

THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 250 MA 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								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	400	415	440	380	416	440	460 480
			190	200	208	220	190	208	220	230 240
RATING	kVA		230	230	230	207	230	249	264	276 288
	kW		184	184	184	166	184	199	211	221 230
EFFICIENCY (%) @ 0,8 p.f.	4/4		91,9	92,2	92,3	92,7	91,8	92,4	92,6	92,8 92,9
	3/4		93,0	93,2	93,2	93,3	92,9	93,3	93,5	93,6 93,7
	2/4		93,9	93,9	93,7	93,3	93,6	93,9	94,0	94,1 94,1
EFFICIENCY (%) @ 1,0 p.f.	4/4		93,9	94,2	94,4	94,9	93,6	94,1	94,3	94,5 94,6
	3/4		94,8	95,0	95,1	95,3	94,6	94,9	95,1	95,2 95,3
	2/4		95,5	95,5	95,5	95,2	95,2	95,4	95,5	95,6 95,6
STAND-BY RATING (163/27)	kVA		253	253	253	228	253	274	290	304 317
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			91,4	91,8	92,0	92,5	91,4	92,0	92,3	92,4 92,5
SHORT CIRCUIT RATIO (referred to class H rating)			0,36	0,40	0,43	0,54	0,30	0,34	0,35	0,37 0,39
REACTANCES (%) (referred to class H rating)										
Direct axis synchronous	x _d		354	319	297	238	425	384	364	348 333
Quadrature axis synchronous	x _q		146	132	123	98	176	159	150	144 138
Direct axis transient	x' _d		22,0	19,9	18,5	14,8	26,4	23,9	22,6	21,7 20,8
Direct axis subtransient	x'' _d		15,3	13,8	12,8	10,3	18,3	16,6	15,7	15,0 14,4
Quadrature axis subtransient	x'' _q		16,8	15,2	14,1	11,3	20,2	18,2	17,3	16,5 15,8
Negative sequence	x ₂		16,0	14,5	13,4	10,8	19,2	17,4	16,5	15,8 15,1
Zero sequence	x ₀		6,4	5,8	5,4	4,3	7,7	6,9	6,6	6,3 6,0

TIME CONSTANTS [s]

Open circuit (T' _{do})	1,124	Subtransient (T'' _d)	0,008
Transient (T' _d)	0,111	Armature (T _a)	0,012

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	Available on double bearing configuration (on request)
N-end bearing/Lubrication	6313 2Z C3 / Prelubricated
Weight [kg]	599
Inertia (J) [kgm ²]	1,89
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	0,018
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)

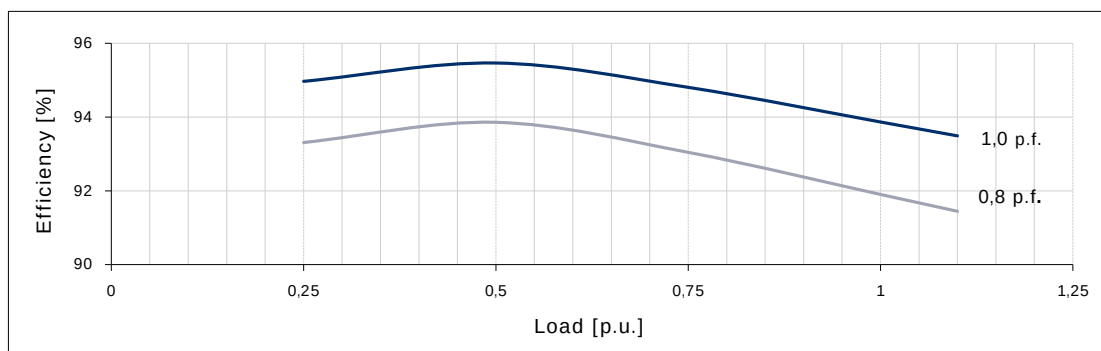
STANDARDS

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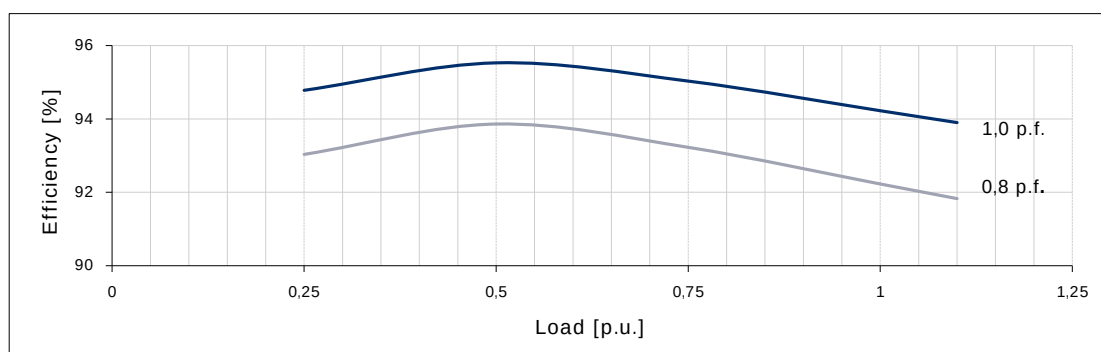
Typical efficiency curves

