

THREE-PHASE SYNCHRONOUS GENERATOR  
**MXB-E 180 MA 4**

4 POLES

CONTINUOUS DUTY

50 Hz-1500 min<sup>-1</sup> / 60 Hz-1800 min<sup>-1</sup>

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		43,0	45,0	45,0	40,5	45,0	48,8	51,6	53,9	56,3
	kW		34,4	36,0	36,0	32,4	36,0	39,0	41,3	43,7	45,0
EFFICIENCY (%) @ 0,8 p.f.	4/4		88,8	88,9	88,9	88,9	88,9	89,5	89,7	89,9	89,9
	3/4		90,2	90,2	90,1	89,7	90,3	90,7	90,9	91,0	91,0
	2/4		91,1	91,0	90,8	89,7	91,2	91,5	91,6	91,6	91,5
EFFICIENCY (%) @ 1,0 p.f.	4/4		91,9	92,1	92,4	92,7	91,6	92,1	92,4	92,6	92,8
	3/4		93,0	93,2	93,3	93,2	92,8	93,2	93,4	93,6	93,7
	2/4		93,8	93,8	93,7	93,0	93,6	93,9	94,0	94,1	94,1
STAND-BY RATING (163/27)	kVA		47,3	49,5	49,5	44,6	49,5	53,7	56,8	59,3	61,9
STAND-BY EFFICIENCY (%) @ 0,8 p.f.			88,2	88,3	88,4	88,6	88,3	89,0	89,3	89,4	89,5
SHORT CIRCUIT RATIO (referred to class H rating)			0,43	0,45	0,49	0,61	0,34	0,38	0,40	0,42	0,43
REACTANCES (%) (referred to class H rating)											
Direct axis synchronous	x <sub>d</sub>		281	265	246	197	353	319	302	288	276
Quadrature axis synchronous	x <sub>q</sub>		128	121	112	90	160	145	137	131	126
Direct axis transient	x' <sub>d</sub>		14,9	14,1	13,1	10,5	18,7	16,9	16,0	15,3	14,7
Direct axis subtransient	x'' <sub>d</sub>		11,7	11,0	10,2	8,2	14,7	13,3	12,5	12,0	11,5
Quadrature axis subtransient	x'' <sub>q</sub>		12,8	12,1	11,3	9,0	16,1	14,6	13,8	13,2	12,6
Negative sequence	x <sub>2</sub>		12,3	11,6	10,8	8,6	15,4	13,9	13,2	12,6	12,1
Zero sequence	x <sub>0</sub>		9,0	8,5	7,9	6,3	11,3	10,2	9,6	9,2	8,8

TIME CONSTANTS [s]

Open circuit (T' <sub>do</sub> )	0,594	Subtransient (T'' <sub>d</sub> )	0,010
Transient (T' <sub>d</sub> )	0,060	Armature (T <sub>a</sub> )	0,012

MECHANICAL CHARACTERISTICS

D-end bearing/Lubrication	Available on double bearing configuration (on request)
N-end bearing/Lubrication	6207 2RS C3 / Prelubricated
Weight [kg]	181
Inertia (J) [kgm <sup>2</sup> ]	0,30
Overspeed [min <sup>-1</sup> ]	2250
Method of cooling	IC 01
Cooling air required [m <sup>3</sup> /s] @ 50/60 Hz	0,13 / 0,15
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	0,123
Overloads	10% for 1 hour
3-phase short circuit current	>= 300% (3 I <sub>n</sub> ) 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

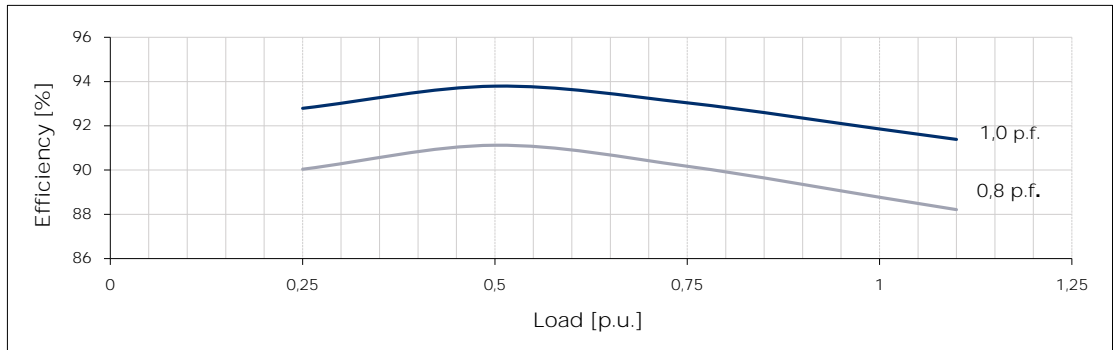
IEC 60034-1; BS 4999-5000; NEMA MG 1.32.
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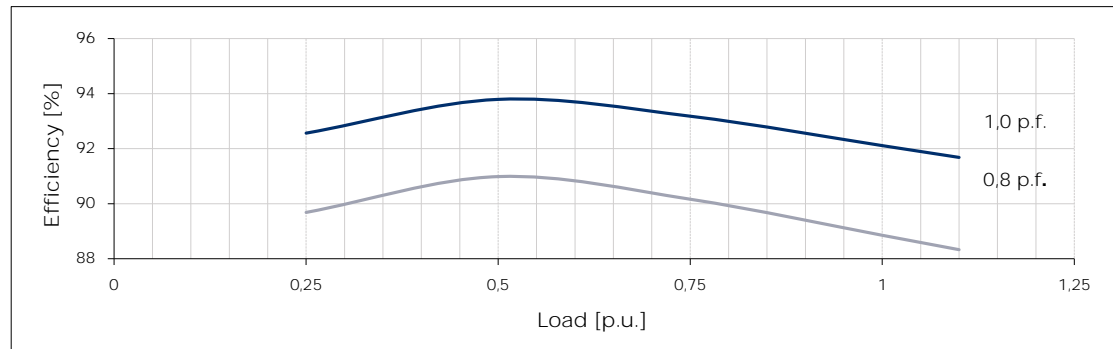
Typical efficiency curves

