

THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 250 SA 4

4 POLES

CONTINUOUS DUTY

50 Hz-1500 min⁻¹ / 60 Hz-1800 min⁻¹

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		180 180 180 162	180 195 206 216 225
	kW		144 144 144 130	144 156 165 173 180
EFFICIENCY (%) @ 0,8 p.f.	4/4		91,4 91,8 91,9 92,1	91,5 92,0 92,2 92,4 92,4
	3/4		92,6 92,8 92,8 92,6	92,6 93,0 93,1 93,2 93,3
	2/4		93,4 93,4 93,2 92,5	93,3 93,5 93,6 93,6 93,6
EFFICIENCY (%) @ 1,0 p.f.	4/4		93,7 94,0 94,2 94,6	93,5 93,9 94,2 94,3 94,5
	3/4		94,6 94,9 95,0 95,0	94,4 94,8 94,9 95,1 95,1
	2/4		95,3 95,3 95,3 94,8	95,0 95,2 95,3 95,4 95,4
STAND-BY RATING (163/27)	kVA		198 198 198 178	198 215 227 238 248
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			91,0 91,3 91,5 91,8	91,0 91,6 91,9 92,0 92,1
SHORT CIRCUIT RATIO (referred to class H rating)			0,44 0,49 0,53 0,66	0,37 0,41 0,43 0,45 0,47
REACTANCES (%) (referred to class H rating)				
Direct axis synchronous	x _d		322 291 270 216	387 350 330 317 303
Quadrature axis synchronous	x _q		133 120 112 90	160 145 137 131 125
Direct axis transient	x' _d		19,8 17,9 16,6 13,3	23,8 21,5 20,3 19,5 18,6
Direct axis subtransient	x'' _d		13,9 12,6 11,7 9,4	16,7 15,1 14,3 13,7 13,1
Quadrature axis subtransient	x'' _q		15,3 13,8 12,9 10,3	18,4 16,6 15,7 15,1 14,4
Negative sequence	x ₂		14,6 13,2 12,3 9,8	17,6 15,9 15,0 14,4 13,8
Zero sequence	x ₀		5,9 5,3 4,9 3,9	7,0 6,4 6,0 5,8 5,5

TIME CONSTANTS [s]

Open circuit (T' _{do})	0,912	Subtransient (T'' _d)	0,008
Transient (T' _d)	0,092	Armature (T _a)	0,010

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	Available on double bearing configuration (on request)
N-end bearing/Lubrication	6313 2Z C3 / Prelubricated
Weight [kg]	513
Inertia (J) [kgm ²]	1,56
Overspeed [min ⁻¹]	2250
Method of cooling	IC 01
Cooling air required [m ³ /s] @ 50/60 Hz	1,7 / 2,1
Degree of protection	IP 23
Type of construction available	B2 (B34 on request)
Direction of rotation	CW

OTHER DATA

Phase resistance [Ω] @ 20 °C - Star series	0,024
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

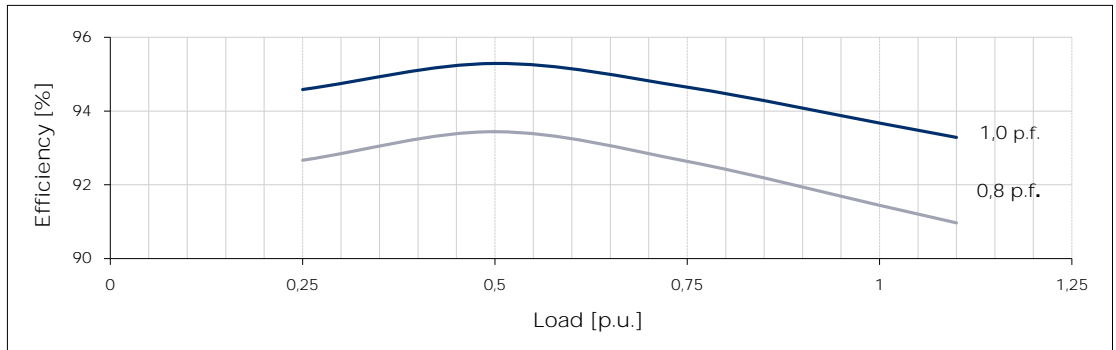
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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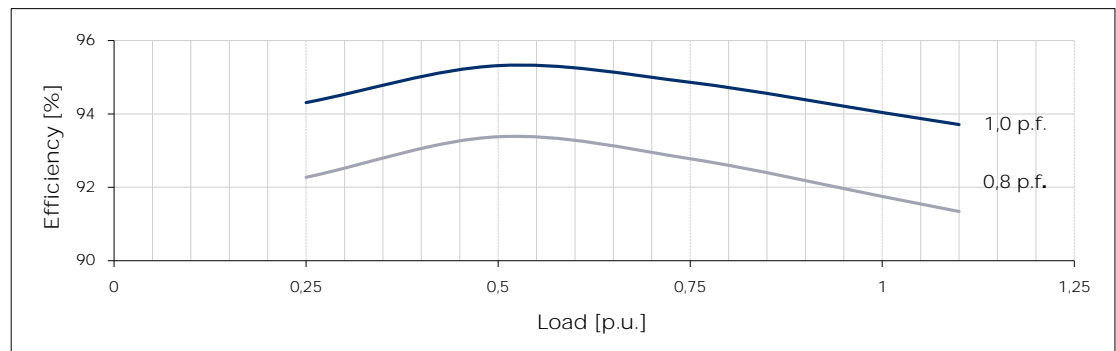
Typical efficiency curves