50 Hz - 1500 min⁻¹

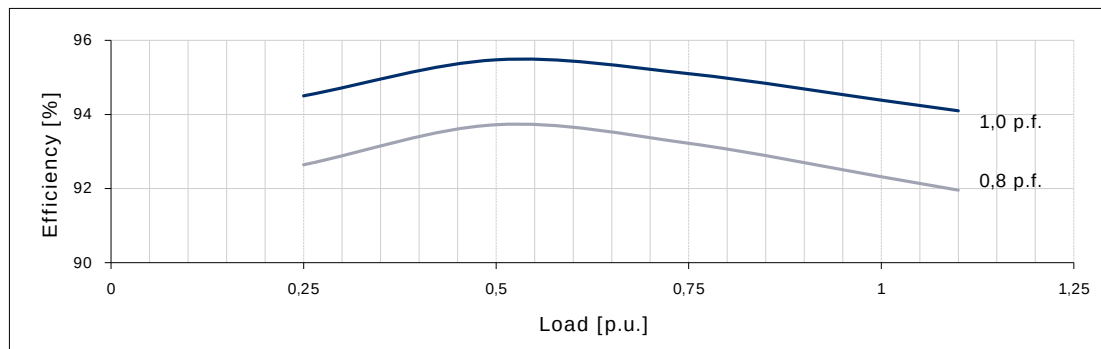
380 V



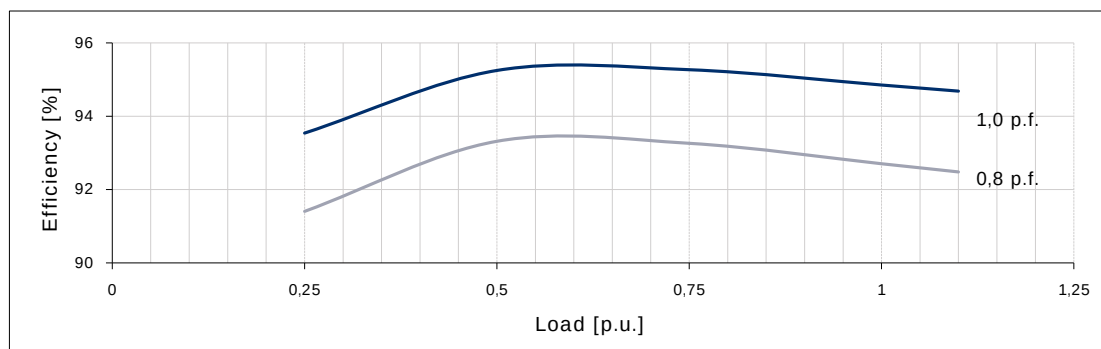
400 V



415 V



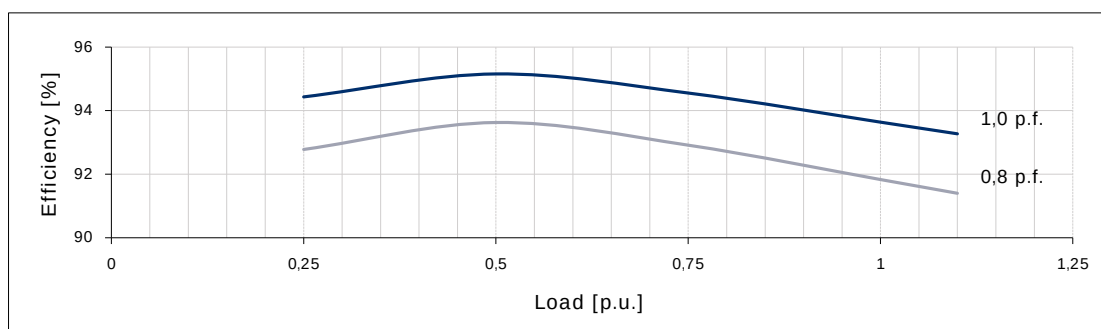
440 V



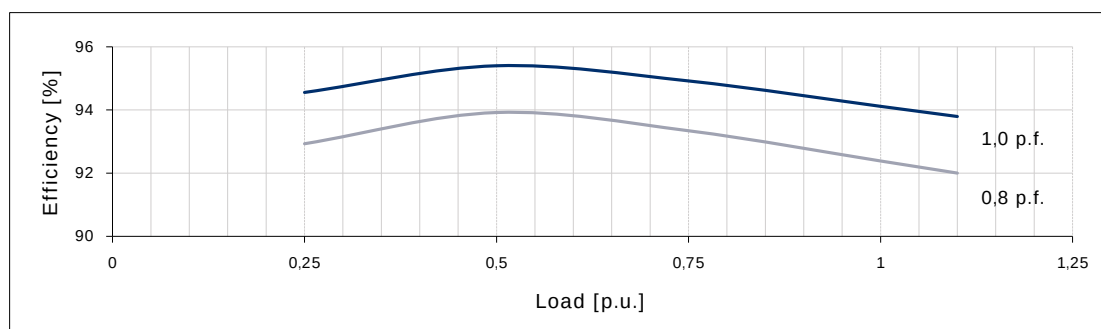
Typical efficiency curves

60 Hz - 1800 min⁻¹

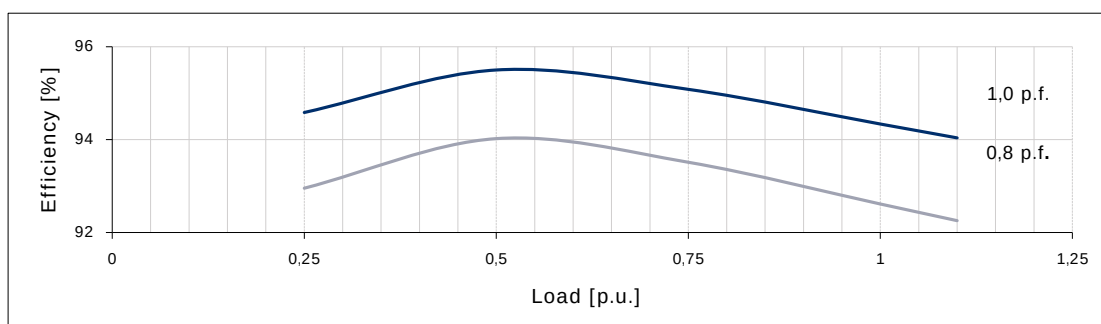
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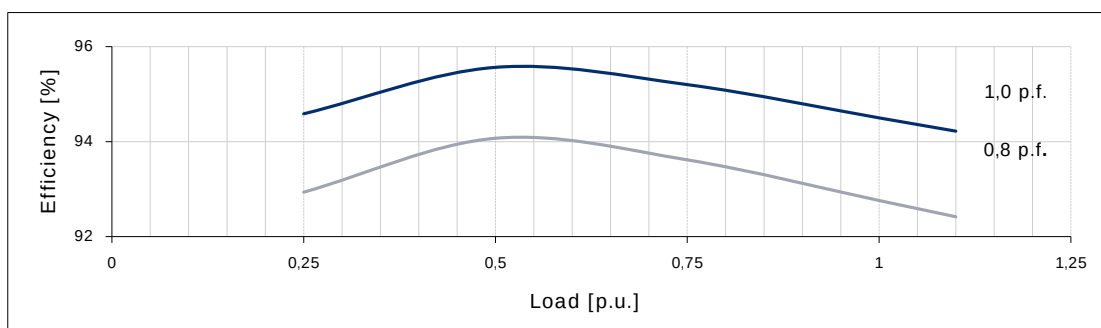
416 V



