

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	19,0	20,0	20,0	19,0	20,0	21,7	22,9	24,0	25,0	
		kW	15,2	16,0	16,0	15,2	16,0	17,3	18,3	19,2	20,0	
EFFICIENCY (%) @ 0,8 p.f.		4/4	85,3	85,4	85,6	85,5	85,2	86,1	86,4	86,6	86,8	
		3/4	87,1	87,1	87,1	86,7	87,0	87,7	88,0	88,1	88,1	
		2/4	88,3	88,2	88,0	87,0	88,2	88,6	88,8	88,9	88,8	
EFFICIENCY (%) @ 1,0 p.f.		4/4	89,1	89,4	89,7	90,1	88,6	89,3	89,7	90,0	90,3	
		3/4	90,6	90,8	90,9	90,9	90,1	90,7	91,1	91,3	91,4	
		2/4	91,6	91,6	91,5	90,9	91,2	91,6	91,8	91,9	91,9	
STAND-BY RATING (163/27)		kVA	20,9	22,0	22,0	20,9	22,0	23,8	25,2	26,4	27,5	
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			84,6	84,7	84,9	85,0	84,5	85,4	85,8	86,0	86,2	
SHORT CIRCUIT RATIO (referred to class H rating)			0,49	0,52	0,56	0,66	0,39	0,43	0,46	0,48	0,50	
REACTANCES (%) (referred to class H rating)												
Direct axis synchronous		x _d	283	268	249	211	357	323	305	292	280	
Quadrature axis synchronous		x _q	122	116	108	91	154	139	132	126	121	
Direct axis transient		x' _d	19,5	18,5	17,2	14,5	24,6	22,3	21,0	20,1	19,3	
Direct axis subtransient		x'' _d	9,7	9,3	8,6	7,3	12,3	11,1	10,5	10,1	9,6	
Quadrature axis subtransient		x'' _q	10,7	10,2	9,5	8,0	13,5	12,2	11,6	11,1	10,6	
Negative sequence		x ₂	10,2	9,7	9,0	7,6	12,9	11,7	11,0	10,6	10,1	
Zero sequence		x ₀	8,5	8,1	7,5	6,4	10,8	9,7	9,2	8,8	8,4	

TIME CONSTANTS [s]

Open circuit (T' _{do})	0,476	Subtransient (T'' _d)	0,008
Transient (T' _d)	0,050	Armature (T _a)	0,008

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	-
N-end bearing/Lubrication	6207 2RS C3 / Prelubricated
Weight [kg]	116
Inertia (J) [kgm ²]	0,14
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	0,414
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

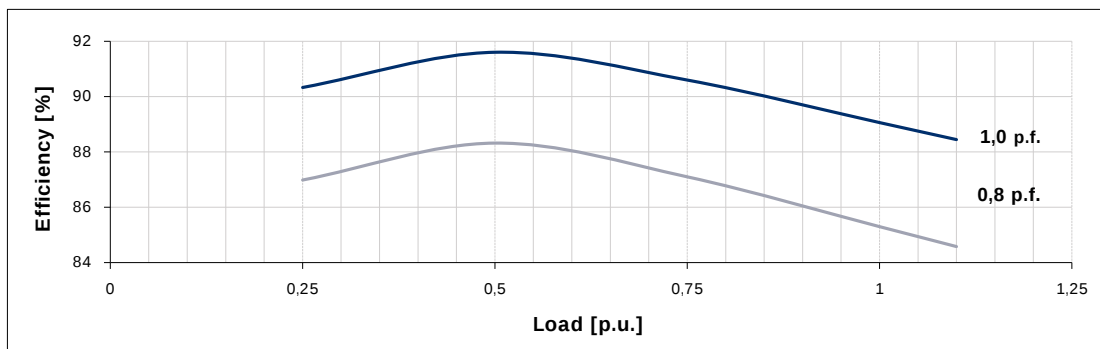
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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THREE-PHASE SYNCHRONOUS GENERATOR
MXB-E 160 LA 4

