

THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 225 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		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		114	120	120	108	120	130	138	144	150
	kW		91	96	96	86	96	104	110	115	120
EFFICIENCY (%) @ 0,8 p.f.	4/4		90,8	91,0	91,3	91,9	90,5	91,1	91,4	91,6	91,8
	3/4		92,2	92,3	92,5	92,7	91,9	92,3	92,6	92,7	92,9
	2/4		93,2	93,3	93,3	93,0	92,8	93,2	93,3	93,4	93,5
EFFICIENCY (%) @ 1,0 p.f.	4/4		93,0	93,3	93,6	94,2	92,6	93,1	93,4	93,6	93,8
	3/4		94,2	94,3	94,5	94,8	93,7	94,1	94,4	94,5	94,7
	2/4		95,0	95,1	95,1	95,0	94,6	94,8	95,0	95,1	95,2
STAND-BY RATING (163/27)	kVA		125	132	132	119	132	143	152	158	165
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			90,3	90,5	90,8	91,5	90,0	90,6	91,0	91,2	91,4
SHORT CIRCUIT RATIO (referred to class H rating)			0,36	0,38	0,41	0,51	0,28	0,31	0,33	0,35	0,36
REACTANCES (%) (referred to class H rating)											
Direct axis synchronous	x _d		388	369	343	275	491	444	421	402	384
Quadrature axis synchronous	x _q		162	154	143	114	204	185	175	167	160
Direct axis transient	x' _d		23,2	22,0	20,5	16,4	29,3	26,5	25,1	24,0	22,9
Direct axis subtransient	x'' _d		12,8	12,1	11,3	9,0	16,1	14,6	13,8	13,2	12,6
Quadrature axis subtransient	x'' _q		14,0	13,3	12,4	9,9	17,7	16,0	15,2	14,5	13,9
Negative sequence	x ₂		13,4	12,7	11,8	9,5	16,9	15,3	14,5	13,9	13,3
Zero sequence	x ₀		6,3	6,0	5,6	4,5	8,0	7,2	6,9	6,6	6,3

TIME CONSTANTS [s]

Open circuit (T' _{do})	1,101	Subtransient (T'' _d)	0,010
Transient (T' _d)	0,103	Armature (T _a)	0,011

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	Available on double bearing configuration (on request)
N-end bearing/Lubrication	6309 2RS1 C3 WT / Prelubricated
Weight [kg]	377
Inertia (J) [kgm ²]	1,07
Overspeed [min ⁻¹]	2250
Method of cooling	IC 01
Cooling air required [m ³ /s] @ 50/60 Hz	0,2 / 0,233
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	0,052
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

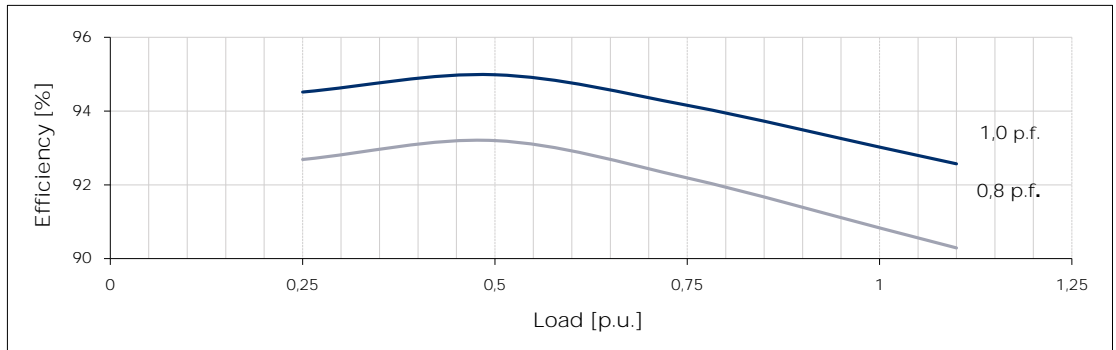
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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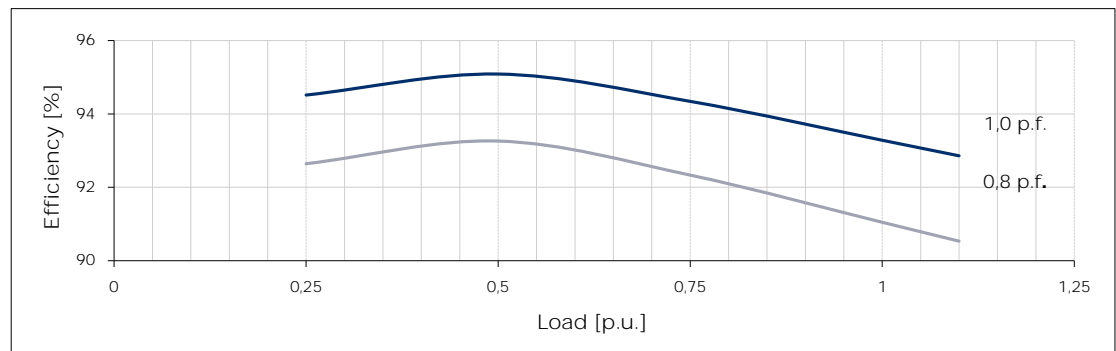
Typical efficiency curves

