

General characteristics

Pole number	6	Insulation class	H
Phase number	3	Protection class	IP23
Number of wires	12	NDE Bearing type	6324.2RS
Execution	Brushless	DE Bearing type	6330
Regulator type	DER-1/A	Maximum Overspeed	2250
Winding pitch	2/3	Altitude	0-1000
Code voltage reference	T0405P3	Balancing	ISO1940-1

Ratings 50Hz

kVA / kW @ Temp. Rise / Ambient °C - 0.8 PF																			
STANDBY-163/27					STANDBY-150/40					H-125/40					F-105/40				
Series	Star Y	760V	800V	830V	880V	760V	800V	830V	880V	760V	800V	830V	880V	760V	800V	830V	880V	760V	800V
Parallel	Star YY	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V
Series	Delta Δ	440V	460V	480V	508V	440V	460V	480V	508V	440V	460V	480V	508V	440V	460V	480V	508V	440V	460V
Parallel	Delta ΔΔ	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V
ECO46 1S6 A	kVA	870	870	870	-	835	835	835	-	810	810	810	-	730	730	730	-	648	648
	kW	696	696	696	-	668	668	668	-	648	648	648	-	584	584	584	-	518	518
ECO46 2S6 A	kVA	1075	1075	1075	-	1030	1030	1030	-	1000	1000	1000	-	900	900	900	-	800	800
	kW	860	860	860	-	824	824	824	-	800	800	800	-	720	720	720	-	640	640
ECO46 1L6 A	kVA	1350	1350	1350	-	1285	1285	1285	-	1250	1250	1250	-	1125	1125	1125	-	1000	1000
	kW	1080	1080	1080	-	1028	1028	1028	-	1000	1000	1000	-	900	900	900	-	800	800
ECO46 2L6 A	kVA	1720	1720	1720	-	1650	1650	1650	-	1600	1600	1600	-	1440	1440	1440	-	1280	1280
	kW	1376	1376	1376	-	1320	1320	1320	-	1280	1280	1280	-	1152	1152	1152	-	1024	1024

Ratings 60Hz

kVA / kW @ Temp. Rise / Ambient °C - 0.8 PF																			
STANDBY-163/27					STANDBY-150/40					H-125/40					F-105/40				
Series	Star Y	830V	880V	920V	960V	830V	880V	920V	960V	830V	880V	920V	960V	830V	880V	920V	960V	830V	880V
Parallel	Star YY	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V
Series	Delta Δ	480V	504V	530V	554V	480V	504V	530V	554V	480V	504V	530V	554V	480V	504V	530V	554V	480V	504V
Parallel	Delta ΔΔ	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V
ECO46 1S6 A	kVA	-	988	1044	1044	-	948	1002	1002	-	920	972	972	-	830	876	876	-	736
	kW	-	790	835	835	-	758	801	801	-	736	778	778	-	664	701	701	-	588
ECO46 2S6 A	kVA	-	1183	1290	1290	-	1133	1236	1236	-	1100	1200	1200	-	1000	1080	1080	-	880
	kW	-	946	1032	1032	-	907	989	989	-	880	960	960	-	800	864	864	-	704
ECO46 1L6 A	kVA	-	1512	1620	1620	-	1440	1542	1542	-	1400	1500	1500	-	1250	1350	1350	-	1120
	kW	-	1210	1296	1296	-	1150	1234	1234	-	1120	1200	1200	-	1000	1080	1080	-	896
ECO46 2L6 A	kVA	-	1956, 5	2064	2064	-	1876, 9	1980	1980	-	1820	1920	1920	-	1630	1730	1730	-	1456
	kW	-	1565, 2	1651, 2	1651, 2	-	1501, 5	1584	1584	-	1456	1536	1536	-	1304	1384	1384	-	1164, 8

