



Totally Focused. Totally Independent.

Technical Specification

EC043 4 A



The world's largest
independent producer of
alternators 1 – 5,000kVA

All electrical and mechanical data contained in this document is provided for reference only and represents typical values under optimal operating conditions. Actual performances may be subjected to cumulative tolerances or variances due to materials, construction or other specific operating and loading conditions, in accordance with IEC 60034.

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Regulations and Certifications

The alternators are designed, built and tested in accordance with **ISO 9001**, within a certified quality management system. The entire range meets the most common international specifications, including:

CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530

BS 4999-5000, NF 51.111, NEMA MG 1-2011

ISO 8528-3

In addition, they comply with specific regulations for particular markets, such as:

UL 1446, UL 1004-4, UL 1004-B

CAN/CSA-C22.2 No14-95 / No100-95

The ECP and ECO series comply with EEC directives **2006/42/EC (Machinery Directive)**, **2014/35/EC (Low Voltage Directive)**, **2014/30/EC (Electromagnetic Compatibility Directive)**, **2011/65/EC (RoHS 2)** and **2015/863 (RoHS 3)**.

Windings and performance

- ▶ All alternators feature **reduced-pitch (2/3)** windings, which:
 - Eliminate triple harmonics in the voltage waveform
 - Reduce neutral currents during parallel operation
- ▶ **Parallel operation** Use alternators of the same model and winding configuration. For different models, contact Mecc Alte Application Engineering to verify compatibility.
- ▶ **Damping cage** All models except the ECP3 series include an aluminum or copper damping cage for greater stability during load transients.
- ▶ **Reconnectable windings**
 - 12 leads: 50 Hz 380–440 V and 220/110–240/120 V (derating may apply); 60 Hz 380–480 V and 220/110–240/120 V (derating may apply)
 - 6 leads: 50 Hz 380–440 V and 220–240 V (derating may apply); 60 Hz 380–480 V and 220–240 V (derating may apply)

Winding configurations	Standard		Special (dedicated)			
	12 reconnectable wires	6 reconnectable wires	380 V and 600 V 60 Hz	690V 50/60Hz	220-240V 1ph 50Hz	220-240V 1ph 60Hz
ECP3 to ECO38 G (NPE)	●	○	○	○	○	○
ECO40 to ECO46	○	●	○	○	○ *	○ *
ECO47	● 4 wires		○	○	–	–
THD (Total Harmonic Distortion)	<3.5% at full load L-L	<3.0% at full load L-L	<3.5% at full load L-L	<3.5% at full load L-L	<4.5% at full load L-N	<4.5% at full load L-N
Interference suppression	VDE 0875 G/N/K, EN61000-6-3, EN61000-6-2, others available on request					

* Only up to ECO40 series

● Standard

○ Optional

Insulating Materials and Electrical Performance

- ▶ **Insulation Class:** H on the entire range
- ▶ **Efficiency:** High efficiency as standard
- ▶ **Motor Start:** Inrush current >300% for 20 seconds
- ▶ **THD (Total Harmonic Distortion):**
 - o <3.5% L-L typical (three-phase windings)
 - o <4.5% L-N typical (single-phase windings)

Winding protection

Winding protection is crucial to ensure the longevity of the generator based on environmental conditions and electrical stress.

Protection Level	Standard	Standard+	Grey	Grey+	Total+	V-Type
Treated Components	Active parts	Exciter stator	Main stator + exciter	Stator + Exciter	Stator + Exciter + Rotor	Complete system
Type of Treatment	Impregnation resin only	Resin + Grey paint EG43	Grey paint EG43	Stator (EG43) + Exciter (Black severe ep.)	Black protection (stators) + EG43 (rotating parts)	Double VPI, Anti-Corona Wire, Double Layer Black
Series/Typical Application	ECP3, ECP4 (Standard Use)	ECP28, 30, 32	Marine Applications / NPE, ECO, HCP	Harsh industrial environments	Extreme/abusive conditions	Harsh Environments (Extended Warranty)

Detail of specific treatments

- ▶ **Grey paint EG43:** Standard protection against moisture and contaminants.
- ▶ **Black Protection:** Advanced physical barrier against chemicals and high humidity.
- ▶ **V-Type Treatment:** Includes vacuum impregnation (VPI), internal stator insulation, and corona-resistant materials for maximum reliability.

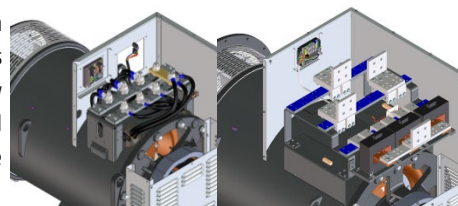
For more information visit: [Insulation_System_Guide](#)

Construction

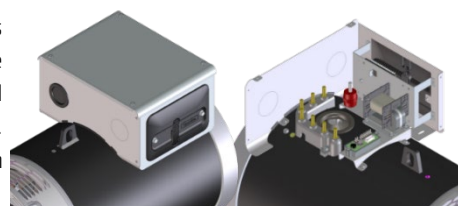
The robust mechanical structure withstands up to 5G in any direction and 9G vertically, and its design allows easy access to connections and components during routine maintenance checks. The mechanical design used the most advanced FEM techniques. The materials used are: DD12 steel for the frame, C45 steel for the shaft and cast iron or die-cast aluminum for the end brackets: the fans are made of die-cast aluminum and nylon reinforced with fiberglass, UL compliant materials. The rotors are dynamically balanced according to ISO 1940-1 grades 6.3 (up to series 32) or 2.5 (series 34 onwards).

Terminals and terminal blocks

Easy access to the regulators is ensured by a pull-out drawer or drop-down panel to allow for safer adjustment. Large terminal blocks allow easy access of power cables, in the higher power ranges ECO43 and ECO46 terminals allow convenient choice of power cable or busbar connection with input and connection versatility. Current transformers are available as an option on the ECO 40, 43, 46 and 47 series with single or dual output.



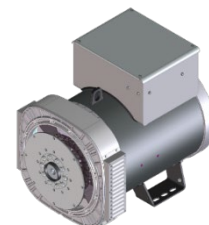
A new AVR panel has been installed on the Type-C family. The terminal blocks have been redesigned in a special "L" configuration, specifically to facilitate connections with customers; With this type of terminal block, a second terminal block can be positioned in order to obtain 12 terminals available. Current transformers are available as an option on the ECO38 series with single or dual output.



Protection for the environment

In addition to the protection on the windings themselves, alternators can have a higher degree of protection. The standard level is IP23 but the following solutions are also available: IP23 DP with ingress filters, IP23 with terminal box only in IP45, IP43 and IP45. Downgrades may apply.

For more information visit: [Bulletin_IP](#)



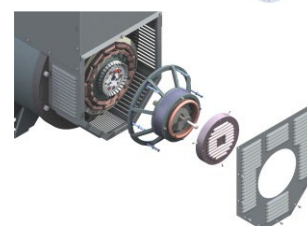
Optional PMG

The MeccAlte PMG is optionally available factory-fitted on ECP28, ECP30, ECP32, ECP34 and ECO38; Alternatively, only the preparation for future mounting is optional.



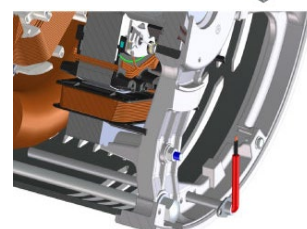
On the ECO 40, 43 and 46 series it is optionally available factory-fitted or retrofitted. On the ECO47 the PMG is standard.

The entire AVR range is fully compatible with MAUX and PMG systems, minimizing spare parts management and inventory flexibility, as one AVR adapts to all applications. The PMG delivers the same amount of kVA as the MAUX.