50 Hz - 1500 min⁻¹

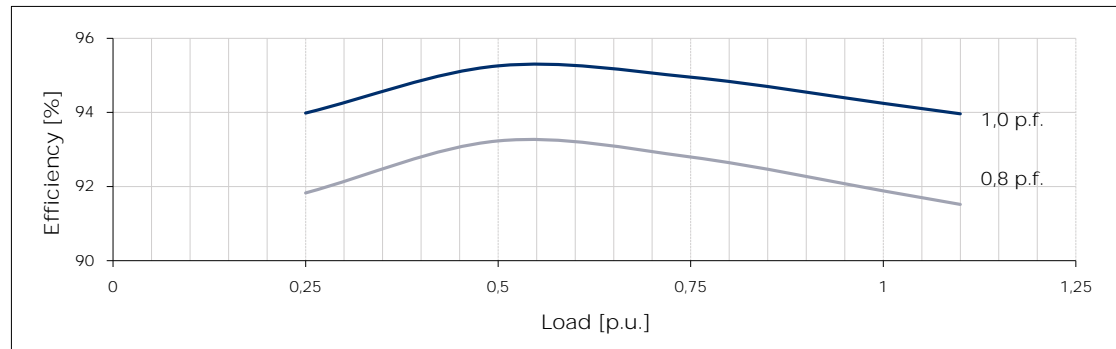
380 V



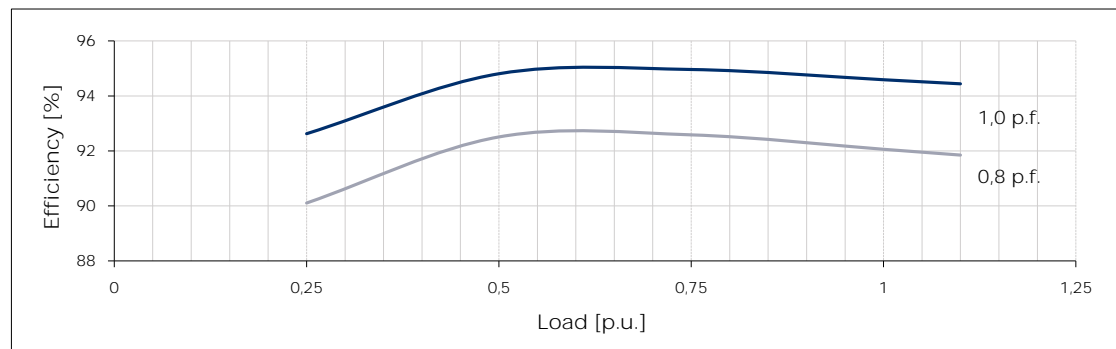
400 V



415 V



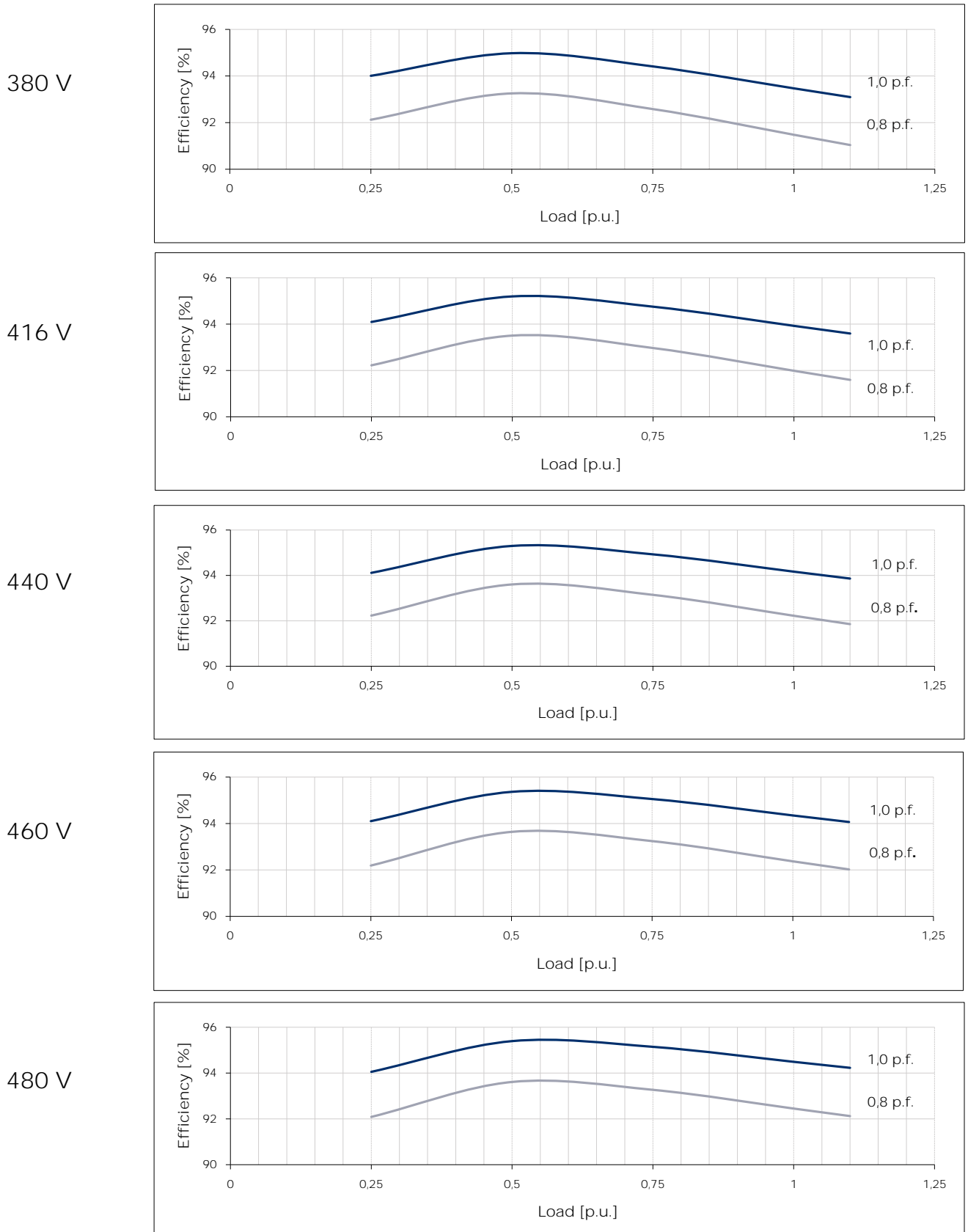
440 V



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Typical efficiency curves

60 Hz - 1800 min⁻¹





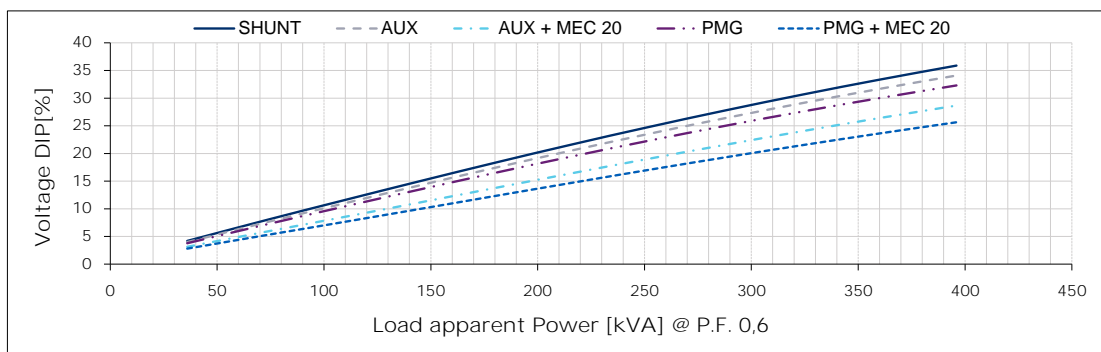