Reactance & Time constants- Class H / 400V

Unsaturated (ref. EN60034-4)			ECO46 1S6 A	ECO46 2S6 A	ECO46 1L6 A	ECO46 2L6 A
X_d	Direct-axis synchronous reactance	%	-	-	-	-
X'_d	Direct-axis transient reactance	%	-	-	-	-
X''_d	Direct-axis subtransient reactance	%	-	-	-	-
X_q	Quadrature-axis synchronous reactance	%	-	-	-	-
X'_q	Quadrature-axis transient reactance	%	-	-	-	-
X''_q	Quadrature-axis subtransient reactance	%	-	-	-	-
X₂	Negative-sequence reactance	%	-	-	-	-
X₀	Zero sequence reactance	%	-	-	-	-
Saturated						
X_d	Direct-axis synchronous reactance	%	-	-	-	-
X'_d	Direct-axis transient reactance	%	-	-	-	-
X''_d	Direct-axis subtransient reactance	%	-	-	-	-
X_q	Quadrature-axis synchronous reactance	%	-	-	-	-
X'_q	Quadrature-axis transient reactance	%	-	-	-	-
X''_q	Quadrature-axis subtransient reactance	%	-	-	-	-
X₂	Negative-sequence reactance	%	-	-	-	-
X₀	Zero sequence reactance	%	-	-	-	-
K_{cc}	Short circuit ratio		-	-	-	-
T'_d	Transient time constant	sec	0,25	0,258	0,265	0,275
T''_d	Subtransient time constant	sec	0,021	0,023	0,022	0,024
T'_{do}	Open circuit time constant	sec	9,5	10,4	11	12,5
T_a	Armature time constant	sec	0,027	0,029	0,031	0,034

Additional information - Class H / 400V

I_o	Excitation current at no load	A	-	-	-	-
I_c	Excitation current at full load	A	-	-	-	-
Overload						
Overload per 20 sec. PRP or 10 sec. COP			300			
Heat dissipation			-	-	-	-
Telephone Harmonic Factor - THF			<2	<2	<2	<2
Waveform Distors.(THD) full load LL/LN			3 / 2,9	3,4 / 3,3	3,3 / 2,9	2,7 / 2,8
Waveform Distors.(THD) no load LL/LN			2,5 / 2,4	2,9 / 2,8	2,7 / 2,6	2,8 / 2,6