Anti-condensation heater

Our entire range can be equipped with anti-condensation heaters of adequate power and sized to the alternator. The voltage for heaters must be specified when ordering. New cylindrical cartridge heaters are available on request and can be retrofitted.



Accessories

Additional optional can be mounted on our alternator series, such as PTC or PT100 thermistors on both windings and bearings, anti-condensation heaters, high and low profile terminal blocks (on most series), parallel devices, current and voltage transformers, air filters, IP43 and IP45 protections and many more. For more information visit: [C-type-accessories](#)

Excitation and regulation systems

All ECP/ECO series are equipped with MAUX auxiliary winding to power the digital controller.

DxR

Both the DSR and DER1 are available for PC connection via the DxR2 USB interface and DxR TERMINAL software to query/download alarms and settings for analysis or for cloning other controllers. DER2 has a built-in USB connection and can be connected to your PC without any optional connection card. Through the DxR connection, other settings such as LAMS, synchronous external control based on digital RAM, and soft start can be achieved. Simple analog potentiometers are available for the most common adjustments.

MxK

The digital controllers of the MxK series (M2K, M2KS, M3K, M3KS, M3KSHD) are configurable via the MeccAlte App for PC or mobile devices, using the USB2MxK (USB) or MxKconnect (Wi-Fi) accessories. The M3KSHD model integrates a USB port for direct connection to the PC, without the need for optional cards. The M2KS, M3KS and M3KSHD models also support CAN Bus communication (SAE J-1939) for integration with MeccAlte GC controllers. Software-accessible features include LAMS, external voltage control ($\pm 10V$), soft start, and PID autotuning. The controller records up to 64 alarms in E2PROM memory and provides the current status via A ALARMS address. There are analog potentiometers for VOLT, STAB, AMP, and DROOP (the latter on M3K, M3KS, and M3KSHD models only). The M3KSHD includes High Dynamic Response (HDR) for a quick rush of excitement. All MxK regulators are equipped with protections against over/under excitation, overcurrent, V/f, short circuit and power overvoltage.

Regulator	M2K	M2KS	M3K	M3KS	M3KSHD	DSR	DER1	DER2
ECP3 to ECO38 G (NPE)	●	○	○	○	○	○	○	○
ECO40 to ECO46	○	○	●	○	○	○	○	○
ECO47	○	○	○	○	●	○	○	○
Parallel operation	-	-	✓	✓	✓	✓	✓	✓
Network Parallel	-	-	✓	✓	✓	✓	✓	✓
Reference 3 phase (rms)	-	-	✓	✓	✓	-	✓	✓
Accuracy	+/-0.5%	+/-0.5%	+/-0.5%	+/-0.5%	+/-0.5%	+/-1%	+/-0.5%	+/-0.5%
Remote voltage control	✓	✓	✓	✓	✓	✓	✓	✓
Alarm log	✓	✓	✓	✓	✓	✓	✓	✓
Analog and digital configurable	✓	✓	✓	✓	✓	✓	✓	✓
LAMS (Load Acceptance V/f)	✓	✓	✓	✓	✓	✓	✓	✓
APO (Active Protection Output)	-	-	-	-	✓	✓	✓	✓
Soft start	✓	✓	✓	✓	✓	✓	✓	✓
High Dynamic Response	-	-	-	-	✓	-	-	✓
USB connection without external cards	-	-	-	-	✓	-	-	✓

● Standard ○ Optional ✓ Available

Derating coefficients

Altitude (meters)	Ambient temperature (Celsius)							
	25	40	45	50	55	60	65	70
≤ 1000	1.07	1	0.96	0.93	0.91	0.89	0.85	0.82
$> 1000 \leq 1500$	1.01	0.96	0.92	0.89	0.87	0.84	0.81	0.77
$> 1500 \leq 2000$	0.96	0.91	0.87	0.84	0.83	0.79	0.77	0.73
$> 2000 \leq 3000$	0.90	0.85	0.81	0.78	0.76	0.73	0.71	0.68
$> 3000 \leq 4000$	0.84	0.78	0.75	0.73	0.70	0.68	0.66	0.62
$> 4000 \leq 5000$	0.78	0.72	0.69	0.67	0.65	0.62	0.59	0.56
$> 5000 \leq 6000$	0.70	0.65	0.63	0.61	0.58	0.55	0.53	0.50

Notes on short-circuit curves

The coefficients indicated must be used to correct the values of the three-phase short-circuit curves as a function of the nominal voltage.

The indicated coefficient must be used to correct the values of the three-phase short-circuit curves as a function of the type of short-circuit voltage.

50 Hz		60 Hz			3 Steps	2 L-L phases	1 L-N phase
Voltage	Factor	Voltage	Factor				
380	0.93x	415	0.85x	Instant	1x	0.87x	1.30x
400	1x	440	0.90x	Minimum	1x	1.80x	3.20x
415	1.04x	460	0.95x	Supported	1x	1.50x	2.50x
440	1.10x	480	1x	Maximum duration	20 s	10 s	4 s

All curves are shown for star connection in series or parallel at 400V 50 Hz or 480V 60 Hz. If the unit is reconnected from series to star parallel, the additional coefficient is 2x. From the star series to the delta series, it is 1.72x. From star in series to parallel triangle, it is 3.44x.

A smaller generator can be selected for a given engine starting service, as it has lower subtransient reactance values for nonlinear loads. The entire range from 6.5 to 3400 kVA is capable of delivering a sustained short-circuit current of >300% for up to 20 seconds.

Selection & Sizing Tools

Online tools available at select.meccalte.com support alternator selection, sizing and configuration:

- ▶ **Sizing Tool** – power sizing, motor starting and electrical verification for industrial alternators.
- ▶ **Ratings Book** – complete kVA ratings reference, 50/60 Hz, all standard voltages and temperature classes.
- ▶ **PMG Configurator** – model selection and output configuration for permanent magnet generators.
- ▶ **3D/2D CAD Library** – STEP models and 2D drawings for alternators and AVR regulators.
- ▶ **Winding Resistance** – reference resistance data for all alternator families.

For more information visit: select.meccalte.com

General characteristics

Pole number	4	Insulation class	H
Phase number	3	Protection class	IP23
Number of wires	12	NDE Bearing type	6322.2RS
Execution	Brushless	DE Bearing type	6324.2RS
Regulator type	M3K	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
ECO43 1S4 A	kVA	900	900	900	825	860	860	860	800	820	820	820	760	750	750	690	655	655	615
	kW	720	720	720	660	688	688	688	640	656	656	656	608	600	600	552	524	524	492
ECO43 2S4 A	kVA	1016	1016	1016	907	975	975	975	870	930	930	930	830	850	850	770	744	744	664
	kW	813	813	813	726	780	780	780	696	744	744	744	664	680	680	616	595	595	531
ECO43 1M4 A	kVA	1038	1125	1125	1093	992	1070	1070	1044	950	1025	1025	1000	870	950	950	910	760	820
	kW	830	900	900	874	794	856	856	835	760	820	820	800	696	760	760	728	608	656
ECO43 2M4 A	kVA	1250	1250	1140	983	1200	1200	1096	940	1150	1150	1050	900	1050	960	820	920	920	840
	kW	1000	1000	912	786	960	960	877	752	920	920	840	720	840	840	768	736	736	672
ECO43 2L4 A	kVA	1420	1420	1420	1349	1358	1358	1358	1290	1300	1300	1300	1235	1200	1200	1140	1040	1040	988
	kW	1136	1136	1136	1079	1086	1086	1086	1032	1040	1040	1040	988	960	960	912	832	832	790
ECO43 VL4 A	kVA	1540	1540	1540	-	1500	1500	1500	-	1400	1400	1400	-	1280	1280	1280	-	1120	1120
	kW	1232	1232	1232	-	1200	1200	1200	-	1120	1120	1120	-	1024	1024	1024	-	896	896