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Inspired solutions

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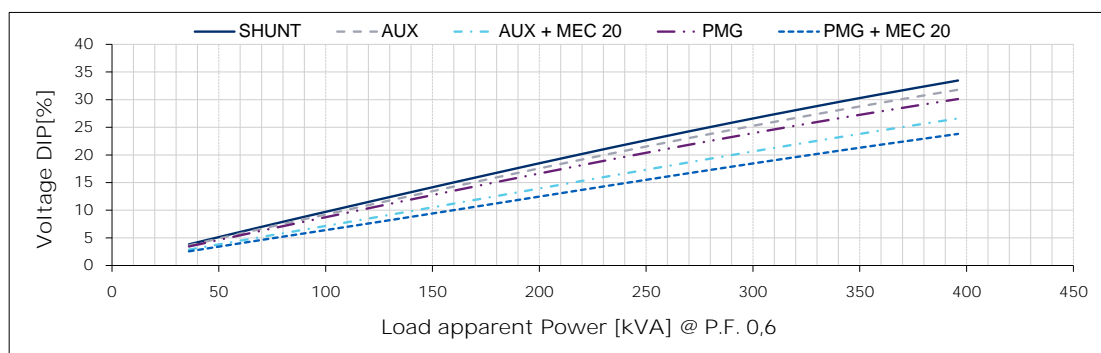
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

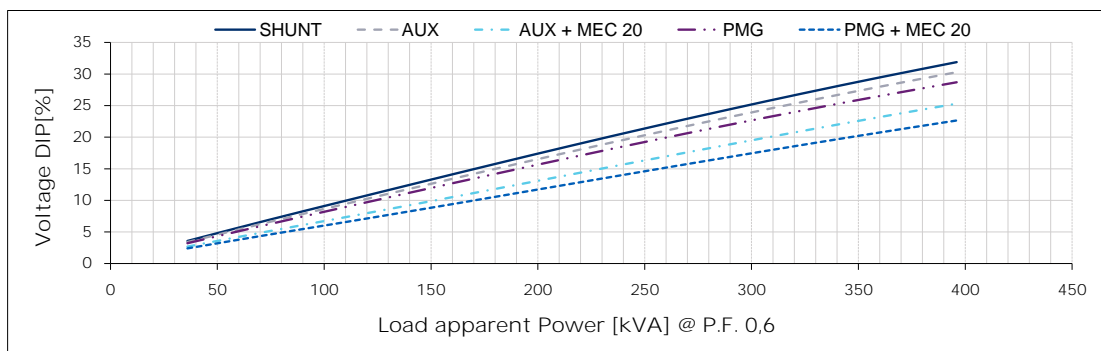
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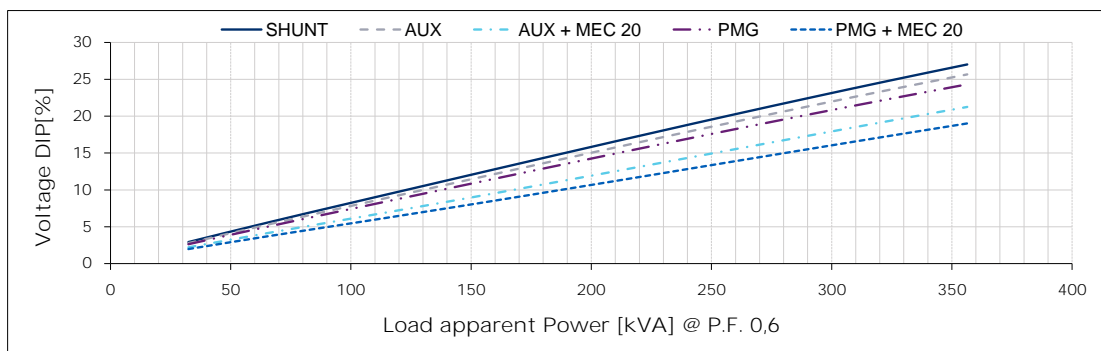
400 V



