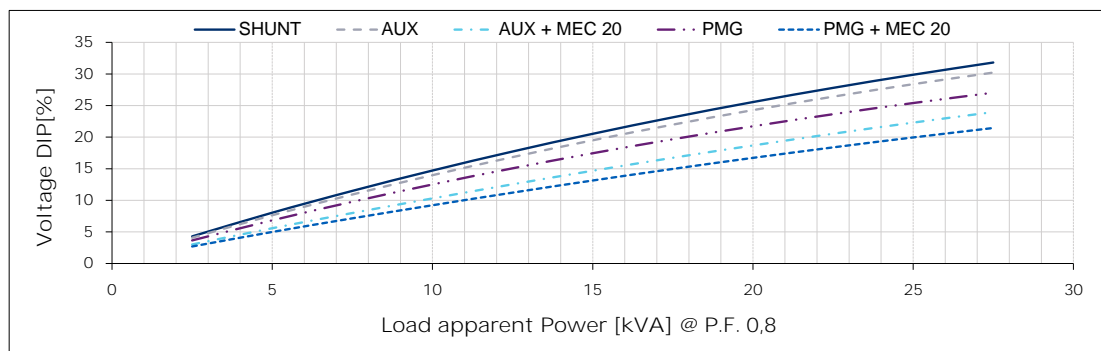
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