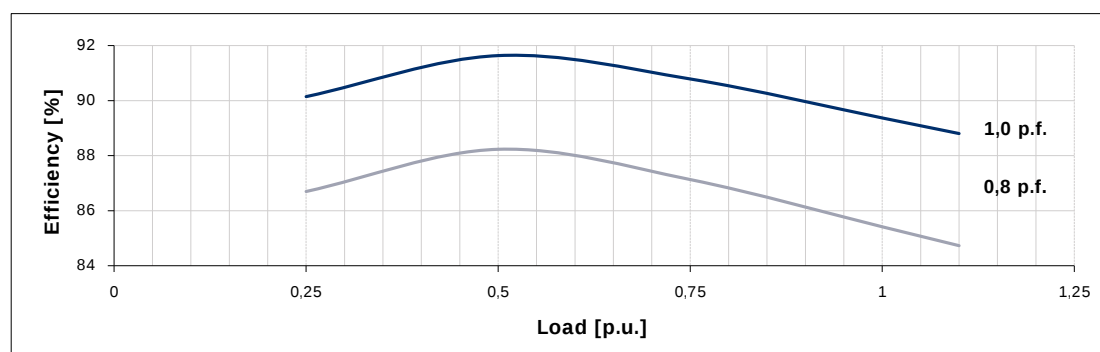
Typical efficiency curves

50 Hz - 1500 min⁻¹

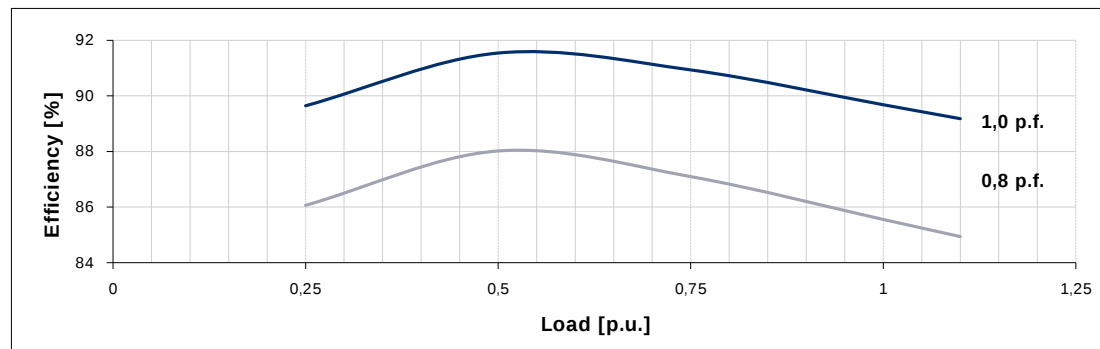
380 V



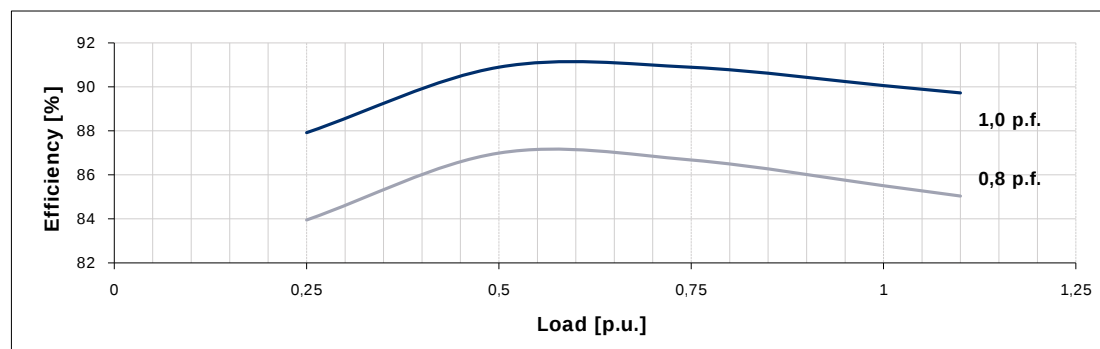
400 V



415 V



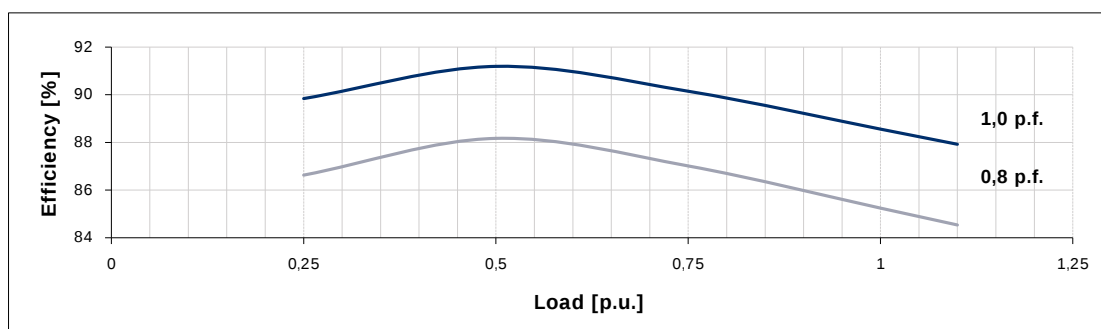
440 V



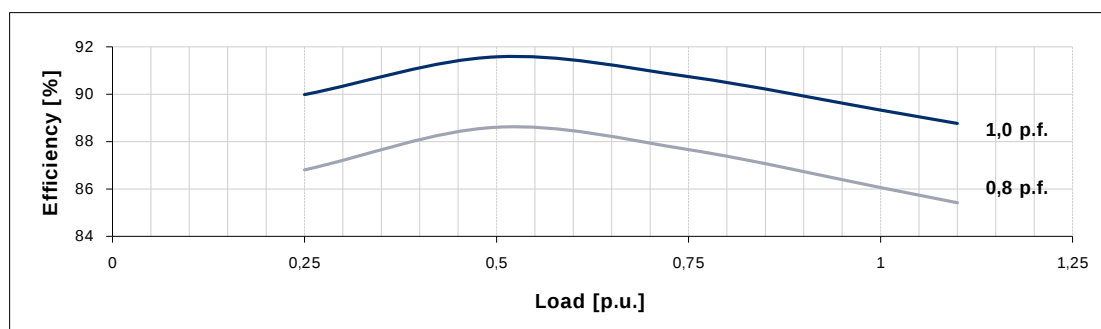
Typical efficiency curves

60 Hz - 1800 min⁻¹

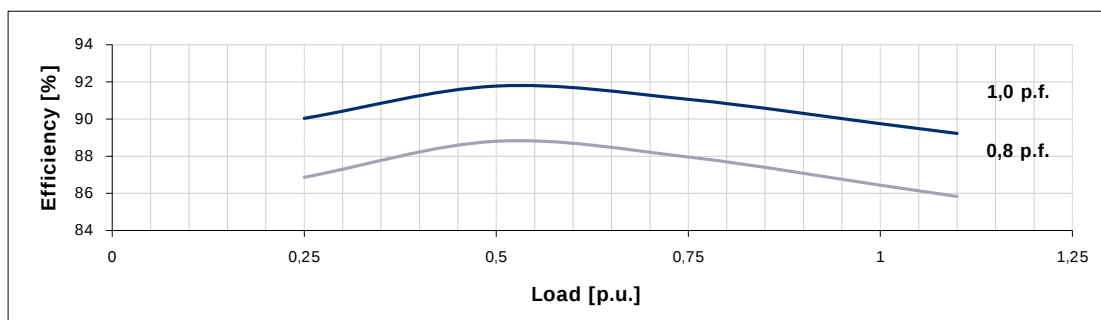
380 V



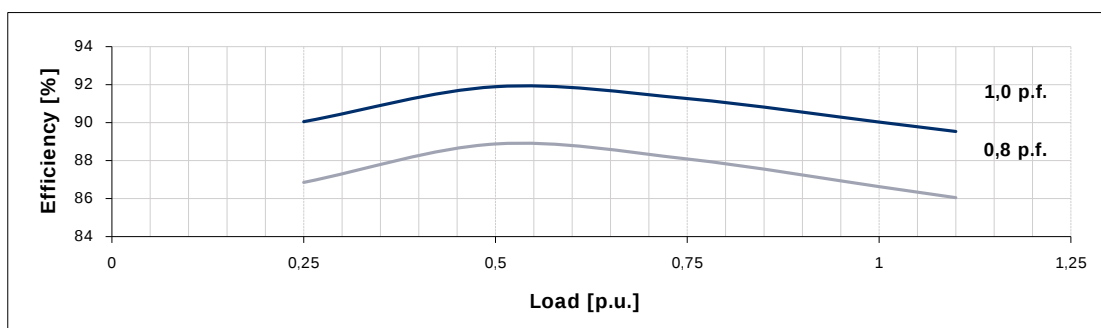
416 V



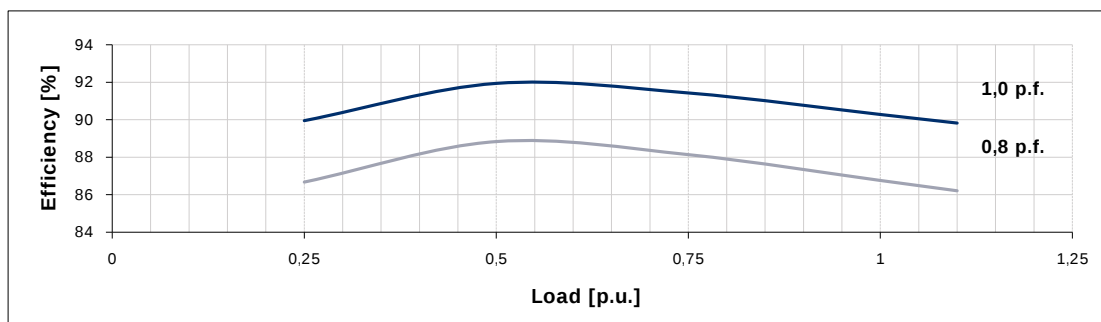
440 V



460 V



480 V

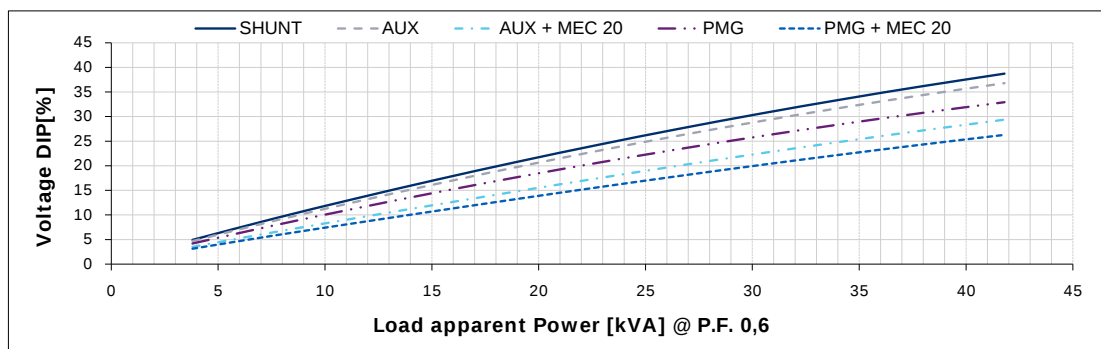


THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 LA 4

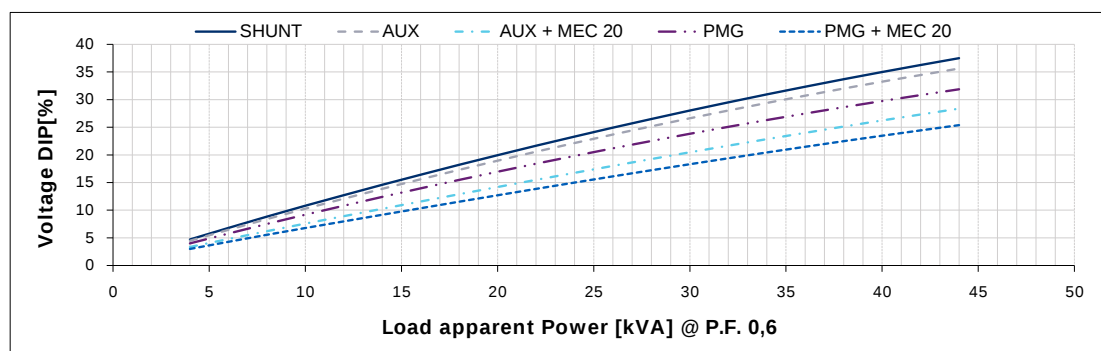
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