50 Hz - 1500 min<sup>-1</sup>

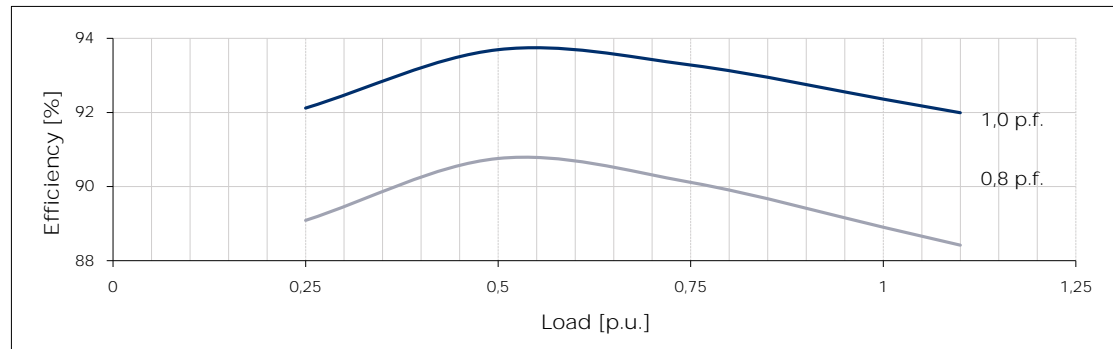
380 V



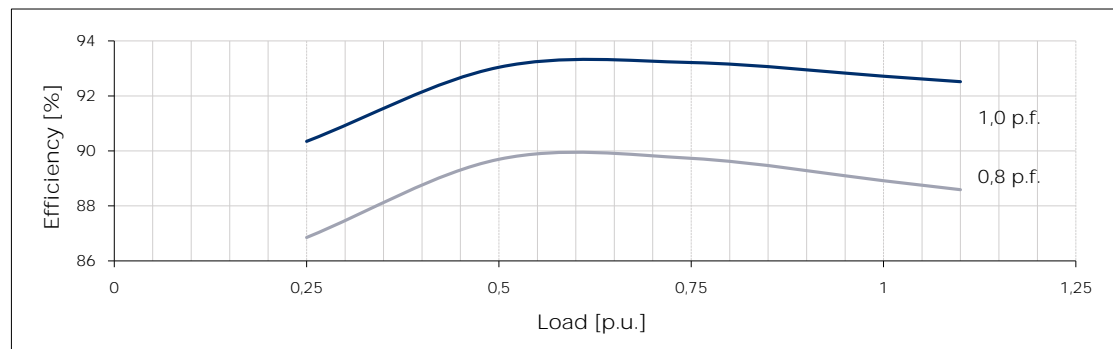
400 V



415 V



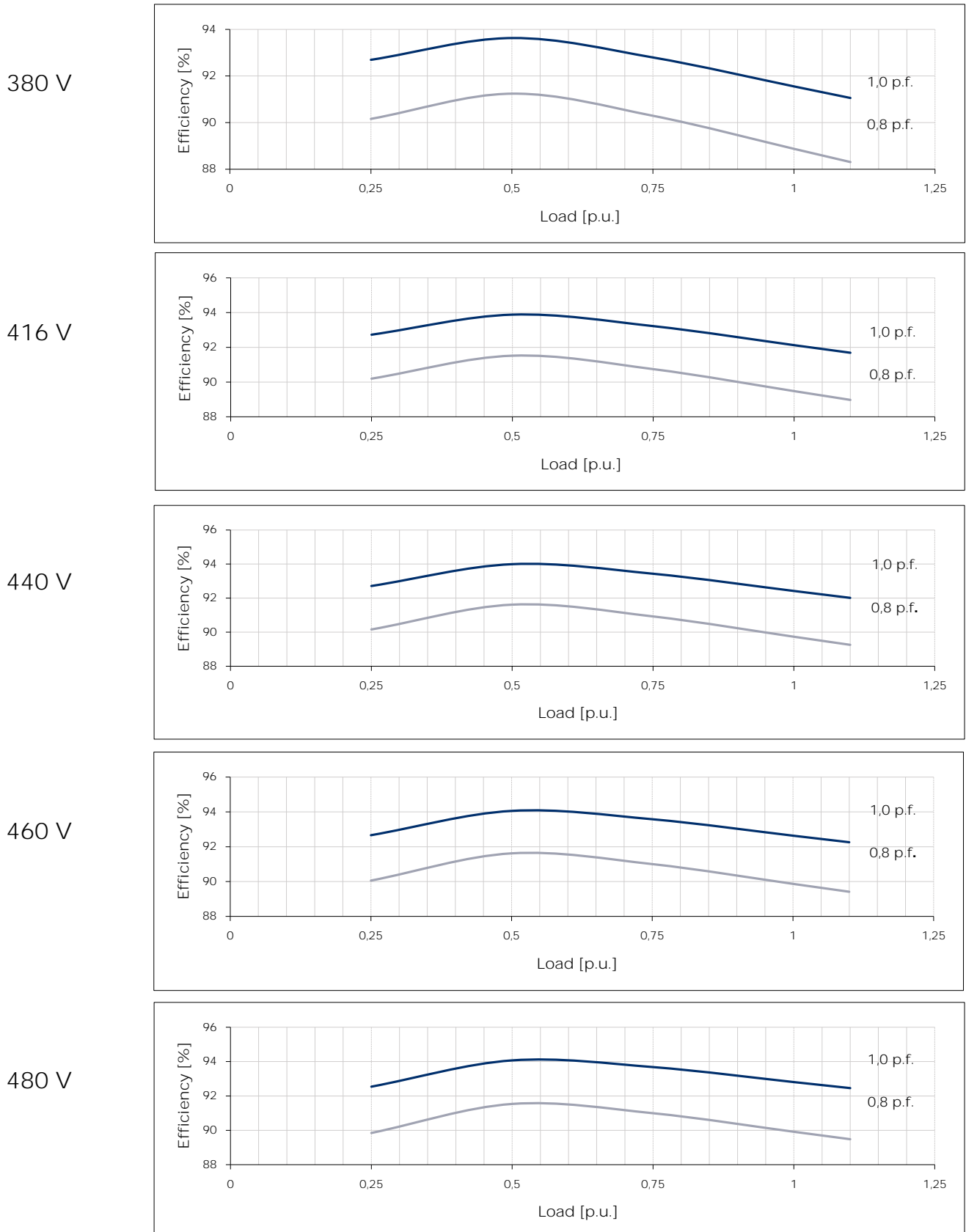
440 V



THREE-PHASE SYNCHRONOUS GENERATOR  
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Typical efficiency curves