415 V



440 V





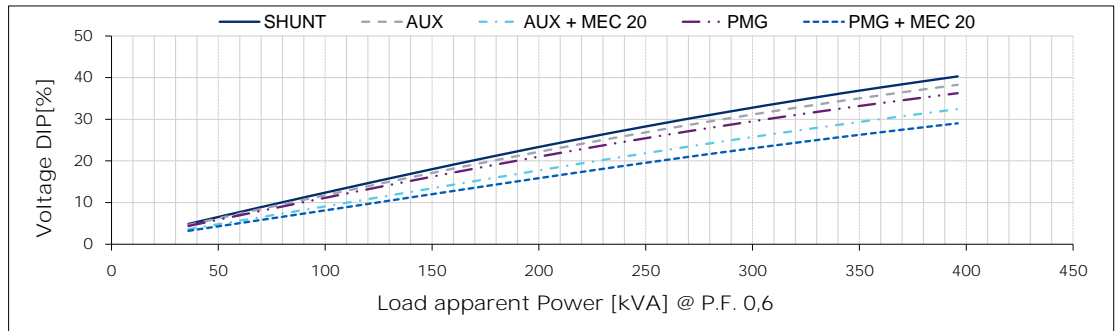
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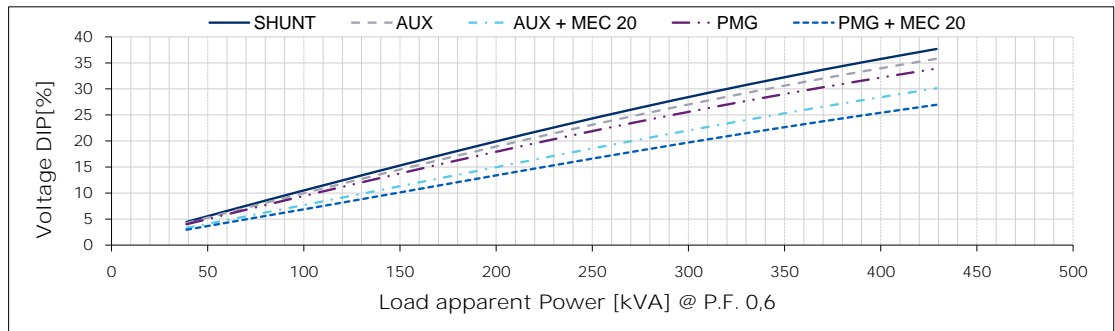
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

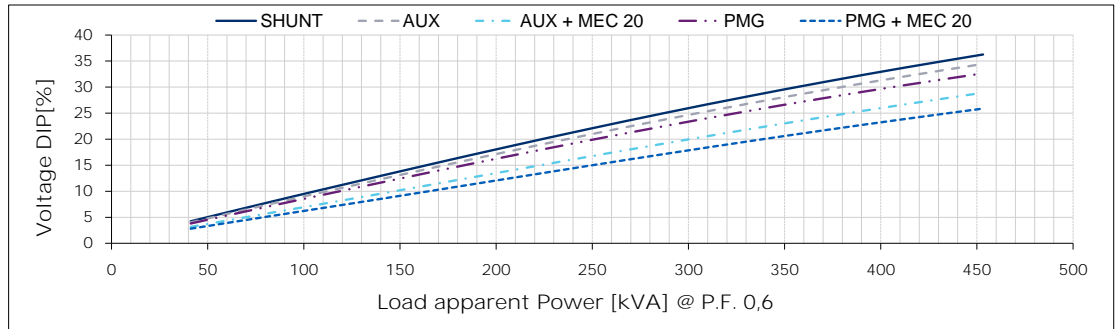
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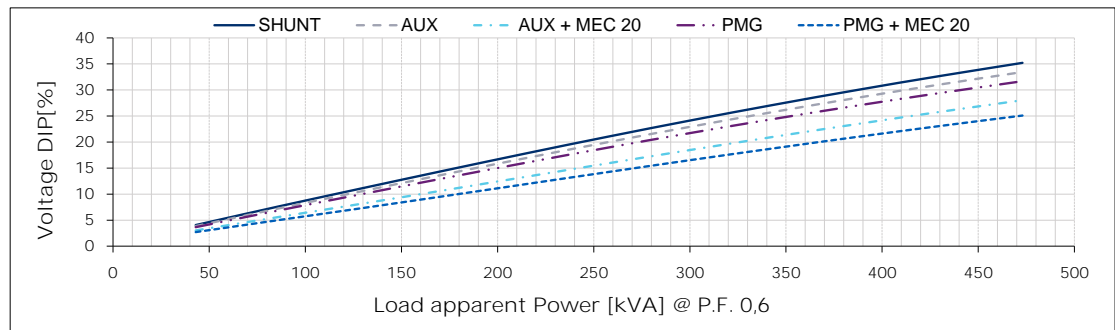
416 V