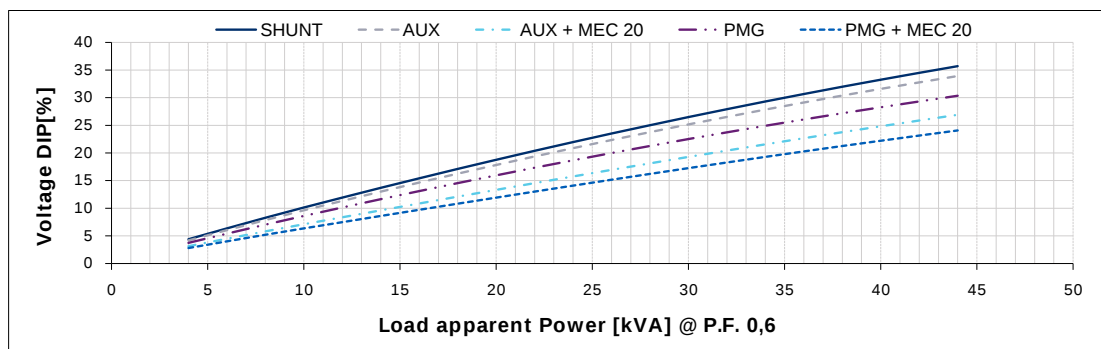
380 V



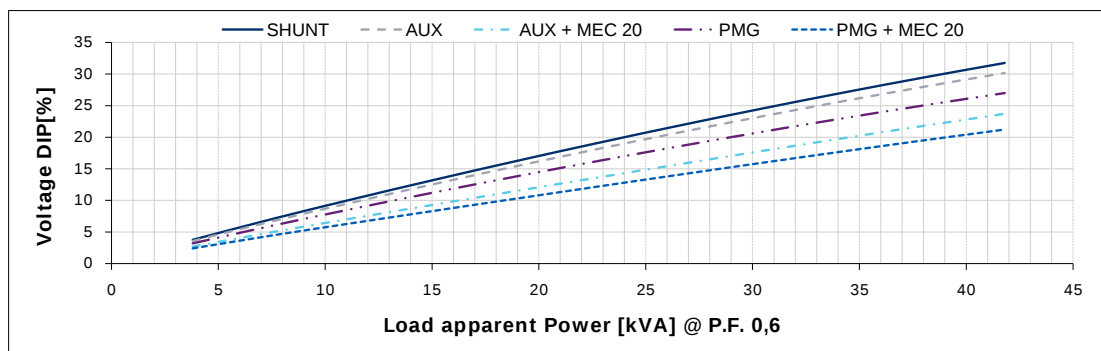
400 V



415 V



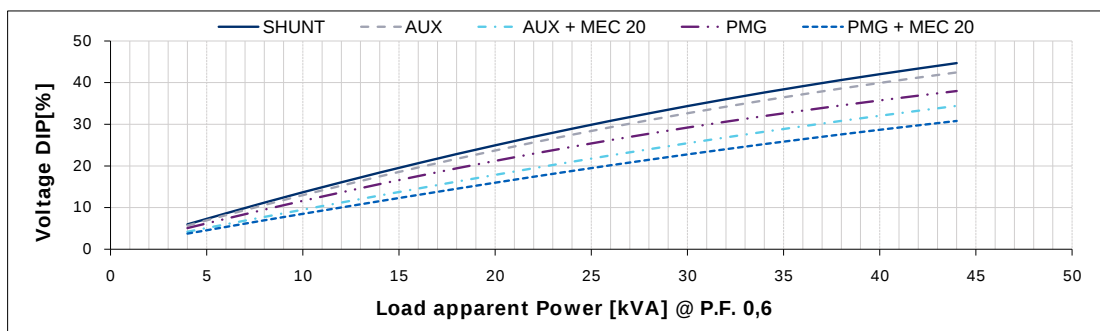
440 V



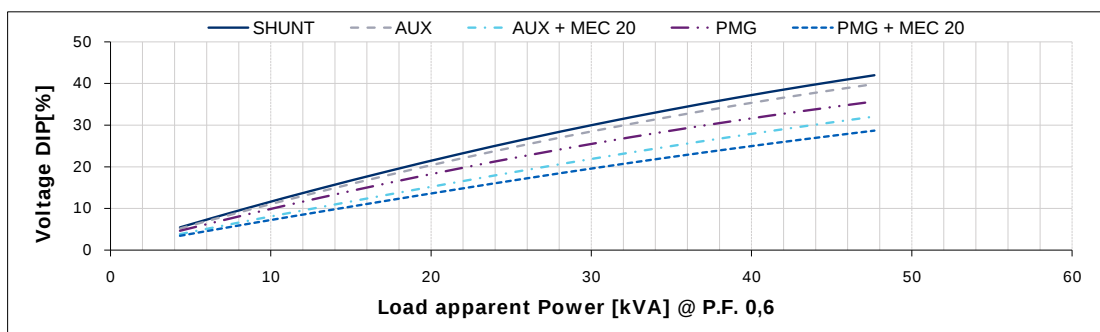
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

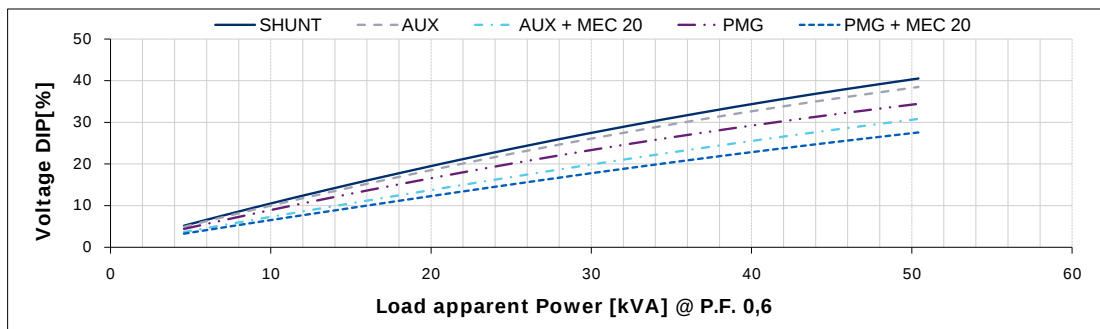
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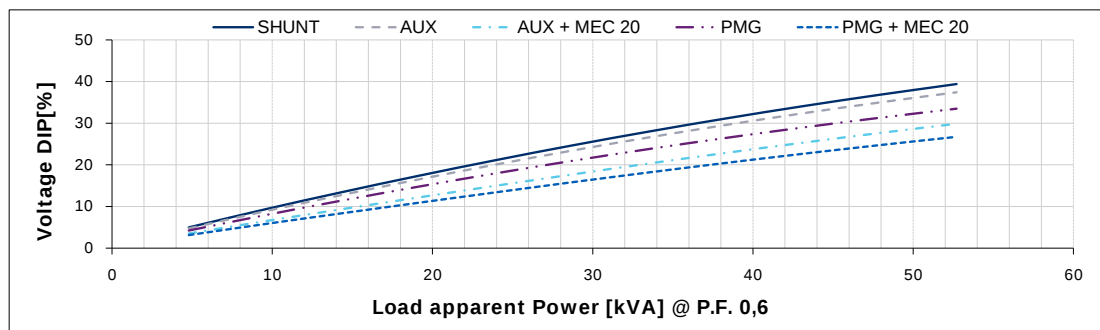
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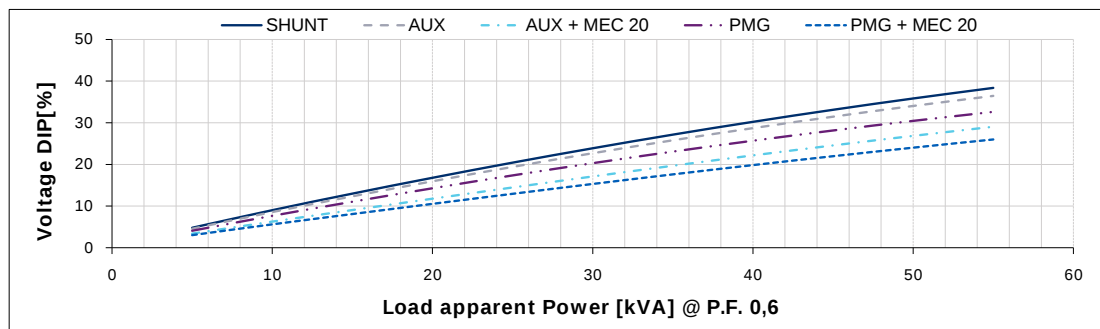
440 V