Reactance & Time constants- Class H / 480V

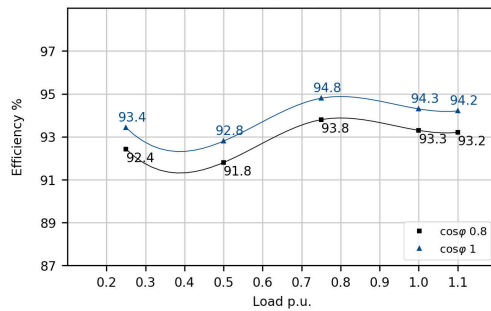
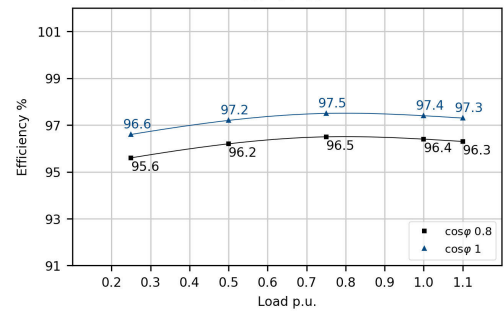
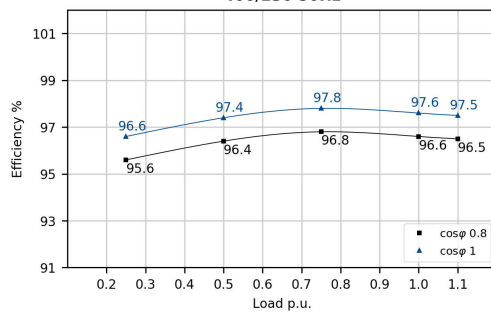
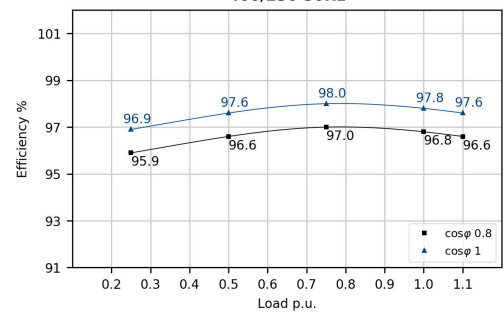
Unsaturated (ref. EN60034-4)			ECO46 1S6 A	ECO46 2S6 A	ECO46 1L6 A	ECO46 2L6 A
X_d	Direct-axis synchronous reactance	%	-	-	-	-
X'_d	Direct-axis transient reactance	%	-	-	-	-
X''_d	Direct-axis subtransient reactance	%	-	-	-	-
X_q	Quadrature-axis synchronous reactance	%	-	-	-	-
X'_q	Quadrature-axis transient reactance	%	-	-	-	-
X''_q	Quadrature-axis subtransient reactance	%	-	-	-	-
X₂	Negative-sequence reactance	%	-	-	-	-
X₀	Zero sequence reactance	%	-	-	-	-
Saturated						
X_d	Direct-axis synchronous reactance	%	-	-	-	-
X'_d	Direct-axis transient reactance	%	-	-	-	-
X''_d	Direct-axis subtransient reactance	%	-	-	-	-
X_q	Quadrature-axis synchronous reactance	%	-	-	-	-
X'_q	Quadrature-axis transient reactance	%	-	-	-	-
X''_q	Quadrature-axis subtransient reactance	%	-	-	-	-
X₂	Negative-sequence reactance	%	-	-	-	-
X₀	Zero sequence reactance	%	-	-	-	-
K_{cc}	Short circuit ratio		-	-	-	-
T'_d	Transient time constant	sec	0,25	0,258	0,265	0,275
T''_d	Subtransient time constant	sec	0,021	0,023	0,022	0,024
T'_{do}	Open circuit time constant	sec	9,5	10,4	11	12,5
T_a	Armature time constant	sec	0,027	0,029	0,031	0,034

Additional information - Class H / 480V

I_o	Excitation current at no load	A	-	-	-	-
I_c	Excitation current at full load	A	-	-	-	-
Overload			-			
Overload per 20 sec. PRP or 10 sec. COP			300			
Heat dissipation			W	-	-	-
Telephone Interference Factor - TIF				<40	<40	<40
Waveform Distors.(THD) full load LL/LN			%	3 / 2,9	3,4 / 3,3	3,3 / 2,9
Waveform Distors.(THD) no load LL/LN			%	2,5 / 2,4	2,9 / 2,8	2,7 / 2,6

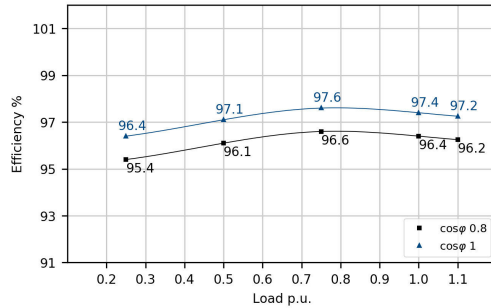
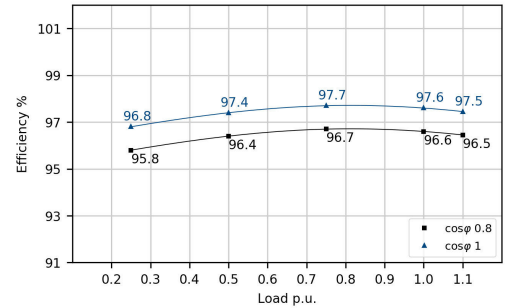
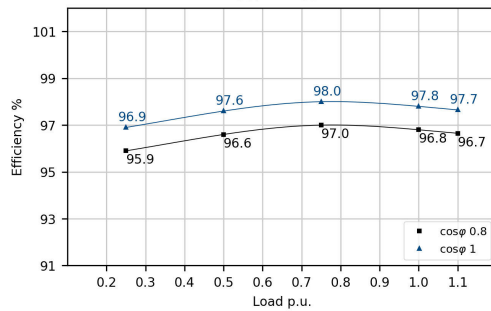
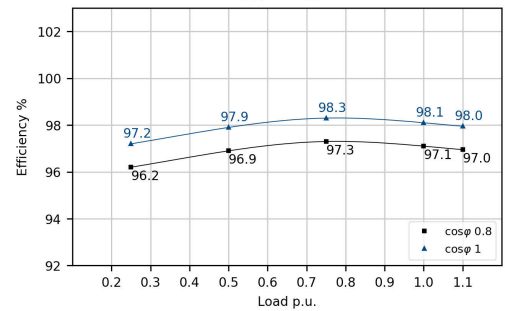
Efficiencies @ 50Hz