60 Hz - 1800 min<sup>-1</sup>





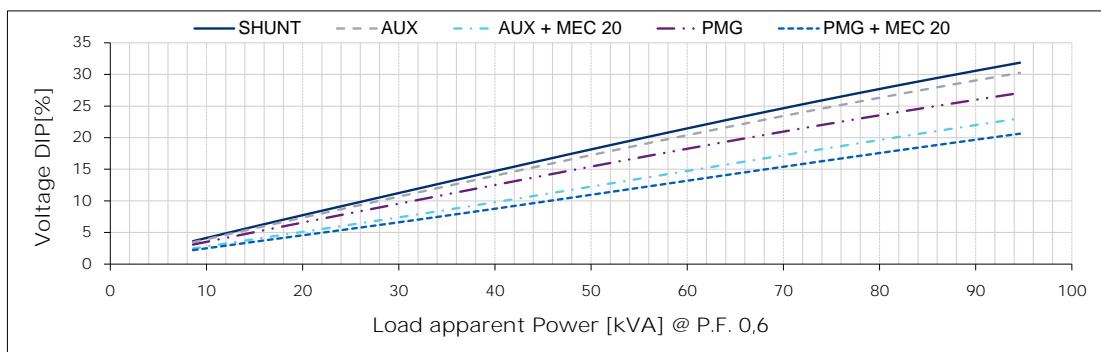
MarelliMotori  
Inspired solutions

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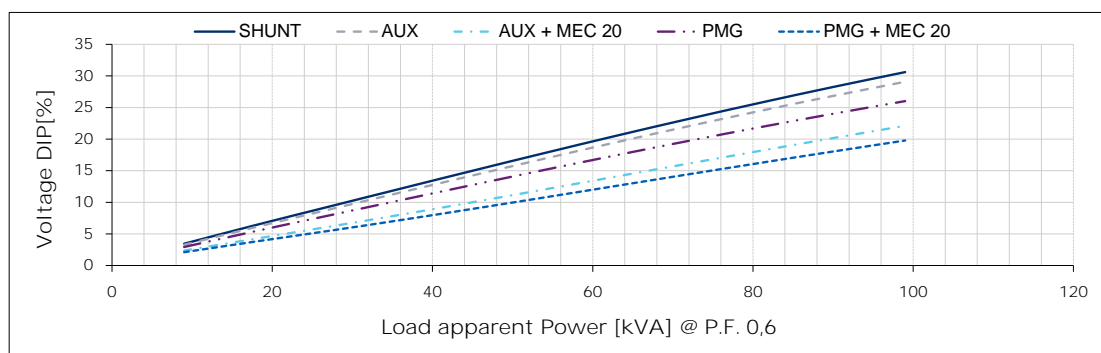
Typical voltage DIP curves

50 Hz - 1500 min<sup>-1</sup>

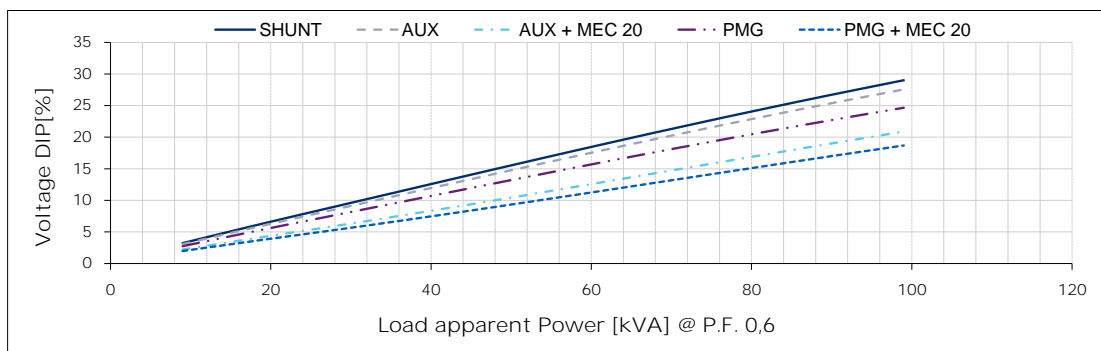
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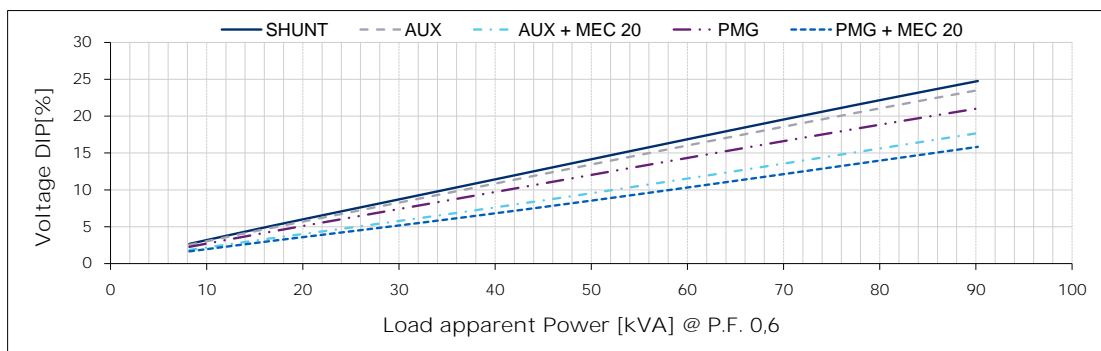
400 V