460 V



480 V



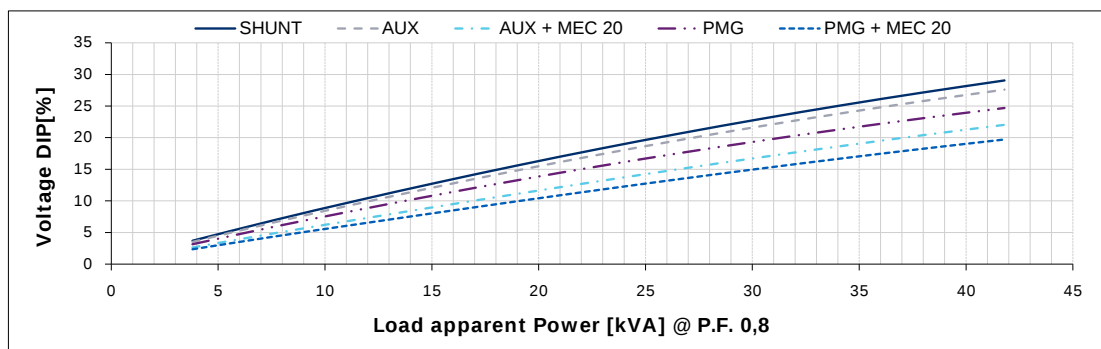
For P.F. different from 0,6 the following simplified formula can be used: $\Delta V (@ P.F.) = \Delta V (@ 0,6) \cdot \sin(\arccos(P.F.)) / 0,8$