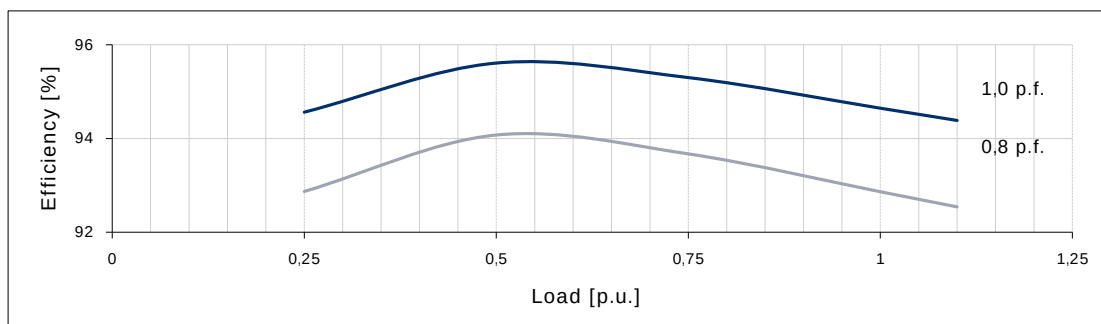
440 V



460 V



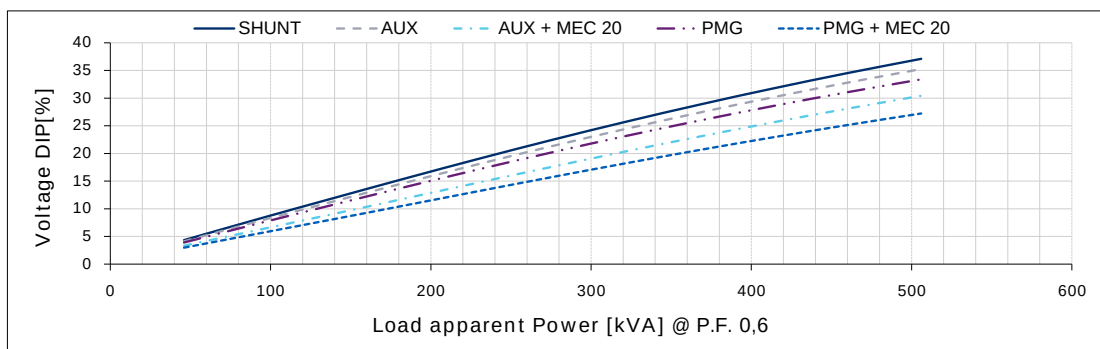
480 V



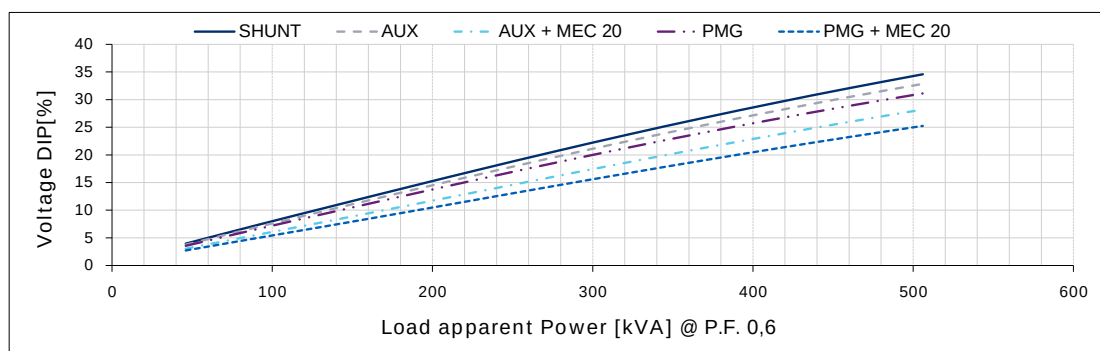
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