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
ECO43 1S4 A	kVA	990	1080	1080	1080	945	1030	1030	1030	900	985	985	985	820	900	900	900	720	790
	kW	792	864	864	864	756	824	824	824	720	788	788	788	656	720	720	720	576	632
ECO43 2S4 A	kVA	1115	1159	1220	1220	1069	1111	1170	1170	1020	1060	1116	1116	935	969	1020	1020	816	850
	kW	892	927	976	976	855	889	936	936	816	848	893	893	748	775	816	816	653	680
ECO43 1M4 A	kVA	1147	1200	1290	1365	1117	1144	1227	1300	1050	1100	1180	1250	960	1000	1080	1140	840	880
	kW	918	960	1032	1092	894	915	982	1040	840	880	944	1000	768	800	864	912	672	704
ECO43 2M4 A	kVA	1300	1420	1525	1525	1250	1357	1450	1450	1200	1300	1400	1400	1090	1200	1300	1300	960	1040
	kW	1040	1136	1220	1220	1000	1086	1160	1160	960	1040	1120	1120	872	960	1040	1040	768	832
ECO43 2L4 A	kVA	1585	1618	1700	1700	1516	1550	1630	1630	1451	1482	1560	1560	1339	1368	1440	1440	1161	1186
	kW	1268	1618	1360	1360	1213	1240	1304	1304	1161	1186	1248	1248	1071	1094	1152	1152	929	949
ECO43 VL4 A	kVA	1736	1824	1824	1824	1680	1765	1765	1765	1600	1700	1700	1700	1450	1540	1540	1540	1280	1360
	kW	1389	1459	1459	1459	1344	1412	1412	1412	1280	1360	1360	1360	1160	1232	1232	1232	1024	1088

Reactance & Time constants- Class H / 400V

Unsaturated (ref. EN60034-4)			ECO43 1S4 A	ECO43 2S4 A	ECO43 1M4 A	ECO43 2M4 A	ECO43 2L4 A	ECO43 VL4 A
X_d	Direct-axis synchronous reactance	%	367	431	396,5	377	391	359,3
X'_d	Direct-axis transient reactance	%	20	19,1	19,1	21,2	18,5	18,2
X''_d	Direct-axis subtransient reactance	%	10,3	8,99	9,68	11	8,7	8,53
X_q	Quadrature-axis synchronous reactance	%	157	177,5	173	160,4	181	120,3
X'_q	Quadrature-axis transient reactance	%	157	177,5	173	160,4	181	120,3
X''_q	Quadrature-axis subtransient reactance	%	22	22,3	21,3	21,2	19,9	19,1
X₂	Negative-sequence reactance	%	16,2	15,7	15	16	14,2	12
X₀	Zero sequence reactance	%	3,4	4,26	4,02	3,83	4,06	3,74
Saturated								
X_d	Direct-axis synchronous reactance	%	304,6	357,7	329,1	312,9	324,5	298,2
X'_d	Direct-axis transient reactance	%	16,6	15,8	15,8	17,6	15,4	15,1
X''_d	Direct-axis subtransient reactance	%	8,55	7,46	8,04	9,11	7,22	7,08
X_q	Quadrature-axis synchronous reactance	%	130,3	147,3	143,6	133,1	150,2	99,8
X'_q	Quadrature-axis transient reactance	%	130,3	147,3	143,6	133,1	150,2	99,8
X''_q	Quadrature-axis subtransient reactance	%	18,3	18,5	17,7	17,6	16,5	15,8
X₂	Negative-sequence reactance	%	13,4	13	12,5	13,3	11,8	9,93
X₀	Zero sequence reactance	%	3,4	4,26	4,02	3,83	4,06	3,74
K_{cc}	Short circuit ratio		0,5	0,33	0,26	0,35	0,38	0,29
T'_d	Transient time constant	sec	0,225	0,234	0,24	0,245	0,271	0,31
T''_d	Subtransient time constant	sec	0,018	0,017	0,017	0,018	0,018	0,022
T'_{do}	Open circuit time constant	sec	7,7	8,3	8,2	8,1	8,9	9,5
T_a	Armature time constant	sec	0,02	0,022	0,023	0,024	0,026	0,032

Additional information - Class H / 400V

I_o	Excitation current at no load	A	0,9	1,1	0,8	1,5	1,2	0,8
I_c	Excitation current at full load	A	3,5	4,1	3,5	4,3	3,9	3,3
Overload								
Overload per 20 sec. PRP or 10 sec. COP			300					
Heat dissipation	W		32976	35874	38639	41338	43333	44241
Telephone Harmonic Factor - THF	%		<2	<2	<2	<2	<2	<2
Waveform Distors.(THD) full load LL/LN	%		2,8 / 2,6	2 / 2,3	1,9 / 2,2	1,5 / 1,7	1,5 / 1,5	1,7 / 1,6
Waveform Distors.(THD) no load LL/LN	%		3,1 / 3	2,7 / 2,9	2,5 / 2,7	2,1 / 2,1	2,4 / 2,4	2,6 / 2,5