THREE-PHASE SYNCHRONOUS GENERATOR MXB-E 160 LA 4

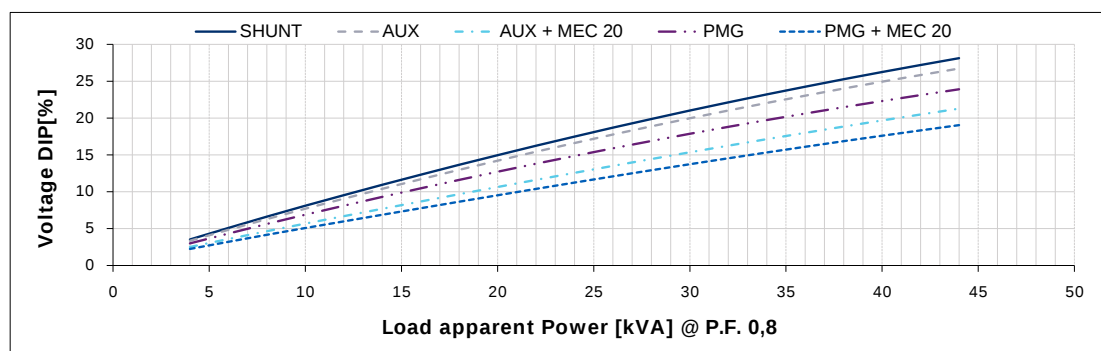
Typical voltage DIP curves

50 Hz - 1500 min⁻¹

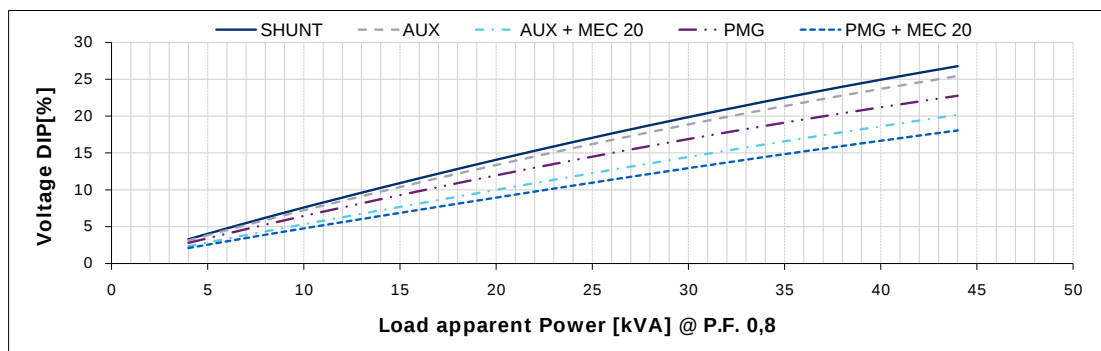
380 V



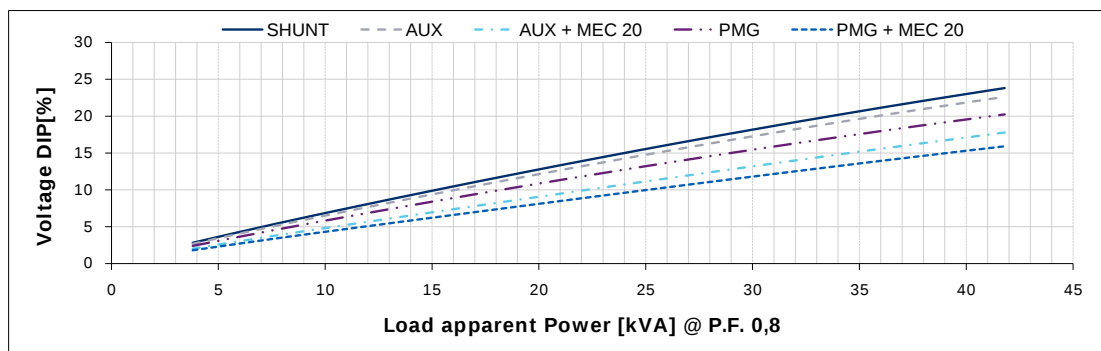
400 V



415 V



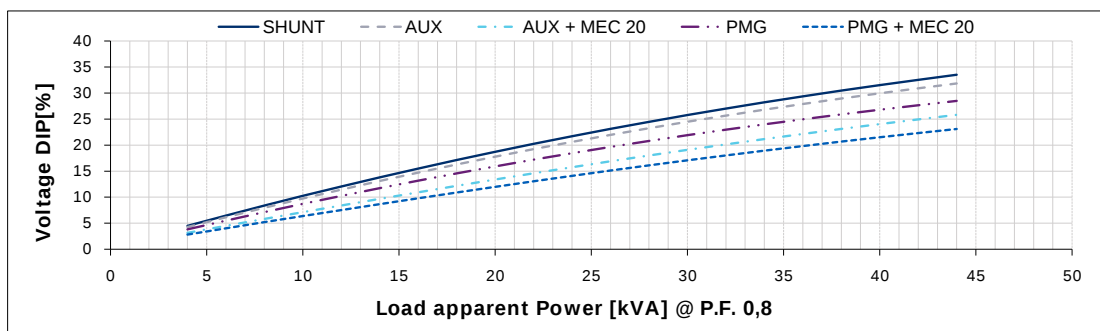
440 V



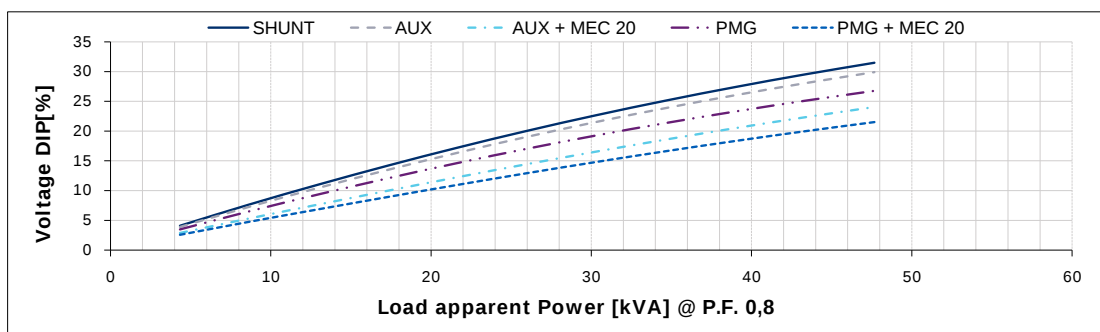