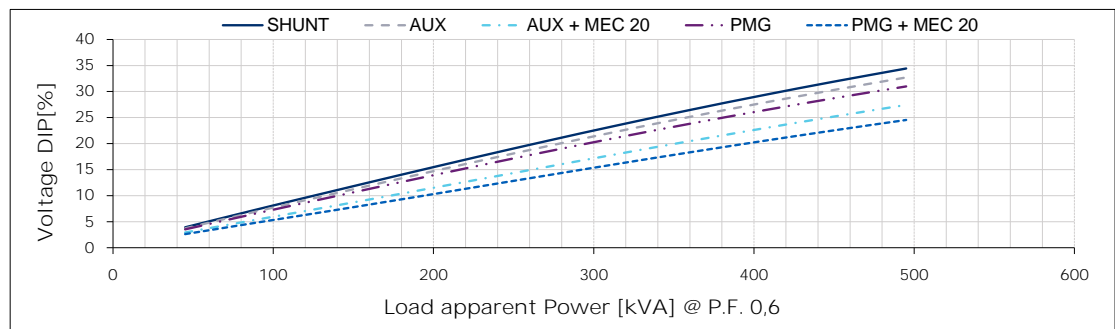
440 V



460 V



480 V



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

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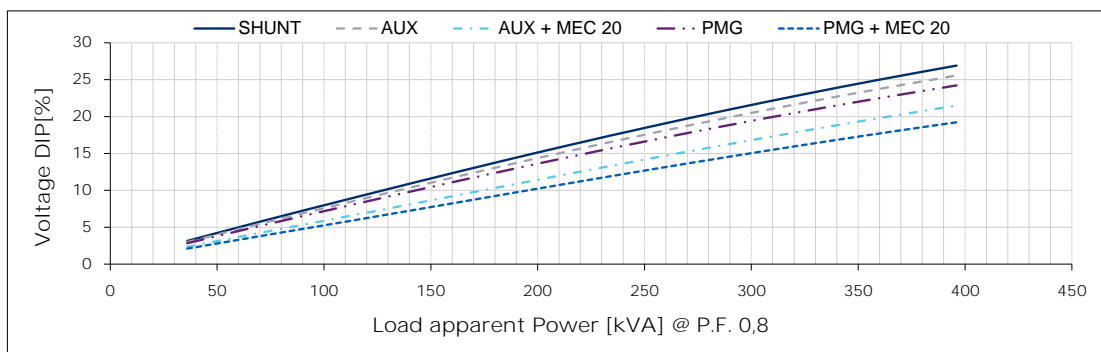
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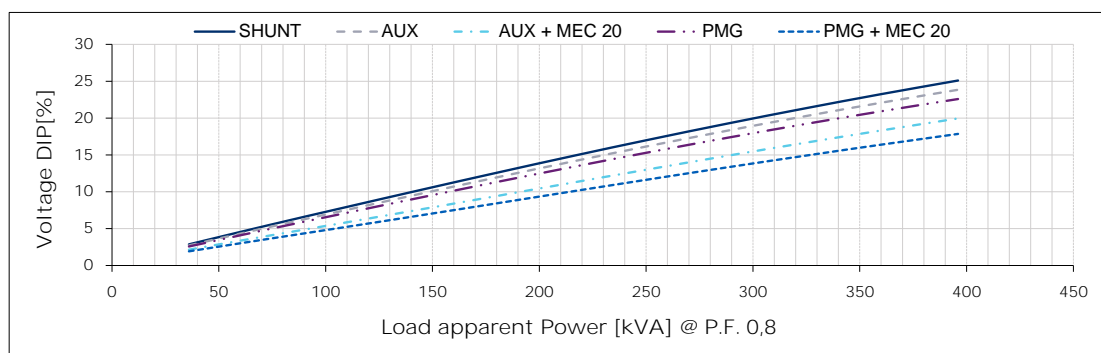
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

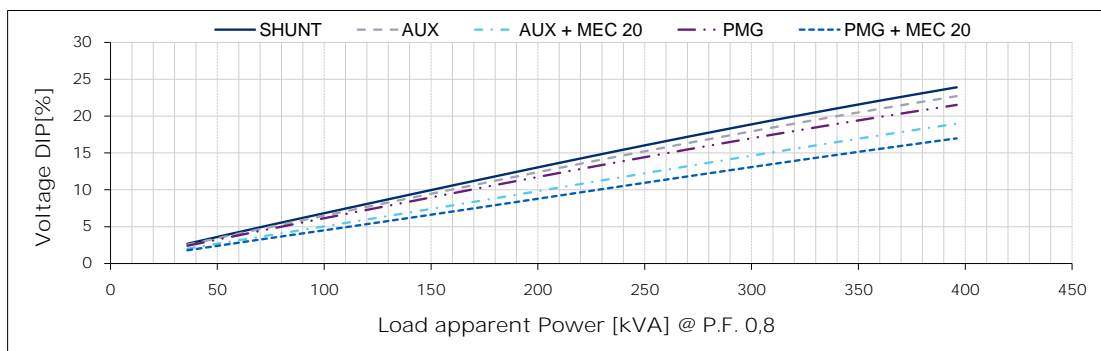
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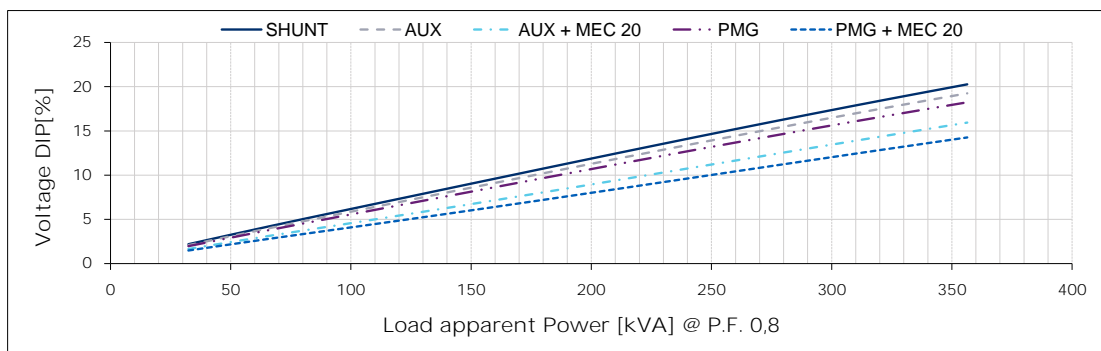
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415 V



440 V





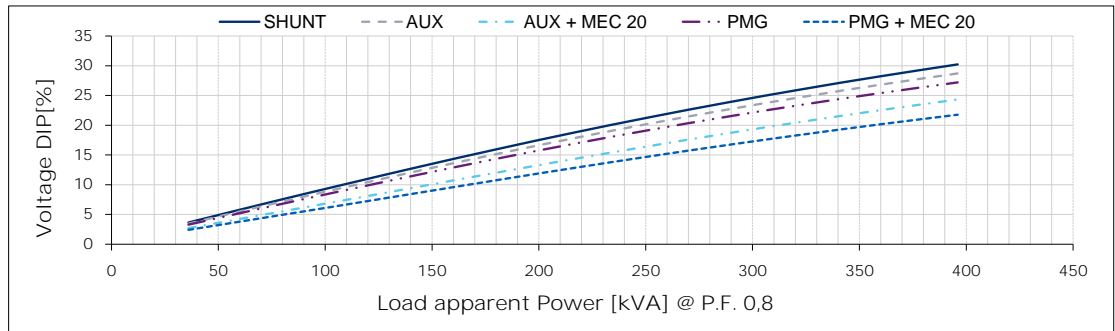
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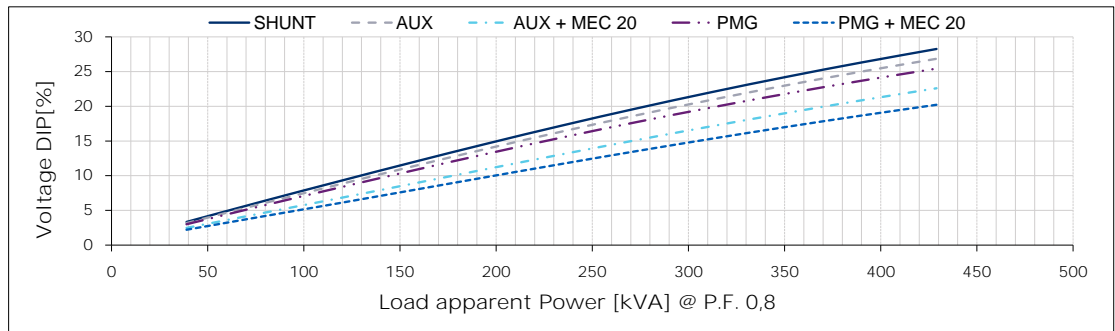
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