50 Hz - 1500 min⁻¹

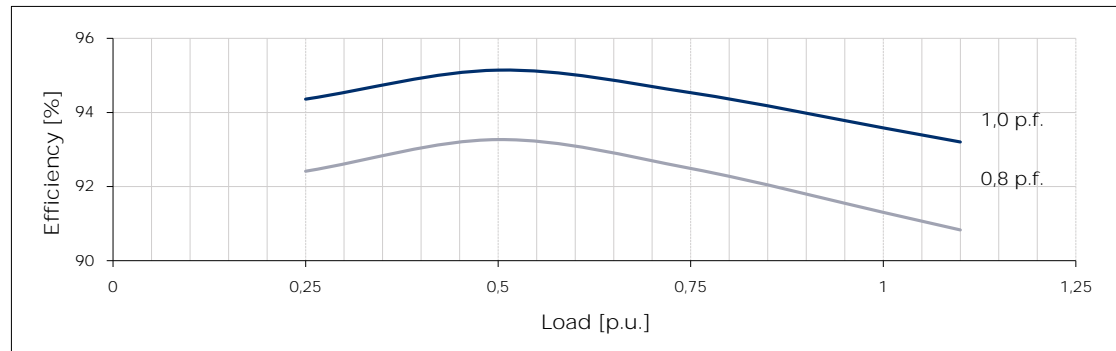
380 V



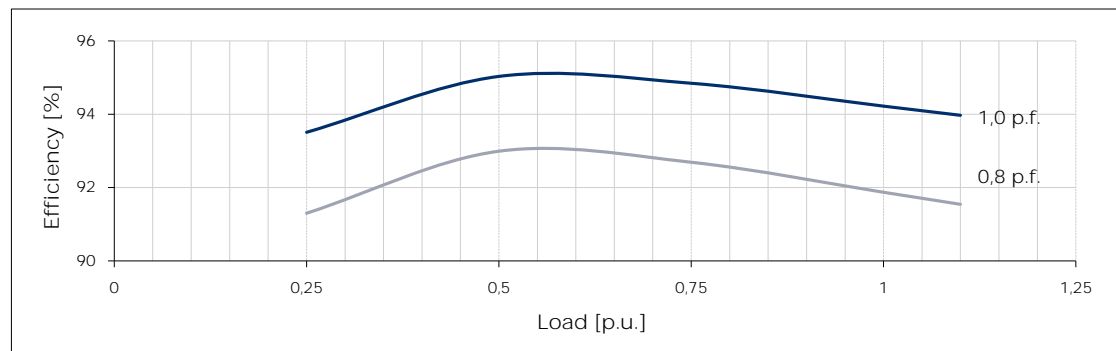
400 V



415 V



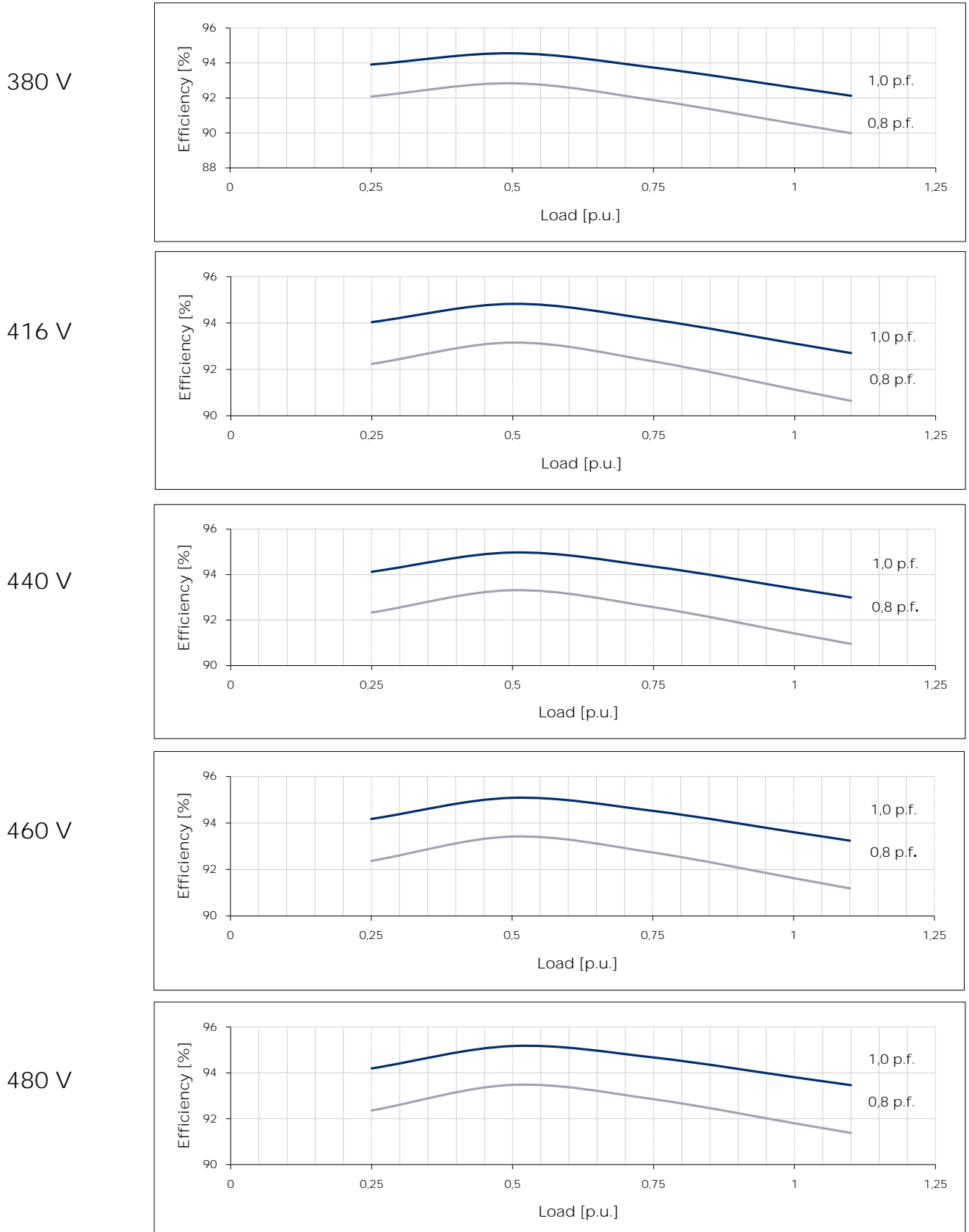
440 V



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Typical efficiency curves

60 Hz - 1800 min⁻¹





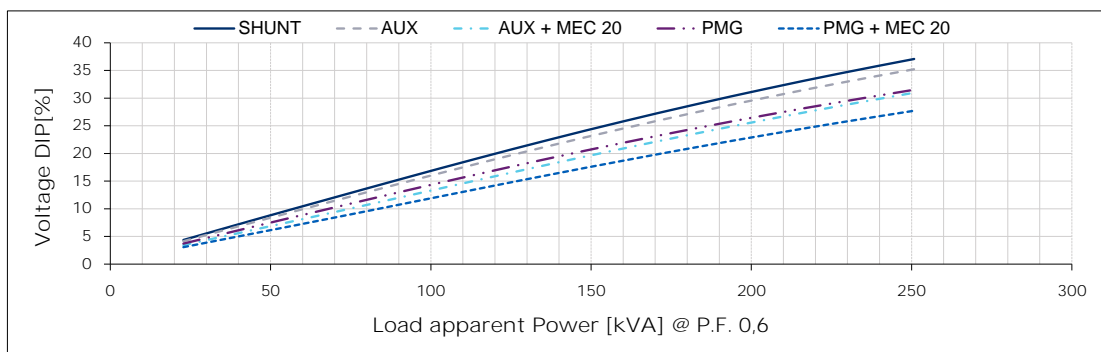
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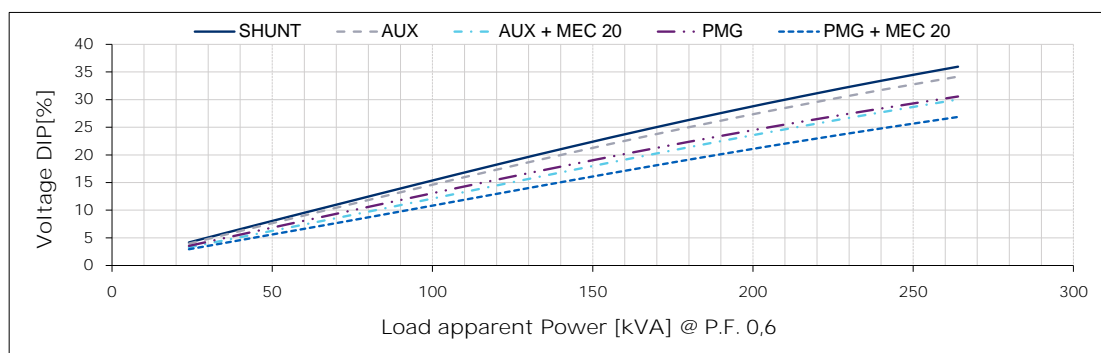