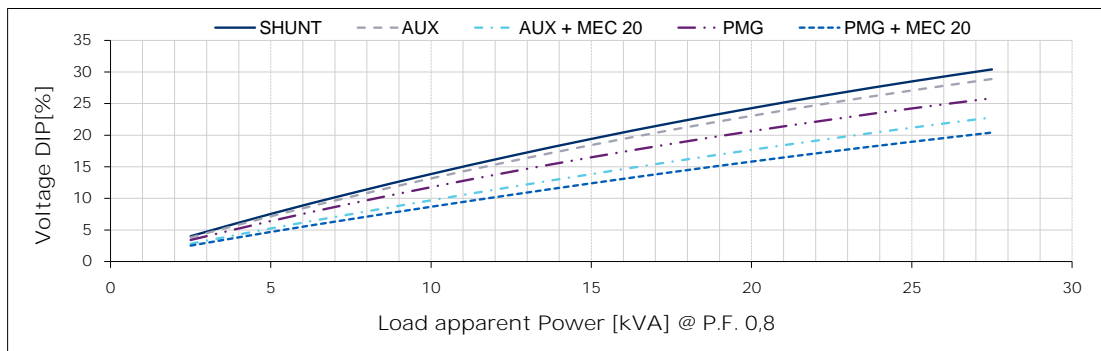
380 V



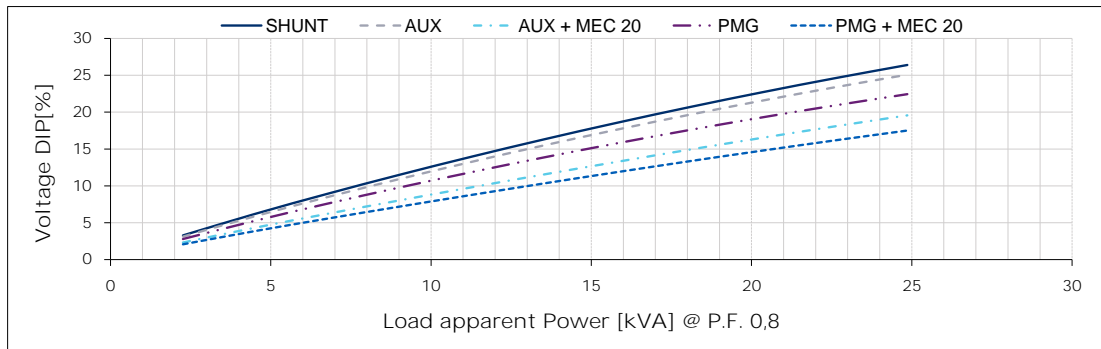
400 V



415 V



440 V





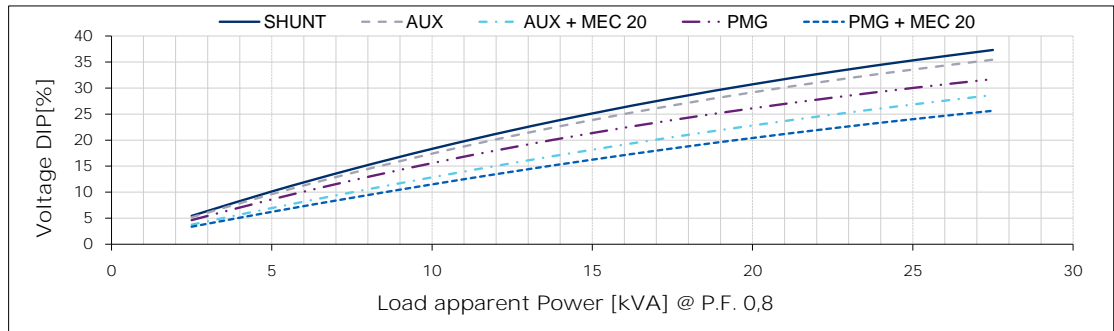
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THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 SA 4

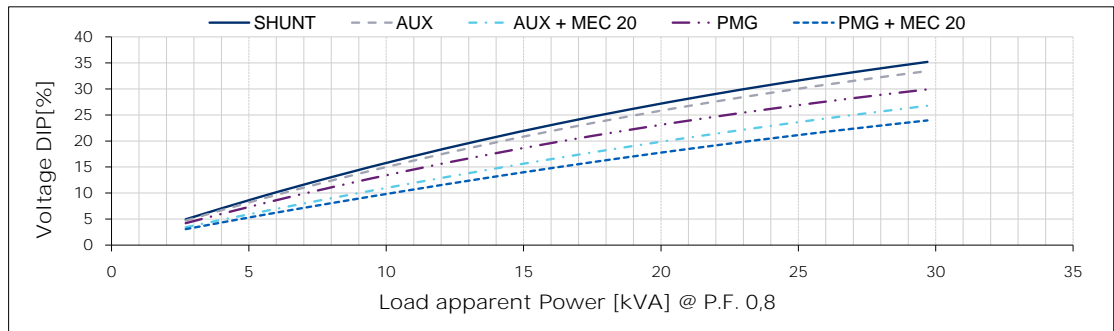
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