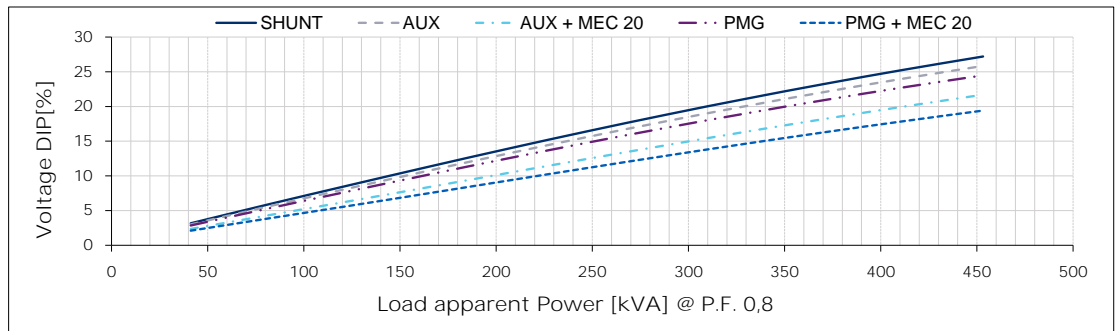
380 V



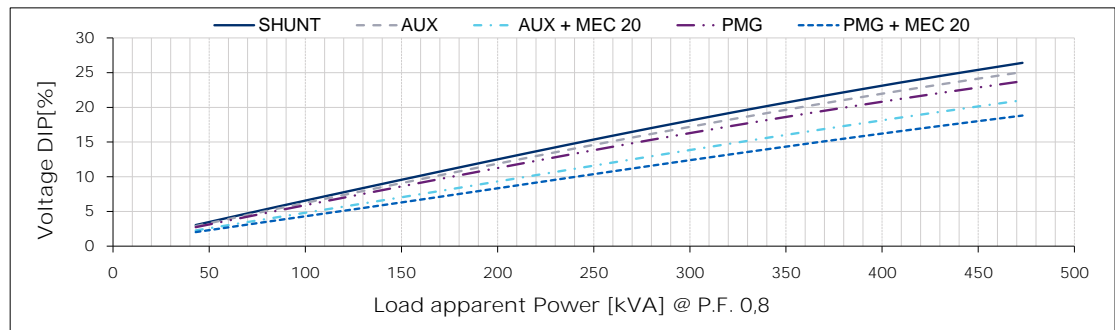
416 V



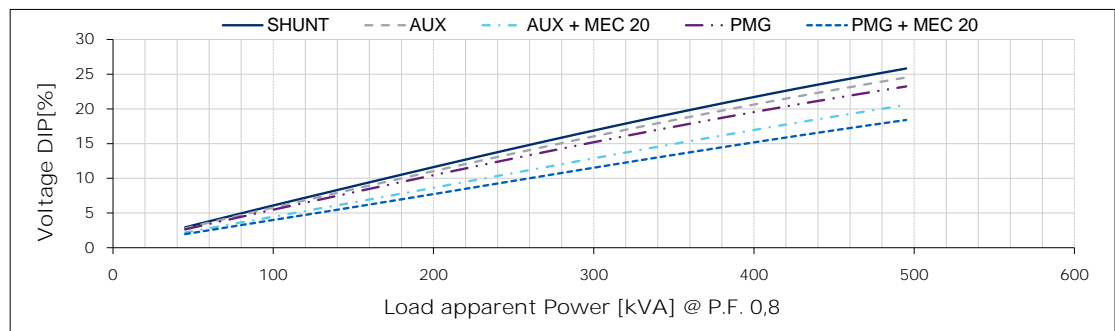
440 V



460 V



480 V

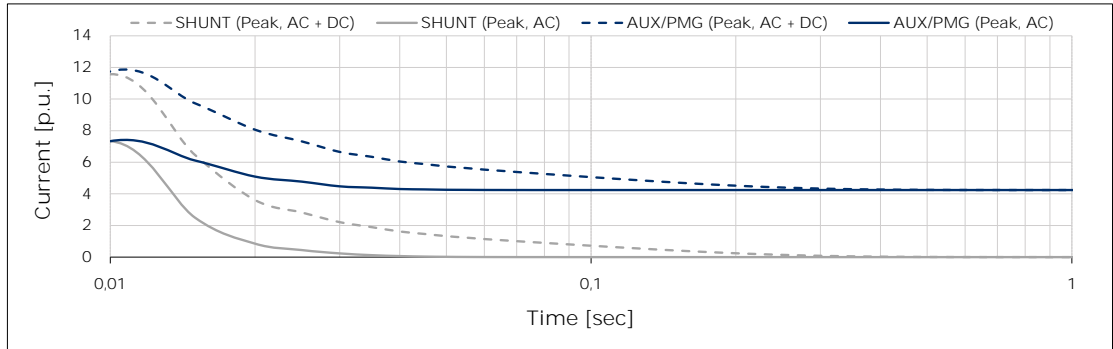


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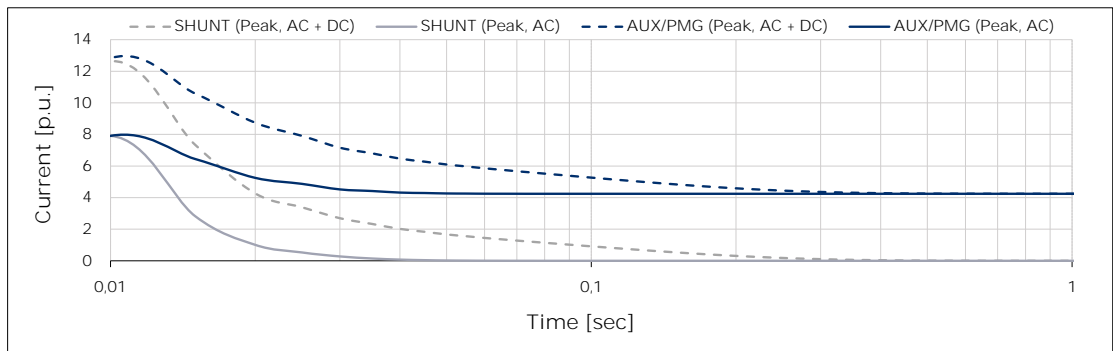
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