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

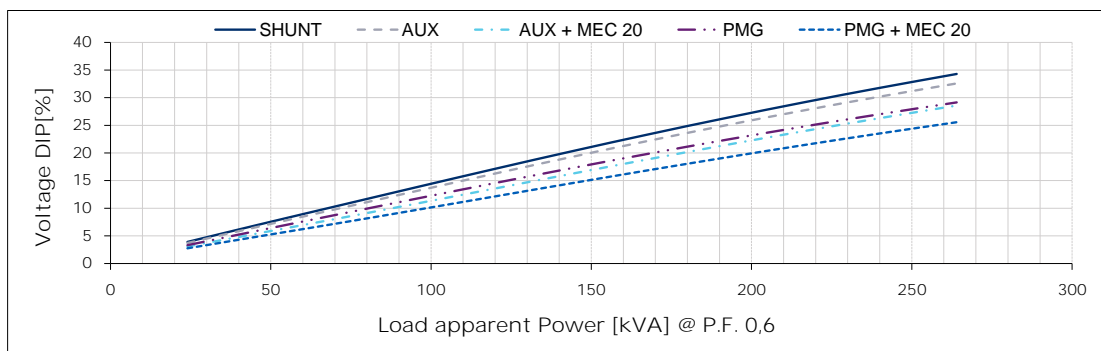
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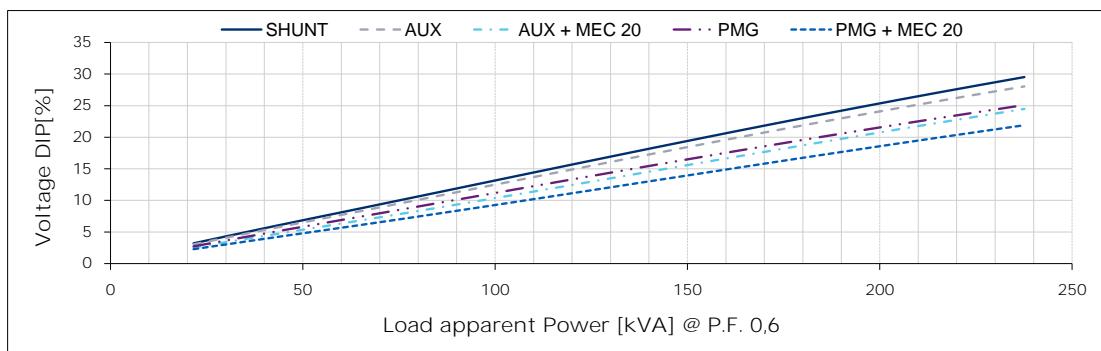
400 V



415 V



440 V





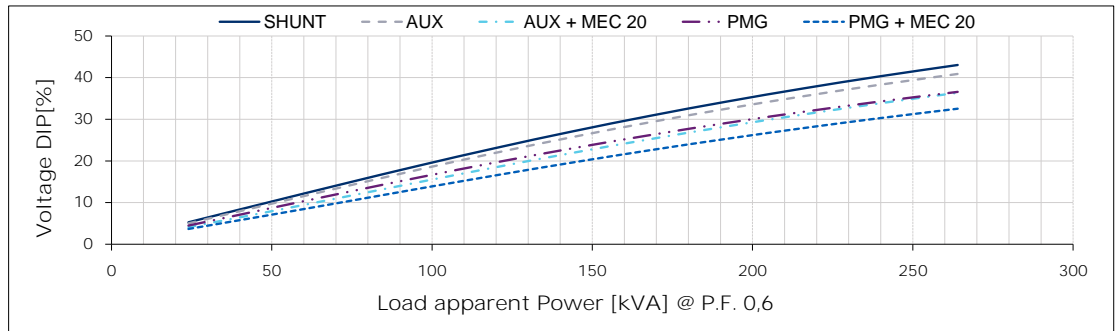
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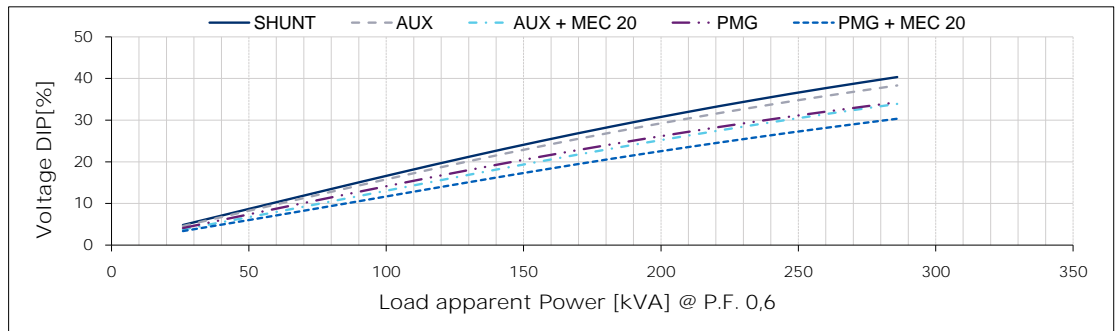
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