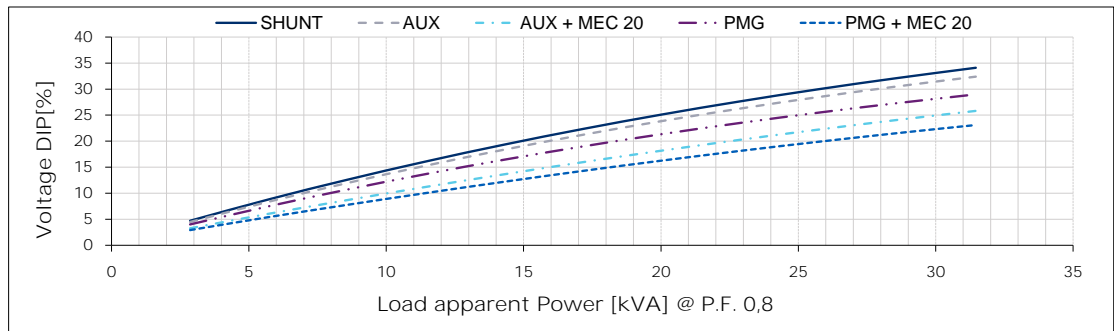
380 V



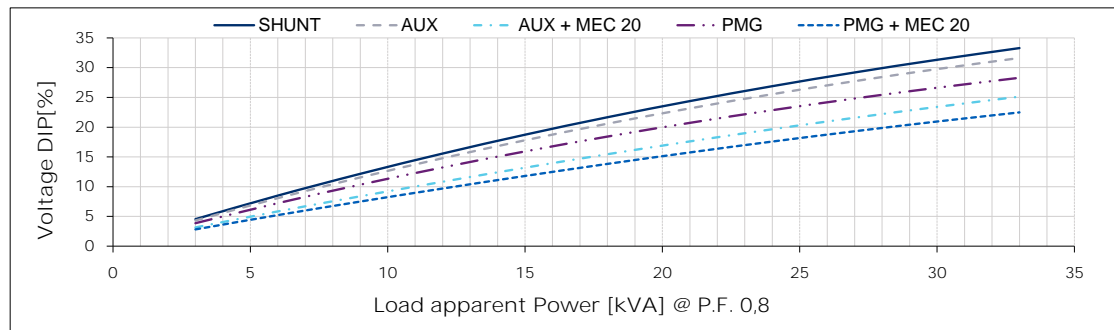
416 V



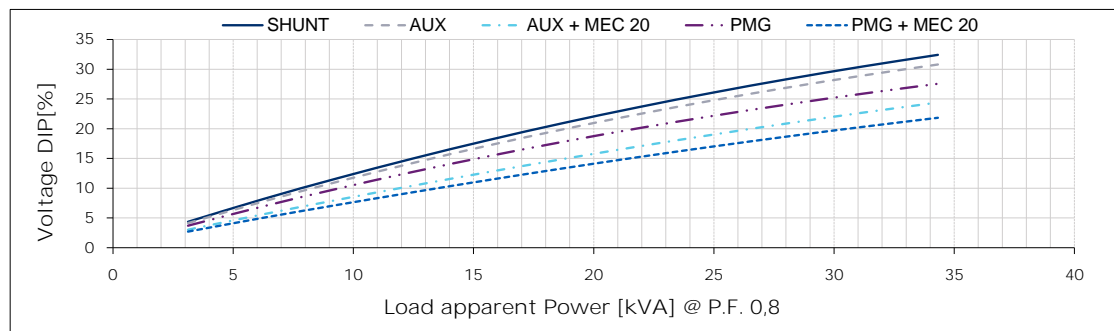
440 V



460 V



480 V

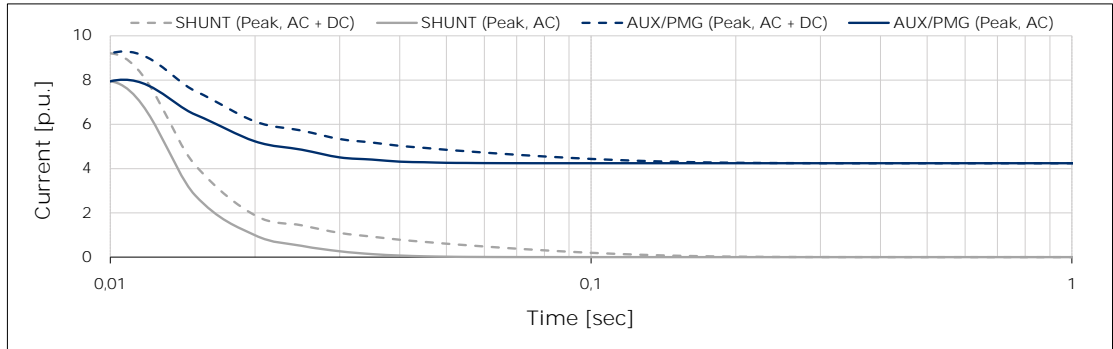


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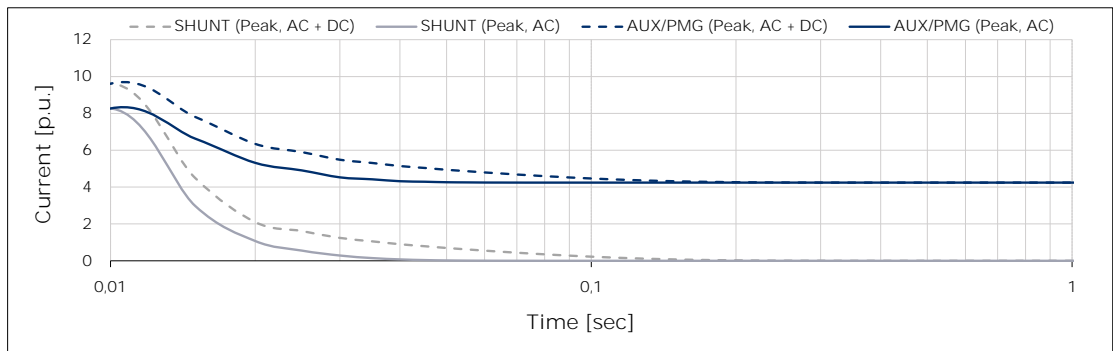
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