Reactance & Time constants- Class H / 480V

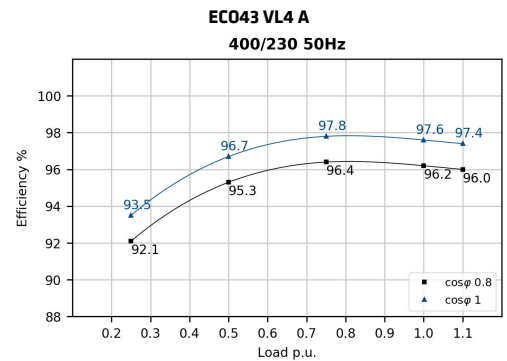
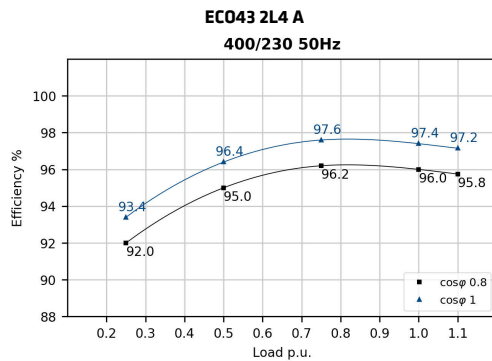
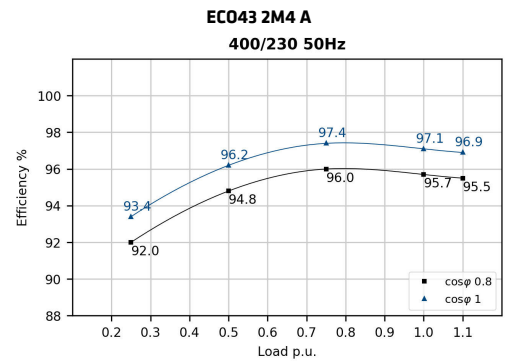
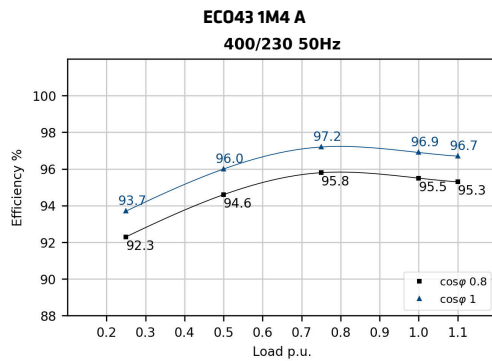
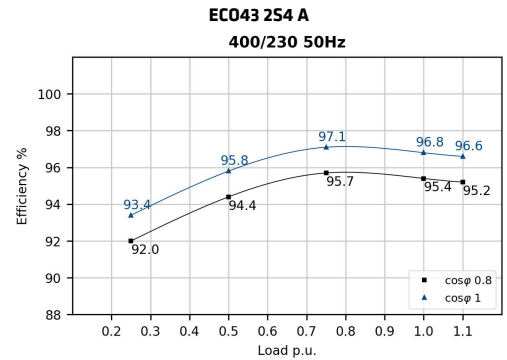
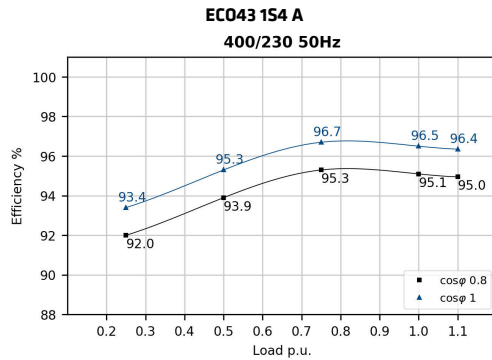
Unsaturated (ref. EN60034-4)			ECO43 1S4 A	ECO43 2S4 A	ECO43 1M4 A	ECO43 2M4 A	ECO43 2L4 A	ECO43 VL4 A
X_d	Direct-axis synchronous reactance	%	367	431	434,8	382,4	391	363,6
X'_d	Direct-axis transient reactance	%	20	19,1	20,9	21,5	18,5	18,4
X''_d	Direct-axis subtransient reactance	%	10,3	8,99	10,6	11,1	8,7	8,63
X_q	Quadrature-axis synchronous reactance	%	157	177,5	189,7	162,7	181	121,7
X'_q	Quadrature-axis transient reactance	%	157	177,5	189,7	162,7	181	121,7
X''_q	Quadrature-axis subtransient reactance	%	22	22,3	23,4	21,5	19,9	19,3
X₂	Negative-sequence reactance	%	16,2	15,7	16,5	16,3	14,2	12,1
X₀	Zero sequence reactance	%	3,4	4,26	4,4	3,89	4,06	3,78
Saturated								
X_d	Direct-axis synchronous reactance	%	304,6	357,7	360,9	317,4	324,5	301,8
X'_d	Direct-axis transient reactance	%	16,6	15,8	17,3	17,9	15,4	15,3
X''_d	Direct-axis subtransient reactance	%	8,55	7,46	8,81	9,24	7,22	7,16
X_q	Quadrature-axis synchronous reactance	%	130,3	147,3	157,5	135,1	150,2	101
X'_q	Quadrature-axis transient reactance	%	130,3	147,3	157,5	135,1	150,2	101
X''_q	Quadrature-axis subtransient reactance	%	18,3	18,5	19,4	17,9	16,5	16
X₂	Negative-sequence reactance	%	13,4	13	16,7	13,5	11,8	10,1
X₀	Zero sequence reactance	%	3,4	4,26	4,4	3,89	4,06	3,78
K_{cc}	Short circuit ratio		0,5	0,33	0,25	0,35	0,38	0,29
T'_d	Transient time constant	sec	0,225	0,234	0,24	0,245	0,271	0,31
T''_d	Subtransient time constant	sec	0,018	0,017	0,017	0,018	0,018	0,022
T'_{do}	Open circuit time constant	sec	7,7	8,3	8,2	8,1	8,9	9,5
T_a	Armature time constant	sec	0,02	0,022	0,023	0,024	0,026	0,032

Additional information - Class H / 480V

I_o	Excitation current at no load	A	0,9	1,1	0,8	1,5	1,2	0,8
I_c	Excitation current at full load	A	3,5	4,1	3,5	4,3	3,9	3,3
Overload						-		
Overload per 20 sec. PRP or 10 sec. COP		%	300					
Heat dissipation		W	37876	39150	42753	46667	46606	47867
Telephone Interference Factor - TIF			<40	<40	<40	<40	<40	<40
Waveform Distors.(THD) full load LL/LN		%	2,8 / 2,6	2 / 2,3	1,9 / 2,2	1,5 / 1,7	1,5 / 1,5	1,7 / 1,6
Waveform Distors.(THD) no load LL/LN		%	3,1 / 3	2,7 / 2,9	2,5 / 2,7	2,1 / 2,1	2,4 / 2,4	2,6 / 2,5

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
ECO43 1S4 A	%	92,0	94,0	95,6	95,2	95,0	92,0	93,9	95,3	95,1	95,0	91,8	93,9	95,4	94,9	94,5	90,9	93,3	95,0	94,5	94,2
ECO43 2S4 A	%	92,0	94,5	95,8	95,5	95,3	92,0	94,4	95,7	95,4	95,2	91,8	94,3	95,5	95,2	95,0	91,3	94,1	95,6	95,0	94,7
ECO43 1M4 A	%	92,2	94,7	95,9	95,6	95,3	92,3	94,6	95,8	95,5	95,3	91,9	94,5	95,6	95,3	95,0	91,4	94,3	95,7	95,1	94,7
ECO43 2M4 A	%	92,0	94,9	96,3	95,8	95,5	92,0	94,8	96,0	95,7	95,5	91,8	94,9	96,1	95,5	95,2	91,3	94,5	95,9	95,3	94,9
ECO43 2L4 A	%	92,0	95,1	96,5	96,1	95,8	92,0	95,0	96,2	96,0	95,8	91,8	94,9	96,2	95,8	95,5	91,3	94,6	96,1	95,6	95,3
ECO43 VL4 A	%	92,1	95,4	96,7	96,3	96,0	92,1	95,3	96,4	96,2	96,0	91,8	95,2	96,3	96,0	95,7	-	-	-	-	-

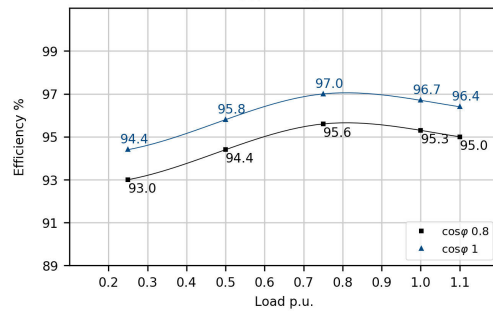


Efficiencies @ 60Hz

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
ECO43 1S4 A	%	92,9	94,2	95,3	94,7	94,5	93,0	94,3	95,5	95,2	94,6	93,0	94,5	95,9	95,4	95,1	93,0	94,4	95,6	95,3	95,0
ECO43 2S4 A	%	93,0	94,5	95,4	95,2	95,0	93,0	94,6	95,6	95,7	95,6	93,0	94,8	96,0	95,9	95,8	93,0	94,7	95,8	95,8	95,6
ECO43 1M4 A	%	93,1	94,6	95,5	95,4	95,1	93,2	94,7	95,8	95,9	95,7	93,5	94,9	96,2	96,1	95,9	93,4	94,8	96,0	95,9	95,7
ECO43 2M4 A	%	93,0	94,9	95,8	95,5	95,3	93,0	95,0	96,1	96,0	95,8	93,0	95,2	96,3	96,2	96,0	93,0	95,1	96,1	96,0	95,8
ECO43 2L4 A	%	92,5	95,0	96,1	95,8	95,5	92,5	95,1	96,3	96,3	96,1	92,5	95,3	96,7	96,5	96,2	92,5	95,2	96,5	96,4	96,2
ECO43 VL4 A	%	92,4	95,2	96,3	96,0	95,7	92,4	95,3	96,5	96,5	96,3	92,4	95,5	96,9	96,7	96,4	92,4	95,4	96,7	96,6	96,4