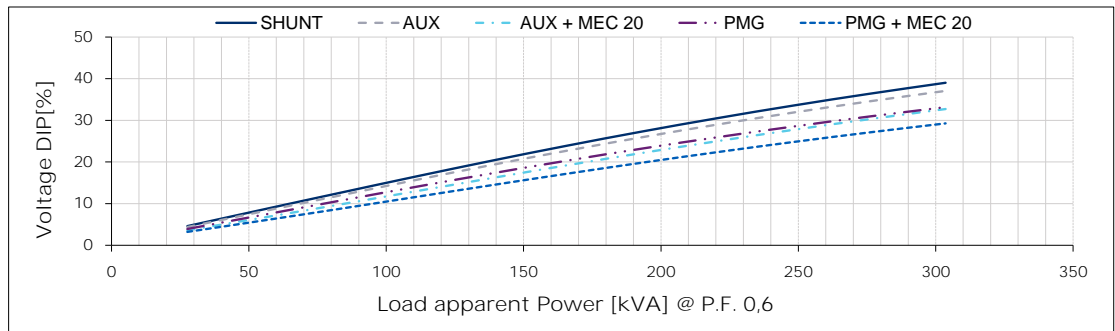
380 V



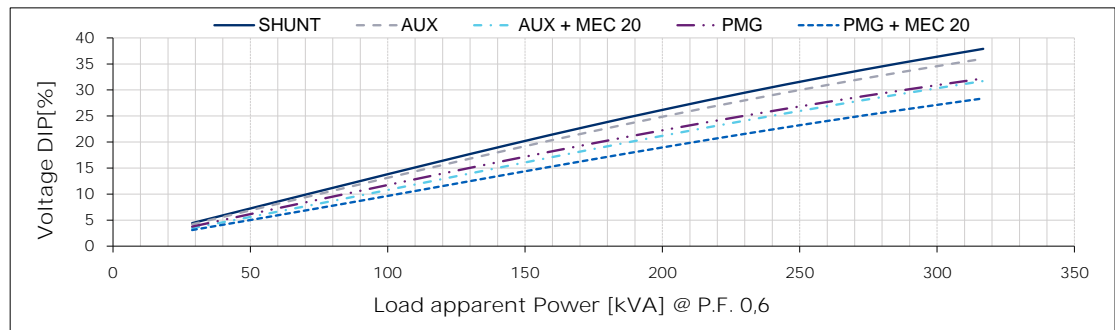
416 V



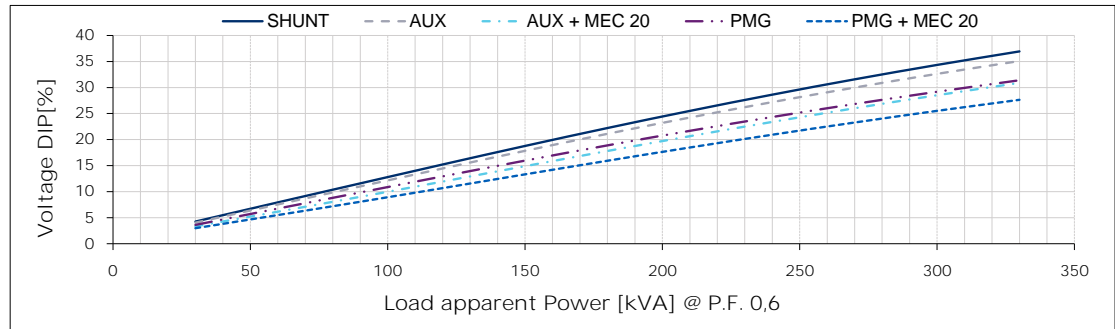
440 V



460 V



480 V



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



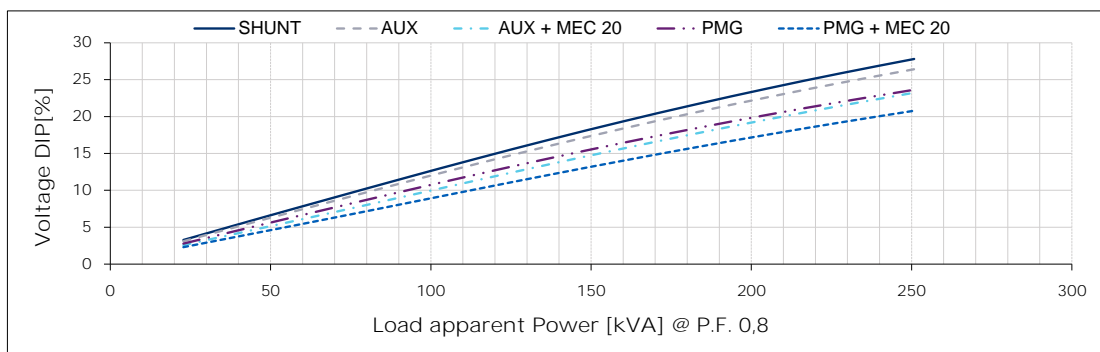
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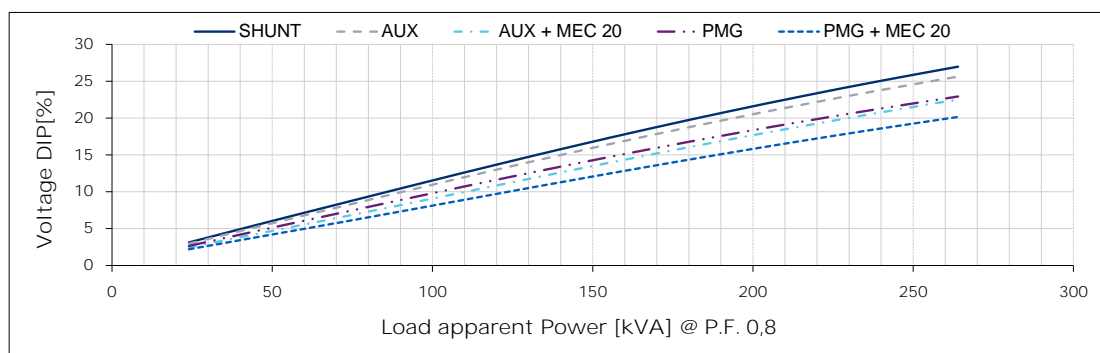
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