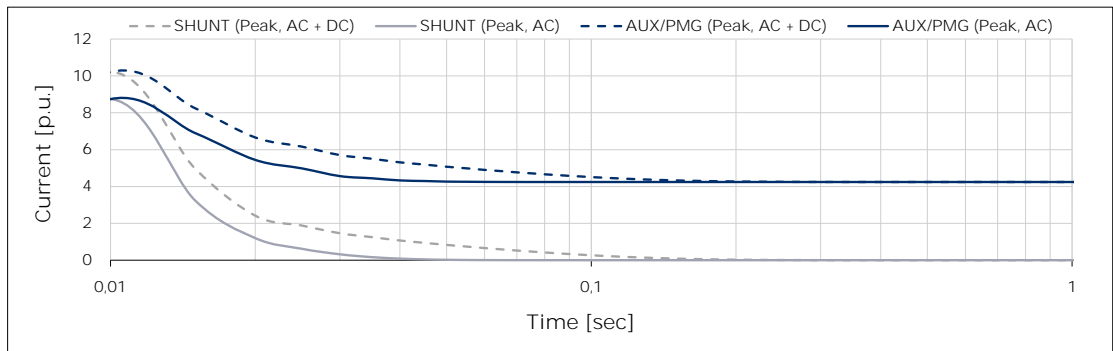
380 V



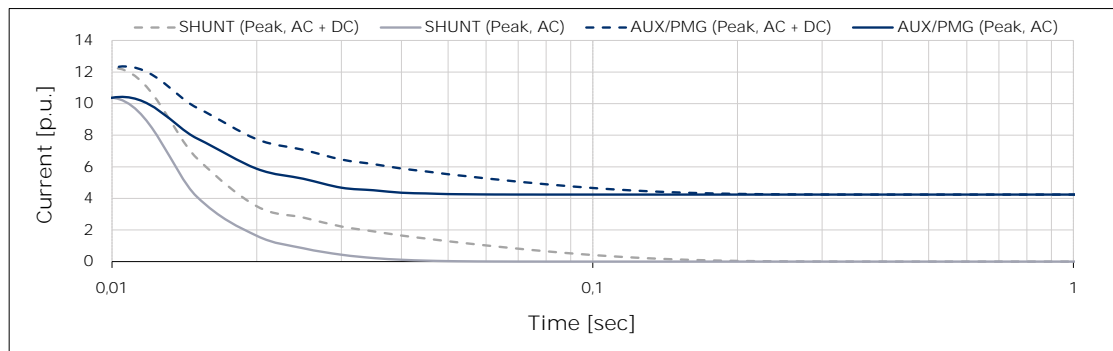
400 V



415 V



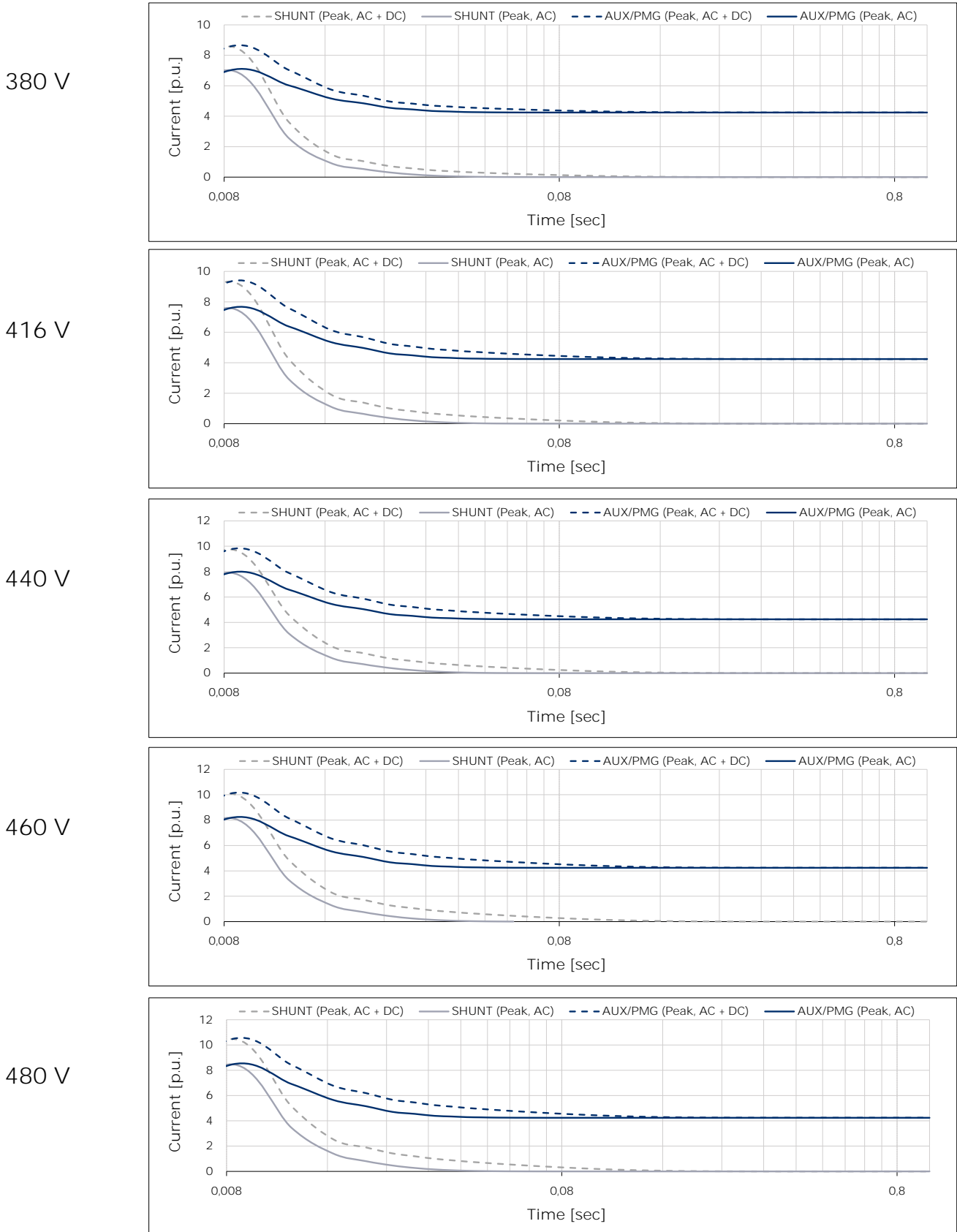
440 V



THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 160 SA 4

Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