Models		380V 50Hz					400V 50Hz					415V 50Hz					440V 50Hz				
		0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1
EC046 1S6 A	%	92,4	93,1	93,8	93,4	93,2	92,4	91,8	93,8	93,3	93,2	92,2	93,0	93,6	93,1	92,7	-	-	-	-	-
EC046 2S6 A	%	93,1	93,8	94,3	94,0	93,8	93,1	92,5	94,4	93,9	93,8	92,9	93,7	94,1	93,7	93,3	-	-	-	-	-
EC046 1L6 A	%	92,1	93,0	95,2	94,7	94,5	92,1	92,9	94,9	94,6	94,5	91,9	92,9	95,0	94,4	94,0	-	-	-	-	-
EC046 2L6 A	%	91,8	92,9	95,7	95,4	95,2	92,1	92,8	95,4	95,3	95,1	91,9	92,8	95,5	95,1	94,7	-	-	-	-	-

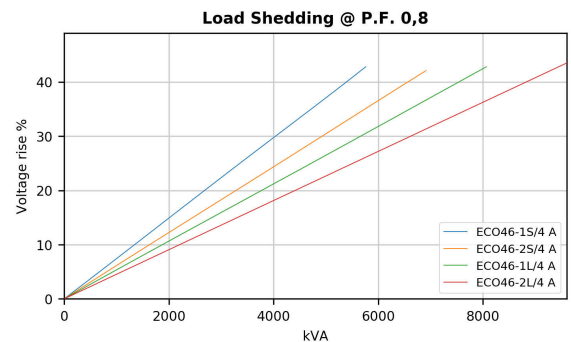
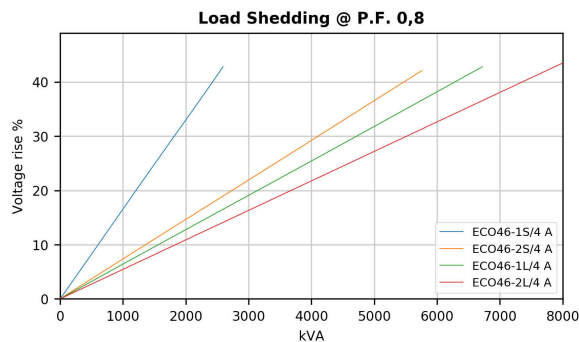
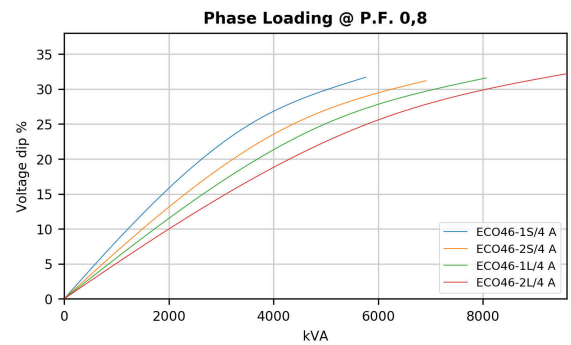
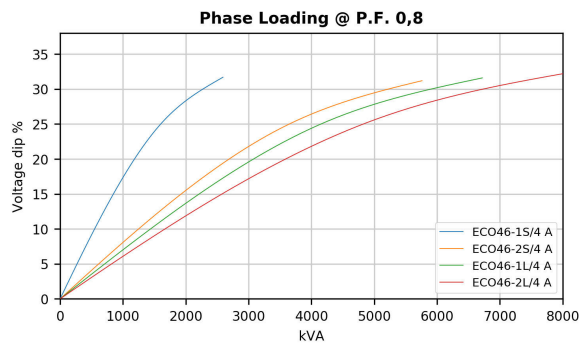
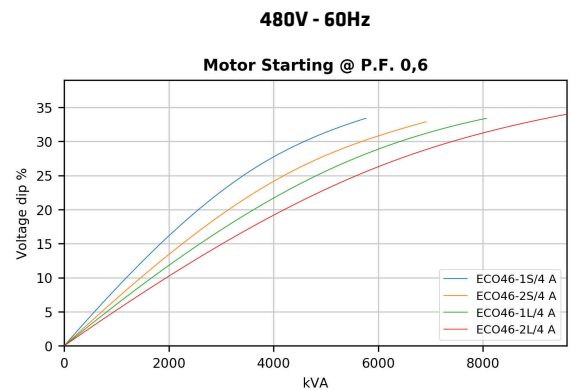
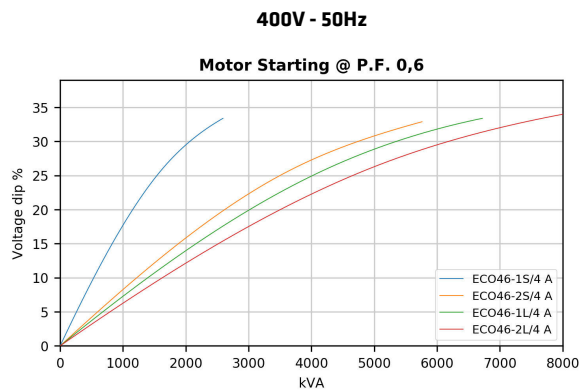
EC046 1S6 A**400/230 50Hz****EC046 2S6 A****400/230 50Hz****EC046 1L6 A****400/230 50Hz****EC046 2L6 A****400/230 50Hz**

Efficiencies @ 60Hz

Models		415V 60Hz					440V 60Hz					460V 60Hz					480V 60Hz				
		0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1