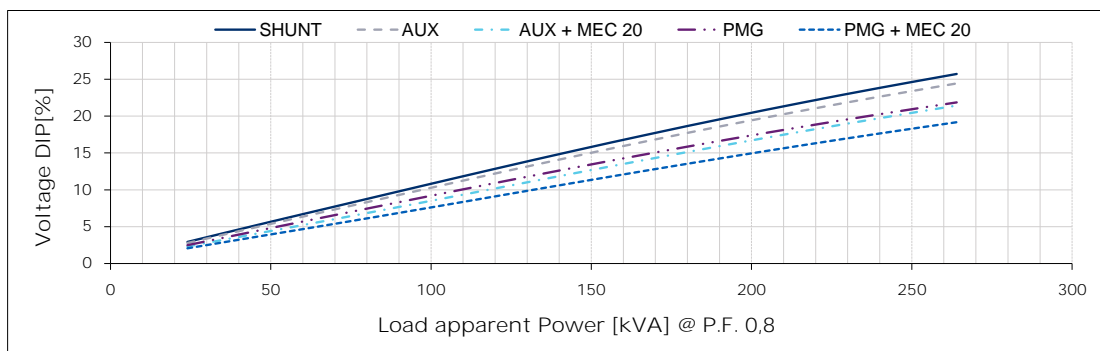
380 V



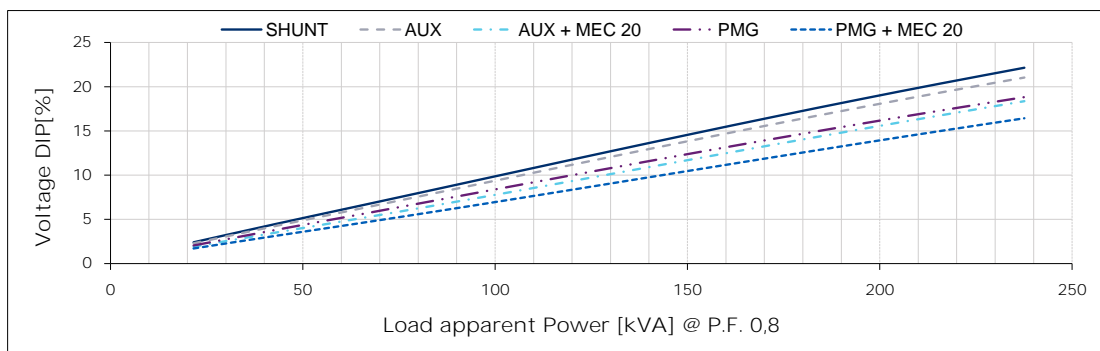
400 V



415 V



440 V





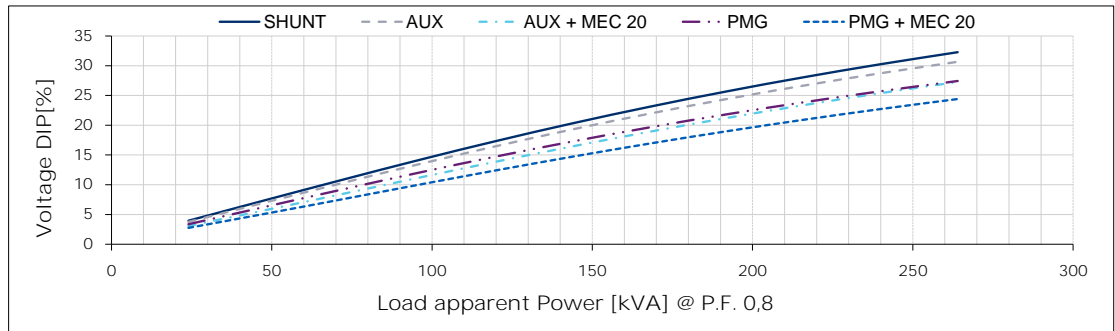
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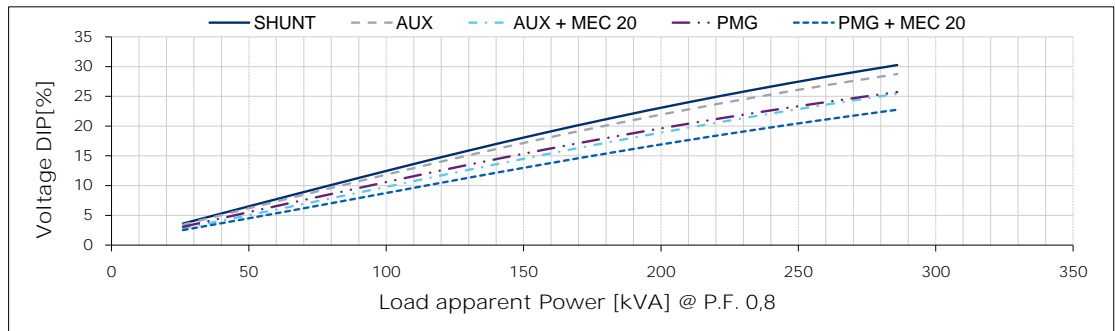
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