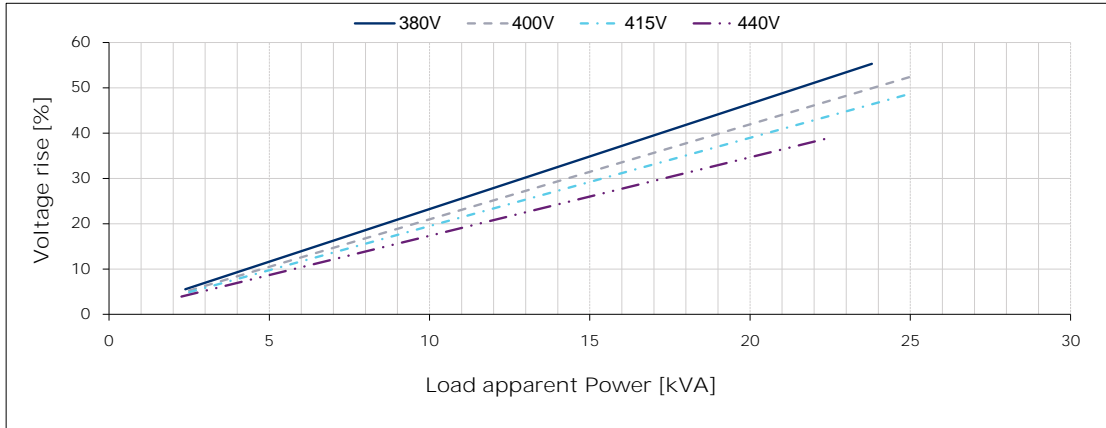


Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

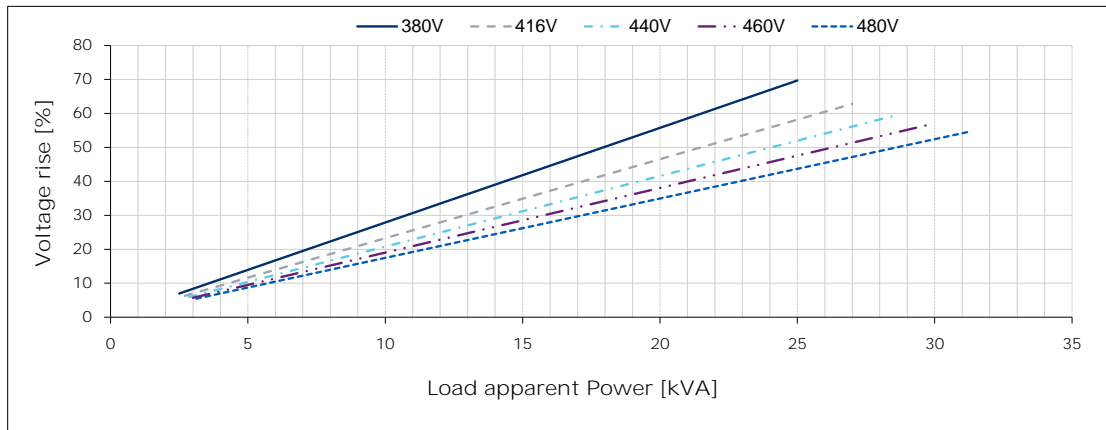
	2 phase	1 phase
Instantaneous (max)	1,02	1,23
Continuous	1,50	1,83

Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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