415 V



440 V





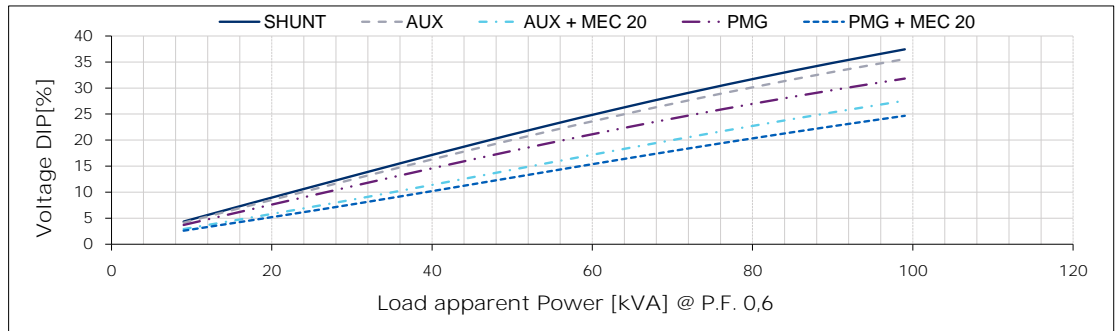
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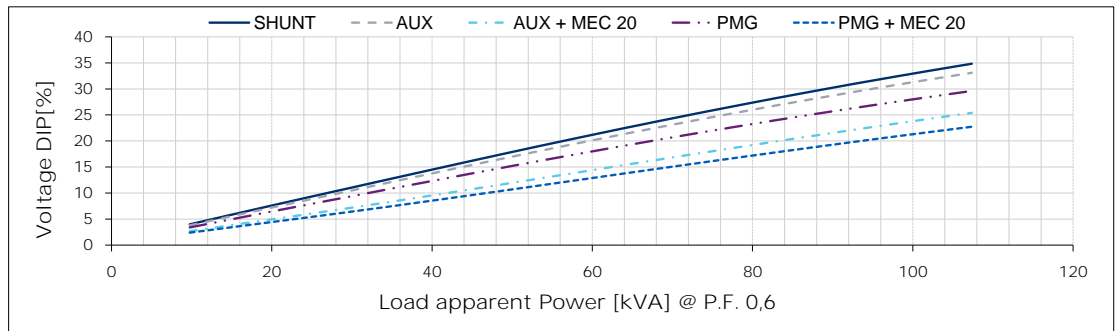
Typical voltage DIP curves