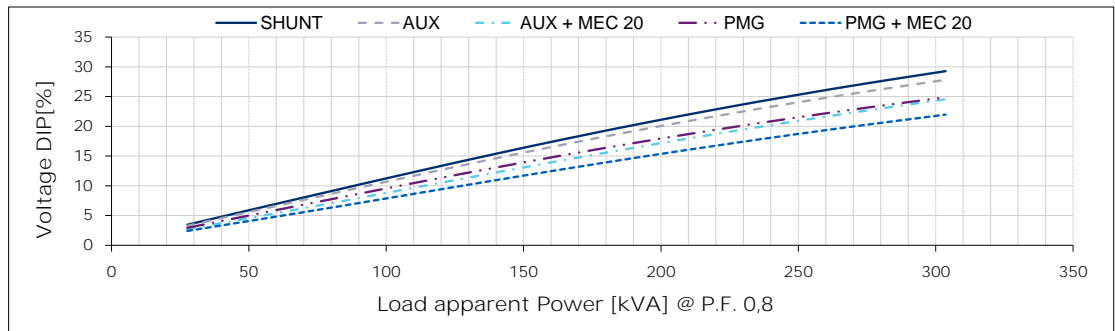
380 V



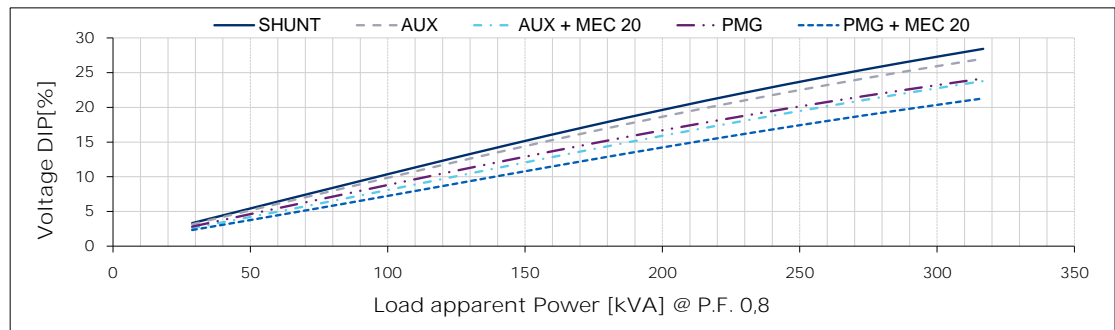
416 V



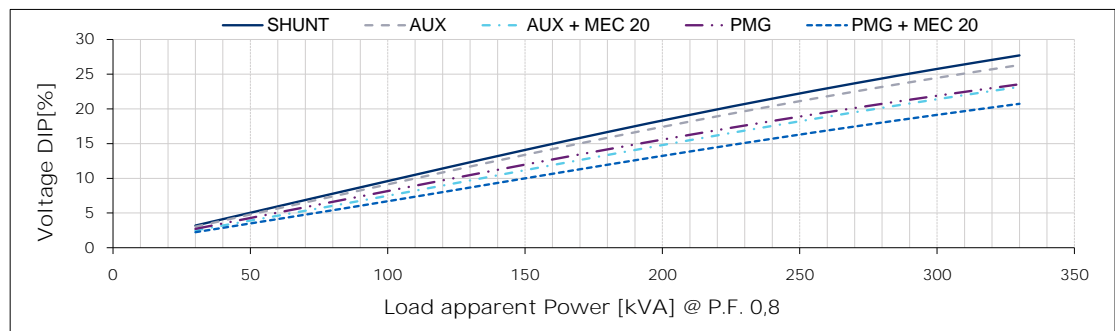
440 V



460 V



480 V

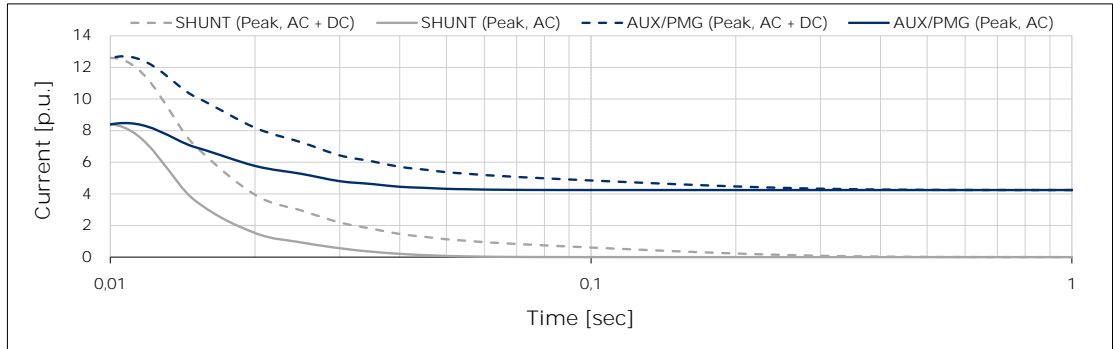


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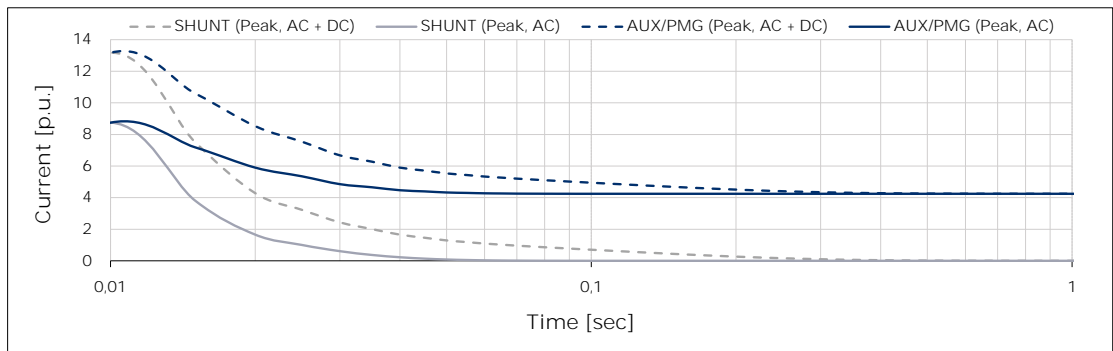
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