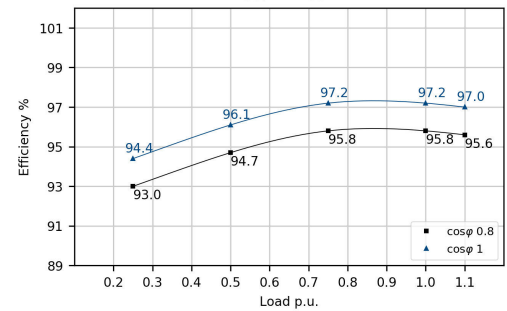
ECO43 1S4 A

480/277 60Hz



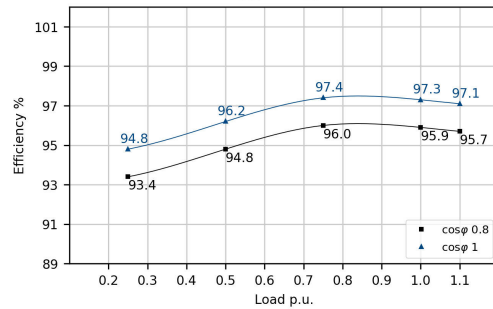
ECO43 2S4 A

480/277 60Hz



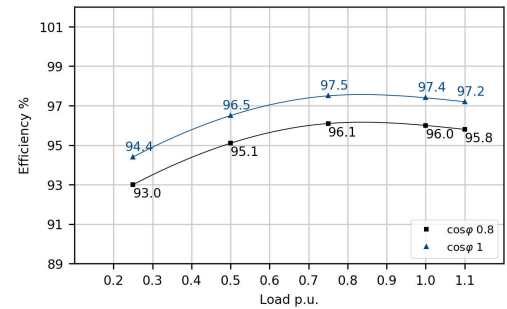
ECO43 1M4 A

480/277 60Hz



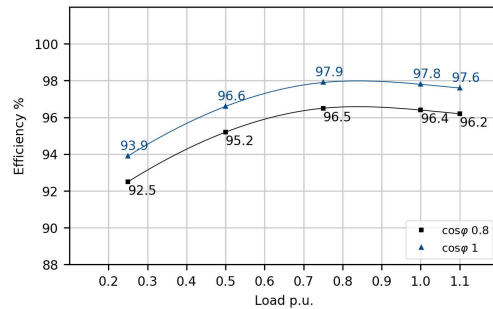
ECO43 2M4 A

480/277 60Hz



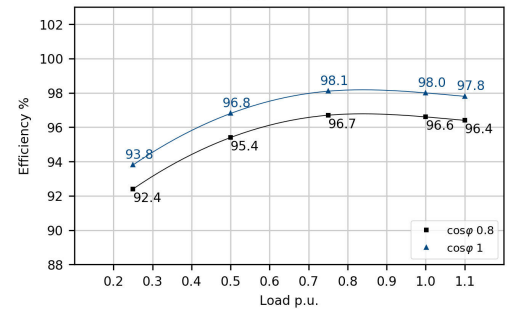
ECO43 2L4 A

480/277 60Hz

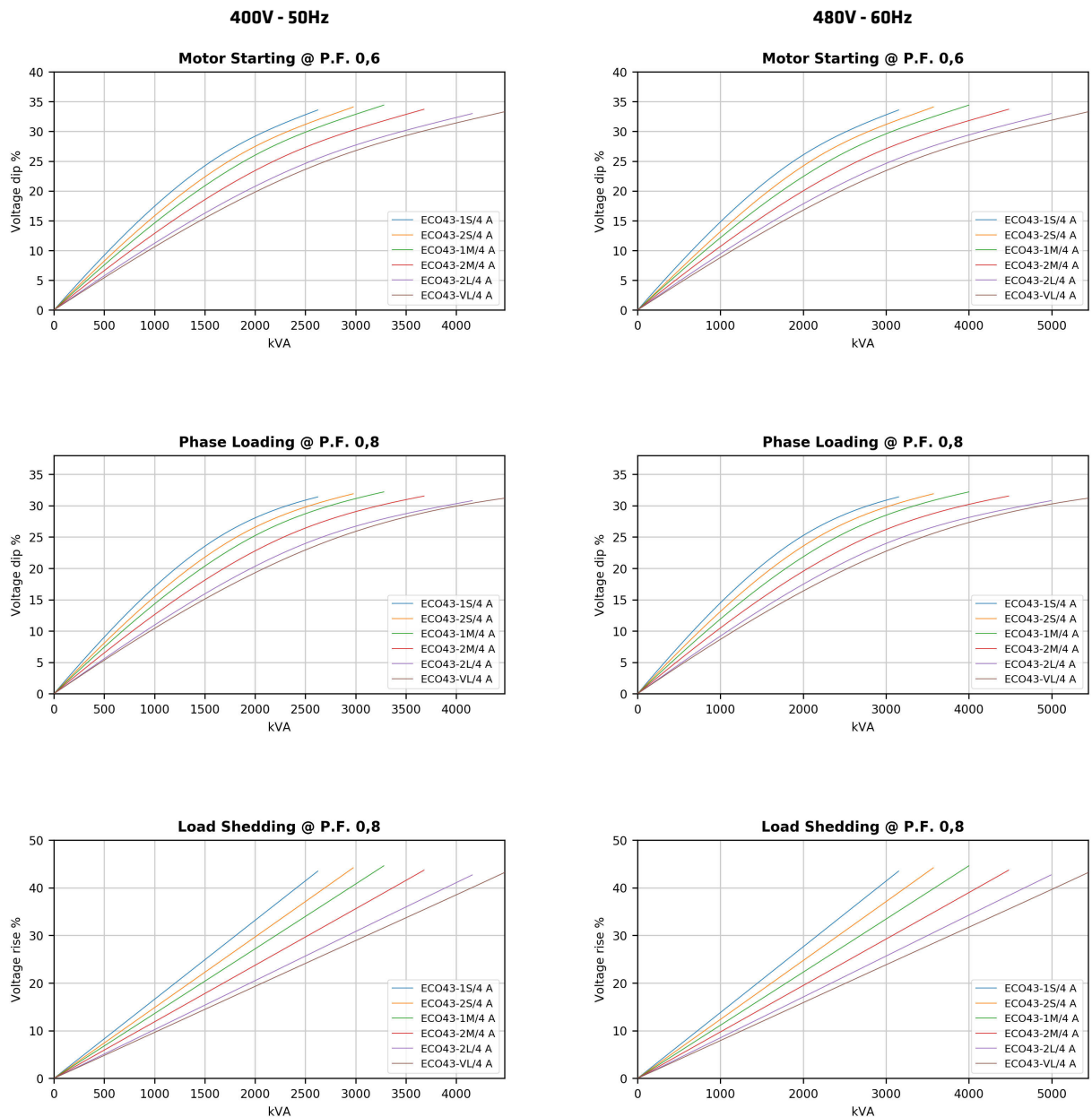


ECO43 VL4 A

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:

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

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):

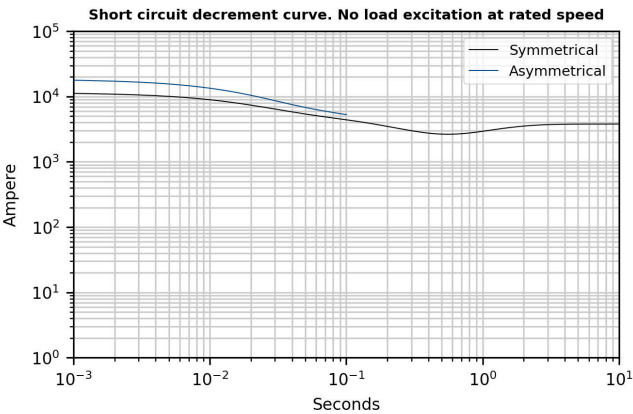
$$VCC = (400/V_{\text{new}})^2 \text{ if } 50 \text{ Hz}; VCC = (480/V_{\text{new}})^2 \text{ if } 60 \text{ Hz}$$

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.).