ECO46 1S6 A	%	-	-	-	-	-	92,2	93,0	93,5	93,3	93,2	92,3	92,7	94,2	93,5	93,3	92,4	93,1	93,6	93,4	93,3
ECO46 2S6 A	%	-	-	-	-	-	91,8	92,5	94,4	94,0	93,9	92,0	92,7	94,8	94,2	94,0	92,0	92,6	94,5	94,1	94,0
ECO46 1L6 A	%	-	-	-	-	-	92,4	93,0	94,7	94,7	94,6	92,3	93,2	95,1	94,9	94,7	92,4	93,1	94,8	94,8	94,7
ECO46 2L6 A	%	-	-	-	-	-	92,3	92,9	95,4	95,1	95,0	92,3	93,1	95,8	95,3	95,1	92,3	93,0	95,5	95,2	95,1

ECO46 1S6 A**480/277 60Hz****ECO46 2S6 A****480/277 60Hz****ECO46 1L6 A****480/277 60Hz****ECO46 2L6 A****480/277 60Hz**

Transients voltage



In order to scale transient curves as a function of a power factor or voltage if not indicated, please proceed as follows:

Power Factor coefficient corrector (PFCC), to be used on power factor 0.6 curves:

$$PFCC = \sin(\text{ARCCos}(PF_{\text{new}})) / 0.8$$

Example. The PFCC at power factor 0.3 is 1.192 [$PFCC = \sin(\text{ARCCos}(0.3)) / 0.8$]. This means that the voltage fall at a given power at pf 0.3 is equivalent to the one that can be read on the pf 0.6 curve if the load is considered 1.192 times bigger (19% higher value.).