60 Hz - 1800 min<sup>-1</sup>

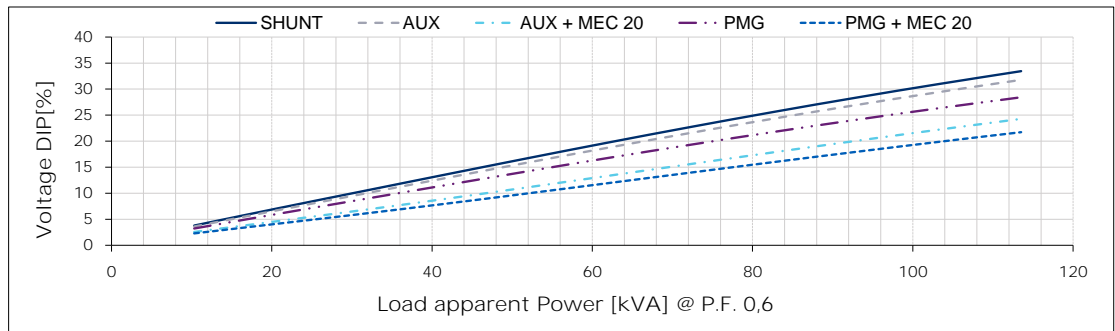
380 V



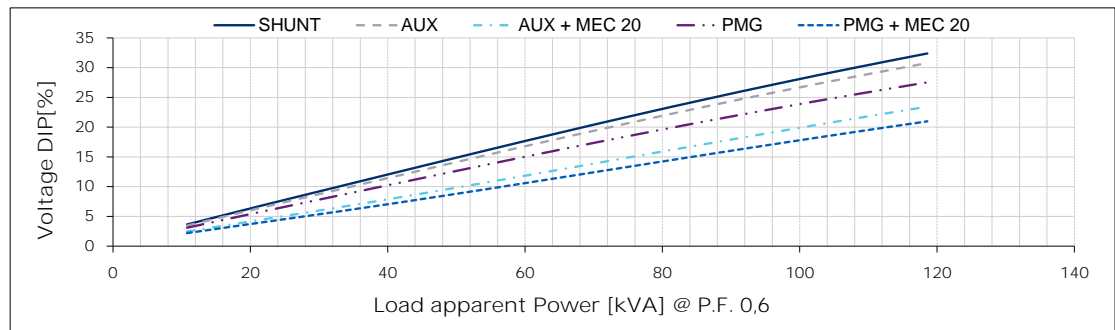
416 V



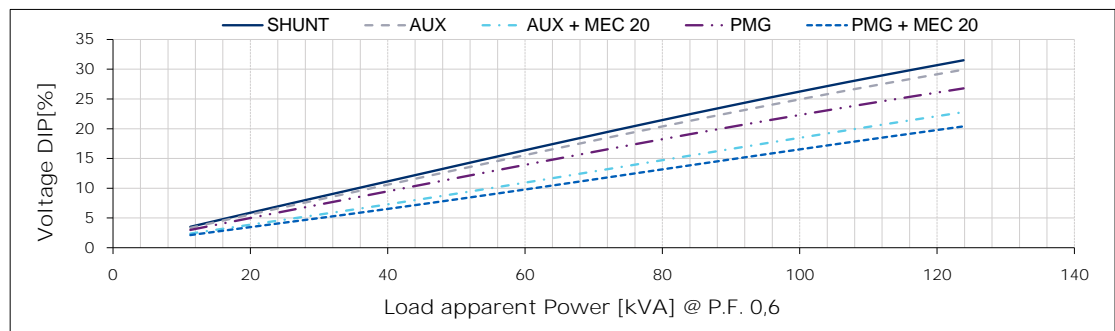
440 V



460 V



480 V



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



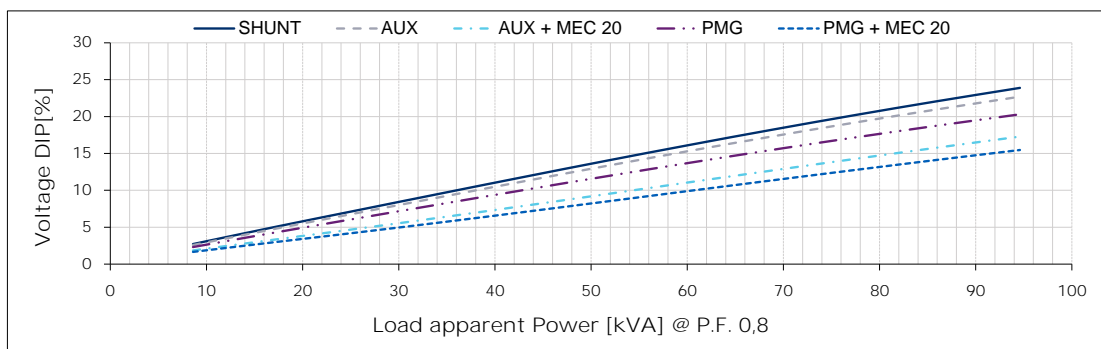
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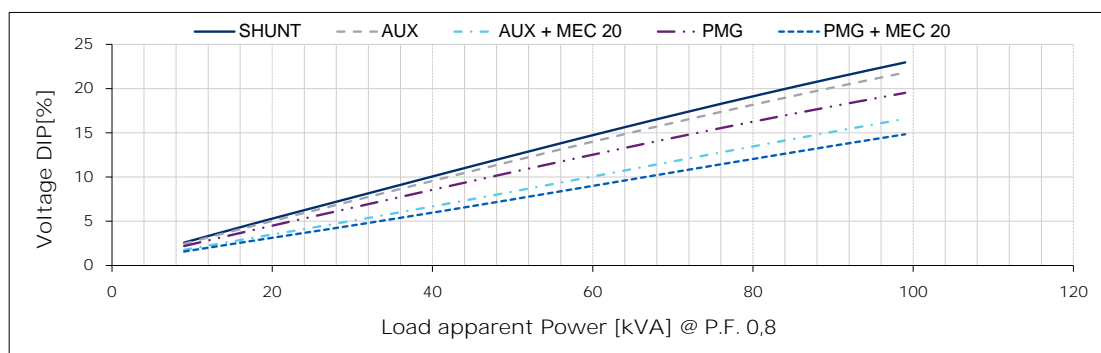
Typical voltage DIP curves

50 Hz - 1500 min<sup>-1</sup>

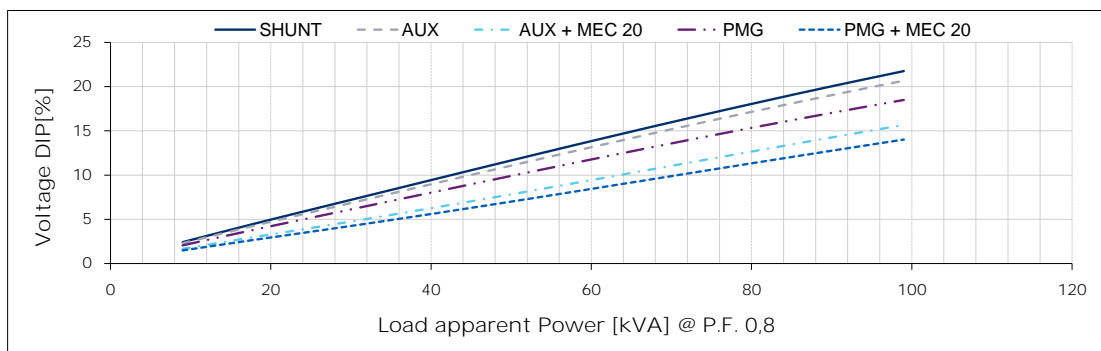
380 V



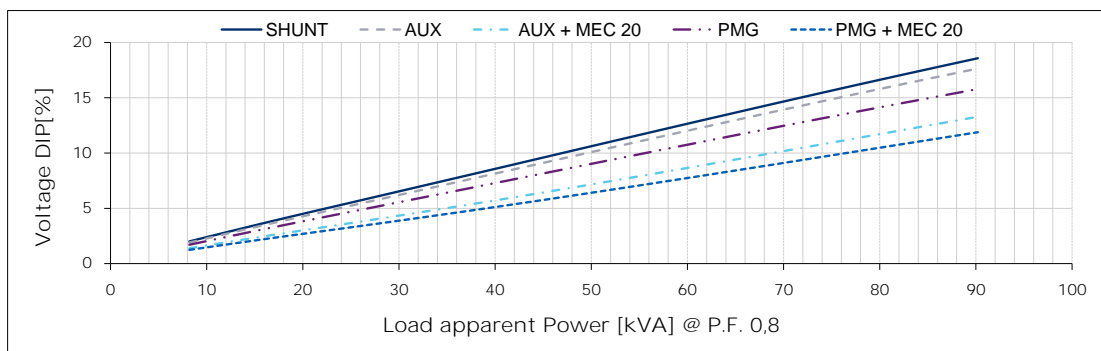
400 V



415 V



440 V





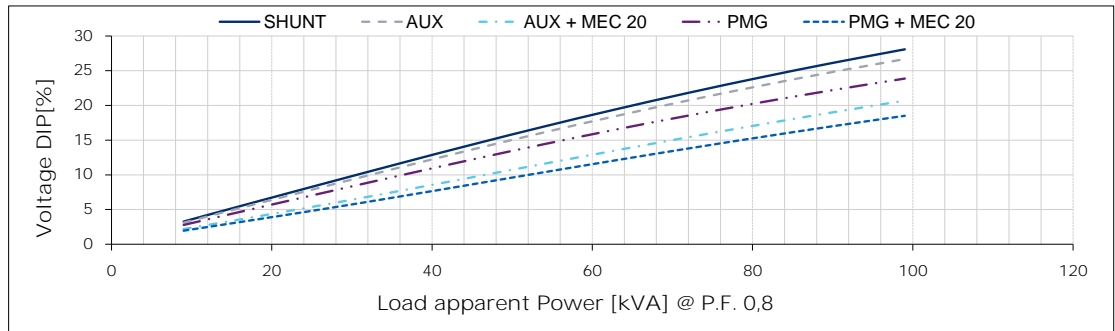
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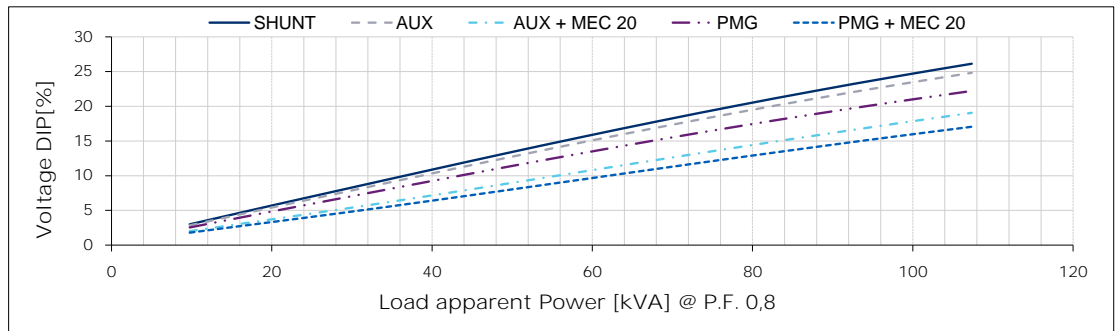
Typical voltage DIP curves