Typical voltage DIP curves

60 Hz - 1800 min⁻¹

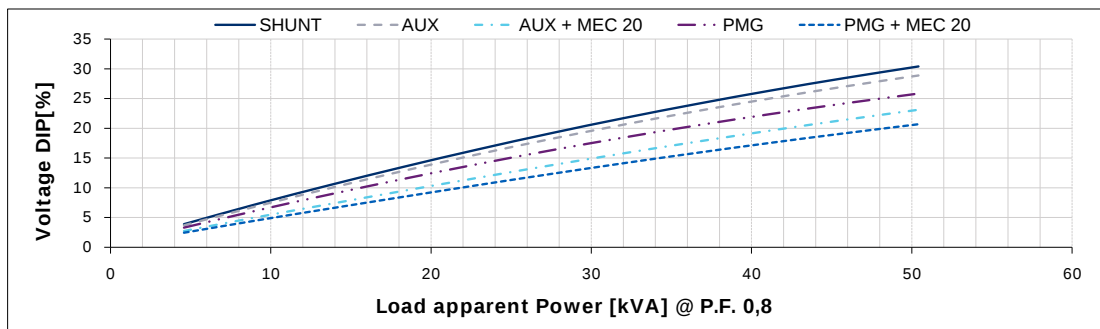
380 V



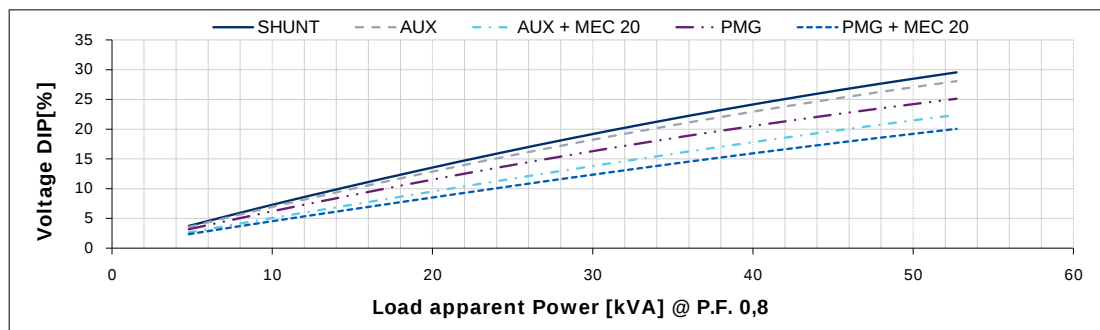
416 V



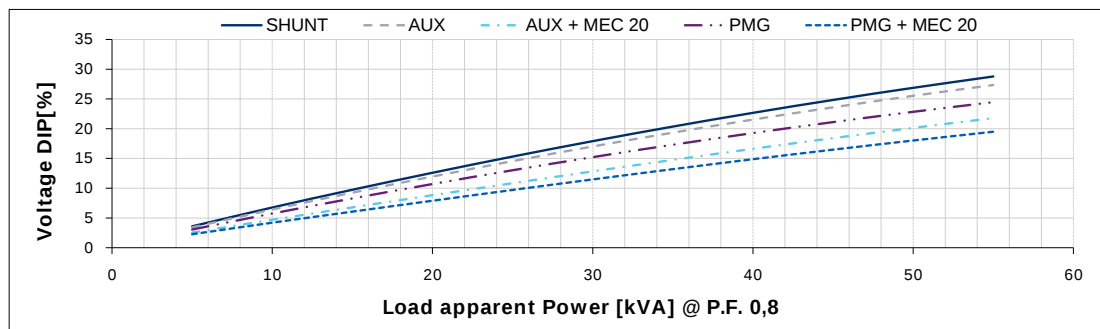
440 V



460 V



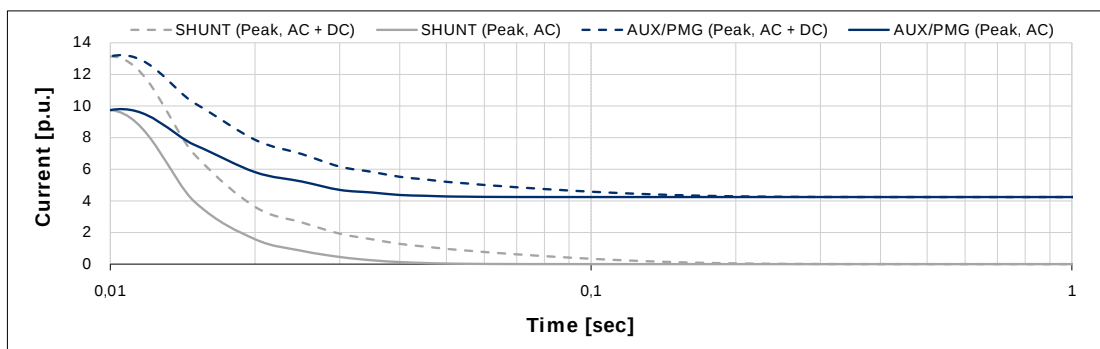
480 V



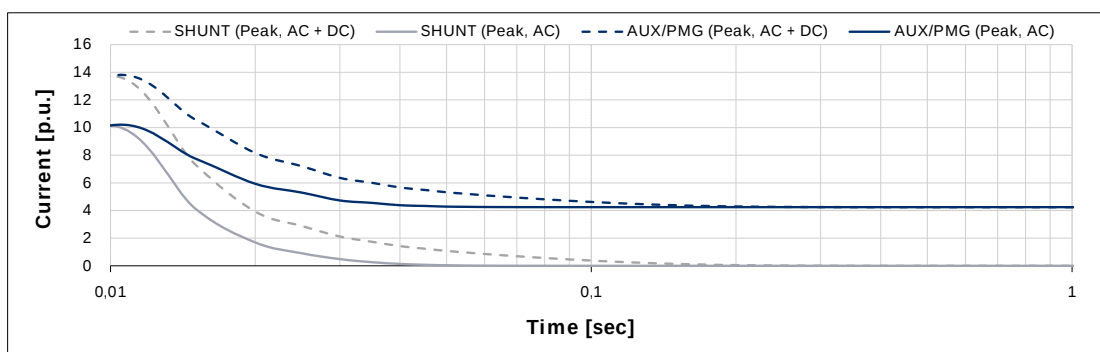
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min⁻¹