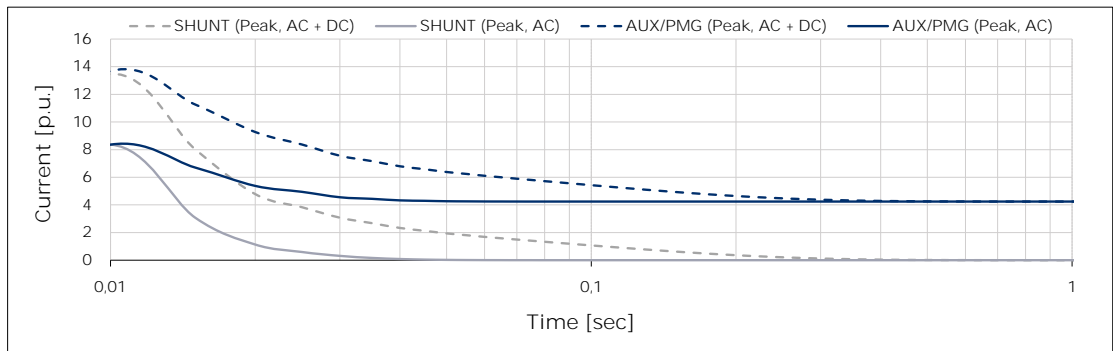
380 V



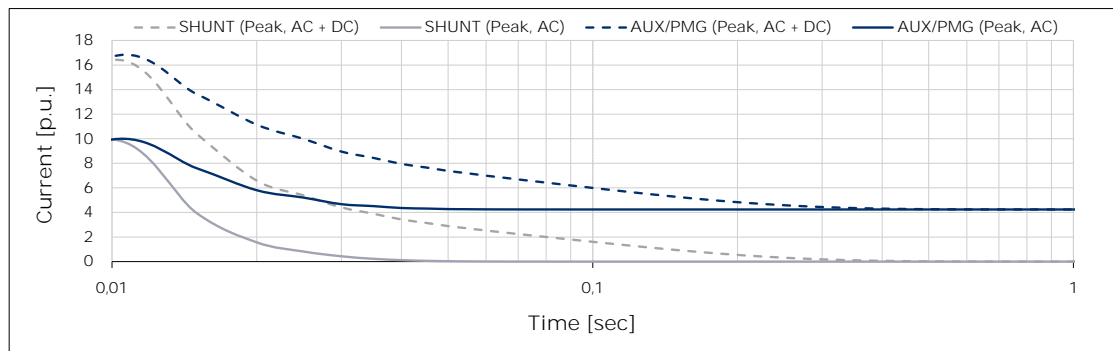
400 V



415 V



440 V

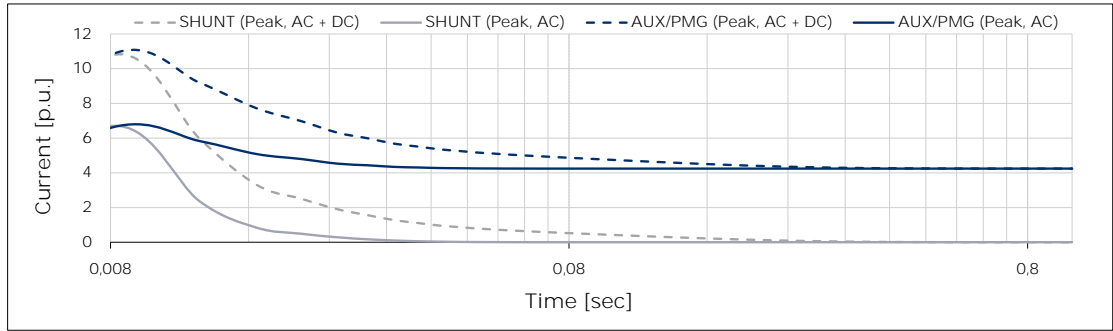


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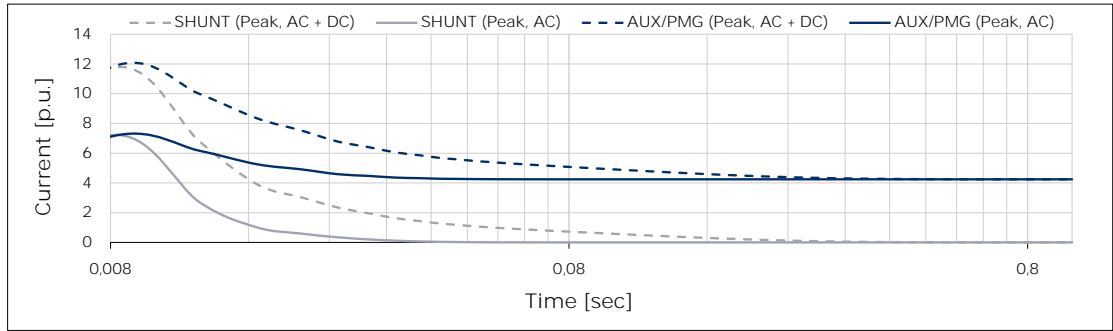
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