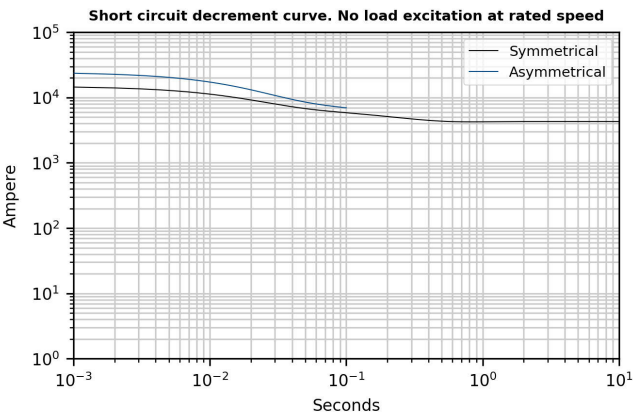
In this example, a 100 kVA load insertion at 415V is equivalent in voltage fall to a 133kVA load insertion at 480V.

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

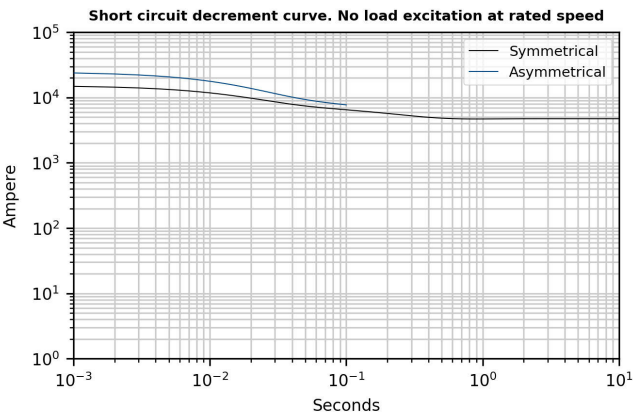
ECO43 1S4 A



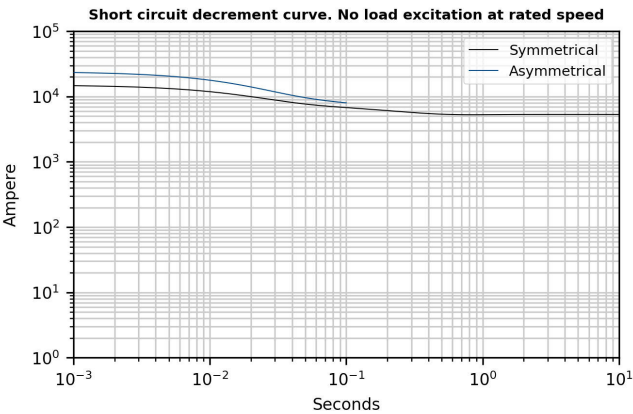
ECO43 2S4 A



ECO43 1M4 A



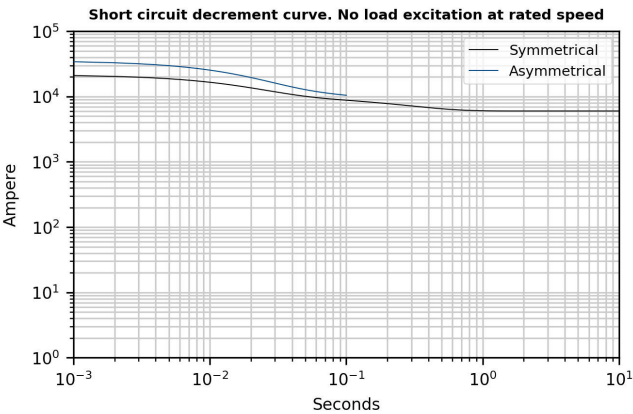
ECO43 2M4 A



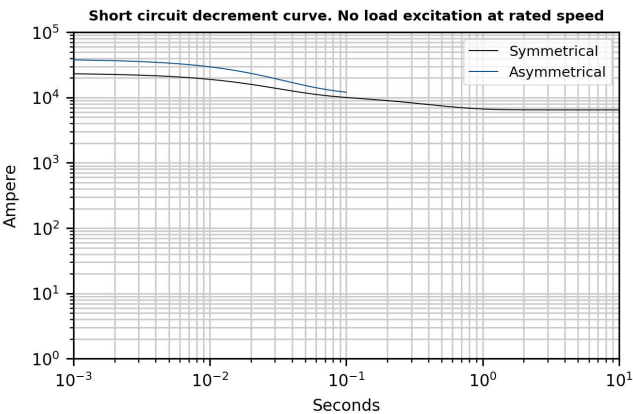
*Please refer to tables at page 6

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

ECO43 2L4 A



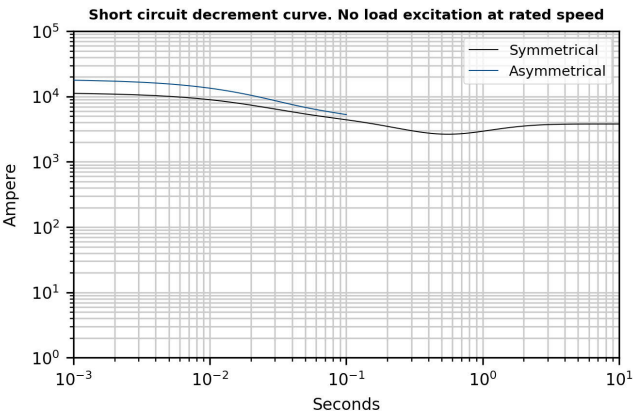
ECO43 VL4 A



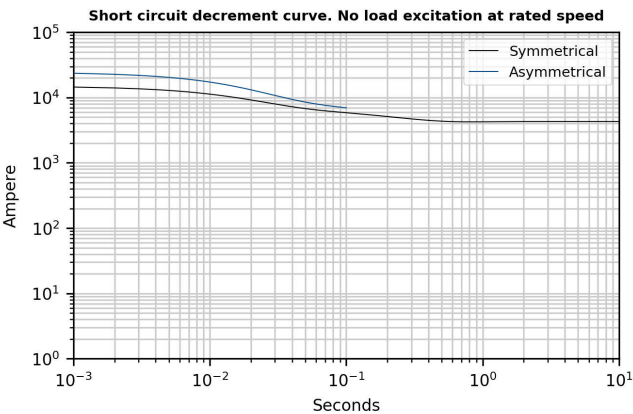
*Please refer to tables at page 6

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

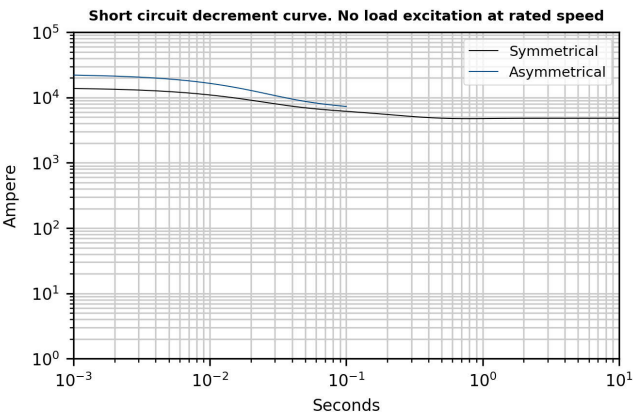