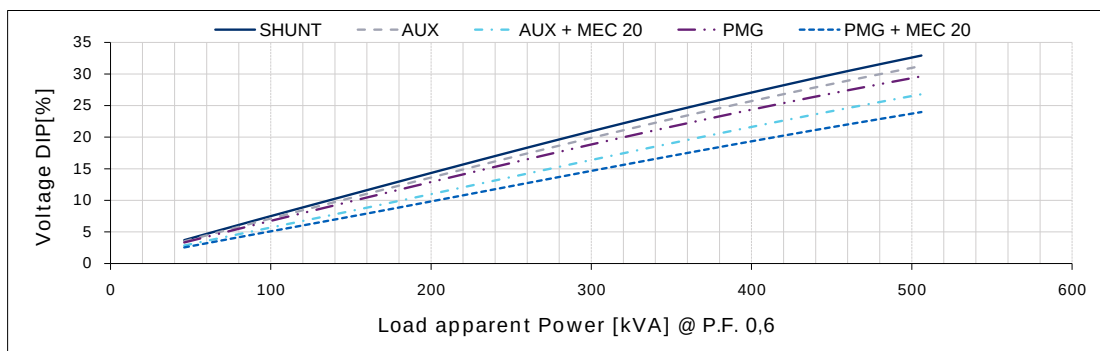
380 V



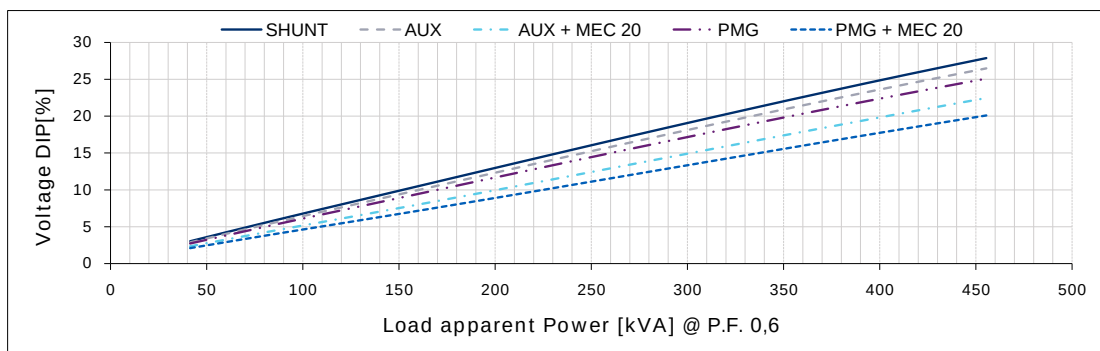
400 V



415 V



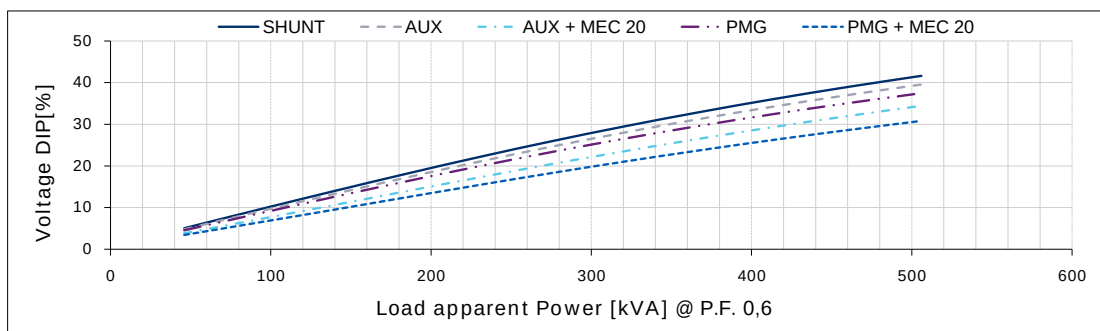
440 V



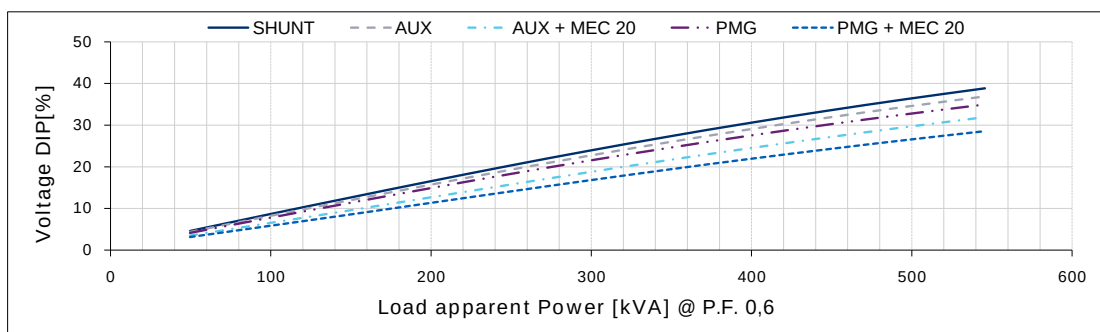
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

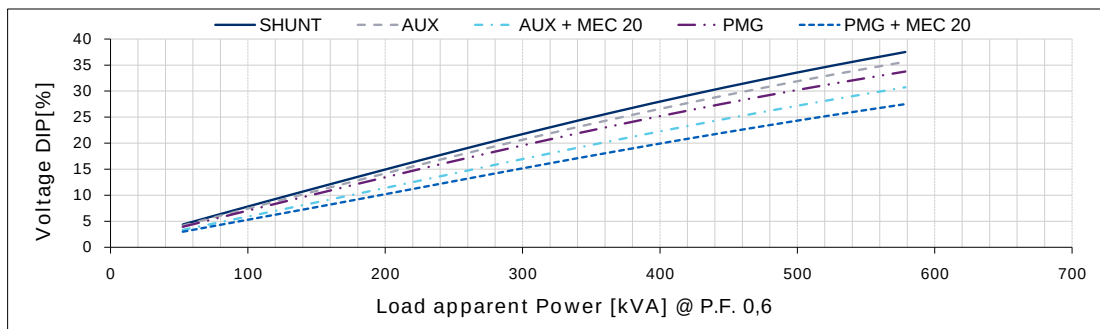
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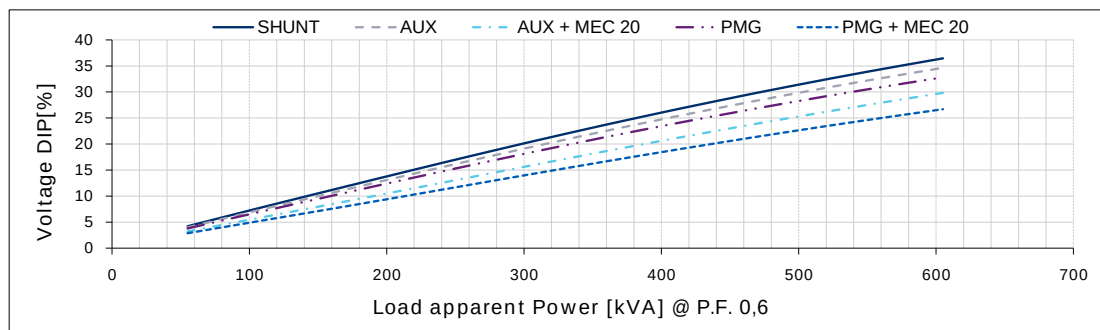
416 V