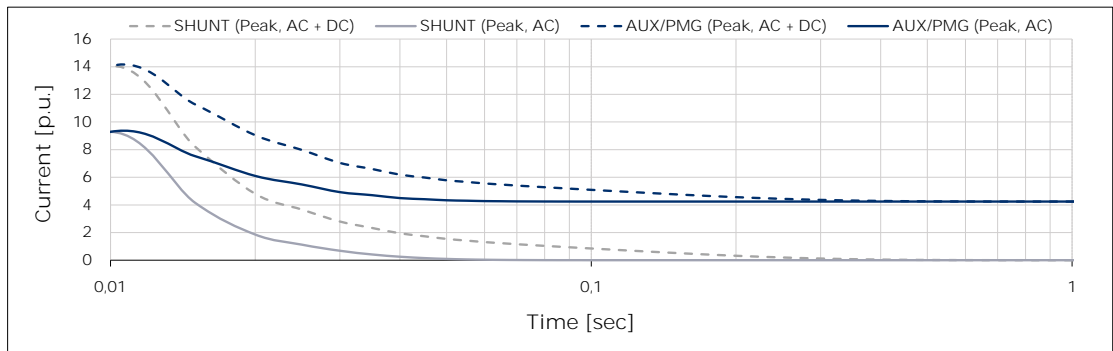
380 V



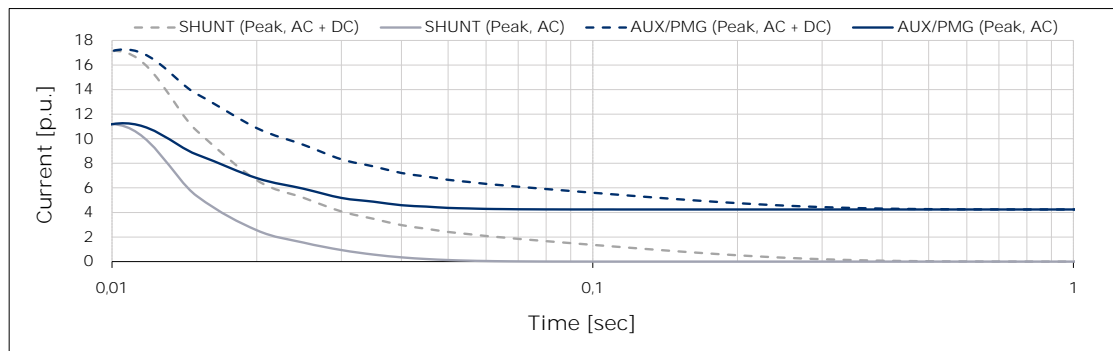
400 V



415 V



440 V

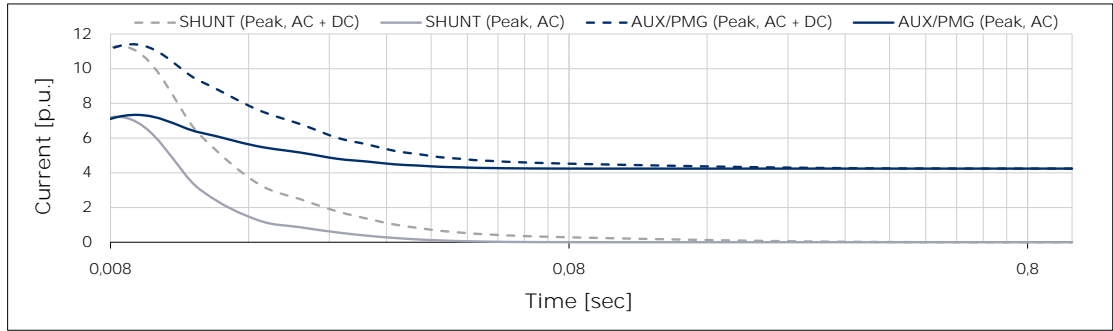


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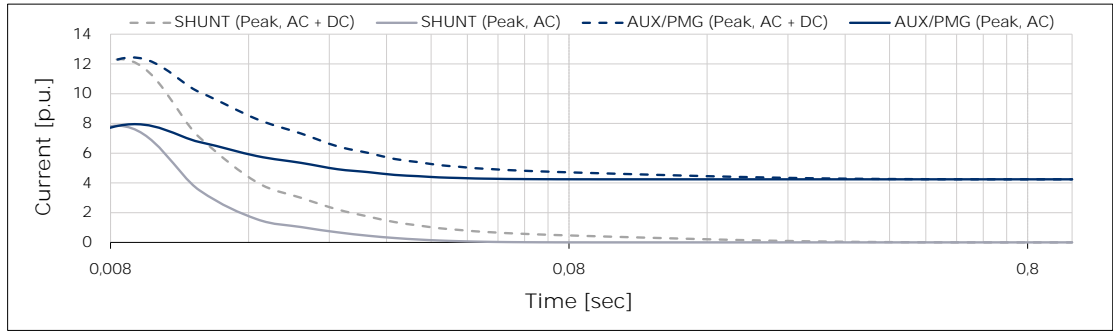
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