60 Hz - 1800 min<sup>-1</sup>

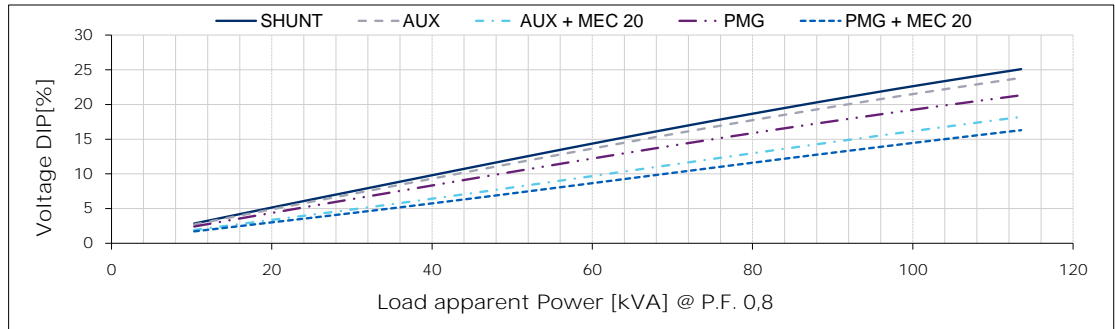
380 V



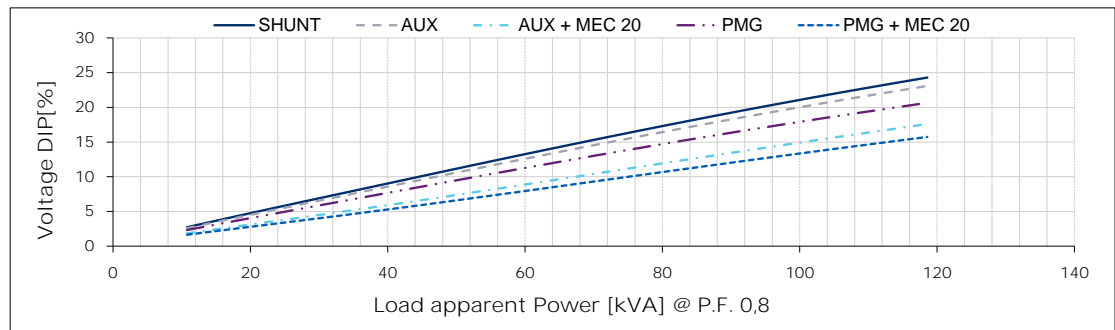
416 V



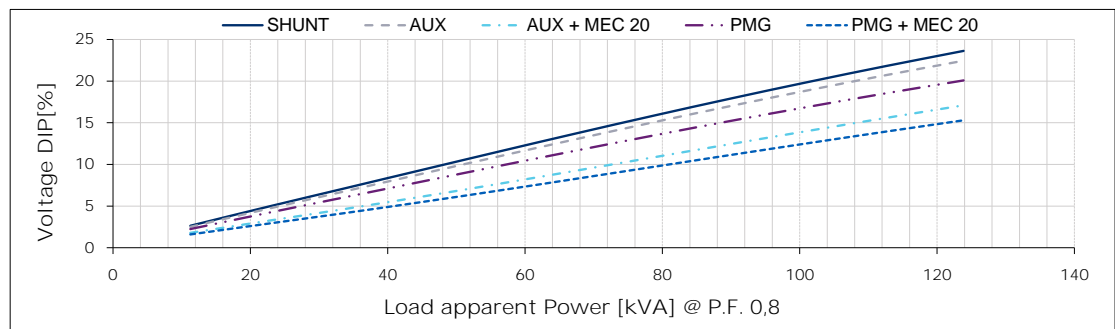
440 V



460 V



480 V

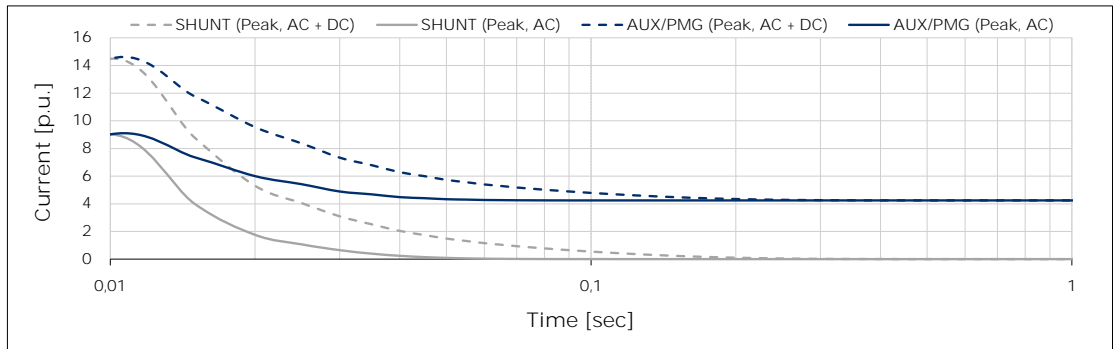


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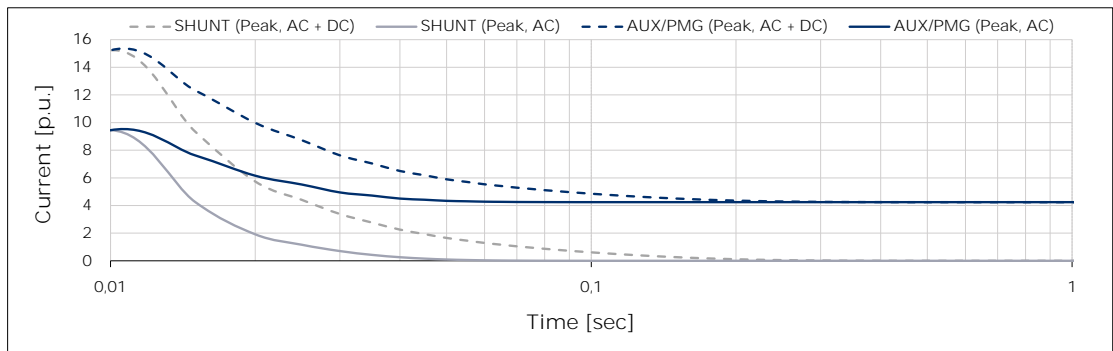
Typical 3-phase short circuit decrement curves