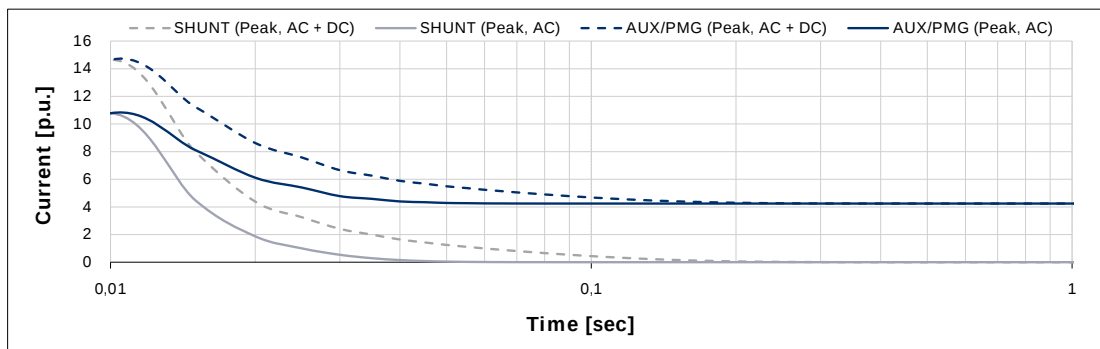
380 V



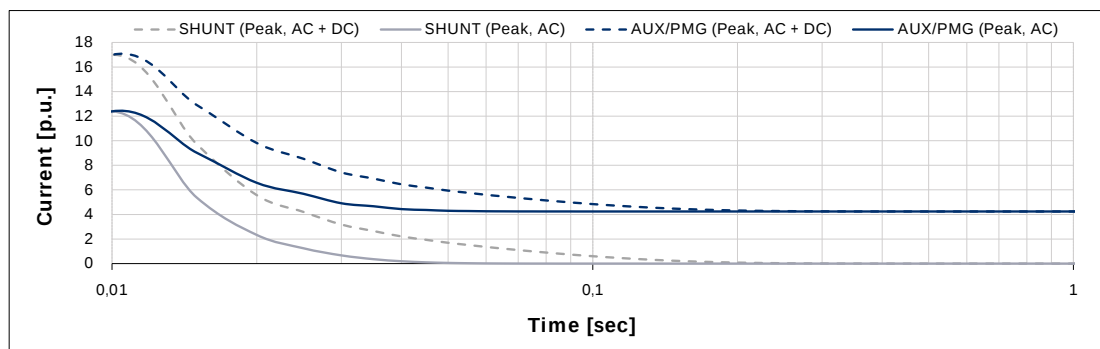
400 V



415 V



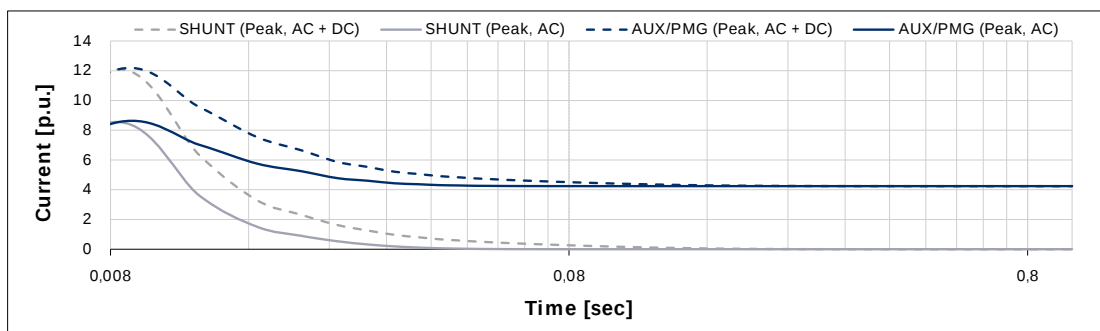
440 V



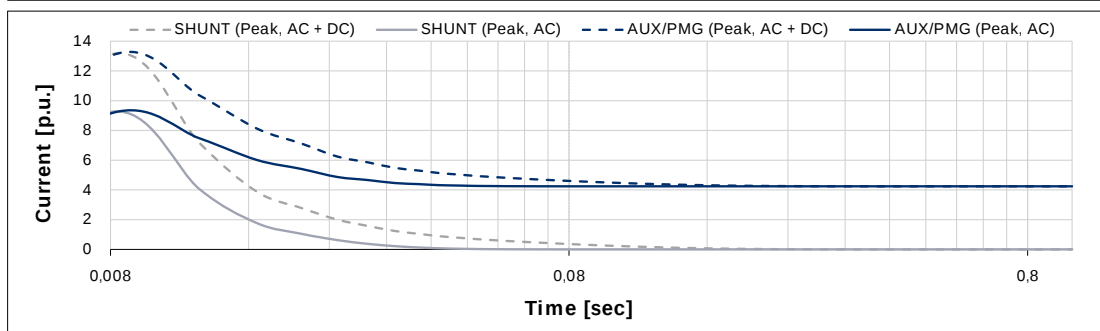
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min⁻¹