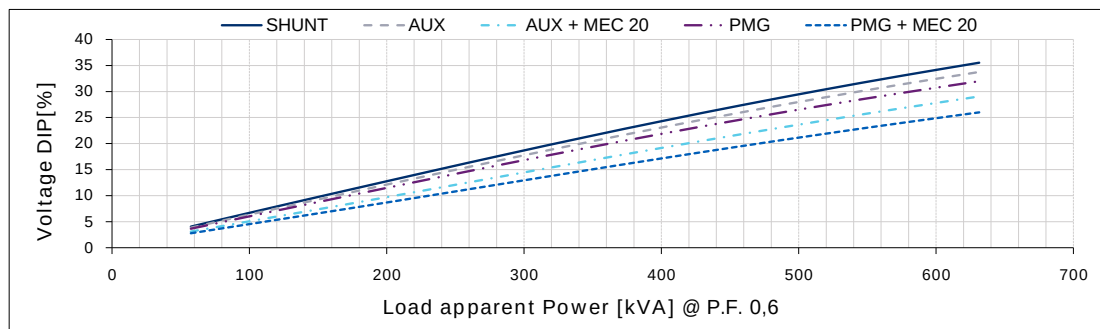
440 V



460 V



480 V



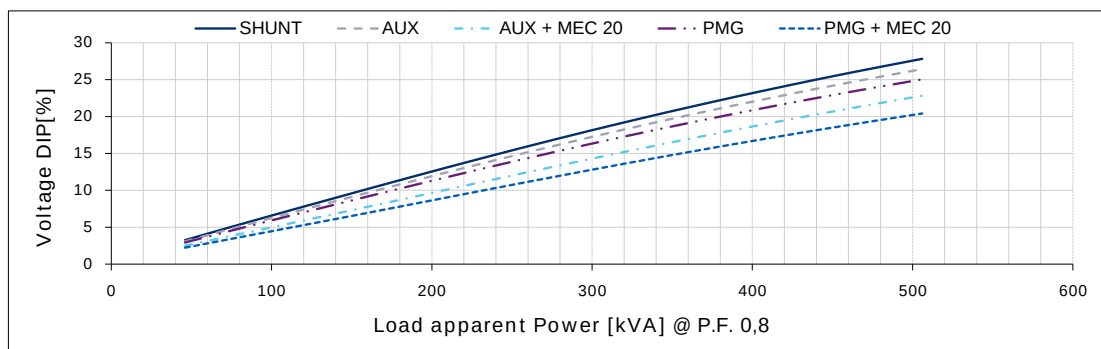
For P.F. different from 0,6 the following simplified formula can be used: $\Delta V @ P.F. = \Delta V @ 0,6 \cdot \sin(\arccos(P.F.)) / 0,8$

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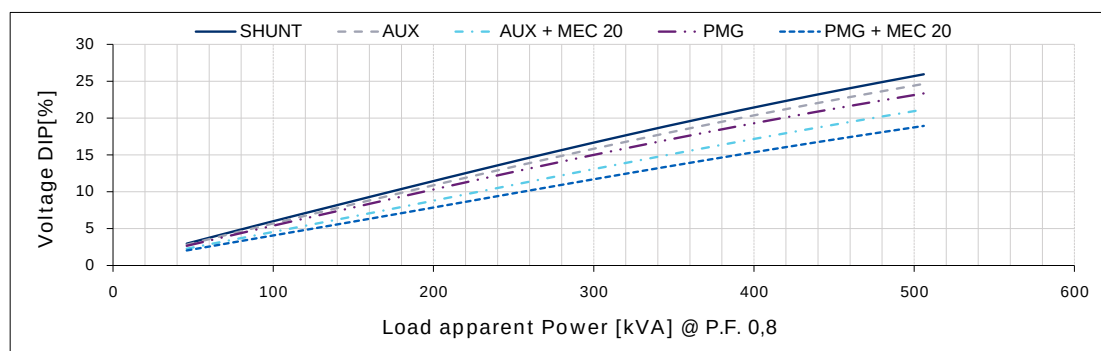
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

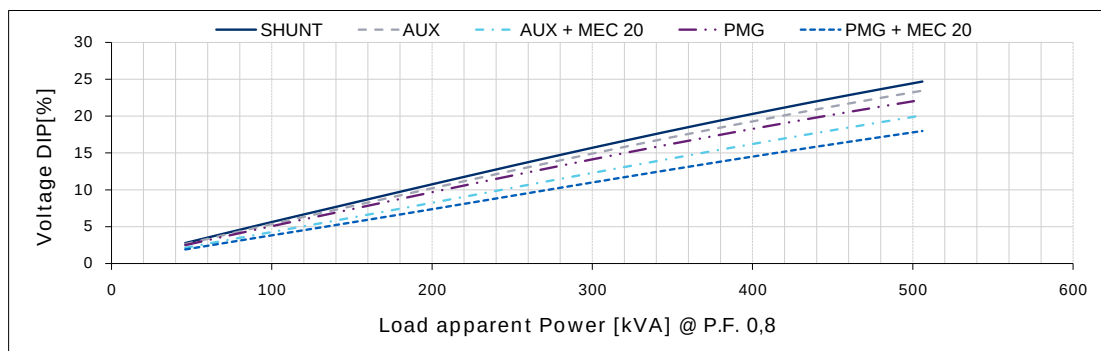
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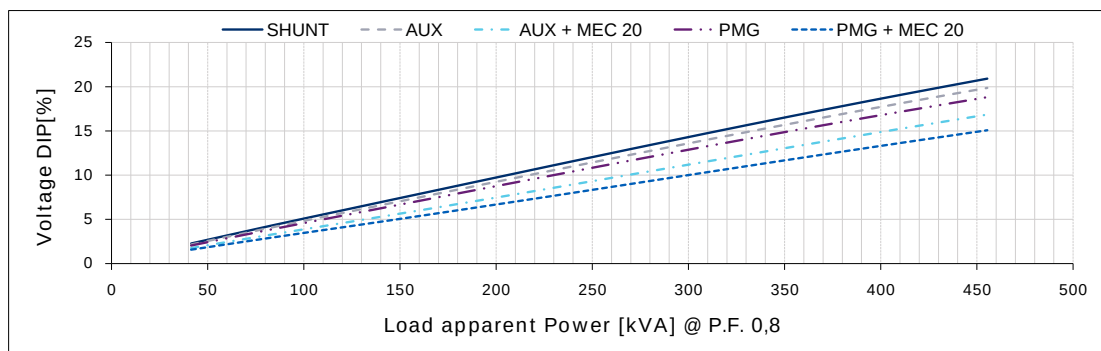
400 V