50 Hz - 1500 min<sup>-1</sup>

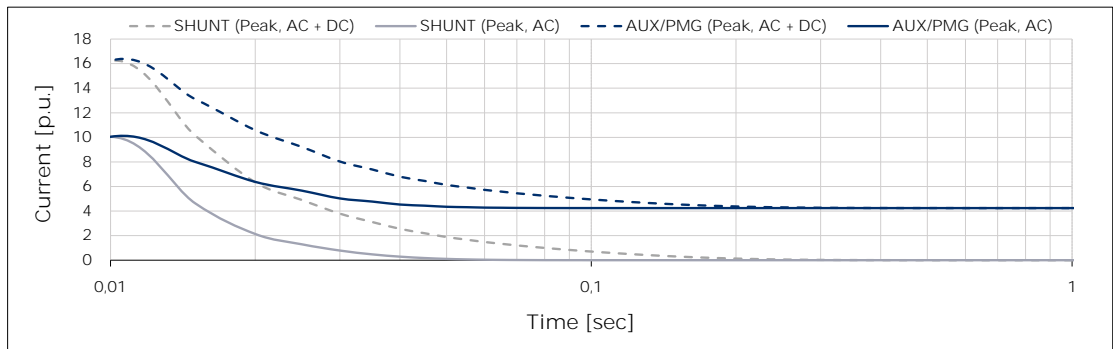
380 V



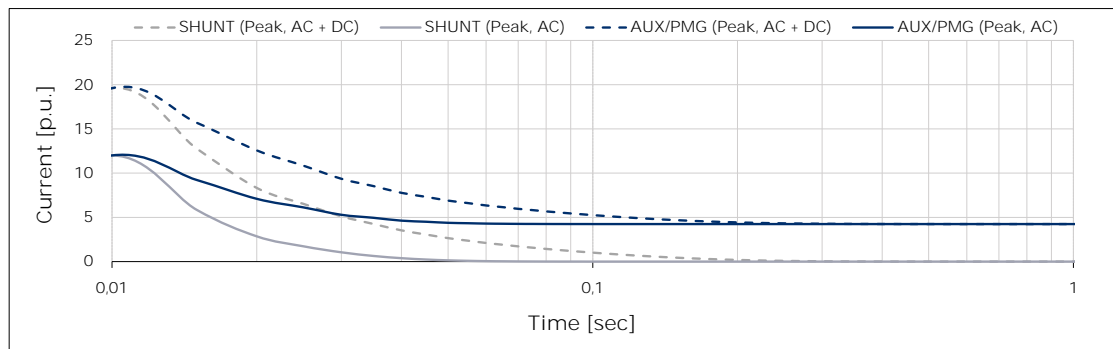
400 V



415 V



440 V

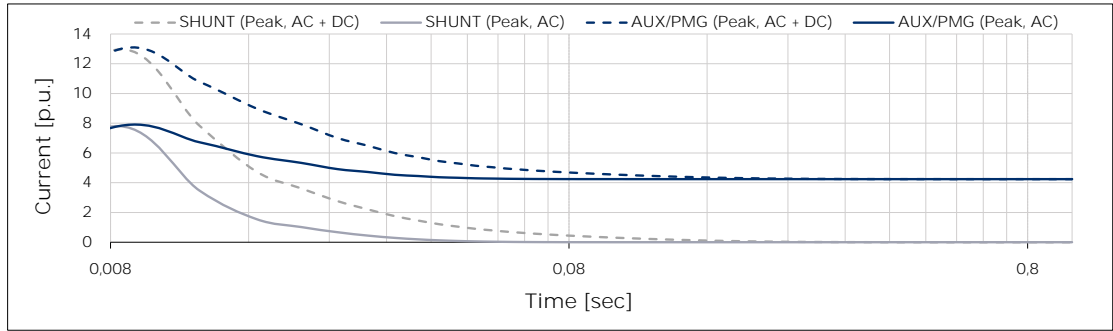




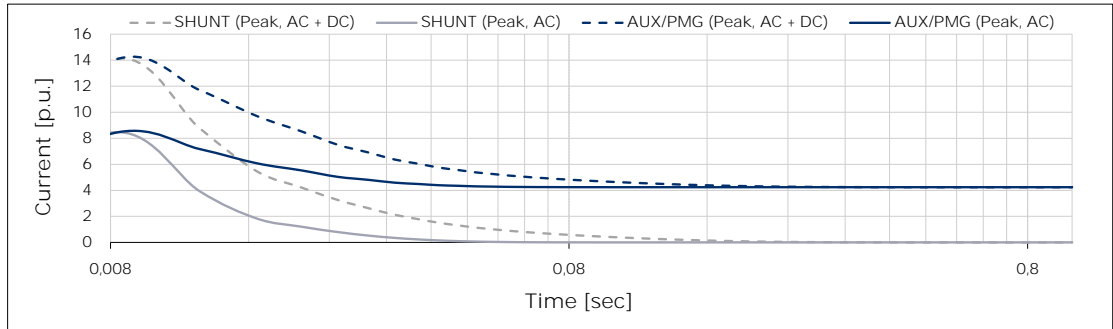
Typical 3-phase short circuit decrement curves