In this example, a 100 kVA load insertion at pf 0.3 is equivalent in voltage fall to a 119kVA load insertion at pf 0.6.

Voltage coefficient corrector (VCC):

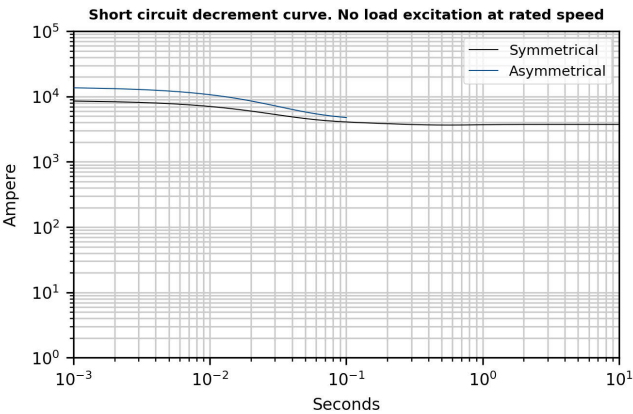
$$VCC = (400/V_{\text{new}})^2 \text{ if } 50 \text{ Hz}; VCC = (480/V_{\text{new}})^2 \text{ if } 60 \text{ Hz}$$

Example. VCC at 415V 60 Hz is 1.338 [$VCC = (480/415)^2$]. This means that the voltage fall at a given power at 415V is equivalent to the one that can be read on the power factor 0.6 curve if the load is considered 1.338 times bigger (33% higher value.).

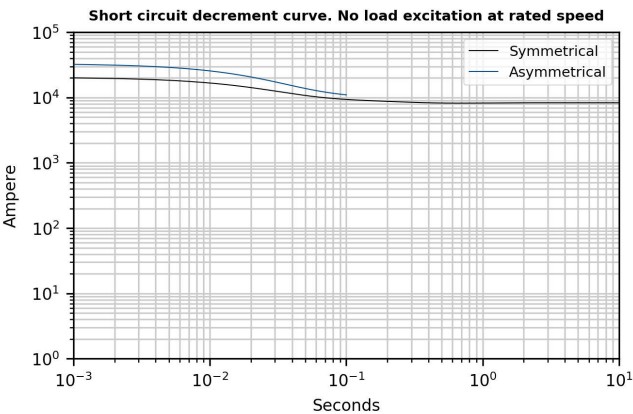
In this example, a 100 kVA load insertion at 415V is equivalent in voltage fall to a 133kVA load insertion at 480V.