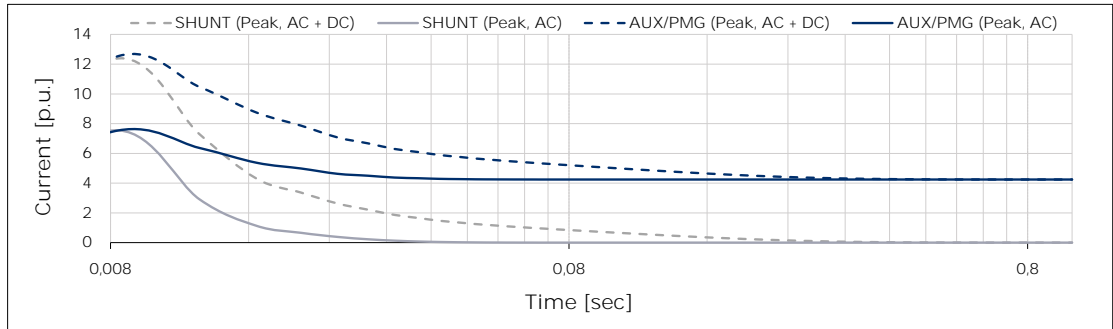
380 V



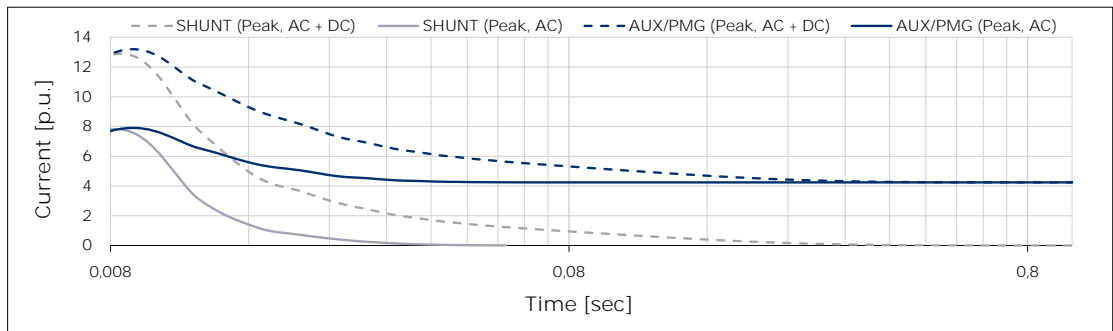
416 V



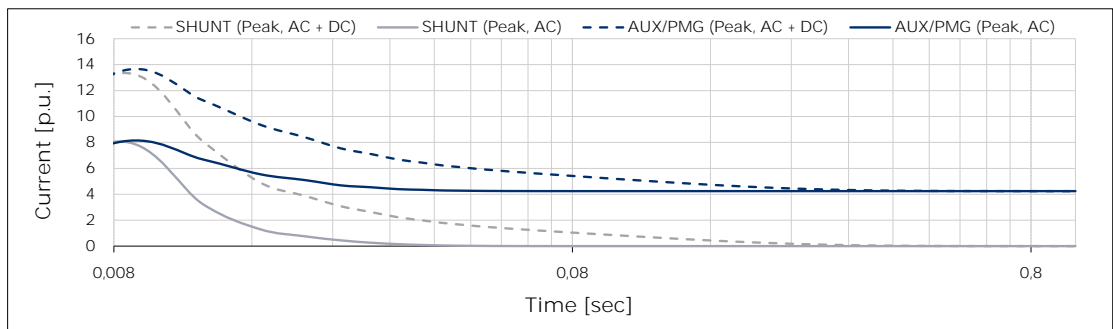
440 V



460 V



480 V



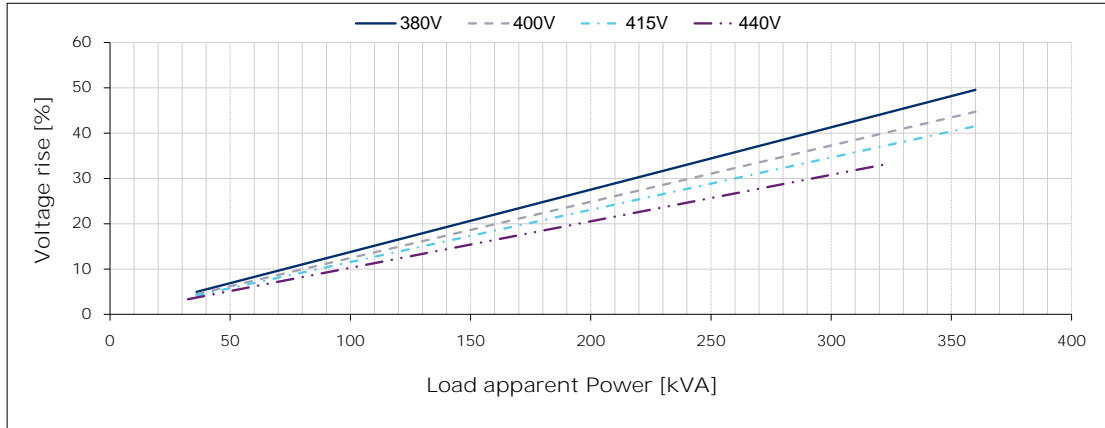
Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

	2 phase	1 phase
Instantaneous (max)	0,92	1,15
Continuous	1,50	1,83

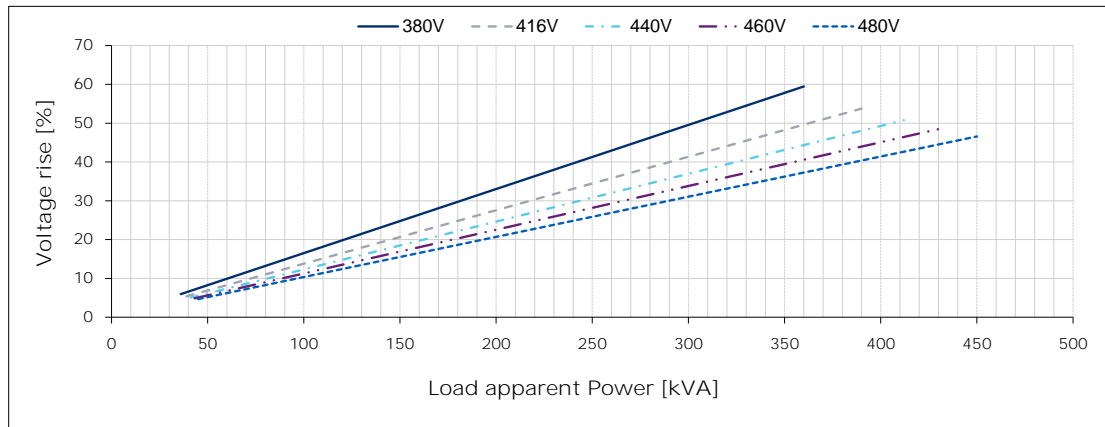
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Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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