60 Hz - 1800 min<sup>-1</sup>

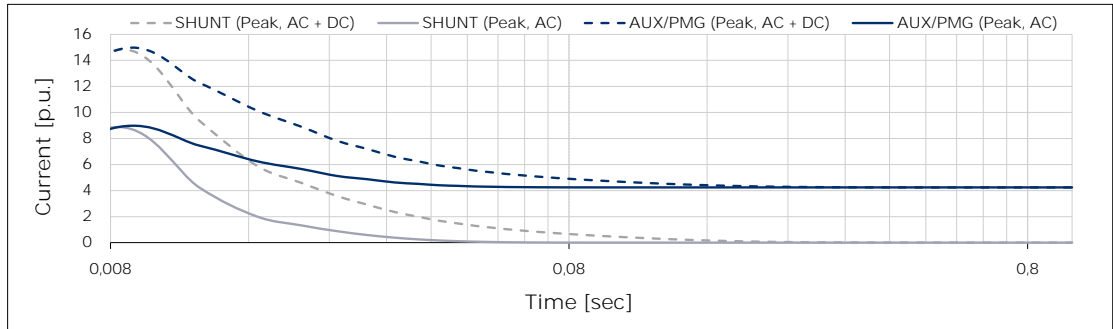
380 V



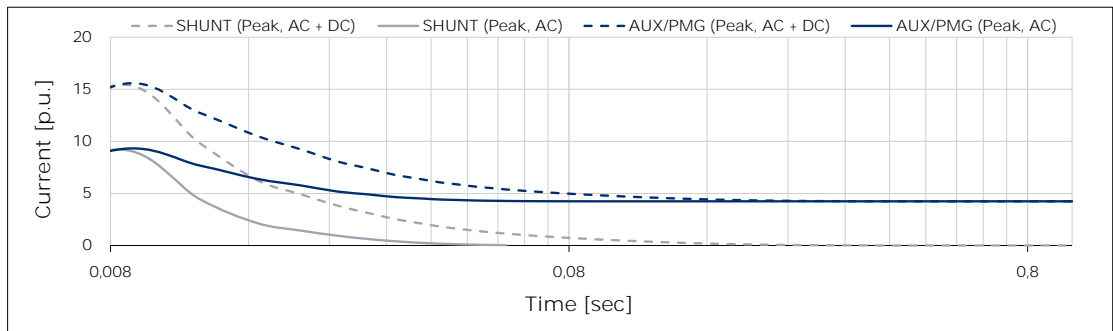
416 V



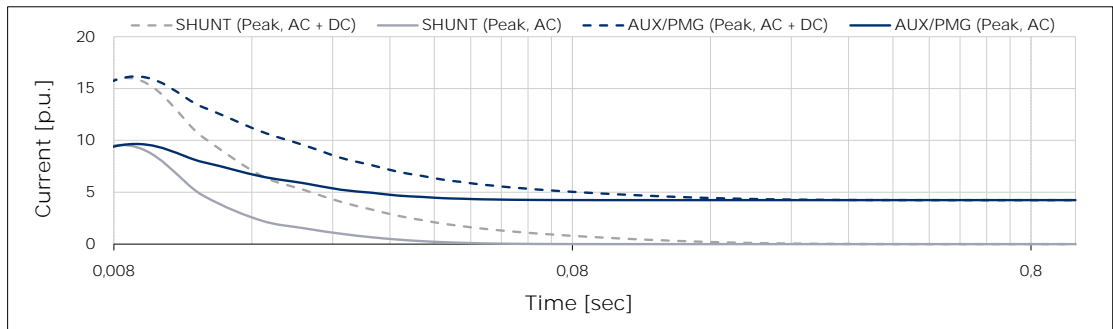
440 V



460 V



480 V



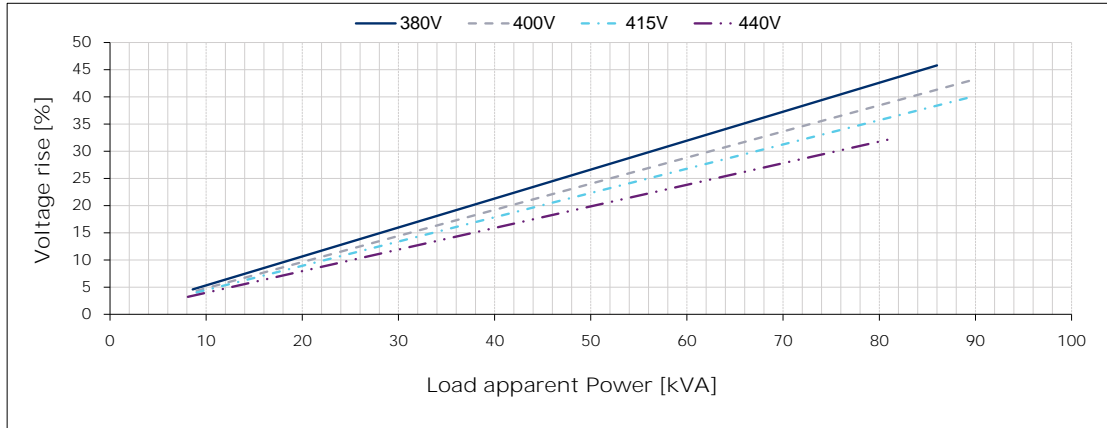
Above curves are based on a three-phase short circuit  
For other type of short circuit use the following multiplication factors

	2 phase	1 phase
Instantaneous (max)	0,92	1,12
Continuous	1,50	1,83

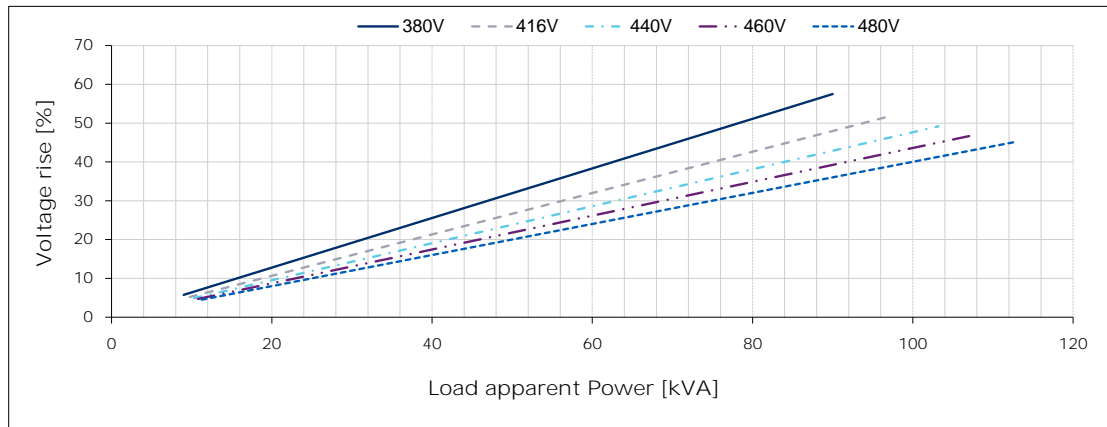
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Typical load rejection curves

50 Hz - 1500 min-1



60 Hz - 1800 min-1



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