50Hz Short circuit decrement curves - No load excitation at rated speed

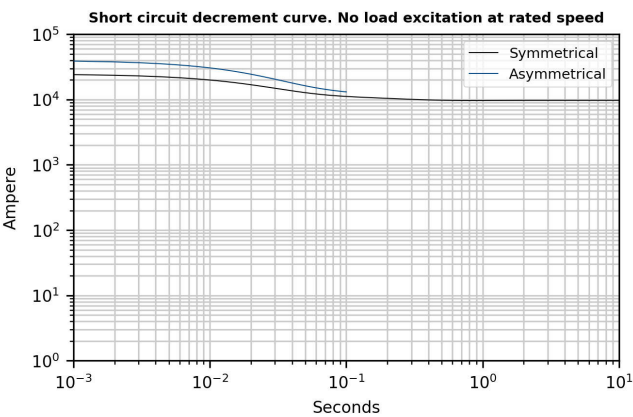
ECO46 1S6 A



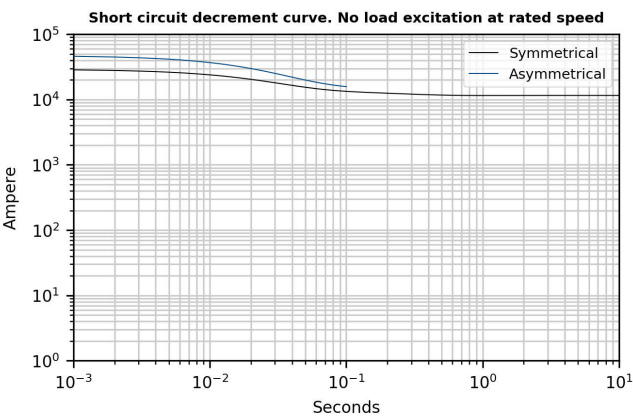
ECO46 2S6 A



ECO46 1L6 A



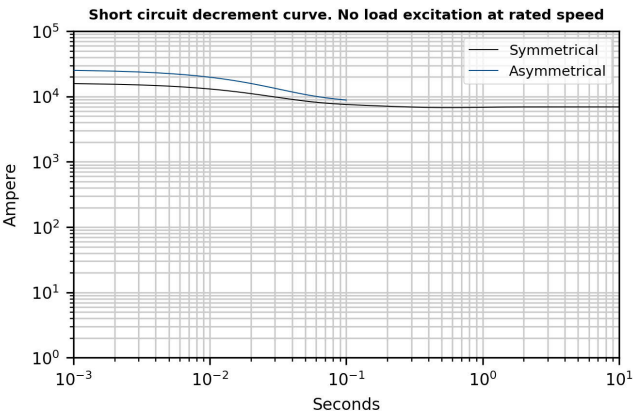
ECO46 2L6 A



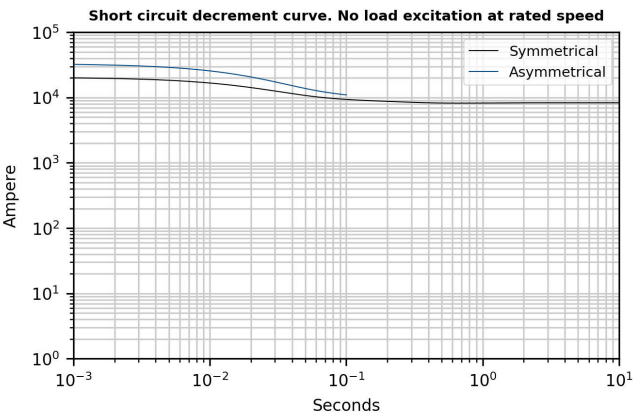
*Please refer to tables at page 6

60Hz Short circuit decrement curves - No load excitation at rated speed

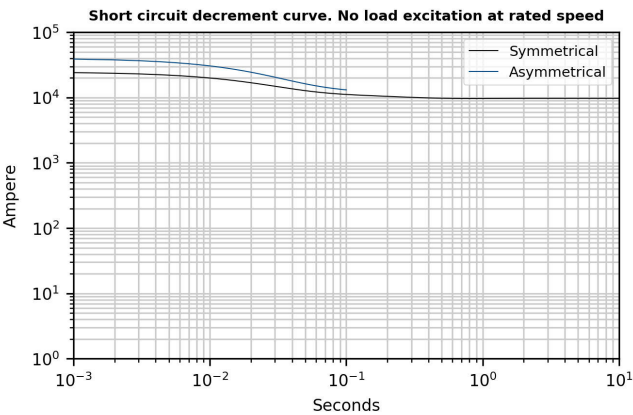
ECO46 1S6 A



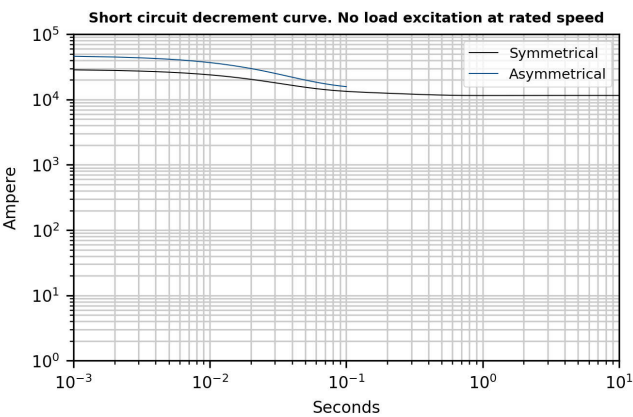
ECO46 2S6 A



ECO46 1L6 A



ECO46 2L6 A

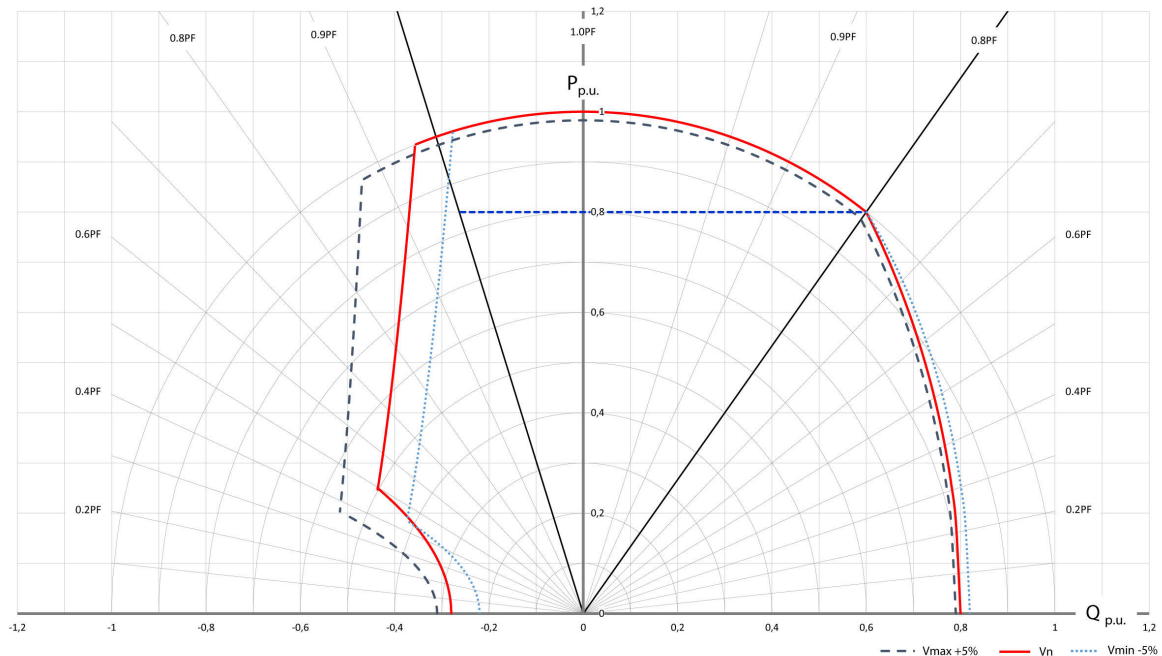


*Please refer to tables at page 6

Additional Characteristics

Data		ECO46 1S6 A		ECO46 2S6 A		ECO46 1L6 A		ECO46 2L6 A	
		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Damper cage		Copper							
Single stator coil resistance (20°C)	Ω	-	-	-	-	-	-	-	-
Rotor Winding Resistance (20°C)	Ω	3,05		3,5		3,977		4,5	
Stator Exciter Resistance (20°C)	Ω	12,9		12,9		12,9		12,9	
Rotor Exciter Resistance (20°C)	Ω	0,12		0,12		0,12		0,12	
Auxiliary Winding Resistance (20°C)	Ω	0,414		0,33		0,36		0,39	
Weight of complete generator	kg	3100,0		3400,0		3900,0		4800,0	
Unbalanced magnetic pull	kN/mm	6,4		6,5		6,8		7,0	
Air flow	m ³ /min	135,0	162,0	135,0	162,0	135,0	162,0	135,0	162,0
Noise level at 1m/7m	dB(A)	97/86	100/91	97/86	100/91	97/86	100/91	97/86	100/91

PQ Diagram



The PQ diagram above refers to three-phase application only.