ECO43 1S4 A



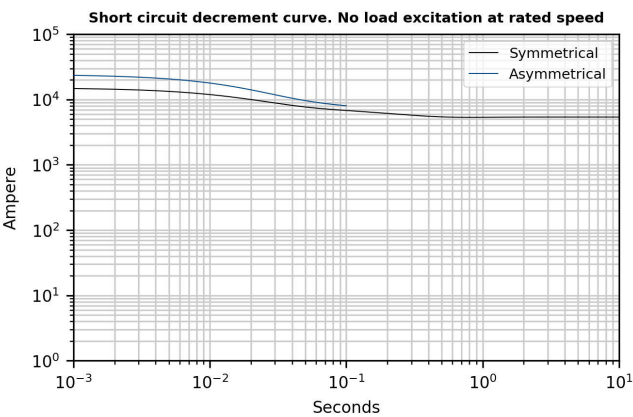
ECO43 2S4 A



ECO43 1M4 A



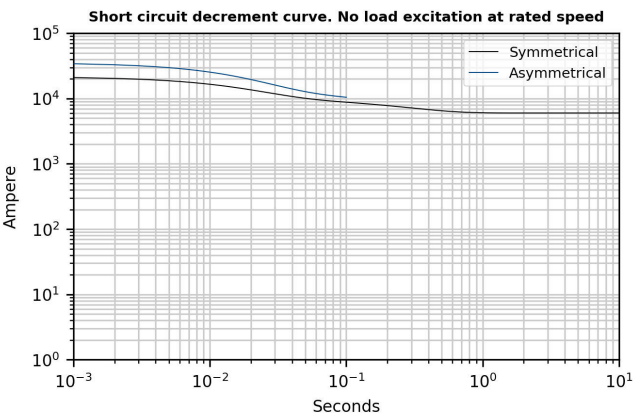
ECO43 2M4 A



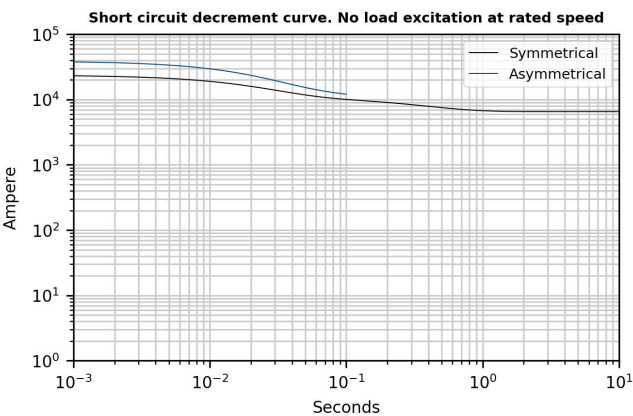
*Please refer to tables at page 6

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

ECO43 2L4 A



ECO43 VL4 A

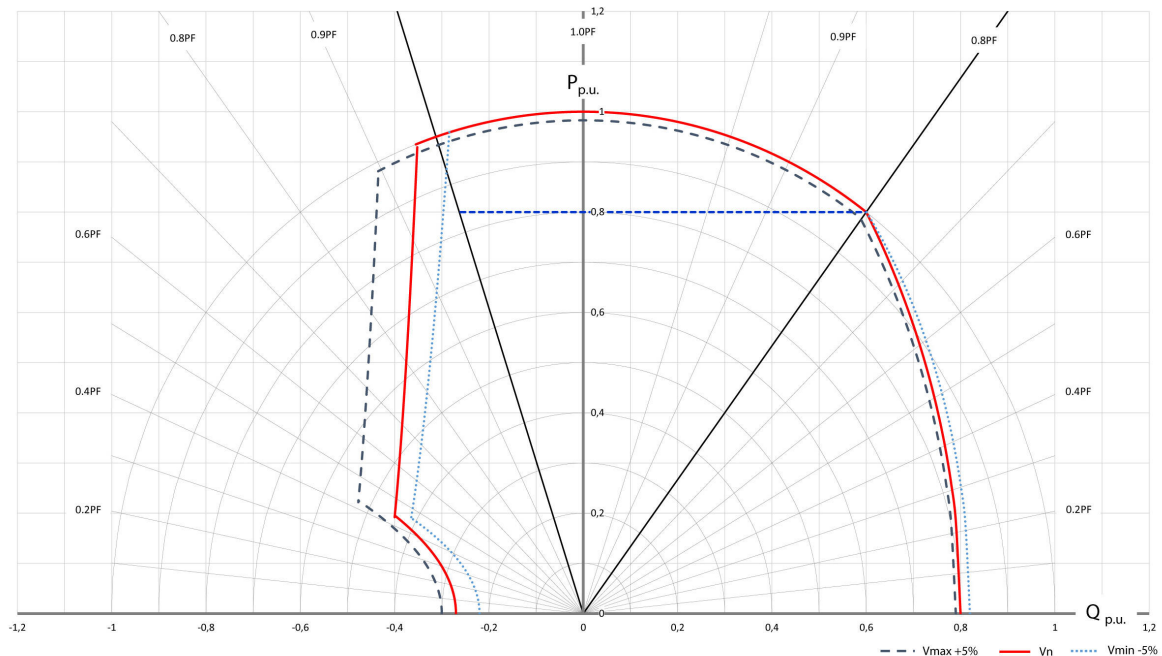


*Please refer to tables at page 6

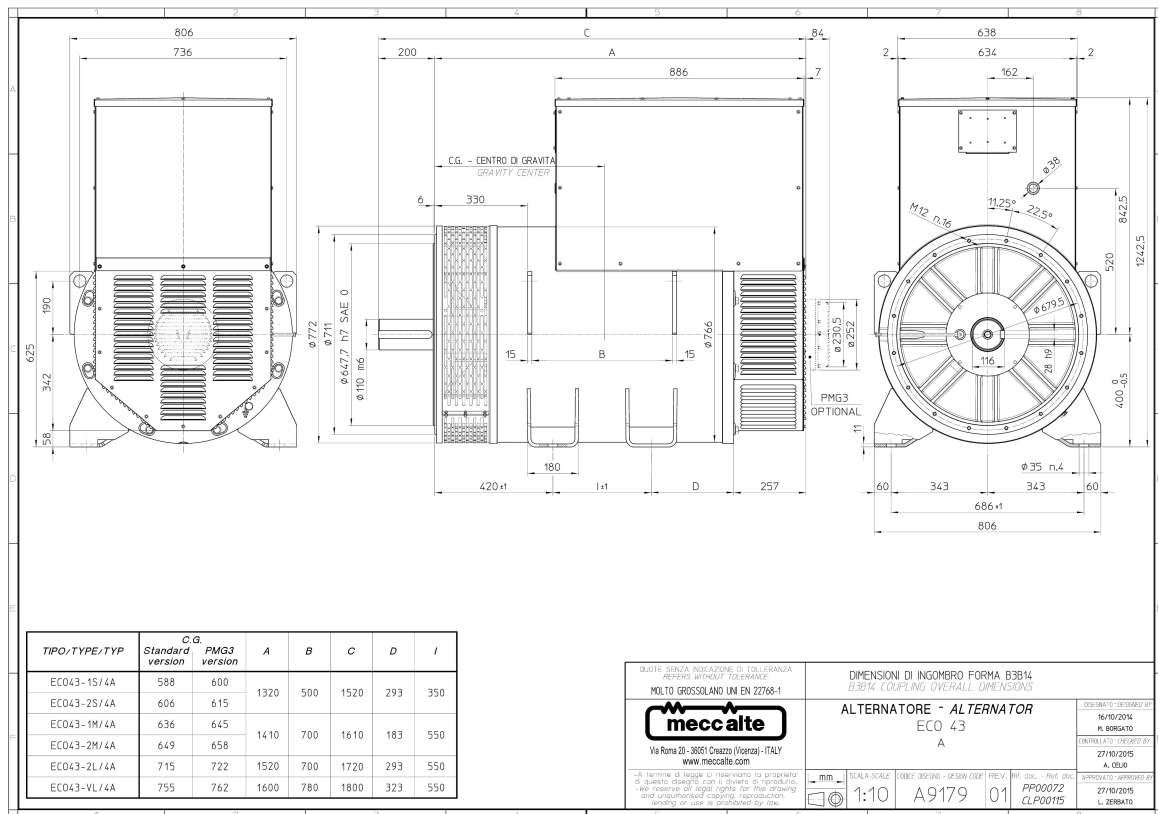
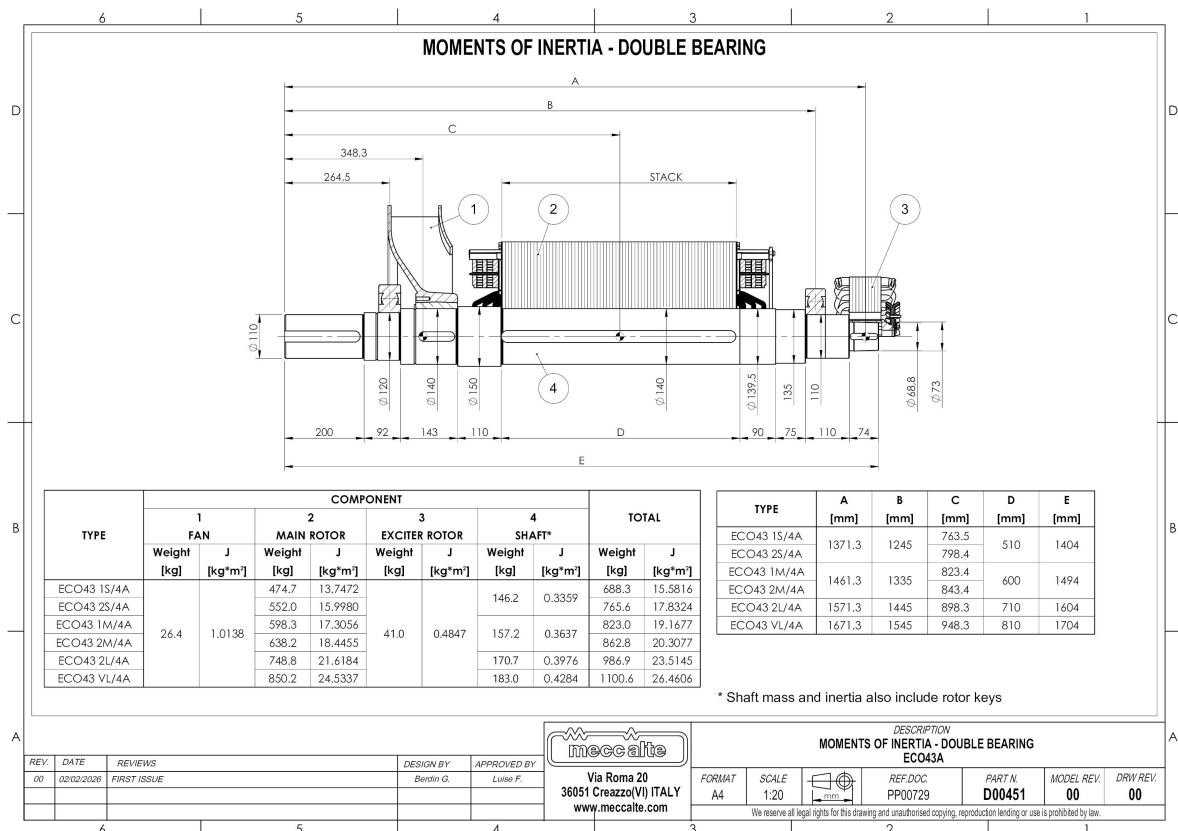
Additional Characteristics

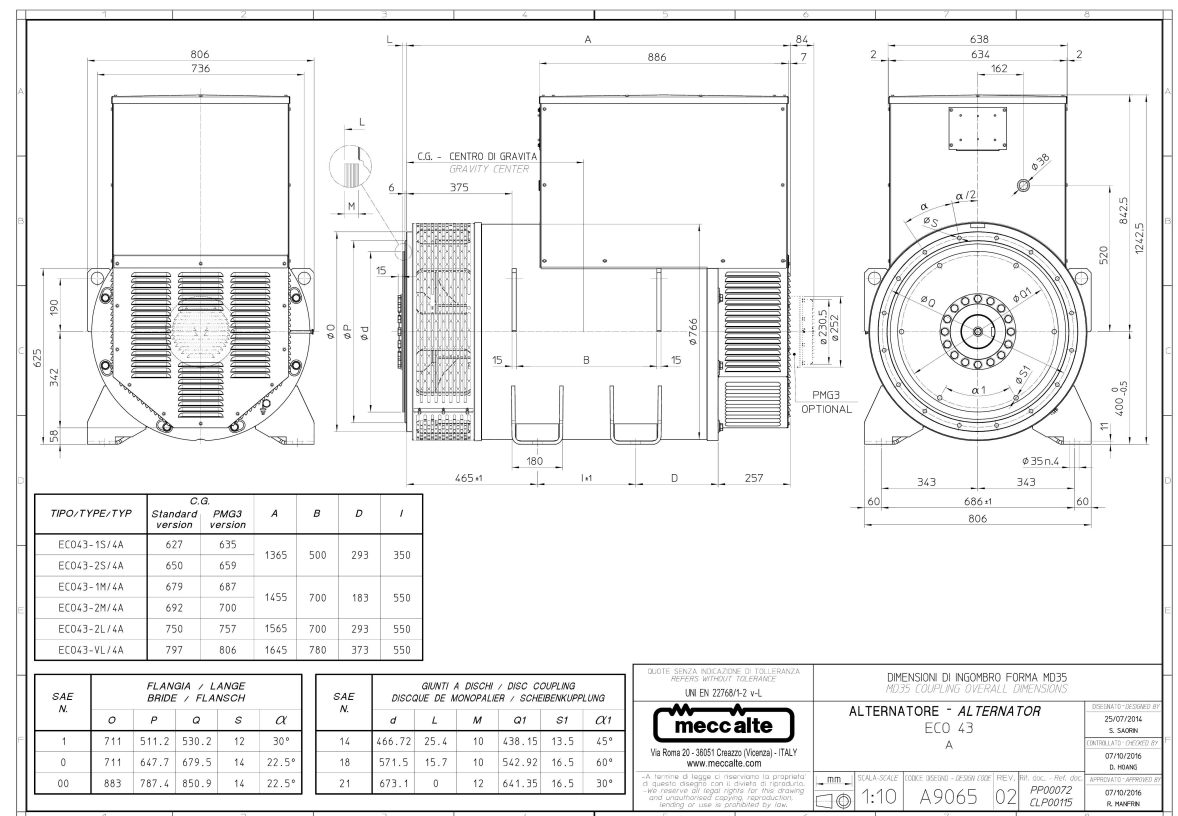
Data		ECO43 1S4 A		ECO43 2S4 A		ECO43 1M4 A		ECO43 2M4 A		ECO43 2L4 A		ECO43 VL4 A	
		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Damper cage		Copper											
Single stator coil resistance (20°C)	Ω	0,01181		0,00962		0,01015		0,0077		0,00624		0,00642	
Rotor Winding Resistance (20°C)	Ω	2,1		2,3		2,325		2,5		2,8		2,886	
Stator Exciter Resistance (20°C)	Ω	10,63		10,63		10,63		10,63		10,63		10,63	
Rotor Exciter Resistance (20°C)	Ω	0,13		0,13		0,13		0,13		0,13		0,13	
Auxiliary Winding Resistance (20°C)	Ω	0,44		0,413		0,492		0,713		0,677		0,4	
Weight of complete generator	kg	1920,0		2140,0		2275,0		2370,0		2700,0		2980,0	
Unbalanced magnetic pull	kN/mm	5,0		5,7		5,4		5,0		5,9		6,1	
Air flow	m³/min	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0
Noise level at 1m/7m	dB(A)	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89

PQ Diagram



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





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