415 V



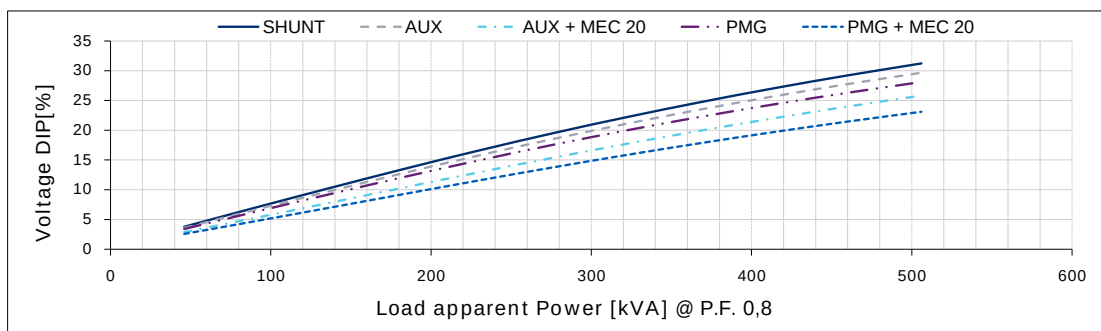
440 V



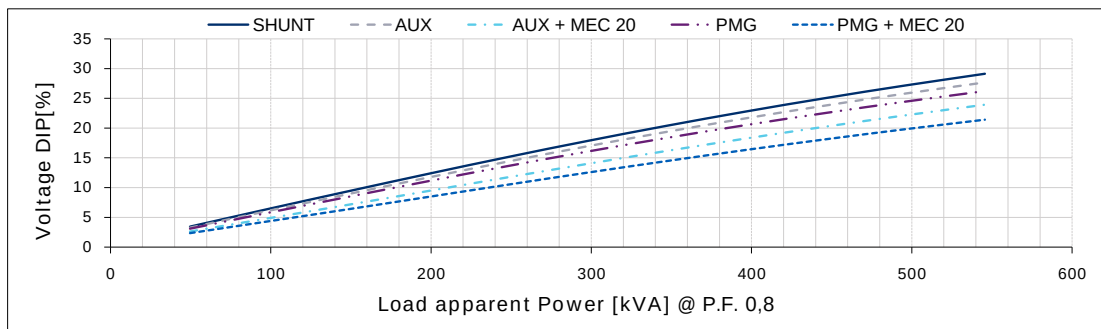
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

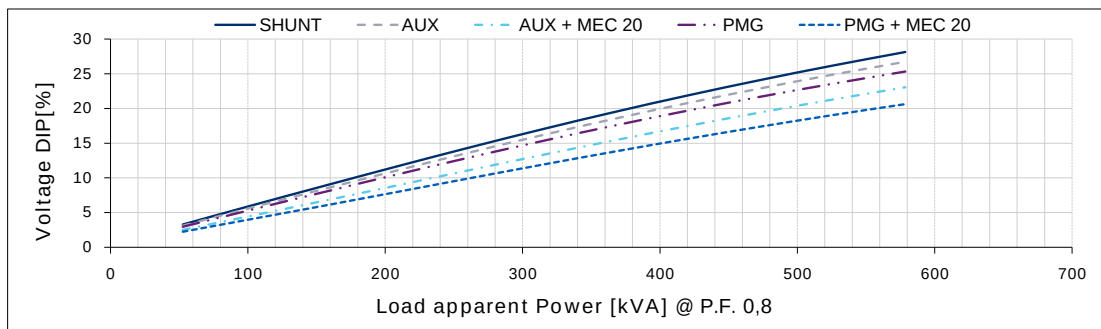
380 V



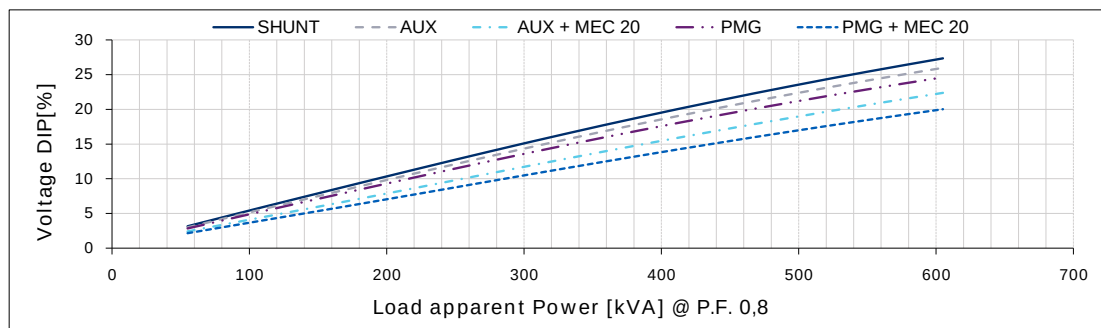
416 V



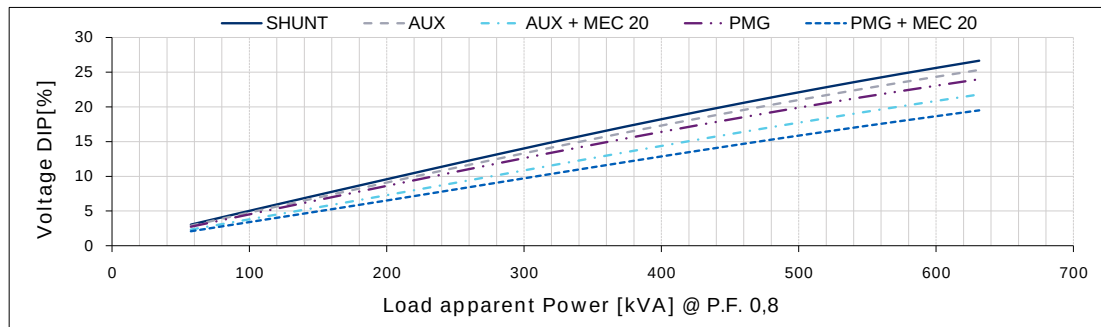
440 V



460 V



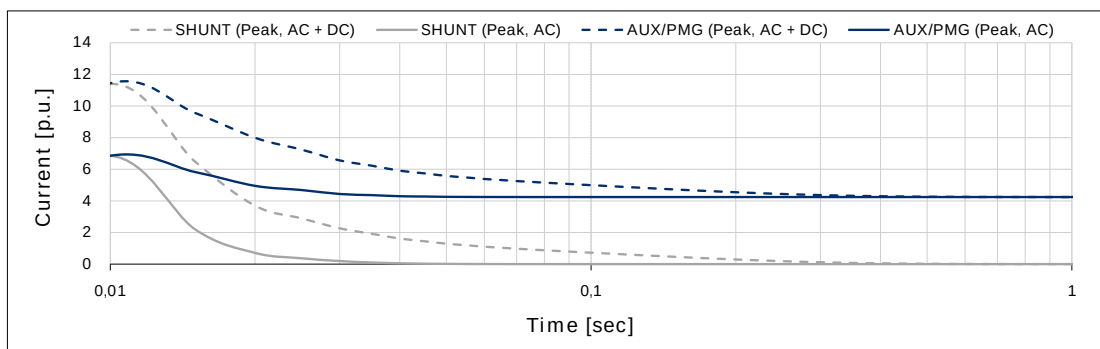
480 V



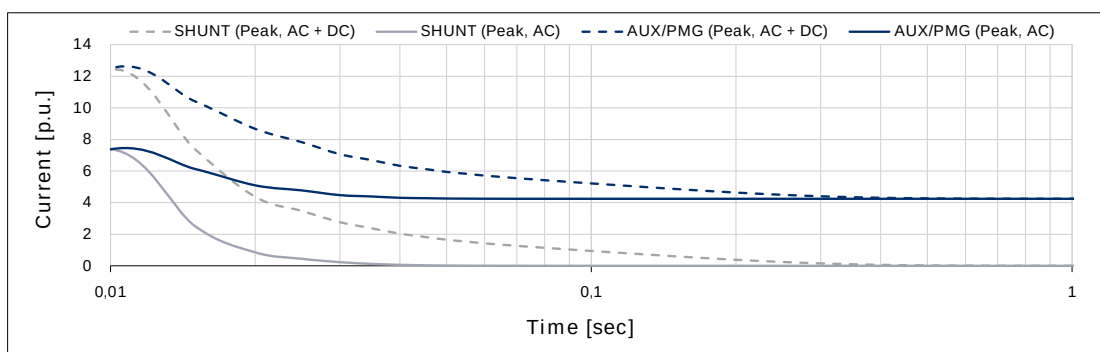
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