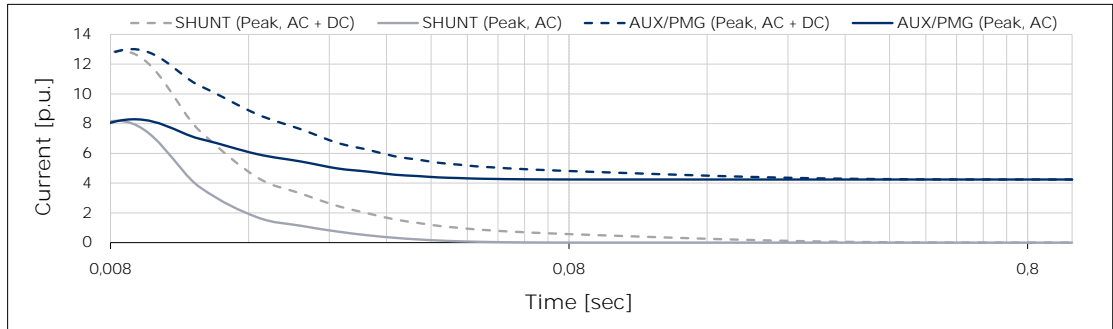
380 V



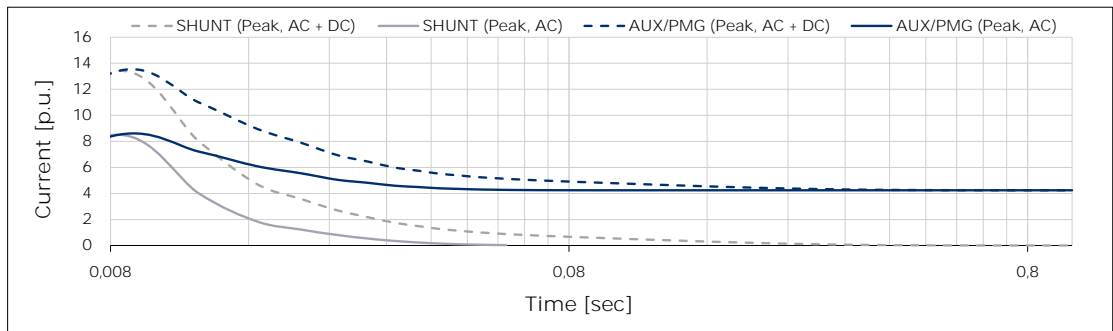
416 V



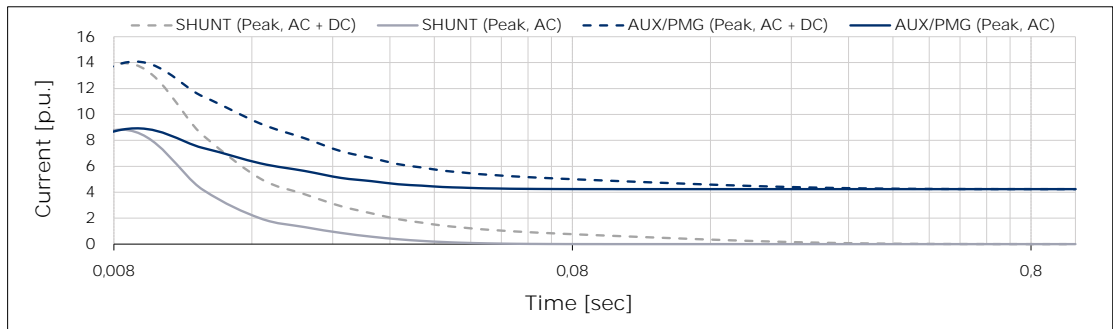
440 V



460 V



480 V

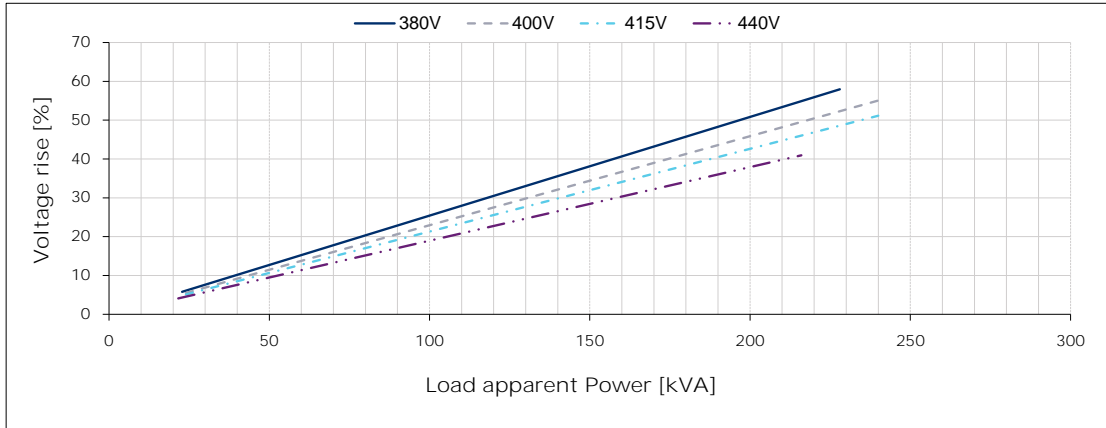


Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

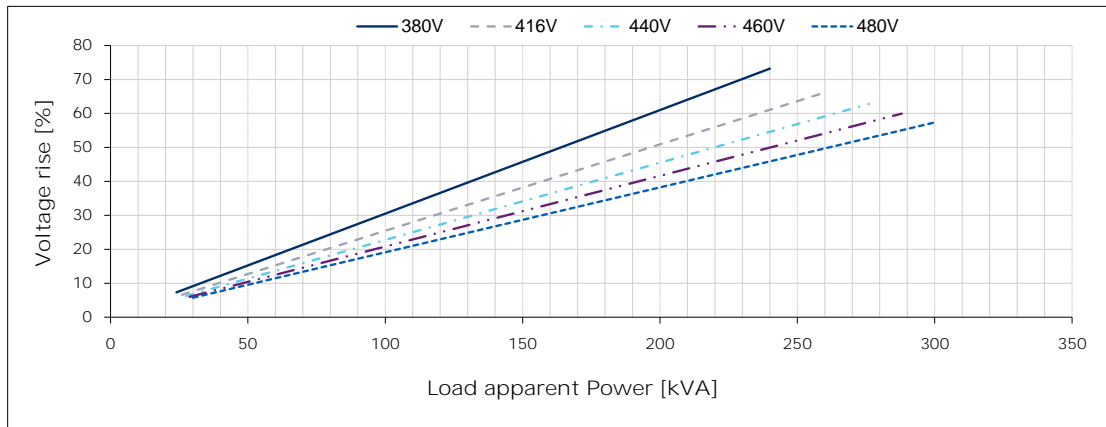
	2 phase	1 phase
Instantaneous (max)	0,96	1,21
Continuous	1,50	1,83

Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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