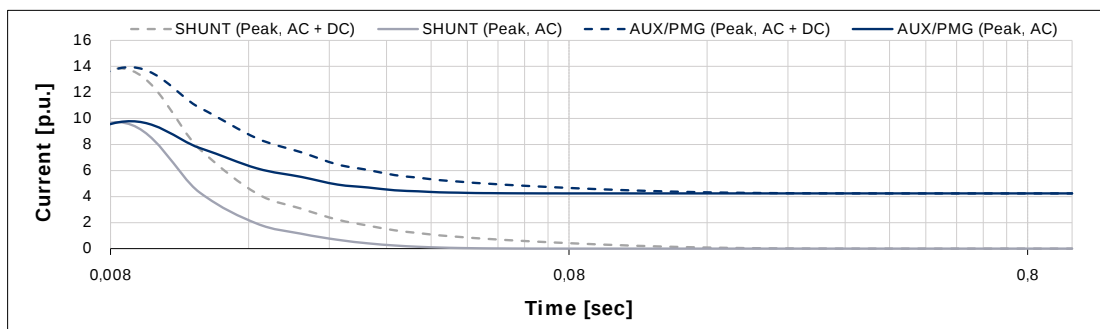
380 V



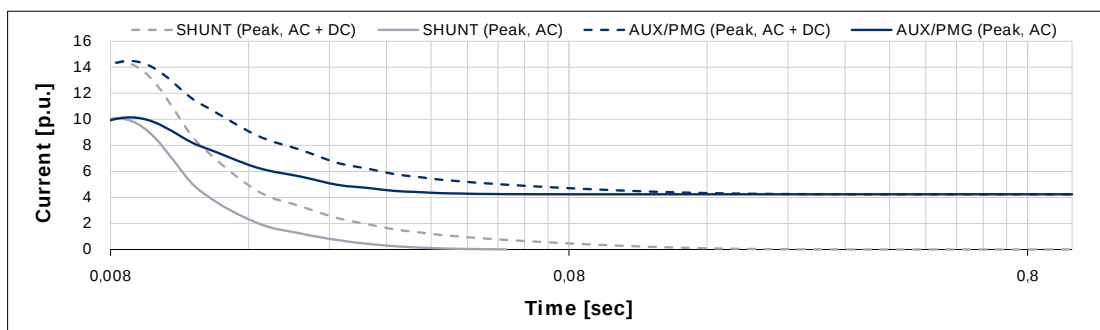
416 V



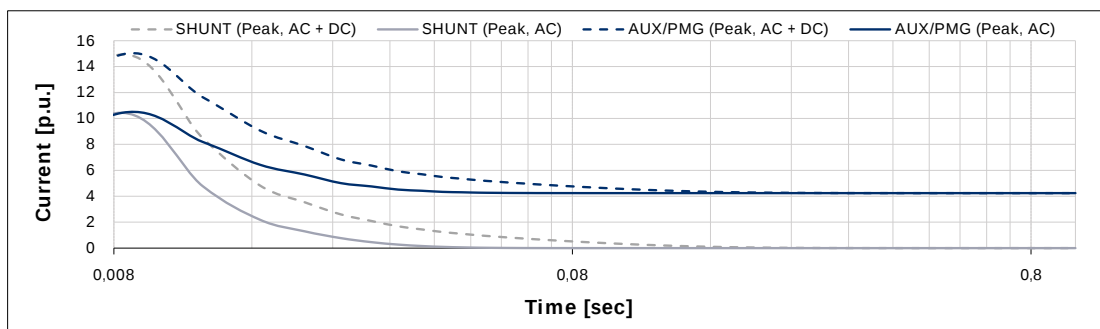
440 V



460 V



480 V



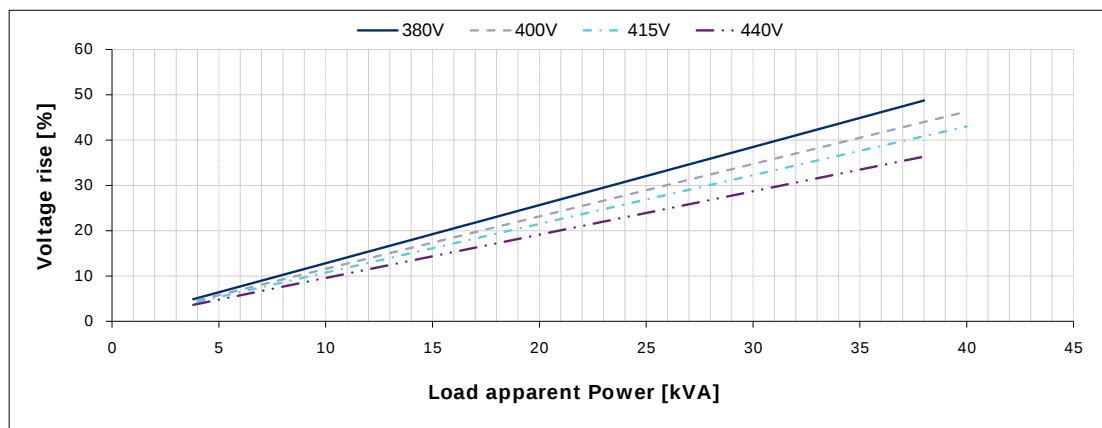
Above curves are based on a three-phase short circuit
For other type of short circuit use the following multiplication factors

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

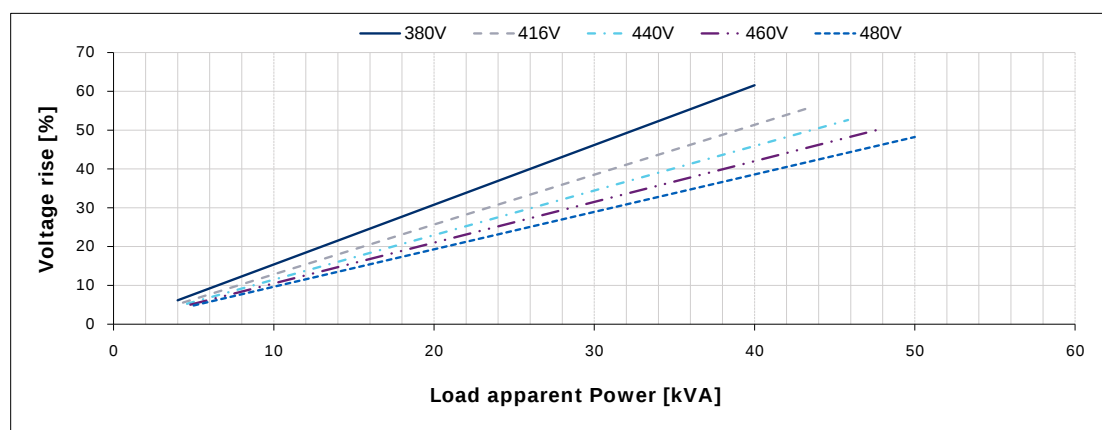
SYN.DS.0054_ =

Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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