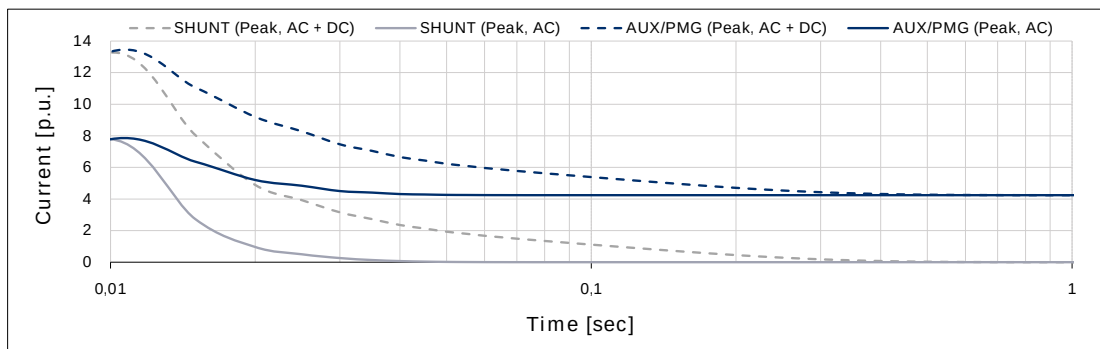
380 V



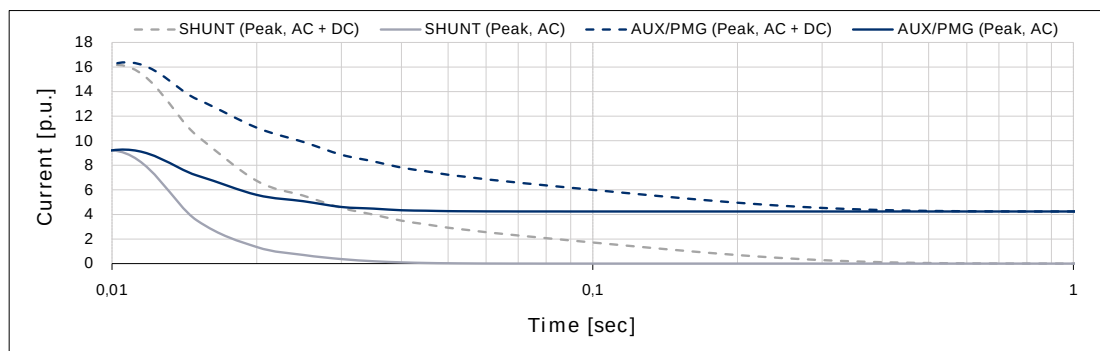
400 V



415 V



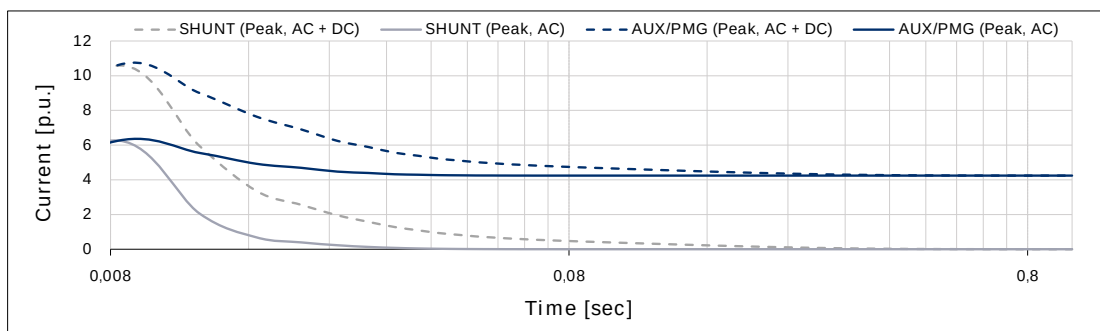
440 V



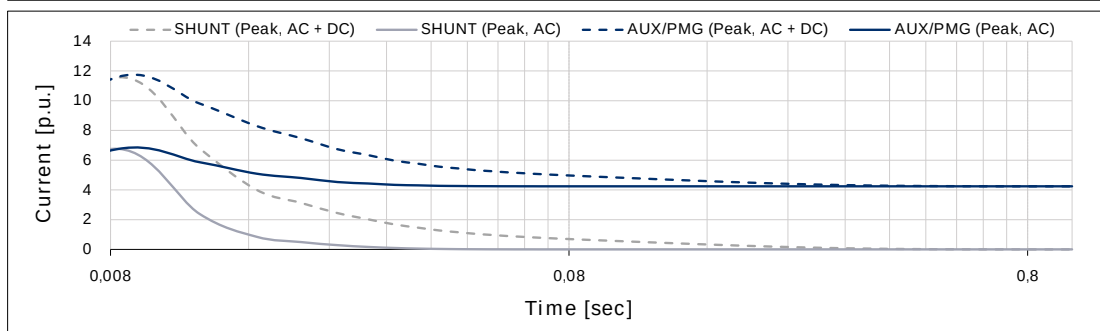
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

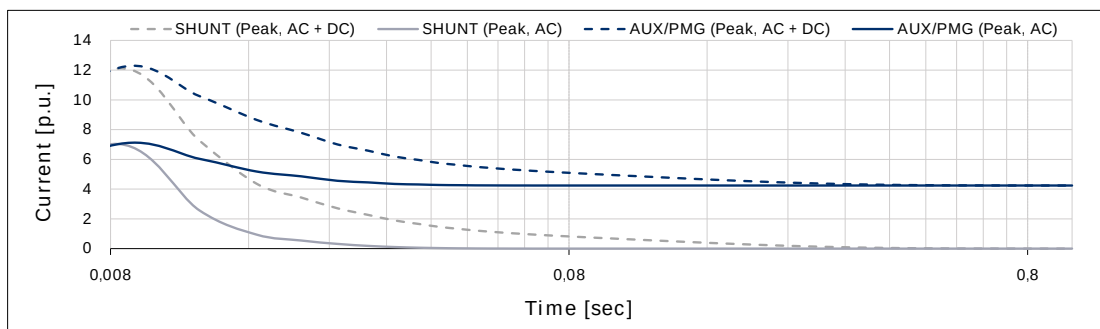
380 V



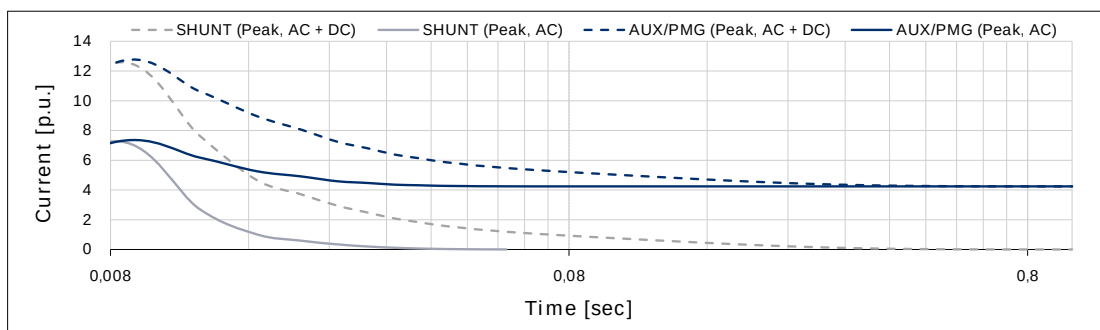
416 V



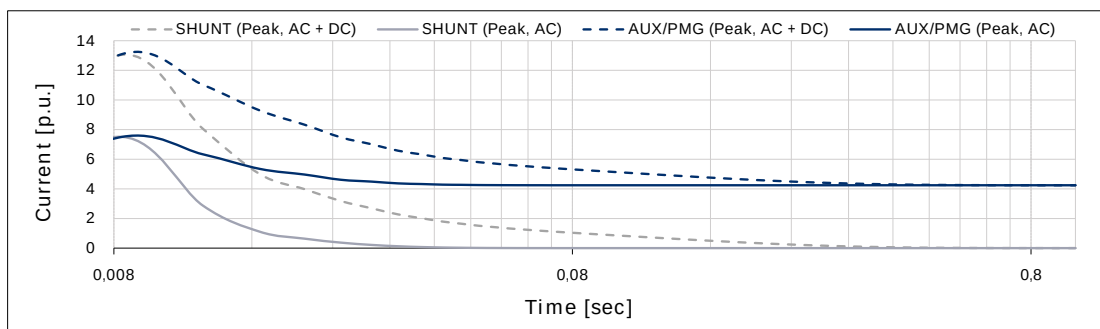
440 V



460 V



480 V



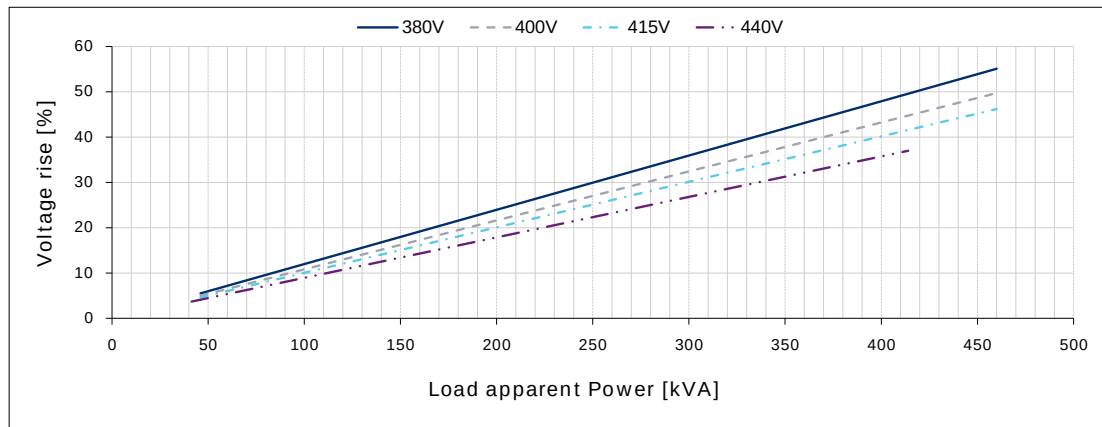
Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

	2 phase	1 phase
Instantaneous (max)	0,94	1,18
Continuous	1,50	1,83

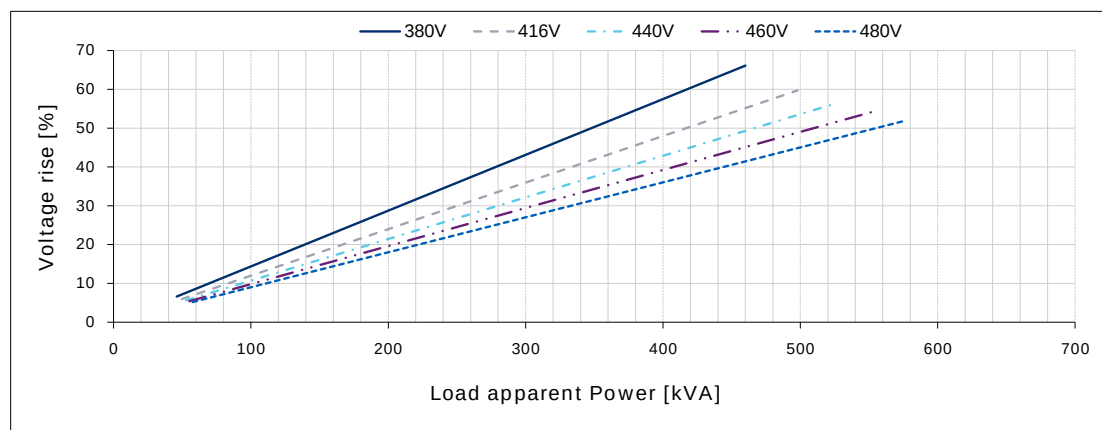
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Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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